
Papers

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Philosophy and Religion: Importance of Philosophy of Religion

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Abstract

We cannot have freedom from religion like Sam Harris, and Richard Dawkins would wish, but we can have freedom of religion. If we have freedom of religion, it is imperative to address what religion is. We live believing or disbelieving in God. Those who choose to live believing in God, live either converting others to their faith or live belligerent against those who are not in their faith. Those who choose to live disbelieving in God choose to live for what happens between the existential limits of birth and death. Still others like Harris and Dawkins attack those who preach, practice and propagate belief in God. We find it difficult to live in peace with fellow believers who don’t believe or behave like us. We don’t seem to marvel as to why people choose to believe in God. In this paper, an attempt is made to define the relationship between philosophy and religion by emphasizing the importance philosophy of religion. Philosophy of religion helps us to understand what the believer who holds belief must know about their beliefs about God. While religious claims are focused on ontological concerns, philosophy is focused on the questions that necessitate such beliefs. In religion, answers are many and understood as being true or false. In philosophy, the questions are considered as being either relevant or irrelevant. Philosophy of religion distinguishes the issues related to the epistemic-ontological and epistemic-existential concerns. Here are some insights the believer should know about beliefs related to God: First, God, like Gold is definable but God, unlike gold, is not identifiable. Establishing the ontological and metaphysical necessity of God cannot establish ontological identity. So it becomes imperative to go back to the question “why is there something instead of nothing” (Leibnitz). This is the basis for all religions. Second, we must believe that no one has a monopoly on religious truth—in that, the gap between what we know and what there is to know is so immense—that it can be a formula for humility. The birth of believer is the birth of meaning and an authentic life. Thirdly, we must note that the believer is not one who defines what truth is but is a witness to what truth does in the life of the believer. So it does not matter whether “truth transcends the text” but what matters is what transforms the believer. Religion is not about what truth is but about what truth does. What philosophy does is to ascribe meaning to religious claims in the context of everything else. All answers we claim to have are answers to questions. We can have questions without answers, but we cannot have answers without questions.

Key Words: Religion, Philosophy. Questions and Leibnitz
Introduction

We do not know how insentient matter becomes sentient, but we know that when sentience becomes intentional,\(^1\) we have to deal with the content of mental states. When we become cognizant of our intentional states, we can define and defend those mental states. We are aware of the material, mental, moral and mortal self. We are aware that insentient matter becomes sentient, sapient and intentional even if we do not know how. We are aware of our intentional or cognitive states, even if we do not know why. We are aware that we can either subscribe to divine prescriptions or ascribe to human ascriptions of right and wrong to what we say and do, even if there is no scientific basis for doing so. We are aware of being and non-being\(^2\) and cognizant that we can choose to either live or die.\(^3\) Most people choose to live rather than die. Those who choose to live, know why they choose to live and those who choose to die, know why the choose to die. It is when we choose to live when we could choose to die that life begins to have meaning. Religion is about meaning associated with God, but since God is only definable and believable but not identifiable, the emphasis should be on why we choose to believe in God. Theists argue that God is the best explanation for understanding cosmology, consciousness, and conscience. Two things that are associated with God are, moral life and life beyond this planet. Both of which are relevant to all. Philosophy is about the questions of life and religion is about answers to the questions of life. Philosophy of religion explains the answers related to the questions of life and notes its ontological, epistemic and existential implications. What must be noted is that it is not important to establish the truth of what we believe\(^4\) but important to establish the truth of why we choose to believe.

Why we chose to live defines why we believe in what we believe. God in most religion is an explanation of the universe and source for morals. What Leibnitz said was that if anything has a beginning, then it must have a cause, must be contingent and can cease to exist. However, any causal explanation for the universe must be uncaused, must be non-contingent and cannot cease to exist.\(^5\) This provides the basis for philosophy of religion. Philosophy of religion is brought to the forefront when the ontological, epistemic and ontological concerns related to the reality of God is understood in the context of the reality of the universe. Leibnitz’s question is important because we are not only aware of the universe but aware of the question\(^6\) that posits many answers to the questions of life. Sam Harris\(^7\) and Richard Dawkins\(^8\) argue that humans must free themselves from religion. But as long as the questions of life are a given we can only

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3. Albert Camus, The Myth of Sisyphus, Trans Justin O’Brien. (Great Briton: Penguin Books, 1975), 11. Camus argues that “all healthy men have thought of suicide,” (13) and that there is a link between suicide and the absurdity of life (13) He also argues that suicide is a solution to the absurdity of life. Does the absurd require one to escape it through suicide? (16) Camus points out later that committing suicide does not negate the absurdity of life when he argues that it is in the context of this absurdity that we must live (54).
4. We cannot establish the truth of what we believe, even if we try. For we can hold beliefs with or without, against or regardless of evidential considerations.
6. Ibid. 26 “Why is there something instead of nothing”
8. Richard Dawkins, The God Delusion (New York: Houghton Mifflin Company, 2006) 51 51Dawkins argues that the idea of God is a ‘delusion’ p 52. Dawkins argues that beliefs are replicating memes passed on from one generation to the other
argue for freedom of religion. Religion is about being good and living a meaningful life in the context of what we believe; philosophy is about living an authentic life and being intellectually honest with why we believe.

Philosophy of religion is best understood when we juxtapose why we choose to live in the context of why we choose to believe. When we become aware of being and non-being, and we choose to live rather than die then Leibnitz question as to why there is something rather than nothing becomes important. Why we choose to live is the basis for why we choose to believe in God, not the other way around. To Camus suicide was the single question humans confront in life9 and that life is absurd regardless of whether one commits suicide or not. However, Camus argues that suicide does not negate the absurdity of life. We must live in the context of absurdity. In this paper, it is argued that since most people choose to live rather than die, then the question of choosing to live without knowing why we choose to live is the basis for the absurdity of life, not life itself. Most people who choose to live do so not because they can’t or won’t choose to die but because they don’t choose to die. Most people choose to live and know why they choose to live. Life is either absurd or meaningful. Life is absurd if we choose to live and not know why we choose to live. Life is meaningful if we know why we choose to live. To choose to live is to choose to believe, learn and serve. We are not born with all the ‘moments’ in life, for we are given only one movement at a time. So we have to make every moment count. Only those who choose to live have to deal with the question of the meaning of life. The absurdity of life can be best addressed when we understand why we believe in what we believe.

**Religion**

Religion is at its best when it attempts to give answers to three fundamental questions of life—namely the question of origin, the possibility of life beyond this planet and the need and basis for a moral life. Concerning the origin of the universe—either the universe was created or is contingent on God. Either way, God is central in the explanation of the universe. Concerning the possibility of life beyond this planet or the hope of an afterlife, it is a given in human history. Whether it is the resurrection of the soul with a new body or the resuscitation of the old body with the same soul; whether it is the preservation of the dead or the reincarnation of the soul, humans yearn for a life beyond this planet. All life is about hope, but we do not live to hope, but we hope to live. Belief in the Creator-God, life beyond this planet and living a good life is part of the search for a meaningful life. Living a moral life is another feature of the human condition. We are moral when we either prescribe to morals given to us by God or when we ascribe notions of right and wrong to what we say and do. In both instances we are moral. The meaning of life is hard to explain but is considered fundamental if we are to live an authentic life.10 Knowing why we choose to live believing in God makes such a life worth living. Believing in God and life beyond this planet is tied up with why we choose to live a moral life.

**Relationship between life, afterlife, and life beyond this planet.** The sapient and intentional self understands the need to define the relationship between the origin of conscious life and life beyond this planet, for it would be absurd to imagine that conscious life exists only on our planet. Conscious life is contingent on biological sustenance. While mental states are contingent on neural states, they are irreducible to brain states.11 While consciousness on planet earth is

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9 Albert Camus, *The Myth of Sisyphus*, 54
contingent on a carbon-based brain—it does not mean there cannot be non-carbon-based consciousness. Common sense dictates the possibility of life beyond this planet. John Lennon asked us to imagine that there is no heaven\textsuperscript{12}, now it is becoming clear that there is nothing wrong to imagine that there is heaven or life beyond this planet. The best way to understand life and afterlife is to define afterlife is in the context of life beyond this planet. Understanding religion as beliefs related to life beyond this planet takes into consideration not only the possibility of the afterlife in the context of the existence of God but includes the possibility of the existence of other conscious beings. People who choose to live believing and disbelieving in God do so in the context of afterlife. Those who believe in God believe in life after death and those who believe in life after death believes in God.

**Why God as the creator-God is understood as the uncaused cause.** The cognizant mortal self is aware that all beings that have a beginning have a cause for being\textsuperscript{13}. It is easy to establish the need for a causal being (*de dicto*) and with some difficulty determine the need for the uncaused cause (*de re*) based on the facticity of the universe and the question of regression. However, *de dicto* and *de re* necessity can only establish the ontological necessity of God, but cannot determine the metaphysical necessity of God. The metaphysical claim that God cannot not exist or necessarily exits in all possible worlds can be only held as true as an epistemic truth. Even though it is hard to establish why there can only be one creator-God and one immortal-God, the Egyptians (Pharaoh Akhenaten)\textsuperscript{14} and Hebrews\textsuperscript{15} argued for such a being. While we can establish God as the causal being and with some difficulty determine why God is considered as the uncaused cause, we cannot by reason explain why there can be only one such being. However, while God is definable and believable, God is not identifiable should God encounter us. We cannot give any particular identity to the concept of creator or immortality, neither has God revealed any identity to identify God. Ontological necessity nor metaphysical necessity can provide the basis ontological identity. Not ‘identifiable’ does not mean that God has no identification. It means that God’s identity is not known or that it is not revealed from the information we have about God. If God chooses not to reveal his identity, there must be a reason. God, understood as the causal necessity does not give any *de re* identity of God. Causal necessity and the necessity for the uncaused cause to stop the cycle of regression does not provide any identity for God. Neither can the monotheistic idea that there is only one uncaused cause provide an identity for God as God.

**Moral nature of human beings.** The social self is cognizant of the moral and volitional self and that we are moral when we either subscribe to divine prescriptions given to us by God or to ascribe to human ascriptions of right and wrong to what we say and do. If we subscribe to divine prescriptions, then we turn our attention to God, but if we ascribe to human ascriptions, then, we turn our attention to the law.\textsuperscript{16} If God is the source of morals, then the question to ask is, is right conduct right because God said so or God said so because it is right\textsuperscript{17}. We are moral.

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\textsuperscript{12} The popular song entitled “Imagine there is no Heaven”
\textsuperscript{13} Then it must also be true that if there is a being without beginning, such a being cannot have a cause for its being and cannot cease to exist. Understanding God in the context of causal, logical, metaphysical necessity defines the different aspects of God. Causal necessity defines God as the Creator-God, metaphysical necessity of God defines God as God in all possible world. If we can establish a posteriori necessity of God, then we could establish the ontological identity of God. Necessity can be understood in terms of Doxastic or epistemic necessity, deontic or moral necessity, metaphysical or model necessity, nomic or physical necessity.
\textsuperscript{14} Akhenaten (Amenhoptep VI)
\textsuperscript{15} Deut. 6:4 Know that your God is one. 1 Timothy 1:17 argues that God is invisible and immortal
\textsuperscript{16} Here the law is a social contract (Hobbes).
\textsuperscript{17} Ascribed to Epicurus
not because we do what is right but because we ascribe notions of ‘right’ and ‘wrong’ to what we do and say. What is moral is what is rational, just, good and lawful. We do things as being right and wrong because God said so or do so because we ascribe ascriptions of right and wrong to things we say and do. Being moral by prescriptions or ascriptions does not change the fact that we are moral. The best way to define the moral self is to understand the Divine Self. Only religion attempts to explain the mortal and moral self in the context of the immortal and divine self.  

The best way to define religion is to define the relationship between being good and doing good. For we can do good and not be good, but we cannot be good and not do good. If what is right and wrong is defined by God then morals are preestablished and can be held as absolute. However, if morals are defined as what is ascribed as right and wrong in what we say and do, then moral/laws are social contracts to regulate behavior. The best way to define human condition is to understand morals in the context of being moral. What is the difference between morals from being moral. Morals define what we say and do as right or wrong. We can be considered as being moral when we either ascribe notions of right and wrong to what we say and do or when we accept preestablished divine prescriptions given to us from God. The only way what is wrong is wrong even if everyone is doing it and what is right is right even if no one is doing it, is, if God is God in all possible worlds and if there is life beyond this planet.

Philosophy

Philosophy is best for its questions—and questions there are many—Leibnitz question is perhaps the most important—why is there something rather than nothing. The truth of metaphysics is not related to establishing the truth of its claims but to the relevance of the questions. The job of metaphysicians is not to see whether the answer of religion correspond to facts but to address the answers in the context of the relevance of the questions that necessitates metaphysical answers. To question, challenge and confront the proposed answers to the issues of life is to be intellectually honest. Questions are neither right nor wrong; answers might be either true or false. We may have questions without answers, but we cannot have answers without questions. An answer is right or wrong only in relationship to questions. The relevance of the answers is tied up with the relevance of the questions. If the relevance of the answers is tied to the relevance of the question, we must understand why it is so. Each question is studied for its relevance even if the answers cannot be ascertained as true or false. So we shall look at the fundamental questions and respect the answers regardless of establishing the veracity of the answers. Answers are different, definitive, and divisive. Questions are common and universal—they are either relevant or irrelevant. Questions determine the relevance of the answers, and answers without questions are irrelevant.

Philosophy of Religion

Religion without philosophy would be half meaningful, philosophy without religion would be half empty. The nature of consciousness—is such that it allows us to be cognizant of our mental states, which is the basis for metaphysics. The content of our cognizance is the basis of religion. This is significant in that we understand the nature of what we are aware of because of this

18 What is moral can be defined as what is just, right, good or legal. But the question is why do we define what we do and say as being right and just.

special awareness. Metaphysics or the nature of reality is possible only because of the type of awareness that human condition exhibits. While religion is interested in the truth of what believe, philosophy of religion is interested in the truth of why we choose to believe. Philosophy and religion are two different subjects. One deals with questions and other deals with answers. Philosophy emphasizes the relevance of the questions and understands that answers are subject to change, revision, and enhancement. Religion emphasizes the veracity of the answers without too much emphasis to the relevance of the questions that necessitates such answers. Philosophy of religion deals with three fundamentals concerns related to religious claims. The epistemic concerns; the ontological concerns and the existential concerns related to the explanation for cosmology, the nature of consciousness and the content of conscience. Each answer must be understood in the context of the relevance of the questions. Whether God exists or not is an ontological matter, how we come to know about God is an epistemic matter. Whether we choose to believe in God is an existential matter.

**Ontological awareness.** The material/mental self is cognizant that we are alive, awake, alert and aware.\(^{20}\) We are aware that humans have a material, genetic, moral, social, mental or intention self and more importantly that we have a mortal or temporal self.\(^{21}\) We are aware of being and non-being. We are also aware of God that is considered as birthless and deathless. The awareness of being and non-being in the context of God that is birthless and deathless purports the possibility of life beyond this planet. To choose to live is to choose not to die and to choose not to die is to choose to live. We are aware that all beings that have a beginning can cease to exist and beings that do not have a beginning cannot cease to exist. The mortal self is aware of the immortal self. The claims we make that God is the uncaused cause, non-contingent and cannot cease to exist are metaphysical claims. The metaphysical necessity defines God as God in all possible worlds. Why should God be considered as God in all possible worlds? Because there are abstract realities such as numbers and universals require a mind to house such realities. This mind must be eternal and single if mathematical and geometrical truths remain true in all possible worlds alike. What the believer must know about God is that God has no beginning, non-contingent and cannot cease to exist nor choose to exit (choose to die). As opposed to humans who have a beginning, can cease to exist or choose to exit (choose to die). It is hard to accept that God is a being that is without cause, without beginning and cannot cease to exist, but even more difficult to accept the notion that there is only one such being. ‘Beginning’ implies beings, but being does not imply beginning. Only beings that have a beginning have their beginning in the beginning. There are beginningless realities such as numbers and universals—but such realities can be accepted only if there is an eternal mind in whose mind such realities exist.

**Epistemic awareness.** The cognitive and epistemic self is aware that whether God exits or not is an epistemic-ontological matter, however, the truth and falsity of what we know of about God is an epistemic-existential matter. Truth and falsity are epistemic concerns.\(^{22}\) What philosophy of religion does is to show that we can know about God without believing in God but we cannot believe in God without knowing something about God. Intentional states are such that we can know *(de dicto)* and believe *(de re)* without knowing the *de re* identity of God. We can know and hold something as true independent of knowing the identity of what is

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\(^{20}\) Unlike animals that are unaware that they are alive, awake, alert and aware.

\(^{21}\) Martin Heidegger, *Being and Time* 380, 389

\(^{22}\) Bertrand Russell “Truth and Falsehood” Michael F. Goodman and Robert A. Snyder *Contemporary Reading in Epistemology* (New Jersey: Prentice Hall, 1993) 174. The mind can create beliefs but they cannot make them true or false. Truth is not an intrinsic matter but an extrinsic matter.
claimed. Empirical beliefs are such we can know and believe what is known, but metaphysical beliefs are such that even if they were empirical, we must choose to believe or disbelieve because they can be held as true regardless of empirical verification. Beliefs in religion can be understood as being either basic or non-basic., de dicto or de re., faith-based or fact based truths. Basic beliefs are beliefs that are not supported by others beliefs. Non-beliefs are beliefs supported by other beliefs. Belief in God is basic. Beliefs in religion can be held as true with or without evidence, against or regardless of evidence. So while God cannot-not exist, belief or disbelief in God is an existential matter. People choose to live either believing or disbelieving in God. The reality of God is important only the context of the awareness and the choice to believe or disbelieve in God.

Intentional or mental states can be understood as de dicto or de re beliefs, where de dicto beliefs deal with the proposition of the belief, and de re beliefs deal with a particular aspect of the subject of the proposition. Mental states are interesting. We are not only aware of what we are aware of, but we are conscious of the fact that we can choose what to be aware of--such as the concept of God, the self, and freedom. Consciousness is a visible neural emergence –in that we can detect by MRI whether cognitive states are present even though we cannot extrapolate what those mental states are. So consciousness is a visible emergence like liquidity in water, but the conscious self is an invisible neural emergence like gravity where there is mass. It is the conscious self that is cognizant of why we believe in God. It is the conscious self that gives reasons for why they choose to believe in God. So belief in God is a justified belief–decision. While the justification for empirical beliefs is directed towards evidence, the justification for metaphysical beliefs is directed towards the decision as to why we choose to believe.

**Existential awareness.** The existential self is cognizant that establishing what truth is, is not as important as understanding what truth does. All life is about meaning. But we do not live to ascribe meaning to life; we ascribe meaning to life to live. What makes life absurd is not life but the imposition of life. What must be noted is that it is only ‘birth’ that is an imposition, not life nor death. When we become aware of being and non-being and become aware that we can choose to live or die we realize that both life and death are not impositions. When we can choose to live or die, life is not an imposition; when we can choose to die before natural death, death is not an imposition. Most people choose to live rather than die, but this does not preclude that they can’t or won’t choose to die. It is not life that is absurd but choosing to live and not knowing why we choose to live is what creates the absurdity of life. So all life is about ascribing meaning to life. God and belief in the self and freedom are all part of human attempt to remove the absurdity of life. So belief in life beyond this planet, extraterrestrial life and after-life is all part of the quest to remove the absurdity of life. Because of the existential awareness of God, humans have to live either believing or disbelieving in God. Further, we have to live believing or disbelieving that life has meaning. For once we become aware of both being and non-being, and know that we can choose live or die. Those who choose to live know why they choose to live or know why they choose not to die. Only such a life is worth living. While one can choose to live a meaningful life without God one can also live a meaningful life in the context of God. The humanists argue that we can live a meaningful life between the womb and the tomb while theists argue that we can live a meaningful life in the context of life beyond this planet.

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24 I coined this expression in 2001 in my Book *What is your Belief Quotient*, (Monograph Publisher 2001)

25 Humanist like Sartre would argue that one can live an authentic life only independent of God. (Humanism and Existentialism)
Conclusion

History has taught us that humans do not have ‘freedom from religion’ but do have freedom of religion. We do not have freedom from religion because we are not free from the questions that necessitate belief. If freedom of religion is considered fundamental to humans, then we must understand what religion is in the context of why we choose to live believing or disbelieving in God, freedom and the self. Life is absurd only if we choose to live and not know why we choose to live. Knowing why we choose to live is to address the questions as to why we choose to believe in God, freedom and the self. Here each believer has a right to define and defend why they choose to believe what they choose to believe. A secular mind allows for such diversity of beliefs. There is no place for fundamentalism and dogmatism. We must not attempt to establish the truth of what we believe. Instead, we must establish the truth of why we choose to believe. As long as we have questions, we will have beliefs related to life beyond this planet.

The sapient self is cognizant of the questions that posit the ontological and metaphysical necessity of God. The ontological necessity of God posits the causal explanation for the concrete universe, the metaphysical necessity of God provides the explanation for the abstract universe such as numbers and universals. The ontological necessity of God is the basis for belief in God. Metaphysical necessity is the basis that posits God as God in all possible worlds providing the reason why we believe that 2+2=4 as true in all possible worlds. God is definable and believable, though from what we know about God, God is not identifiable. Ontological or metaphysical necessity cannot help us acknowledge God as God should God encounter us. Religion, in general, argues that the mortal self is created, contingent and can cease to exist and that the immortal self is uncreated, non-contingent and cannot cease to exist. The best way to define the mortal self is to understand the self in the context of the immortal self.

The truth about religion is not related to establishing the veracity of its answers; it is related to the relevance of the questions and the meaning associated with the answers. No one has monopoly over religious truths; we can claim ownership of our answers because of the relevance of the questions. The attributes of God that the believer wants to define and defend is up to the devotee. Religion is about ascribing meaning to life independent of trying to establish the truth of what we believe. All life is about meaning, but we do live to ascribe meaning to life. Whether “truth transcends the text” is not as important as how ‘truth transforms the believer.’ The birth of a believer is the beginning of eternal life. We can choose to live in the context of the existential limits between birth and death or choose to live in the context of life beyond this planet.

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26 Quine seems to suggest that any explanation for belief can be the basis for truth.

27 What must be noted is that Kripke introduced the idea that not only is a priori truth true in all possible worlds but a posteriori truth once established are also true in all possible worlds. However, 2+2=4 is real but has no place nor location.

28 From what we know about God

29 The conscious self is aware of the material, metaphysical, moral, and mortal self. The best way to understand the conscious self is to understand the sapient self. (how the sentient self becomes sapient is a mystery) The best way to understand the material self is to understand it in the context of the genetic self. The best way to understand the mortal self is to understand it in the context of the volitional self.

30 For some it is the idea of the creator-God, for others it is the idea of moral-God still others it is the basis for why God is God in all possible worlds. We cannot be arguing over what the believer puts emphasis on.
Bibliography


Block, Ned and Stalnaker, Robert. “Conceptual Analysis, Dualism and the Explanatory Gap”


A critical literature review on entrepreneurial traits and business performance: Citation and thematic analyses with a conceptual model

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Abstract

The relationship between the entrepreneurial traits (entrepreneurial orientation, entrepreneurial skills and entrepreneurial experience) and business performance have a considerable scholarly attention in the literature. Most of the scholars have found a strong relationship between the said variables. Thus, a growing number of researchers consider entrepreneurial traits as a powerful tool for business performances. It has found that different thoughts being empirically developed on entrepreneurial traits and business performance. The purpose of this paper is to offer a clearer picture of the relationships of entrepreneurial traits and the business performance. A total of 135 research papers published between 1996 and 2016 have been considered for the study. The review basically consist with two main aspects. Firstly, a thematic analysis is carried out to explore the main categories and the identical themes within each category. Secondly, the author further reviews the literature by means of a citation analysis and then the top ranked and most cited papers are categorized accordingly.

Despite the large number of research papers are written based on the performance of an entrepreneurial firms, the present study investigates the relationship between four main attributes and firm performance. The author develops a conceptual model to interpret the identified relationships of the categorized variables. The developed model also indicates new relationships inbetween the independent and dependent variables. On the other hand, it reflects the research gaps for future researches. Therefore, there is a valid reason to study the relationships of the entrepreneurial traits and business performance. Key words: Entrepreneurial traits, Entrepreneurial growth intention, Business performance

1. Introduction

This study examines the relationship of entrepreneurial traits on business performance. There are several factors that directly link with the business performance of a firm (Naldi et. al., 2007; Stam and Elfring, 2008). However, this study has mainly focuses on the role of entrepreneurial traits towards business performance.

Therefore, the purpose of this study is to identify the real picture of the relationships of entrepreneurial traits and business performance. Firstly, a thematic analysis is carried out to explore the main categories and the identical themes within each category (Liñán and Fayolle, 2015). Secondly, it further reviews the literature by means of a citation analysis and the top ranked and most cited papers are categorized accordingly. Both of these analyses have helped to identify not only the main influential attributes, but also the new relationships within those variables. The author has identified entrepreneurial orientation, entrepreneurial skills and entrepreneurial experience, as influential entrepreneurial traits on business performance. However, some of the scholars have contradictory notions, regarding whether these entrepreneurial attributes have a positive or negative impact on business performances.

The literature shows a positive relationship between entrepreneurial orientation and business performance (Wiklund & Shepherd, 2005; Lumpkin and Dess, 2001; Kreiser et. al., 2002; Knight, 1997.), entrepreneurial skills and business performance (Chrisman et. al., 1998; Lerner and Haber, 2001; Habbershon et. al., 2003) and entrepreneurial experience and business performance (Chandler, 1996; Chrisman et. al., 1998; Ucbasaran et. al., 2010). Therefore, direct positive relationships can be identified between entrepreneurial orientation, skills, experiences and business performance.
In addition, some scholars have identified another relationship between entrepreneurial orientation and entrepreneurial intention (Bird and Jelinek, 1998; Wilson, 2007; Kolvereid, 1996), entrepreneurial skills and entrepreneurial intention (Bird and Jelinek, 1998; Morrison et. al., 2003; Krueger et. al., 2000), and, entrepreneurial experience and entrepreneurial intention (Bird and Jelinek, 1998; Liñán et. al, 2011; Farouk et. al., 2014). There are evidences that entrepreneurial growth intenions has direct positive relationship on business performance (Cliff, 1998; Zhao et. al., 2010; Gatewood, 2002). Hence, the author has hypothesized the mediating effect of the entrepreneurial growth intention in-between the entrepreneurial attributes (orientation, skills, and experiences) and the business performance.

Sajjad et. Al., (2012), have highlighted that there is a impact of culture on entrepreneurial intention. Liñán et. al., 2010 argues that entrepreneurial knowledge and self efficacy have direct effect on entrepreneurial growth intention. Similarly, Deniz et. al., (2011), has notified that the entrepreneur's level of perceived business related fear has a negative impact towards business performance. Matsuno et. al., 2002 has highlighted the direct effect of entrepreneurial proclivity on the business performance. Dvir et. al., (2009) assumed that entrepreneurs have distinct personality traits and they are also correlated with higher level of venture uncertainty. Among the traits mentioned most often were: innovativeness, proactiveness, risk taking, competitive agresiveness, autonomy, skill set, learning from experience and leadership (Dvir et. al., 2009; Zhao and Seibert, 2006; Rahatullah and Raeside, 2008). Cope, (2011) emphasized that the learning from experience would increase the entrepreneurial preparedness for future challenges.

Thus, the purpose of this paper is to do a comprehensive literature review to identify the existing gaps in the literature, theory and practice. The author is proposed a conceptual model to show the relationships identified from the literature. The proposed model would be useful to empirically prove the real relationships among the selected variables.

2. Methodology

The author considered three entrepreneurial traits (entrepreneurial orientation, entrepreneurial skills, entrepreneurial experience) as independent variables and the business performances as the dependent variable. The research papers published between 1996 and 2016 have been considered for the study. In order to review the most recent literature on the selected variables, the author has carried out a systematic analysis. Only the journal articles have been considered for the study (Gregoire et. al., 2006), to maintain the uniformity of the comparisons (Liñán and Fayolle, 2015).

Listed articles, in Google scholar have been selected for the study due to its wider coverage of journals. Initially, 177 research papers have identified and out of which, 135 most relevant research papers were selected for the analysis by reading the abstract and the conclusion part of the papers. Accordingly, 125 research papers have selected based on entrepreneurial orientation, entrepreneurial skills, entrepreneurial experience, entrepreneurial intention and business performance (25 each). The remaining 10 research papers have selected covering the general topics (common entrepreneurial traits, analyzing methods).

It has found that different thoughts being empirically developed on entrepreneurial traits and business performance. The review basically consist with two main aspects. Firstly, a thematic analysis is carried out to explore the main categories and the identical themes within each category. Secondly, it further reviews the literature by means of a citation analysis and the top ranked and most cited papers are categorized accordingly.

3. Analysis

3.1 Thematic Analysis

A total of 135 research papers published between 1996 and 2016 have been considered for the thematic analysis (Table 2). As the author considers only the journal articals published during the past twenty
years, most outdated data has not came into the count. Then the selected papers were classified in to six main categories and further in to 4-5 sub categories through skimming. If the paper is based on two or more sub categories, the most relevant theme was chosen at skimming. Then the themes were classified according to the similarity of the content they carry.

When comparing the total citations of the entrepreneurial group categories, entrepreneurial growth intention got the highest score which is 54,898 and entrepreneurial orientation, business performance, entrepreneurial skills and entrepreneurial experience marked the total of 23,893, 19,101, 9,834 and 9,007 respectively. The most widely used model in the entrepreneurial growth intention related papers (Shinnar et. al., 2012; Krueger et. al., 2000; Wilson et. al., 2007; Kolvereid, 1996; Liñán et. al., 2011) is, “Theory of Planned Behaviour”. Subjectivist theory and learning theory have widely used in entrepreneurial orientation related papers (Covin and Lumpkin, 2011; Tang et. al., 2008; Wang, 2008; Keh et. al., 2007). Table 1 presents the distribution of papers by sub category.

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Source: Author’s survey, 2017
Table 2: Distribution of research papers by year (1996 – 2016)

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Source: Author’s survey, 2017

3.2 Citation Analysis

Citation analysis has done considering the journal ranking system stipulated in the ABS Academic Journal Guide – 2015 (Figure 1). Accordingly, the selected 135 journal articals have further analyzed and most influential 30 research papers have selected on entrepreneurial orientation, entrepreneurial skills, entrepreneurial experience, entrepreneurial growth intention, business performance and general topics related to the review (5 each). All these selected articles had published in reputed journals which were fallen under the rank no. 4. Table 3 presents the classification of top ranked, most cited research papers (1996 – 2016).

Figure 1: Graphical presentation of the six main categories

Source: Author’s survey, 2017
Table 3: Classification of top ranked, most cited research papers (1996 – 2016)

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4. Discussion

Lumpkin & Dess (1996) have emperically proved that there are five main dimentions which could act as components of entrepreneurial orientation. They are innovativeness, proactiveness, risk taking, competitive aggressiveness and autonomy. In addition, many scholars have identified similar dimentions of enterenurial orientation (Johan and Dean, 2005; Lumpkin and Dess, 2001; Chen et. al., 2011). All these dimentions have positive relationships with business performance. Skills and
experience have a positive effect on business performance, because they provide the basis for ability to entrepise (Baron and Markman, 2003; Chrisman et. al., 1998; Lerner and Haber, 2001).

In addition to the aforementioned variables, the author has identified the mediating effect of the entrepreneurial growth intention, in-between the entrepreneurial traits and business performance. Considering all the related variables (entrepreneurial orientation, entrepreneurial skills, entrepreneurial experience, and entrepreneurial growth intention and business performance) discussed in this review, it could be proposed following conceptual model (Figure 2) for identifying the real relationships affiliated to the said variables.

![Conceptual model](image)

**Figure 2**: Conceptual model to show the relationships between the entrepreneurial traits and business performance.

5. Conclusion

The main contribution of this paper lies in the classification of the considerable amount of papers published on the relationships of entrepreneurial traits and business performance over the period of 1996 – 2016. Although, there are thousands of research papers available in the Google scholar database, the author has considered only 135 journal articles published during 1996 and 2006. The author has identified the mediating effect of the entrepreneurial growth intention, in-between the entrepreneurial traits and business performance. Having identified the new relationships, the author addresses research gaps for future consideration. This situation implies that further research is necessary to get the real picture of the relationships affiliated with the entrepreneurial traits and business performance.

Citation analysis is a powerful instrument that identifies the most influential papers in a field of research (Liñán and Fayolle, 2015). In this study the 30 key articles have found to be most cited and top ranked and they could be considered as the identical and most influential research papers within the selected groups. Thematic analysis has given a clearer picture of the different themes of the review. It offers an overview of the different sub-categories in the study area. In addition, it addresses the explicit and implicit gaps in the literature which may need further attention. As the author has identified different themes within the study area, future researchers can formulate new research topics by combining those themes.
The author has developed a conceptual model to show the relationships existing among the variables. Hence, the findings of this paper would inspire the new entrepreneurs to get the real picture of the relationships of entrepreneurial attributes and the performance of an entrepreneurial business.

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A Numerical study on flow and heat transfer between two rotating spheres

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ABSTRACT

An analysis of the angular velocity, pressure and temperature fields of a two-dimensional viscous flow of an incompressible fluid in the presence of convective flow in an annular gap of two concentric and eccentric spheres maintained at different temperatures and rotating about a common axis while the angular velocities of the sphere are arbitrary function of time, outlined in this paper. The Navier-Stokes equations were solved employing finite Difference Method. The results of numerical simulations were presented and subsequently validated with the theoretical derivation. Further, the behaviour of the streamlines in the presence of blowing and suction in the presence of convection was studied and extensive analysis on the relationship of variables in diverse circumstance was carried out.

Keywords: Concentric sphere, Eccentric sphere, streamlines, Blowing and Suction

1. INTRODUCTION

The flow and heat transfer in an annulus between two spheres have been studied in various circumstances my many researchers. These studies can be divided in to two categories. A numerical study of time dependent incompressible flow between two rotating spheres has been presented by Pearson [1] in which one (or both) of the spheres is given an impulsive change in angular velocity starting from a state of either rest or uniform rotation where Reynolds numbers lie in the range of 10-1500. The steady motion of a viscous fluid contained between two concentric spheres which rotate about common axis with different angular velocities have considered by Munson and Joseph[2]. Moghadam and Rahimi[3] have numerically considered the case of transient motion and the heat transfer of a viscous incompressible flow contained between two vertically eccentric spheres maintained at different temperatures and rotating about a common axis which different angular velocities when the angular velocities are an arbitrary functions of time. The similarity solution of Steady-state motion and heat transfer of a viscous incompressible fluid contained between two concentric spheres maintained at different temperatures had been studied by Moghadam and Rahimi[4]

In second category, many researchers have investigated the effect of transpiration on flow in an annulus between two spheres. Gulwadi et al.[5] have considered effect of transpiration on free convection in an annulus between concentric porous spheres. The steady laminar flow of incompressible Newtonian fluid in an annulus between two concentric porous spheres with injection /suction at their boundaries has been studied by Gulwadi et al.[6], Mahian et al.[7] studied the numerical solution of unsteady flow between concentric rotating spheres with suction and blowing at their boundaries. The effect of suction and blowing in the study of flow and heat transfer of a viscous incompressible fluid between two vertically eccentric rotating spheres has been studied at different temperature by Mahian et al.[8]. Openform also used to study the viscous flow past two adjacent elliptic cylinders [9]

Here, the governing equation has been solved using both exact solution method and a numerical method for a general case of viscous flow in-between vertically concentric rotating spheres with angular velocities. The results of numerical simulations have been validated using the theoretical results and the behaviors of the streamlines have been studied. Outcomes for several functions are presented including Reynolds numbers, when the inner sphere is rotating with prescribed time-dependent functions and the outer sphere is initially starts rotate with constant angular velocities at different temperature gradient.
2. METHODOLOGY

We illustrate the methodology used for numerical procedure and theoretical derivation. The velocity distribution model for the case which the outer sphere is stationary while the inner sphere rotates is presented. The pressure can be derived by the velocity distribution of the system. The velocity distribution of the analytical expression provides the basis for an initial estimate for the 3-D velocity field. We considered the following geometry

![Fig.1. Geometry of rotating spheres](image)

The continuity equation in polar coordinates,

\[
\frac{\partial \rho}{\partial t} + \frac{1}{r^2} \frac{\partial (\rho r^2 v_r)}{\partial r} + \frac{1}{\sin \theta} \frac{\partial (\rho \sin \theta v_\theta)}{\partial \theta} + \frac{1}{\sin \theta} \frac{\partial (\rho v_\omega)}{\partial \omega} = 0
\]

Suppose that the velocity is entirely in \( \theta \) direction:

Then we have \( v_\theta = v_\theta(r, \theta) \) and \( v_r = v_\omega = 0 \)

Then the continuity equation can be express as \( \frac{\partial (\rho_\theta \sin \theta)}{\partial \theta} = 0 \)

therefore \( v_\theta \sin \theta \) does not depend on \( \theta \). \( v_\theta \sin \theta = u(r) \), where \( u(r) \) is a function of \( r \) only.

Navier-Stokes equation describes the motion of viscous fluid substances. The components of these equations are summarized as below where all components of velocity vector are included.

\( r \) - component:

\[
\rho \left( \frac{\partial v_r}{\partial t} + v_r \frac{\partial v_r}{\partial r} + \frac{v_\theta}{r} \frac{\partial v_r}{\partial \theta} + \frac{v_\omega}{\sin \theta} \frac{\partial v_r}{\partial \omega} - \frac{v_\omega^2}{r} \right) - \frac{\partial p}{\partial r} + \mu \left( \frac{1}{r^2} \frac{\partial}{\partial r} \left( r^2 \frac{\partial v_r}{\partial r} \right) \right) + \frac{1}{r^2 \sin \theta} \frac{\partial}{\partial \theta} \left( \sin \theta \frac{\partial v_r}{\partial \theta} \right) + \frac{1}{r^2 \sin \theta \omega^2} \frac{\partial^2 v_r}{\partial \omega^2} - \frac{2}{r^2 \sin \theta} \frac{\partial}{\partial \theta} \left( v_\theta \sin \theta \right) - \frac{2}{r^2 \sin \theta} \frac{\partial v_\omega}{\partial \omega} + \rho g_r
\]

\( \theta \) - component

\[
\rho \left( \frac{\partial v_\theta}{\partial t} + v_r \frac{\partial v_\theta}{\partial r} + \frac{v_\theta}{r} \frac{\partial v_\theta}{\partial \theta} + \frac{v_\omega}{\sin \theta} \frac{\partial v_\theta}{\partial \omega} + v_\theta v_r \right) - \frac{\partial p}{\partial \theta} + \mu \left( \frac{1}{r^2} \frac{\partial}{\partial r} \left( r^2 \frac{\partial v_\theta}{\partial r} \right) \right) + \frac{1}{r^2 \sin \theta} \frac{\partial}{\partial \theta} \left( \sin \theta \frac{\partial v_\theta}{\partial \theta} \right) + \frac{1}{r^2 \sin \theta \omega^2} \frac{\partial^2 v_\theta}{\partial \omega^2} - \frac{2}{r^2 \sin \theta} \frac{\partial}{\partial \theta} \left( v_\theta \sin \theta \right) - \frac{2}{r^2 \sin \theta} \frac{\partial v_\omega}{\partial \omega} + \rho g_\theta
\]

\( \omega \) - component

\[
\rho \left( \frac{\partial v_\omega}{\partial t} + v_r \frac{\partial v_\omega}{\partial r} + \frac{v_\theta}{r} \frac{\partial v_\omega}{\partial \theta} + \frac{v_\omega}{\sin \theta} \frac{\partial v_\omega}{\partial \omega} + \frac{v_\theta^2}{r} \right) - \frac{\partial p}{\partial \omega} + \mu \left( \frac{1}{r^2} \frac{\partial}{\partial r} \left( r^2 \frac{\partial v_\omega}{\partial r} \right) \right) + \frac{1}{r^2 \sin \theta} \frac{\partial}{\partial \theta} \left( \sin \theta \frac{\partial v_\omega}{\partial \theta} \right) + \frac{1}{r^2 \sin \theta \omega^2} \frac{\partial^2 v_\omega}{\partial \omega^2} + \frac{2}{r^2 \sin \theta} \frac{\partial}{\partial \omega} \left( v_\omega \cot \theta \right) + \rho g_\omega
\]
\[\rho \left( \frac{\partial v_\omega}{\partial t} + v_r \frac{\partial v_\omega}{\partial r} + \frac{v_\theta}{r} \frac{\partial v_\omega}{\partial \theta} + \frac{v_\omega}{\partial r} \frac{\partial v_\omega}{\partial \omega} + \frac{v_\omega v_\theta \cot \theta}{r} \right) = -\frac{1}{r} \frac{\partial P}{\partial \omega} + \mu \left( \frac{1}{r^2} \frac{\partial}{\partial r} \left( r^2 \frac{\partial v_\theta}{\partial r} \right) \right) + \frac{1}{r^2} \frac{\partial v_\theta}{\partial \theta} + \frac{2}{r} \frac{\partial v_r}{\partial \omega} + \frac{2 \cot \theta}{r \sin \theta} \frac{\partial v_\theta}{\partial \omega} \right) + \rho g \omega \]

Next we assumed that motion is steady \( \left( \frac{\partial v_\omega}{\partial t} = 0 \right) \), no external forces \( (g_r = g_\theta = g_\omega = 0) \). Above assumptions for the velocity components and reduced form of the equation of continuity, generates the following simplified forms for the equation of motion.

\[ \begin{align*}
\text{r-component} & \quad - \frac{v_\theta^2}{r} = - \frac{1}{q} \frac{\partial P}{\partial r} \\
\text{\( \theta \)-component} & \quad - \frac{1}{r} \frac{\partial P}{\partial \theta} + \mu \left( \frac{1}{r^2} \frac{\partial}{\partial r} \left( r^2 \frac{\partial v_\theta}{\partial r} \right) \right) + \frac{1}{r^2} \frac{\partial v_\theta}{\partial \omega} \left( \frac{1}{\sin \theta} \frac{\partial}{\partial \theta} \left( v_\theta \sin \theta \right) \right) = 0
\end{align*} \]

\[ \omega \text{- component is zero.} \]

Here the Navier-Stokes equation for incompressible flow has solved by Finite Element Method (FEM) and implicated scheme for no-slip boundary condition and Dirichlet condition, which specify that the velocity at the wall is zero and specified value of the unknown potential on the boundary respectively. Here we have used one of reduced form the Navier-Stokes equation. That is

\[ \rho (U. \nabla) U = \nabla \cdot [p I + \mu (\nabla U + (\nabla U)^T)] + F; \rho \nabla . U = 0 \]

The Reynolds number is changed to capture creeping flow and as well as transient flow. Because of the known velocity field is solved keeping all its terms. In each time step \((n+1)\), the value of the dependent variables are found from their values of previse time steps \((n), (n-1), \) and \((n-2)\). All the solutions were taken by running the numerical methods at least for 60 second. The flow field is covered with a regular mesh to solve the difference equation. A tridiagonal method algorithm is used in both direction \(x\) and \(y\). Here we have use Coarser mesh in the domain. Here we solve the Navier-Stokes equation for one small triangle in the mesh and then solve for all other triangles. Final solution was the combination of solutions of all the triangles.

![Fig.2. Mesh Geometry](image)

The flow pattern in the meridian plane for \( Re=20 \) is shown in Fig.3. In this case, we considered the laminar flow interface with the outer sphere kept fixed while inner sphere rotate with constant angular velocity assuming no suction or blowing. Then suction/blowing Reynolds number is zero \((Re_\omega = 0)\).
The Eddies were created by the centrifugal effect generated by the rotation of the inner sphere as in Fig.3. Then we can observe two stagnation points at the poles of the streamlines

![Streamlines of velocity field for $Re = 20, e = 0$](image)

**Fig.3. Streamlines of velocity field for $Re = 20, e = 0$**

Fig4.(a) and (b) exhibits, the flow patterns of the meridian plane for $Re=20$. The Eddies created by the centrifugal effect generated by the rotation of the inner and outer spheres and there are four stagnation points at the poles on the streamlines. Here we did not consider any suction or blowing at the meridian plane

![Streamlines of velocity field of $Re = 20, e = 0$](image)

**Fig.4. Streamlines of velocity field of $Re = 20, e = 0$**

(a) The outer sphere rotates (b) both spheres rotate

Fig5.(a) and (b) Illustrates the graphs of velocity magnitude verses radius of the inner sphere of theoretical data and data obtained from numerical method.

![Graphs of velocity magnitude versus radius](image)

**Fig.5. The graphs of velocity magnitude versus radius of inner sphere**

(a) plotted by theory data (b) plotted by numerical data.
MATLAB curve fitting for numerically obtained data resulted the Fig.6.

![Graph of velocity vs radius](image1)

**Fig.6. The graph of velocity magnitude versus radius using MATLAB curve fitting**

Fig.7 (a) and (b) illustrate, the development velocity profiles and pressure profiles with increasing rotational angular velocity of the inner sphere.

![Graph of velocity magnitude vs radius](image2)

(a) **Graph of velocity magnitude vs radius**

(b) **Graph of Pressure vs radius**

With increasing angular velocity and radius velocity magnitude of the flow dramatically decreased and pressure gradually increased. Fig.8.(a) and (b) demonstrates the development of velocity and pressure profiles with increasing rotational angular velocity of the both spheres.

![Graph of pressure vs radius](image3)

(a) **Graph of pressure vs radius**

(b) **Graph of velocity magnitude vs radius**

**Fig.8. (a) Pressure profile (b) Velocity profile**

Flow pattern in the meridian plane for Re=20 and \(Re_w = 0.5\) is shown in Fig.9 (a). In this case, the outer sphere was kept stationary and the inner sphere rotated with constant angular velocity. The blowing
suction Reynolds number $Re_w$ is lower than the rotational Reynolds number $Re$. Then as in illustration in Fig.9 (a), eddies get closer to poles.

Fig.9. Streamlines of velocity field for $Re = 20, Re_w = 0.5, e=0$ (a) with a blowing (b) no blowing

Fig. 10. illustrates the temperature distribution. Here we considered the cold flow from the inner sphere toward the outer sphere.

Fig.10. Temperature distributions

The streamlines of velocity field for $Re = 20, = 0.5, e=0$ are shown in the Figure.10 and Figure.11. Together with time-dependent angular velocity. Then we can observe four stagnation points on the pole.
Fig.11. The streamlines of the velocity field for $\text{re}=20, \text{re}_w = 0.5$ $e=0, \Omega_{io} = -\exp(1 - t)$

![Streamlines](image1)

Fig.12. The streamlines of the velocity field for $\text{Re}=20, \text{Re}_w = 0.5$ $e=0, \Omega_{io} = 2\sin\left(\frac{\pi t}{2}\right)$

The temperature distribution of the system with time-independent angular velocity is much better than in the system with time-dependent angular velocity. This fact is illustrated in Fig.13.

![Temperature Distribution](image2)

Fig.13. Temperature distribution of the system
(a) with time-dependent angular velocity (b) with time-independent angular velocity

The distance between centres of inner and outer sphere is known as the eccentricity. The eccentricity and velocity magnitudes are proportional to each other. Following figure illustrate usual relationship between magnitude of velocity versus eccentricity.

![Graph of Velocity vs Eccentricity](image3)

Fig.14. Graph of velocity versus eccentricity

The following figures illustrate the relationships when both spheres rotate in the system.
Moreover, following graphs illustrate the relationships, when inner sphere rotate while outer kept fixed.

3. CONCLUSION

Behaviors of Fluid in-between of two concentric and non-concentric spheres were studies using a numerical method. Study was carries out for three cases. First, the inner sphere was rotated while the outer kept fixed next, the inner sphere was kept fixed whereas outer sphere was rotated and finally, both spheres were rotated. Then we observed the stagnation points changed with the boundary conditions.

The distance between two stagnation points on the upper pole decreases with increasing blowing or suction. We modelled the heat transfer systems as inner sphere was cool and outer sphere was hot. Then we observed the temperature distribution was better in time dependent angular velocity field than in time dependent angular velocity field.

The maximum velocity magnitude of the system increases with increasing eccentricity. When both spheres rotate, the porous and the turbulent velocities decrease with increasing Reynolds number of the system. If the Reynolds number is beyond 1000, the maximum temperature of the system is constant else it change with Reynolds number. The porous velocity decreases and turbulent velocity increases with increasing Reynolds number of systems where the inner sphere rotates and the outer sphere is fixed. The maximum temperature changes with increasing Reynolds number.

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A study of Ancient Embroidery Craft of Sri Lanka in Relation to Colombo National Museum

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Sri Lanka was a country with full of craftsmanship and Buddhist culture was the chief inspiration for the fine arts and crafts of Sri Lanka. The ornamentation on textiles and clothes was mostly inspired by ancient crafts and arts. During the 20th century the ornamentation on clothes was transformed due to colonialism, and then the introduction of the open economy after 1980s. The introduction of the sewing machine was a turning point in textile embroidery. However, ancient embroidery techniques are almost unknown and little researched area when compared to other craftsmanship of Sri Lanka. The Colombo National Museum is one of the places, which conserved most of the ancient samples of embroidery of Sri Lanka. This study was based on qualitative research method under grounded theory and the objectives were analyse ancient embroidery techniques of Sri Lanka and identify the significance of ancient designs of embroidery. This study only focused on and observed embroidered female clothing samples at Colombo National Museum. In ancient time, the difference between the lower and upper classes could be recognized through the colour of yarn, quantity and the quality of embroidery on the dress, because it dignified the social status of the wearer.

Keywords: Sri Lanka, Embroidery, Colombo National Museum

Introduction

Modern embroidery was not a developed handcraft of the Sinhalese, and is believed to be a product of the colonial impact. Further, Sri Lankan have developed less craftsmanship as compared to Indian embroidery. The greatest amount of ornamentation in ancient Sri Lanka on clothes and textiles was done manually, since the sewing machine was not available at that time. After 1980s the apparel industry vastly developed due to the open economy. As a result, modern machinery for embroidery and computerized sewing machines dramatically transformed mainly the garment industry. In the latter part of the century the growth of the garment industry continued to develop rapidly. Consequently the modern methods of ornamentation on clothes and textiles developed while the traditional methods were discontinued.

Aims and Objectives

- Analyse ancient embroidery techniques of Sri Lanka
- Identify the significance of ancient designs of embroidery

Methodology

Fashion is an observable phenomenon and for this research study observations were foremost to gather the data. The inductive qualitative methodology was used under grounded theory. The use of the inductive qualitative methodology combines historical, object-based, oral history, written archival documents, literary sources, and visual material methods. This study began with raw data collection, and then built theoretical categories and propositions from relationships discovered from the gathered data. The data were compared with personal experiences and existing literature to conclude the memos.

Limitations

- The National Museum limits observation to exhibited objects, with other conserved ancient garments and cloths in the museum archaeological department.
- Further photography of samples is prohibited due to conservation concerns.

Literature Review

Embroidery designs were popular during the British period (from 1815 to 1948) and were mostly used for women’s jackets, handkerchiefs and betel bags (Coomaraswamy and De Silva, 1906). The designs
used for embroidery were traditional and mostly inspired by *palapethi moshtaraya, liyaval moshtaraya, havadi* and *galbinduva*. In addition to these, flowers, birds, animals and leaves were mostly used. Coomaraswamy and De Silva stated:

*The embroidery designs were popular at that time and mostly used for ladies jackets, handkerchiefs and betel bags. This was very common than patchwork. They have used different color threads for embroidery, mostly red, blue and white. They never used same fabric or thread color for embroidery. Furthermore attaching lace to the embroidery cloth was common or used buttonhole stitch to cover the edge (1906: 123).*

Coomaraswamy (1956) explained that the women’s jacket with flowers and parrots were embroidered with gold threads, which was the iconic piece of Sri Lankan skillfulness for the craft of hand embroidery. Further, he mentioned an embroidered sleeve of a jacket that belonged to a queen of the 18th century, which was identical in its appearance of hand embroidery. The other two cotton jackets with *mante* belonged to Coomaraswamy, and one was embroidered with blue and red-coloured threads, and the other in red and gold-coloured threads. At the back of these jackets, a design of two Bo leaves was embroidered, with two birds facing each other. The front body of the jackets had an embroidered vase with flowers. Sabaragamuva and Southern province dancers’ (*yak thovilkaruvan*) costume jackets too were highly embroidered with blue, red and white-coloured embroidered stitches. At the beginning of the 20th century, embroidery seamstresses were few, and they decorated upper-class men’s, women’s and younger women’s jackets and hats. Most of the skilled seamstresses were low caste women, and their creativity was incomparable. Due to the social rank system in the country, low-caste women used to wear self-developed, modest and unornamented cloths. But upper-caste women had their clothes made by seamstresses and added heavier embroidery all over the jackets with gold and silver threads mixed with beads. Those jackets were excessively decorated with embroidery designs inspired mainly from the structures of nature. *Govigama* caste (upper caste – low country) women wore highly decorated jackets with *redda*, since they belonged to an upper caste, and low castes were not allowed to wear decorated clothes. This was a norm of monopoly of the social system.

Coomaraswamy and De Silva (1906) have explained that embroidery designs were popular at the beginning of the 20th century and later, and mostly were used for women’s jackets, handkerchiefs and betel bags. This was more commonly used in women’s clothing than patchwork. Further, coloured threads were used for embroidery and prominent were red, blue and white colours. Moreover, the blue colour was the common colour for the Kandyan district, and they decorated their white clothing with gold or silver embroidery. Proving the above, Lynton (1995) stated that Kandy had a cotton embroidery tradition that used blue, red and white threads on white or blue backgrounds. Therefore, it can be said that the Kandyans’ most favoured colours for embroidery were red, blue and white, and other colours were used rarely.

The seamstresses living at that time certainly did not use similar colours for both fabric and threads used for embroidery. Furthermore, attaching lace to the embroidery cloth was common, or the buttonhole stitch was used to cover the edge. Most embroidery designs were decorated by using the appliqué technique. The common fabric used for embroidery was cotton and those were developed locally. Occasionally, the fabrics were dyed with natural dyes of blue or red colours. Aristocratic women’s wear embroidery was frequently done by using imported threads from England (Coomaraswamy, 1956). Further, the needles and embroidery frames were also imported from England, since they were not available in the local market.

The stitches that were used to do the embroidery at the beginning of the 20th century were:

- *Patta masme* (decorated feather stitch)
- *Damval masme* (chain stitch)
- *Moottu masme* (combined stitch)
- *Kewala dithwa* and *thrittwa, bottam casa masme* (buttonhole stitch)
- Decorated edge stitch
- Herringbone stitch
- Triangle stitch
The chain stitch, centipede, feather and buttonhole stitches were used frequently on embroidery (De Silva, 1968). The *patta masme* (decorated feather stitch) was a difficult stitch to do, and two needles had to be used simultaneously. Sometimes three different colours were used for the embroidery with three needles. To fill the inside of the embroidery design, mostly sateen stitch was used, and to decorate the edges chain stitch was utilized. When stitching leaves, the stitch frequently used was the ‘triangle’ stitch. The edges of the appliqué work on the embroidery designs were stitched with a running stitch or it was covered with a chain stitch. The blanket stitch was also used to cover the edges of the appliqué designs.

**Data Analysis**

There are samples of embroidered designs in the National Museum, Colombo, and most of the embroidered samples that have been discussed are found there. One of the samples displayed is an embroidered belt from the early 20th century (National Museum, Colombo, 20th century; fig. 02). It was decorated with floral designs using gold thread and gold beadwork. The design was filled with embroidered motifs and leaves, and was simultaneously decorated with beads and coil work.

The Colombo *Chetty* bride’s highly embroidered belt exhibited at the National Museum, Colombo (National Museum, Colombo, 20th century; fig. 03) was decorated using gold-coloured thread, silver-coloured beads and trimmings over an orange-coloured silk fabric. The flower motifs in the design were hybrid with the leaves and flower buds used as a continuous design work. In addition, the sateen stitch, *nati masme* and cords with beaded threads were used to decorate the design. The embroidered outfit belonging to a Malay bride is dated as 1960 and is exhibited at the National Museum, Colombo (National Museum, Colombo, 20th century; fig. 04). It was created from a crimson red-coloured silk fabric and decorated with embroidered beadwork. The coil work too was used as a decoration technique to beautify the outfit. The attached beads are covered with a coil work. Gold-coloured trimmings were used to fill the design motifs of the flowers and leaves.
There is also a white-coloured, embroidered dress belonging to a Malay bride at the National Museum, Colombo (National Museum, Colombo, 20th century; fig. 05). The dress is mostly of a very fine, soft transparent material. The embroidery is bold and filled with larger-sized motifs of flowers and leaves. The hems of the outfit are embroidered using a smaller-sized scalloped stitch while it is continued to a larger-sized scalloped stitch. The scalloped seams and embroidered motifs looked machine stitched. Further, white and gold-coloured lustre threads cover the embroidery design. An embroidered jacket belonging to a Moor bride is in the Colombo National Museum, believed to have been worn at the beginning of the 20th century (National Museum, Colombo, 20th century; fig. 06). The embroidery design was worked on a purple-coloured silk fabric with gold-coloured trimmings, cords and threads. The design is similar to an overall design and consists of the motifs of flowers, leaves and geometrical shapes. In addition, the hems of the bodice, waist and sleeves are decorated by using a continuous embroidered work consisting of flower and leaf motifs. After considering the pieces of the pattern carefully it can be seen that the embroidery design was an engineered one based on the shape of the pieces of the pattern. The embossed look of the leaves in the embroidery was achieved by attaching the chords, and then it was covered using the sateen stitch. Further, the colour of the thread used was gold, and it was used to cover the motifs of the leaves and flowers.
There was another identical embroidery method called hardanga designs (Personal Collection, 1982, 20th century; fig. 07). This technique was influenced from black Caribbean nationals who lived and worked in early Sri Lanka. These people came from South Africa for pearl hunting in the deep sea. Those women were skilful in all handcrafts inspired from their native country, and these influenced Sri Lankan women. The hardanga design was delicate, a work of counting and drawing threads to create an open work design over the fabric. It began with a basic measurement of material marking where the needle would be used to pull the fabric. The fabric used for these designs was smooth and easy to measure. The designs were delicate and sumptuous. These designs were mostly used for women’s jackets, blouses, sari jackets and handkerchiefs.

Fig. 04: Section of a Malay bride’s upper bodice garment, 20th Century, National Museum; Colombo.

Fig. 05: Section of a Malay bride’s outfit, 20th Century, National Museum; Colombo.

Fig. 06: Section of a Moor bride’s jacket, 20th Century, National Museum; Colombo.
Conclusion

Sri Lanka’s cultural heritage and skilled craftsmanship passed down through ages has had a great influence on handicrafts. The significance of ancient embroidery was the delicate traditional designs of Sinhalese arts and crafts, manually done, and they used specific colour schemes. The hand needle and cotton or silk threads were used to decorate ancient Sri Lankan women’s textiles and clothes. It was used as a decorative element and to express family status and wellness. Later machine embroidery was added as a timesaving method of decoration. Therefore, embroidery became a common element of most women’s attire during the 20th century and as a result of this the caste differentiation was gradually disappeared from the society.

Reference

Sarasaviya. (1963) Hattayata Mosthara, 4 September, 3.
A SYSTEMATIC LITERATURE REVIEW ON EMOTIONAL INTELLIGENCE AND ENTREPRENEURIAL SUCCESS

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Abstract

Many researchers have tried to unlock the secrets of successful entrepreneurs, explore their cognitive processing, their personality types often with contradictory results. However, research has shown that individuals with greater emotional intelligence are better able to appraise, manage and regulate not only their emotions but also of others. Such abilities allow these individuals to judge if the emotions are linked to opportunities, thus use these emotions in the process of decision making that enhance high performance. Hence, it is important to study the effect of emotional intelligence on entrepreneurial success.

The purpose of this study is to collect the current knowledge in the fields of entrepreneurial success, emotional intelligence and its applications related to entrepreneurial success and to identify the research gaps in related areas.

Present study identifies 03 main research areas in literature review by means of citation analysis. A thematic analysis is carried out to identify specific themes of sub categories researched within each main category. 44 sub categories are recognized as themes they are the success factors of entrepreneurship. Literature survey also reveals that there is a relationship between emotional intelligence and success factors of entrepreneurship.

Study also implies that it is necessary to carry out further research to identify the gaps and have a better understanding in the area.

Keywords Entrepreneurial success. Emotional Intelligence. Literature review. Citation Analysis. Thematic Analysis.

1.0 Introduction

Successful entrepreneurial activity is important for a healthy economy and can be a major source of job creation. While the concept of entrepreneurship has been around for quite some time, researchers continue to examine the factors that underlie entrepreneurial performance. Specifically, researchers have sought to further examine why some entrepreneurial ventures are more successful than others.

Significant rise in enthusiasm on entrepreneurship has been witnessed in past decades. The same enthusiasm has been radiated to the academic arena increasing the research efforts by the academic community devoted to the subject. This increased attention seems to have given growing evidence that new firm creation is a critical driving force of economic growth and creating new jobs. (Birch, 1979; Birely, 1987; Reynold, 1987).

This study was able to gather research articles written on entrepreneur success discussing various success factors. Many articles discuss the personality of the entrepreneur and its effect on the performance.

Emotional intelligence is a psychological phenomenon which has become a popular area in research. Initially introduced by Salovey & Mayer (1990) and later it was brought to the public by psychologist and journalist, Daniel Goleman (1995). His book, ‘Emotional Intelligence’ was on New York Times
best seller list for a year and a half, with more than five million copies in print world-wide in 40 languages.
This literature study categorize the articles related to emotional intelligence (EI) to gather information on its impact on entrepreneurial success.

2.0 Literatures

The entrepreneurial success research area

When examining the literature on entrepreneurial success, three distinct areas of research emerge. First area of research is the ‘cognitive factors’ which in generally discuss the personality of the entrepreneur. Literature recognizes 23 characteristics of cognitive factors related to entrepreneur’s positive psychology. Out of the selected research articles, there are 12 papers discuss about the various cognitive factors.
Second area of research recognized by the literature survey is the ‘social capital & social skills’ whereas the third area of research is ‘human capital’. Markman & Baron (2003) explains that social capital and human capital are two distinct areas of entrepreneurial success.
Social capital refers to opportunity enabled by social structure and proxy of resources made available through organizational position, elite institutional ties, social networks & contacts and relationships. Social skills are described as competencies that enable individuals to interact effectively with others. Human capital discusses two main areas; ability and acquired skills. Ability refers to intelligence, health, personality, attractiveness whereas acquired skills refer to education, training, tenure, experience and interpersonal relationships. (Markman & Baron, 2003).

Emotional intelligence research area

Since emotional intelligence explains the psychological ability of a person, its applications on entrepreneurship is important. Psychologist and journalist, Daniel Goleman (1998) explains the concept as the ability to recognize and manage emotions in one self and in other.
Research articles identified in this study discuss many aspects of emotional intelligence and its impact on entrepreneurship. Most of the articles identified by the citation analysis have more than 500 citations. Findings of these articles address the influence of emotional intelligence on success factors recognized for entrepreneurial success.

3.0 Methodology

Initially 106 articles were identified in the areas of entrepreneurial success and emotional intelligence. All 106 published research articles were screened through and selected 23 articles as most relevant and influential.
Those 23 articles were read independently and gathered information about entrepreneurial success factors addressed by them. Most of the articles describe more than one characteristic related to entrepreneurial success.
Articles reflecting the area of emotional intelligence were analysed to gather information on emotional intelligence and its impact on entrepreneurship.

4.0 Analysis and Discussion

4.1 Citation analysis

Most influential papers identified by the citation analysis carry the most number of citations. Articles collected are ranging from year 1982 to 2014(except one in 1965), which gives a good coverage of work done in this area of research.
Three main areas of research identified by the literature review are described below.

Group 1: Cognitive factors
Cognitive factors explained by cognitive psychology studies the underlying behaviour of mental process. Literature review recognizes 12 papers addressing cognitive factors of entrepreneurial success. These articles have been published in different journals ranging from year 1978 to 2004. One representative article has been published in 1965, but it has received 874 citations.

**Group 2: Social capital / social skills**

Social capital defined by social psychology is a branch for identifying individual behaviour in the society. (Snyder, 1993). Two articles addressing social capital and social skills were identified under entrepreneurial success. Published in two different journals in 1995 and 2003, both have received higher number of citations.

**Group 3: Human capital**

Human capital explains the ability of the individual or the skills acquired by the individual. Six influential papers identified addressing human capital factor on entrepreneurial success. These papers range from 1982 to 2008. Two articles have received citations of 6845 and 9102.

**Emotional intelligence**

Six articles were identified as most influential articles related to emotional intelligence. All articles represent from different journals. Two important articles from Solovey & Mayer (1990) and Goleman (1998) who introduced the definition of emotional intelligence have received higher number of citations, 11387 and 9102 respectively. These articles address the relationship between emotional intelligence and entrepreneurial success.

Table 1: Most cited and influential papers:

<table>
<thead>
<tr>
<th>Group category</th>
<th>Paper</th>
<th>Journal</th>
<th>Cites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive factors</td>
<td>Ahmed, 1985</td>
<td>PID</td>
<td>220</td>
</tr>
<tr>
<td></td>
<td>Perry et.al., 1986</td>
<td>ISBJ</td>
<td>62</td>
</tr>
<tr>
<td></td>
<td>Begly &amp; Bord, 1987</td>
<td>JBV</td>
<td>1378</td>
</tr>
<tr>
<td></td>
<td>Lorrain &amp; Dussault, 1990</td>
<td>UQ</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>Broehl, 1978</td>
<td>Cambridge</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Markman &amp; Baron, 2003</td>
<td>HRMR</td>
<td>541</td>
</tr>
<tr>
<td></td>
<td>Krigel &amp; Hanson, 1999</td>
<td>JOCM</td>
<td>189</td>
</tr>
<tr>
<td></td>
<td>McClelland, 1965</td>
<td>JPSP</td>
<td>874</td>
</tr>
<tr>
<td></td>
<td>Goleman, 1998</td>
<td>Bantam</td>
<td>9102</td>
</tr>
<tr>
<td></td>
<td>Vesper, 1984</td>
<td>UOW</td>
<td>230</td>
</tr>
<tr>
<td></td>
<td>Baum &amp; Locke, 2004</td>
<td>JAP</td>
<td>1333</td>
</tr>
<tr>
<td></td>
<td>Histrich &amp; Gracher, 1995</td>
<td>JMP</td>
<td>68</td>
</tr>
<tr>
<td>Social capital / Social skills</td>
<td>Cox &amp; Jennings, 1995</td>
<td>LODJ</td>
<td>81</td>
</tr>
<tr>
<td>Human capital</td>
<td>Markman &amp; Baron, 2003</td>
<td>HRMR</td>
<td>541</td>
</tr>
<tr>
<td></td>
<td>Goleman, 1998</td>
<td>Bantam</td>
<td>9102</td>
</tr>
<tr>
<td></td>
<td>Hodgetts &amp; Kuratko, 1992</td>
<td>Book</td>
<td>318</td>
</tr>
<tr>
<td></td>
<td>Dafna, 2008</td>
<td>JEC</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td>Reijonen, 2008</td>
<td>MRN</td>
<td>91</td>
</tr>
<tr>
<td></td>
<td>Boyatzis, 1982</td>
<td>Book</td>
<td>6845</td>
</tr>
<tr>
<td></td>
<td>Aldrich &amp; Martinez, 2001</td>
<td>ETP</td>
<td>987</td>
</tr>
<tr>
<td>Emotional Intelligence</td>
<td>Salovey &amp; Mayer, 1990</td>
<td>ICP</td>
<td>11387</td>
</tr>
<tr>
<td></td>
<td>Goleman, 1998</td>
<td>Bantam</td>
<td>9102</td>
</tr>
<tr>
<td></td>
<td>Chell &amp; Baines, 2000</td>
<td>ERD</td>
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<tr>
<td></td>
<td>McClelland, 1965</td>
<td>JPSP</td>
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<tr>
<td></td>
<td>Boyatzis, 1982</td>
<td>Book</td>
<td>6845</td>
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<td></td>
<td>Vesper, 1984</td>
<td>UOW</td>
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</tr>
<tr>
<td></td>
<td>Baum &amp; Locke, 2004</td>
<td>JAP</td>
<td>1373</td>
</tr>
<tr>
<td></td>
<td>Boren, 2010</td>
<td>FAC</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Ahmetoglu et. al., 2011</td>
<td>PID</td>
<td>90</td>
</tr>
</tbody>
</table>
4.2 Thematic analysis

Thematic analysis identifies the sub categories of main research areas. Table 2 gives a summary of sub categories identified in each group and number of articles related to each sub category or themes. Table 3 presents the distribution of articles by main research area by year. As the table shows, no obvious pattern emerges when comparing the year of publication and research category. Figure 2 gives a graphical representation of the yearly variation.

Table 2: Sub categories in thematic analysis

<table>
<thead>
<tr>
<th>Group</th>
<th>Sub categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive Factors (34)</td>
<td>Need for achievement (03)</td>
</tr>
<tr>
<td></td>
<td>Internal locus of control (03)</td>
</tr>
<tr>
<td></td>
<td>Risk taking propensity (03)</td>
</tr>
<tr>
<td></td>
<td>Feel of Independence (01)</td>
</tr>
<tr>
<td></td>
<td>High self-efficacy (01)</td>
</tr>
<tr>
<td></td>
<td>Opportunity recognition (03)</td>
</tr>
<tr>
<td></td>
<td>Perseverance (01)</td>
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<tr>
<td></td>
<td>Honesty (01)</td>
</tr>
<tr>
<td></td>
<td>Spirituality (01)</td>
</tr>
<tr>
<td></td>
<td>Ethicality (02)</td>
</tr>
<tr>
<td></td>
<td>Innovativeness (03)</td>
</tr>
<tr>
<td></td>
<td>Love of work (01)</td>
</tr>
<tr>
<td>Social capital/</td>
<td>Effective communication (01)</td>
</tr>
<tr>
<td>Social skills (11)</td>
<td>Generating enthusiasm &amp; commitment (01)</td>
</tr>
<tr>
<td></td>
<td>Effective negotiations (01)</td>
</tr>
<tr>
<td></td>
<td>Effective interviews (01)</td>
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<tr>
<td></td>
<td>Performance review (01)</td>
</tr>
<tr>
<td></td>
<td>Handling conflicts (01)</td>
</tr>
<tr>
<td></td>
<td>Raising external capital (01)</td>
</tr>
<tr>
<td>Human capital (18)</td>
<td>Productive (01)</td>
</tr>
<tr>
<td></td>
<td>Creativity (03)</td>
</tr>
<tr>
<td></td>
<td>Interpersonal skills (02)</td>
</tr>
<tr>
<td></td>
<td>Mental skills (01)</td>
</tr>
<tr>
<td></td>
<td>Technical skills (01)</td>
</tr>
<tr>
<td>Emotional Intelligence</td>
<td>09 papers</td>
</tr>
</tbody>
</table>

Source: Author survey 2017
Table 3: Research Papers by category Vs year of publication

<table>
<thead>
<tr>
<th></th>
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<th></th>
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<tbody>
<tr>
<td>G1</td>
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<td>2</td>
<td>-</td>
<td>2</td>
<td>1</td>
<td>2</td>
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<tr>
<td>G2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>G3</td>
<td>1</td>
<td>-</td>
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<td>1</td>
<td>1</td>
<td>-</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>EI</td>
<td>2</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

G1: cognitive factors; G2: social capital/social skills; G3: human capital; EI: emotional intelligence

Source: Author survey 2017

Figure 2: Research papers by category:

Based on the citation analysis and the thematic analysis, following conceptual model as shown in Figure 2 was identified.

Figure 2: Categories of papers from citation analysis:

Source: Author survey 2017
5.0 Discussion and conclusion

Emotional intelligence is a psychological phenomenon which describes the entrepreneurial behaviour. Since this is an emerging area, new knowledge flow would definitely widen its horizons. As discussed, entrepreneurship is an important area exerting a big impact on national economy of a country and successful entrepreneur is a part of its economic growth.

Main contribution of this paper is to categorize journal publications found on entrepreneurship and emotional intelligence from 1982 to 2014 and to identify the research gaps within each of their classification. (Fig 2). This situation implies that further research on literature is necessary to have a better understanding in this area.

This paper utilizes a powerful instrument of citation analysis to find more influential papers on the subject. Citation analysis distinguishes 23 key articles from 106 papers identified in literature review. By carrying out the literature review on those influential articles, 03 main areas of research have been identified on entrepreneurial success. These areas are cognitive factors, social capital/ social skills, and human capital.

Subsequently, a thematic analysis was carried out to find the sub categories explaining the main 03 research areas. This method of analysis shows a systematic approach in extracting the knowledge from articles to develop a pattern or links within different knowledge areas.

This study identifies 23 themes or sub categories under the main research area of cognitive factors. They include themes like need for achievement, internal locus of control, risk taking propensity etc. Research area, social capital/ skills has identified 11 sub divisions of themes. Some of the themes are effective communication, developing relationships and elite institutional ties etc. human capital area of research identifies 10 sub categories in this study. Some of the categories are, leadership, experience, education etc. (table 2).

Many empirical studies have been carried out in positivistic approach to find relationships and success factors of entrepreneurship. Since entrepreneurship is an area dealing with human behaviour and humans, a humanistic approach would be a better alternative to carry out research in this area with a qualitative approach. McGurk & O’Neil (2016) explains “Qualitative research seeks to understand the ways people experience events, places, and processes differently as part of a fluid reality, a reality constructed through multiple interpretations and filtered through multiple frames of reference and systems of meaning making”.

This work has a major implication for all kinds of enthusiastic entrepreneurs. They can make a self-assessment and find out the areas need to be developed by enhancing emotional skills. Buddhist teachings pioneered in developing mindfulness by deep understanding of the mind and regulating it with spiritual practice to keep it calm and free. They are effective ways of emotional management and emotional intelligence improvement. Research carried out by Swoden et.al. (2015) on student nurses and midwives have found that mindfulness training has been associated with higher emotional intelligence.

Reference


Birch, D.G., 1987. Job creation in America: How our smallest companies put the most people to work.


A systematic Literature review on Intrapreneurship and Organizational performance

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Abstract
Research on intrapreneurship become a growing field of interest during past decades. However the significance of this stocks lacks systematization and categorization. Therefore it is needed collecting current stock of knowledge in this field. The paper present systematic literature review of intrapreneurship development related to organization, individual and contextual complexities. Emerge of Intrapreneurship in the organization foster the process innovation and organizational growth. Intrapreneurial environment in organization is an important factor nowadays for the development and sustainability of nascent small and medium scale organizations. The purpose and contribution of this paper is to depict a clear picture of sub elements in complexities and explore novel areas for research by using the methods of citation and thematic analysis. Citation analysis explore the categories of main dynamic areas of attraction of researchers. Thematic analysis identifies the specific themes being researched within each category. There are five categories of complexities identified in this paper and sixth category is with new researchable dimensions and which cannot be classified into five areas. A number of gaps can be identified throughout the analysis that would postulate new research avenue on development of intrapreneurship.

Keyword - Intrapreneurship, Corporate Entrepreneur, Organizational performance.

1. Introduction
Intrapreneurship is explained as those who can transform the organization in a more lucrative one Octilia Cadre, Daniel Badulescu (2016). Intrapreneurs are not entrepreneurs in the proper sense of notation, intrapreneurs are specialists with a exceptional training and able to use knowledge accumulated for innovations or transform the organization into success Bostjan Antoncic and Robert D. Hisrich (2003). The factor employees motivation leads to intrapreneurship of the organization where as the innovative performance emerges out. Organizational supportive environment has been identified as internal climate factors in the other hand it has been described as facilitator for organization to spur intrapreneurship activity Kuratku et al 1990, 2006 Zahra and Covin 1995 Antoncic and Hisrich 2001. Human capital include the individual knowledge, ideas, which encourage and enable organizational innovativeness. Simultaneously human capital and organizational support create synergetic effect Lutfihak Alpkan et al. (2010) . Those factors has been encouraged to study the interaction of organizational support for intrapreneurship quality for human capital combination impact to innovative performance. The comparative study of Intrapreneurship in large firms and SMEs states that there are two different words structure and organizational terms by Camille Carrier (1994). The combination of these different words and relationship related managerial contexts the intrapreneurship emerges.

Intrapreneurship has been classified in to four dimensions as new business venturing, innovativeness, self renewal and proactiveness Bostjan Antoncic (2007). The same researcher has identified Environment and organization as intrapreneurship antecedent. Three distinct organizational factors and agency factors which identified as highly correlated such of organizational level factors, size, age and complexity promote agency problem and curtail intrapreneurship Gareth R. Jones and John E. Butler (1992).
The concept of intrapreneurship is a role model to revitalize organizations evidenced by growing number of research publications. The concept of intrapreneurship makes a vital role in presence of market competition as competitive advantage. Nicolaidis and Kosta (2011) recommends adopting intrapreneurship as it comes across as the unique competitive advantage. The evolution of concept intrapreneurship in many organizations are seeking way of reinventing or revitalizing their structures giving more attention on corporate entrepreneurial roots, corporate entrepreneurship is powerful antidote to large companies staleness, lack of innovation, stagnant top line growth and the inertia that often overtakes the large, mature companies of the world Neal Thornberry (2001).

Despite this greater interest research into intrapreneurship and performance innovation is still in a nascent stage and there is a need to develop a shared understanding of not only what is meant by the term “intrapreneurship”, but also its development and associated complexities in organizational context. This systematic review has been stimulated by a need to organise different insights into intrapreneurship and organisational performance undertaking a theoretical synthesis of the field of corporate entrepreneurship and its related sub-fields. In particular, the aims of the review are to:

1) Determine the nature of the relationship between intrapreneurship and organisational performance.
2) Develop an oversight of existing research into intrapreneurship and organisational performance.
3) Through cross-cultural studies, identify core issues arising from existing research into intrapreneurship and organisational intrapreneurship.
4) Focus attention on a smaller number of fields.
5) Identify future areas of research.

The objective of this review is to systematically look at the research into social intraprenurship and organizational performance. The current stock of knowledge lacks systematization and categorization to accommodate further studies. Therefore, the Purpose of the study is to create a conceptual framework by identifying gaps through a systematic process of justification empirical phenomenon about intrapreneurship. The study identify dynamism, trends exist to research on intrapreneurship and related field.

This paper discusses the concept of intrapreneurship development and associated complexities in organizational context. This review will commence by outlining each of the stages undertaken during the review of the literature. It will go on to report on the research that explores intrapreneurship and organizational performance, providing both a citation and thematic analysis. The review will conclude by considering the key features of the research, the implications this has for academics and policymakers, before suggesting areas for future research.

2. Methodology

The objective of this review is to systematically look at the research into Intrapreneurship and organizational performance. The methodology employ in this study is descriptive analysis, citation analysis and thematic analysis. Journal articles published in Goggle scholars, web of science under heading intrapreneurship, corporate entrepreneurship and organizational performance were used for the study. 82 most relevant research papers from 1990 to 2015 were selected for the analysis. Short listed 25 influential and ranked more than 2 of ABS papers were used for the citation analysis, tabulated in table 1. Citation analysis reflects the most dynamic research elements related to the topic currently discussed Francisco Linan, Fayolle Alain (2015). Thematic analysis identify most common fundamental researched area tabulated in table 2. Articles were categorized in to five main groups of themes studied for intrapreneurial development, organizational, individual, contextual and organizational performance. 6th group was assigned in thematic analysis for the papers not fit into other five categories.
3. **Analysis and discussion**

3.1 **Descriptive analysis**

Identified 82 articles published over the period of fifteen years for the analysis. Descriptive analysis depict a surge in publication after the period of 2001 to 2005 as in Fig. 1. During the Period 1990 to 1995 it had been conducted considerable number of study on intrapreneurship. The most cited articles of Zahra (1993, 1995) were published in that period triggering the concept of intrapreneurship for researches.

**Fig 1: No of articles published over the period of 1990 to 2015**

![Graph showing the number of articles published per year from 1990 to 2015](image)

The categorical analysis of citation shows inequality influence in five areas. The most cited paper of group 1 indicate two type of phenomena on corporate entrepreneurship processes surrounding them: 1 the birth of new businesses within existing organization such that internal innovation and venturing and (2) the transformation of organizations through renewal William D. Guth and Ari Ginsberg (1990). The area identified as in group 2 organizational complexities.

The most cited (1395) paper in group 2 discuss the complexities of organization influence on corporate entrepreneurship. The influential factors autonomous strategic factors, strategic context, induced strategic behavior and structural context influence on concept of corporate strategy had been studied Robert A. Burgelman (1983). Four typologies "Defender, Prospectors, Reactors and Analysis" of organization and strategic management have explored Raymond E. Miles et al. (1978) as integration of corporate entrepreneurship and strategic management.

The contextual influences categorized under group 4 has considerable no of citation (4037). The most cited paper (1949) Shaker A. Zahra and Jeffrey G. Covin explored two areas of internal factors (organizational structure, culture and system) and external factors (industry globalization, product/ market life cycle stage and government regulation in contextual influence.

The lowest citation indicate in the group 3 and 5 the area of individual and organizational performance. The most significant gap exist in individual complexities indeed all the complexities foster organizational performance.
### 3.2 Citation analysis

Table 1. Ranked & most cited papers.

<table>
<thead>
<tr>
<th>Group category</th>
<th>Paper</th>
<th>Journal</th>
<th>ABS Rank</th>
<th>Citation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gr. 1 Intrapreneurship Development</td>
<td>Bosjan Antoncic et al (2003)</td>
<td>JSB&amp;ED</td>
<td>2</td>
<td>686</td>
</tr>
<tr>
<td></td>
<td>R. Duane Ireland (2009)</td>
<td>ETP</td>
<td>4</td>
<td>551</td>
</tr>
<tr>
<td></td>
<td>Noor Hazlina Ahmad (2012)</td>
<td>JIMSME</td>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Gearth R Jones (1992)</td>
<td>LODJ</td>
<td>4</td>
<td>324</td>
</tr>
<tr>
<td></td>
<td>Bostjan Antoncic (2003)</td>
<td>EMD</td>
<td>2</td>
<td>154</td>
</tr>
<tr>
<td></td>
<td>William D. Guth (1990)</td>
<td>SMJ</td>
<td>4</td>
<td>1432</td>
</tr>
<tr>
<td>Gr. 2. Organizational Complexities</td>
<td>Lutfihak Alpkan (2010)</td>
<td>EMD</td>
<td>2</td>
<td>222</td>
</tr>
<tr>
<td></td>
<td>Robert A. Burgelman (2014)</td>
<td>MS</td>
<td>4</td>
<td>1395</td>
</tr>
<tr>
<td></td>
<td>Camille Carrier (1994)</td>
<td>ISBJ</td>
<td>3</td>
<td>224</td>
</tr>
<tr>
<td></td>
<td>Donald F. Kuratko et al. (1990)</td>
<td>SMJ</td>
<td>4</td>
<td>762</td>
</tr>
<tr>
<td></td>
<td>Berthold H. Hass (2007)</td>
<td>IMDS</td>
<td>2</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>John C. Goodalea (2011)</td>
<td>JOM</td>
<td>4</td>
<td>129</td>
</tr>
<tr>
<td></td>
<td>Shaker A. Zahra (1991)</td>
<td>JBV</td>
<td>4</td>
<td>1045</td>
</tr>
<tr>
<td></td>
<td>Bruce R. Barringer (1999)</td>
<td>SMJ</td>
<td>4</td>
<td>1178</td>
</tr>
<tr>
<td>Gr. 3. Individual complexities</td>
<td>ERIL g. Rule (2007)</td>
<td>JBS</td>
<td>3</td>
<td>147</td>
</tr>
<tr>
<td></td>
<td>Carmen Camelio (2011)</td>
<td>ISBJ</td>
<td>3</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>Abhishek Srivastavaa (2005)</td>
<td>JBV</td>
<td>4</td>
<td>118</td>
</tr>
<tr>
<td></td>
<td>Neal Thornberry (2001)</td>
<td>EMJ</td>
<td>2</td>
<td>191</td>
</tr>
<tr>
<td>Gr. 4 Contextual (Internal &amp; External Environment) complexities</td>
<td>Shaker A. Zahra (1993)</td>
<td>JBV</td>
<td>4</td>
<td>1121</td>
</tr>
<tr>
<td></td>
<td>Shaker A. Zahra (1995)</td>
<td>JBV</td>
<td>4</td>
<td>1949</td>
</tr>
<tr>
<td></td>
<td>Jeffrey G. Covin (1988)</td>
<td>JMS</td>
<td>4</td>
<td>967</td>
</tr>
<tr>
<td>Gr. 5: Organizational performance</td>
<td>J. Augusto Felicio (2012)</td>
<td>EMD</td>
<td>2</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>Jasna Auer Antoncic (2011)</td>
<td>IMDS</td>
<td>2</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td>David Smallbone (1993)</td>
<td>IJEBR</td>
<td>2</td>
<td>425</td>
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</tbody>
</table>

Fig 2 : Categorical analysis of citations

<table>
<thead>
<tr>
<th>Citation Analysis</th>
<th>Gr. 1</th>
<th>Gr. 2</th>
<th>Gr. 3</th>
<th>Gr. 4</th>
<th>Gr. 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citation</td>
<td>3159</td>
<td>5880</td>
<td>498</td>
<td>4037</td>
<td>558</td>
</tr>
</tbody>
</table>

Source - Author survey 2017

3.3 Thematic analysis

Thematic analysis comprise sub areas most discussed under context selected by citation analysis as per the illustrated below. All 83 papers were thoroughly studied for the classification of each sub areas. The suggested further study areas were selected and classified under group 6.

Gr 1. Intrapreneurial Development (20)

- General test of theories
- Intrapreneurial Orientation
- Intrapreneurship
- Intrapreneurial Scale
- Intrapreneurial capabilities
- Intrapreneurial economics
- Intrapreneurial ventures

Gr 2. Organizational Dimensions (19)

- Organizational Support
- Organizational Behavior
- Organizational complexities
- Organizational learning
- Organizational change
- Socio cultural characteristics

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Based on the descriptive analysis, citation analysis and the thematic analysis, following conceptual framework as shown in Figure 3 was identified. The conceptual framework identified over the analysis of citation mainly consist elements of organizational/individual dimensions, intrapreneurship, contextual complexities and organizational performance. Intrapreneurship act as mediating factor which may contributed to foster the organizational performance. The framework identifies organizational/industrial and contextual complexities as intrapreneurial antecedents. Citation analysis explore major elements associate with intrapreneurship and organizational performance. Subthemes could be

Table 2: Intrapreneurship development paper by category.

<table>
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<tr>
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<tbody>
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<td>1</td>
<td>1</td>
<td>8</td>
<td>7</td>
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<td>3</td>
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<tr>
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<td>1</td>
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</tr>
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<td>5</td>
<td>15</td>
<td>21</td>
<td>25</td>
<td>82</td>
</tr>
</tbody>
</table>

Source - Author survey 2017
identified by thematic analysis for further study in depth. Citation analysis indicated the most discussed field of researched conducted in previous.

**Fig 3: Conceptual framework from citation analysis**

4. **Discussion and Conclusion**

Corporate entrepreneurship i.e. Intrapreneurship is the most significant concept in large organizations which enable dynamism within the organization. The study initially identified five most influential area associated to intrapreneurship using citation analysis. Thematic analysis disclosed the sub themes and new themes studied and published over last two decades. Five vital areas associated with intrapreneurship are organizational/individual, contextual and organizational performance. Intrapreneurship foster organizational performance acting as mediating factor within the organization mostly highlighted in large organization. Integrating the relationships explored by the citation analysis conceptualize proposed frame in Fig 3 for future research.

Many theories such as plan behavior theory (TPB) Francisco Linan (2015), Theory of resource base view (TBV) J. Augusto Felico et al. (2012) and Agency theory Gareth R. Jones (1992), Upper Echelon Theory (UET) Carmen Camelo (2015) were found in previous studies. A model of corporate entrepreneurship strategy had been illustrated Duane Ireland et al. (2009) with three antecedent strategies as corporate entrepreneurial strategy, element of a corporate entrepreneurship strategy and consequences of using a corporate entrepreneurship strategy. Organizational support, behavior, learning and culture were some of sub study areas found under group 2. Human capital, human integration, spectrum, social capital were the sub study areas identified in group 3. Contextual dimensions internal and external factors were the key study area identified under group 4. Final destination of many papers was Organizational performance such as corporate venturing, organic and inorganic performance, diversifications strategy were the sub study areas in group 5.

The lowest number of citations represent avenues for future research. Less number of citation depict a literature gap in the area of individual complexity of intrapreneurship. Many papers were measured organizational, individual and contextual dimensions as antecedent factors of intrapreneurship and studied the relationship with organizational performance. Some papers discussed multidimensional factor related to organizational performance and intrapreneurship. Carmen Camelo (2015) analyzed cognitive approach integrating demographic characteristics and personal values influence innovation performance of intrapreneurship. Resource base view theory highlight bundle of resources as
competitive advantage. Tangible and intangible resources are leading factors to competitive advantage of an organization. Intrapreneurship as a unique competitive advantage Christos S. Nicolaidis et al. (2011) and intangible resource as well for an organization.

References


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An Asia-Friendly Curricular Model of Bi/ Multilingual Education (BE) and CLIL (Content and Language Integrated Learning)

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Key terms: Bilingual education, BE curricular model, CLIL

Sri Lankan Bilingual Education has its recent history since 2002. Yet it has a lengthy local history since the 3rd BC. This paper intends to present an academic product developed out of the research conducted on BE in 2007 and 2010. According to these researches, the need for a BE curricular model was a must in the system of education. Consequently the model called A (5Cs + S) (Asoka, 2012) was developed. This combines competence based curriculum development with CLIL dominated BE. The major linguistic feature emphasized by this is the importance of language-use ‘across’ (as media) and ‘in’ (as subjects) the curriculum. Knowledge production which is one component of the competence development is shown in this model as an integrative effort of content (syllabi), communication in minimum two languages, cognition, community and culture: these are the five ‘C’s involved in the model. ‘S’ stands for skills and ‘A’ does for right attitudes. The model emphasizes the need for both formal and tacit knowledge necessary for performing skills of day-to-day living. It has also given a special place to attitudes with the opportunity for multiplying value of both knowledge and skills of people to apply them addressing ethics in line with culturally specific norms and universally accepted values.

Introduction:

In any system of education, a curricular model is an important need to address the basic components and the rationale behind curricular decisions reached in the process of curriculum development. A curriculum itself is a design plan for learning. A curricular model lays the rationale for the curriculum design formally arranged to meet unique needs, contexts and purposes while ensuring cohesion among curricular components in a unique pattern. This cohesion addresses educational purposes (as goals, objectives, outcomes and competences), necessary educational experiences for achieving the set targets, the way to effectively organize educational experiences and the mechanism for ensuring whether the set targets have been achieved or not. National curricular models can be developed using the prevailing models and by adapting them. This is common in any system of education as a preliminary and very important requirement.

In addition, using curricular models, language planning is vital in curriculum development. This is mandatory in bi/multilingual education which is today adequately powerful to address linguistic and societal demands of localization, globalization and internationalization. This is basically addressed by introducing languages as subjects under different political titles in addition to prescribing languages as media of instruction without causing language paralysis in and through education.

Diversity of Sri Lankan education in terms of using languages as media of instruction can be basically found as a dichotomization: monolingual education (ME) and bi/ multilingual education. The latter has had a longer history than the former in human civilization. ME uses only one language as the media of instruction across a curriculum while BE uses minimum two. Use of minimum two languages does not mean use of pedagogical techniques such as code switching, code mixing and translangugaging. In this context, several subjects in a curriculum are prescribed with the possibility and facility of learning in a less known language and the rest in a known language (mostly the mother tongue).
Nevertheless, the number of subjects selected for learning in a less known language should not be larger than the same of the learnt in students’ first language (mostly the mother tongue). The research conducted in Sri Lanka (NIE, 2007) has proved that the number of subject which is to be taught in less known language, should not be more than three because the majority of the shifters (NIE, 2007) have encountered the problems of academically important linguistic requirements and cognition when tackling more than three subjects in their less known language. Consequently learning has become intolerable. In selection of the subjects which are expected to be taught in the less known language. The subjects reading students’ primary social institutions are wise to be avoided, according to research, in teaching in a less known language.

Sri Lankan BE:

BE in Sri Lanka has a long history with its use in four major eras: pre-colonialism, colonialism, post colonialism and of modernity. These four eras have used different models, different linguistic targets and different languages in different numbers in different stages of education.

In pre-colonial era, religion based formal education was delivered vastly using BE in its most efficient two way model since the 3rd BC in Sinhala and Pali and then Sanskrit has also been in use since the 1st BC. The BE introduced in the colonial era was a solution introduced against a negative consequence of implementing ME in English medium and Swabasha education. This was restructured in the post-colonial educational reforms of Dr. Kannangara implementing BE from 6 onwards. Yet this was not continued. Gradually the whole system of government Sri Lankan General Education became monolingual in education using Sinhala/Tamil. Consequently schools were also called Sinhala Medium schools, Tamil medium schools and bilingual schools. These bilingual schools did not deliver BE: they, too, delivered ME in both Sinhala and Tamil.

The fourth era of Sri Lankan BE has commenced in 2001 introducing the National Amity School Programme as a solution-finding-channel for the prevailing ethnic conflict. First, this was introduced to the GCE (A/L) Science stream and it was an utter failure. Then this facility was opened from Grade 6 onwards making students, on their wish, attract to study several subjects. At the beginning, there were no clear decisions with a rationale for behind its curriculum. Still there is not a policy on Sri Lankan BE. Yet policy matters are reflected in different ways in circulars and curricular practices.

National CLIL Framework:

The islandwide surveys conducted by the National Institute of Education (NIE) in 2007 and 2010 have been much in use in decision making of curricular matters and certain administrative issues regarding BE. The first research convinced that the Ministry of Education (MoE), Sri Lanka the need to implement BE with a country-friendly, desirable educational and linguistic targets using a suitable model. It emphasized the need for a National Framework of BE and consequently the National CLIL Framework was proposed.

The National CLIL Framework basically consists of three major components: curricular framework (National BE Curricular Architecture), implementation-framework and policy framework. Nevertheless, the National BE Curricular Architecture is a component of the National Curricular Framework.

Commonalities between Sri Lankan BE curriculum and that of the ME are the subjects, the number of subjects, content limits, time frame, common targets in terms of competences, performance and learning outcomes, summative evaluation patterns and public examinations. Differences can be identified in use of languages as media of instruction, pedagogy, textbooks and other learning and teaching material development, teacher development and evaluation procedures.
The desirable mode proposed in Sri Lankan BE is two way cum developmental model. The former emphasizes balanced bilingualism and biliteracy while the latter targets functional bilingualism and biliteracy. The Figure 1 shows how these linguistic targets are linked with the A (5Cs + S) curriculum.

The currently popular BE curricular model applied in the Western countries is Coyle’s 4Cs curriculum (1999, 2005). This has been used to develop the Sri Lankan A (5Cs + S) curricular mechanism (Figure 2) by combining socially and linguistically important aspects with educational demands for holistic development of individuals. This model essentially emphasizes life-long learning through self-directed learning strengthened by four pillars of learning (Dellor’s Report: Learning: the Treasure Within (1996)).

In discussion on embedding competence based education in the A (5Cs + S), concrete evidence of learning is ensured in terms of performance. Anybody’s performance is always lower than that his/her competence. It is also age and grade appropriate. Performance can be ensured through evaluating in coherent physical actions consisting of knowledge, skills and attitudes practiced in a conscious competence ladder. The relevant competence areas can be prescribed for a country using a comprehensive national competence model.

Conceptualization of A (5Cs + S) Curricular Model:

This model basically shows integration of curricular components, language aspects in a curriculum and content related aspects in BE. The major curricular components are learner, learning and learning material, teacher, teaching and teaching material and assessment/evaluation.
The A (5Cs + S) curricular model is conceptualized in the way it is visualized in the Figure 2. Its 5Cs stand for content, cognition, communication, culture and community. The cumulative picture of these 5Cs can directly be connected with the psycho-social theories, psychological theories, sociological theories, educational linguistics and educational principles in curriculum development.

Content with its limits under the term syllabi of subjects is the source and resource for supporting both learning and teaching; it (syllabi) is not the focus of learning in education. Content in selection should be comprehensible (i+1) addressing age- and grade appropriateness. Cognition is directly related to thinking at different levels and many mental activities such as attention, motivation and so on. Thinking is a process mixed with the input introduced across content, and there are always restrictions in terms of time, quantity, depth, necessary levels of thin-king, societal demands and familiarity and so on in curriculum development. Community concept is essentially sociological and supports psycho-social theories. The Asian culture, in its essence, is community based: rather than the ‘I-concept, the ‘we’-concept is prevailing. Even the nuclear families spend nuclear cum extended family system. System of kinship also exists with a socially close, strong network. Sometimes residential patterns, marriage systems, and different norms make them further close to each other addressing primary socialization in a very strong manner connecting with informal education and formal education. This community feature can be positively brought to the curriculum for assisting children’s education through extending mutual support. The cumulative concept of the 5Cs can be merged with education as a vast collection of experience and an intergenerational interpretation across cultural transmission and transformation to achieve the already mentioned linguistic outcomes without leading to local linguistic genocide.

Language mediation and other educational achievements in a curricular model should first be apt to locality. Internationalization can be interpreted as a middle path which allows not to be arrested in extremisms of localization and globalization deviating from fallacies in English (monolingual fallacy, native speaker, the early start fallacy, the maximum exposure fallacy and the subtractive fallacy). Nonetheless, the 5Cs are highly interconnected and they promote knowledge showing educationists the need for coherence needed in curriculum development to bridge the world of learning with the world of work.

‘S’ and ‘A’ of the model respectively stand for performative skills and attitudinal demands for working and living. Knowledge is immaterial and useless when it is not applicable. This is not properly addressed in the current Sri Lankan education. The current examination system is an illusion and
amisguide in decision-making of learners’ performative realities of knowledge. The proposed A (5Cs + S) curricular model considers both skills based knowledge and knowledge led skills as highly important.

Attitudinal development through education is a must in any education system. This is promoted using different terms such as values, norms and ethics as well. In the proposed new curricular model, attitudinal development has been paid special attention by placing it to multiply the value of knowledge and skills. The A (5Cs + S) curricular model gives an additive picture for knowledge and skills with multiplicable concept using attitudes.

Another new concept applied in the ‘A’ of the A (5Cs +S) is the Daniel Pink’s Asia Centric Conceptual Age and ‘A Whole New Mind. This replaces the Knowledge Era (left-brain users) producing knowledge workers (Peter Drucker, and Durker Gurteen) through life-long learning by the right brain activators. The Asia Centric Conceptual Age gives a significance to the sixth sense organ (mind) using ‘three driving forces of an individual to be creators and empathisers’: ‘abundance, Asia, automation’. In this context, the right brain activators with creations and emotional intelligence would exceed their power over left-brain activators (knowledge workers) according to Daniel Pink.

This is the cumulative picture of the newly proposed bilingual education curricular model, A (5Cs + S) making it Asia Centric and Sri Lanka friendly. Research on this model is essential in many ways to show educational practical importance and value of this curricular model.

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Dr. Joshi, Shubhra
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Fictional tales have always been admired. Stories about monsters are being narrated to children from a very long time. Thus we can say that literature shares a great bond with folklores and myths. Various literary narratives have mythical elements and characters which are now been reinvented. They always appeal to the senses of the readers. Every time a fictional story comes around it change the way we look at certain things. Stephanie Meyer’s Twilight is one such story which is attempting a different revolution. The book is trying to present before the readers a new side of supernaturalism. Supernatural word comes from the Latin word *supernaturalis*, *supra* means above and *naturalis* means natural; meaning beyond nature. Supernatural, its adjective form means anything that is caused by something which cannot be explained by the laws of the nature. Supernatural is above science and the laws of the nature. It is transmundane in nature. Myths, Ghosts, Vampires, and Fairies are some of the popular examples of supernatural beings. One of the first things that a reader will notice in Twilight is that Meyer has diverged from traditional representation of supernaturalism. She has presented a modern approach in the presentation of supernatural elements and characterization. The vampires in Meyer’s books are different from the stereotypes which are a part of supernaturalism. It is well known that vampires have always been a popular element in literature. The word Vampire first appeared in 18th century. Despite being the oldest and most ubiquitous creatures, the origin of Vampires remains unknown for many years. Some believed the word to have a Turkish origin, other believe it to be a Greek or Hungarian. However people of modern world connect vampires to Transylvania owing to their knowledge of Dracula. When the writings about vampires came out people have presented them as monstrous beings. They are shown as frightful beings who are dead people coming back to life and they crave for blood. A few centuries ago, Dracula was considered to be the archetype of the vampire. Many stories came before and after the emergence of Dracula. But only the personality of Dracula became the archetype of the vampire as a monster. Bram Stoker’s Dracula came in 1897 and the book became a part of horror genre. The book presented vampires as true monsters and became a classic for horror and gothic fans. Regarding the character traits of Dracula, Melton says,

While the early literary vampires pictured by such writers as Goethe, Coleridge, Shelley, Polidori, Byron and Nodier were basically parasites, possessing few traits to endear them to the people they encountered, nevertheless they performed a vital function by assisting the personification of the darker side possessed by human beings. The Romantic poet of the Nineteenth Century assigned themselves the task of exploring the dark side of the human consciousness. (Melton, xxxiii)

If one goes along with this particular theory, the character of vampire is such that people will fear it. He used to live in secluded and dark places, mostly castles. He had no friends and had a scary animal like looks. He used to sleep in coffin and goes out only in the darkness. Dracula was often shown as a quintessence of evil and a sexual predator that used to drink blood of ladies. “In Stoker’s novel, Dracula was presented to the readers as an earthly embodiment of supernatural evil” (Zanger 18). When the novel was written, the literature at that time was male dominated. So Dracula also came out as male’s writing. In the novel the writer, the protagonist, the antagonist (Vampire) was all played by men only. Women at that time were seen as insignificant creatures and hence were not given any superior role in the novel. They were portrayed as nominated victims who were helpless and dependent on males. In such classical vampire themed novels, the vampire was generally seen in a romantic avatar. There was a relationship between the Vampire and the victim and the story moved around that plot. The Vampire in old classical novels was seen as the incarnation of Anti-Christ. Since then the Vampire literature has changed noticeably over the centuries. Perhaps this change was seen necessary by the writers of Modern Supernaturalism. They wanted to bring a change in the stereotyped representation of the old
supernatural elements and beings. The best examples in recent times are *Harry Potter* and *Twilight*. Both the series have Modern supernaturalism as a common thread between them. For example the Witches in William Shakespeare’s *Macbeth* and J.K. Rowling’s *Harry Potter* are very different from each other. The witches of *Macbeth* are shown as evil looking, scary females who are always ready to cast some mischief. However the witches in *Harry Potter* are portrayed in a completely different manner. They are modern world’s women who are sophisticated and good looking. It is their choices that one makes define them, not who and what they are.

The same can be said about the supernatural characters in *Twilight* also. The good characters are shown by the depiction of Cullens whereas James, Victoria represents the evil characters. The Vampires shown in *Twilight* are very different from the archetype *Dracula*. They don’t live in dark solitary castles, neither are they scared of sunlight and garlic. The Cullens in *Twilight* lives in beautiful modern home and they are friends with human beings also. They have no fright of sunlight and neither they are terrified of stakes and garlic. Though they have to move from one to place to another quite frequently, yet they never disturbed the balance of nature.

This is a ‘new’, contemporary and a compassionate form of vampire who is brought forward by Stephanie Meyer. She pushes beyond the common archetype to reinvent the supernatural in her own way. The new vampire is drastically different in many ways. With their arrival Vampire literature saw a major change. Earlier the genre was full with horror and gruesome happenings. But with the arrival of modern supernaturalism some new attributes are brought forward. The vampires nowadays are shown with a compassionate nature; the seductive side of their charm is also enhanced. They are still associated with pale, cold skin and fangs but now they have chiseled cheek bones, gelled hair, abs of steel and appealing eyes. Now Vampire novels are attracting young people from all over the globe. Bram Stoker’s *Dracula* is a classic example and now the young generation is going crazy over Damon Salvatore, Stefan Salvatore and Edward Cullen. Vampires are no longer a myth; they are present among us in T.V and book stores. While each classical vampire novel has singular reputation, Vampires Fictional charisma has never been larger as it is today. Vampires have now become decipherable part of our today’s generation. It has become a reachable fixation for the teenagers of today’s times. Various forms of media such as TV, books, games etc., have all captured this contemporary trend and capitalized its fame. *The Vampire Diaries* is yet another example of modern supernaturalism. The series tells about the story of two vampire brothers who like Cullens, lives among humans. This TV series is also quite popular among viewers and has attracted major attention. The attempt to bring forward a new twist in Vampire is welcomed by many people.

With the reinvention of Modern Supernaturalism, the writers are now also featuring the problems of young generation in their works. Somewhere along the main theme, the issues related to the teens are also visible in the storyline. Like for example In *Harry Potter*, the story is not only restricted around a magical world. It also showcases the issues related to the psychology of the teenagers. The class discrimination, the lessons related to goodness and evil, the problem of broken homes etc., are some of the major concerns reflected in the work of J.K Rowling. Now when we talk about Stephanie Meyer’s *Twilight*, it also explains some of the issues related to teenagers. Young Adult literature is often set in high school and involves rites of passages such as first love and heartaches. As a genre, it highlights the challenges that are presented before teenagers while making the evolution from childhood to adulthood. Young Adult fiction not only provides strong thrills for readers, but also employs the fantastic elements of various genres to produce the concerns of teenagers as influential metaphors. Meyer’s characters in *Twilight* revolve around the life of teenagers only. Bella, the lead female character was a simple girl who is trying hard to find her true self. She was never guaranteed stability in her life. Being a kid from a broken family it was indeed difficult for her to comprehend easily with the things around her. But her arrival in Forks changed her life completely. By the end of the novel she grew from a weak, restrictive child to a young, compassionate and a fearless woman. Her journey from a troubled teenager to a sorted out happy girl is something which attracts young teenagers toward the work. Many young girl readers
will be able to associate themselves with the character of Bella. For some she may come out as a pathetic and weak character but for some she may bring some solutions.

In fantasy literature an author with his/her imagination can create another world within our world. They also try to link the reality with their mind's eye. Stephanie Meyer also tried to achieve that by writing the Twilight series. Stephanie Meyer emerged as a young adult fiction writer after the success of Twilight. The book series has sold over 100 million copies all over the world in different languages. Her story of re inventing supernatural and focusing on vampires has brought her tremendous fame. Her story about a young girl falling in love with a vampire has become a huge sensation. Furthermore the movie adaptations of the books have increased the Twilight Mania which gripped the minds of young adult fiction lovers. From a long time the vampires have proved to be interesting to people of all ages. However, Twilight is not a vampire based story. Vampires indeed are a central part of the story but in fact is a love story between two young and different people. Like any other love story, the two of them are destined to be together, but have loads of hurdles standing in their way. Despite all the dangers before them, Bella Swan and Edward Cullen manage to create a complicated yet passionate love saga. This trait of being a love story incorporated with fairy tale elements has made Twilight a different book from the regular vampire fictions. In this sense, the book has more familiar element with classical love stories than being a typical gothic vampire story. Can this love story between a young human girl and an enigmatic vampire boy be the reason for the huge female fan following? From a very long time, the genre of love stories remained a popular one among the readers. From Shakespeare’s Romeo & Juliet to Meyer’s Twilight, the same classical pattern has been followed and achieved pinnacle. The delicate and mesmerizing way in which the story has unfolded itself in Twilight has made millions to obsess over it.

In an interview Meyer shared that she had a dream about a young girl and a glittering boy lying down in a meadow. They were discussing about the complexities in their relationship which forbid them to move ahead with it. This story was present in the subconscious of Meyer which resulted in the creation of Twilight. Complexities are also shown in the love story of Bella and Edward. At first Edward was not ready to accept this relationship as he considered himself dangerous and continued to push Bella away. Apart from that the entry of James added more problems for them. The story of Twilight is narrated by Isabella ‘Bella’ Swan who described herself as a ‘slender’ and ‘Ivory skinned’ (Twilight,9) girl. Just like many other teen girls Bella felt that she fits nowhere and remains unmindful to everything round her. She felt there is nothing attractive about her yet she catches the eyes of Edward Cullen, a beautiful vampire. As a child Bella left Forks and moved to Phoenix with her mother in search of a sunnier life. But after her mother Renee’s new marriage, Bella decided to move back to Forks to live with her father, Police Chief Charlie Swan. For her, Forks was an ‘alien planet’ (Twilight,5) and reminded her of the past. As she was of compromising nature, she decided to let her mother settle in her life and shifted to Forks. Back at Forks, she started to fight various complexes and began to lead a quiet life. Being an old fashioned, she took the position of a motherly figure at her father’s house. Her character was shown as a very silent person who had a lot in her mind but refused to open up before other. Everything was pretty normal in her life before she met Edward Cullen. Edward was over hundred years old Vampire and his gentleman like manners and protective side attracted Bella towards him and that brought them closer. His old fashioned and charming behavior and extremely good looks resembled more that of a traditional gentleman than an ordinary high school boy. And Bella being an old school was highly infatuated with him. She accepted her feelings for Edward very soon in the book, “I was unconditionally and irrevocably in love with him” (Twilight, 92). But the fact that Edward is a vampire stands in the way of their mutual happiness. The romance of Bella and Edward drives Twilight. The story by Meyer allows readers to experience the sexually innocent relationship between the lead characters. The passion which drives them forward is somewhat similar to Heathcliff and Catherine in Wuthering Heights by Emile Bronte. The chemistry between Heathcliff and Catherine was so strong that the classical work of literature is still admired by many readers. The similarity between the characters of two books is also a major reason for females to obsess over Twilight. The thrill and passion between the characters in the two books binds them together.
Although majority of vampires mentioned in twilight are good, there are three other vampires who fall in the category of evil. Their interference in the fairy tale romance of Bella and Edward created great problems. Laurent, Victoria and James are shown as typical, cruel and parasitical characters. They took pleasure in hunting and killing humans and are shown as shrewd personalities. James, the most evil one of them calls Bella ‘a snack’ (Twilight, 180). He is shown as a sly tracker who is adamant to hunt down Bella just for pleasure. In the end he was killed and burnt by Cullens and the fairy tale romance of Bella and Edward comes to a happy end. The introduction of good and evil vampires in the novel shows a balance. The balance in the nature is created with the perfect blend of evil and good. On one hand there are evil vampires who hunt humans for pleasure and cause chaos in the Forks. Then, on the other hand is a family of humanized vampires who protects the human connected with them. Good and evil are always present in our society in one or other form. Some people also believe that the fairy tale element in Twilight is similar to that of Beauty and The Beast. In the story a beats living in the castle falls in love with Belle, a young maiden from village. As they spend time with each other, Belle is able to know the real beast. She is able to recognize the kind heart and soul of the true prince that hides on the inside. Here in Twilight Edward is an entrancing modern ‘beast’ who falls in love with ‘human’ beauty Bella. In his own words Edward admits, I could kill you easily, Bella simply by accident” (Twilight), it shows he is aware of the beast inside him which he has hidden well by the garb of humanity. Bella on the other hand ends up thinking “The Vampire who wanted to be good- who ran around saving people’s lives so he wouldn’t be a monster” (Twilight). This tender manner of describing Edward makes reader think him as a beast who is suffering his cruel fate.

The efforts of Cullens and their race against James and Victoria form the climax of the novel. Though Cullens are also the vampires yet their approach towards their manner of living is different. As shown in the novel, they like to spend a normal life among humans. Though they have their code of conduct yet nothing distracts them from that. This is what Modern Supernaturalism is in real term. Shedding the traditional approach, Meyer has shown a different side of the vampires. Melton says, “Leaving folklores behind, the literary vampire of the nineteenth century transformed from ethnic vampire into a cosmopolitan citizen of the modern imagination” (Melton, xxxiii). The Cullens in Twilight do have a humanistic approach to their life. They don’t go by natural instincts and lived their lives cautiously. Meyer tries hard to describe Cullens as a regular American family who plays baseball and are just like any other human family, says Nayar (68). Even their joint efforts to save Bella indicate that they consider her as a part of their family. All these things are common in human life. But correlating them with supernatural creatures excites readers. Vampires are suddenly realistic as they are going to human school, intermingles with them and are also a part of their civilization. Stereotyped image of Vampire never brings out his character in this way. Vampires were meant to be terrified of, they are blood thirsty creatures. The vampires in Twilight on other hand are shown differently. They have a chosen a different way to lead their lives. They believe in living in harmony with humans and continue to have peace around them. Quite ironically the Head of the family Carlisle Cullen is portrayed as a doctor. A doctor who is a vampire yet has a strong control over his urges. Apparently unlike their predecessors, Cullens want to live a peaceful life. The new vampire seems to have moved from a monster to being well-regarded.

So far we have talked about the Vampires and how they are portrayed in Modern Supernaturalism. Now another major question is related to its huge popularity. Twilight series after its publication has received attention from all over the world. So much was the rave about the series that it got published in 36 other languages. As if the books were not enough, soon Twilight series came back with movie adaptations. Robert Pattinson as Edward Cullen fascinated girls from everywhere. His apt portrayal of charming and classy vampire earned the movie adaptations a grand success. Young adult fiction is always appreciated and loved by the readers. However, Twilight has attracted a large number of female fans. If one tries to comprehend the reason behind this crazy rave among the female readers, there can be many possibilities. Twilight, as discussed earlier is a mix of fairy tale and Gothic literature. Both the genres magnetize large number of readers from round the globe. Apart from that the resemblance of lead characters with Beauty and The Beast and Wuthering Heights can be assessed as a major grounds for female fan’s attention. It
is believed that fairy tales just like fantasy fictional work attracts young girl readers a lot. Fairy tales with their mesmerizing plot provides an escape from the real world. Meyer’s Twilight also possesses many similar elements of fairy tales. The supernatural creatures, a tempting story filled with romance and excitement, presents a perfect way to escape reality for young girl readers. In her work, Meyer combined different genres, used the simple language, portrayal of ideal characters which all together appealed to the young female readers.

An interesting thing to note here is that unlike the stereotyped females in Vampire fiction, Bella is given major importance. The story revolves around her, her relationship with Edward is beautifully described and her growth as a character is also shown. She is portrayed as an average teenager girl. But when luck favored her she got the best from her life. Forks, the place which she hated in the very beginning, became an integral part of her life. All the changes in her life can attract any teenage girl. As discussed earlier, the character of Bella provides and acts as a role model for many average teenage girls. Like them, Bella too had various complexes in her life which she overcomes after some time. She plays the part of ‘new kid in school’, a theme common in teenage fictional works. From a shy, conscious and a sufferer of broken family, she matured into a young woman of great abilities. Such attributes in her character attracts the young girl readers. The manner in which the personality of Bella undergoes a change can appeal to any regular teenage girl. Through her, Meyer grabs the attention of young female readers. She showed her perspective in the novel and gave her a voice to express her adolescent issues.

Sexual tension and the fairy tale love exhibited in Twilight also manage to gather many teen female followers. The confliction of romantic choices between the lead characters plays a foremost role in making vampire fiction so enthralling. One of the famous quotes from Twilight can give the readers an idea. “And so the lion fell in love with the lamb” (Meyer). It shows the precarious relationship between Edward and Bella. The female character seems to adjust with this idea of being in love with a monster. Whereas the quote from Edward suggests that the relationship will be impossible- he being the predator and she being the prey will never happen. The sexual tension and the never ending romance hooked the readers to anticipate the future and thus end up making Twilight a great book. Bella is taken by Edward’s charm in the very beginning of the story. But their actual relationship takes off when Edward states his uncontrollable yearning to shield her. The caring and protective love of Edward makes the readers believe in the impossible.

Other than showing the young romance accompanied with some action, Twilight also throws light on two major topics. ‘Perpetual Youth’ and ‘Beauty’ are something which a mortal can only wish for. Yet these two qualities are there in the Cullen family. All the members of Cullen family are bequeathed with ageless beauty and never ending youth. And these two factors mark them different from all the human characters. Plus they are also envied for their graceful looks and temperament. Every character as portrayed by Meyer gets dumbfounded and gasps for air while talking with Cullens. While this youth and beauty seems irrelevant to the Vampires, they remain a major issue in the lives of human. Eternal Youth and beauty is an idea which is highly gripping for teens. They never want to grow old and leave their adolescence behind. In the Vampire world, when a human is changed into a vampire, they remain the same age that they were turned for the rest of their existence. Their bodies remain indestructible and they are immune to any physical damage. This is what appeals the young female readers to the life of vampires. From a very long time our society is obsessed with fair color, anti-ageing products and the ways to look younger. This craze is not just with older generation but also with the adolescents. In the world of vampires, if a human become vampire, all of their imperfections are perfected. The media in the society today has captured a natural likeness with supernatural and capitalized this fixation. And that is one of the major reasons for Twilight to gain popularity as it exhibits the idea to remain young forever among the teen readers.

Stephanie Meyer is changing the face of supernatural world, providing readers to envision a dream full of magic. Her huge popularity among the readers is a proof in itself. The young readers are able to accept this change in Vampire fiction. The never ending fame of the books and the movie franchise has
made *Twilight* a literary achievement. The book certainly draws on literary reunion of gothic and fairy tales. This shows that fairy tales bring up questions and problems that an ordinary human being might face. The plot and heart of *Twilight* might be a love story but it also brings forward themes like parent-child relationship, broken families, acceptance among others and various issues of adolescence. It can then be said that fairy tale elements in *Twilight* attracts young readers towards it. There is a awe-inspiring search for the truth that leads to an even more exciting surprise. Bring a compassionate and ordinary girl as the protagonist, who attains the happy ending and ends up enjoying herself at something as ordinary and adolescent as a high school prom. Characters from today’s popular Vampire fiction like Edward Cullen, Damon Salvatore, Stefan Salvatore have supported the progressive themes in the vampire fictional world. The modern supernatural element- Vampire is presented with a completely new face. In the end to sum up the paper it can be said that beauty, romance, emotion and mystery associated with Modern supernaturalism have mesmerized the modern teenagers.

Bibliography

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**Secondary Sources**


Analysis of Bio Methane production from food waste as a long term renewable energy option

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Abstract

The rapid depletion of non-renewable energy resources and the threat of global climate change have forced the energy sector to seek alternative sources of energy to produce energy while preserving the environment. Bio methane is one of the best alternative energy source that has great potential for efficient energy production at an acceptable cost. So far, large scale production of bio methane has been neglected in comparative studies that focus on long term renewable options. Bio methane can be used to produce electricity and heat, and also be used as a fuel. It is produced from organic waste (dead animals and plant materials), wastewater, manure, sludge, etc. The purpose of this article is to analyze the Bio methane potential of food waste with respect to the characteristics of the equivalent food waste samples. Parameters such as Total solids (TS), Volatile Solids (VS), Total Ammonium Nitrogen (TAN) and Total Chloride content were determined in order to recognize the correlation between Biological Methane potential with the each parameter of food waste samples.

Keywords: Bio methane, Food waste, Renewable energy

1. Introduction

With the rapid growth of population, food waste contributes to a large proportion in municipal solid waste throughout the world. The release of untreated food waste has become a major problem in both developed and developing countries. Characteristics of the food waste is changing with the composition of it and due to the high moisture content, it is easily biodegradable.

There are several traditional methods of treating food waste including landfilling, incineration and composting. (Zhang et al., 2014). Land filling of food waste is not allowed in many countries and incineration process is highly energy intensive due to the high moisture content and causing the environmental pollution. Among the alternative treatment methods, anaerobic digestion has been introduced as a more effective way of treating the food waste due to high moisture content of food. (Zhang et al., 2007)

Food waste is rich in organic matter and the chemical energy stored in this waste could be released as methane during the anaerobic digestion process. Characteristics of the food such as moisture content, energy content and density and reactor design and operating conditions play a vital role in biogas production process where biodegradable organic matter will be broken down by the anaerobic microorganisms in the absence of Oxygen. The physical and chemical characteristics of the food waste including volatile solids content, nutrient contents, particle size as well as the biodegradability are highly important factors for designing an anaerobic digester. It is possible to have an idea about the biodegradability of the given food waste by measuring the biogas or methane production and the amount of volatile solids degraded during the anaerobic digestion process. (Doelle K, 2015)

Previous research work had been carried out to analyze the food waste collected in the city of San Francisco, California for the potential of bio gas generation. This work had been conducted using batch anaerobic digestion tests performed at thermophilic region. After 10 and 20 days of digestion, the methane yield had been reported as 348 and 435 mL/gVS respectively and the average methane content of the biogas had been determined to be 73%. The average destruction of the Volatile solids had been reported as 81%. (ZHANG et al., 2007) Another study has been conducted to determine the optimum mixing ratio of cafeteria, vegetable and fruit wastes in biogas generation using batch anaerobic digesters at mesophilic temperature ranges. For several mixing ratios, the cumulative biogas generation has been reported as 225, 279, 305 and 332 L/day. These results clearly show that food waste is having a high biodegradability and significant potential of generation of bio methane. (Mamun and Torii, 2015)
The main objective of this research work was to characterize the food waste sample collected from Kaduwela Municipal Council to assess its’ potential of generation of the biogas in a thermophilic anaerobic digester which was operating at 55°C. The ability of the conversion of the food waste to bio methane was examined for several inoculum to substrate ratios for identifying the best combination for the optimum biogas generation.

2. Methodology

2.1. Characterization of food waste

The food waste was supplied by Kaduwela municipal council waste treatment facility, Sri Lanka. The collected food waste samples were analyzed for total solids (TS), volatile solids (VS), total ammonium nitrogen (TAN) and total chloride contents according to the standard methods of American Public Health Association (APHA), as described below. Every test was triplicated for optimum accuracy of the results.

For analyzing the total solids content, the following method was applied. A clean porcelain dish which has been washed and dried in a hot air oven at 105°C for one hour was taken and the weight of the empty evaporating dish was obtained by an analytical balance to the nearest 3 decimal places. 5 g of the sample was measured and transferred into the porcelain dish. The oven was switched on and allowed to reach 105°C and the porcelain dish with the sample was placed in the oven. The sample was allowed to dry for about 1-2 hours until the measured mass was constant. The dish was allowed to be cooled in the desiccator and weighed as soon as it has cooled to avoid absorption of moisture due to its hygroscopic nature.

For analyzing the Volatile solids/ organic dry matter in the waste sample, the resulted sample from above experiment was placed in the muffle furnace and the sample was dried for about 20 minutes until a constant mass was obtained. The dish was allowed to be cooled in the desiccator and the weight measurement was taken.

Colorimeter was used for analyzing both Total ammonia Nitrogen and Total Chlorine content in the waste sample. Three waste samples were prepared for 10% total solids by dilution with water and the stored program number for analyzing TAN was entered to the colorimeter. A sample cell was filled with 10 mL of deionized water and kept it as the blank sample and a second sample cell was filled with 10 mL of the waste sample which was prepared. The contents of Ammonium Salicylate Reagent Powder Pillow was added to each sample cell. Then both cells were capped and shaken for the purpose of dissolving and a 3 minutes reaction period was allowed to be reached. Then the contents of Ammonium Cyanurate Reagent Powder Pillow was added to each sample cell. A 15 minutes reaction time was allowed to be reached and Total Ammonium Nitrogen value of the prepared sample was obtained with reference to the blank sample.

For analyzing Total Chlorine content, the stored program number was entered to the colorimeter. A sample cell was filled with 10 mL of the sample and it was considered as the blank sample. A second sample cell was filled to the 10-mL mark with sample and the contents of DPD Total Chlorine Powder Pillow was added to it. A 3 minutes reaction time was allowed to be reached and Total Chlorine value of the prepared sample was obtained with reference to the blank sample.

2.2. Analysis of Bio methane potential (BMP)

The bio methane production of food waste was determined under this analysis and digestion tests were carried out on the samples of waste collected from Kaduwela municipal council. The operative volume of each digest sample was 0.5L with different inoculum to substrate ratios (ISR).

1. Only Inoculum (500ml)
2. Inoculum to substrate ratio of 4:1 (400 ml inoculum and 100 ml substrate)
3. Inoculum to substrate ratio of 3:1 (375 ml inoculum and 125 ml substrate)
4. Inoculum to substrate ratio of 2:1 (333 ml inoculum and 167 ml substrate)

After filling the bioreactors, they were air sealed and nitrogen gas was purged for two minutes to make anaerobic condition inside the bioreactors. Then bioreactors were placed inside the water bath and the gas outlet of each anaerobic bioreactor was connected to each 1 L measuring cylinder to collect biogas by downward displacement. Then the temperature controller was switched on and the controlling temperature of the BMP test setup was adjusted to 55°C. Then the electric heater was switched on through the temperature controller and started heating the water bath. The wave maker was switched on to make a uniform temperature profile inside water bath at 55°C. Even though the temperature was indicated in temperature controller, a thermometer was used to ensure the temperature in water bath is 55°C. Multi position magnetic stirrer (operated in 100 rpm) with magnetic stir bars(x4) inside anaerobic reactors was used to mix the substrate and inoculum inside bioreactors.

The inoculum used was obtained from active anaerobic digester that was digesting complex organic matter at steady-state at Elephant House ice cream factory in Ranala, Sri Lanka. The inoculum was a granular sludge and it was stored under 4°C until it was taken for the BMP test. The substrate was obtained from Kaduwela municipal council waste treatment facility, Sri Lanka and total solid content of the substrate was adjusted to 10% (W/V %) before conducting the BMP tests.

3. Results & Discussion

3.1. Results for the characterization of food waste

The characteristics of food waste samples which were used in the anaerobic digestion tests are given in table 1, table 2, table 3 and table 4. The data have been given as the average of triplicates and the standard deviations are also shown.

| Table 1: Total solids (w/w %) in the food waste samples |
| Sample 1 | 28.57% |
| Sample 2 | 27.19% |
| Sample 3 | 27.63% |
| Average | 27.80% |
| Standard Deviation | 0.01 |

| Table 2: Volatile solids (w/w %) in the food waste samples |
| Sample 1 | 25.13% |
| Sample 2 | 24.05% |
| Sample 3 | 24.54% |
| Average | 24.57% |
| Standard Deviation | 0.01 |

According to the values reported, VS/TS ratio of the food waste samples is 0.88.

| Table 3: Total Ammonium Nitrogen concentration in the food waste samples |
| Sample 1 | 3.5 mg/L |
| Sample 2 | 3.1 mg/L |
| Sample 3 | 3.7 mg/L |
| Average | 3.43 mg/L |
| Standard Deviation | 0.31 |

| Table 4: Total Chlorine content in the food waste samples |

70
Sample 1 1.6 mg/L  
Sample 2 1.6 mg/L  
Sample 3 2.4 mg/L  
Average 1.87 mg/L  
Standard Deviation 0.46

### 3.2. Results of the biogas analysis

The total bio gas accumulation results have been shown in the figure 1.

![Figure 1: Total biogas accumulation in each day for different ISR](image)

### 3.3. Composition of the generated biogas

Average Methane composition for the anaerobic digestion of food waste has been given in table 5.

<table>
<thead>
<tr>
<th>ISR</th>
<th>CH₄ composition (%)</th>
<th>CO₂ composition (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>74.91</td>
<td>25.09</td>
</tr>
<tr>
<td>3</td>
<td>66.89</td>
<td>33.11</td>
</tr>
<tr>
<td>4</td>
<td>81.96</td>
<td>18.04</td>
</tr>
<tr>
<td>Inoculum</td>
<td>97.96</td>
<td>2.04</td>
</tr>
</tbody>
</table>

In overall, the biogas produced at higher ISR had higher Methane contents with compared to the lower ISR although there is a slight fluctuation in the values obtained for ISR of 2 and 3. This could be due to the high amount of volatile solids added by the inoculum for the anaerobic digestion process at high ISR. According to the results obtained by (ZHANG et al., 2007), about 73% of Methane content had been reported from the generated biogas analysis. The values obtained for ISR of 2, 3 and 4 in this study are consistent with the previously reported values.
Figure 2: Total accumulation of Methane from inoculum and substrate for different ISR

Total biogas accumulation and Methane production in each day during the digestion of food waste for different Inoculum to substrate ratios are given in figure 1 and figure 2 respectively. Total biogas accumulation has shown a great increase during the first day of anaerobic digestion and after 6 days, it has reached almost constant value, which indicates that the biogas production has stopped. For all ISR, Methane production has first increased with a steep gradient and after 2 days, it has remained constant. With the increase of the inoculum to substrate ratio from 2 to 4, it could be clearly observed that the obtained methane production had been increased. The lowest methane production has been observed in the sample which only contained 500 ml of inoculum. This result might have occurred due to the reason that there was insignificant amount of substrate for the digestion by the anaerobic microorganisms in that sample which lowers the production of Methane. The highest accumulation of Methane of 854 ml has been obtained for inoculum to substrate ratio of 4. There is a significant difference in the Methane production obtained from the different combinations of substrate and inoculum amounts.

3.4. Comparison of the Methane accumulation from substrate and inoculum

Figure 2 shows the total Methane accumulation from inoculum and substrate separately from each sample after 6 days of anaerobic digestion. When inoculum and substrate ratio had been increased from 2 to 4, the production of Methane from the inoculum has shown a gradual increase from 353 mL to 423 mL, while the production of Methane from the substrate amounts in these samples have shown a fluctuation in the range between 418 to 502 ml. Approximately equal amounts of Methane had been generated by both inoculum and substrate at the ISR of 2:1.

3.5. Calculation of the total biogas yield and Methane yield
Amount of volatile solids degraded at each ISR is given in table 6 and the biogas yield and Methane yield (amount of gas produced/g. VS degraded) are shown in figure 4.

Table 6: Amount of Volatile solids degraded for different ISR

<table>
<thead>
<tr>
<th>ISR = 2:1</th>
<th>ISR = 3:1</th>
<th>ISR = 4:1</th>
<th>Inoculum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial total Volatile Solids (gVS)</td>
<td>121.14</td>
<td>136.41</td>
<td>145.5</td>
</tr>
<tr>
<td>Final total Volatile Solids (gVS)</td>
<td>108.23</td>
<td>110.17</td>
<td>96.06</td>
</tr>
<tr>
<td>Volatile Solids degraded (gVS)</td>
<td>12.92</td>
<td>26.24</td>
<td>49.45</td>
</tr>
</tbody>
</table>

Figure 4: Bio gas yield and Methane yield per Volatile solids degraded for different ISR

Although, biogas and Methane production have increased with the increase of inoculum to substrate ratio, according to figure 3, both biogas yield and Methane yield (mL of gas produced/g. VS degraded) have been gradually decreased when ISR had been increased from 2 to 4. This could be due to the increase of amount of VS added and degraded with the increase of ISR as shown in table 6. Since inoculum mostly consists of volatile solids, when the contribution of inoculum is high in the sample, more volatile solids will be degraded and more Methane will be generated.

According to (ZHANG et al., 2007), approximately 425-445 mL/g.VS of Methane yield had been obtained after 28 days of digestion. (Cho, Park and Chang, 1995) had obtained 472 mL/g.VS after 25 days. The maximum Methane yield obtained in this study is 88 mL/g.VS degraded for ISR of 2:1. Although this value is comparably low when considering the reported values, this could be due to different VS/TS ratios of the food waste samples, methane compositions in the generated biogas and also the digestion conditions. VS/TS ratio of the samples analyzed by (Cho, Park and Chang, 1995) is around 0.95 while it is 0.88 for the food waste tested in this research.
Conclusion
According to the characterization of the food waste, it contained 27.8% of average total solids and 24.57% volatile solids content which gives a VS/TS ratio of 0.88. Different amount of Methane contents were produced by the tested food waste samples of 500ml which had been prepared to different Inoculum to substrate ratios. About 74.91%, 66.89% and 81.96% of Methane compositions were obtained for the samples of ISR of 2:1, 3:1 and 4:1 respectively. The maximum Methane accumulation of 854ml was obtained for ISR of 4:1 after 6 days of anaerobic digestion. Although there were slight confusions in the samples which were prepared for ISR of 2 and 3, in overall, with the increase of the inoculum to substrate ratio, production of Methane has been increased. Both biogas yield and Methane yield (ml of gas produced/gVS degraded) had been gradually decreased with the increase of ISR from 2 to 4. The maximum yield of Methane obtained from this study is 88 mL/gVS degraded for the ISR of 2:1. Although, the production of Methane is increased with the increase of ISR, this could be due to the increase of the amount of volatile solids added and degraded when the contribution of the inoculum is high. In overall, it could be concluded that, the analyzed food waste from Kaduwela municipal council waste treatment facility, is having a considerable potential for anaerobic digestion.

Acknowledgement
We have to express our appreciation to technical staff at University of Moratuwa for helping us to carrying out these experiments.

References
Antique Culture and Advancing Women

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Abstract

Githa Hariharan’s novels are examples of social realities. Her first novel The Thousand Faces of Night is such a novel which talks about the clash between three generations of women and the culture which prohibits them by not letting them to pursue their dreams. It is mandatory for a woman to submit herself in the hands of patriarchy to make her family happy. In the name of culture and tradition a woman’s role as an ideal daughter, wife, mother is assigned only in relation to others. Her own self stays in the state of dilemma when she enters into the institution of marriage. Devi, the chief protagonist of this novel also faces the same problem and walks out of the house as an act of prohibition returns to her mother Sita, rejecting the man-made structure of patriarchal culture to become independent than being an ideal housewife. Githa Hariharan sensitively portrays the tension of Indian women caught between tradition and modernity through her gallery of women characters in which one set of women submit themselves in the hands of patriarchy and another set which questions it.

Keywords: Women, Tradition, Modernity

India is a country which abounds with cultural heritage and traditional boundaries. This novel is setup in such an Indian environment in which women are treated as mother, protector and sometimes as God. But the irony is that it is the same country which prohibits women to acquire equal rights and opportunities in comparable to men. The reflection of this is also seen in this novel. Githa Hariharan through her casual and ready language makes the readers obsess with the characters. The novel shows the pathetic condition of women characters who struggle to present themselves in the traditional bounded society though they possess individuality. Githa Hariharan, though presents Devi as the chief protagonist of this novel, she presents some other characters such as Sita, Mayamma, Devi’s grandmother and Parvatiamma to showcase the different facets of women in India.

This paper focuses on the transformation that took place in the inner psyche of women with reference to the rigorous efforts to break the thwarting barriers made by the culture based society as male ideology. Githa Hariharan’s women who belong to three different generation reminds us of the three different phases of Elaine Showalter in categorizing the progress of women as ‘Feminine’, ‘Feminist’ and ‘Female’. Here the first generation includes Devi’s grandmother and Mayamma who just follow the footpath showed by the ancestors in safeguarding and slaving the men community. The second generation: Sita’s mother and Parvatiamma protest against the constrictions made by the family and society in a silent way but Devi who belongs to the third generation, unable to digest the uncaring, uninvolved and ununderstanding nature of Mahesh comes out of the house as an act of protest and joins her mother.

Githa Hariharan uses Indian mythical stories taken from the Ramayana and the Mahabharata to illustrate the state of her women characters in this novel. The story of marital discord and the woman’s survival outside marriage is remarkably represented by the writer with the help of stories taken from the Mahabharata. In a traditionally bounded country like India, myths are given more importance and values and ethics mentioned in those myths are transmitted from one generation to another through stories as in the case of Devi through her grandmother.
Her grandmother’s stories emphasize and try to find or launch a link with reality by highlighting the basic qualities of woman such as pride, destiny and self-sacrifice. The story of Gandhari, who is married to a very rich prince, whose palace was “twice as big as magnificent as her parents Palace” (28) but his “White eyes the pupils glazed and useless” (29). In anger Gandhari takes a vow to never see the world; so she bounds her eyes with her veil. Devi’s grandmother says, “She embraced her destiny—a blind husband with a self sacrifice worthy of her royal blood” (29).

The reflection of Gandhari’s story is seen in the life of Sita, Devi’s mother. Sita puts aside the music by breaking the strings of her Veena to execute traditional duties of wife, daughter-in-law and mother and transforms herself into an ideal daughter-in-law. Sita’s swayamvara was a mini-concert. Besides her dark skin she was admired for her music and it helped her to get the title from a “talented bride to efficient, reliable, daughter-in-law.”(102) But by the end of the novel, she returns to music which gives the strong decision of her release from the clutches of the past.

Devi, from the story of Amba told by her grandmother, chooses the survival strategy “A woman fights her battle alone” (36) and changes her own life. This story builds a brave attitude in Devi. The lines, “I lived a secret life of my own; I became a woman warrior, a heroine, I was Devi. I rode a tiger and cut of the evil magical demons heads” (41) shows how she prepares herself to face the male dominated society and at the end she makes the statement of her grandmother “‘A woman without a husband has no home’” (38) false.

After getting married, the replacement of grandmother’s stories with that of her father-in-law made a confusion in the mind of Devi. She feels that “Her stories were a prelude to my womanhood, an initiation into its subterranean possibilities”. (51) but his stories “always have for their center-point an exacting touchstone for a woman, a wife”. (51) As his father, Mahesh also has stereotypical views on womanhood so he doesn’t allow Devi to go for a work. He says “There is so much for you to do at home. Mayamma is getting old, she needs help. If you you need to get out of the house, why not join Tara’a painting classes?”(56) and he always stresses the importance of a baby in their life and says “what will you do when the baby comes?”(65) Devi’s inner urges pricks her and makes her feel that her marriage life is nothing but “yawning middle chapters” (54) of her womanhood.

This novel also shows how woman opposes patriarchal hegemony by developing female bonding. The bond between Devi and Mayamma is an apt example to showcase the strength which emanates from female bonding. Though they belong to different generation they feel for each other and share their joys and sorrows with each other due to the interactive bond they held between them. The thankful speech of Mayamma about Parvatiamma, Mahesh’s mother who sheltered Mayamma when she came to her with a torn Sari, after the death of her helpless son, brings forth the truth that she had been more ambitious. So she, like a man in a self-absorbed search for a god, escaped the life of a mere householder. After the departure of Parvatiamma, Mayamma was again left alone. She says to Devi “Parvatiamma was my sister, my mother, my daughter. But they all leave, child, no one stays long enough.” (82)

Mayamma blesses Devi when she plans to leave the house, saying go, Devi, search for that forest you crave in your delirious youth. Go deep, deep, into the hollows, and into the wild terrors of its dark stretches. My words wing in a different direction and build a nest for the coming night. Yours, thirsty, seek the river, miles away, where the dim forest gives way to a transparent flood of light. (126) Because she cannot change her life as her destiny is scribbled. So, she wants Devi’s life to be a different one. “A restless Devi went into the October night with Gopal’s entourage.” (131)

When she comes to know the self centred nature of Gopal just like Mahesh, she boarded to Madras alone to join with her mother, Sita. Devi thought of three different generation of women namely Mayamma, Sita and herself, who struggled and survived by the devotion to family which they fashion for themselves to create a balance between traditional ideas and modern thoughts. But when she thought
of herself she says “I have made very few choices, but once or twice, when a hand wavered, when a string was cut loose, I have stumbled on-stage alone, greedy for a story of my own.” (137) Githa Hariharan explains the pathetic, confusing state of Devi while leaving Gopal as “She had felt bold and carefree when she left Mahesh’s house, a little like a heroine. But she felt like a fugitive now, though she was, for the first time, no longer on the run.” (138)

Devi straightens her back when she saw the house and quickened her foot steps on hearing the faint sounds of veena which invites her into the house. Sita is seen sitting before the broken Veena, waiting for her daughter Devi who is coming back to her in search of a life of her own, breaking the commitments of society enforced upon her. To liberate from the pressures of feminine role-play to attain a free creative individuality, Devi and Sita showed their strong and rebellious will power. Now both realize that “whatever is dependent on others is misery; whatever rests on oneself is happiness”. (68)

Thus, through the novel The Thousand Faces Of Night, Githa Hariharan shows how women survives in the traditional bound male dominated society facing all hurdles and survives with their inner power and female bonding.

References:


Cost benefit study of household energy transition for BIMARU states
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Abstract:

Energy is a crucial element for development and plays a key role in poverty eradication and in advancing the welfare of mankind by driving investments in health, education, water supply and industrialization. However, we cannot rely on traditional carbon intensive fuels to push for economic growth as they are not only finite in quantity but the effects have been disastrous for the environment. In this context, energy transition attracts global attention today. Energy transition to modern and clean fuels calls for attention to the factors of affordability, availability and accessibility. Despite significant efforts by many nations on these dimensions, energy transition still remains incomplete due to various challenges and obstacles. This paper aims at studying the Indian context through use of econometric techniques and quantify the cost and benefits that accrue to the society due to shift to clean energy. The results from the analyses indicate that using clean energy sources will lead to overall social benefits. They are relevant with the findings from previous literature and strengthen some of the arguments made in earlier studies. The findings from saving and cost-benefit analysis can be buttressed as an argument for enabling switch to cleaner fuels. All options for the energy transitions in BIMARU states would yield gains for the people equivalent to 7-12% of Indian GDP. Thus, the quantified savings and gains that this paper yield can be used to recommend policies to accelerate the energy transition.

Introduction:

Energy is a crucial element for sustainable development and plays a key role in poverty eradication and in advancing human welfare through investments in health, education, water supply, industrialization and in combating the harmful effects of climate change (Sustainable Energy for All, 2015). United Nations (UN) recognizes providing access to affordable, reliable, sustainable and modern energy for all as one of the sustainable development goal (UN SDG 7). The proportion of the global population that has access to the electricity improved to 85%, over the last few decades. However, still 1.1 billion people across the world lack access to modern energy (Smalley, 2005). Half of humanity- about 3 billion people are still relying on solid fuels for cooking and heating, which are not only finite in quantity but the usage of these fuels is a public health hazard with people being pushed into perpetual poverty (Ekouevi, 2012). In this context, energy transition attracts global attention today. Energy transition to modern and clean fuels calls for attention to the factors of affordability, availability and accessibility. Despite significant efforts by many nations on these dimensions, energy transition still remains incomplete due to various challenges and obstacles. As the previous literatures are yet to provide quantitative estimate for benefits of the energy transitions from household perspective, this paper seeks to fill in the gap and quantify such benefits using econometric techniques. In specific, this paper utilizes cross sectional data from six BIMARU (Bihar, Jharkhand, Madhya Pradesh, Rajasthan, Uttar Pradesh) states in India to provide monetary estimate for net benefits. For the purpose of this paper, net benefits considered only include health benefits and therefore the estimates arrived are only a conservative estimate with actual benefits being much larger.

The paper proceeds as follows: Section I deals with Literature review. Section II describes the dataset and presents summary statistics. Section III presents Methodology and econometric analysis. Section IV presents results and discusses them. Section V concludes.

1. Literature Review:
IEG (2008) study mentions multi-fold benefits with transition to electricity which include income benefits from access to new opportunity of work especially in non-farm sector, leisure and domestic
benefits, time savings, education benefits, increased agricultural and industrial productivity, improved health outcomes and public good benefits of increased security and reduced environmental contamination.

Usage of inefficient and carbon intensive fuels seem to negatively impact environment. Usage of carbon intensive fuels emit pollutants such as particulate matter, carbon monoxide, nitrogen dioxide, sulphur oxides (mainly from coal) and other matter including carcinogens that have devastating effect on health. Indoor air pollution has been the causative agent for many diseases e.g., acute respiratory infections, chronic obstructive pulmonary disease, lung cancer, asthma, tuberculosis and low birth weight. According to Global Burden Disease Project 2012 (WHO), nearly 7 million deaths were attributed to ambient air pollution and household air pollution.

Although there are many studies that highlight the benefits of transition towards clean fuels, quantifiable studies especially in Indian context are clearly lacking. Studies from elsewhere have highlighted that benefits of shifting from unclean to clean energy go beyond environmental and include economic and social benefits. Bluffstone et al (2015) randomized control studies in Tanzania indicates time savings with shift from charcoal to LPG. Aglina et al (2016) study in ECOWAS region points at improved life expectancy due to adoption of grid electricity.

Coming to the Indian context, 800 million people in India still continue to use unclean fuels for their daily energy consumption. Further, the poor in India live in substandard houses which are unfit to be connected to modern energy systems (Balachandra, 2011). Unaffordability due to poverty and inaccessibility due to inadequate infrastructure are the root-cause for lack of access to modern energy systems. Despite the government claims of 99% village electrification through setup of grid infrastructure, energy usage of grid remains very low due to various factors such as high cost of grid, unreliable supply, low duration of electricity, frequent outages and low quality.

II. Data:
This study utilizes a household-level dataset from a survey conducted between Dec 2014 and May 2105 by the Council on Energy, Environment, and Water (CEEW) and Columbia University. A sample size of 8,568 was collected from 714 villages in 51 districts in the BIMARU states. Sample selection techniques ensure randomness and representativeness (Aklin 2016). The survey collected a variety of data ranging from monthly savings, monthly energy expenditures to the number of livestock and pressure cookers each household possess.

Monthly Energy Expenditure for each Kerosene, LPG and Firewood is determined based on whether the fuel is purchased at subsidized price or market price which is captured in the survey. Firewood also entails additional time cost which is valued at minimum wages prevailing in India. Electricity grid costs include monthly rental fee. Infrastructure set-up cost especially for electricity and administrative cost are borne by government and are in the nature of sunk costs and therefore not used in cost-benefit analysis. Secondly, the study evaluates the benefits from society point of view rather than the government and therefore the costs are not considered.

III. Methodology:
This paper combines the use of regression analysis of cross-sectional data and literature to quantify the cost & benefits that accrue to the society from the household perspective. Regression analysis is primarily used to determine the savings for each type of fuel consumption. The estimated average savings per household is then projected proportionately to the whole of BIMARU states based on the actual fuel user consumption data. Based on fuel shifts, the difference in the annual savings is then calculated. Annual mortality and morbidity benefits are estimated using value of statistical life (VSLY) for each fuel usage. Total benefits for a single year thus is calculated as the sum of calculated difference of annual savings, mortality and morbidity benefits. The annual benefits are then assumed to remain same for 30 years. Discount rate of 5% is then applied to derive net present value of cost and benefits.
**Empirical model**

The objective of the econometric analysis is to analyse how energy expenditure effect monthly savings of each household. The dependent variable is monthly savings while the main independent variables are monthly energy expenditures on kerosene, firewood, grid, and Liquefied Petroleum Gas (LPG), all variables measured in rupees per month. Savings and expenditure variables are converted to log form for their usage in regression analysis. However, negative savings and zero expenditure will be problematic in log transformation therefore a constant value is added to avoid the problem with conversion to log transformation.

The basic regression model, controls for factors that influence both savings and energy expenditure, which include, number of meals per day, number of family members, whether household is rich or poor, educational status of the household, gender, number of animals domesticated, number of pressure cookers, cooking time per day, number of fans, electricity stealing awareness, awareness on whether kerosene effects health. The model uses multivariate regression analysis to include control variables and also use various techniques to eliminate the effect of outliers.

\[
\log(\text{Monthly savings})_i = \beta_0 + \beta_1 \log(\text{Monthly energy expenditures})_i + \beta_2 X_i + \epsilon_i
\]

$X_i$ are control variables which include: Gender, is a dichotomous variable with 0 for female and 1 for male household head; Education, is categorical with ‘1’ indicating no formal schooling, ‘2’ indicating up to fifth standard, ‘3’ indicating up to tenth standard, ‘4’ indicating twelfth standard or diploma, and ‘5’ indicating graduate and above; Rich, is a dichotomous with 0 for poor and 1 for rich household; Family members, is the number of adults and children in the household; Domesticated animals, is the number of domesticated animals in the household; Number of pressure cooker, is the number of pressure cookers that a household has; Number of meals cooked per day, is the number of meals cooked per day. Average monthly savings per each household is then estimated by holding energy expenditure and other control variables at mean value. Assuming that monthly savings remain the same for all 12 months, the monthly savings is multiplied by 12 to derive average annual savings. Resultant annual savings per each household is then projected proportionately to the total BIMARU population who use any of the energy source. Proportionate population data for different fuel usage is provided by Planning Commission, Government of India.

The paper proceeds to calculate cost & benefits for shift from unclean to clean energy sources. The shifts proposed include: Kerosene to LPG, Kerosene to Grid, Firewood to LPG and Firewood to Grid. First, savings for the shifts is estimated based on the projected results from regression. Savings from the shift is estimated as difference between savings of each fuel estimated from the regression results. The paper next calculates mortality and morbidity benefits based on Bjorn Larsen index of health benefits. Tabel-1 provides the index of health benefits as estimated by Bjorn Larsen. Based on available literature, 24 hour PM 2.5 emissions are estimated at 250 μg/m^3 for firewood, 100 μg/m^3 for Kerosene, 50 μg/m^3 for LPG and 0 μg/m^3 for Grid. Global Burden Disease data published by WHO is then used to estimate mortality and morbidity benefits for energy shifts. e.g., for shift from kerosene to grid, health benefits are estimated to be in the range of 41%. This translates into 41% annual deaths avoided and 41% annual disease days avoided. VSL estimates from the literature are then used to estimate annual mortality & morbidity benefits. Total benefits for the shift is then calculated as the sum of savings from shifts, mortality and morbidity benefits. Total annual benefits are assumed to be constant for 30-year period and discount rate of 5% is applied to arrive at net present value.
Table-1: Bjorn Larsen Index of health benefits

<table>
<thead>
<tr>
<th>Transition</th>
<th>Kerosene $\rightarrow$ Grid</th>
<th>Kerosene $\rightarrow$ LPG</th>
<th>Firewood $\rightarrow$ Grid</th>
<th>Firewood $\rightarrow$ LPG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposures</td>
<td>$100 \rightarrow 25 \mu g/m^3$</td>
<td>$100 \rightarrow 50 \mu g/m^3$</td>
<td>$250 \rightarrow \mu g/m^3$</td>
<td>$250 \rightarrow 50 \mu g/m^3$</td>
</tr>
<tr>
<td>Disease Days</td>
<td>$41%$</td>
<td>$21%$</td>
<td>$100%$</td>
<td>$45%$</td>
</tr>
<tr>
<td>$(430)$</td>
<td>$(220)$</td>
<td>$(1048)$</td>
<td>$(472)$</td>
<td></td>
</tr>
<tr>
<td>$(2759)$</td>
<td>$(1413)$</td>
<td>$(6730)$</td>
<td>$(3029)$</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: OLS Regressions-Impacts of monthly energy expenditures on monthly savings

<table>
<thead>
<tr>
<th>Dependent Variable=Monthly Savings (Log)</th>
<th>Kerosene</th>
<th>Firewood</th>
<th>Grid</th>
<th>LPG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kerosene Expenditure (Log)</td>
<td>-0.115*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.068)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Firewood Expenditure (Log)</td>
<td></td>
<td>-0.029*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.015)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grid Expenditure (Log)</td>
<td></td>
<td></td>
<td>-0.046*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.024)</td>
<td></td>
</tr>
<tr>
<td>LPG Expenditure (Log)</td>
<td></td>
<td></td>
<td></td>
<td>0.039***</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.018)</td>
</tr>
<tr>
<td>Covariates</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Constant</td>
<td>2.995***</td>
<td>2.545***</td>
<td>2.628***</td>
<td>2.893***</td>
</tr>
<tr>
<td></td>
<td>(0.392)</td>
<td>(0.3)</td>
<td>(0.299)</td>
<td>(0.302)</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.098</td>
<td>0.098</td>
<td>0.098</td>
<td>0.101</td>
</tr>
<tr>
<td>Observations</td>
<td>3468</td>
<td>3468</td>
<td>3468</td>
<td>3468</td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

IV. Results & Discussion:
The OLS regression results for all four models are presented in Table 2. The results provide a mixed result. Annual monthly energy expenditure of kerosene, firewood & grid negatively affect monthly savings while LPG seems to be positively impacting monthly savings. In other words, a 1% increase in monthly expenditure on kerosene, firewood and grid decreases monthly savings by 11.5%, 2.9% and 4.6% respectively, holding all other variables constant. On other hand, 1% increase in LPG expenditure seem to positively increase monthly savings by 3.9%. Results also indicate that other factors such as gender, education, number of meals per day, time for cooking, years since grid and people steal electricity influence people’s monthly savings, which justifies the decision to control for these variables in the regression models. Also, the results from econometric analysis are then projected to whole BIMARU state population based on actual fuel usage statistics available from Planning Commission, Govt of India (DCH Handbook, 2014). The projection results are provided in table-3.
Regression of kerosene expenditure on other fuel expenditures i.e. Firewood, Grid & LPG, yields that kerosene is substitutable by grid, implying consistency with literature which put forth kerosene and grid as lighting energy sources. Increase in grid expenditure by 1% brings down kerosene expenditure by 2.2%. However, there seems to be positive correlation with LPG i.e. increase in LPG expenditure also leading to increase in kerosene expenditure. LPG and firewood are primarily cooking fuels and lighting needs are not met by them. Regression of firewood on LPG expenditure yield that increase in LPG expenditure by 1% decreases firewood expenditure by 12.7%. In consonance with literature, there is no substitutabiltiy observed between firewood and kerosene or firewood and grid. With increase in LPG expenditure by 1%, grid expenditure seems to be increase positively by 3.7% implying both are complementary. Results of the multi-variate fuel choice analysis yields: Kerosene & Grid are substitutes, Kerosene & LPG are complementary, Firewood & LPG are substitutes and Grid & LPG are complementary. This implies that shifts largely operate through Kerosene to Grid and Firewood to LPG. Other fuel shifts do not reduce the carbon intensive fuel usage. So we only explore the shifts from Kerosene to Grid and Firewood to LPG.

<table>
<thead>
<tr>
<th>Description</th>
<th>Kerosene</th>
<th>Firewood</th>
<th>Grid</th>
<th>LPG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average monthly savings per each household (holding other variables at mean value)</td>
<td>0.891</td>
<td>0.582</td>
<td>0.527</td>
<td>0.578</td>
</tr>
<tr>
<td>Total population in BIMARU states for each fuel</td>
<td>56,691,129</td>
<td>50,193,884</td>
<td>47,462,978</td>
<td>17,684,879</td>
</tr>
<tr>
<td>Total monthly savings for all BIMARU states (In Million)</td>
<td>50.50</td>
<td>29.22</td>
<td>25.00</td>
<td>10.23</td>
</tr>
<tr>
<td>Total yearly savings for all BIMARU states(In Million)</td>
<td>606.01</td>
<td>350.63</td>
<td>300.02</td>
<td>122.72</td>
</tr>
</tbody>
</table>

Table 3: Cost benefit projections from econometric analysis (1 USD=64.47 Rs).
All above figures in USD

Bjorn Larsen index of health benefits estimates (provided in table-1) are used for estimation of mortality and morbidity benefits. WHO Global Burden disease report is used for total disease days and total mortality data. Table-4 below summarizes the estimates on number of avoided deaths and avoided disease days as a result of shift from carbon intensive fuels to non-intensive. Shift from kerosene to grid (100→25 μg/m³) will therefore reduce the exposure emissions thus leading to overall positive impact on mortality and morbidity estimates. The resultant avoided death and disease days are then valued at VSLY benchmarks from the literature. Benefits per annum are then calculated as the sum of savings benefit from shifts, mortality and morbidity benefits. Savings benefit for each shift is simply calculated as the difference between savings estimated in table-3 for different fuel types. e.g., For kerosene to grid transition, savings from shift is simply calculated as difference of grid savings and kerosene savings, both of the estimates available in table-3.
Net benefits are then assumed to remain the same for next 30-year time period to arrive at net present value for the transition. We assume that households will hold on to these transitions at least for 30 years though this may be higher in real time. For the calculation of net present value, we apply discount rate of 5% (discount rate based on literature study including Bjorn Larsen).

Based on the findings indicated above, if households make the switch to clean energy, people of the BIMARU states can accrue benefits up to 5-6% of Indian GDP (2015 terms). If future benefits are discounted at higher rate i.e., 9% then NPV is valued at 3.72% (Kerosene to Grid) and 4.13% (Firewood to LPG) still showing large amount of benefits.

The results of this study are in-line with the findings from previous literatures- Bluffstone et al (2015) and Alam et al (1998), in terms of the benefits to clean energy transition. The outcomes could also be used to tackle the issue of low willingness to pay in India for clean energy fuels as indicated by Jain et al (2016) study. This study provides quantified estimates to policy makers to refer to with regards to the amount of savings for each fuel shift. Illustrating the relatively high savings acquired by using a clean alternative would induce people in the BIMARU states to reduce if not stop the use of “free-of-cost” firewood and polluting kerosene and make the necessary switch.

V. Limitations

Though this paper aims at quantifying the benefits to the society by analysing household shifts to energy transition, the benefits are limited to health benefits. Dataset is cross-sectional and therefore we do not control for unobservable factors that affect the variables in the regression modelling. Though the fuel choice is endogenous, the objective of the study is not to imply casualty but to conduct cost benefit analysis.

Outdoor ambient air pollution impact is not considered for the analysis. VSLY for morbidity is valued at 2705 USD while value of day of disease at 2.7 USD which seems to be close approximation but not precise. Sensitivity analysis changes this benchmark values but however variation is not big indicating the estimates are consistent. Transition benefits are only assumed for 30 years though this may be higher and only health benefits are considered. All this yield that actual benefits may be much larger than estimated.
VI. Conclusion
The shift from carbon intensive to cleaner alternatives has been proposed by many researchers and academics for decades. The literature especially in Indian context lacked empirical focus. This paper fills that gap. The results from our analyses indicate that using clean energy sources allow society to save more. The findings from saving and cost-benefit analysis can be buttressed as an argument for enabling switch to cleaner fuels. Energy transitions would yield substantial gains for the society. This paper estimates benefits for the people of the BIMARU states in the range of 7.5%-12% of Indian GDP as on 2015 on a conservative side. With such high savings, government can dovetail policies that attack the low willingness to pay problems in clean fuels.

References


Differences of Entrepreneurial Orientation in terms of Entrepreneurial Motivation: with special reference to Small and Medium Enterprises in Badulla Divisional Secretariat

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Abstract
Entrepreneurial Orientation is considered as a combination of several variables that is intended to create a value in organizations. Entrepreneurship is strongly linked to Small and Medium scale Enterprises. To be an entrepreneur, people need motivation. Thus, this study was conducted with the aim of identifying the differences of Entrepreneurial Orientation in terms of entrepreneurial motivation in Small and Medium scale Enterprises in Badulla Divisional Secretariat. Accordingly, a sample of 50 SMEs was studied by using a self-developed questionnaire. The result of the independent sample t-test employed in order of achieving the main objective of this study reveals that there is no difference of Entrepreneurial Orientation in terms of entrepreneurial motivation on SME owner managers in Badulla Divisional Secretariat.

Keywords: Entrepreneurial Motivation, Entrepreneurial Orientation, SME Sector

Introduction
Entrepreneurial Orientation (EO), is a combination of innovative, proactive and risk-taking behavior that is intended to create value in organizations (McDougall & Oviatt, 2000). As Lumpkin & Dess (1996), EO is defined as processes, structures, and/or behaviors that can be described as aggressive, innovative, proactive, risk taking, or autonomy seeking.

Individual entrepreneur’s values are strategically affected to the behaviors in SMEs (Soininen et al., 2012). According to Verheul et al., (2010), entrepreneurship is strongly linked to SMEs, which are the main developing force of the developed market economies. SMEs are usually representing the majority of all the enterprises and accordingly they are the main driving force of entrepreneurship development and economy. Further, EO has been found to have a positive impact on SMEs (Wiklund, 1999; Smart & Conant, 1994; Covin & Slevin, 1991). Islam et al., (2011), have found that entrepreneurial characteristics are significantly related to the success of SMEs.

To be an entrepreneur, people need motivation, desire and ability to pursue opportunities. These factors are altered from person to person. The motivational differences create a variation among people in their perception of risk taking behavior, opportunity considerations, and decision making process (Shane & Venkataraman, 2000). Entrepreneurial motivation can be classified under “pull” or “push” motives (Shane, 2001). According to Weatherston (1995), entrepreneurs are motivated by both “pull” and “push” forces.

Though these two factors are defined as motivational factors, according to Singh et al., (2011), push factors are considered as negatively motivated factors and pull factors are considered as positively motivated factors. Further, Hanifa et al., (2011), have identified that wage gap, higher unemployment rates and professional segregation are negative push motivators. According to Gilad & Levine (1986), push factors are negative external forces of entrepreneurship. Moreover, Hakim (1989) has identified that push factors often have negative connotations.
Thus, this study questions that will negative motives hinder the EO while positive motives increase the EO. Therefore, the main objective of this study is to identify the difference of EO in terms of entrepreneurial motivation with special reference to Badulla Divisional Secretariat. In this paper, firstly literature on entrepreneurial motivation and EO will be presented. Secondly, methodology of the research and thirdly results and discussion of the study will be presented. Finally, conclusion of the study will be discussed.

**Literature review**
The literature supporting the research question raised in this study is summarized below. Accordingly, conceptualizations on entrepreneurial motivation will be presented initially. Secondly, theoretical clarifications on the EO will be discussed.

**Entrepreneurial Motivation**
Motivation is the willingness to exert high levels of effort towards achieving organizational goals conditioned by the effort’s ability to satisfy some individual need. General motivation is concerned with effort towards achieving any goal, while organizational goals deal with work-related behavior (Williams, 2009). The differences of motivation create the differences in people’s perceptions when making decisions, considering opportunities and taking risks. Therefore, this variation of motivation has an influence on the individual’s readiness to act on the opportunities on time that would detrimental to the entrepreneurial process (Shane & Venkataraman, 2000). Entrepreneurial motivation can be classified under "pull" or "push" motives (Shane, 2001). Among the pull motives they uncovered reasons such as market opportunities and the need to apply knowledge for practical uses, and among the push motivations they found that the need for a change in the working environment was one of the most important things (Silvia et al., 2001). Pull and push are different motives behind starting a business (Brush, 1999). According to Stevenson (1986), “pushing” and “pulling” are motivating factors which is contributing to become business owners.

**Pull Factors**
Pull factors are those that make starting a business attractive. For an example controlling one’s own time at work (Watson et al., 1998; Gilad & Levine, 1986). According to the Verheul et al., (2010), pull motives include the need for achievement, the desire to be independent and social development possibilities. Weatherston (1995), has identified pull factors as desire for independence, lack of confidence in others to commercialize their product, need to control their invention and desire for wealth. Further, Minniti et al., (2006), has identified pull motives as the factors which are characterized by the positive motives which pushes people to be an entrepreneur mainly due to their dream and vision to create new idea, to seek opportunity, and to create interesting working environment. Moreover, pull factors are internal motives that draws people to start a business, usually occurred as a result of seeing an opportunity (Hakim, 1988).

**Push Factors**
Push factors are those that impel a person to start a business in order to avoid some undesirable situation. For an example an abusive boss (Watson et al., 1998; Gilad & Levine, 1986). According to Verheul et al., (2010), push motives may arise from the exit from or risk of unemployment, family pressure and or dissatisfaction with the present situation in general. Further, Weatherston (1995), has identified that the push motivations were mainly related to dissatisfaction in their jobs. According to Minniti et al., (2006), push motives are deriving due to impoverished situation, usually family reasons, life style and to fulfill other "necessity" reasons.

**Entrepreneurial Orientation**
Entrepreneurial Orientation (EO) has become a central concept in the domain of entrepreneurship that has received a substantial amount of theoretical and empirical attention (Covin et al., 2006). According to the view of Lumpkin & Dess (1996), EO is defined as processes, structures, and/or behaviors that can be described as aggressive, innovative, proactive, risk taking, or autonomy seeking. EO is defined as a tendency which is not created or imposed by top management, but reflects the strategic posture as
exhibited by multiple layers of management (Stevenson & Jarillo, 1990). EO is a firm-level construct that is closely linked to strategic management and the strategic decision making process (Lumpkin & Dess, 1996; Naman & Slevin, 1993; Burgelman, 1983; Kanter, 1983). Table 1 would illustrate the definitions of EO dimensions.

**Table 1-Definitions of EO dimensions**

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovativeness</td>
<td>A willingness to support creativity and experimentation in introducing new products/services, and novelty, technological leadership and R&amp;D in developing new processes and creative solutions in pursuit of a competitive advantage.</td>
</tr>
<tr>
<td>Pro-activeness</td>
<td>An opportunity-seeking, forward-looking perspective characterized by the introduction of new products and services ahead of the competition and acting in anticipation of future demand (Lumpkin &amp; Dess, 1996).</td>
</tr>
<tr>
<td>Risk taking</td>
<td>A tendency to take bold actions such as venturing into unknown new markets, committing a large portion of resources to ventures with uncertain outcomes, and/or borrowing heavily (Lumpkin &amp; Dess, 1996).</td>
</tr>
<tr>
<td>Autonomy</td>
<td>An independent action by an individual or team aimed at bringing forth a business concept or vision and carrying it through to completion (Lumpkin &amp; Dess, 1996).</td>
</tr>
<tr>
<td>Competitive aggressiveness</td>
<td>The intensity of a firm’s efforts to outperform industry rivals, characterized by a combative posture and a forceful response to competitor’s actions (Lumpkin &amp; Dess, 1996)</td>
</tr>
</tbody>
</table>

**Entrepreneurial Motivation and EO**

According to Verheul et al., (2010), individuals decide to engage in entrepreneurial activities because of these different motivations. Push and pull factors motivate people to become entrepreneurs (McClelland et al.,2005; Segal et al.,2005; Hakim 1989). According to Weatherston(1995), entrepreneurs are motivated by both “pull” and “push” forces. Further, Brush (1999), has described pull/push motives as an approach that targets to describe the differing motives behind starting a business. According to Stevenson (1986), “pushing” or “pulling” factors are contributing to become business owners. Hanifa & Baalbaki (2011), have described push factors as job redundancy, glass ceiling, economic recessions, financial reasons, job dissatisfactions, which are motivating people to become entrepreneurs. Moreover, they have defined push factors as negative external motivating factors such as wage gap, higher unemployment rates and professional segregation. According to Hisrich & Brush (1986), both push and pull factors work together to turn people to become business owners. Accordingly, in this study also pull motives and push motives are being used to examine the influence on EO considering the view presented by Lumpkin & Dess (1996), as most of the scholars have been used it for their studies.

**H1:** There is a difference of EO in terms of entrepreneurial motivation

Accordingly, the conceptual framework (Figure 1) can be established as follows.
Research methodology
This study was based on registered SMEs in Badulla Divisional Secretariat of Uva Province of Sri Lanka. There were 397 registered SMEs (Census and Statistical Department (2010), and a random sample of 50 SMEs were selected for the study based on the World Bank Definition for Sri Lankan SMEs (World Bank, 2011). Data were collected by using a self-developed questionnaire, comprised with three main sections based on Miller’s (1983) nine point scale. To assess the internal reliability of questionnaire, a pilot survey was conducted by using 18 respondents. Cronbach’s alpha value indicated that the internal reliability of the questionnaire was at an acceptable level. The descriptive statistics; frequencies, percentages, graphs and tabulation techniques were used, to describe the profile information of the sample, to assess the level of the EO and to identify the motives of SME owner managers. Mean and standard deviation were used to identify the level of EO according to the range created by investigator as follows; 1 <= X< 2.5 - Low level, 2.5 <= X< 3.5 - Moderate level and 3.5 <= X< 5 - High level. In order to achieve the main objective of identifying the differences of EO in terms of Entrepreneurial Motivation was mainly achieved by using independent sample t-test.

Results and discussion
Concerning on this research study, primary data were collected from 50 respondents who are the SME owners of Badulla Divisional Secretariat. Table 2 presents the frequencies and percentages related to gender, age of respondents and firm age.

Table 2- Frequency and Percentage of Basic Information

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>24</td>
<td>48</td>
</tr>
<tr>
<td>Female</td>
<td>26</td>
<td>52</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-30</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>31-50</td>
<td>37</td>
<td>74</td>
</tr>
<tr>
<td>&gt;50</td>
<td>11</td>
<td>22</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td><strong>Firm age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;1 years</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>1-5 years</td>
<td>18</td>
<td>36</td>
</tr>
<tr>
<td>6-10 years</td>
<td>13</td>
<td>26</td>
</tr>
<tr>
<td>&gt;10 years</td>
<td>11</td>
<td>22</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>
According to table 2, majority of the sample is compromised with female. When considering the age, the highest portion of the sample is contributed by 31-50 age categories. In Ranges of firm age distribution the highest portion of the sample is contributed by the businesses which are continuing from 1 to 5 years.

Level of EO - To assess the level of EO, descriptive analysis of mean and standard deviation is found on the level of EO indicators. Table 3 illustrates mean and standard deviation of EO indicators.

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovativeness</td>
<td>3.4</td>
<td>0.67974</td>
</tr>
<tr>
<td>Pro-activeness</td>
<td>3.635</td>
<td>0.67046</td>
</tr>
<tr>
<td>Risk taking</td>
<td>3.392</td>
<td>0.52366</td>
</tr>
<tr>
<td>Competitive aggressiveness</td>
<td>3.333</td>
<td>0.81092</td>
</tr>
<tr>
<td>Autonomy</td>
<td>3.4</td>
<td>0.91189</td>
</tr>
</tbody>
</table>

As to the table 3, innovativeness, risk taking, competitive aggressiveness and autonomy have moderate tendency while pro-activeness has slight improvement beyond the moderate level as 71% of SME owner managers have used proactive activities by being a first mover to the market. Especially, they have paid their attention to the external environment by observing the target market, consumers’ preferences, price levels and competitors’ behaviors.

Motives of Owner Managers - According to the table 4, push factors such as job dissatisfaction, lack of employment opportunities, insufficient salary or inflexible work schedule, family pressure and financial reasons have the highest number of frequency when comparing to pull factors (a desire for independence, desire for self-fulfillment and other personal rewards). It means 78% of owner managers have been motivated with push factors to start a business.

<table>
<thead>
<tr>
<th>Motives</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pull factors</td>
<td>11</td>
<td>22</td>
</tr>
<tr>
<td>Push factors</td>
<td>39</td>
<td>78</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>

Differences of the Level of EO in terms of Entrepreneurial Motivation. Table 5 illustrates the SPSS output of independent sample t-test.
Table 5- Independent sample t-test

<table>
<thead>
<tr>
<th>Levene’s test for equality of variances</th>
<th>t-test for equality of means</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>2.087</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>2.482</td>
</tr>
</tbody>
</table>

As to table 4, evidence could not be traced for a statistically significant (P>0.05) difference of level of EO in terms of entrepreneurial motives. Thus, it implies that there is no difference of EO in terms of entrepreneurial motivation. As to the results, though push motives are considered as negative motives while pull motives are considered as positive factors, there is no any difference of level of EO in terms of these entrepreneurial motives.

Conclusion and suggestions

Conclusions on the Level of EO - As to the results of descriptive statistics, innovativeness, risk taking, competitive aggressiveness and autonomy have moderate level of tendency while pro-activeness has slight improvement beyond the moderate level.

Conclusions on Identifying Motives of SME owners - According to the frequency value obtained from descriptive statistics, it can be illustrated that most of the SME owner managers have become entrepreneurs because of the push motives such as unemployment, job dissatisfaction, insufficient salary or inflexible work schedule, family pressure and financial reasons.

Conclusions on the Differences of EO in terms of Entrepreneurial Motivation - The findings related to the main objective does not support the hypothesis established in this study. According to the value of independent sample t-test, there is no difference of EO in terms of entrepreneurial motivation.

H1: There is a difference of EO in terms of entrepreneurial motivation

However, there was no adequate evidence to support this hypothesis. According to the research findings some policy implications and suggestions can be identified to develop SMEs in Badulla Divisional Secretariat such as providing new technology, financial facilities and knowledge, conducting awareness programs, training programs and workshops. Accordingly, the future research can focus on the differences of EO in terms of entrepreneurial motives in several other industries and sectors such as hotel sector and apparel industry.

References


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Differentiation of *Pectobacterium carotovorum* isolates from selected crops grown in different geographical areas of Sri Lanka and determination of their host range

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**Abstract**

Bacterial soft rot caused by *Pectobacterium carotovorum* is a destructive disease of vegetables, fruits and ornamentals found worldwide. This pathogen belongs to family Enterobacteriaceae and is separated into six subspecies. Characterization of pathogens as much practically as possible is important for implementation of control measures and management strategies on a disease.

Although there are limited studies on characterization at the strain level of *P. carotovorum* in Sri Lanka, the geographical distribution of its sub-species is unknown. Therefore this study was conducted with the specific objectives of determination of the geographical distribution and host range of *P. carotovorum*, characterization of their isolates using biochemical and physiological characters.

Among the biochemical and physiological tests, only Indole test and Citrate utilization test showed variation. Cluster analysis for biochemical tests divided the isolates in to three clusters which show evidence for the presence of different *P. carotovorum* subspecies. Isolates showed variable results for host range identification which was followed using nine crops. Three other clusters were also created using host range identification, all the biochemical, physiological and pathogenicity tests and SDS PAGE banding patterns.

The results show the existence of at least three subspecies and a variation within each subspecies. The susceptibility of the different strains to the control measures needs to be determined. Identification of subspecies using sequence analysis is pending.

**Keywords:** Soft rot Erwinia, Host range, SDS-PAGE

**Introduction**

Bacterial soft rot caused by *Pectobacterium carotovorum* (Synonymous to *Erwinia carotovora*) is a destructive disease found worldwide, resulting great economic lost (Dhanvantari and Dirks, 1987; Dickey and Kelman, 1988). This pathogen belongs to family Enterobacteriaceae and is separated into six subspecies: atrosepticum, betavasculorum, carotovorum, odoriferum, wasabiae and brasiliensis (Hauben *et al*., 1998; Duarte *et al*., 2004). Although there are six subspecies, in 2003 Garden *et al*. suggested that three sub species; atrosepticum, betavasculorum and wasabiae should be elevated to species level (Garden *et al*., 2003, Costa *et al*., 2006).

Although there are a limited number of studies on characterization at the strain level of *P. carotovorum* in Sri Lanka, the geographical distribution of its sub species is unknown. The control measures of a pathogen may need fine adjustments according to the specificities of species, sub-species or strains. As such identification of pathogen and further characterization as much as practically possible is important for implementation of control measures and management strategies in agriculture, seed certification and quarantine.

Therefore this study was conducted in 15 selected geographical regions in Sri Lanka, with main objective of Differentiation of *P. carotovorum* isolates from selected crops grown in different geographical areas of Sri Lanka. Specific objectives of the study were determination of the geographical distribution and host range of *P. carotovorum*, characterization of their isolates using biochemical and physiological characters.
Method and materials
Sample collection
The study was conducted in 15 selected geographical regions: Bandarawela (Ba), Nuwara Eliya (Nu), Welimada (Wm), Talawakele (Ta), Haton (Ht), Ragala (Ra), Haguranthka (Ha), Wellawaya (We), Suriyawewa (Su), Ranna (Rn), Ambalanthota (At), Nochchiyagama (No), Galewela (Ga), Hettipola (He) and Dambulla (Da) in Sri Lanka. Fifty five disease samples including *Solanum tuberosum* (Po), *Brassica caulorapa* (Kn), *Allium porrum* (Le), *Daucus carota* (Ca), *Allium cepa* (Be), *Phaseolus vulgaris* (Lb), *Brassica oleracea* var. Capitata (Cb), *Raphanus sativus* (Ra) , *Lactuca sativa* (Lt), *Capsicum annuum* (Cp), *Cucumis sativus* (Cu), *Solanum melongena* (Br), *Apium graveolens* (Ce), *Lycopersicon esculentum* (To) and *Momordica charantia* (Bt) were collected from above selected geographical regions. These samples were transported in an icebox to laboratory at Faculty of Applied Sciences, Rajarata university of Sri Lanka for further experiments.

Pathogen isolation
*Pectobacterium* colonies were isolated in MacConkey agar using scraping of disease infected tissues of vegetables and yams according to the procedure followed by Al-Zomor et al. (2013). Inoculated plates were incubated at room temperature for 24 hours. Then properly isolated pink color single colony of each sample was taken from MacConkey agar plates and re-streaked 3 times on separate Nutrient Agar (NA) plates or re-streaked on NA plates until one type of colonies appeared. These plates were placed at room temperature.

Pathogenicity testing
Pathogenicity of the isolates was determined using healthy carrot and potato slices. Well grown healthy carrot and potato which had not any visible mechanical damage were washed with 3% Sodium hypochlorite solution containing a drop of detergent. Then they were rinsed three times with sterile distilled water and air dried at room temperature. Slices of 7-8 mm thickness were cut along the long axis using a sterile knife. Each slice was kept in sterile petri dish which contained two glass slides on moist filter paper. Loopful of purified *Pectobacterium* colony was taken from NA plate and rubbed on two places in the vegetable slice. A control without bacteria was also maintained at one end of the same slices (Perombelon and vanderwolf, 2002). They were incubated at room temperature and observations were taken after 24 and 48 hours. This procedure was repeated two times. After conformation of pathogenicity, stock cultures of isolates were prepared using Nutrient agar slants, 50% glycerol and sterile distilled water.

Pathogen identification and differentiation
Gram test, Oxidase test, catalase test, KOH string test, Urease Production, H₂S production, Indole production, Starch hydrolysis and Citrate utilization tests were followed as biochemical tests while growth at 36°C and 5% Sodium Chloride tolerance tests were followed as physiological tests. All these tests were repeated for all the isolate to prevent false positive and false negative results.

Sodium Dodecyl Sulphate Polyacrylamide gel electrophoresis (SDS PAGE)
SDS PAGE was followed for all 55 sample isolates. First the isolates from the stocks were cultured on MacConkey agar plates and incubated at 37°C for overnight. Then loopful amount of colonies were transferred in to 5 mL of Luria Bertani (LB) medium and incubated 20 hrs with 150 rpm. Three milliliters of culture was removed and centrifuged at 13,000 rpm for 5 minutes. Then pellet was re-suspended in 500 μl of sterilized distilled water. Eighty microliters of the suspension was mixed with 20 μl of loading buffer (see appendix) and boil for 5 minutes. After the preparation of the samples, they were loaded in to the gel apparatus using a Hamilton syringe. SDS PAGE was followed using 10% and 12% resolving gels (pH 8.8) with 4% stacking gel (pH 6.8) to identify the suitable resolving gel. Then 10% resolving gel was selected and samples were run at 25 mA in 10% gel. Then the gel was removed from the glass plate and fixed in fixing solution (50%methanol, 10%Glacial acetic acid) for overnight. After the fixing it was stained using coomassie blue staining solution (0.3% coomassie blue,45%
Methanol, 10% Glacial acetic acid) for 20 minutes. Then it was destained three times with 20 minutes each changing destaining solution (40%methanol, 10%Glacial acetic acid).

**Host range Identification**
All the sample isolates were inoculated separately in nine different crops; *Daucus carota, Solanum tuberosum, Beta vulgaris, Brassica oleracea* var. *Capitata, Capsicum annuum, Allium porrum, Brassica caulorapa, Allium cepa, Raphanus sativus* to examine the pathogenicity of the isolates using pathogenicity testing procedure. Three replicates were followed for each isolate.

**Data Analysis**
Isolates were clustered by different parameters using SPSS 20.0 and SDS-PAGE was analyzed using TOTAL LAB TL 120 V.2009 and GelAnalyzer 2010 gel analysis software.

**Results and discussion**
Pathogen isolation and purification
The first step of the identification and differentiation pathway is the isolation of pathogen. *Pectobacterium* can be isolated satisfactory using MacConkey Agar (MA) as this species belongs to family Enterobacteriaceae. Isolated colonies of *Pectobacterium carotovorum* on MacConkey agar were pink color circular colonies with entire margin. They were convex and 1 to 3 mm in diameter. *P. carotovorum* purified on NA plates at room temperature were white in color, circular, entire colonies with convex elevation and 1 to 3 mm in diameter. Most of the strong lactose fermentive *Pectobacterium* appear in pink colonies on MA while weak lactose fermenters do not produce dark pink halos. Although MA is a selective and differential medium, it does not give strong evidence to identify *Pectobacterium* by the colony color because most of the lactose fermentative Gram negative bacteria appear as pink colonies. Pathogenicity test can easily be used as one of the best solutions for confirms identity of *Pectobacterium* colonies.

Except soft rot erwiniae, *Pseudomonas* also causes soft rot diseases to vegetables (Liao and Wells, 1987; Scortichini, 1994, Barth et al., 2009). However MA was beneficial in differentiating *Pseudomonas* from *Pectobacterium* as *Pseudomonas* are non-lactose fermenters and appear in pale yellow colonies in MA. Nevertheless weak lactose fermentative *Pectobacterium* produce pale colonies, so further confirmation of their identity is necessary. Catalase and oxidase tests were followed for this purpose as *Pseudomonas* is both oxidase and catalase positive while *Pectobacterium* is catalase positive and oxidase negative.

**Pathogenicity testing**
For the confirmation of *Pectobacterium*, pathogenicity test was followed using healthy carrot and potato slices. Here the use of slices of two storage tissues other than healthy sample of their originally isolated host was done for the comparison of their severity to the same host. Most of the researchers use this strategy to compare the pathogenicity of the isolates (Costa et al., 2006, Amdanet al., 2015). All 55 isolates gave positive results for carrot slices within 24 or 48 hours. Potato slices were infected by only some isolates within 24 or 48 hours. The infection on the carrot slices was heavier than the potato slices in most isolates in general, but NuRa1, NuPo1, HaCb1, At Be1, BaCa3, Da Be1, DaBe2 showed higher infection value for potato slices than carrot slices. Although the WmPo1, WmPo2 originally isolated from the disease potato tubers they did not show infection on healthy potato slices in the pathogenicity test, but they infected carrot slices, HtCp1 and HtCp3 also did not show infection on the potato slices. However in a subsequent experiment these ones produce symptoms on potato. There was a drop in ambient temperature from the first and second set of experiments. Therefore the effect of temperature was suspected for the different results of pathogenicity on potato. This needs further investigation

Pathogen identification and differentiation

Biochemical tests were followed for the basic identification and further differentiation of the *Pectobacterium*. All the isolates were negative for Gram test, starch hydrolysis test, Oxidase test, urease test and H₂S production test while positive for KOH string test, catalase test, growth at 36 C° and 5 %
NaCl tolerance test. Cluster analysis of biochemical and physiological tests divided the isolates into three main clusters. NuCe1, HaTo1, AtTo2, AtBe1, AtBe2, BaCa1, BaLe1, BaLe2, RnCu1, WmCa1, RaCa1, HtCp2, HtCp3, HeCu1, SuTo3, GaCb2 which were present in cluster one showed positive result for both indole and citrate utilization tests. BaCa2 and BaCa3 in cluster two showed negative results for both indole and citrate utilization tests. All other isolates which were in cluster three showed positive results for citrate utilization test and negative result for indole test.

Since all isolates were positive for growth at 36°C and for 5% NaCl tolerance tests the presence of *P. atrocepticum* and *P. wasabiae* may be excluded. Further none of the isolates produced symptoms characteristic to black leg disease caused by *P. atrocepticum*. When compare these results with biochemical characters of *Pectobacterium* subspecies, BaCa2 and BaCa3 isolates from carrots from Bandarawela shows similar biochemical characters as *P. betavascularum*. However according to the literature the host range of *P. betavascularum* mostly limited to the sugar beet (Charkowski et al., 2006; Toth et al., 2003), yet it can infect other plants such as cucumber, beans, melon, tomato, squash, maize, potato, eggplant, carrot, turnip, garlic, onion, garden beet and date palm fruit (Nedaienia and Fassihiani, 2011). Therefore a possibility of presence this species in localities where sugar beet is not present cannot be ruled out. According to the literature *P. carotovorum* subsp. *carotovorum* shows variable results for indole production test. Thus when considering the indole test positive members they may have close relationship with *P. carotovorum* subsp. *carotovorum*. However this is not conclusive because the indole production is variable for *P. carotovorum* subsp. *carotovorum*. Furthermore Indole production negative citrate utilization positive isolates may also be either *P. carotovorum* subsp. *odoriferum* or *P. mearothorum* subsp. *carotovorum*. Further characterization using DNA based techniques would reveal more information.
Host range identification
Cluster analysis for host range, shows the relatedness among the isolates based on their ability to infect the hosts. The main purpose of host range identification test was to check whether there is a link between the infection ability with respect to different subspecies, geographical region or to the originally isolated host. All the isolates were negative for Allium cepa. According that ability of infect Beta vulgaris isolates were separated in to two major clusters, cluster 1 and cluster 2. Cluster 1 consists of members that do not infect Beta vulgaris while cluster 2 consists of isolates which have that ability. When comparing the results of this test with results of biochemical tests, BaCa2, and BaCa3 again grouped separately in this analysis as they showed negative results only for Raphanus sativus and Allium cepa, while showed positive infection for Beta vulgaris and other crops. This is another good evidence to indicate that BaCa2 and BaCa3 are related to P. betavascularum. It is noticeable that, by comparison of the other two clusters in Dendrogram 1 with the analysis of host range identification, the isolate did not show clear separation according to the biochemical and physiological similarities like did BaCa2 and BaCa3. However, all isolates which were isolated originally from Solanum tuberosum and Lactuca sativa from different geographical regions included in same clusters separately in both biochemical tests and host range identification test. It may due to the presence of same strain. When consider the geographical region with respect to infection ability some isolates such as HaPo and HaTo, AtBe, AtTo and AtCp which were originally isolated from different crops but same geographical region showed identical host ranges. Similarly some isolates such as GaCb1 and GaCb2, HtLt2 and HtLt4, RnKe1 and RnKe2, HaPo1 and HaPo2, HtCp1 and HtCp3 WmPo1 and WmPo2, BaCa2 and BaCa3, SuTo1, SuTo2 and SuTo3, DaBe1, DaBe2 and DaBe3, AtBe1 and AtBe2, AtTo1 and AtTo2 which were isolated from the same crop in the same geographical region showed similar host ranges.

Cluster analysis for all the tests
Cluster analysis on all the tests including colony morphology, pathogenicity, physiological, biochemical and host range identification tests which followed for isolates. Although it showed some similarities with cluster analyses for biochemical tests and Host range identification, such as BaCa2 and Baca3 in separate cluster, it did not display the biochemical and physiological similarities clearly

SDS PAGE
SDS PAGE was done for the total protein of all Pectobacterium isolates. Gel analysis software GelAnalyzer 2010 identified twelve informative bands in the isolates. Among these, band number 6 was present in all the isolates and that can be taken as a common band. Band number 5 was next prominent band among isolates. When consider the SDS PAGE analysis BaCa2 and BaCa3 were in same cluster. Similarly isolates which were isolated originally from Solanum tuberosum and Lactuca sativa from different geographical regions again had similar band patterns separately. Furthermore SuTo1, SuTo2 and SuTo3 which showed similar host range included in same cluster.

Conclusion
Considering these all results it can be conclude that Pectobacterium carotovorum subspecies present in all tested geographical regions. Biochemical and physiological results shows the existence of at least three subspecies and a variation within each subspecies. Isolates have different host ranges with having some similar infection abilities such as in all isolates of Solanum tuberosum and Lactuca sativa

Further directions
Identification of subspecies using sequence analysis is pending and the susceptibility of the different strains to the control measures needs to be determined

References
amplification of the 16S-23S Intergenic Spacer Region, *British Biotechnology Journal*, 7(3), 102-110


**Appendix**

Loading buffer: Tris base 0.379g, Glycerol 5g, β-Mercapto ethanol 2.5 mL, SDS 1.15g, water 50mL, Bromophenol blue 0.05 g
Ecopreneurship as a promising drive for Business Performance: A Review of Eco friendly Food & Beverage Industry in Sri Lanka

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Abstract
In Sri Lanka, entrepreneurial businesses heavily contribute for the economic growth of the country. Hence, failure of the entrepreneurial sector is an economic cost to the entire development of the country. In recent times, perceptions of the entrepreneurs have significantly changed, especially with the growth of the globalization and green concepts. Today environmentalism grows rapidly and it helps to make the world a better place.

Ecopreneurship is a new approach emerged in 21st century for making money being environmentally friendly. Ecopreneurs can be considered as a subcategory of entrepreneurs. This paper has mainly focused on reviewing ecopreneurship as an emerging driver for business performance. It has found that most of the scholars have different insights towards ecopreneurship. The researcher mainly developed this paper based on a literature review along with a case review of ten eco friendly food and beverage business models in Sri Lanka. The author evaluates the performance of those models according to the Triple Bottom Line (TBL) framework. For that reason, the ethical role of those selected models is discussed by considering their economic, societal and environmental responsibility. The empirical evidence on ecopreneurial practices under the Sri Lankan context is inadequate and the researches based on eco friendly business models, also notably absent. Therefore, there is a valid reason to study the ecopreneurial aspects of the Sri Lankan entreprenures.

Key words: Ecopreneurship, Business performance, Eco friendly business models.

1. Background of the study
Entrepreneurs in Sri Lanka are triggered by self-employed capitalists. Sri Lankan entrepreneurial ventures contribute for 80 percent to the total firms and 70 percent to the total work force (Lussier et. al., 2016). The business failure rate in Sri Lanka is 45 percent (Lussier et. al., 2016).

In recent past, different entrepreneurial fields were emerged in worldwide. In today’s context, more and more consumers are turning to eco-friendly alternatives and the demand for those products has significantly increased. There are multiple benefits of greening such as; cost reduction, gaining more profits, better reputation, increased brand perception, creating green jobs...etc. Therefore, most of the companies are now try to operate their businesses in ethical and environmental friendly manner.

Scholars have provided several definitions for ecopreneurs. Out of which most accepted definition came in to the spotlight during 2010, proposed by Kirkwood et. al. (2010). They emphasized that the ecopreneurs are entrepreneurs who identified new ventures based on the sustainable concepts. Walley and Taylor (2002) defined the ecopreneurs as change drivers. Thus, the interest towards the ecopreneurship related researches have been increased during the past decade and more and more environmental issues have been discussed under this domain.

Hence, the objective of this study is to review and discuss the performance of ten eco friendly food and beverage business models in Sri Lanka according to the Triple Bottom Line (TBL) framework. Under the Sri Lankan context, the research works on ecopreneurship are very limited. Hence, the author tries to fill this void by analyzing the ecopreneurial aspects of the Sri Lankan entreprenures. Thus, a
comprehensive case review has done for evaluating the selected eco friendly business models in Sri Lanka.

1.1 Paving the Way for Ecopreneurship

Ecopreneurs are entrepreneurs who create sustainable ventures. They make good money by developing eco-friendly businesses and sustainable ideas. The domain of “Eco- entrepreneur” has started in the early stages of 1970. In the early 1990s the environmental entrepreneurship began to emerge, with the introduction of the terms “environmental entrepreneur” and “green entrepreneur” (Blue,1990; Bennett,1991).

According to the Nielsen global survey conducted in 2014, companies that claim to be ethical, grew worldwide by 267% between 2000 – 2014 (Imagine 4 Tomorrow, 2017). The list of world’s most ethical companies was published by the Arizona-based Ethisphere Institute during March, 2016. According to their list, there are 31 companies namely; National Australia Bank, the Rezidor Hotel Group, L’Oréal, Illy Caffè, Marks & Spencer, Cisco, GE, Intel Corp., Levi Strauss & Co., Northern Trust, Kellogg Co., LinkedIn, Pepsi Co., Royal Caribbean Cruises, UPS, Windham Hospitality Worldwide, Microsoft, Ford Motors Co., Colgate-Palmolive Co., Ricoh Co., Delphi Automotive PLC, Marriott International, 3M Co., H & M AB, Accenture, Tata Steel Ltd., Shiseido Co., Ecolab, Starbucks, Capgemini, and MasterCard (Imagine 4 Tomorrow, 2017), that operates their businesses in ethical and environmental friendly manner.

1.2 The Eco Friendly Business Model

Generally, entrepreneurship is an engine for economic development and it is a driving force of innovation (Schumpeter, 1934). This study reviews ten eco friendly food and beverage business models in Sri Lanka.

Ecopreneurs grab opportunities from the environment to create eco friendly business models. Schumpeter (1934), in his theory of economic development has emphasized that the new venture creation has a positive impact on economic development and it is one of the main drive for economic growth. He believed that the innovation is the most important element of creating new ventures. In general, Sri Lankans, are not favorable towards entrepreneurship as an occupation since the education system of the country, not encourages self-employment (Lussier et. al., 2016). Hence, the education system of the country has limited provisions for entrepreneurship. Financing is the major obstacle for Sri Lankan entreprenures to create a venture (Lussier et. al., 2016). Therefore, starting a new entrepreneurial venture in Sri Lanka is not that easy. Global Entrepreneurship Monitor 2015-2016, Special Report on Entrepreneurial Finance, highlighted that “95 Percent of worldwide entrepreneurs are financed their own startups” (Global Entrepreneurship Monitor 2015-2016, 2017). Dixon and Clifford (2007) reported that there is a strong relationship between entrepreneurialism and environmentalism. Kirkwood and Walton, (2010) argue that the field of ecopreneurship is still in its infancy. Schumpeter’s Theory of Economic Development (1934) and Ecological Modernisation theory (Spaargaren & Mol, 1992) emphasized that the ecopreneurship would be one of the best solutions for environmental issues. Quinn (1971) pointed out that ecological movements pave the way for a profitable new market.

2. Methodology

Researcher used the deductive approach to explain the theoretical underpinning and the case related insights of the selected business models. The case review was conducted by using a purposeful sample of 10 ecopreneurial business models of the food and beverage industry in Sri Lanka. Those businesses produce Sri Lankan organic foods and beverages mainly for the export market. Data collection has been done mainly through the official websites of the selected eco friendly companies.

The business performances of the selected business models, have evaluated based on the Triple Bottom Line (TBL) framework developed by John Elkington (Elkington, 1994). As there is no universal method
for calculating the business performances under the Triple Bottom Line framework (Hall, 2011), the author has evaluated the firms’ performances by comparing the eco friendly products, societal activities, and environmental related activities of those firms. Accordingly, various eco friendly products of the selected companies have been compared. Firm’s societal contribution has identified through its’ activities related to Corporate Social Responsibility (CSR). Companies’ environmental responsibility has discussed by considering its’ contribution to the environmental protection and by the certifications and quality standards obtained for their ethical behavior. Accordingly, the business performances of each firm have measured by comparing the physical outcomes of each firm.

2.1 Triple Bottom Line (TBL) framework as a tool for measuring the Business performance

This review was mainly done according to the Triple Bottom Line (TBL) framework. Freer Spreckley (1981) in his publication called “Social Audit - A Management Tool for Co-operative Working”, has emphasized that a firm should measure and report on financial performance, social wealth creation, and environmental responsibility.

TBL term was initiated by John Elkington (1994), to evaluate the firm’s performances under ethical grounds. It consists of three main elements namely; economic component, social component and environmental component. Sometimes scholars refer these three elements as 3Ps which stands for Profit, People and Planet (Elkington, 2004; Fauzi et. al., 2010; Henriques and Richardson 2013). According to the views of John Elkington (1994), monetary profits should be earned with a responsible, accountable and transparent manner. Traditionally, business performances were measured through “profit” or “loss” and the cost of the societal and environmental impact was not considered as a compulsory requirement (Kennerley, 2003). In other words, the Corporate Social Responsibility (CSR) has not been considered for their cost- benefit analyses. A firm should keep a balance, among its economical, social and environmental responsibilities. TBL is one of the handful models for sustainability (D’Atri, 2013). The sustainable development concept was firstly defined by the Brundtland Commission of the United Nations in 1987 (Aiking, 2014). Generally, Profit, People and Planet often refer to as pillars of sustainability (Aiking, 2014, Crews, 2010).

3. Results and Discussion

3.1 Comparison of Eco-friendly Food and Beverage Business Models in Sri Lanka

For this case review the author has considered ten reputed eco friendly food and beverage business models in Sri Lanka. They are Bio Foods (Pvt.) Ltd., Greenfield Bio Plantations (Pvt.) Ltd., Enrich Tea & Food Exports (Pvt.) Ltd., Saraketha Organic (Pvt.) Ltd., MA’s Tropical Food Processing (Pvt) Ltd., Renuka Agri Foods PLC., CBL Natural Foods (Pvt.) Ltd., MJF Group, Organico Guru Lanka (Pvt.) Ltd. and Lanka Organics (Pvt.) Ltd. Business performances of the aforementioned companies have analysed (Table 1) under the three main pillars (economic models, social responsibility and environmental responsibility) of the triple bottom line framework.

<table>
<thead>
<tr>
<th>Name of the Company</th>
<th>Economic Models (Profits)</th>
<th>Social Responsibility (People)</th>
<th>Environmental Responsibility (Planet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>01. Bio Foods (Pvt.) Ltd.</td>
<td>* Organic Black Tea</td>
<td>*Establishment of a training center to educate farmers about organic and bio-dynamic farming techniques.</td>
<td>**Taken steps to Reduce Environmental Footprint Certifications</td>
</tr>
<tr>
<td></td>
<td>* Organic Green Tea</td>
<td>* Annual employees’ day.</td>
<td>*HACCP</td>
</tr>
<tr>
<td></td>
<td>* Organic Spices (Black &amp; White Pepper, Cinnamon, Cardamom, Clove, Nutmeg, Mace, Turmeric, Ginger etc. ...etc.)</td>
<td>*Construction of tube wells for the North &amp; East communities in Sri Lanka.</td>
<td>*ISO22000:2005 certification</td>
</tr>
<tr>
<td></td>
<td>* Organic Coconut Products (Canned Coconut Milk, Virgin Coconut Oil, Extra</td>
<td></td>
<td>*Ceylon Quality Certificate (CQC)</td>
</tr>
<tr>
<td>Source : Bio Foods (Pvt.) Ltd.; Official website <a href="http://www.biofoodslk.com">www.biofoodslk.com</a></td>
<td></td>
<td></td>
<td>*FAIRTRADE</td>
</tr>
<tr>
<td>Company</td>
<td>Products</td>
<td>Certifications</td>
<td></td>
</tr>
<tr>
<td>----------------------------------------------</td>
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<td>-------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>02. Greenfield Bio Plantations (Pvt.) Ltd.</td>
<td>Live Virgin Coconut Oil, Coconut water, Coconut Cream, Low Fat Desiccated Coconut, Coconut chips)</td>
<td>*Organic Fairtrade Tea *Organic Spices *Organic Herbs (Culinary + Medical) *Organic Fruits *Organic Cashew Organic Coconut (Fresh + Processed) *Organic King Coconut Water *Organic Sweetens + Syrups</td>
<td>*Building of a new cultural center at the estate for social functions *Fairtrade Social Premium is paid to the Social Committee made up of elected representatives of the estate workers *Medical Camps *Optical Camps ** Taken steps to Reduce Environmental Footprint Certifications</td>
</tr>
<tr>
<td>Source : Greenfield Bio Plantations (Pvt.) Ltd.; Official website <a href="http://www.fairtradeorganictea.com">www.fairtradeorganictea.com</a></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>03. Enrich Tea &amp; Food Exports (Pvt.) Ltd.</td>
<td>*Organic Spices *Organic Coconut Products (Coconut Flake) *Cheliza Organic Pyramid Tea Bags</td>
<td>*Respect human rights *Guarantee health and safety work                                               ** Taken steps to Reduce Environmental Footprint Certifications</td>
<td></td>
</tr>
<tr>
<td>Source : Enrich Tea &amp; Food Exports (Pvt.) Ltd.; Official website <a href="http://www.enrichtea.com">www.enrichtea.com</a></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>04. Saraketha Organic (Pvt.) Ltd.</td>
<td>* 250 products, from fruits, vegetables, rice, spices to greens, herbs and free-range eggs. * Organic dried fruit *Organic fresh smoothies</td>
<td>*Packing materials made with both cloth and paper with each purchase of Saraketha products accompanied with these packaging will contribute to the upliftment of the lives of the children at Chitra Lane Children’s Resource Centre *Sustainable packaging *Training school teachers to uplift their standard of English through a range of innovative teaching programmes. ** Taken steps to Reduce Environmental Footprint Certifications</td>
<td></td>
</tr>
<tr>
<td>Source : Saraketha Organic (Pvt.) Ltd.; Official website <a href="http://www.saaraketha.com">www.saaraketha.com</a></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>05. MA’s Tropical Food Processing (Pvt) Ltd.</td>
<td>* Organic Soups * Organic Curry Powder * Organic Sauces * Organic Chutney * Organic Curry paste * Organic Curry leaf *Organic Spices (Pepper, Nutmeg, Cardamom, Cinnamon, Clove...etc) * Organic Coconut milk * Organic Jackfruit curry *Organic Banana Curry * Organic Banana Flower Sambol</td>
<td>*Provides accommodation for all employees, where both husband and wife are both employed with the company &amp; all meals are provided by the company’s canteen. *Family welfare for financial assistance to support home improvement, children’s education or other family welfare related areas. *Special allowance and support during and after pregnancy and new born savings account. ** Taken steps to Reduce Environmental Footprint Certifications</td>
<td></td>
</tr>
<tr>
<td>Source : MA’s Tropical Food Processing (Pvt) Ltd.; Official website <a href="http://www.masfoods.lk">www.masfoods.lk</a></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>08. MJF Group</strong></td>
<td>* Dilma Tea with Carbon Neutral Facility</td>
<td>*Rainbow Centre for children with special needs – MJF Center at Moratuwa * Women empowerment through skill development * Conducting Aid to the Ex-Abled Annual Sports Festival * Empower Culinary &amp; Hospitality School is an outcome of the philosophy of MJF Foundation *Improving healthcare for uplifting community *Empowering children on plantations * Marine Conservation *Species Conservation Religious Certificates Kosher Certification Halal Certificate</td>
<td>* 'Greening Batticaloa' and 'Biochar Application', reduces the carbon footprint to zero. *Adding renewable energy sources to reduce emissions. * 'Waste for Life' - 20% of the waste will be recycled to produce low cost building material. * Solar to Staff' - provided solar power through the installation of solar panels Certifications * JAS *Organic certification to Regulation (EC) *Organic certification to USDA *ISO 14001:2004 *ISO 9001, FSSC 22000, *BRC and ISO 14001</td>
</tr>
<tr>
<td><strong>09. Organico Guru Lanka (Pvt.) Ltd.</strong></td>
<td>* Organic Snacks and nuts *Deserts and cake mixes *Pastas, Rice and grains *Vinegour, Oil and Sauces *Juices and Jams *Organic Garlic Mayonnaise</td>
<td>*OrganicoGuru.com offers a range of ethically-sourced Vegan, Dairy-free, Gluten free, Sugar free, Nut free and Egg free products *Provide healthy organic food for health conscious customers * Provide Gluten Free &amp; Lactose Free Products.</td>
<td>** Taken steps to Reduce Environmental Footprint</td>
</tr>
</tbody>
</table>
According to the comparison, the eco friendly food and beverage business models in Sri Lanka indicates, that they have a range of competitive economic products manufactured under the ethical grounds. Analysis indicates that CBL Natural Foods (Pvt.) Ltd., Bio Foods (Pvt.) Ltd., Renuka Agri Foods PLC and MA’s Tropical Food Processing (Pvt) Ltd. have more eco friendly varieties when compare to the other selected companies. All these companies have better concern towards Corporate Social Responsibility (CSR). Specially, the MJF Group practices higher level of CSR and environmental conservation related activities. The highest number of certifications had obtained by the MJF Group and Bio Foods (Pvt.) Ltd. Those two companies had received green certifications, organic certifications, quality standard certifications ...etc. for their green products and for their ethical manufacturing process. Their ethical role and the societal and environmental contribution had very well recognized by the several local and international organizations.

4. Conclusion
As pointed out by Hall (2011), there is no universal method for calculating the performances based on Triple Bottom Line. On the other hand all the three elements of the TBL cannot be measured through a monetary value. Finding a common measurement is the main challenge, when applying TBL for measuring the business performance. Other than the TBL method, there may be some other models to measure the business performances of a firm.

Triple bottom line approach is the road map for any company wishing to achieve sustainability (Venkatraman & Nayak, 2015). Nowadays, consumers are willingly embracing environmental friendly products. Therefore, people across the world have increased awareness on green products. Most of the consumers are ready to pay premium amount for organic foods. Hence, firms can earn more profits from organic products than non-organic products. Thus, the Sri Lankan government has a major role to cultivate the green concept and inspires the entrepreneurs to go with green.

5. Propositions for the future research works
In this paper the author has underlined the dynamics of ecopreneurship, considering the ecopreneurial food and beverage industry in Sri Lanaka. Thus,
P1 : It would be useful to investigate how other industry aspects affect for the performance of an ecopreneurial businesses in Sri Lanka.
P2 : In addition, it is worthwhile to empirically determine the real effect of the ecopreneurial traits on firms’ performance under the Sri Lankan context.

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EMPOWERING STUDENTS FOR CLIMATE CHANGE ADAPTATION - Fiji as a case study

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Abstract:

Fiji, comprise of 332 islands. The central area of Viti Levu comprise of mountains, therefore much of the residences, the commerce and industry are located in close proximity to the beaches, which make life more vulnerable to climate change.

The annual and seasonal mean air temperatures have been continuously increasing. The sea level rise is approximately 6mm per year. Cyclones are more intense and ocean acidification continues. All these predictions reveal that Fiji needs to adapt to the reality of climate change.

In Fiji, even though prolonged drought seasons, intense cyclones, sea level rise are seen, life goes on without making an effort to adapt to the environmental changes. At the Fiji National University it has become my duty to prepare an effective strategy to empower the students with the knowledge on mitigation measures and adaptation techniques for combating climate change.

Conference paper will highlight on environmental changes happening in Fiji Islands due to climate change, the negligence by the communities and their consequences, the knowledge transferred to the students to empower them and equip them as messengers to minimize disasters.

Keywords: Climate Change, Adaptation, Empowerment, Fiji Island

Introduction:

Climate Change:
According to the United States Environmental Protection Agency or EPA climate change is the totality of all weather conditions (in a given region) accumulated over a long period of time such as over 30-year period. They argue that climate is the sum of all statistical weather information that helps describe a place or region, which includes not only averages, but also standard deviations about the average, and all other statistical information that can be computed from weather observations over an extended period of time (https://www.epa.gov/climate-indicators/weather-climate). EPA states that it is misleading to say that climate is simply "average" weather. The Intergovernmental Panel on Climate Change (IPCC-https://climate.nasa.gov/effects) forecasts a temperature rise of 2.5 to 10 degrees Fahrenheit over the next century and the net annual costs for mitigation to increase over time as global temperatures increase.

According to the United Nations Framework on climate change (UNFCC-http://newsroom.unfccc.int/cop-23-bonn/how-fiji-is-impacted-by-climate-change/) Fiji’s 300 volcanic islands including low-lying atolls are highly susceptible to cyclones and floods. Sea flooding is usually associated with the passage of tropical cyclones close to the coast. In 2012, Vunidogoloa of Fiji became the first village to begin relocating to higher ground due to sea-level rise.

According to the World Bank report of 2000 on Adapting to Climate Change, climate threats to Fiji’s society and economy include: higher rates of disease as average temperatures rise;increasingly destructive storms as oceans get warmer and weather patterns become more severe;and disruptions to agriculture as the intrusion of saltwater damages existing farmland. On Fiji’s main island of Viti Levu, these factors are expected to contribute to economic damages of up to $52 million per year, or...
roughly four percent of Fiji’s gross domestic product. According to Frank Bainimarama, COP23 President and Fijian Prime Minister “Unless the world acts decisively to begin addressing the greatest challenge of our age, then the Pacific, as we know it, is doomed.”

Attitude of the Fijian community towards the environment:

Apart from the impact of climate change, day to day the environment is also affected through negligence. The destruction to water resources, the air, the soil and the forest cover is on the increase (Perera, 2014a). As the population increases the impact of the people on the environment is also increasing. Fiji continues to build along the coastal belt disregarding the need to maintain a buffer zone. The mangroves and other coastal plants which act as barriers to wind and water are removed, thus removing the protective barriers which have kept the people safe from the harm of the rough ocean (2014b). The coastal erosion is on the increase and the sea has slowly but surely crept into the land. The small island nations do not contribute to climate change but are affected by it, so they need to adapt. Unfortunately the urgency for adaption and commitment towards environmental protection needs to be preached more to the vulnerable communities for the sake of their own survival.

Every nation is striving towards economic growth hence development of industry and infrastructure is a day to day activity. As a result of increase in population and intense agriculture, the usage of agrochemicals and accumulation of waste is high (Perera et al, 2014). The landfills are getting piled up with a huge amount of packaging materials and non-biodegradable in small island nations such as Fiji as much as the large island nations and the landfill of Lautoka and Suva of Fiji are comparable in size to the landfills of more developed nations (Perera, 2014b). The burnt cultivation and the excessive usage of chemicals have led to the loss of top soil leading to more extensive usage of agrochemicals. With elevated coastal erosion the sand gets washed off into the sea at such high rate that the sea grass beds and the corals are buried under the sand that their productivity as an ecosystem has tremendously decreased. In Fiji many areas close to the urban centers rarely have healthy coral colonies (Perera, 2014b).

Education as a vessel for protection from harm:

Environmental Education is a must to combat the impacts of climate change. Education can be of different forms: formal, non-formal and informal and each one is effective depending on the target group (Perera, 2016). The formal, non formal and informal environmental education is slowly been utilized in the countries which are vulnerable to climate change. The formal education on environment is not part of the primary and secondary school syllabus of Fiji and is being included at present. Some tertiary institutions still teach biology, physics and chemistry as pure subjects rather than environmental science in their curriculum even at undergraduate level. Fortunately this too is changing as the subject of climate change is spoken about by people at large. The experts of environmental education attempt to ensure that the relevant subject areas are included in the curriculum, extensive field work is included in the syllabus and models are built to ensure that students learn by seeing.

Importance of Empowerment;

The free dictionary states that to empower is to invest with power, especially legal power or official authority or to equip or supply with an ability; enable. The Collins English Dictionary states that the empowerment of a person or group of people is the process of giving them power and status in a particular situation. Thus the empowerment of students indicate that they are given sufficient subject matter to be able to make decisions on environment where they exist. This would involve teaching, planning, decision making, constructing and monitoring. If one is to ensure that these targets can be reached at tertiary level, then the programs of environmental education at tertiary level should be so structured to achieve these targets. This paper will provide examples of how this was reached. Furthermore, research was carried out to investigate the ability of the students for field work. It was established that the Fijian students show exceptional ability to learn in the field (Perera, 2014c).
**Methodology: Empowerment through quality Education:**

The quality of the teaching programs of the Fiji National University and the University of Fiji is set by the Fiji Higher Education Commission. Under their purview quality assured BSc. Programs and postgraduate programs are developed on environmental science. The course units include subject areas such as Climate change and the South Pacific, Coastal Zone Management, Geographical Information System, Natural Resource Management, Environmental Impact Assessment, Waste to Resources. Each of these units has a field work component which enables the student to gain experiences through hands on praxis. The examination regulations state that the allocation of marks for hands on work is 40% and the percentage for examinations 60%.

As part of the hand on work, the students at Fiji National University built a rain water harvesting unit. The purpose is to have an alternative source of water to combat fluctuation in rainfall due to climate change. The students participated in the construction hence learnt how to build it. On their return to their island they will be able to build such a system in their island.

In most of the small island nations materials are in short supply, hence to use bins to separate waste is an expensive affair. The students need to build bins cost effectively, therefore the use of the waste bottles from the dump site was a better option for construction of the waste bins. The students are not highly enthusiastic to go to the dump site to collect the bottles and use it to construct the bins, but after they have performed the exercise they have now learnt a new skill, which is important for the small island nations, i.e. to learn to be creative in using waste.

Monitoring of water quality in the field- the students are given the opportunity to map streams and rivers to prepare profiles of these natural resources as reference data. The environmental influence on the natural resource due to its positioning as well as due to artificial factors created by man are demarcated. Strategies for monitoring of the manmade influence are prepared with reachable timelines. Even though the instrumentation for monitoring of water quality are not readily available or man power to calibrate the instruments accurately are not present they are taught the planning process and are conversant with reaching goals in a timely manner. A research methodology course has been made compulsory for all students, as much as a course on ethics and English language.
The students are well exposed to learn the hardships of working in the coastal environment as well as in the terrestrial environment. One of the key factors is to ensure that the student understands that the natural resource that they study is vital for life and every attempt should be made to protect it. They also learn that development is important for life; hence a clear cut balance need be reached as to how far the natural resource can be made an instrument in the development process. For eg: the sand dunes are important as protective barriers against cyclones. In order to protect them, today the sand dunes are declared as national heritage sites open for tourism. Almost every visitor to Fiji Island visits sand dunes; hence bring an income to the nation.

Learning to work side by side with the lecturers provide a substantial amount of strength for the students in their learning process. The students are given the opportunity to be involved in the International Conferences such as the International conference on Oceans and Rivers of which the author was the chair. The students volunteered in all aspects of the three-day conference. The students also volunteered in the Knowledge based Conference held in May 2017, of which again the chair was the author. In both conferences the students were given the opportunity to also present their findings from field work either as papers or posters, thereby gaining confidence in the field.
Factors which needs to be taken into consideration for empowerment to be effective:

Few factors however are vital in field assessments: The students are not be made to feel that their field work is just for fun. In order to achieve the expected outcome proper planning takes place, by comprehensive planning prior to reaching the site. The students are told of the expected out come and the assignments are given deadlines. In addition referencing is encouraged and the assignments are only accepted through the moodle such that similarity indices can be observed.

Discussion and Conclusions:
As a small island nation Fiji is faced with climate change, therefore requires a solid man power, which can create awareness, train, monitor and assist in adaptation to climate change. At present people for these tasks are lacking. Therefore it has become the duty of the professionals in the field of environmental science to ensure that the children at primary and secondary level and students at tertiary level receive quality environmental education. Preparation of appropriate curriculum, courses, programs are a must, but they should include a certain percentage of hands on field work as well as classroom teaching. As the Fijian society prefers to learn faster through hands on work this area needs to be further enhanced. As education is today a global business the curriculum however need to be able to compete in the international job market. The purpose of the work of the authors is to ensure that the students are empowered in such a way that they will not give up in the midst of crisis, but will have the skills to survive through adequate knowledge.

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Perera, A. (2014c) ‘Teaching Conservation of Marine and freshwater Habitats through field Work; Seeing is believing’, FNU- Poster, , International Conference on Oceans and Rivers, Fiji National University, Nadi, Fiji Islands
EVOLUTION OF TRANSCULTURALISM IN POST-COLONIAL INDIA

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Abstract

India is a biggest secular and multicultural land as it is concerned. When people started to move from their place, they easily get adaptation in their new environment, because people from India have interwoven with their multiculturalism well in advance. Multiculturalism is not new to Indians, as Mr.Pirzada in “When Mr.Pirzada Came to Dine” and Dev in “Sexy” from Jhumpa Lahiri’s short story collection Interpreter of Maladies are some examples to prove the above theory. But at the same time, Mrs. Sen in the short story entitled “Mrs. Sen” from India finds difficult to adapt the new culture in America. Mr.Pirzada and Dev are like salt in the water finds no difficult to interlace with the host country. But Mrs.Sen often laments of her past where, she was with her family in India on the other. Jhumpa Lahiri is one of the eminent diasporic writers, and also a second generation emigrant settled in America after her birth. She often deals with Identity Crisis, Rootlessness and Multiculturalism in most of her works. Trans-culturalism, being famous in Lahiri’s works, her characters go in quest for new cultures very often and settle in different localities, where at first they struggle to adapt it.

Keywords: Multiculturalism, Alienation, Quest for identity.

Traders are the first to find sea routes to all the continents also they are the predecessor for the future sailors to sail across the world. They are the path finders of colonial India to disperse themselves from one place to another. Research says that there are two types of migrations in olden days, they are “Overseas Migration and Migration to Industrially developed Countries”. Compared to others, India gets the credit for the large number of Indians migrated and settled in many places. There are two types of phases in Indian Diaspora regarding migration, Colonial and Post-Colonial. After the colonization many people were sent as workers to Burma (old Myanmar), Sri Lanka, Malaysia, Indonesia etc. So people spread from India to other countries by these reasons also. And it can be said that Indians are not new to migration which is called diaspora now. In Jhumpa Lahiri’s works, Interpreter of Maladies is a short story collection. “Mr.Pirzada Came to Dine” is one of the short stories in this collection. Mr.Pirzada was awarded a grant from the Pakistan government to study on foliage in New England. The grant is not so sufficient when converting it to dollars, though he stays in England to do his research leaving his wife and seven daughters in Dacca.

Little Lilia the other major character in this story is the narrator of this story. Lilia’s parents are Indian emigrants settled here before their daughter’s birth that little Lilia knows nothing about their home land. Mr.Pirzada’s sufferings and struggles are portrayed by Lilia to us. First she never considered him much but soon she gets used to his evening visit. Though Mr.Pirzada is a man from the land of cultures, he never complained or feels bad of other country’s culture and values. As it is mentioned already, he is like a salt in water mingles with other culture and customs easily. His only struggle is missing the communication from his family in Dacca. India Pakistan separation has broken into a war, which affected the normal life of the people there. Mr.Pirzada often laments about his missing family in Dacca.

Her parents would console him not to worry that they will be in safe place. The little Lilia was affected much by his story, so she started praying for him to be soon with his family in Dacca. Once Lilia asked Mr.Pirzada to do a jack-o-lantern for Halloween party, he readily accepted and carved
a lantern for her. He endured the bitter winter as the residents in there do. Mr. Pirzada on the whole is well adjustable to the new environment. He finds his way from work place to his room and from room to Lilia’s house. Trans culturalism in not new to India and Indians as the people started moving from the time before colonization.

It is similar to the story of Dev in other short story “Sexy”. Dev is also an Indian emigrant working in a bank. People now loves quest for new cultures, as a result they keep on travelling from their home land to other places across the world. Miranda an American girl loves an Indian named Dev, who is in the brink of transforming to Indian culture. As Dev’s wife went to India for vacation, he finds it easy to spend time with Miranda his new girlfriend. Miranda admires India and its tradition it owns. Dev often explains about India and its bio-diversity to Miranda. She likes the way he attached to his wife and his children. Here it remarkable that Dev and Mr. Pirzada celebrating the host country’s festivals, adapting the slang of locals, attires of that country are some evidences to prove that Indians naturally adapt to the new environment without difficulty.

Miranda is so fast that she preferred Indian items while shopping. She once experienced the name Dixit in her childhood as Dixit family was residing near her house. Always she surfs Indian cookery videos in a shop, preferred Bollywood songs cassettes and Indian grocery for cooking. The craving for new culture and customs by the new generation has become usual now. And it is evident in Dev, Mr. Pirzada and Miranda as they prefer a new way of life against their routine life. Also she regrets now that she failed to maintain a good friendship with the Dixit family she knows in her childhood. But it was Rohin who opened her eyes that she is trying to own a man who is already married and having his own mistress at home. There is another reason for dating Dev is that Miranda felt very lonely often. As for the society, Miranda wants to date Dev so that she will be considered as an adult.

Mr. Pirzada and Dev may be successful in mingling with the host country, but Mrs. Sen finds it difficult to mingle with the new host culture. As for Mrs. sen, she is similar to the character of little American boy Eliot for whom she baby sits every day. Both are same as they cannot do anything on their own. Eliot is a little boy may be, but Mrs. Sen hesitates to do it on her own. She relies much on her husband for everything. The only difference between Eliot and Mrs. Sen is that she speaks out her agonies whereas Eliot cannot. But he marvels at her graceful work with the blade she used to cut vegetables. He also admires her long braided plait unlike to his mother’s loose hair. In all her lamentations, it is clear that she never thought of leaving her family and close ones for long. Mainly she cannot easily meet her parents and relatives in her home land very often.

Mrs. Sen will never try to mingle with the host country and its culture in near future. Out of Mr. Sen’s struggle, she still afraid of driving and so she prefers bus or ask Mr. Sen to take her fish market to buy fresh fish. On the whole it was Mrs. Sen who finds it difficult to adapt to the new environment and its culture. It is because she wants to be with her family and relatives in her home land where she cherish her good old memories. At the same time Dev and Mr. Pirzada easily adapted to the new land and its environment with all its differences.

References


Factors Affecting Internet Parental Practices And Effects of Internet Parental Practices to Internet Addiction, Risk and Usage of Children-
Systematic Literature Review

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Abstract

Research on e-education become a growing field of interest during past decades. Current education policy of “Facilitation to access the digital world” will promote the IT education in Sri Lanka. The policy makers believe that by generating more IT savvy people in education system, Sri Lankan youth will be enabled to access the global job opportunities with much ease. And also with other initiatives like “Free-Lap Tops, and with highly developed mobile networking technologies ,Sri Lankan children will access internet more frequently in future. However, parents are facing real dilemma when parenting the children through internet. It is not advisable to restrict the internet totally or to give them the free access without any parental involvement. How to parent the children in internet will be a challenging task for parents. However, the research relating to this field is still lacking. There are many studies to explain the benefits of internet education such as low cost communication, availability of abundance of information and services, ease of sharing information, and access to any form of entertainment etc.. Some literature shows the negative impact including spam mails, virus, trogon and other malware, leakage of private information, addiction and exposure to harmful content. Therefore it is needed collecting current stock of knowledge in this field. The purpose of this paper is to present systematic literature review of relationship between parental practices and internet addiction, risk and usage of children. This paper is based on scholarly works and employs citation and thematic analysis. There are 47 themes identified in this paper under four major areas. A number of gaps can be identified throughout the analysis that would postulate new research avenue for the academics and policy makers.

Keywords: e-education, Internet parental practices, internet usage, citation analysis, thematic analysis, Sri Lanka

Introduction

Internet is a high speed data highway and has made our lives supper convenient and always connected. There are myriad of benefits of internet for any one irrespective of their ethnicity, gender and the age and they include unlimited and low cost communication, availability of abundance of information and resources, ease of sharing information, availability of online services and e-commerce and readily available access to any form of entertainment. Turow and Nir, 2000 show that majority of parents believe that Internet helps their children’s school work and at the same time they are in an opinion that children who do not have Internet access are at a disadvantage in comparison to their peers who do have Internet access. Better skills in computers results in better learning outcomes and successful carriers in modern digital world (Kuhlemeier and Hemker, 2007). All these benefits have their associated cost and could emanate in different forms including spam mails, virus, trogon and other malware, leakage of private information, addiction and exposure to harmful content. (Bremer, 2005) has identified following internet dangers to the children (1) Access to inappropriate information, (2) Child readily can purchase inappropriate materials, (3) Falling prey to online predators. According to the research findings of Lee and Chae 2007, the amount of time children use the internet is positively related to the perceived declines in family time. Especially children addicted to online gaming not only spend less time with
family but also communicating less with the family. The aim of this study is to analyse the current literature with respect to internet parenting and internet mediation and identify the areas where little or no detailed research have been carried out and where current literature has disagreements and come up with a model to expand the current body of knowledge on how to parent the children effectively in digital era. In particular, the aims of the review are to:

1) Determine the nature of the relationship between **Effects of Internet Parental Practices to Internet Addiction, Risk and Usage of Children**

2) Develop an oversight of existing research into **Effects of Internet Parental Practices to Internet Addiction, Risk and Usage of Children**.

3) Through cross-cultural studies, identify core issues arising from existing research into **Effects of Internet Parental Practices to Internet Addiction, Risk and Usage of Children**.

4) Identify future areas of research.

**Methodology**

The methodology employ in this study is descriptive analysis, citation analysis and thematic analysis. Journal articles published in Goggle scholars, web of science. All the research articles with respect to following words in the title of the article were searched in the Google Scholar.

| "internet parenting" |
| "internet Mediation" |
| internet "parental mediation" |
| internet "internet parenting" |
| "parental Mediation" |

100 most relevant research papers from 1990 to 2015 were selected for the analysis. Short listed 88 influential papers ranked more than 2 of ABS were used for the citation analysis, as shown in table 1. Citation analysis reflects the most dynamic research elements related to the topic. Thematic analysis identify the most common fundamental researched area relating to the parental mediation and internet usage, risks, and PIU. Articles were categorized in to four main groups of themes.

**Analysis**

Research articles were categorised into four major groups and themes. Articles related to “Internet Risk”, are dealing with the internet risks and factors affecting the internet risk. Articles addressing PIU (Problematic Internet Use) were identified as the second group and different themes were identified based on the factors affecting PIU.

Third group is dealing with the articles on internet usage (time and content) and factors affecting the internet usage. The last category is related to the internet mediation techniques (mediating and controlling) employed by parents and factors affecting them. The word “perceived” has been used throughout this article to represent the children’s perception.
**Thematic Analysis**

**Table 1: Internet Risk, PIU, Usage and Mediation Techniques**

<table>
<thead>
<tr>
<th>Group</th>
<th>Theme</th>
<th>No of Articles</th>
<th>Most Recent Articles</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Effect of internet skills on internet risk</td>
<td>3</td>
<td>2012(2),2016(1)</td>
</tr>
<tr>
<td></td>
<td>Effect of internet attitude on internet risk</td>
<td>2</td>
<td>2012(1),2016(1)</td>
</tr>
<tr>
<td></td>
<td>Effect of internet usage on internet risk</td>
<td>10</td>
<td>2014(1),2015(1),2016(3)</td>
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<tr>
<td></td>
<td>Effect of mediation techniques on internet risk</td>
<td>5</td>
<td>2012(1),2014(1),2015(1)</td>
</tr>
<tr>
<td></td>
<td>Effect of perceived mediation techniques on internet risk</td>
<td>28</td>
<td>2014(3),2015(2),2016(7)</td>
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<tr>
<td></td>
<td>Effect of child parent relationship on internet risk</td>
<td>5</td>
<td>2014(2),2015(1),2016(1)</td>
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<tr>
<td></td>
<td>Effect of child health condition/psychological wellbeing on internet risk</td>
<td>2</td>
<td>2012(1),2015(1)</td>
</tr>
<tr>
<td></td>
<td>Difference in perceived exposure vs actual exposure</td>
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<td>2005(1)</td>
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<tr>
<td></td>
<td>Effect of PIU on internet risk</td>
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<td>2011(1)</td>
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<td></td>
<td>Internet Risks</td>
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<tr>
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<td>Effect of internet usage on PIU</td>
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<td></td>
<td>Effect of child parent relationship on PIU</td>
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<td></td>
<td>Effect of parental modelling on PIU</td>
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<tr>
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<td>Effect of socio-demographic factors on PIU</td>
<td>11</td>
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<td>2</td>
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<td></td>
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<td>6</td>
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<td></td>
<td>Effect of parental support on PIU</td>
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<td></td>
<td>Effect of internet attitude on internet usage</td>
<td>2</td>
<td>2013(1),2016(1)</td>
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<tr>
<td></td>
<td>Effect of mediation techniques on internet usage</td>
<td>2</td>
<td>2013(1),2014(2),2016(1)</td>
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<tr>
<td></td>
<td>Effect of perceived mediation techniques on internet usage</td>
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<td>2014(1),2015(5),2016(1)</td>
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<tr>
<td></td>
<td>Effect of child parent relationship on internet usage</td>
<td>3</td>
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<td></td>
<td>Effect of socio-demographic factors on internet usage</td>
<td>15</td>
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<td></td>
<td>Internet Usage</td>
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<tr>
<td></td>
<td>Effect of internet usage on behavior problems</td>
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<td>2011(1)</td>
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<td></td>
<td>Effect of internet addiction on usage</td>
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<td>2009(1)</td>
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Effect of parents internet usage on child's internet usage | 1 | 20015(1)
Effect of socio-demographic factors and other family characteristics on home internet access | 1 | 2010(1)

<table>
<thead>
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<th>Group</th>
<th>Theme</th>
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<td>Effect of internet skills on mediation techniques</td>
<td>5</td>
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<td></td>
<td>Effect of internet attitude on mediation techniques</td>
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<td>2013(2),2014(1),2016(1)</td>
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<td></td>
<td>Effect of socio-demographic factors on internet mediation techniques</td>
<td>16</td>
<td>2014(2),2015(1),2016(2)</td>
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<td></td>
<td>Effect of child parent relationship on mediation techniques</td>
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<td>2016(1)</td>
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<td></td>
<td>Effect of parenting styles on mediation techniques</td>
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<td>2006(1),2010(1)</td>
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<td></td>
<td>Effect of child health condition on mediation techniques</td>
<td>1</td>
<td>2015(1)</td>
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<tr>
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<td>Effect of internet usage on mediation techniques</td>
<td>5</td>
<td>2013(1),2014(1),2015(1)</td>
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<td></td>
<td>Parenting style and disagreement over mediation techniques by child and parent</td>
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<td>2012(1)</td>
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<td></td>
<td>Mediation techniques employed</td>
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<td></td>
<td>Perceived mediation techniques employed</td>
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<td></td>
<td>Parental Internet Attitude</td>
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<td></td>
<td>Mediation techniques employed vs perceived mediation techniques employed</td>
<td>6</td>
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<td></td>
<td>Effect of self-regulation on mediation techniques</td>
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<td>Effect of socio-demographic factors on perceived mediation techniques</td>
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<td>2014(1)</td>
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</table>

**Source:** Author survey 2017

**Citation Analysis**

In the citation analysis first eight articles with highest citations for each group were identified

**Table 2: Most Cited Papers**

<table>
<thead>
<tr>
<th>Group</th>
<th>Paper</th>
<th>Journal</th>
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</thead>
<tbody>
<tr>
<td><strong>Internet Risk</strong></td>
<td>(Gentile et al., 2004)</td>
<td>Journal of Adolescence</td>
<td>968</td>
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<td></td>
<td>(Livingstone and Helsper, 2008)</td>
<td>Journal of Broadcasting &amp; Electronic Media</td>
<td>408</td>
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<tr>
<td></td>
<td>(Mesch, 2009)</td>
<td>CyberPsychology &amp; Behavior</td>
<td>350</td>
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<tr>
<td></td>
<td>(Lee and Chae, 2007)</td>
<td>CyberPsychology &amp; Behavior</td>
<td>226</td>
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<tr>
<td></td>
<td>(Lwin, Stanaland and Miyazak, 2008)</td>
<td>Journal of Retailing</td>
<td>144</td>
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<tr>
<td></td>
<td>(Liau, Khoo and Hwaang, 2005)</td>
<td>CyberPsychology &amp; Behavior</td>
<td>135</td>
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<tr>
<td></td>
<td>(Leung and Lee, 2012)</td>
<td>New media &amp; society</td>
<td>123</td>
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<tr>
<td>Group</td>
<td>Paper</td>
<td>Journal</td>
<td>Citations</td>
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<td>-------------</td>
<td>--------------------------------------------</td>
<td>----------------------------------------------</td>
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<tr>
<td>PIU</td>
<td>(Yen et al., 2009)</td>
<td>Psychiatry and Clinical Neurosciences</td>
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<td>(Leung and Lee, 2012)</td>
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<td>(Floros and Siomos, 2013)</td>
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<td>(Chang et al., 2014)</td>
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<td>(Valcke et al., 2010)</td>
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<td>(Liau, Khoo and Hwaang, 2005)</td>
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Source: Author Survey 2017
Discussion
As per (Wang et al., 2005) “we know very little about what happens when parents, teens, and the Internet come together” (p.1257).
Very little research has been conducted on how parenting styles affect the internet parenting styles (different mediation techniques employed) and also how mediation techniques (from parent’s angle) affect the internet risk, PIU and internet usage. The available studies, have mostly involved children in the data collection and this could have resulted in a research bias.
There are very few studies conducted on how family socio-demographic and other family related factors affects the home internet access. And also research conducted on how PIU affects internet risk is very minimal.
There are many contradictions on past research findings. (Wang et al., 2005) report that fathers, younger parents, parents who use the Internet with their children, and parents with younger teens engage in a higher level of parental Internet monitoring. But this finding is not in line with the findings of (Valcke et al., 2010) as they have observed a stronger involvement of mothers in parental control.
(Wang et al., 2005) found that older parents tend to control to a larger extent, but (Valcke et al., 2010) found that it is rather younger parents mirroring the highest level of parental control. As per (Lou, 2010) over 70% parents set up internet rules which is quite contrasting to the findings of (Valcke, 2007) that 52% of children hardly ever experience any control when using internet at home. According to (Lou, 2010), parents with higher internet literacy have less control over the internet activities of their children but as per (Lee, 2012) parent’s internet skills were positively associated with frequency of restrictive mediation. Therefore to expand the current body of knowledge and further inquire into the contradictory research findings, I propose following theoretical framework for future research in this area.

Figure 2: Proposed Conceptual Model for Future Research

Source Author survey 2017
**Conclusion**

Still this area of research is relatively new and there so many contradictory research findings as well as areas where no research have been carried out. In Sri Lanka, no research has been carried out with respect effect of internet mediation techniques to internet usage, risk and PIU. Therefore proposed theoretical framework could be very useful in doing a research in this area to expand the current body of knowledge.

**References**


Fashion Reigns the Virtuous Aspirants

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Abstract:

The Literature reflects life so far it is concerned, but here the paper discloses that not only literature, but also film does the same, at times. Literature and film do teach the society based information to the spectators in a practical manner. The novel Two Virgins and the film Fashion are taken up for study to prove at what precedent the both interwoven in terms of aspiration and degradation. Lalitha’s avarice is to become a cine star. Hence, she is born in a middle class village family, she puts an effort to turn out to be a talk of the town. She is beautiful in appearance than her sister so she is liked very much by her father. At once she gets the opportunity to shine in the industry, her chastity is first hoodwinked by the chance giver who becomes situationist swiftly. The recital reflects on the character of Meghna Mathur who also taken a replica of Lalitha. In this world, human beings can aspire anything to become but when it is applied to women, there might be some restriction at certain doings. Though it is, without bothering they want to cross and do achieve in terms of giving shape to their dream in a troublesome field. Whatever the situation may be, once the avarice is fixed in the mind of aspirants that should be done. By applying this to the current paper, it shows how the results would be. In this paper Lalitha is suffered in loads of ways to get success but the fashionable aims of her not let her down to be in a compact place.

Keywords: Modernity, Aspiration, Degradation

In the eyes of girls there is a beautiful world called Fashion. It has an enchanting quality and power which is equally balanced. In this indicated world, there are two evils good and bad. Half of the aspirants in this world of fashion is ruled by Bad evils, which daringly spoils the dreams of the dreamers. The other half fortunately travel in the right track of success. But the present paper is all about bad evil’s impact on the virtuous aspirants. It is a universal fact that girls always have fond on cosmetics and the fashionable things as they needed. They do watch the beautiful ladies and their mannerism closely, even without having a single blink of their eyes. It is well said in the article “Impact of Fashion on Stuents”:

Fashion has taken up the lives of teenagers so much that most of them are more concerned about their style statement at an age where they should be more concerned about their grades. Teenagers of the present times have involved themselves so much with fashion that they don’t get sufficient time for any other work; time that they should be spending mostly on their studies is being wasted checking out new fashion styles and thronging markets and malls to find something like that. Instead of reading textbooks youngsters these days prefer to read fashion
magazines and try hard to imitate the models or celebrities so as to resemble them. (“Target Study” July 2013)

In this novel, Miss Mendoza, a school teacher is being keenly watched by two rural girls Saroja and Lalitha as an embodiment of style and fashion. During the Visiting day, Miss Mendoza does flower in her springy little pony and drape a beautiful sari with high heeled slippers. Saroja speculates on how she could walk in wearing this much of a heel and noticed her tea when she drinks, Miss Mendoza crooks her little finger, it does not touch the tumbler and every sip she wiped her lips with her handkerchief that she takes from her purse. In these two girls, Saroja, an innocent watched her out of the corner of her eyes a lot than Lalitha. Because Lalitha is a perfect doer than just being a passive admirer. She takes care of her physic so much and wants to be slim like a goddess in the picture. For fear of putting on fat she avoids sweetmeals and also the fashion is to be skinny and lean everywhere except for the breasts in her dream world of fashion. It is well shown in the running pages of Two Virgins Novel vividly. Like, the action of Lalitha, Meghna Mathur in Fashion has also been a great follower and a doer of following the model on television and shows. It probes her thought profoundly to become a top model and to be in reality. So she prepares herself to turn over like a model from then on. Naturally, she does know only the dazzling hours of model on stage more than knowing the terrible minutes of model off stage. They fail to understand the motto of success and failure in the modeling world. Yes, there is a success, but not much and also a failure but in so much. This is what, happens in the field of fashion and the girls are the key victims for the chance givers and productivity of their business. But they are not ready to accept this bitter fact. They feel glad when they get the chance to become what they want to become in their dream, blindly.

Getting opportunity is not an easy job. It is a highly infrequent one, especially in the field of media. The chosen characters of this paper, namely: Lalitha and Meghna Mathur are highly deserved to become an artist and also a model in their own industry. As they desire, they got a chance to show their talents by the worst evils of filmmaker and Abhijeet Sari. A filmmaker from the novel Two Virgins casts Lalitha in his documentary on rural life and makes Lalitha the talk of the town. But it is happened only by losing her virginity at one point.

In the quest of a bright future and the contemporary values, straight forward girls simply fall into the trick of the cunning foxes who are in the hunt of these innocent or beginner girls who step in the city in the hope of bright perspectives. This is what reflects in the select movie Fashion by the shrewd character Abhijeet Sari. He is the one who tempts Meghna Mathur to get closer to him for his thirst of lust. She has also lost her virginity. When they raise their head to ascend the question against the evilicious activities of them, the answer would fall on the head of the girls alone. This is the current scenario of the present life of some innocent girls. The novel tells the drawbacks of city life for the innocent virtuous rural girl as well girls should be clear that, the mechanical life of film city is truly different from the actual life. It should be known to every poor novice in this field, otherwise the results of their unaware dream would be worse as above mentioned.

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GLOBAL WARMING: REAL OR FEIGNED THREAT TO HUMANITY

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ABSTRACT

The controversial and prevailing issue of global warming (GW) and/or climate change (CC) poses sizable apprehensions among human populations worldwide. Some less-informed people think that the issue of GW and CC are only imaginary, nonsense simple matter. The truth is that GW is a real occurrence which has a direct or indirect effect to CC and human survival. Eventually, this global phenomenon may determine the fate of humans to exist as organisms in this only living planet. And based on empirical physico-social observations, CC is a valid threat both to one’s internal and external communities. Despite of these on-going realities, it is believed that something could still be constructively done to rehabilitate the condition of our ailing environment. The time is not yet too late for us to respond to the pressing demand to restore our nature. However, continual apathy and dispiritedness to the crucial call to revive our ecosystem brought about by GW and CC, could worsen and become irreversible threat to the perpetuation of humanity. Thus, the concerted efforts of all inhabitants of every society in the world is a critically persisting necessity. If we want human species to live through thousands of decades of millennia, now is the opportune time to act sincerely and selflessly for the biotic milieu.

Keywords: altruism, atmospheric disturbance, biota, ecology, environmental alteration, greenhouse gases

INTRODUCTION

To the layman, GW may be regarded similar or the same as CC. To them they are nothing but some normal physical disturbances or variations in the atmospheric cycle. But literatures say that GW is the rise in the average global surface temperature. It is caused primarily by the build-up of human-produced greenhouse gases (GHGs), mostly carbon dioxide (CO\textsubscript{2}) and methane (CH\textsubscript{4}) (Kovats et al., 2006). These gases trap heat in the lower levels of the atmosphere. While CC refers to the broader set of changes that go along with GW. In other words, CC is an aftereffect of GW. These alterations include weather patterns, the lands, the oceans, the ice and snow, and ecosystems (Epa.gov). One reality is that to rehabilitate nature is very tedious and challenging.

Climate change is the biggest health threat of the 21\textsuperscript{st} century (Costello et al., 2009). It is posited that the effects of CC on human health will affect most populations and will put the lives and wellbeing of billions of people at increased risk. This is so because other inhabitants of this planet simply do not care about environmental conservation. The rises on the Earth's average surface temperatures are likely to go beyond the safe threshold of 2°C above preindustrial average temperature. Today, many people knew that the accumulation of GHGs particularly CO\textsubscript{2} are the ones responsible for the increase in global temperature. This carbon overload has been said to be mainly due to the burning of fossil fuels like coal, oil, and gas. The problem is further aggravated when we keep on cutting down trees and burning forests. Though there are other gases that contribute to increased environmental temperature like CH\textsubscript{4} and nitrous oxide (N\textsubscript{2}O), they are of secondary importance. Due to human activities, the concentrations of CO\textsubscript{2} in the atmosphere keep on increasing. Thus, it stays longer in the atmosphere than the other major heat-trapping gases (Wikipedia.org).

On the other hand, it is also worth knowing that should all of the energy emitted from the Earth’s surface escaped into space, the Earth would be too cold to sustain human life. Such that heat-
trapping gases serve as a blanket surrounding the Earth and keeps its temperatures within a range that enables life to thrive on the planet. Unfortunately, these gases especially CO$_2$, are accumulating in the atmosphere at increasing concentrations due to man-intervened activities. Thus, the atmosphere’s insulating blanket is getting too thick that overheats the Earth because less energy (heat) escapes out into space (U.S. DOE, 2008).

Bringing down the temperature of the Earth’s atmosphere to optimal level goes with the question of what is the proper thing to be done. As mentioned, the number one cause of CO$_2$ accumulation in the atmosphere that led to the increase in global temperature is the burning of fossil fuels. But sad to note that even agriculture (especially livestock production) also accounts about one-fourth of global GHG emissions (McMichael, 2013). This means that the effects of producing red meat from CH$_4$-producing ruminants (e.g. cattle, sheep, and goats) are so great. Some radical thinkers even proposed that production of these animal protein sources should be curtailed in order to get rid of further GHG emissions. This paper aimed to present multifaceted issues and concerns on GW and CC to let global inhabitants appreciate its necessity.

**DISCUSSION OF ISSUES**

**Effects of CC on Key Environs and Sectors**

*Terrestrial.*

Chakraborty & Newton (2011) posited that global food production must increase by 50% to meet the projected demand of the world’s population by 2050. The authors claimed that meeting this very difficult challenge will be made even more complicatedly tough if CC would melt portions of the Himalayan glaciers to affect 25% of world cereal production in Asia.

Geological features of the Earth reminds us that roughly only 25% of the total global space is covered by land, the rest being wrapped with different forms of water bodies. And sad to say that out of the 25% land mass only 10% or less is actually considered potential agricultural lands (Brady & Weil, 1999). Realistically, this 10% remaining potential agricultural lands are even decreasing time after time due to continued human habitations and land-use conversions.

On the other hand, Jetz et al. (2007) worriedly emphasized that over the past few decades, land-use and CC have led to substantial range contractions and species extinctions. That even under environmentally benign scenarios, it is estimated that at least 400 species are projected to suffer >50% range reductions by the year 2050, and over 900 by the year 2100. It means that CC will severely affect biodiversity in the near future. Root et al. (2003) pointed out that over the past 100 years, the average global temperature has increased by approximately 0.6°C and is projected to continue to rise at a rapid rate. While land-use change in tropical countries may further lead to yet greater species losses.

*Aerial.*

The above-ground ecosystem is an equally-important environment to give attention to. An article in Jenkinson et al. (1991) say that one effect of GW will be to accelerate the decomposition of soil organic matter thus releasing CO$_2$ to the atmosphere which will boost the warming trend. Relatedly, Cox et al. (2000) averred that continued increase in the atmospheric concentration of CO$_2$ due to anthropogenic emissions is predicted to lead to significant changes in climate. They say that about half of the current releases are being absorbed by the ocean and land ecosystems. However, they advanced that this absorption is sensitive to climate and atmospheric CO$_2$ concentrations, creating a feedback loop. In their three-dimensional carbon–climate model, it indicates that carbon-cycle feedbacks could significantly accelerate CC over the twenty-first century. They claimed that under a “business as usual” scenario, the terrestrial biosphere acts as an overall carbon sink until about 2050, but turns into a source thereafter.
Marine.

Carpenter et al. (2008) in their assessment of reef-building corals showed that of the 704 species that could be assigned conservation status, 32.8% are in categories with elevated risks of extinction. The decrease in abundance were associated with bleaching and diseases caused by increased sea surface temperatures. Results indicate that such extinction risks have been further aggravated by local-scale anthropogenic disturbances. The above findings was also backed up in Guldberg (1999), claiming that sea temperatures in many tropical regions have increased by almost 1°C over the past 100 years, and are currently increasing at ~1–2°C per century. It was asserted that increased sea temperatures result to coral bleaching. Coral bleaching occurs when the thermal tolerance of corals and their photosynthetic symbionts (zooxanthellae) is exceeded.

Similarly in an article, Dudgeon et al. (2005) pointed out that fresh waters are also experiencing declines in biodiversity. They say that this fall off is far greater than those in the most affected terrestrial ecosystems. It was further articulated that if trends in human demands for water remain unaltered and species losses continue at current rates, the opportunity to conserve much of the remaining biodiversity in fresh water will vanish even sooner. Turner (2010) accentuated that CC is the culprit that poses profound, direct, and well-documented threats to biodiversity. It mentioned that significant fraction of Earth's species is at risk of extinction due to changing precipitation and temperature regimes, rising and acidifying oceans.

Human Health.

Myers & Patz (2009) claimed that large-scale anthropogenic changes to the natural environment, including land-use change, CC, and the deterioration of ecosystem services, are all accelerating. They stressed that these changes are interacting to generate five major emerging public health threats that endanger the health and welfare of people. These risks include increasing exposure to infectious diseases, water scarcity, food scarcity, natural disasters, and population displacement. Taken together, they may represent the greatest public health challenge humanity has faced. Additionally, Pounds et al. (2006) declared that as the Earth warms, many species are likely to disappear because of changing disease dynamics. Their study showed that recent mass extinction associated with pathogen outbreaks is tied to GW. Hence, with CC promoting infectious diseases and eroding biodiversity, the urgency of reducing GHG concentrations is inexcusable.

Active Role or Participation Enjoined From One’s Self.

More than anything else, the great crusade needed to arrest these tremendous ecological enigma need to come from within an individual. No amount of good programs and excellent plans would be useful in solving these global-environmental atrocities if there is no active participation of every citizenry. Such that it is very essential that proper and true understanding of the real score with respect to these global issues need to be understood and internalized by all people in the world. But, this thing is easier said than done because to let a person understand and appreciate by heart and mind this environment-restoration campaign is very difficult. To let an individual realize the imperative of this crucial issue would take so much time and patience. Nevertheless, it is believed that proper education and instilling of the right value system to oneself is very fundamental in this pursuit (Garvey, 2008)

Family.

The family is popularly called as the basic unit of every society. Everyone’s first informal education clearly comes from the home. It is where the foundation of the psycho-social orientation of a person is rooted (Carlson, 1999; Suva, 2014). An effective and influential element of one’s external actions essentially comes from his own family. Necessarily, a strong nation means one with a firm and
well-valued families. Well-valued families produce well-principled persons. They are the ones who could easily understand and responsively adopt sound practices for the good of the environment and for the welfare of the people.

**Academes.**

Colleges and universities whether public or private have expected significant contribution for initiating awareness and desirable practices that are favorable to mitigating the ill effects of CC. The schools have the greatest reach to the masses because almost all parts of any country in the world today have been provided with learning institutions across levels. A common objective should be faithfully adopted among the academes seeing to it that environmental protection should be a key subject area for learning. An agenda promoting the use of eco-friendly organisms like *Rhizobium* and the utilization of mulching materials in crop production may be a favorable start (Nierras, 2014; 2015).

Developing a desirable personal attitude and right value system of an individual seems to be the most difficult aspect to be changed/adopted in one’s behaviour (Prager, 2012; Sholl, 2011). But this matter should be treated by the academes as a tough but remediable challenge for the sake of human perpetuation. Losing hope and surrendering to this greatest test of all time would mean the downfall and gradual annihilation of humanity.

**National & Local Government Units (NLGUs).**

One way in which a country may show its concern in rehabilitating nature is to unreservedly participate into such pacts as the Paris Agreement and similar accord. This understanding which took effect on 4 November 2016 stipulates to limit GW to no more than 1.5°C above pre-industrial levels (Hulme, 2016; Lavanya, 2016; Rogelj et al., 2016). It required the Parties to submit their *Intended Nationally Determined Contributions (INDCs)*. The signatories also agreed to come together every five years to report on their emissions and implementations efforts. Correspondingly, attaining the purposes and aspirations of a worldwide covenant would not likely succeed without the active participation of well-informed leaders of local communities. The kind of leadership that all societies necessitate to possess is proactivity. The hands-on partaking of local leaders and their constituents of global activities applied in their own districts are indispensable thing in arresting GW. Solving the gigantic problem of CC must appeal the active involvement of all members of every community. Thus, the committed participation of human societies led by their respective frontrunners are specially needed in this extraordinary difficult endeavor.

**Non-Government Organizations (NGOs).**

The idea that NGOs incorporate in their general objective a plan of action for the protection and/or rehabilitation of the environment is remarkably laudable. Being part of the vast surroundings, all types of NGOs need to take active part in arresting or mitigating the ill-effects of GW and CC. These efforts may be done by requesting them or through their own initiative find appropriate solutions to recuperate Mother Nature. Top management may issue formal declaration to their constituents to perform or practice eco-friendly tasks. In the case of religious NGOs, continuously supporting environment protection drive both in word and in deed are some of the most practical instruments they may use for evangelizing their members. In short, ecosystem protection should be the concern of everyone and may not be left only to the environmentalists or to the eco-friendly groups.

**CONCLUSION**

Being aware of the intricacies and ill-effects of GW/CC is not enough. Exceedingly more important is to do our part conscientiously and scrupulously. If we fail to perform our personal-civic obligations today, the great misery goes to the posterity. Regaining the good condition of our ailing environment requires a slow and tedious process. But, it is posited that there still goes a thousand ways
to bring back the livability of our planet. Today is the exact time to act in rebuilding our unwell environment. Tomorrow might be too late already. There appears to have no swift way nor a magical means for restoring our ecosystem’s fitness for the biota. Working together by all sectors towards a common goal in saving Mother Earth is an uncompro

In essence and without directly or indirectly imputing a blame on anyone, it is the responsibility of the present generation to do all means to protect or revive our ecosystem. Pointing out fingers as to who is to be condemned would bring no good to us and would just waste our resources. Instead, we should use our limited time to work together in unity to attain our common purpose to arrest this global menace.

RECOMMENDATION

The following ways may be useful in helping out rebuild our deteriorating environment:

1. Encouraging all world leaders to devotedly participate in the crusade to revive nature such as signing the famous Paris Agreement on CC;
2. Designing and faithfully implementing by all countries of programs or activities that sustainably require the active participation of every inhabitant regardless of location, race, and nationality;
3. Assessing by every country of all their potential GHG contributors and finding out effective ways of reducing or stopping the continual release of those harmful gases;
4. Participating in the massive replanting of GHG arresters (trees) in all areas especially in the denuded forest lands;
5. Effectively restricting the cutting down of trees worldwide; and
6. Incorporating a subject on “Environmental Awareness & Protection” in the curricula in all school levels worldwide.

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Herbicides for rice cultivation under limited irrigation


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Abstract

Weed management is a critical issue for rain-fed rice farmers in Sri Lanka. All herbicides recommended in Sri Lanka by Department of Agriculture (DOA) have been tested under irrigated systems. So, it is necessary to look for herbicides which are effective under lack of water situations. Having that objective a field experiment was conducted adopting RCBD in yala-2014 seasons at the Rice Research and Development Institute, Batalagoda, to evaluate the performance of five (05) treatments namely; Bispyribac-sodium100g/l SC, Oxyfluoren240g/l SC (Spraying), Oxyfluoren240g/l SC (Application with sands), Pretilaclor300g/l + Pyribenzoxim20g/l SC, Cyhalofop-butyl100g/l SC followed by MCPA with comparison to control. Plot size was 10.5 m² and plots were separated by 30cm (Width) bunds. Seeds of Bg 300 were broad casted at a seed rate of 100 kg/ha. Weed counts at 06 days after spraying, Weed dry weight at 06 days after spraying and final grain yields were measured. Only life saving irrigation was adopted. All other cultural management practices were done according to the recommendation of the DOA. Data was analyzed employing ANOVA using the SAS software package. Weed Controlling Efficacy (WCE) were calculated for each treatments using standard formulae. Bispyribac-sodium100g/l SC and Pretilaclor300g/l + Pyribenzoxim +20g/l SC showed a higher WCE values; 95.73% and 89% respectively. It is concluded that, Bispyribac-sodium100g/l SC and Pretilaclor300g/l + Pyribenzoxim20g/l SC can be effectively used in areas where water is a limited factor at the rate of 300 ml/ha and 1.25l /ha respectively.

Keywords: Weed Controlling Efficacy, One-shot Herbicide, Pre-emergent, Post-emergent

Introduction

Weed management is a critical issue for rain-fed rice farmers in Sri Lanka. Herbicides are the easier and popular method of weed control among Sri Lankan farmers. All herbicides recommended in Sri Lanka by DOA have been tested under irrigated systems. So, it is necessary to look for herbicides which are effective under limited moisture conditions which experienced in rain-fed conditions. Having that objective this experiment was carried out.

Materials and Methods

A field experiment was conducted adopting Randomized Complete Block Design (RCBD) with 03 replicates in the yala 2014 season at the Rice Research and Development Institute, Batalagoda, to evaluate the performance of six (05) treatments namely; Bispyribac sodium 100g/l SC, Oxyfluoren 240g/l SC (Spraying), Oxyfluoren 240g/l SC (Application with sands), Pretilaclor300g/l + Pyribenzoxim 20g/l SC, Cyhalofop-butyl 100g/l SC followed by MCPA with comparison to control plots (Herbicide Untreated and Hand Weeded treatments). Plot size was 10.5 m² and plots were separated by small bunds. Seeds of Bg300 were broad casted at a seed rate of 100 kg/ha. Weed dry weight at 06 days after sowing, weed counts at 06 days after sowing, and final grain yields were measured. Field was not impounded with standing water. Only life saving irrigation practiced whenever plant showed temporally moisture stress symptoms like leaf rolling. All other cultural management practices were done according to the recommendation of the Department of Agriculture, Sri Lanka. Weed Controlling Efficacy (WCE) were calculated for each treatments using standard formulae given below:

\[
WCE = \left( \frac{NW - T}{NW} \right) \times 100
\]
where WCE= Weed Control Efficacy or Weed Control Efficiency, NW= Weed dry weight of No Weeding Control and T=Weed dry weight of treatment concerned. Data was analyzed employing ANOVA using the SAS software package.

**Table 01: Properties of herbicides tested**

<table>
<thead>
<tr>
<th>Herbicide formulation</th>
<th>Description</th>
<th>Mode of Action</th>
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<tbody>
<tr>
<td>Bispyribac sodium 100g/l SC</td>
<td>Post-emergent Herbicide, One-shot herbicide (kills grass, sedges and broadleaves)</td>
<td>Acetolactate Synthase Inhibitor</td>
</tr>
<tr>
<td>Oxyflurofen 240g/l SC</td>
<td>Pre-emergent Herbicide, One-shot herbicide</td>
<td>Protoporphyringen Oxidase Inhibitor</td>
</tr>
<tr>
<td>Preti-clor 300g/l + Pyribenzoxim 20g/l SC</td>
<td>Post-emergent Herbicide, One-shot herbicide</td>
<td>Inhibition of Cell Division + Acetolactate Synthase Inhibitor</td>
</tr>
<tr>
<td>Cyhalofop-butyl 100g/l SC</td>
<td>Post-emergent Herbicide, Grass-killer herbicide</td>
<td>Acetyl CoA Carboxylase Inhibitor</td>
</tr>
<tr>
<td>MCPA (2-methyl-4-chlorophenoxy acetic acid)</td>
<td>Post-emergent Herbicide, Broadleaves and sedge killer herbicide</td>
<td>Synthetic Auxin (Growth Regulator)</td>
</tr>
</tbody>
</table>

**Results and Discussion**

**Figure 01: Weed floral composition in the experimental site**

Weed flora of the experimental site consists of 50% of sedges, 36% of broadleaves and 14% of grasses.
Table 01: Relative abundance of Weed species found in the experimental site

<table>
<thead>
<tr>
<th>Species</th>
<th>Common Name</th>
<th>Family</th>
<th>Evenness (Relative Abundance)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Grasses</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ischaemum rugosum</td>
<td>Gojarawalu/ Wrinkle duck beak</td>
<td>Poaceae</td>
<td>1.84</td>
</tr>
<tr>
<td>Echinochloa crus-galli</td>
<td>Bajiri/ Barnyard grasss</td>
<td>Poaceae</td>
<td>12.26</td>
</tr>
<tr>
<td><strong>Sedges</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fimbristylis miliacea</td>
<td>Heen-Kudametta/ Lesser fimbrystylis</td>
<td>Cyperaceae</td>
<td>15.95</td>
</tr>
<tr>
<td>Cyperus difformis</td>
<td>Bolamal-Thunessa/ Umbrella plant</td>
<td>Cyperaceae</td>
<td>27.60</td>
</tr>
<tr>
<td>Cyperus iria</td>
<td>Digatinal-Thunessa/ Umbrella sedge</td>
<td>Cyperaceae</td>
<td>6.74</td>
</tr>
<tr>
<td><strong>Broadleaves</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lindernia rotundifolia</td>
<td>Lindernia</td>
<td>Scrophulariaceae</td>
<td>1.84</td>
</tr>
<tr>
<td>Monochoria vaginalis</td>
<td>Diya-habarala/ Pickerel weed</td>
<td>Pontederiaceae</td>
<td>2.45</td>
</tr>
<tr>
<td>Ludwigia octovalvis</td>
<td>Welkarambu/ Water clover</td>
<td>Onagraceae</td>
<td>0.61</td>
</tr>
<tr>
<td>Murdannia nudiflora</td>
<td>Heen-girapala/ Dove weed</td>
<td>Commelinaceae</td>
<td>4.90</td>
</tr>
<tr>
<td>Sphaeranthus indicus</td>
<td>Mudumahana</td>
<td>Asteraceae</td>
<td>25.76</td>
</tr>
</tbody>
</table>

Cyperus difformis showed the highest relative abundance of 27.60 whereas as Ludwigia octovalvis showed the lowest relative abundance of 0.61. Among grasses Echinochloa crus-galli showed the highest relative abundance of 12.26. Among sedges Cyperus difformis were the highest abundant weed species. Among broadleaves Sphaeranthus indicus showed the highest relative abundance of 25.76.

Table 02: Weed dry weights, Grain yields and Weed Controlling Efficacy of different herbicides

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Weed Dry Weight (g/m²)</th>
<th>Grain Yield (t/ha)</th>
<th>WCE%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bispyribac sodium 100g/l SC at the rate of 300 ml/ha within 08-14 Days After Sowing (DAS)</td>
<td>9.43 c</td>
<td>3.2 a</td>
<td>95.73%</td>
</tr>
<tr>
<td>Oxyflurofen 240g/l SC at the rate of 2.0 l/ha (Spraying) within 03-05 DAS</td>
<td>177.87 ab</td>
<td>2.6 c</td>
<td>19.5%</td>
</tr>
<tr>
<td>Oxyflurofen 240g/l SC at the rate of 2.0 l/ha (Application with sands) within 03-05 DAS</td>
<td>123.23 abc</td>
<td>2.4 c</td>
<td>44.23%</td>
</tr>
<tr>
<td>Pretilaclor300g/l +Pyribenoxim 20g/l SC at the rate of 1,251/ha, within 06-10 DAS</td>
<td>24.30 c</td>
<td>3.1 ab</td>
<td>89%</td>
</tr>
<tr>
<td>Cyhalofop-butyl 100g/l SC at the rate of 2.0 l/ha within 07-15 DAS followed by MCPA at the rate of 1.8 l/ha within 18-21 DAS</td>
<td>59.77 bc</td>
<td>2.8 abc</td>
<td>72.95%</td>
</tr>
<tr>
<td>Herbicide Untreated Control</td>
<td>220.97 a</td>
<td>1.8 d</td>
<td>0%</td>
</tr>
<tr>
<td>Hand Weeded Control</td>
<td>0 c</td>
<td>2.53 bc</td>
<td>100%</td>
</tr>
</tbody>
</table>
**Means within a column with the same letter are not significantly different  (α=0.05)**

The highest weed dry weight showed in no weeded treatment. Weed dry weights were comparatively higher in *Oxyflurofen 240g/l SC (Spraying)* and *Oxyflurofen 240g/l SC (Application with sands)* treatments as well. Soil Seed bank is a highly variable factor, that’s why it showed a higher *coefficient of variation (CV)*. Grain yields were fairly lower because of water stress experienced by plants during the growing season. There was a relationship between weed dry weight and grain yields. Higher the weed dry weights lower the grain yield. *Bispyribac sodium 100g/l SC* and *Pretilaclor300g/l + Pyribenzoxim  20g/l SC* showed a higher WCE values; 95.73% and 89% respectively under rain-fed conditions. Abeysekara A.S.K. et al. (2014) also reported similar results. Therefore, *Bispyribac sodium 100g/l SC* and *Pretilaclor300g/l + Pyribenzoxim  20g/l SC* can be effectively used in rain-fed agriculture at the rate of 300 ml/ha and 1.25l /ha respectively.

### Conclusion

*Bispyribac sodium 100g/l SC* and *Pretilaclor300g/l + Pyribenzoxim  20g/l SC* can be effectively used in rain-fed agriculture at the rate of 300 ml/ha and 1.25l /ha respectively.

### References


PEST MANAGEMENT RECOMMENDATIONS, Department of Agriculture, Peradeniya (2015).
SIGNIFICANCE GREEN INTRAPRENEURSHIP ON COOPERATE SUSTAINABILITY IN SRI LANKA
By: Aluthgamage Hasintha Sharmen Pemerathna
Edulink International Campus

Abstract:

Purpose: The main intention of this research is to identify the ideologies and functionalities of green intrapreneurs Sri Lankan and the contribution of such practices on the corporate sustainability efforts.

Design/methodology/approach: Main corporate ventures desired for sustainability is identified as the public limited companies. And the structural equation modeling was mainly used to test the set hypothesis. While the sustainability report score model was used to identify and measure sustainability level of the companies. Further the results will be testifying two models and then conclude the model fit proving hypothesis in the process.

Findings: Results indicate a strong relationship between green culture and the corporate sustainability. And the suggested model is proven with proper statistical parameters. Overall sustainable consciousness in public limited companies are identified as lower moderate. However the there is an identifiable gap between the top management understanding on the Green Intrapreneurship concept and the commitment for such practices inside their organizations.

Contribution of the paper: This paper will contribute key knowledge base for the top management decision makers in the public and corporate structure in Sri Lanka, to use the concept of green intrapreneurship as a sustainable tool.

Key Words: Green Culture, Green product life cycle management, Performance base pay, public limited companies.

Introduction

Green entrepreneurship
Entrepreneurial contribution on global business sustainability is increasingly discussed topic among many academics (Wankel, 2008). While some scholars claim that such efforts are directly connected to the study of the way of life another set of academics view it as an obligation that high income earning countries should fulfill towards the developing nations. Further the scholar’s view this practice of draining entrepreneurial effort to the developing world from developed world would bring about the sustainable development in those countries (Scoones, 2009). This phenomena is said to have a telling effect on the boost of social entrepreneurship and green entrepreneurship concepts around the world. Schaltegger, (2002) believes this approach would reduce the tall on environmental damage and increase the quality of life in many countries. Another argument is made by fisher (2009) claiming that capitalism economical structures has become natural than the nature itself. Once Nobel Prize winner “Muhammad Yunus” is viewed as an entrepreneur economist, an entrepreneur whose decisions are based on economical intentions. Moreover, this role is also viewed as pivotal in sustainable development. However many researchers argue that the stability in growth cannot be achieved until the business system meets with innovative strategy to produce green entrepreneurship (Luchs et al., 2010). The technical waves like clean tech boom are clear indications on the improvement of the significance of green energy. Further, the modern era economists believe that the solution for sustainability and green environment is not brought about from the policy makers but by the market structure itself. Hence, it is the reason for the increase in the level of ecopreneurs in the world. Moreover, significant shift of customer taste from synthetic to green quenches buying can be noticed during the past decade this has led the fueling up on importance of ecopreneurship. (Warren, 2007). According to the Harvard business
review eco entrepreneurship concept is not just a tool to achieve sustainability it is a new business opportunity that has provided profitable markets for the business expansion. In another research finding Elkington and Burke (1989) argue that the eco concept can be used as an alternative strategy to tap the difficult markets. It is also argued that such practices like tax reliefs and subsidiaries needs to be managed to a certain limit in order to improve the efficiency of the eco entrepreneurship. While this concept is largely seen as a movement forward most of the academics also believe that the concept of green entrepreneurship is a good strategy to break the numbness in cooperate innovation cycle, while creation of such practices would also hail on the companies cooperate public image. However, according to ashok foundation eco-preneureship is triggered by the efforts created through social entrepreneurs, where the profit and the social concern is of high importance (Ashok foundation,2009).

Why intrapreneurship?
The concept of intrapreneurship is defined by the researchers as cooperate entrepreneurship or internal cooperate entrepreneurship (Schollhammer, 1981; Burgelman, 1983). This phenomena is famous among organizations as it would motivate the employees to accomplish targets beyond their current scope, hence resulting in innovation inside the organization Stevenson and Jarillo, 1990). According to Schumpeterian innovation concept, there are defined highlighted characteristics that distinguish the intrapreneurs among other management concepts. Namely, developing or improving new or existing products rang, strategizing the future of the business, improving and inventing new processors, finally creating new competitive advantage in the market place. According to Zahra,(1993) technological advancement has both improved the industrial growth and the dependency on innovation inside the organization which required additional layer of internal entrepreneur also known as “Intrapreneurship”. Recent industrial analysis has proved that high tech external environment has intensified the internal bureaucratic structure to identify the and practice the concept of intrapreneurship more intensely (Guth and Ginsberg, 1990). While another research reflect that the company’s experience on high market growth may be a direct result of success in cooperate startup which is the very same thing as intrapreneurship (Hobson and Morrison, 1983). Zahra,(1991) further mention that hostility of the environment has urged the organizations to consider more on cooperate entrepreneurship. Indeed, the unfavorable environmental conditions with high ambiguousness and high level of competitive rivalry has increased the importance of the cooperate entrepreneurship (Covin and Slevin, 1989). A Slovenian researcher has found out that the increased industrial rivalry, higher demand for technological products, improvement in customer dynamic and increase non-favorable conditions for the business has a positive impact on the internal demand for the intrapreneurship both in Slovenia and in USA.

Significance of green intrapreneurship
While many research efforts are targeted at identifying the eco-preneurship impact on the sustainability, some researchers emphasized the related dependency of the same concept on intrapreneurship. MacMillan et al.,(1984) argues that the concept of eco-preneurship largely depends on the success of intrapreneurship inside the organization as the environment is dynamic and technology bound, internal mechanism to create cooperate entrepreneurship would determine the sustainable impact or green innovation inside the organization (Ruzzier et al., 2006). Due to the increased awareness on environmental facts and change in the attitude on “green guilt”, many customers are willing to acquire green products with a little incremental cost component. Management skills and systems would stimulate this process of increasing the creativity of green intrapreneurship (Antoncic and Hisrich, 2001, 2004). Moreover, innovation can be stimulated by green intentions top management commitment, employee awareness and rewards system of the organization (Lee and Tsai, 2005). Intrapreneurship has been identified as one of the main characteristics of emerging organizations in today’s context, along with the concept of green management which is also considered to be of growing importance Covin and Slevin,1991). Pinchot, (1985) explains that the concept is proven its effectivity on small businesses, even under the hostile environment. Hence the theorization of green intrapreneurship seems to have practical implication, while green intrapreneurship literature in Sri Lanka is lacking research is focused on following stated objectives to be fulfilled.
Objectives
01. To identify the existence of green intrapreneurship in Sri Lanka.
02. To determine the significance of green intrapreneurship in cooperate world in Sri Lanka.
03. To analyze the impact of green intrapreneurship on the cooperate sustainability in Sri Lanka.
04. To identify the further areas of improvements in future research.

Literature review

Introduction:
This chapter has looked into the composition of intrapreneurship and further would try to identify related concepts that runs parallel to the same concept. The chapter would also throw light on the Sri Lankan literature for the above mention subject matter. The evolution of sustainable management has gone through many phases starting from pre-Stockholm, Stockholm sustainability until the WCED; and post era of WCED (Mebratu, 1998). However, all those development theories focuses on the environmental factors as one of their main stated goals (Capra, 1982). Moreover, most of the organizations consider the techno- optimization as the main strategy in achieving the sustainability goals, when those strategies are also directly empowered with environmental end goals, which is again emphasized on green intrapreneurship. Further Lele, (1991) suggested that sustainability is comprise of three main dimensions, namely techno centric, eco centric and social centric. Where the eco centric being the concern over the environmental paradigms. In another similar research the concept of sustainability was characterized with two perspectives namely, positivism sustainability and normative sustainability where in positivism sustainability the focus is placed on the body of science and the logical approach to everlasting development. While in the normative sustainability certain ethical parameters were put in to consideration.

Green intrapreneurship and Eco Sustainability Goals
Parker, (2007) has observed that aligning sustainable goals with profit goals will enhance the eco-preneurship paving the way to increase in goal congruence. Study further claims that restraining green aims to NPOs’ and social entities other than profit for business activities would reduce green entrepreneurship practices. Further in this approach organizations would look in to social aspects and the ecological means of achieving the company objectives. Since the universal justice is involved both social and environmental means are equally utilized in this approach (Osorio et al., 2005). In all these approaches sustainable development parameters are directly connected to ecological means. Hence the green business is considered to be the main component in all those definitions. As Antoncic and Hisrich, (2001) explained the modern era companies try to fulfill their cooperate objectives through cooperate entrepreneurship also known as intrapreneurship. Another research has pointed out that the sustainability is being able to survive long run, for which the resources needs to be best utilized without a wastage. Hence the eco effectiveness is implied in the concept always (Elkington, 1997). Hence it can be concluded that sustainable goals will trigger green entrepreneurship and Green entrepreneurship cannot be succeeded without green intrapreneurship.

Green enabled culture, intrapreneurship and cooperate sustainability
According to Duarte & V. Machado, (2013) properly streamlined sustainable goals will pave the way to create a green culture inside the organization. The study further argues that sustainable performance indicators and measures would improve the companies’ dependency on eco-preneurship. In another research it was found out that the sustainable business goals would stimulate the business environment to produce ecofriendly products while innovation system would generate greener ideas (Peattie, K. 2005). Michael, (2006) has argued that the government intervention on sustainable climate of the business environment, has increased the eco business activities in organizations. Charter et al. (2002) has argued that sustainable products need to be reliable throughout its product life cycle by being energy efficient, nonpolluting and easily repairable. Further the study claims that such characters need to be included in the product design stage through proper green enabled system. Overall most of the researchers argue that green enabled culture is created through sustainable business goals.
Research Gap: Although many researchers have found the ability of green culture to stimulate green intrapreneurship practices inside the organizations there is a clear gap in literature on identifying the capability of green culture to stimulate cooperate sustainable development.

Impact of Management attitude on intrapreneurship in creating cooperate sustainability

Harris & Crane, (2006) has found out that management attitude on the green products are mostly apathetic despite the high alert on green pressure. Another study has observed that sustainable goals will trigger high level of green management practices inside the organization Creating positive attitude on such practices. Especially most of the managers has used design for disassembly practices to assure less pollution. Further study highlights that these managers would give priority to novel green ideas arisen among the team and facilitate individuals to implement those ideas (Ding, Wang & Zou, 2016). Roy & Khastagir, (2014) has observed that sustainable goals have a direct impact on the green innovation process of the organization. Further the study claimed that this phenomena would increase task allocation and share culture in the organization. Moreover the study claims that, in order to trigger innovation culture top management should reduce the hierarchy and allocate power to other levels to make decisions. In all of these studies it is identified that top management attitude is essential in creating green culture while green related innovation and power allocation is a direct result of top management commitment on sustainable management.

Research Gap: Although the top management attitude is mapped with intrapreneurship, there was no clear cut relationship identified between cooperate sustainable development and Positive attitude of managers.

Power delegation and resource allocation on Green Intrapreneurship practices.

Trentin, Forza & Perin, (2015) has found out that resource allocation has a direct impact on the green management practices. Study further explains that such allocation of power will improve the understanding of the firms’ customer perception on the ecofriendly products. Moreover it will result in incremental innovation that would reduce the process errors while promoting share ring culture. Another research done on the storm water management technology in Africa has found out that the community involvement, decision-making and idea generation is high when the projects are funded with financial and nonfinancial resources and facilitated with proper infrastructure system. Further the study claims that all these consequences are possible if the households who are involved in those project has the authority to make viable decisions (Baptiste, 2014). Roy & Khashagir, (2016) has found out that the innovation system is a must have factor for green management practices while the delegation of decision making power need to be rein stored to do that.

Research Gap: According to the literature power delegations, resource allocation and infrastructure arrangement of the company to improve the green management practices would have a positive impact on creating green intrapreneurship inside the organization.

McKinney’s’ seven 7 framework

Although the initial intention of this model is to identify the strategic implementation path of the company, it is later evolved in to identification of the sustainable development needs and the environmental needs of the company. Mainly, through utilization of soft approach and hard approach. The argument of this approach is that while identifying the resource base view of the organization it is also important to identify the soft S factors that would lead to change in the share value and necessary vision on green strategies while developing related skills focused on the sustainable goals (Peters and Waterman, 2004). It is found that many American and Japanese companies has examined the successful combination of hard components with soft components has given the company competitive edge on sustainable development (Peters and Waterman, 1982). According to Boyle, (2007) company should be
able to make the business process more flexible for the innovation to flourish. Further he explains that such practices would also allow the company to adopt green enabled innovation in the organization. Another set of researchers Bilal Bin Saeed & Wenbin Wang (2014) has identified that the Seven S framework is more effective tool compared to other contemporary tools like Burke-Litwin and Bilal & Wang which also focuses on similar areas, at times with the exception of containing direct attribute like climate change. However, these models have proved less effective over the last few decade. Following model is utilized by Bin Saeed & Wenbin Wang to accomplish sustainable goals.

Further according to this model any entrepreneur or cooperate entrepreneur should be given with correct strategic HRM priority with sufficient access to resources and power, where only then the company would receive the maximum benefit from McKinsey framework.

**Green supply chain management**

Supply chain management practices can be considered as the practice of inculcating the supply chain practices of the organization to the international political agenda with eco driven value addition (Jacoby, 2010). Also the concept is viewed as total conversion and integration of value chain activities to a green inherited procedure (Wang and Gupta, 2011). According to the same research such green integrations would bring about higher saving of natural resources, reduced wastage, drop in pollution and increase recycling efforts. Moreover in the contemporary environment many organizations has the tendency of augmenting the efficiency of reverse logistics management cycle. Also, the study describes the importance of insisting the green supply chain management practices at the very beginning of the value chain and the due diligence that needs to be maintained throughout the cycle of product life.

**Green Product life cycle Management**

Wang and Gupta (2011) also have invented the model/framework that would enable green logistics and supply chain management. The concept is seen as a successful analysis on the product life cycle of the various companies and the product portfolio was also considered in this regard.

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**Figure 02: Green product life cycle**

Research done in industrial magazine in Canada has found out that the company those have implemented such strategies would be merited with reduced cost structure, improved value to operations, greater distribution of goods and services, increased product and service differentiation (Industry Canada, 2013). In another research done in Canada has found out that short term and long term gains can be realized by using green SCM practices. Further the study evolved to observe the upstream and dawn stream activities, highlighting the necessity to convert those activities to greener means (Simpson and Samson, 2008). Moreover, the study involved in the industrial analysis of the same concept. Dell has identified the importance of inter channel collaboration that would reduce the transport, storage cost, while HP has reduced the size of the package to reduce the transport cost and to reduce the carbon footprint. While the companies like Kodak and Coca-Cola has a huge improvement in their recycling efforts. All these initiatives are directly connected to green cooperate entrepreneurship or in other words green intrapreneurship (Jacoby, 2010).

All the strategies discussed in this chapter has a direct bearing on the company’s overall strategy to enhance the resource allocation and authorization to improve green intrapreneurs in the organization. While systematic management discipline and innovative culture would also stimulate such green strategies.

**Methodology and framework**

**Introduction:**

This chapter would identify the appropriate theoretical scope and lay a foundation on the discovery of a necessary platform and a framework on which this research should be carried out. Various research methods and tools will be reviewed before concluding on a selective research strategy and tools. Ontology of this study is a positivism based output were the contemporary practice of green intrapreneurship is reviewed by the study. Hence the main research approach is quantitative base, where many researchers in the same field of studying entrepreneurship was preferred this approach (Cukier et al., 2011; Phillips, 2012). Sampling method of judgmental sampling were used as other non-random methods like snow bowling and convenient sampling was said to have biasness and tendency of leaning towards one clique (Tracy, 2013). And the questions were combination of semi closed and closed ended type. Further, the Likert type scales would be utilized to identify the level of intrapreneurship activities, innovativeness and pro activeness of the organizational context. To scan the environment of the organization Miller and Friesen, (1984) questionnaire method was utilized. Study would also deploy unstructured question (Open ended) questions to understand the in-depth scope of the study , in this approach however the respondents will be motivated to tell the stories rather than answering questions (Lyons and Coyle, 2007).

**Sampling**

Some researches argue that increasing sample size in a research doesn’t enhance always enhance the validity of the data set (Marshall et al. 2013,). However Mayring (2007) argues that using a single case or a very small sample will reduce the validity of findings .Therefore the number of respondents used in this case would be 50 public limited companies. Including areas like manufacturing, garments, telecommunication and banking public sector businesses will be reviewed. Main reason for the selection is the access of information.

**Procedures**

The study would contain five main hypothesises that will be tested through correlationa and structural equation modelling .However following conceptual framwork will be used in the study
**Hypotheses**

**H1:** There is a positive relationship between green culture and cooperate sustainability.

**H2:** There is a positive relationship between green product life cycle management and cooperate sustainability.

**H3:** There is a positive relationship between Performance based pay on green intrapreneurs and cooperate sustainability.

**H4:** There is a positive relationship between Positive attitude on green intrapreneurship and cooperate sustainability.

**H5:** There is a positive relationship between power & resources allocation to intrapreneurs and cooperate sustainability.

**Measurements**

Structural equation modeling will be used to testify the relationship between independent and dependent variables. Further to support equation modelling, measurement method adopted by Cheng et al., (2014) will be used, where five point likert scales will collect data from strongly disagree to strongly agree opinions. The average coefficient will be calculated after directing several questions to validate each variable. Further to identify the cooperate sustainability(dependent variable), Sustainable Reporting Scoring Model will be used. Further this model can be effectively used for public limited companies and the score will vary from 0 to 4. Following figure will show the components of that model. To testify the main conceptual framework.
Table 01: Sustainability Reporting Score Model

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Score</th>
<th>0 (Lowest)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4 (Highest)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experience</td>
<td>Do not include any disclosures or report in any year</td>
<td>NA</td>
<td>Report or disclosures in the current year</td>
<td>Report or disclosures in prior three or more years</td>
<td>Report or disclosures in prior years and current year</td>
<td></td>
</tr>
<tr>
<td>Format</td>
<td>Do not have any format</td>
<td>NA</td>
<td>Sustainability disclosures of one or less pages containing details of sustainability/CSR activities carried out by the company</td>
<td>NA</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>CEO statement</td>
<td>Do not include sustainability initiatives in the CEO statement</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Stakeholder focus</td>
<td>Do not include any stakeholder group</td>
<td>NA</td>
<td>Include one stakeholder group</td>
<td>Include two stakeholder groups</td>
<td>Include three stakeholder groups</td>
<td></td>
</tr>
<tr>
<td>Sustainability aspect</td>
<td>Do not include any dimensions of sustainability</td>
<td>NA</td>
<td>Mention only one dimension of sustainability</td>
<td>Mention two dimensions of sustainability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sustainability goals</td>
<td>Do not include sustainability goals for the current year or future years</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Sustainability goal achievement strategy</td>
<td>Do not include any method or any means of achieving the listed goals</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>GRI guidance</td>
<td>Do not follow GRI guidelines or other guidelines</td>
<td>NA</td>
<td>NA</td>
<td>Follow other guidelines</td>
<td>Follow GRI guidelines</td>
<td></td>
</tr>
<tr>
<td>GRI application level</td>
<td>Do not have an application level</td>
<td>NA</td>
<td>GRI application level of C</td>
<td>GRI application level of B</td>
<td>GRI application level of A</td>
<td></td>
</tr>
<tr>
<td>External assurance</td>
<td>Do not seek external verification</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td></td>
</tr>
</tbody>
</table>

Source: Science Direct

Findings of the study

Table 2: The results of exploratory factor analysis of factor 1 (Sustainable development).

<table>
<thead>
<tr>
<th>Environmental commitment of top management</th>
<th>Factor loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experience (D1)</td>
<td>0.72</td>
</tr>
<tr>
<td>Format (D2)</td>
<td>0.68</td>
</tr>
<tr>
<td>CEO Statement (D3)</td>
<td>0.73</td>
</tr>
<tr>
<td>Stakeholder Focus Sustainability aspect (D4)</td>
<td>0.75</td>
</tr>
<tr>
<td>Sustainability Goals (D5)</td>
<td>0.65</td>
</tr>
<tr>
<td>Sustainability Goals achievement strategy (D6)</td>
<td>0.79</td>
</tr>
<tr>
<td>GRI Application Level (D7)</td>
<td>0.80</td>
</tr>
<tr>
<td>Eigenvalue</td>
<td>8.055</td>
</tr>
<tr>
<td>Percent of variance</td>
<td>80.60</td>
</tr>
</tbody>
</table>
As mentioned in the table the factor remains to be highly influential with high Eigen value and the factor lading is significant in this case. The variance of the factors remains to be high at 80.60 percent. However the sustainable goals and format of the company support those goals remains to be less overall. Further the companies seems to adopt sustainable goal achievement strategy without admitting that those are sustainable goals. D₃ and D₆ has respectively 0.65 and 0.79 factor loading values. However the GRI Application Level remains to be a factor with high relevance with 0.80 value.

Table 3. The results of exploratory factor analysis of factor 2-6

<table>
<thead>
<tr>
<th>Organizational efficiency outcome</th>
<th>Factor loading</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Green culture</strong> (Eigenvalue 1.213; percent of variance 21.45)</td>
<td>0.76</td>
</tr>
<tr>
<td>Awareness about green management practices (gc₁)</td>
<td>0.71</td>
</tr>
<tr>
<td>Positive attitude on green management principles (gc₂)</td>
<td>0.62</td>
</tr>
<tr>
<td>Motivation to achieve green enabled targets (gc₃)</td>
<td>0.72</td>
</tr>
<tr>
<td><strong>Green product life cycle management</strong> (Eigenvalue 1.103; percent of variance 18.23)</td>
<td>0.70</td>
</tr>
<tr>
<td>Number of Green Projects suggested (plm₁)</td>
<td>0.75</td>
</tr>
<tr>
<td>Existence of green products in portfolio (plm₂)</td>
<td>0.78</td>
</tr>
<tr>
<td>Percentage of R&amp;D spent on green products (pdm₁)</td>
<td>0.72</td>
</tr>
<tr>
<td>Significance of recycling process (pdm₄)</td>
<td>0.69</td>
</tr>
<tr>
<td><strong>Performance based reward system</strong> (Eigenvalue 1.147; percent of variance 19.78)</td>
<td>...</td>
</tr>
<tr>
<td>Green KPIs Included (rs₁)</td>
<td>0.69</td>
</tr>
<tr>
<td>Inclusion of Green management criterion on reward package (rs₂)</td>
<td>0.75</td>
</tr>
<tr>
<td><strong>Positive attitude on green intrapreneurship</strong> (Eigenvalue 1.168; percent of variance 20.07)</td>
<td>0.69</td>
</tr>
<tr>
<td>Tolerance Level on Green product failure (pa₁)</td>
<td>0.70</td>
</tr>
<tr>
<td>Perception on the green intrapreneurship (pa₂)</td>
<td>0.72</td>
</tr>
<tr>
<td>Level of trust placed on intrapreneurs in achieving sustainable goals (pa₃)</td>
<td>0.73</td>
</tr>
<tr>
<td><strong>Allocation of power &amp; resources to intrapreneurs</strong> (Eigenvalue 1.103; percent of variance 17.54)</td>
<td>0.63</td>
</tr>
<tr>
<td>Level of decision making power of intrapreneurs (ra₁)</td>
<td>0.67</td>
</tr>
<tr>
<td>Ability to involve in strategic decision making (ra₂)</td>
<td>0.72</td>
</tr>
<tr>
<td>Easiness/Ability to fund self-driven green project (ra₃)</td>
<td>0.70</td>
</tr>
</tbody>
</table>

According to the table all the factor loadings are in the acceptable rang and the variance percentage is also significant in value. Bellow table would show the composite reliability and the factor loading validly of the selected factors.

Table 04: Results of composite reliability, AVE, and factor loading.

<table>
<thead>
<tr>
<th>Items</th>
<th>Factor loading</th>
<th>Composite reliability</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green Culture</td>
<td></td>
<td>0.95</td>
<td>0.64</td>
</tr>
<tr>
<td>gc₁</td>
<td>0.71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>gc₂</td>
<td>0.62</td>
<td></td>
<td></td>
</tr>
<tr>
<td>gc₃</td>
<td>0.72</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Green product life cycle management</td>
<td>0.84</td>
<td>0.62</td>
<td></td>
</tr>
</tbody>
</table>
Average Variance Extracted value (AVE) is more than 0.5 in all the factors. Therefore it can be concluded that the convergent validity of the construct is valid. Further the implied Chi Square value is 223.456 and the normed fit index is reported 0.972 and the Comparative Fit Index of 0.983 is also supporting the fitness of the model. Further the report also indicate the RMSEA value of 0.042 which is lower than the 0.05 margin. Overall it can be concluded that the model fit is acceptable in this module.

Discussion

Also the category of “intrapreneurs” were carefully identified with the questioning of top management. They were chosen based on the decision making capacity and authority. And the questionnaire type of Intrapreneurs are different from Senior managers, which targets more on identifying the attitude of those intrapreneurs of the green marketing activities they are involved in and to identify the motivational level of the organization. The questions were focused on identifying the company’s effort on maintaining the green product life cycle (Wang & Gupta, 2011). And the sustainability embedded diagnostic model will also be tested through questions to identify the green leniency of the organization (Saeed, B.B. & Wang, W. 2014). Although the top managers were not expected to know the complex in depth understanding on those modules, it was expected that they use the essence of those concepts if the systems are embedded with proper green entrepreneurial activities. All the respondents have given the feedback. While most of the respondents were males there was few female respondents in the pool of sample. Study was not focused on scattering the sample test on the demographic or geographic basis as the intrapreneurship concept was best forged and maintained under the proper autocratic organizational structure, where most of the startups hesitate to allocate the authority to such practices (Burgelman, 1983). In analyzing the content of the results more qualitative descriptions were made by public limited companies managers. Most of the research work is concentrated in the Colombo region due to the availability of abundant of business cases with diverse business interactions and complexed business environment. Also in-terms of adopting the new business concepts as a region, Colombo region remains in the top destination. However, overall enthusiasm on responding on the topic was desirable. The reason for that was frequently explained as the inherent curiosity of the workers in the mind, special among top management. Chief operating officer in a phone importing business says “It’s good to know new ways of doing business, plus it is interesting how this concept works out”, “Another respondent said “ the subject area looks interesting, but how practical it is would be the question to post”. Hence, it can be observed that the interest on the topic is created mainly through potential future benefit on the management capability of the business. In another analysis it was found that the awareness level of the
concepts like green intrapreneurship, green supply chain management was varying according to the typology of the business organization. Following chart will explain the scenario.

Figure 01. Awareness level of “Green Intrapreneurship” concept.

Source: Research Survey data

According to this data set it is identifiable that big privet companies had the highest understanding on the subject matter as they are more competent and up-to-date on the business eco system. Noticeably, their continuous professional development have direct impact on this. As when researcher questioned about source of their knowledge most of them replied “we got covered that in the management seminar/workshop” Mostly in this workshops industrial and academic experts would conduct the sessions. Hence the importance of the human resource development and continuous professional development is a prior condition to implement green intrapreneurship practices. Further the study shown that the privet company’s top management has higher awareness on the concept. More than 34% of intrapreneurs in public sector was with high awareness about the Green Intrapreneurship. Were rest of the 64% of the Intrapreneurs either has less understanding or never heard of the concept before. This low knowledge on the concept is related to their pattern of participation on “strategic management training” by the employees. While Senior managers’ are proactively participating on strategic management workshops. Another telling factor is that nature of official conduct in the business typology. In the number of meeting events held at cooperate level most of the Intrapreneurs were requested to suggest improvements to the ongoing process , hence as a result of self-studying for this task some Intrapreneurs got to know the concept of green intrapreneurship practices. One Intrapreneurs said
“I didn’t know this concept but I got to know it while searching data to be presented in the meetings as new implementations”

However, it can be concluded that awareness is related to the nature of off the job training the company is delivering and their relatedness to the strategic management terminologies. Also the formalities of management structure.

**Green enabled Culture**

Green enabled culture is “A platform where Eco friendly goals and strategies are valued, shared, promoted and integrated to the usual business activities” (Krug, 2016). Following facts are presented in the research.

![Figure 06: Green enabled culture](source_image)

**Source:** Research Data

As depicted in this diagram more than 30% of the private sector large organizations were evident with strong cooperate green culture. One international bank senior manager implied

“*We have KPI set to initiate green project, be it paper saving, energy/electricity/light saving or environmental friendly CSR project and if we accomplish those there is a higher chance for promotions and ECT…*”

Another cooperate head in the industry of electrics and electronic appliances claims

“*Our director board always welcome ecofriendly products, although most of our products contains Bio plastic components and with less energy wastage, we see this as the future trend in the world*”

In both the cases green intrapreneurs were empowered to find out green projects as their top management attitude and support is high for such projects which laid a foundation to build a common value set among the employees of the corresponding entity.
**Cooperate Sustainable Goals**

Most of the companies who do not witness all enabled green culture do not include sustainable goals in their missions. One ICT company’s mission statement reads as

“Coupling up services to easy access and fasten up the life with simple remedies of ICT products for both business and client”

The trend remains to be a constant in many export oriented businesses. And another business in the tea export industry claims that their mission is to

“Meeting the foreign client requirements through efficient management and maintaining quality product delivery”

Looking at these missions, both of them are targeted at improvement of market share and increasing the productivity of the business. None of those missions were directed at sustainable goals. This can be seen as the drawback in these type of businesses and main reason for not having the green enabled policies. Due to lack of interest on sustainable goals most of these companies are distant from green goals or green intrapreneurs’ practices. Their main intention seems to be rotating around short term profit and long term survival. One manager in a fabric manufacturing factory went on to say that

“My company wants me to think new but it should always be highly cost effective, rather than innovative. In the sense they want me to innovate cost cutting”

This is a clear indication of goal overlapping and confronting, many companies sustainable goals are highly motivated by short term objectives. However companies with stated strategic goals has higher improvement in forming go green concepts, hence empowering the intrapreneurs to achieve sustainable goals. Following graph will prof that facts. According to the sustainable goals higher the opportunities to include the green intrapreneur’s concepts inside the organizations. Most of the banks, leading textile giants and the telecommunication service providers have enabled the green intraprenual activities. Manager of One of the electrical appliance company mentioned that

“I recommended LED bulbs 1 ½ years ago despite the less reputation and high price at the time, and I took initiations to import/part assemble those products it took couple of months to pick up but at the moment it is our star product”

Another banking institution supervisor claimed that

“Our EMS (Environmental Management system) is the best in the country and we received the excellence awarded in the environmental footprint Management. Our Company always try to reduce carbon footprint by reducing paper usage electricity usage and less fuel usage. For this they are accept our ideas projects and allow us to implement those in our related fields. It’s a huge benefit to the company, which will contribute to the positive PR, cost reduction and ultimately reduction of total cost long run”.

The same trend can be seen by the response of a manager of leading ICT service provider in Sri Lanka. The study highlight the underling notion that most of the public limited companies are not ready for the concept of Green Intraprenuership. However most of the companies has shown positive symptoms
Conclusion

Table 05: Structural Equation Modelling Results

<table>
<thead>
<tr>
<th>Paths</th>
<th>Estimate</th>
<th>p-Value</th>
<th>Hypotheses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green culture → cooperate sustainability</td>
<td>0.764</td>
<td>0.004</td>
<td>H1: supported</td>
</tr>
<tr>
<td>green product life cycle management →</td>
<td>0.614</td>
<td>0.022</td>
<td>H2: supported</td>
</tr>
<tr>
<td>cooperate sustainability</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance based pay on green intrapreneurs → cooperate sustainability</td>
<td>0.756</td>
<td>0.001</td>
<td>H3: supported</td>
</tr>
<tr>
<td>Positive attitude on green intrapreneurship → cooperate sustainability</td>
<td>0.421</td>
<td>0.004</td>
<td>H4: supported</td>
</tr>
<tr>
<td>power &amp; resources allocation to intrapreneurs → cooperate sustainability</td>
<td>0.542</td>
<td>0.008</td>
<td>H5: supported</td>
</tr>
</tbody>
</table>

Source: Research Data

The hypothesis test is positive on this occasion with good significance values all the relationship identified in the study has properly mapped with hypothesis and hypothesizes are proven comprehensively. The structural equation model results are as follows.

Above Figures would proves the model 01 and Model 02 in the structural equation model. While the model 01 includes factors that focuses on operations management. According to this analysis it is evidential that the “Green sustainability Trigger model” a feasible model with statistical significance. Hence it can be argued that green intrapreneurship has a direct impact on the corporate sustainability in Sri Lanka.
References


Impact of Brand value on Consumer Buying decision, empirical evidence from life insurance in Sri Lanka

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Abstract

Present research was designed to analyze those factors that are impact of brand value on consumer buying decision in life insurance in Sri Lanka in which consumer buying decision is determined through brand value. Empirical data was obtained from selected insurance companies in Sri Lanka. A sample of life insurance consumers were chosen from the selected insurance companies so as to observe their views, enabling researcher to test research hypotheses that had been formulated upon the theoretical exposure, which gained throughout the research theoretical review of which a considerable time was used to revealed that consumer buying decision, the extent to which goal achieving task through a consented effort by Managers and non Managers has been largely encountered. Attempt was made to measure the degree of influence of possible factors in connection with the operational dimensions while attempting to assess the significance of those factors that are influenced towards the consumer buying decision in the insurance companies in Sri Lanka.

Keywords: brand value, motional value, functional value, consumer buying decision

Introduction

Consumers play an important role as they must communicate or express their dissatisfaction or complaints before remedies can be taken (Donoghue & de Klerk 2009). Consumer behavior has become a popular research area among academics in marketing and organizational behavior. Most of the previous researchers have paid considerable attention on consumer behavior. Services activities, the major contributor to the economy grew by 5.3 per cent in gross value added terms in 2015 compared to 5.2 per cent growth in 2014, accounting for 56.6 per cent of the GDP. This growth was largely buoyed by the robust growth in financial service activities, supported by the transportation of goods and passengers including warehousing, real estate activities including ownership of dwellings, and wholesale and retail trade activities. Further, the expansion in public administration services, other personal service activities, insurance, human health activities, telecommunication and IT programming services positively contributed to this growth. However, professional services, education, accommodation, food and beverage services, and postal and courier activities contracted in 2015 compared to 2014, decelerating the overall growth in Services (Central Bank of Sri Lanka, 2015). Insurance sector maintained its growth momentum without major prudential concerns and recorded a relative share of 3.3 per cent in terms of total assets of the financial sector at end 2015. There were 28 insurance companies operating in Sri Lanka, which are registered with Insurance Board of Sri Lanka (IBSL). The level of expansion of the insurance sector in the country in 2015 was relatively slow as reflected in marginal improvement in penetration and density. Insurance penetration, i.e. total premium as a percentage of GDP, continued to be low at 1.0 per cent at the end of 2015. The penetrations for long-term and general insurance were 0.5 per cent and 0.6 per cent respectively by end 2015 in comparison to 0.4 per cent and 0.5 per cent by end of 2014. The low insurance penetration can be attributed to the lack of awareness of the general public on insurance and its benefits, and inefficiencies in policy management (Central Bank of Sri Lanka, 2015).

Insurance sector in Sri Lankan is one of the significant contexts that demands empirical studies in par with the postulations proposed by Gunawardena, Munasinghe & Disanayaka (2016), Dissanayake & Ismail (2015), Dissanayake (2015). Moreover, the concepts of brand equity, different market based applications, namely celebrity endorsements, brand activations and corporate social responsibility practices into brand relation behaviors such as customer brand relationship behavior, brand personality and brand evangelism and purchase intention have also been found as significant areas to be further
studied as highlights and apart from the insurance segment, financial services sector, telecommunication sector and tourism management sector of Sri Lanka have been highlighted as significant contexts in the economy in the following review. (Dissanayake, 2015; Hennayake, 2016; Wanninayake & Dissanayake, 2007). The Insurer does not say that Death is insured and they will cover to prevent a death. What they say is that they will pay something if and when Death occurs. In order to ensure effectiveness it requires participations, collaborations and co-ordinations from all including the consumer.

**Literature Review**

The experience of searching, buying and consuming brands through the exposition to specific brand-related stimuli may also provide value and pleasure outcomes (Brakus *et al.*, 2009). Moreover, functional value has been described as task-related, rational, and associated with more information gathering (Babin *et al.*, 1994). Sri Lankan service sector uses celebrity endorsement intensively compared to other product categories, especially in financial service, telecommunication and insurance services to build brand relationship behaviors (Dissanayake, 2015). Meanwhile, it has revealed that the dimensions mentioned for services as employees, facilities, experiences, and word-of-mouth which relate to the dimensions of perceived quality & brand loyalty (Aaker, 1991). The above-mentioned factors reveal that the service brand equity dimensions are not solely depending on the service attributes, but other related attributes to the service. Service quality is central to the development of strong service brands because it enhances perceived superiority of the brands and helps to differentiate brands in the markets. Gunawardane N, Munasinghe A, Dissanayake D. M. R.(2016), Many studies have revealed that the brand awareness is playing a vital role when it comes to the consumer’s choice of the brand or the purchased decision.

In this sense, numerous academic studies of consumer research (Chitturi *et al.*, 2008; Dhar and Klaus, 2000) and advertising (Okazaki *et al.*, 2010) have provided empirical evidences that utilitarian/functional and hedonic/experiential benefits and appeals differ in their impact on consumers’ attitude, preferences and purchase intentions. Drawing on these empirical evidences, we are of the opinion that there exist dissimilar effects between experiential and functional elements on consumers’ reactions toward a brand such as brand equity, consumer-brand identification and word-of-mouth. Purchase decision is a part of consumer decision making process. It is important to note that there are two prior stages which are information search and evaluation of alternatives that consumer act consecutively to reach the stage of purchase decision and brands affect consumer in those stages.

**Conceptual Framework**

The conceptual framework developed from previous theories of brand value which are affecting decision making process -- is presented in diagram.
Research Methodology

The aim of this research is to identify the influences of brand value determinants and its effect on consumers’ purchase decision. The research approach used was a “deductive approach”. The study is based on both secondary and primary data. The secondary data were collected from reputed journals and textbooks and research articles referring to consumer behavior. The primary data were collected through a survey research to investigate the responses from the selected sample. The survey was conducted through a structured self-administrated questionnaire presented to the selected sample. A reliability analysis (Cronbach’s Alpha) was used to test the reliability of the considered three dimensions of brand value. The reliability analysis revealed that the alpha coefficient of the three dimensions as 0.71 for emotional Brand value, 0.723 for functional Brand value and 0.733 for customer taste and it exceeded the minimum coefficient suggested by Nunnally (1967). It has used the simple random sampling and the sample size was 200 life insurance customers and the attributes of the sampled respondents.

Table 1. Operationalization of considering variables

<table>
<thead>
<tr>
<th>Concept</th>
<th>Variable</th>
<th>Item/Indicators</th>
<th>Measure</th>
<th>Q: No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brand Value</td>
<td>Emotional value</td>
<td>Optimistic feel&lt;br&gt;Want to feel like Myself&lt;br&gt;Want to feel free Curious for knowledge Want to be in control</td>
<td>Five point likert scale</td>
<td>01 to 06</td>
</tr>
<tr>
<td></td>
<td>Functional value</td>
<td>Product feature&lt;br&gt;Product attribute Easy to deliver Office environment</td>
<td>Five point likert scale</td>
<td>07 to 10</td>
</tr>
<tr>
<td></td>
<td>Consumer trait</td>
<td>Innovativeness&lt;br&gt;Personality&lt;br&gt;Ethnocentrism&lt;br&gt;Susceptibility&lt;br&gt;Materialism</td>
<td>Five point likert scale</td>
<td>11 to 15</td>
</tr>
<tr>
<td>Degree of impact on Buying decision</td>
<td>Degree of impact on Buying decision</td>
<td>Need recognition&lt;br&gt;Information search Evaluation of alternatives Purchase decision Post purchase decision</td>
<td>Five point likert scale</td>
<td>16 to 20</td>
</tr>
</tbody>
</table>

Result

One questionnaire was used to collect data as the research instrument to collect data as it is the best and powerful tool for acquiring data. Twenty indicators were chosen. Lickert scale was used to convert the views of respondent into numeric (Data). Accordingly means, medium, mode, standard deviation and variance were used to find the variability of each factor.
Table 2. Emotional value

<table>
<thead>
<tr>
<th>item</th>
<th>mean</th>
<th>Medium</th>
<th>Mode</th>
<th>Standard Deviation</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optimistic feel</td>
<td>2.66</td>
<td>2</td>
<td>2</td>
<td>0.9</td>
<td>0.81</td>
</tr>
<tr>
<td>Want to feel like</td>
<td>3.66</td>
<td>4</td>
<td>4</td>
<td>0.911</td>
<td>0.83</td>
</tr>
<tr>
<td>Myself</td>
<td>3.01</td>
<td>3</td>
<td>3</td>
<td>0.977</td>
<td>0.955</td>
</tr>
<tr>
<td>Want to feel free</td>
<td>3.41</td>
<td>4</td>
<td>4</td>
<td>0.977</td>
<td>0.946</td>
</tr>
<tr>
<td>Curious for knowledge</td>
<td>2.79</td>
<td>3</td>
<td>2</td>
<td>1.105</td>
<td>1.222</td>
</tr>
<tr>
<td>Want to be in control</td>
<td>3.02</td>
<td>3</td>
<td>4</td>
<td>1.07</td>
<td>1.145</td>
</tr>
</tbody>
</table>

16% of the sample was strongly agreed with the statement and the mean value was 3.45. Based on the findings, researchers conclude that Emotional value has also had a considerable impact on purchase decision.

Table 3 Functional value

<table>
<thead>
<tr>
<th>item</th>
<th>mean</th>
<th>Medium</th>
<th>Mode</th>
<th>Standard Deviation</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product feature</td>
<td>3.55</td>
<td>4</td>
<td>4</td>
<td>1.006</td>
<td>1.013</td>
</tr>
<tr>
<td>Product attribute</td>
<td>3.31</td>
<td>3</td>
<td>4</td>
<td>1.008</td>
<td>1.017</td>
</tr>
<tr>
<td>Easy to deliver</td>
<td>3.64</td>
<td>4</td>
<td>4</td>
<td>0.977</td>
<td>0.955</td>
</tr>
<tr>
<td>Office environment</td>
<td>3.63</td>
<td>4</td>
<td>4</td>
<td>0.969</td>
<td>0.939</td>
</tr>
</tbody>
</table>

17% of the sample was strongly agreed with the statement and the mean value was 3.71. It clearly showed that brand awareness has a higher impact on Functional value for purchase decision.

Table 3 Consumer trait

<table>
<thead>
<tr>
<th>item</th>
<th>mean</th>
<th>Medium</th>
<th>Mode</th>
<th>Standard Deviation</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovativeness</td>
<td>3.32</td>
<td>4</td>
<td>4</td>
<td>1.123</td>
<td>1.123</td>
</tr>
<tr>
<td>Personality</td>
<td>3.54</td>
<td>3</td>
<td>4</td>
<td>0.923</td>
<td>0.853</td>
</tr>
<tr>
<td>Ethnocentrism</td>
<td>3.69</td>
<td>4</td>
<td>4</td>
<td>0.86</td>
<td>0.86</td>
</tr>
<tr>
<td>Susceptibility</td>
<td>3.76</td>
<td>4</td>
<td>4</td>
<td>1.04</td>
<td>1.04</td>
</tr>
<tr>
<td>Materialism</td>
<td>3.41</td>
<td>4</td>
<td>4</td>
<td>0.977</td>
<td>0.946</td>
</tr>
</tbody>
</table>

It shows that 32% of the sample was strongly agreed with the statement and the mean value was 3.54. The researchers were able to conclude that consumer trait has also had a considerable impact on purchase decision.

Testing Hypotheses

Hypotheses testing were carried out in order to identify whether there is a significant relationship between elements of brand and consumer buying decision. According to the correlation analysis, it was
revealed that there is a significant relationship between each selected element of brand value, consumer traits and consumer buying decision. Each relationship was significant and the strength of the relationships was above 0.5 which showed that there is a strong relationship between the independent and the dependent variable.

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Correlation Analysis</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>There is a significant relationship between emotional value and consumer</td>
<td>Coefficient correlation = 0.918</td>
<td>Accepted – H1</td>
</tr>
<tr>
<td>buying decision.</td>
<td>Significance of p = 0.000</td>
<td></td>
</tr>
<tr>
<td>There is a significant relationship between functional value and consumer</td>
<td>Coefficient correlation = 0.900</td>
<td>Accepted – H2</td>
</tr>
<tr>
<td>buying decision.</td>
<td>Significance of p = 0.000</td>
<td></td>
</tr>
<tr>
<td>There is a significant relationship between brand association and young</td>
<td>Coefficient correlation = 0.907</td>
<td>Accepted – H3</td>
</tr>
<tr>
<td>female consumers” purchase decision of foreign makeup products.</td>
<td>Significance of p = 0.000</td>
<td></td>
</tr>
</tbody>
</table>

Conclusions

The research has important implications on theory and practitioners. The framework provides new insights into the understanding of the impact of brand value on consumer buying decision. In a practical context, brand marketer can use the findings of this study to see their strengths and weaknesses in their use of brand value and can improve their performance accordingly. From all of the findings of this study, the brand marketers can identify that emotional brand value, functional brand value; consumer traits have an impact on consumer buying decision. So based on that knowledge, The companies can better plan for their branding activities in the future.

we do propose to extend the future studies on different market based applications, namely celebrity endorsements, brand activations and corporate social responsibility practices into brand relation behaviors such as customer brand relationship behavior, brand personality and brand evangelism which elaborate comprehensive directions to examine behavioral responses for the referred brands.

References


Impact of Online Visual Merchandising in Clothing Purchasing Behavior among Sri Lankan Consumers

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Department of Textile & Clothing Technology University of Moratuwa, Sri Lanka

Abstract:

The Internet has developed into a new clothing distribution channel and the online visual merchandising (OVM) becomes one of the key aspects of increasing sales in the fashion retail industry. The online visual merchandising is a sensory tool to stimulate the potential customers to make a purchase in an online platform. This research is to explore the effect of online visual merchandising on Sri Lankan consumers' clothing purchasing behavior and to identify the importance of various online visual merchandising attributes to attract the consumers. In this study, the Stimulus–Organism–Response (S-O-R) model has been used to evaluate the interaction between the online visual merchandising attributes and the consumer purchasing decisions. Data was collected through questionnaires from different consumers within the Western Province of Sri Lanka. A total of 80 eligible data from 100 responses were continued for data analysis. Result of the study revealed that the online visual merchandising attributes, such as: Product type, Product detail description, Actual Product colours, Zoom feature, 3D view, Model image, Visual appeal, Search function, Background colour, Typography, Product layout, discount banners and sales promotions have a significant effect to stimulate the Sri Lankan consumers to make purchasing decisions.

INTRODUCTION

Within just few years, Internet has become one of the important channels for sales and virtual customer service unit in the fashion apparel sector. According to the source “Internet Live Stats” there were 4,267,507 internet users in Sri Lanka in the year of 2014 and the Internet user rate grow in 9% per year. With the growing usage of Internet in Sri Lanka, apparel websites have become one of the key sources to increase apparel sales. But in Sri Lanka only few retailors maintain proper apparel websites to attract the customers to make a purchase. Online visual merchandising is an essential sensory tool to attract customers in this scenario. In this research 3 main categories of online visual merchandising attributes were taken into consideration to understand how they affect consumer purchasing decisions. The purpose of this study is to explore the effect of Online Visual Merchandising in clothing purchasing behavior among Sri Lankan consumers and identify the importance of various online visual merchandising attributes and in order to provide guidance and insight for Sri Lankan retailers, online visual merchandisers and researchers.

Visual Merchandising in Apparel Stores

Visual merchandising is defined as, the store presentation to attract the possible customers to make purchases (Diamond & Diamond, 2007). Lea-Greenwood (1998) highlighted the visual Merchandising as an instrument in marketing to attract consumers to enter stores. Thus, the general purpose of in-store VMD is to communicate store and merchandise information to the customer (Diamond and Diamond, 2007). Visual merchandising includes the whole store environment such as merchandise presentation, store design and image, mannequins, props and materials, lighting, graphics, and signage. So, VMD is considered with both the visual and the marketing functions of the store environment and it improves the store image and increase sales ((Diamond & Diamond, 2007). Kerfoot, Davis & Ward (2003) have investigated the effects of VMD stimuli on brand recognition, browsing, purchase intentions, and liking for displays in women’s apparel stores. Aspects of VMD that influenced perceptions were identified, including environmental or atmospheric characteristics (e.g., merchandise color, materials and lighting), manner of merchandise presentation, and path finding or having a clear path to navigate in the store. Results showed that coordinated merchandise color was more pleasant and led to more
purchasing than uncoordinated merchandise color. In addition, presentations that helped shoppers visualize outfits (hanging presentation) or that gave shoppers an idea of how the outfit would look when worn (mannequin presentation) were positively perceived and tended to stimulate multiple purchases and browsing (Kerfoot, Davis & Ward, 2003).

**Online Visual Merchandising in Online Apparel Stores**

E-commerce is a big business and it's getting bigger every day. Growth estimates from E- Marketer report emphasize that business-to-consumer (B2C) e-commerce sales worldwide will reach $1.5 trillion in 2014, increasing nearly 20% over 2013 (Nielsen Global Survey of E-commerce, Q1 2014). For apparel related websites, the significance of the layout and design of the websites has been emphasized by Allen (2000). Allen (2000) indicated that if Internet retailers offer more information through the visual display of apparel products using a variety of images, then consumers will purchase more apparel products in the Internet. Visual aspects of product presentation such as images of the online product in its closest representation of end use, displayed in conjunction with similar items, and from various angles such as front, back, and side view can generate higher purchase intentions for consumers and in turn, increase higher selling for e-business.

**Visual Merchandising in Apparel Stores**

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**S-O-R model in Online Visual Merchandising**

In 1974, Mehrabian & Russel have proposed the S-O-R model as an approach to the Environmental philosophy. Mehrabian & Russel (1974) considered the sense related variables and information rate as the stimulus in the environment and the pleasure, arousal and dominance as the primary emotional responses. At the end, the final result will be an approach or avoidance behavioral response. (See FIGURE 1).
This study explores online visual merchandising attributes and their effects on Sri Lankan consumers purchasing behaviors, according to the Stimulus-Organism-Response (S-O-R) model. S-O-R model is a very popular and commonly used model to investigate on consumer behaviors in the past researches. The online visual merchandising attributes were chosen in to 3 main categories with reference to past studies as product presentation, visual design and web advertising. (See FIGURE 2).

According S-O-R model, the stimulus is the independent variable which includes all the online visual merchandising attributes. Three (3) affective variables such as pleasure, satisfaction and cognition are included in the organism. There are three 3 main dependent variables in the response factor regarding the Sri Lankan consumer behavior in an online environment namely purchasing intension, stay longer browsing and intention to visit the store. (See TABLE 1).
### METHODOLOGY

The observation was based on 6 major OVM attributes, evaluating 10 leading Sri Lankan apparel websites and 10 international apparel websites. The purpose is to understand the OVM attributes used in Sri Lankan apparel websites and differentiation of international apparel websites. 30 minutes discussions were conducted with 20 randomly picked consumers, prior to the questionnaire development process. These consumers were asked about their comments, opinions and suggestions about the Sri Lankan apparel websites, online retailing environment and their related purchasing behavior. According to their comments, 18 from 20 consumers are prefer to go In-store shopping than online purchasing after browsing the apparel website.

The questionnaire was designed to measure three main factors related to consumers purchasing decisions Stimulus, orgasm and response. This theoretical frame work was adapted to this research from the S-O-R mode (Mehrabian & Russel, 1974) Questionnaire was given to the 100 randomly picked Sri Lanka consumers in western province by using two distribution methods. First 50 questionnaires were given individually by hand and other 50 questionnaires were sent online via Facebook. Researches published, Apparel websites, Books related to consumer purchasing behaviors were also used to collect the secondary data related to the research.

<table>
<thead>
<tr>
<th>Independent variable (Stimulus)</th>
<th>Affective (Emotional) variable (Organism)</th>
<th>Dependent variable (Response)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product presentation</strong></td>
<td>Pleasure</td>
<td>Purchasing intention</td>
</tr>
<tr>
<td>Product type</td>
<td>Satisfaction</td>
<td>Stay longer browsing</td>
</tr>
<tr>
<td>Product detail description</td>
<td>Cognition</td>
<td>Intent to visit the store</td>
</tr>
<tr>
<td>Actual Product colours</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zoom feature</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3D view</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model image</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Visual design</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visual appeal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Search function</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Background colour</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Typography</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Product layout</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Web advertising</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discount banners and promotional text</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TABLE 1S-O-R model according to this study**
RESULTS

Description of Sample: Overall 84 responses were used to collect data in this research.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Frequency n = 84</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>63</td>
<td>75%</td>
</tr>
<tr>
<td>Male</td>
<td>21</td>
<td>25%</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-25</td>
<td>36</td>
<td>42.87%</td>
</tr>
<tr>
<td>25-35</td>
<td>42</td>
<td>50%</td>
</tr>
<tr>
<td>35-45</td>
<td>5</td>
<td>5.95%</td>
</tr>
<tr>
<td>45-55</td>
<td>1</td>
<td>1.19%</td>
</tr>
<tr>
<td>55 above</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full time employee</td>
<td>50</td>
<td>59.52%</td>
</tr>
<tr>
<td>Full time student</td>
<td>29</td>
<td>34.52%</td>
</tr>
<tr>
<td>Part time employee</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Part time student</td>
<td>2</td>
<td>2.38%</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>3.57%</td>
</tr>
</tbody>
</table>

TABLE 2 Sample characteristics

From all the respondents 75% of participants were female and 25% were male consumers. The majority of 93% of participants were aged between 15 to 35 years of age. Almost 60% of respondents were indicated that, they were full time employees, while 34% were full time students. From 84 research participants, majority of 90% participants have been visited fashion retailers apparel websites in past 6 months.

Analysis of Independent Variables

Product Presentation

According to the result, over 80% of the respondents were interested about each product presentation independent variable.

Visual Design
Over 80% of respondents were interested about the visual design independent factor and the web advertising factor.

**Analysis of Affective Variables**

The result shows that, 60% of the sample was enjoying spending time in apparel websites and around 40% is using the apparel website to get the knowledge about the latest collection in the store, because it saves their time when they do store shopping. In this situation, the consumer take their purchasing decision while browsing online.

**Analysis of Dependent Variables**

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FIGURE 4  Visual design.

FIGURE 5  Affective variables

FIGURE 6  Dependent variables
According to result, over 70% respondents were intent to stay longer browsing, if they like the visual design. This will happen when the consumers be pleasure and satisfied about the website visual design. Even 60% respondents are in pleasure and satisfied, only 26% was persuaded to go store shopping. This may happen due to consumer’s busy life style and the distance for them to the store. According to all the result, all the selected online visual merchandising attributes helps to make a positive purchasing decision to the consumer.

CONCLUSION

The purpose of this study is to explore the effect of Online Visual Merchandising in clothing purchasing behavior among Sri Lankan consumers. The research identified some online visual merchandising (OVM) attributes which are attracting the customers to make purchases. A complete list of OVM attributes were chosen based on the previous literature. Accordingly, 12 OVM attributes were identified in the list, including Product type, Product detail description, Actual Product colours, Zoom feature, 3D view, Model image, Visual appeal, Search function, Background colour, Typography, Product layout, discount banners and sales promotions. These attributes were further categorized in to 3 main categories such as, product presentation, visual design and web advertising. The Stimulus- Organism- Response (S-O-R) model was used to understand the relationships between the OVM attributes and the consumer purchasing behaviors. The findings shows that, all the chosen OVM attributes have a significant effect to stimuli the consumers. Furthermore, the OVM attributes have a significant effect to consumer pleasure and satisfaction. It shows that the Sri Lankan consumers enjoying the apparel websites. But cognition is not a significant factor to stimuli the Sri Lankan consumer. According to the findings of the research Sri Lankan consumers prefer store shopping than purchasing apparel online due to various reasons such as, Perfect fit-on, quality, Size dimension and emotional fulfillment. The result shows the consumers prefer browsing if they like the website design and persuade to purchase after browsing. In this situation online visual merchandising is highly essential to attract and persuade the customers to make purchases.

LIMITATIONS AND RECOMMENDATIONS

This research was conducted by a small sample of 84 consumers in western province. So, there is an opportunity to conduct this research broadly within Sri Lanka. Also in this research almost 90% of the sample is within 15 to 35 of age. So it limits the generalization of the research findings. It would be better if the selected sample will be in a wide diversity among the real environment. For this research, the online visual merchandising attributes were chosen by referring to the past researches. So, consumers only focusing to those attributes directly. It make lack of the real result of the research. If the same research can test by using a different framework for different sample in a different context to confirm the results, it would be more valuable.

REFERENCES


Indian Family Life: A Reservoir of Culture and Tradition

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Abstract
Family is divine building block of a society. It safeguards and binds relationships. It fastens human beings intimately and emotionally. Novel being a part of Literature reflects society as a mirror in a very lively manner. R.K.Narayan’s character and situations are rooted with this sort. Narayan’s novel The English Teacher is a delicate and redolent with the fragrance of love, the pulse of a family. Krishnan the hero in this novel is a married young man and also a father of Leela, a little girl. To him, love is not a physical appetite or obsessive passion. It possess serenity, beauty and tenderness of wedded which stands platonic. India is a land of tradition and culture where familial love is considered pure and eternal. R.K.Narayan makes the readers visualise this veritable human relationship of the land. The English Teacher talks about a love story. The life of Krishna and Sushila is happy and contend. The clearly cast back the value and cultured domestic life in Indian families through the day to day situations of Krishna and Sushila. The theme of familial love is thoroughly forecasted in the entire novel. Without communication there is no relationship fulfilled. Here the bond between Krishna and Sushila is beyond, even after the death of his beloved wife the communication continued. This feature is the intrinsic power of Indian family which is the foremost treasure of the land.

Keywords: Familial relationship, Indian family, Love

India is a land of tradition and culture. Family system is the pulse of Indian society. It safeguards the values and binds relationships. It is such a bond that fastens human relationships emotionally and intellectually.

The family is a divine building block of a society. The Indian family has been a dominant institution in the life of individual and in the life of a community. Novels reflect society as a mirror which presents scenes in a very lively manner. The family relationships constitute the major theme in Narayan’s fictions. It is considered as an immediate context and the novels are notable for the delineation and precision of the family relation.

The beauty about the Indian culture lies in its age-long prevailing tradition of the family system. In Narayan, the characters and situation are rooted in the geography and history of India especially South India.

Apart from western culture and tradition, India possesses varied customs and rituals. Here marriage itself is a wonderful ritual which is followed according to the traditions of the particular region. Narayan who is from a south Indian middle class Brahmin family gives out with all flavor the portrayal of the land, culture, tradition and importance of familial bond.

This paper explores how the fiction of R.K. Narayan helps in understanding the nuances of Indian Culture and tradition and its conflicts with some examples from his work The English Teacher. Narayan’s literary creations are colourful fabrics woven with the intricate threads of Indian culture such as traditions, customs, religious beliefs, faiths, social hierarchies, family system, bitter & sweet melodies of love and marriage.

R. K. Narayan’s central characters in his novels shows everything that occurs in the development of human relationships. His heroes are aware of the social and political changes, but they do not take sides not do they commit themselves to any ideology. Narayan has created all sorts of the human relationships in which he depicts the pure and incredible Indian culture and tradition. It is
important to note that Narayan is a conservative Indian both in thought and spirit in the presentation of human relationship.

The relationship between the husband and wife is carried through Narayan’s world of values in his novel *The English Teacher* also The novel *The English Teacher* narrates about a simple, stylish ordinary living man Krishnan who lives with small dreams and limited expectations. It pictures how much he loves his family and cares it. This is one of the poignant feature of Indians. This story revolves around a very soft spoken, kind hearted and sensitive lead character, typical orthodox village lady, one eccentric character in atypical village environment. The protagonist narrates his story (Krishnan) about his different phases of life. All the charters are very natural and we can feel them. We have used this world believe because this story is all about belief and faith. How a person starts believing the supernatural things and slowly gets involved into it. It is not only the supernatural factor it is the eternal and pure love of a husband towards his love wife. This sort of eternal love is seen in the nook and corner of Indian cities and villages.

*The English Teacher* achieves the point of sublimity which considered one of the major quality in Indian family system. The proper understanding of each-other, self-respect for each-other, and the frank communication between them are the marked features of the relationship between Krishna and Susila in *The English Teacher*. In *The English Teacher* R. K. Narayan has beautifully projected the role of love and death as predestined agents in the structure of a successful husband-wive relationship. In the relationship between Krishna and Susila, love and romance are successfully resolved and future of the relationship depends upon fate and chance. Through Krishna’s acceptance of Susila’s death in a natural manner lies the sublimity of the relationship between the couples. Krishna accepts the reality of human existence in the form of death. Though Krishna accepts the death of his wife but he is unable to retrieve from the memories. Here Narayan beautifully expresses the life after death and the longings and pain of Krishna.

The portrayal of Krishna – Susila relationship is vivid and fascinating. They make themselves a unique pair because there is no question of individuality, pride and ego in their relationship. The strength of their relationship lies in their sublime nature which inspires them to face one of the bitterest realities of human existence. It is because of mutual devotion for each-other and proper understanding for each-other that the relationship between Krishna and Susila that their relationship attains the high of sublimity. R. K. Narayan has presented the importance of husband-wife relationship by observing the daily affairs of both the husband and the wife. Krishna is a devoted husband. In this novel, we find that owing to his true love of his wife, even death is not capable of separating Krishna from his wife Susila. After a brief period, Krishna has entered into direct communion with the spirit of his wife and this rejuvenates him and he reconciles with life again.

In this novel he has beautifully projected the role of love and death as inevitable agents in the formation of a successful husband-wife relationship. In the relationship between Krishna and Susila love and romance are successfully resolved and the future of this relationship depends upon fate and chance. The beauty of the relationship between Krishna and Susila lies in Krishna’s acceptance of Susila’s death in a natural manner. Krishna accepts the reality of human existence in the form of death. They make themselves a unique pair because there is no question of individuality pride and ego in their relationship. The strength of their relationship lies in their sublime nature which inspires them to face one of the bitterest realities of human existence. It is because of mutual devotion for each other .in this novel we can find that owing to his true love of his wife even death is not capable of separating Krishna from his wife. The husband and wife relationship presented in *The English Teacher* clearly reveals the separation and loneliness are the two natural agents of human relationships.

The connubial relationship presented in *The English Teacher* clearly reveals that the separation and loneliness are the two natural agents of human relationships. Every human being to fight against them. The presentation of relationship between Krishna and Susila is the basis of the novelists’ new philosophic understanding of life as well as death.
To conclude Narayan's books are basically stories of Indian life and he jumps at the chance to delineate the universal life of the Indian town with all its backwardness. He distinguishes his constraints as a craftsman, and just plans to handle profoundly clear and fascinating books about India and Indian individuals. His portrait of Indian family life is correct to realities. He reliably expects a mirror to remember India and Indian society and puts forth it without any bends. Narayan in all sense gives respect and privilege to incredible Indian culture and tradition through his pen.

References

Modelling Future Collaborative Supply Chains from the Perspective of Green Procurement

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²Department of Industrial Management, University of Kelaniya, Sri Lanka

Abstract
The high competition in the market place forces manufacturing companies to respond more quickly to meet customer requirements through faster product development and shorter delivery times. Many recent studies have discussed about the green supply chain management practices, organizational performance and environmental performance. However, less focus has been there in the areas of collaborative supply chain from the perspective of green procurement in the FMCG industries. In this study, the authors have critically reviewed forty research articles which are in the areas of collaborative supply chain and green procurement practices highlighting the prominence in the boundary of original raw material supplier to the original equipment manufacturer. The outcomes of this paper develops a conceptual framework for collaborative supply chains from the perspective of green procurement and provides a benchmark for dynamic implementation of aforementioned concepts in future collaborative supply chains.

Keywords- Collaborative Supply Chains, Green Procurement, Manufacturing Industry

Introduction
Technology Innovation enhances the supply chain collaboration to a greater extent. The current trend in collaborative supply chain focusses on joint planning, Coordinating and process integration between suppliers, manufacturers, customers and partners in a supply chain. Collaboration in supply chain will help to overcome the challenges faced by manufacturing organizations and create an advantage of speedy product output, reduction of production and logistic costs and the increase of efficiency. Collaboration in the supply chain is an interaction supported by a technology between two or more parties that plays a role in order to achieve a common objective for mutual benefit. Collaboration has become more important in the supply chain and acts as an approach to competitive advantage through reducing cost and improving service level. Green procurement means purchasing products and services that cause minimal adverse environmental impacts. It is the adoption of ecologically responsible practices in business activities used to meet the needs for materials, goods, utilities and services.

Green procurement (GPr) is an approach to procurement in which the environmental impacts play an important role in purchasing decisions, which concern about more than just price and quality. Organizations who are proud of environmental stewardship, are also more concerned about the environment and method of procurement.A number of aspects of the procurement process maybe adjusted to meet a mission of environmental sustainability. Green procurement can push organizations to make environmental friendly products or products made by companies which are committed to environment stewardship. Organizations who engage in green procurement processes may be eligible for the formal environmental certifications.

Green supply chain management (GSCM) is gaining much importance in many industries due to the pressure from the government and environmental consciousness among customers to gain competitive advantage. Nowadays, many businesses are seeking smart ways to reduce supply chain waste and carbon impact. The trends of creative, collaborative planning, emerging markets and infrastructure, working together of industry, government and civil society, the change of regulations, initiatives of green rail and air, the move to closed-loop manufacturing and growing consumer awareness could transform logistics operations in emerging markets. Benefits will have a better opportunity to effectively and efficiently meet the demands of the customers, and thus help in driving and maintaining superior customer service levels.
Literature Review

Togar et al., 2002, stated that two or more companies jointly work together and execute supply chain operations with greater success is called as collaborative supply chain. Leavitt & Wendy (2000) discuss about the vertical, horizontal and lateral collaboration. Vertical Collaboration means two or more organizations share information and resources between manufacturers, distributors, carriers, retailers and end users. Vendor management inventory, efficient customer response and collaborative planning, forecasting and replenishment are examples for vertical collaboration. Two or more different organizations share information and resources such as joint distribution centers enter to horizontal collaboration. Combining and sharing capabilities in both vertical and horizontal way is called lateral collaboration. Their paper explains how practitioners and academics stand to share information and incentive schemes to gain profitability.

Min & Zhou (2002) discuss about the analytical tools and benefits of integrated supply chain concepts and complexity inherent in integrated modeling. Reinventing traditional analytical tools will not be the answer for many managerial issues such as inter-functional or inter-organizational conflicts, joint production planning, dynamic demand forecasting, profit sharing, team-oriented performance measurers, customer relationship management, information sharing, real-time communication, inventory ownership and technical compatibility, involving in real world supply chain problems. Sahay B.S (2003) stated that supply chain managers and consultants consider the trust is the key factor in developing customer-supplier relationship and trust is necessary to maintain long-term co-operation and collaborative relationship. Fawcett E.S et al, (2008) found that customer satisfaction is more valuable than cost savings and recognize major barriers for successful supply chain collaboration in technology, information and measurements systems. People are the key into successful collaborative innovation. Walker et al., 2007 study found both drives and barriers. Internal drivers such as organizational factors and external drivers such as regulation, customers, competition and society and internal barriers such as costs and lack of legitimacy and external barriers such as regulation, poor supplier commitment and industry specific barriers were identified. Seman et al. (2012) discuss the linkage between Green Supply Chain Management and green innovation concept and highlighted that literature implied GSCM has significant relationship on green innovation but cannot provide the sufficient evidence to support that relationship in developing of new green product. Blome et al.2014 suggest that organizations show greater interest to green supplier development initiatives due to their ability to improve and facilitate the accomplishment of innovative as well as emergent sustainability goals. Their findings demonstrate that inter-organizational capabilities are crucial, especially when there is a need for a win-win relationship that would benefit the supplier as well.

Hudnurkar M. et al., 2014 discuss about the factors affecting in collaborative supply chain. They have addressed that there is a gap between downstream supply chain collaboration and one tier supplier and most authors argued about the role of information sharing is found to be highly significant in effective supply chain collaboration. If organizations practice collaborative supply chain, they will get the benefits of cost savings, inventory reduction and increase visibility. Jayant and Azhar, 2014 paper describes the barriers of GSCM in Indian auto component manufacturing industry and have identified 20 barriers to implement GSCM. The identified bottom level barriers are the non-availability of bank loans to encourage green products, cost implication, less customer awareness about GSCM, Lack of training courses about implementing of GSCM, lack of environmental awareness to the supplier, poor organizational culture in adopting GSCM and lack of top management commitment. Sulistio and Rini, 2015 identified that there is a wide research opportunity for sustainable green supply chain management and a lack of advance mathematical modelling exhibits as well as complex system approach because multi-dimensional supply chain drivers are not only limited from economic, social and environmental implementation that is related to corporate and supply chain performance as a whole.

Bag, 2016 discusses the 3C's (collaboration, coordination and cooperation) and development of innovative green procurement practices. Also indicated that better customer retention is the top level element whereas internal integration, information sharing, governance, organizational autonomy, mutuality problem solving and willingness to adapt changes are the bottom level elements. Irani et al.,
2017 identified 24 factors which are related to Green Supply Chain Collaborative based on strategic, managerial, organizational, operational, technological, human-sociological, financial and environmental dimensions. As an outcome of new methods introduced under knowledge management, it will increase supply chain partners’ confidence that every effort is being adopted to reduce dependencies on carbon producing supply chain components.

Asian Productivity Organization (APO) developed the concept of Green Productivity (GP) in 1994 as a strategy for enhancing productivity and environmental performance for overall socioeconomic development. During the APO World Conference on GP in Manila in 1996, it was declared that “Environmental protection should be promoted without sacrificing productivity”. The GP concept allows both large and small companies to improve their environmental performance with the initial concern about productivity and profitability.

Table 1: Literature Review – Research Papers

<table>
<thead>
<tr>
<th>Year</th>
<th>Author</th>
<th>Study Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>2016</td>
<td>Erik Eriksson</td>
</tr>
<tr>
<td>02</td>
<td>2015</td>
<td>Claudine Antoinette Soosay Paul Hyland</td>
</tr>
<tr>
<td>03</td>
<td>2015</td>
<td>Nitin Gaur1, Jayant K.Purohit2, Kamlesh Kushwaha3, Sanchaya Goyal4, Sameer Mittal5</td>
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<td>04</td>
<td>2015</td>
<td>Davide Luzzini, Emma Brandon-Jones, Alistair Brandon-Jones, Gianluca Spina</td>
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<td>05</td>
<td>2015</td>
<td>Anne Touboulic Helen Walker</td>
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<td>06</td>
<td>2014</td>
<td>Manoj Hudnurkar, Suresh Jakar</td>
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<td>08</td>
<td>2014</td>
<td>Benard Onyango Muma1, Richard Bitange Nyaoga1, Robert Bosire Matwere2, Ednah Nyambega</td>
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<td>09</td>
<td>2014</td>
<td>Sunil Luthra Dixit Garg Abid Haleem</td>
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<td>Luthra Suni &amp; Garg Dixit</td>
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<td>11</td>
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<td>Zaabi Al S, Dhaheri Al N &amp; Diabat Ali</td>
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<td>13</td>
<td>2013</td>
<td>Abhijeet Ghadge and Samir Dani &amp; Michael Chester, Roy Kalawsky</td>
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<td>14</td>
<td>2013</td>
<td>Bharracharya A, et., al</td>
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<td>15</td>
<td>2013</td>
<td>Gunasekaran A, Irani Z &amp; Papadopoulos T</td>
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<td>16</td>
<td>2013</td>
<td>K. Mathiyazhagan &amp; A. Noorul Haq</td>
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<td>17</td>
<td>2013</td>
<td>Luzzini Davide, Jones A&gt;B, Jones E.B, &amp; Spina Gianluca</td>
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<td>18</td>
<td>2013</td>
<td>Noorul A &amp; Mathiyazhagan K</td>
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<tr>
<td>Year</td>
<td>Authors</td>
<td>Title</td>
</tr>
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<td>------</td>
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<td>2012</td>
<td>Shaikh Al Zaabi &amp; Noura Al Dhaher &amp; Ali Diabat</td>
<td>Analysis of interaction between the barriers for the implementation of sustainable supply chain management</td>
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<tr>
<td>2012</td>
<td>Prasanta Kumar Deya and Walid Cheffib</td>
<td>Green supply chain performance measurement using the analytic hierarchy process: a comparative analysis of manufacturing organisations</td>
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<td>2012</td>
<td>Zhu Qinghua, Sarkis Joseph &amp; Lai Kee-hung</td>
<td>Examining the effects of Green supply chain management practices and their mediations on performance improvements</td>
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<tr>
<td>2012</td>
<td>Sang M Lee, Sung Tae Kim, Donghyun Choi</td>
<td>Green supply chain management and organizational performance</td>
</tr>
<tr>
<td>2012</td>
<td>B.L. MacCarthy a &amp; P.G.S.A. Jayarathe</td>
<td>Sustainable collaborative supply networks in the international clothing industry: a comparative analysis of two retailers</td>
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<td>2012</td>
<td>Hassan E, Suri C &amp; Searcy C</td>
<td>A Literature review and a case study of sustainable supply chains with a focus on metrics</td>
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<tr>
<td>2012</td>
<td>Stefan Seuring</td>
<td>A Review of Modelling approaches for sustainable supply chain management</td>
</tr>
<tr>
<td>2011</td>
<td>Xiaoong Fu, Quighua Zhu &amp; Joseph Sarkis</td>
<td>Evaluating Green Supplier Development Programs at a telecommunications system provider</td>
</tr>
<tr>
<td>2011</td>
<td>Susana G, Azevedo, Helena Carvalho, V Cruz Machado</td>
<td>The influence of Green practices on supply chain performance: A case study approach</td>
</tr>
<tr>
<td>2011</td>
<td>Ali Diabata, Kannan Govindanb</td>
<td>An analysis of the drivers affecting the implementation of green supply chain management</td>
</tr>
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<td>2010</td>
<td>Jin Sung Rha</td>
<td>The Impact of Green Supply Chain Practices on Supply Chain Performance</td>
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<tr>
<td>2010</td>
<td>Meehan J. &amp; Bryde D</td>
<td>Sustainable Procurement Practice</td>
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<td>2010</td>
<td>Martin Christopher and Helen Peck</td>
<td>Building the resilient supply chain</td>
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<td>2009</td>
<td>Chunguang Bai, Joseph Sarkis</td>
<td>Green supplier development: analytical evaluation using rough set theory</td>
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<td>2009</td>
<td>Alain Yee-LoongChong , Keng-BoontOoi , AmrikSohal</td>
<td>The relationship between supply chain factors and adoption of e-Collaboration tools: An empirical examination</td>
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<td>2008</td>
<td>Pierre J. Richard, Timothy M. Devinney, George S. Yip, Gerry Johnson</td>
<td>Measuring Organizational Performance as a Dependent Variable: Towards Methodological Best Practice</td>
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<td>2008</td>
<td>Victoria M de la Fuente, Lorenzo Ros &amp; Cardos Manuel</td>
<td>Integrating Forward and Reverse Supply Chains: Application to a metal-mechanic company</td>
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<tr>
<td>2007</td>
<td>Mark Stevenson &amp; Martin Spring</td>
<td>Flexibility from a supply chain perspective: definition and review</td>
</tr>
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<td>2007</td>
<td>Sarv Devaraj , Lee Krajewski , Jerry C. Wei</td>
<td>Impact of e-Business technologies on operational performance: The role of production information integration in the supply chain</td>
</tr>
<tr>
<td>2007</td>
<td>Melissa J. Markley and Lenita Davis</td>
<td>Exploring future competitive advantage through sustainable supply chains</td>
</tr>
<tr>
<td>2007</td>
<td>Matopoulos A, Vlachopoulos M, Manthou &amp; Monos</td>
<td>A conceptual framework for supply chain collaboration: empirical evidence from the Agri-food industry</td>
</tr>
<tr>
<td>2004</td>
<td>Sergio Terzi &amp; Sergio Cavalieri</td>
<td>Simulation in the supply chain context: A Survey</td>
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<td>2003</td>
<td>Sergio Terzi &amp; Sergio Cavalieri</td>
<td>Simulation in the Supply Chain Context: A Survey</td>
</tr>
<tr>
<td>1998</td>
<td>Lambert D.M, Cooper C.M. &amp; Pagh J.D</td>
<td>Supply Chain Management: Implementation Issues and Research Opportunities</td>
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<td>1997</td>
<td>Martha C. Cooper, Douglas M. Lambert and Janus D. Pagh</td>
<td>Supply chain Management: More than a New Name for Logistics</td>
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<td>1997</td>
<td>Christian Bechtel and Jayanth Jayaram</td>
<td>Supply Chain Management: A strategic Perspective</td>
</tr>
<tr>
<td>1996</td>
<td>Lambert M.D, Emmelhainz M.A &amp; Gardner J.T</td>
<td>Developing and Implementing Supply Chain Partnerships</td>
</tr>
</tbody>
</table>
Methodology

In this paper, we made a search in academic studies to trace the relevant information with regard to the literature of Collaborative supply chain and green procurement. The most important task is to carry out a literature survey with regard to Collaborative supply chain from a perspective green procurement. Due to huge volumes of publications that have tried to address green issues but less talk about collaborative supply chain and green procurement of 2nd tier raw material suppliers. This paper involved searching for empirical case studies and conceptual papers published in reputed journals concerned with GSCM practices and green procurement and collaborative supply chain practices such as Emerald publications, Elsevier B.V, Tailor and Francis, Science Direct, EBESCO, Springer, etc. The research criteria are used to include keywords such as Collaborative Supply Chain, Green procurement, green productivity and organizational performance.

The research methodology employed in this work considers existing empirical studies in the literature and seeks to build a guiding platform for modelling future collaborative supply chain practice on green procurement. In this regard, the study consists of four phases, from literature survey through to framework development including identification of the critical areas for collaborative supply chain dimensions.

Figure 3: Conceptual Framework

Conclusion

The development of the most appropriate collaborative supply chain from perspective green procurement is a challenge to most decision makers in Green Supply Chain Management. This paper proposed a structured approach to guide FMCG manufacturing companies who intend to develop effective collaborative relationship with their raw material suppliers. The managers in the manufacturing industries should be able to identify the most appropriate ways to maintain and build up the collaborative supply chain within the Green Procurement. This study identifies the three key dimensions upon our taxonomy is based Green Procurement, Collaborative Supply Chain and Green Productivity.

Further, research directions include the validation of the application of collaborative supply chain practices in FMCG industry. It has an important meaning to model future collaborative supply chain practices on green procurement to enhance the green productivity in the organizations.
References


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Multiplier Effect of Zakat: Case Study in Tello Island, South Nias, Indonesia on National Amil Zakat Agency Education Program

Haekal Rasyid, Sudrajat; Siti, Aisyah

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2Education Program Officer, National Amil Zakat Agency, Indonesia

Indonesia is one of the countries with the largest Muslim population in the world. The population of Muslims in Indonesia in 2010 are to 87.18% or 207 million from a total of 238 million people. One of the obligations of muslims is zakat. The National Amil Zakat Agency (BAZNAS) as the official institution which established by the government of Indonesia for manage zakat at the national level (revenue and distribution) reports that there is an increase of zakat revenue in Indonesia about 1.27 trillion rupiah from 2010 to 2014. Tello Island, one of the islands in South Nias district with less than 10% muslim population. The lack of muslim population in the southern district of Nias has a direct impact on the access to islamic education. BAZNAS partnered with MA Baharl Ulum to cooperate on operational and development assistance which distributed from zakat to solve the problem. Based on the method of calculating Social Return on Investment (SROI) on the impacts generated by the program which includes improving access and quality of Islamic education, it is known that its have a SROI ratio of 2.08 which indicating that the program runs well and could continue with no doubt. In addition to the immediate perceived impact, the zakat implementation program by BAZNAS also has other long-term impacts that include the education, entrepreneurship and tourism sectors.

**Keywords**: zakat, muslim, education

**Themes**: Social Sciences and Humanities

**Introduction**

Zakat is one of the five pillars Islam that must be implemented by Muslims. Zakat is the right of Allah (God Almighty) which is given by muslims for those who need. Zakat comes from the word Az-Zaka which has the meaning of developing, sacred, and blessing (Sabiq 2015). The obligation to fulfill zakat are contained in the holy book of the Muslims, Al Qur'an. In the surah At Taubah verse 103. Allah says "Take, [O, Muhammad], from their wealth a charity by which you purify them and cause them increase, and invoke [ Allah 's blessings] upon them. Indeed, your invocations are reassurance for them. And Allah is Hearing and Knowing "(At Taubah: 103). The position of zakat as a duty for Muslims is very high, Allah juxtapose the obligation of zakat with prayer in 82 verses in the Qur'an (Windriatmoko 2016). In the other reference of muslim, al hadith, the Prophet (s) said "Islam is founded on five grounds: pledging that there is no god but Allah and Muhammad is the messenger of Allah, establishing the prayer, paying Zakat, performing Hajj, and fasting in Ramadan" (Hadith Muttafaq'alaih). In At Taubah's verse 60, Allah says "Zakah expenditures are only for the poor and for the needy and for those employed to collect [zakah] and for bringing hearts together [for Islam] and for freeing captives [or slaves] and for those in debt and for the cause of Allah and for the [stranded] traveler - an obligation [imposed] by Allah . And Allah is Knowing and Wise". Amil zakat, the manager and collector of zakat funds entitled to receive the zakat funds are one of those who able to receive zakat. It can be an individual or organization (Qardhawi 2004). Implementation of zakat on a global scale is expected to help alleviate poverty and the success of Sustainable Development Goals (SDGs). This became one of the discussions topic in the World Zakat Forum held in Yogyakarta on 14 - 16 March 2017 which followed by 16 countries.

Indonesia is one of the largest muslims population countries in the world. Based on data held by the Central Bureau of Statistics of the Republic of Indonesia, it is known that the number of Muslims in Indonesia is 87.18% or 207 million people. The existence of zakat management organizations in
Indonesia is officially regulated in Law No. 23 of 2011. The National Amil Zakat Agency (BAZNAS) is a non-structural government institution which is independent and responsible to the President through the Minister of Religious Affairs. BAZNAS has the authority to perform zakat management tasks nationally in the Republic of Indonesia. The results of the tasks of the BAZNAS shall then be reported in writing to the President through the Minister of Religious Affairs and also to the House of Representatives of the Republic of Indonesia at least once a year. The results of research conducted by FEM IPB with BAZNAS shows that the potential of zakat in Indonesia in 2011 reached 217 trillion rupiah or 3.4% of total Gross Domestic Product (GDP) as one method to calculate national income. In fact, zakat funds collected by BAZNAS only reach about 1% of the total national zakat potential (Hafidhuddin 2013). The potential of national zakat and its percentage of GDP can be seen through Table 1 as follows:

<table>
<thead>
<tr>
<th>Number</th>
<th>Information</th>
<th>Potential of zakat (trillion rupiah)</th>
<th>Percentage to GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Potential zakat of household</td>
<td>82.7</td>
<td>1.30</td>
</tr>
<tr>
<td>2</td>
<td>Potential zakat of private industry</td>
<td>114.84</td>
<td>1.80</td>
</tr>
<tr>
<td>3</td>
<td>Potential zakat of State-owned enterprise (SOEs)</td>
<td>2.4</td>
<td>0.04</td>
</tr>
<tr>
<td>4</td>
<td>Potential zakat of savings</td>
<td>17</td>
<td>0.27</td>
</tr>
<tr>
<td>Total</td>
<td>Potential of national zakat</td>
<td>217</td>
<td>3.40</td>
</tr>
</tbody>
</table>

The management of zakat funds in Indonesia are conducted in various forms. One of these forms are education sector. BAZNAS itself has a special section for the disbursement of zakat funds in the field of education. One of many management of zakat fund in the field of education by BAZNAS was done by doing partnership with Madrasah Aliyah (MA) Bahrul Ulum in Tello Island, South Nias Regency. Tello Island is one of 101 islands located in Pulau-Pulau Batu Subdistrict. Pulau-Pulau Batu is one of 35 sub-districts in South Nias. There are at least 7 sub-districts in South Nias: Hibala, Tanahmasa, Pulau-Pulau Batu, Pulau-Pulau Batu Timur, Pulau Pulau Batu Barat, Pulau Pulau Batu Utara and Simuk. The level of education participation in South Nias especially for middle and high education level are in low based on the Nett Enrollment Rate (NER) or Education Enrollment Rate (NER). NER / APM can be found through Table 2 below:

<table>
<thead>
<tr>
<th>Education level</th>
<th>NER/APM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elementary school or equal</td>
<td>98</td>
</tr>
<tr>
<td>Middle school or equal</td>
<td>60</td>
</tr>
<tr>
<td>High school or equal</td>
<td>57</td>
</tr>
<tr>
<td>University or equal</td>
<td>10</td>
</tr>
</tbody>
</table>

The implementation of zakat funds from BAZNAS with Madrasah Aliyah Bahrul Ulum expected to give a positive impact on the education sector in the area. Not only the education sector, a positive impact also increase in other sectors such as economy, trade, transportation, and even tourism potential.

**Method and materials**
The methodology used to determine the impact of zakat fund implementation on the education sector in Tello Island, South Nias is a quantitative method by calculating the value of Social Return on
Investment (SROI) validated and verified by certified institutions, Social Investment Indonesia (SII) based on principle and guide value from SROI Network UK (Social Value International). Data collected using indepth interview, questionnaire, and observation. Value approached by secondary data from Central Bureau of Statistics of the Republic of Indonesia. These data, then calculated based in SROI method. Implementation of this research activity consists of:

- First data collection : 13 – 18 March 2017
- Data analysis : 20 – 25 March 2017
- Second data collection : 10 – 15 April 2017
- Preparation of results report : 17 April – 17 May 2017

Result

The management of zakat funds from BAZNAS cooperated with MA Bahrul Ulum is intentionally expected to improve the quality of education sector, especially in the physical development and operational improvement of learning and teaching activities. Stakeholders are known to implement the program, ie students, parents, teachers, and school institutions. Stakeholders, its roles and impacts are known through Table 3 below:

<table>
<thead>
<tr>
<th>Number</th>
<th>Stakeholders</th>
<th>Roles</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Students</td>
<td>Main subject of learning and teaching activities</td>
<td>Increase the willingness to learn of students</td>
</tr>
<tr>
<td>2</td>
<td>Parents</td>
<td>Responsible for childrens education</td>
<td>Improve access to education for their children, especially islamic education</td>
</tr>
<tr>
<td>3</td>
<td>Teacher</td>
<td>Educators and implementers of learning and teaching process</td>
<td>Increase effectiveness in teaching and learning activities</td>
</tr>
<tr>
<td>4</td>
<td>School institution</td>
<td>Managers of educational institutions</td>
<td>Increase public confidence on school reputation</td>
</tr>
</tbody>
</table>

Table 3 Stakeholers on BAZNAS research cooperated with MA Bahrul Ulum, South Nias, Indonesia

SROI value is done by calculating all information and assumptions into financial value. Based on the estimated changes on currency values, the resulting benefit values will be converted into one value in present value form. Present value can be obtained by using the formula

\[
\text{Present value} = \frac{\text{Impact value 1st year}}{(1+r)^1}
\]

The interest rate \((r)\) refers to the interest rate set by Bank Indonesia in 2017 with an average of 6.5%. After the impact value is calculated and monetized, then calculated the SROI ratio value by using the formula:

\[
\text{SROI} = \frac{\text{Present value}}{\text{Value of input}}
\]

Here are the results of calculated forecast impacts on the zakah fund management program BAZNAS partnered with MA Bahrul Ulum on Tello Island, South Nias, Indonesia:
<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
<th>Year-2017 (IDR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Input</td>
<td>BAZNAS – operational and development assistance for MA Bahrul Ulum</td>
<td>65,000,000</td>
</tr>
<tr>
<td>1</td>
<td>Suluh Nagari Waqf Foundation – Waqf</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>land for school buildings (approximate price)</td>
<td>25,000,000</td>
</tr>
<tr>
<td>B Outcome</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Student</td>
<td></td>
<td>90,000,000</td>
</tr>
<tr>
<td>1.1</td>
<td>Willingness to learn increased</td>
<td>5,880,000</td>
</tr>
<tr>
<td>2 Parent</td>
<td></td>
<td>69,999,993</td>
</tr>
<tr>
<td>2.1</td>
<td>Improve access to education for their children, especially islamic education</td>
<td>180,450,000</td>
</tr>
<tr>
<td>3 Teacher</td>
<td></td>
<td>180,450,000</td>
</tr>
<tr>
<td>3.1</td>
<td>Increase effectiveness in teaching and learning activities</td>
<td>-</td>
</tr>
<tr>
<td>4 School institution</td>
<td></td>
<td>180,450,000</td>
</tr>
<tr>
<td>4.1</td>
<td>Increase public confidence on school reputation</td>
<td>13,200,000</td>
</tr>
</tbody>
</table>

**Result for A**

**Result for B1**

**Result for B2**

**Result for B3**

**Result for B4**

**TOTAL OUTCOME**

<table>
<thead>
<tr>
<th>Deadweight&lt;sup&gt;3&lt;/sup&gt;</th>
<th>Attribution&lt;sup&gt;2&lt;/sup&gt;</th>
<th>DropOff&lt;sup&gt;3&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

**Total Outcome after discount**

**Present Value (r=7.5)**

| Present Value | 187,352,113 |

**SROI Ratio**

| SROI Ratio | 2.08 |

**Discussion**

The projected SROI ratio value in the zakat fund management program of BAZNAS in partnership with MA Bahrul Ulum which is part of the improvement of education sector quality shows that every Rp 1 invested will generate Rp 2.08. This shows that the program provides benefits, especially on social impact.

Based on the observation and indepth interview, the improvement of the education sector through this program also stimulate a positive increase in other sectors. In the trade sector, known to start forming a simple shop around the area of educational activities. Other shops which sell things related to learning needs such as uniform and stationery also appeared. On the social sector, it is known that starting to attract people who living around the village and even around Tello Island interest to visit. The improvement of the education sector at MA Bahrul Ulum also enhances community participation in social activities, especially social activities which initiated by MA Bahrul Ulum. In the tourism sector,
there are long term potential that can be used to attract tourists, especially Muslim tourists because of Islamic education activities in a minority condition (with only less than 10% Muslim from total population) is an attractive site.

Quantitative calculations of the SROI score indicate the magnitude of positive impact on education sector, while the qualitative assessment indicates an increase or opening of other sectors such as trade, social, and tourism as a long or short term potential. Furthermore, social multiplier created by the presence of positive spillovers or strategic complementarities (Becker 2000). This proves that management of zakat funds is able to provide positive multiplier effects for the community.

Please note that the management of zakat funds in this program undertaken by BAZNAS, partnership with MA Bahrul Ulum is only 0.00003% of the total potential of national zakat in Indonesia. This shows the potential of zakat to give a lot of positive impact, especially in Indonesia as a country with the largest Muslim population in the world. A simple conversion refers to the SROI calculations on this program indicating that there is a potential positive impact about Rp 451,359,864,800,000 or 451 trillion rupiah which still can not be utilized yet.

**Conclusion**

Zakat which is the obligation of Muslims is one potential tools to help alleviate various problems that exist in Indonesia or even in this world. Moreover, zakat can be used as an alternative approach to evaluate economic growth (Sarea 2012). The case study conducted on the zakat management program BAZNAS in partnership with MA Bahrul Ulum on Tello Island, South Nias, Indonesia shows that the impact of zakat management is very large both quantitatively and qualitatively.

BAZNAS as an amil zakat institution belonging to the Republic of Indonesia continues to increase the participation of the people of the Republic of Indonesia to be consistent in fulfilling its obligations of zakat. The acceptance of zakat funds which only reached 1% of the total potential of zakat one of them caused by the lack of public awareness of the obligation of zakat. Together with hundreds of other zakat institutions in Indonesia, BAZNAS continues to work through various programs such as socialization, campaigns, or even direct selling to many Muslims throughout Indonesia.

**Reference**


Windriatmoko R. 2016. *Analysis of Service Effect on Muzakki Satisfaction and Loyalty Level (Case Study in BAZNAS of Bogor City)*. Bogor (ID): Bogor Agricultural University


Nutritional Improvement of Yoghurt using Seaweeds

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Abstract

Seaweed is an essential healthy food item. Although it can be utilized in food industry, as a nutritious ingredient, currently seaweed extraction is not used in yoghurt production at commercial level in Sri Lanka. This study investigated the nutrient composition of Ulva lactuca and Gracilaria edulis. As Gracilaria edulis contains comparatively high amounts of nutrients than Ulva lactuca, Gracilaria edulis was selected to be used as a gelling agent and a nutrition enhancer to develop a new yoghurt. The collected seaweed samples were prepared in order to add that into the yoghurt. The development of the enriched yoghurt with the prepared seaweed extraction (Gracilaria edulis) was carried out on the basis of the best ratio of yoghurt extraction which gives the best gelling property.

The nutritional composition of enriched yoghurt was compared with the commercially available yoghurts. It was found that the seaweed yoghurt consists of 0.03%, 76%, 3.10%, 9.30%, 0.76% and 10.58% (w/w) of crude fiber, moisture, protein, fat, total ash and carbohydrates respectively. Also it contains 63.7%, 24.5%, 3.09% of SFA, MUFA and PUFA including essential fatty acids. When comparing with commercially available yoghurts seaweed yoghurt proves that it contains sufficient nutrients to enhance human health. Based on microbiological and shelf life analysis seaweed yoghurt was safe to consume. One yoghurt per day is enough to be consumed to satisfy the daily recommended Omega 3 intake per person.

Key words: Yoghurt, Seaweeds, Gracilaria edulis, Omega fatty acids

1.0 Introduction

Yoghurt is a custard and acidified semisolid dairy product which is commercially available in market. Yoghurt is made with bacteria such as Lactobacillus bulgaricus and Streptococcus thermophilus which are known as yoghurt cultures according to Munzur M., (2004) Fermentation of lactose by these bacteria will produces lactic acid which changes the milk proteins in order to give the texture of the yogurt and also a longer shelf life when compared to fresh milk. Mostly cow milk is used to produce yoghurt. Yoghurt contains proteins, vitamins, calcium, carbohydrates and fats. It contains 80g of yoghurt per cup usually, in each brand which is present currently in Sri Lankan market. The percentage amounts of important nutrients like Protein and fat are relatively low when compared to the weight of the yoghurt i.e. 3g of proteins (3.75%) and 3g of fat (3.75%) and also most of the other important elements like essential fatty acids are completely absent or not present in considerable amount. A good starting point for figuring out how much yogurt you should eat per day is the recommended daily dairy consumption. For anyone over the age of 9, the U.S. Department of Agriculture (2016) recommends to consume three cups of dairy per day.

Algae are the most common edible type of seaweeds which are used as an ingredient in food preparations. According to MacArtain et al. (2007), As it contains high amount of fiber and protein, it has been recommended to take a typical portion of edible seaweeds around 8g per person on daily basis. Based on this information, the two algal species considered in the present study especially Ulva lactuca and Gracilaria edulis have enough sources of proteins, carbohydrates, lipids, fibres, essential fatty acids which are important for the enhancement of human nutrition. According to the previous investigations, this algal species contains substantial amounts of proteins (average, 7 - 19%), carbohydrates (average, 12 - 34%), lipids exhibited relatively smallest proportion (average, 0.4 - 2.2%). The average energy contents varied from 1.5 to 2.1 kcal g⁻¹. Of these, about 20 - 37% was constituted...
by essential amino acids was stated by Ghadikolaei, K et al. (2011). Therefore, these seaweeds can act as an important ingredient in yoghurt which could enhance the nutritional level of the yogurt (per cup).

2.0 Materials and Methods

2.1 Sample collection and preparation
Samples of one species of green algae (Ulva lactuca) and one species of red algae (Gracilaria edulis), which can be considered as two of the most commonly available seaweed varieties in Sri Lanka were collected from coastal areas of Jaffna and Mandaithivu of northern coastal belt. The collected samples were packed fresh with sea water in an air-tight polythene bag and kept in ice.

2.2 Proximate analysis of seaweeds
Analysis of Moisture, Ash, Crude protein, crude fiber and Total fat of the seaweeds were determined as described by AOAC (2000).

2.3 Preparation of Seaweed Extraction
According to Arachchi M.J et al., (2016) The seaweeds were washed well in running water until all the sand particles washed away from the seaweeds. Then they were pressure cooked for 20 minutes in distilled water where the volume should be 45 times of its dry weight. Then the extraction was filtered through the muslin cloth. Then the extraction was stored in the refrigerator.

2.4 Preparation of yoghurt
According to Kumar, D. et al (2016), Fresh whole milk was filtered to remove dirt if any in it and then boiled to reduce 15% of its initial volume. During boiling of milk 10% sugar and vanilla were added and stirred continuously by a stirrer to prevent the formation of cream layer. Previously treated seaweed extraction was then added to each cup separately at a rate of 0.5%, 1.0%, 1.5%, 2.0%, 2.5% (v/v) except control. Heated milk was allowed to cool and when milk temperature was 42-43°C and then starter culture (1.5%) was added to each cup and then incubated at 37°C for 12-15 hours until complete curd formation. Finally, yogurt samples were cooled and stored at refrigerated condition for 15 days of storage study.

2.5 Chemical analysis
Moisture, ash, protein, and pH of yogurt samples were determined by the methods described previously under 2.2; Moisture content by drying oven method at 105°C for 24 hours; Ash content by muffle furnace ignition method at 550°C; Protein content by Kjeldahl; Fat content by Majoineer method; carbohydrate were determined by standard mathematical procedure as mentioned earlier as described by AOAC (2000).

2.6 Determination of Fatty acid profile
Fat of the seaweed yoghurt extracted by Chloroform-methanol extraction as described by Christie W., (1983). And fatty acid methyl esters were prepared according to AOAC (2000). Determination of fatty acid profiles were based on Gas Chromatography-Mass Spectroscopy as described by Hites R. A., (1997).

2.7 Determination of caloric value of the developed seaweed yoghurt
Analysis of Moisture, Ash, Crude protein, crude fiber and Total fat of the developed yoghurt were determined as described in 2.2 AOAC (2000); thereby the caloric value was calculated.

2.8 Microbiological analysis:
Total plate count and Enumeration of Yeast and Moulds were carried out according to SLS: 1989 part 2

2.9 Shelf Life Determination
Peroxide value was determined according to Pearson (1991). And also total plate count, Enumeration of Yeast and Moulds according to SLS: 1989 part 2 were determined on weekly basis.
3.0 Results and Discussion

3.1 Proximate Analysis (Wet weight basis%) of seaweeds

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Ulva lactuca</th>
<th>Gracilaria edulis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture</td>
<td>84.3 ± 0.57</td>
<td>87.00 ± 1.00</td>
</tr>
<tr>
<td>Ash</td>
<td>12.4 ± 0.20</td>
<td>7.93 ±0.23</td>
</tr>
<tr>
<td>Crude Protein</td>
<td>13.54 ± 0.19</td>
<td>14.31 ± 0.14</td>
</tr>
<tr>
<td>Total Fat</td>
<td>0.75 ± 0.21</td>
<td>0.91±0.028</td>
</tr>
<tr>
<td>Carbohydrates</td>
<td>32.00</td>
<td>33.00</td>
</tr>
<tr>
<td>Crude Fiber</td>
<td>54.75 ± 2.06</td>
<td>63.43± 0.57</td>
</tr>
</tbody>
</table>

Table 1 : Proximate analysis of seaweeds

Based on the nutritional composition results, *Gracilaria edulis* was selected as it contains high nutrients when it compared with *Ulva lactuca*. So *Gracilaria edulis* extraction was added in to the yoghurt preparation.

Using the seaweed extraction the yogurts were developed in different yoghurt: extraction ratio such as 0.5%, 1%, 1.5%, 2.0% and 2.5 % seaweed extractions. As 2.5% extraction in yoghurt had the best gelling ability, it was selected to add in to the yoghurt as a substitute to the gelatin. Furthermore, the same shininess which is observed in gelatin added yoghurts was given in the developed yoghurt.

3.2 Proximate analysis of seaweed yoghurt

<table>
<thead>
<tr>
<th>Parameters</th>
<th>% (W/W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture</td>
<td>76 ± 0.0</td>
</tr>
<tr>
<td>Ash</td>
<td>0.77 ± 0.023</td>
</tr>
<tr>
<td>Crude protein</td>
<td>3.1 ± 0.152</td>
</tr>
<tr>
<td>Total fat</td>
<td>9.3 ± 0.057</td>
</tr>
<tr>
<td>Carbohydrates</td>
<td>10.8 ± 0.20</td>
</tr>
<tr>
<td>Crude fiber</td>
<td>0.03 ± 0.017</td>
</tr>
<tr>
<td>Fatty acids</td>
<td></td>
</tr>
<tr>
<td>SFA</td>
<td>63.7± 0.027</td>
</tr>
<tr>
<td>MUFA</td>
<td>24.5±0.053</td>
</tr>
<tr>
<td>PUFA</td>
<td>3.09±0.017</td>
</tr>
</tbody>
</table>

Table 2 : Proximate analysis and fatty acid profile of seaweed yoghurt
### 3.3 Comparison of seaweed yoghurt with commercially available yoghurt

![Figure 1: Comparison of crude fiber](image1.png)

When comparing the content of crude fiber in the seaweed yoghurt with commercial yoghurts such as sample A, B and C seaweed yoghurt has significantly higher percentage of crude fiber where seaweed yoghurt consist of 0.03% and other brands consist of 0%. Although the value of fiber is less when comparing with the overall weight of the developed yoghurt, still when comparing with the other brands they do not contain at least minute amounts of fiber

![Figure 2: Comparison of crude protein](image2.png)

When comparing the protein content of the seaweed yoghurt with commercial yoghurts, yoghurts, Seaweed yoghurt has less percentage than the other commercially available yoghurts such as A and C but higher than B where seaweed yoghurt consists of 3.3% and other brands such as A and B consist of 3.75%. This may be due to the high temperature thermal treatments done with the yoghurt. Protein is very sensitive to heat therefore the essential amino acids might be degraded due to that. Use of very low flame while pressure cooking or using any other extraction procedure would help to retain more proteins.

![Figure 3: Comparison of total fat](image3.png)

When comparing the fat content in the seaweed yoghurt with commercially available yoghurts such as A, B and C, seaweed yoghurt has significantly higher percentage than the other commercially available yoghurts where seaweed yoghurt consist of 9.3% and other two brands consist of 3.75% and one brand consist of 1.25%
When comparing the carbohydrates content in the seaweed yogurt with commercially available yoghurts such as A, B and C, seaweed yoghurt has lesser percentage than the other commercial yoghurts. The reason for this may be the presence of higher amounts of fats, crude fiber like nutrients in the developed sea weed yoghurt.

When it comes to the comparison of the analysis of fatty acid profile with the yoghurt brands that are currently in SriLankan market such as A, B and C, they do not contain monounsaturated fatty acids as well as polysaturated fatty acids but only in B it contains 2% of saturated fatty acids. Seaweed yoghurt was found to have high amounts of SFA and MUFA and also quite a considerable PUFA. And also the Omega 3 percentage of the developed seaweed yoghurt is 1.67 which consists of essential fatty acids for human nutrition.

### 3.4 Caloric value of the seaweed yoghurt

According to the observed values for Carbohydrate, protein and fat, the calculated total caloric value of the yoghurt was 139.3 Kcal/100g. This value was below than the maximum reference value given by USDA Nutritive value of foods reference for yoghurt.

### 3.5 Microbiological analysis

<table>
<thead>
<tr>
<th>Weeks</th>
<th>Total plate count (CFU/g)</th>
<th>Yeasts and moulds count(CFU/g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1.65 x 10^2</td>
<td>9.63 x 10^1</td>
</tr>
<tr>
<td>1</td>
<td>1.82 x 10^2</td>
<td>1.22 x 10^2</td>
</tr>
<tr>
<td>2</td>
<td>9.81 x 10^1</td>
<td>9.40 x 10^1</td>
</tr>
</tbody>
</table>
Table 3: Microbiological analysis of seaweed yoghurt

Both the Total plate count and yeast and moulds have increased over time and it has recorded a rapid acceleration of the growth of microbial populations from 0th week to 1st week. Based on the results showed that the number of molds and yeasts and the total count had a sudden decreasing trend during the 15th day which may be due to occurrence of an unfavorable conditions for microbial growth. According to the SLSI standards when consider about the hygienic quality it should be less than 1000/g yeasts and less than 1/g moulds. Microbiological counts of seaweed incorporated yoghurt was complied with SLSI standards during 15 days of storage time. Yet the values for both total plate count and yeast and moulds at the end of 2nd week complied the specification for yoghurt products (SLS 824, Food Act 26, 1989 part 2) And also in according to the Food Safety regulations, Ireland. (2014)

Evaluation of the values obtained for the tested parameters of the shelf life determination study, it can be concluded that the product is safe to be consumed up to the 2nd weeks of storage and the shelf life of the product would be last more than for 2 weeks.

3.5 Shelf life evaluation

<table>
<thead>
<tr>
<th>Weeks</th>
<th>Total plate count (CFU/g)</th>
<th>Yeasts and moulds count(CFU/g)</th>
<th>Peroxide Value (Meq/Kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1.65x10²</td>
<td>9.63 x 10¹</td>
<td>2.17</td>
</tr>
<tr>
<td>1</td>
<td>1.82x10²</td>
<td>1.22 x 10²</td>
<td>3.16</td>
</tr>
<tr>
<td>2</td>
<td>9.81x10³</td>
<td>9.40 x 10¹</td>
<td>4.27</td>
</tr>
</tbody>
</table>

Table 4: Shelf life analysis of seaweed yoghurt

As shown, the Peroxide Value (PV) of the milk emulsion increased gradually from an initial value of 2.17meq/kg to 4.27 meq/kg upto 2 weeks of storage. There is a general trend of increasing the PV as storage time increases as shown in the figure. But after 10 days of storage PV increased rapidly in as an indication that there was high lipid oxidation. But still the values complied the SLSI standard values.

4.0 Conclusion

Seaweeds (Gracilaria edulis) can be used as a substitute for the gelatin because of its gelling property when preparing yoghurt. And also seaweed extraction provides shininess as same as given by gelatin, therefore the developed yoghurt can be introduced to the market as a successful gelatin free yoghurt, which could be ideal for those who have concerns in vegetarian diet.

When using Gracilaria edulis seaweed extraction as an ingredient to the yoghurt which ultimately contains quite high amounts of nutrient parameters such as crude fiber, fat and essential fatty acids, proving that this seaweed yoghurt can be considered as a nutritionally enriched yoghurt product or a functional food. As the daily recommended Omega 3 intake per person is between 0.2g where 0.22 g per day of each as a minimum described by Kolanowski W., (2005) and according FDA 2000 the daily intake amount should not be exceeded than 3g, Consumption of one yoghurt per day will satisfy the Omega 3 requirement for a person.

Shelf life was conducted Up to the second week of time, during that period the microbial growth and the peroxide values were acceptable when comparing with the standards therefore the yoghurt is safe to consume up to two weeks of time.
Acknowledgement
Authors thank the faculty of Science of the Horizon Campus, for their support and facilities provided in making this study a success.

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Optimization of DNA extraction protocol for herbarium specimens

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Abstract

DNA extraction from herbarium materials is very important to preserve endangered/threatened species and also species that are extinct now. But DNA extraction method from herbarium specimens is difficult due to the collection and processing steps that are followed to prepare herbarium. In addition to those physical and chemical alteration, age of herbarium specimens also play an important role in the integrity of DNA from such specimens.

Here a modified cetyltrimethylammoniumbromide (CTAB) extraction protocol was used to extract genomic DNA successfully from herbarium specimens. However liquid nitrogen couldn't be avoided in this modified protocol. The concentration and quality of DNA of recently prepared herbarium specimens (2013 and 2015) were comparably higher than to that obtained from old herbarium specimens (1990 and 1991). This protocol can be simply used in any laboratories without sophisticated facilities. In addition, this protocol is less time consuming and less labor intensive. Therefore this kind of simple protocols will open up many research works involving DNA extraction from valuable herbarium materials and thereby many downstream applications.

Key words: Herbarium specimens, CTAB and DNA

Introduction

There are several methods to conserve rare/threatened/endangered plants, such as, cryopreservation, germplasm preservation, botanical gardens, national parks, and micropropagation and other tissue culture techniques and habitat conservation etc. In that way, Museum specimens (particularly herbaria) also plays an important role in the conservation of rare plants or even the plants which are extinct now. Museum specimens constitute the basic source of biodiversity information not only for morphological studies, but also for studies in molecular evolution, due to the recent rapid development of molecular methods, especially PCR (Polymerase Chain Reaction; Mullis and Faloona, 1987). There are several examples of studies of plants, fungi, and animals where DNA has been successfully recovered from minute amounts of material from museum collections (Rogers and Benedich, 1985; Pääbo, 1989; Savolainen et al., 1995; De Castro and Menale, 2004; Jankowiak et al., 2005; Cota-Sánchez et al., 2006). This has opened up the possibility to answer evolutionary questions that otherwise would remain unanswered. The age of herbarium material from which DNA has been successfully amplified has varied in different studies. The length of amplified fragment that has been recovered has also varied and should be correlated to the degree of degradation of the DNA. So if we could isolate DNA of those kinds of plants, we could ensure the survival of them too.

There were several protocols put forward to isolate pure and intact DNA from plant tissues. But these protocols are not successful for all plants as they have different complex structures and functions. The Cetyltrimethylammoniumbromide (CTAB) method and its modifications also have been used to obtain DNA from various plant tissues to be used in PCR and other downstream applications. Further various commercial extraction kits, such as, DNeasy plant mini kits (Qiagen Valencia, CA, USA) are also available but they are not preferred by all due to their high cost.

These protocols and methods are efficient for DNA extraction from fresh plant tissues but not much helpful for the dried and older samples like herbarium specimens as well as samples with high concentration secondary metabolites and polysaccharides. So extraction of DNA from herbarium samples requires modified protocols.
The integrity of DNA from herbarium specimens depend on the specimen collection and processing practices (Clayton M.Costa and Roland P.Roberts). Post collection processing of specimens, including alcohol treatment, time between collection and drying, and method of drying can have adverse effects on the quantity and quality of DNA obtained (Staats et al, 2011). In addition, the age of the specimens (time since collection) may impede DNA retrieval due to natural DNA degradation over time (Staats et al, 2011). This combination of natural DNA degradation and post collection processing practices that accelerate DNA degradation compounds are the problems encountered when older plant specimens are used. Damaged or degraded DNA hinders PCR-based molecular studies and next-generation sequencing (Lindahl 1993). Therefore in this study a modified CTAB DNA extraction protocol was successfully used to extract DNA from old and new herbarium specimens.

Materials and methods


CTAB extraction buffer constitutes the following CTAB (2% w/v), PVP40 (2% w/v), 1.42M NaCl, 20mM EDTA (pH=8), 100mM TrisHCl (pH=8) and 5mM Ascorbic acid.

Herbarium materials were ground using motor and pestles separately using liquid Nitrogen and transferred to 1.5ml Eppendorf tubes. Pre-warmed extraction buffer (65°C) was added to each Eppendorf tube using micropipette. After that, all the Eppendorf tubes with the contents were incubated at 65°C for 15 min and centrifuged at 12,000rpm for 15 min. Then supernatant from each tube was transferred to fresh tubes while pellet was discarded. CHISAM (570µl) was added to each tube and centrifuged at 12,000rpm for 10 min. Supernatant was transferred to fresh Eppendorf tube. Then 0.7 volume of ice cold Isopropanol was added to each tube with the help of micropipette and centrifuged at 13,000rpm for 8min. Supernatant was carefully discarded and pellets were taken. Pellets were washed with 500µl of 70% ethanol and centrifuged at 5,000 rpm for 5min. Then Supernatant was carefully discarded and pellets were taken and re-suspended in 15 µl 1X TE buffer. Finally all the DNA samples were stored at -20°C until use.

Each DNA sample (8µl) was mixed with 2 µl Gel loading dye and loaded in 1.5%agarose gel and subjected toagarose gel electrophoresis.

Results and Discussion

Very discreet faint DNA bands were observed in agarose gel electrophoresis when DNA of herbarium specimens of *Solanum melongena* (prepared in 1991) and *Clitoria ternatea* (prepared in 1990) were used. It might be due to the extensive degradation of DNA of old herbarium specimens (1991 and 1990). Bright DNA bands were observed when recently prepared (*Theobroma cacao* (2013), *Gossypium hirsutum* (2015), *Passiflora edulis* (2015), Withania *somnifera* (2015) and *Annonasquamosa* (2015)) herbarium specimens were used for DNA extraction. Katariina et al (2009) had used zirconia/silica beads and mini-Bead beater to homogenize the herbarium specimens for extraction of DNA. Further they had used Glass milk to purify DNA. In another work by LenkazáveskáDrábková, tissue pulverization was done using Mixer Mill (or Tissue lyser). Further β-mercaptoethanol also had been included in the protocol for DNA extraction from polysaccharide rich plants’ herbarium materials and also they had used kits. But here those kinds of expensive instruments and chemicals were avoided to accomplish the work. Even though insufficient cell disruption of herbarium materials/any starting materials could lead for low yield and purity of DNA, but in this study, DNA extraction was effectively done for herbarium specimens using only minimal requirements and facilities. However liquid nitrogen couldn’t be avoided in this modified protocol as liquid nitrogen improves the tissue homogenization.
Conclusion
DNA extraction from herbarium specimens is often difficult in relation to plant chemistry, drying method of specimens and chemical treatment of specimens, however pure and intact DNA was extracted from herbarium specimens using a modified CTAB protocol with minimal requirements.

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Particulate Matter Dispersion Model for Power Plants

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Abstract
Accurate prediction of associated hazards resulting from accidental releases of Particulate Matter (PM) from power plants is imperative in risk analysis and emergency response. PM 10 and PM 2.5 are the most health damaging considered to other pollutant in atmosphere thus people with heart or lung diseases are the most likely to be affected. This paper elaborates the protracted modeling of well-known Gaussian Plume Dispersion model used in forecasting of dispersion and behavior patterns of PM emitted from Sri Lankan power plants. Adiabatic and environmental lapse rates are analyzed in identifying the atmospheric stability conditions and the type of the plume buoyant or momentum. The PM emission rate is modified with particle interaction coefficient of 0.002 and the effective stack height is modified by adding the distance travelled by particles due to drift velocity. Stack tip downwash, building downwash and multiple stack effect are integrated in the model with Geographic Information System (GIS) to characterize PM in both urban and rural areas. The model is validated with meteorological, topographical, demographic and refinery emission data where the results depict that stable atmospheric condition is the most challenging. This framework can be used in identifying the concentration contour lines, spatial point PM concentrations, PM dispersion pattern during emergency situations and the minimum ground level concentration with the relevant ground level distance through graphical representations with numerical figures.

Key words – Particulate matter, dispersion, model, Gaussian plume

1 Introduction
Particular matter generally consists of complexes created either from organic or inorganic solid particles and liquid droplets that are dispersed in atmosphere. These particles consist of dust, soot, dirt and smoke which can sometimes be visible to the naked eye. The work on this research is based on the PM emitted from thermal power plants. The primary products of diesel combustion from stationary generators are water, carbon dioxide and nitrogen. But the incomplete combustion with insufficient oxygen causes emission of particulate pollutants. PM emitted from diesel exhaust is comprises of carbon, water, hydrocarbon and Sulphur hydrides, which are visible as a hazy dark smoke. The composition of PM in diesel exhaust is approximately 0.045% of total emission, but varies with the performance of the diesel generator (Huy and Kim Oanh, 2017).

As per World Health Organization (WHO) reports PM are the most health damaging substance of all the other air pollutants. The particles having a diameter of 10 microns (PM10) or less are considered as the most health damaging particles because they can penetrate inside the lungs. Long-term exposure to particulate pollutants adds the risk of respiratory and cardiovascular diseases along with the lung cancer(Harrison et al., 2017). PM contributes to the environmental pollution in a great deal by making water bodies acidic, damaging the leaves in forests and farm crops, contributing to acid rains etc. Hence the need of a model to demonstrate the dispersion of particulate matter in atmosphere is high when considering the health and environmental damage caused. Identifying the affecting areas by PM dispersion and the concentration of PM in the territory has become a critical necessity in Sri Lanka.

1.1 The Gaussian Plume Model
The work in this research is based on modeling the PM dispersion in atmosphere using the Gaussian plume dispersion model. A dispersion model is a tool to predict the concentrations of pollutants emitted from the point/ site of generation to a site/point of deposition considering the data on emission characteristics, meteorology and topography of the terrain. The Gaussian model assumes a release from
a stationary point source dispersing through a steady-state form the time of the emission until the release reaches the receptor. That is for each time period the concentrations are calculated the meteorological conditions are assumed to be same throughout the considered entire time period.

Particulate pollutants from the thermal power plant are released to the atmosphere from the stacks mixed with other gaseous pollutants. Those PM which are mixed with other gases have a momentum when they enter to the atmosphere. They are in heated and thus in higher temperatures than the rest of substances in atmosphere and that makes them less dense making a plume pollutant (Brusca et al., 2016). The wind profile, emission temperature and ambient temperature largely affect the rise of the plume of pollutants. The effect of all these atmospheric and plant characteristics upon the shape of the plume is included in the Gaussian plume model equation. Modifications have been applied in the equation to make it accurate to demonstrate the shape of plume consisting of particulate matters.

\[
C(x,y,z) = \frac{Q}{2\pi \sigma_y \sigma_z U_s} e^{-\frac{y^2}{2\sigma_y^2}} \left( e^{-\frac{(Z+H)^2}{2\sigma_z^2}} + e^{-\frac{(Z-H)^2}{2\sigma_z^2}} \right)
\]

The Gaussian equation has been developed in order to demonstrate the dispersion of gaseous pollutants emitted from a point source (Alemayehu and Hackett, 2015). The purpose of the research is to modify the Gaussian plume model to model the dispersion pattern of particulate matter emitted from thermal power plants in Sri Lanka. Following modifications are done in the Gaussian plume model to convert the equation to adapt to demonstrate the particulate matter dispersion apart from the gaseous dispersion in atmosphere.

The effective stack height (H) is the summation of actual stack height and the plume rise. But as this model demonstrate the dispersion of particulate matter: the effective height is affected by the force exerted by gravity upon the particulate matter. This gravity force is insignificant on the gaseous. But for particulate matter, the gravity force upon the matter should be considered when calculating the effective stack height. And also once the wind speed is much larger than the flue gas emission rate, the plume begins not from the mouth of the physical stack height, but a smaller distance below to the mouth, well known stack-tip downwash concept. Thus accurate value for plume rise can be obtained by replacing H by H(x) as follows,

\[
H(x) = H - x^*(vt/ Us)
\]

Many of secondary particulate matter undergoes thermodynamic equilibrium chemical reactions which are called as the gas-to-particle conversion -GTPC processes. One such method of particulate matter generation is nucleation, in which particulates are formed from gaseous phase substances. The particulates formed from nucleation has small contribution to the total mass of soot at the emission point, but has a great influence when the plume tend to continue adding a considerable generation of mass because they provide active sites for the surface growth. This process leads to the generation of large number of small size particles. The other major method of PM generation by chemical interactions is the process of nucleation. Nucleation is the process of formation of particulates from aerosols by nucleating condensable species to form a new particle. GTPC process tends to reside in the accumulation mode particulate matter range (normally 0.1 to 2.5 μm). It is found that the ammonia and acid gases in the atmosphere are major inorganic atmospheric aerosol precursor sources which control composition of PM in the atmosphere through the GTPC process (Mohankumar and Senthilkumar, 2017). Both Condensation and Nucleation under GTPC process effect for an increment in PM emission rate as follows with a term called 

\[\alpha \text{ – particle interaction coefficient (0.002).}\]

\[
Q_{tot} = \alpha Q + Q
\]
2 Material and Methodology

The basis of the model is the straight-line, steady-state Gaussian plume equation, which is used with above modifications to model simple point source emissions from stacks, that experience the effects of aerodynamic downwash due to nearby buildings, isolated vents, multiple vents and so on. Here wind exponent power factor and building downwash concepts have been integrated in characterizing different geographical conditions. The following methodology was used in building the model successfully using MATLAB interface. Sapugaskanda oil refinery data were analyzed during validation of the model.

\[ U_s = U_{ref} \left( \frac{h_s}{Z_{ref}} \right)^p \]  

(1)

Where \( p \) is the wind profile exponent. Values of \( p \) are automatically taken by the model as a function of stability category and wind speed. The stack height wind speed, \( U_s \), is not allowed to be less than 1.0 m/s. The demographic condition around the vicinity of the power plant can be taken into account through the selection of correct exponent factor rural or urban and the default values are as follows.
Table 2. Wind power exponent factor table

<table>
<thead>
<tr>
<th>Stability category</th>
<th>Rural exponent</th>
<th>Urban exponent</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0.07</td>
<td>0.15</td>
</tr>
<tr>
<td>B</td>
<td>0.07</td>
<td>0.15</td>
</tr>
<tr>
<td>C</td>
<td>0.1</td>
<td>0.2</td>
</tr>
<tr>
<td>D</td>
<td>0.15</td>
<td>0.25</td>
</tr>
<tr>
<td>E</td>
<td>0.35</td>
<td>0.3</td>
</tr>
<tr>
<td>F</td>
<td>0.55</td>
<td>0.3</td>
</tr>
</tbody>
</table>

2.2 Atmospheric stability

The tendency of the atmosphere to resist or enhance vertical motion and the turbulences termed the stability. Stability is related to both the change of temperature with height (the lapse rate) given by the boundary layer energy budget, and wind speed together with surface characteristics (roughness). Stability classes are defined for different meteorological situations, characterized by wind speed and solar radiation (during the day) and cloud cover during the night. Dispersion estimates include six stability classes A – Very unstable, B – Unstable, C – Slightly unstable, D – Neutral, E – Stable, F – Very stable (Modi et al., 2013). The stability class determination factors are all taken by analyzing the lapse rate and inversion effects. The model is developed such that once the user enters the time period of his interest, the relevant stability class is displaced.

Table 3. Atmospheric stability class table

<table>
<thead>
<tr>
<th>Surface wind speed (m/s) (Us)</th>
<th>Day</th>
<th>Night cloud cover (6pm-6am)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10am-3pm</td>
<td>3pm-6pm</td>
</tr>
<tr>
<td>&lt;2</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>2-3</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>3-5</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>5-6</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>&gt;6</td>
<td>C</td>
<td>D</td>
</tr>
</tbody>
</table>

2.3 Buoyancy and Momentum Fluxes

Many sources of air pollution release material in the atmosphere with some initial momentum and positive buoyancy which make the puff or plume rise gradually while dispersing under the influence of both the source generated and naturally occurring turbulence (Air and Concentrations, no date). For most plume rise situations, the value of the Briggs buoyancy flux parameter, Fb (m4/s3) and momentum flux parameter Fm are needed in determining the type of the plume. We developed the model such that effective plume height alters depending on the type of the plume and atmospheric stability condition.
After the selection of plume type momentum or buoyant, the model is integrated such that it calculates the suitable plume height based on the prevailing atmospheric condition. Then the plume height is adjusted such that the distance travelled from drift velocity is reduced from the plume height.

### 2.4 Building downwash

The presence of buildings causes in formation of eddies and wakes which significantly alters the dispersion of pollutants. The building downwash always require the calculation of a distance dependent momentum plume rise. This model stimulates the equations described below to calculate a distance dependent momentum plume rise at a distance of two building heights downwind from the leeward edge of the building (Christensen, 1997). For buoyancy plumes in unstable, neutral, or stable conditions the plume rise will be as follows

$$h_e = h_s + 1.6 \frac{F_b^{1/3} \Delta T}{U_s}$$  \hspace{1cm} (19)

For momentum dominated unstable and stable conditions, the following equations are used to calculate a distance dependent momentum plume rise respectively:

$$h_e = h_s + \left( \frac{3 F_m x_{U_s}}{B_f U_s^2} \right)^{1/3}$$  \hspace{1cm} (20)

$$h_e = h_s + \left( \frac{3 F_m \sin \left( \frac{xU_s}{B_f U_s^2} \right)}{B_f U_s^2} \right)^{1/3}$$  \hspace{1cm} (21)

### 2.5 Dispersion parameters

Equations that approximately fit the Pasquill-Gifford curves are used to calculate $\sigma_y$ and $\sigma_z$ (in meters) in the model (United States Environmental Protection Agency (USEPA), 1995). These 2 coefficients depend largely on atmospheric conditions and crosswind distance from plume center.

$$\sigma_y (m) = 465.1128 x (km) \tan (TH)$$  \hspace{1cm} (16)

$$TH = 0.017453293[c - d \ln(x)]$$

$$\sigma_z (meters) = ax^b \ (x \ in \ kilometers)$$  \hspace{1cm} (17)

Table 4. Constant values in determining dispersion parameters

<table>
<thead>
<tr>
<th>Stability category</th>
<th>c</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>24.1670</td>
<td>2.5334</td>
</tr>
<tr>
<td>B</td>
<td>18.3330</td>
<td>1.8096</td>
</tr>
<tr>
<td>C</td>
<td>12.5000</td>
<td>1.0857</td>
</tr>
<tr>
<td>D</td>
<td>8.3330</td>
<td>0.72382</td>
</tr>
<tr>
<td>E</td>
<td>6.2500</td>
<td>0.54287</td>
</tr>
<tr>
<td>F</td>
<td>4.1667</td>
<td>0.36191</td>
</tr>
</tbody>
</table>
# 3 Results

This model can be used in identifying the concentration contour lines, spatial point PM concentrations, PM dispersion pattern during emergency situations and the minimum ground level concentration with the relevant ground level distance through graphical representations with numerical figures. Following graph series elaborate the significant results obtained for 6 different stability classes in urban area under ordinary emission conditions. The considered stack height is 10m, emission temperature is 473K and the PM emission rate is 1000g/s.

Very unstable

Unstable

Slightly unstable

Neutral

Stable

Very stable
According to the above 6 graphical representations PM with higher concentrations are tend to stay agglomerated in a large area during stable atmospheric classes while they are distributed away and not even touch the ground during unstable conditions. In neutral atmospheric condition the plume spreads alike in the vertical and horizontal as it propagates downstream, forming a coning plume. It generally forms in sunny days. This condition is comparatively good than the stable condition once health and safety effects are considered. Compared to unstable conditions, the particulates with lesser concentrations fall on ground level much near to the stack.

Further the model can be used in analyzing the predictive plume dispersion pattern once accidental releases (Q= 100,000 g/s) happen in both urban and rural areas.

Huge amount of PM agglomorate and reach ground within considerable distances from stack during very stable condition irrespective of geographical location. In unstable condition within rural areas the
plume center being raised well above the stack and it is well mixed and dispersed in the upper atmosphere.

4 Discussion

The developed model can be used to analyze PM dispersion patterns through several significant aspects to identify the most appropriate emission type in minimizing adverse health effects. The below graph elaborates the variation of maximum distance taken by a PM of concentration 0.02g/s to hit the ground under an emission rate of 1000g/s in the six atmospheric stability classes in both urban and rural areas. The critical PM concentration level and emission rate were taken after analyzing refinery data and these values were taken as reference values throughout the research.

Fig 5. Graph of maximum ground level distance vs stability classes for urban and rural areas under normal operating conditions.

According to this graph, the maximum distance taken by PM to hit the ground along the plume center line in urban situation has gradually increased once stability class goes from unstable to stable. This clearly elaborates that the degree of PM with higher concentrations agglomerating or falling to ground covering a large terrain increases once stability class is stable. Since there is a significant scale of dispersion barriers like tall buildings, bridges, stacks and less atmospheric turbulences in urban area, the dilution of PM is hindered and they try to stay concentrated. It can be seen that the maximum ground level distance is given by Neutral atmospheric condition in rural areas. Since the plume tends to disperse alike in both vertical and horizontal directions and no significant barriers are found the maximum ground level distance is high in this atmospheric condition causing more PM to touch the ground.

Fig 6. Graph of maximum ground level distance vs stack height in urban area for all stability classes.

This graph describes how maximum ground level distance (MGLD) varies with different stack heights in all atmospheric classes in urban area under normal emission rates. MGLD does not show any significant variation with stack height under unstable atmospheric conditions. Since PM are well diluted and dispersed in atmosphere, no considerable amount touches the ground in unstable conditions. But
the MGLD shows a decrease when stack height increase up to 12.5m within stable conditions. PM emitted from stacks with heights above 15m under stable atmospheric conditions does not tend to touch the ground rather stay agglomerated in upper sky causing PM smog formations. Thus it is better to have stacks with heights around 15m-20m if the plant is located in a terrain feeling frequent stable atmospheric conditions such that no adverse PM dispersions are felt.

The above figure is analyzed in depicting out how the MGLD varies with different PM emission rates for the most worst case, stable atmospheric condition within urban areas. It clearly images that the MGLD gradually increases with increasing PM emission rate. The prominent reason is that due to emission of large quantity of PM and less atmospheric mixing considerable amounts of high concentrated PM stay agglomerated and fall to ground covering a large area causing more damage. Once the PM emission rate increases adversely habitats even within 10km of the plant should be evacuated. Thus this predictive model assists operators to take the most necessary safety measurements once an accidental release happens and to identify up to which radii from plant habitats should be safely evacuated.

5 Conclusion
This paper focusses on the implementation of a Gaussian Plume Model to analyze and study dispersion of PM in thermal power plants of Sri Lanka. Once the model was developed, Sapugaskanda oil refinery source and geographical data were analyzed in validating the model. Results revealed that performances of the model were quite sturdy at varying of wind velocity and PM emission rates. The near real-time nature of this model makes it a good predictive tool for regulatory purposes. The results obtained through the model depict out that irrespective of the geographical conditions, source parameters and topographical data, the stable atmospheric condition is the most challenging. The model is useful in obtaining a fair value for a GEP stack height by considering the proposed plant source terms and its topographical variations. Model gives the most suitable distance from the stack where habitats should be placed considering all effecting conditions and elaborates how source terms should be altered such that no adverse PM dispersions happen.

The results of this controlled environment could be extended to real scale phenomena by making a deeper analysis of meteorological and geographical variables in order to find solution for adverse weather and topographical conditions. Further this model could be easily used in optimization of algorithms to identify behaviors of all industrial pollutants sources.

Acknowledgement
The authors would like to thank University of Moratuwa for providing support to this project.

6 Appendix
\begin{tabular}{|c|c|}
\hline
\textbf{Symbol} & \textbf{Description} \\
\hline
\text{ds} & Stack inside diameter (m) \\
\text{Fb} & Buoyancy flux parameter (m$^4$/s$^3$) \\
\hline
\end{tabular}
Fm  Momentum flux parameter (m^4/s^3)
g  Acceleration due to gravity (9.8 m/s^2)
hs  Building height (m)
hc  Plume (or effective stack) height (m)
hs'  Physical stack height (m)
hs'' Release height modified for stack-tip downwash (m)
H  Effective stack height (m)
P  Wind speed power law exponent
Qs  Pollutant emission rate (g/s)
Ta  Ambient temperature (K)
Ts  Stack gas exit temperature (K)
Uref  Wind speed at reference height (m/s)
\(\sigma_y\)  Dispersion coefficient in wind direc
\(\sigma_z\)  Dispersion coefficient in vertical direc
S  Stability parameter

\[
U_s = U_{ref} \left( \frac{h_s}{Z_{ref}} \right)^p
\]  \hspace{1cm} (1)
\[
Q_{tot} = a \cdot Q + Q_s
\]  \hspace{1cm} (2)
\[
h_c' = h_s + 2d_s \left( \frac{V_s}{U_s} - 1.5 \right)
\]  \hspace{1cm} (3)
\[
F_b = \frac{g \cdot V_s \cdot \Delta T}{4T_s}
\]  \hspace{1cm} (4)
\[
F_m = \frac{T_s}{T} \cdot \frac{V_s^2}{4} \cdot d_s^2
\]  \hspace{1cm} (5)
\[
\Delta T_c = 0.0297 \times T_s \times \frac{V_s^{1/3}}{d_s^{2/3}}
\]  \hspace{1cm} (6)
\[
\Delta T_c = 0.00575 \times T_s \times \frac{V_s^{2/3}}{d_s^{1/3}}
\]  \hspace{1cm} (7)
\[
\Delta T_c = 0.00575 \times T_s \times V_s \sqrt{s}
\]  \hspace{1cm} (8)
\[
s = 0.0298 \cdot \frac{F_b}{T_s}
\]  \hspace{1cm} (9)
\[
h_c = 21.425 \cdot \frac{F_b^{3/4}}{U_s}
\]  \hspace{1cm} (10)
\[
h_c = 38.71 \cdot \frac{F_b^{3/5}}{U_s}
\]  \hspace{1cm} (11)
\[
h_c = 2.6 \cdot \left( \frac{F_b}{s \times U_s} \right)^{1/3}
\]  \hspace{1cm} (12)
\[
h_c = \frac{3 \cdot d_s \cdot V_s}{U_s}
\]  \hspace{1cm} (13)
\[
h_c = 1.5 \cdot \left( \frac{F_m}{V_s \times U_s} \right)^{1/3}
\]  \hspace{1cm} (14)
\[
H = h_c' + h_c - (xV_t / U_s)
\]  \hspace{1cm} (15)

PM concentration at ground level (Z = 0)
\[
C(x,y,0) = \frac{Q}{2\pi\sigma_y \sigma_z \cdot U_s} \cdot e^{\frac{-y^2}{2\sigma_y^2}} \cdot \frac{-\mu^2}{2\sigma_z^2}
\]  \hspace{1cm} (16)

PM concentration at ground level along the plume centerline(y=0, z=0)
\[
C(x,0,0) = \frac{Q}{2\pi\sigma_y \sigma_z \cdot U_s} \cdot \frac{-\mu^2}{\sigma_z^2}
\]  \hspace{1cm} (17)
Contaminant concentration at ground level along the plume centerline when the emission source is at ground level

$$C(x,0,0) = \frac{Q}{2\pi \sigma_y \sigma_z U_s}$$

(22)
Determine the stability class \[\text{note 1}\]

Calculate wind speed at the stack height, \(U_s\) \[\text{Eq 1}\]

Calculate the adjusted emission rate \[\text{Eq 2}\]

\(V_s < 1.5U_s\)

Yes

No

Modify the stack height \[\text{Eq 3}\]

No modification in stack height

Calculate \(F_b\) \[\text{Eq 4}\]

Calculate \(F_m\) \[\text{Eq 5}\]

Select the stability category

Neutral and unstable

Stable

Yes

No

Calculate \(\Delta T_c\) \[\text{Eq 6}\]

\(F_b < 55\)

Calculate \(\Delta T_c\) \[\text{Eq 7}\]

\(F_b = 55\)

Calculate \(\Delta T_c\) \[\text{Eq 8}\]

Calculate plume rise, \(h_e\) \[\text{Eq 9}\]

\(T_s - T_a = \Delta T_c\)

Calculate plume rise, \(h_e\) \[\text{Eq 10}\]

Select the minimum of \(\text{Eq 13}\) and \(\text{Eq 14}\)

Calculate effective stack height \[\text{Eq 15}\]

Calculate \(\sigma_z\) and \(\sigma_y\) \[\text{Eq 16} \ % \ \text{Eq 17}\]

\(\Delta T_c\)

Calculate plume rise, \(h_e\) \[\text{Eq 11}\]

Calculate plume rise, \(h_e\) \[\text{Eq 12}\]

Select the minimum of \(\text{Eq 13}\) and \(\text{Eq 14}\)

Calculate effective stack height \[\text{Eq 15}\]

Calculate \(\sigma_z\) and \(\sigma_y\) \[\text{Eq 16} \ % \ \text{Eq 17}\]

\[\text{note 2}\]

Calculate concentration \[\text{Eq 18}\]

7 References

Fig 8. Complete flow diagram of the model


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Quantitative Analysis of Blended Learning in ODL Education

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Abstract

The evolution of internet and communication which was once confined to a limited purpose has now branched into the education sector as well. This compels the era to move towards blended learning which is an integration of online technologies into traditional teaching and learning methods. Though there exists many researches related to blended learning there is no quantitative measure on the degree to which the online technology must be integrated to produce an effective outcome. The distance learning program followed by the Open University of Sri Lanka (OUSL) compels the active participation of students in blended learning in order to channel course related content. This research focuses on the quantitative measure of the Open Distance Learning (ODL) through blended learning to implement a positive effect in reducing the dropout rates and performance of students. Our participants include seventy students registered for academic year 2016/2017 at OUSL. They were randomized into categories that was based on the participation in the face to face presentations and online activities. The students who belong to the respective categories were monitored through their performance in the examination. Based on the outcome the means of postulating the adequate levels of blended learning can be deduced. This research would enable the academics to develop the curriculum in an effective manner which would drive towards the success of the student’s learning process.

Key words: open distance learning, blended learning, quantitative measure

Introduction

Traditional face to face learning in a classroom has been dominant education technique for the last few decades. This is where students and teachers meet together in the same place and at the same time. In this environment the student has the face-to-face communication with the teacher, the ability to raise queries within the classroom and face-to-face interaction with classmates. However, classroom learning is normally fairly structured as students have a regular schedule which limits the flexibility of other activities.

With the drawbacks of face to face learning and the overwhelming growth of internet and information technology, e-learning is becoming more and more popular among all the academia. E-learning enables to transfer knowledge to the student via a computer aided system such as web and computer based learning, virtual classrooms and digital collaboration. There are some differences between some of the e-Learning resources such as: online, distance and blended learning. Online learning is "on demand" and self-directed way of studying without needing to attend classes on campus which takes place via the web. The communication could be established with audio, video, discussion forums, e-mails, chat rooms and et cetera. The distance learning is a technique that engages student with learning materials at home or work and this technique does not include the distance. A virtual learning environment is a tool that encourages the distance learning technique. In blended learning, a portion of the traditional face-to-face instruction is replaced by web-based online learning. There should be in-class activities facilitated by a teacher, online materials given by the same teacher and independent study time for students. It is really important to understand how much of the face-to-face instruction must be replaced by online coursework. There are various ways to define blended learning, it is still a problem to understand how to make blended learning work best for students in order achieve a positive outcome. There many researches emerging with respect to this field. Proctor[1] proposes a spectrum of e-learning as highlighted in figure 1.
Contact learning  Flexible learning  Blended learning  Online Learning  Distance

<table>
<thead>
<tr>
<th></th>
<th>Blended learning</th>
<th>Traditional learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Progress</td>
<td>flexibility in speaking and writing</td>
<td>fixed curriculum (textbook and the ability of the teacher)</td>
</tr>
<tr>
<td></td>
<td>supported by regular testing and coaching</td>
<td>- progress is slow and intangible</td>
</tr>
<tr>
<td>Flexibility of attendance</td>
<td>increase flexibility, reducing wasted time and so producing cost savings lessons are done whenever and wherever the student prefers</td>
<td>rigid schedule: the lesson times and days are fixed</td>
</tr>
<tr>
<td>Cost and efficiency</td>
<td>reduces lesson cancellations</td>
<td>- cost of each hour of learning per student is relatively high</td>
</tr>
<tr>
<td></td>
<td>Provide lessons efficiently and at a relatively lower cost</td>
<td></td>
</tr>
<tr>
<td>Speed of learning</td>
<td>depends on the an individual ability of each student</td>
<td>pace of student progress is determined by the slowest group member in the classroom</td>
</tr>
<tr>
<td>Feedback, correction and tracking</td>
<td>students receive personalized feedback on their progress</td>
<td>teacher may not always have the time to give individual feedback during the lesson</td>
</tr>
<tr>
<td>Technology</td>
<td>use advanced technology to create, deliver lessons to students</td>
<td>does not get the advantage of technology or use it appropriately within a traditional classroom</td>
</tr>
</tbody>
</table>

Figure 1: Spectrum of e-Learning

The blended learning inherently is less expensive than traditional classroom learning. Some universities connect students with teachers via web conference technology in order to create a digital classroom. Most of the open universities use blended learning method to deliver their courses content to students which in turn enhances the quality of education. Osguthorpe and Graham[2] identified six reasons that one might choose to design or use a blended learning system: pedagogical richness, access to knowledge, social interaction, personal agency, cost-effectiveness, and ease of revision. Table 1 shows the comparison of the blended learning and the traditional learning methods[3].

Table 1: Blended learning compared to traditional learning methods

Bloom’s Taxonomy originally developed in the 1950’s, under the leadership of educational psychologist Dr. Benjamin Bloom in order to categorize types of learning objectives to promote higher forms of thinking in education and to define a level of mastery in a classroom. There are six levels: remembering, understanding, applying, analyzing, evaluating and creating depending on the desired outcome at each
level by allocating appropriate activities in order to achieve the desired level of mastery. Each milestone in a blended classroom is best suited to address different learning levels of Bloom’s Taxonomy. Hence, it is really important incorporate the face to face interaction in a learning environment to enforce the quality of activities.

Most of the education specialists argued that the studying of the other educational platforms such as face to face learning is really important to integrate them with blended learning techniques. It requires generating usable evidence to evaluate the quality of the students’ learning experiences and learning outcomes. This research discusses about the degree of weightage of online and the face to face learning environment that formulates in providing the best composition of blended learning by analyzing the success rate of students those have enrolled in the courses at the OUSL.

Methodology

The participants included diploma level students enrolled in the DIST program conducted at the OUSL for the academic year 2016/2017. They were randomized between two groups, group A and group B the first involved in both face to face presentations and online activities, the second in online activities only. The group A was further classified into the following categories: 0 - 25%, 25 - 50%, 50 - 75% and 75 – 100%, where the classifications were based on participation of the students which was extracted from the attendance for the respective activities. The curriculum of OUSL does not require students to participate in the face to face presentations as it is not compulsory for the final grade evaluations. The face to face presentations included participation of students in lectures and practical sessions which included hands on activities and lectures with the instructor. The curriculum of OUSL comprise of continuous assessment that includes two assignments, two mid-year tests, laboratory assessments and one final examination throughout the academic year.

There exists a component known as eligibility criteria, which is deduced based on the formulae that includes all the assessments. This criteria decides if the student is eligible to sit for the final exam. The following formula shows the eligibility criteria for the course “Fundamentals of Programming”.

<table>
<thead>
<tr>
<th>Eligibility Criteria: 1B (CAT, OQ) 0.3 + AVG (LAB) 0.3 + (MP) 0.4 &gt;= 40</th>
</tr>
</thead>
<tbody>
<tr>
<td>B - Best, CAT - Continuous Assessment Tests, OQ - Online Quizzes, AVG - Average, LAB - Laboratory Sessions, MP - Mini Project</td>
</tr>
</tbody>
</table>

The methodology is focused on the number of students who got the eligibility based on the above identified categories in group A.

Results

Figure 2 shows the categories, 0 - 25%, 25 - 50%, 50 - 75% and 75 - 100% which are the percentage participation of the students in the face to face presentations. The graph shows the number of students participated in the lectures with respect to the students who have eligibility in sitting for the final examination. The graph indicates that the participation of students in the face to face presentations have in turn affected their performance in the continuous assessment which in turn has affected the eligibility. The number of students in the category 0 - 25% have approximately less than four students and the category 75 - 100% has almost thirty three students which is almost eight times higher than that of students from the category 0 - 25%. The other categories such as 25 - 50% and 50 - 75% does show a gradual increase in the eligible students which indicates that the face to face participation does increase the performance of the students in the assessments conducted.
Figure 2: Eligibility vs. Participation in face to face presentation activities

Figure 3 depicts the overall eligible students based on the participation of the students in the face to face activities. The chart shows the students who have participated in the face to face activities have a higher number of students that are eligible than the students who have a minimum participation in the face to face activities.

Figure 3: Eligibility vs. participation of face to face presentation
Discussion and further work

The blended learning approach is an innovative method of learning in the field of education in which students have a higher probability of learning and engaging education related content by interacting in a well-structured, semi-supervised environment. From the analyzed results it shows that protecting a level of face to face and real-time interaction even in an online program is essential. In the learning process, the components of online and face to face interaction are stronger together than apart. It is recommended to conduct the very first class as a face to face if possible and gradually making the transition of introducing online related content. The interaction between the instructor and the student is a necessary component that will enlighten the grey area that exists while unfolding course related content. Therefore providing information, contents, instructions and resources both digitally and face to face in a semi supervised environment will be effective in increasing the motivation towards the students in learning. These in class interactions may have a different perspective on students with regard to the concepts rather than the participation of online activities only.

The results show that the students whose participation rate was lower comparatively have achieved lower marks than that of the other students. Therefore the research proves that the face to face component is equally important to enhance the quality of learning and it is recommended to increase the number of lectures or rather the face to face presentations for a particular course in order to achieve a positive outcome. This research can be taken as a guide for the development of curriculum and teaching practices in order to emanate a positive outcome with respect to the students learning experience.

In blended learning students have to engage in depth learning through online and face-to-face activities as the curriculum in ODL have been catered in such a manner that is different from traditional universities. Further, blended learning is not a mere replacement of the traditional face-to-face presentation by technology but stipulated according to the recommended proportion of both online and face to face activities. Though it is impossible to endorse a quantitative measure through this research, it is recommended to incorporate a substantial proportion of face to face activity in the curriculum. Throughout these years traditional learning have been well practiced hence it would be advisable to gradually implement the transition of the proportion of online component in blended learning.

Acknowledgments
We thank The Open University of Sri Lanka for the relevant information with regard to the course, Fundamental of Programming and the students.

References


Recognizing the various aspects to market Halal meat successfully among the people practicing Non Abrahamic Religions: A case study in India

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"Halal" food industries are at a very nascent stage in a multi-racial country like India. "Halal" literally means permissible or in other words it encompasses all actions that abide by all the rules and regulations by the law of Shariah. Consuming "Halal" meat is one of the responsibilities of a Muslim and The Holy Quran expands in various verses the importance of "Halal" food, but what is more interesting is that such type of religiously approved food, specially meat is getting a fast acceptance among the people of Non Abrahamic religions specifically in such cities where a significant number of inhabitants are Muslims. It is true that it is quite challenging to assimilate all the Islamic norms in a non Muslim majority surrounding but astounding "Halal meat" food business is growing at a fast pace in India. The purpose of this research is to identify the various factors which plays a significant role in acceptance of "Halal" food so that it becomes easier for the "Halal meat" industries to grab the market in India. The aspects recognized in this context can work as possible market differentiation factors to make a Non Muslim cognizant about and appreciate "Halal meat". This case study was conducted in three "Halal" food outlet in India and the results can be extrapolated to the entire territory of India.

Keywords: "Halal", Shariah, Abrahamic religion.

1. Introduction:

The term "Halal" is ubiquitously used in modern-day fast food industries and restaurants across India. The term got its secure place not only in the idiomatic expressions in a Quranic context; it also finds its deep entrenchment even in a common parlance of informal communication across the country. The term however is widely misinterpreted and improperly used to denote the way of slaughtering an animal. But in its true veracity the term "Halal" means something which is permissible or an act or an action in strict adherence to the rules and regulations commanded by the Islamic Shariah law. As per the code of beliefs abided by a passionate Muslim it's a Islamic tenet and hence it is a duty laid on them to consume only a food which is prescribed as "Halal" according to the glorious Quran. Even though it is scrupulously very challenging to take on board all the Islamic norms in a Non Muslim majority surroundings the dictum of "Halal" food as explained in minutiae in the Surah " Al Maida" of the Holy Quran and elsewhere in the Holy book as well as in various Prophetic traditions is inflexibly followed by Muslims by and large in India.

India is a multilingual, multiethnic country where the Constitution of India guarantees Freedom of religion to its citizens. In absence of a so called State religion there are no diktats laid down as an obligation on the food item sellers or any enterprises associated with the fast food industry to obtain a "Halal" certification. However according to Islamic religious orders it is imperative on the Muslims to ensure that the food which they consume or any business performed in their lives are clean ,spick and span, healthy and not ruinous to their life as well their well being. There are two sided implications on this issue. First of all the Muslims of this country or at least the religiously fervent Muslims, if not the radicals restrict themselves in consuming fast foods or visiting restaurants for a day's outing with their family in case they are convinced about the type of food("Halal" or non "Halal") are served over there. Further the non Muslims are not cognizant about the food safety and quality issues associated with "Halal" food and hence cannot appreciate the justification of consumption of so called "Halal" food. Worst, the Non Muslims especially the people those how does not follow Abrahamic religions, consider this practice as an extremist approach and with a stretch of their wild imagination they stereotype the act of permissible way of animal slaughtering with cruelty which many of them unmistakably see as a trait of a Muslim.
2. Religious Interpretations of Halal in light of the Holy Quran:

Many Muslims use the word "Halal" even without correctly knowing the Quranic elucidation of the term in its intended sense by Allah (SWT). If the glorious Quran is the verbatim word of Allah (SWT) and if the Quran is the lifeblood of Islam then to lead a life according to the Quranic orders and Prophetic traditions ideally should be a mandate for the Muslims. Verses of this divine book are the words of Allah (SWT) and are full of wisdom. Islam as a chosen religion is perfected by our Almighty as the greatest blessings upon His creation on mankind. Islam is not a religion-it’s a way of life. Its unparalleled philosophy with other religions aims the accomplishment of precision of spiritual life intensifying in morality by drawing an egalitarian approach both in inward and outward sphere of life as a necessary condition for vertical ascent. This outward sphere of life quite comprehensively envelopes all the possible conditions of thriving peacefully in this mundane world. According to an Hadith of the Holy Prophet Muhammad (PBUH) as collected in Shahi Muslim as well as Shahi Al-Bukhari the Holy Prophet(PBUH) said "I leave with you two things. As long as you hold them tightly you will definitely not go astray. They are Book of Allah (The Qur'an) and my Sunnah."

The importance of mentioning Allah's name over an animal to be sacrificed for consumption is immense. These regulations are made on certain living beings in the way we take their lives in order that we recognize that Allah has created all living beings for our use.

"We have subjected the [animals] unto you, so that you may give thanks." "(Quran Surah 22, Verse 36).

"In the name of Allah" in Arabic as "Bismillah" is to be mentioned when the life of the animal is to be taken, is also a requisite condition to differentiate whether a food is "halal" or "haram". Its a meek approach towards our creator and a realization that the food is a mark of largesse from Allah (Al-Muqit), and it is he who nourishes us. Therefore an ardent believer or a people of faith ideally should use this procedure while slaughtering an animal and that will be a condition to make the food "halal".

Verse 3 of Surah Al-Maidah (The Table Spread) of the Glorious Qur'an makes an evident avowal about permissible food by circumscribing the proscribed ones.

"Prohibited to you are dead animals, blood, the flesh of swine, and that which has been dedicated to other than Allah, and [those animals] killed by strangling or by a violent blow or by a head-long fall or by the goring of horns, and those from which a wild animal has eaten, except what you [are able to] slaughter [before its death], and those which are sacrificed on stone altars, and [prohibited is] that you seek decision through divining arrows. That is grave disobedience. This day those who disbelieve have despaired of [defeating] your religion; so fear them not, but fear Me. This day I have perfected for you your religion and completed my favor upon you and have approved for you Islam as religion. But whoever is forced by severe hunger with no inclination to sin - then indeed, Allah is Forgiving and Merciful."

3. The rising demand of Halal food in India:

Muslims must adhere to the "Halal" food standards and abstain from consuming the prohibited food ("Haram"). These foods may be capable of consisting detrimental stuffs that are masqueraded as healthy,(Hall and Balentine,2011). Indian society being largely a capitalistic society where the consumers are free at their own will to decide what to consume is conducive of "Halal" foods getting its acceptance to even non Muslims. "Halal" food issues are becoming booming among consumers demand in India especially to non Muslim acceptance in the large cities where a significant population of inhabitants are Muslims. Cities like Delhi, Agra, Lucknow, Hyderabad, Ajmer and Bhopal are among them to mention a few. Hanzae and Ramezani (2011) postulated that "Halal" is becoming a global symbol for quality assurance and lifestyle choice in the near future. In the milieu of increased demand of organic and natural food which has already started appealing to non Muslim consumers specially the younger millennial generation in India, halal food manufacturers in India have a brilliant opportunity to raise up to global standards a safe, wholesome and humane food by fully adhering to
"Halal" and "Tayyib" as tenets of Islam. The Millennial generations are much more concerned about maintain a good health, food safety issues and environmental hygiene adherence. Therefore an insightful approach on the factors influencing market acceptance of "Halal" food is in crux to further illustrate the reasons behind its acceptance.

4. Identifying the possible differential variables to promote "Halal" food:

4.1 Food quality issues: "Halal" certified products can be used as a new product differentiation variable from other competing products in the light of changing taste and preferences of the consumers which can further be an opportunistic development for global business (Sharif and Abd-Lah, 2012). Lampilla and Lähteenmäki (2007) agreed that processing method of meat can always assume a pivotal role for consumer acceptance. A Non Muslims especially that of a consumer practicing a Non-Abrahamic religion can be convinced because of several factors. It goes without saying that what is considered as a good food will not only qualify in terms of hedonic quality only, it should be characterized by its wholesomeness and freshness. Grunert, Hartvig, Larsen, Madsen and Baadsgraard (1996) divided quality issue of a edible product into four distinct classifications. The prime aspect related to quality dimension of a food product is to appeal to the sensory pleasures and hence are associated with the optical, olfactory and glosso-pharyngeal allurements. Health related quality assures the protection of consumers' physical health. Convenience related quality is related to the expended time for buying, storing, making and consuming the product. And the remaining factor seemingly trivial, but having an impressive impact on determining food quality is the packaging standards. The factors discussed automatically relate to food quality with the acceptance of non Muslims towards "Halal" food generally.

4.2 Animal Welfare: Animal welfare comprehends an array of understand to different stakeholders associated with animal husbandry industries. However in it's more precise sense it indicates to the conditions which the animals receive and as such takes account of terms such as animal care, livestock treatment while they are farmed or during the transportation which takes place when they are taken to a slaughter house. At this juncture certain misconceptions need to be removed from the mind of non believers of Islam regarding the rights which are asserted to in the domain of animal rights. Islamic laws vindicate zero tolerance to all the possible forms of animal abuse throughout the process of animal farming till the consumption of its meat. Humans who have been created with a superior intelligence have an immense responsibility to be reasonable and fair to other inferior co creations. The Prophetic Hadiths underscores the mindful and attentive way of animal slaughterring. The spiritual attributes and quality of the meat is of underpinning interest for consumers seeking "Halal" meat (Farouk et.al 2014). It can well be mentioned at this context that not only Muslims, the devout Jews also consume meats as prescribed in book of Levictus of the Holy Torah. Rahman and Aidrous (2012) in their research paper detailed some of the offensive acts of animal slaughtering, which notably includes cruel handling of animals during transportation. During this process of transportation the animals are beaten up unnecessarily. They are even flocked amass in a narrow unhygienic, overcrowded barns or sheds. Animals are transported to the slaughter houses in small overcrowded ill-ventilated trucks tying them in pairs to reduce the job of the personnel required for herding them. The situation further become worse in hot and humid climatic conditions of India especially during summer and during the monsoons. According to the Shariah Law the correct religious practice of animal slaughterring has to be followed under a strict sequencing of actions. Any deviation from the prescribed method will be construed as an intentional injury to the animal and hence make the slaughtered animals meat not permissible for consumption. At first the animal has to be brought at the place of slaughter and should be gently laid down without causing any harm to it. It is a Sunnah to face the animal towards Qiblah, but it's not a Fard however. The knife which is to be used for slaughterring has to be sharpened and chiseled so as to slaughter in one stroke without lifting or placing the knife. The knife should not be so heavy to kill the animal due to its weight. The knife has to be hidden from the animal from the very last moment till its jugular vein is felt. The windpipe (throat), food-tract (esophagus) and two jugular veins should be cut in a single movement of the knife.
Is "Halal" method painful for the animal, is a question which often irks in the mind of a person who justifies and gathers around collecting opinions against animal slaughtering by "Halal" method from people those who don’t support it. Animal activists assemble in rally with placards in their hands against slaughtering and stage protests in a pretention to empathize about the fate of the poor animal by wearing animal masks. Eventually these people may go back after rally to satisfy their gastronomical urge in a Muslim owned restaurant. A team at the University of Hannover in Germany carried out investigations to divulge the facts and to justify or nullify the arraignments on "Halal" through the use of EEG and ECG records during slaughter. Several electrodes were surgically embedded at several points of the skull of all the sheep used in the experiment. Half of the sheep used in the experiment were slaughtered the Halal way by making a prompt and deep incision with a sharp knife on the neck, cutting the jugular veins and carotid arteries of both sides together with the trachea and esophagus but leaving the spinal cord intact. The rest of the sheep were bewildered before slaughter using a captive bolt pistol method as an established conventional method in Western slaughterhouses. The EEG and ECG recordings were allowed to monitor the condition of the brain and heart throughout the slaughtering process. An unchanged EEG graph in the "Halal" method of slaughtering for the first few seconds after the incision was made indicated that the animal did not realize any pain from the cut itself. The following three seconds were described by a condition of deep sleep-like unconsciousness brought about by the draining of large quantities of blood from the body. Thereafter the EEG recorded a zero reading, indicating no pain at all, yet at that time the heart was still palpitating and the body convulsing briskly as a reflex reaction of the spinal cord. It is this stage which is most unpleasant to onlookers who are falsely convinced that the animal suffers whilst its brain does actually no longer record any sensual messages. On the other method, the EEG readings indicated severe pain immediately after stunning. While in the case of first example, the pain sensation of the animal ceases to exist due to the brain starvation of blood and oxygen (a brain death to put it in laymen’s terms) the second example first causes a stoppage of the heart whilst the animal still feels pain. However, there are no unsightly convulsions, which imply of course that there is more blood retention in the meat. From this experiment it was quite evident that those who outlaw Islamic slaughter, arguing for a humane method of killing animals for food, are in reality more anxious about the feelings of people than those of the animals on whose favor they appear to speak.

4.3 Food safety issues: According to famous food writer and blogger Yvonne Maffei an unfortunate issue which is and an alarming concern in the field of food science is the food contamination issue. In a country like India where approximately 60% of the population consumes meat (includes lambmeat, mutton, chicken and beef) the primary food safety practice is necessary due to rise in expectation and demand by health community. The World Health Organization (WHO) created the Food borne Disease Burden Epidemiology Reference Group in 2007 to study global variation in the impact of food borne disease. After considering the known disease-causing agents that can be transmitted by food, the group categorized 31 hazards as the most essential to incorporate. The group found that these 31 food borne hazards caused 600 million food borne illnesses and 420000 deaths in 2010 worldwide. Results from the study indicate that up to 33 million healthy life years are lost each year due to food borne diseases each year -- a number on par with the "big three" infectious diseases -- HIV, tuberculosis and malaria. Nity, Matthew, Raudah and Nazariah(2012) has mentioned that the concept of healthy ideally comprehends being vigilant over what is consumed by us and gets assimilated to our body and also encompasses the process of handling and preparing the food. The meat we eat, starting from the farm to the table that is in all the stages of value chain, it must have lived a pure life from the very beginning, finishing a cycle of life that is acceptable in accordance with Islamic standards. It must have been fed well, been treated well, and been sacrificed well. The blood trapping within the meat of an animal slaughtered in a western method has a more chance of development of various micro organisms. Among the most important organisms that can cause food borne diseases are Staphylococcus aerus, Bacillus cereus, Camphylobacter jejuni, Escherichi Coli,Brucella, Salmonella typhi and paratyphi to name a few. The mishandling of the animal in the entire process from barn to slaughter house when needless punishment is inflicted on the animals to reach market and abattoirs on time and are also devoid of food
and water. The animals eventually lose weight and fall sick thus it increases higher chances of food borne diseases.

5. Methodology
5.1 Sample Size and Sampling Plan: For the purpose of this research data were collected from three restaurants in the Port City of Haldia, in The State of West Bengal, India. All the three restaurants are owned by Muslims and therefore they maintain a strict “Halal” discipline. These three restaurants are crammed during the lunch hours by students of the nearby colleges. Haldia being a knowledge city has many Undergraduate and Post Graduate Institutions which enfolds this small Port City. 147 male students were interrogated for this particular purpose of conducting this research, out of which 95 students were Hindus and 52 students were Muslims. Judgmental Sampling Technique was followed in this case where the choices of sample items were exclusively dependent on personal acquaintances. Random Sampling was not followed for this pilot study because the direct question of religious orientation has a chance of getting irked during the lunch breaks. Hence for the purpose of the Pilot Study personal acquaintances with the students before hand was assured.

5.2 Data Analysis: Through extensive literature survey three factors were identified which can possibly act as factors to promote faster acceptance of Halal food among Non Muslims. Chi Square statistics is used for testing relationships between categorical variables. Here in this case the first categorical variable is the religion which is followed by the students, and the second one is awareness of how halal food has a relation with the factors which were identified to promote faster acceptance among Non Muslims. The factors which were identified through elaborate secondary research are i) Quality Issues of Halal Food ii) Animal Welfare and Human Practices followed in preparing a Halal food and iii) Food Safety issues of Halal Food. Three Chi Square Tests were done to find out the relation between the categorical variables in this case.

5.3 Results: From the three set of Chi Square Tests Performed it was observed that the Null hypothesis can only be accepted in the last case where as in the first two cases the Alternative Hypothesis was accepted. Hence it can be concluded that there is significant differences in the level of awareness between the Hindu and Muslim population concerning how Food Quality standards are maintained as well as how the concern for Animal welfare and Human practices are austerely followed from “Farm to Fork” in case of Halal food. Hence these factors can be used primarily to promote Halal foods fast acceptance to Non Muslims.

Religion they follow * Awareness that halal food related to food quality Crosstabulation

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Chi-Square Tests

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a. 0 cells (0%) have expected count less than 5. The minimum expected count is 22.99.

b. Computed only for a 2x2 table

Religion which they follow * Whether they are aware that halal food related to animal welfare

Crosstabulation

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Chi-Square Tests

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a. 0 cells (0%) have expected count less than 5. The minimum expected count is 20.87.

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**Religion which they follow * Whether they are aware that halal food related to animal welfare**

**Crosstabulation**

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**Religion which they follow * Awareness whether halal food related to food safety**

**Crosstabulation**

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**Chi-Square Tests**

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Religion which they follow * Whether they are aware that halal food related to animal welfare

Crosstabulation

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b. Computed only for a 2x2 table

5. Conclusions:

This empirical research is attempted to arrive at conclusive evidence in support of the fact that how the concept of "Halal" food significantly varies among the consumers practicing different religions. This research highlights on the factors which significantly differentiate "Halal" food from non "Halal" food at the perceptual level of the consumers. These factors can be used further to promote "Halal" food and gain wide acceptance among Non Muslim Consumers. Halal food have gained a larger presence in many of the North American and European fast food chains in recent years and more and more food companies are following the same to get competitive advantage. Consumers will always feel assured if the transparency is maintained in the food production process and can be further reassured if humane practices are followed from "Farm to Fork" in the entire value chain. India being a capitalistic society where consumers are absolutely at their own will to decide on the food they consume, necessarily is an added advantage to promote "Halal" food. The concept of "Halal" and the health benefits associated with "Halal" food is however quite obscured not only in the mind of Non Muslims, but Muslims as well. This research is definitely not liberated from the shortcomings as this is just a pilot study at three Muslim owned restaurants in the port city of Haldia, India. In reality if the results when extrapolated to the entire territory of India, can give different results from what is anticipated.

References:


Separation of Concerns for Web Engineering Projects

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Abstract
There are over a billion websites on the world wide web (WWW) and more are being added every minute. It is becoming increasingly challenging for web developers, designers and companies to create logically sound web applications which are also appealing to users. A common cause for this conflict is that the individuals who excel at developing the logical components of a web application has less regard and capability to contribute to the aesthetic aspects of the project and vice versa. Many developers and organizations resort to solutions such as pre-built templates which are suboptimal solutions for the project requirements and kills the uniqueness of the web site or web application they are building. While others, typically large companies follow time consuming and expensive methodologies employing tools such as wireframes and mockups which needs to be converted to code by a front end developer and costs time and effort to incorporate changes. The author proposes a methodology in which all the stakeholders involved in the development of a web application use a common abstract model which can be used for automatic code generation, promoting the separation of concerns between the logic oriented stakeholders such as developers, architects and the aesthetic oriented stakeholders such as designers.

Keywords: Web Engineering, Separation of Concerns, Model Driven Engineering

Introduction
In order to produce quality web applications which are appealing to users, attention should be paid to both their logical and aesthetic aspects. This requires contribution from individuals with different skill sets and specializations. Facilitating these individuals to focus on their strengths and not be restricted or dependent on concerns of other stakeholders promotes productivity, resulting in quality projects.

Tools such as Integrated Development Environments (IDEs) which are focussed on development and coding, What You See Is What You Get (WYSIWYG) tools which are focussed on the design and Content Management Systems (CMSs) which were originally meant for simple blogs are commonly being used for web engineering projects in the industry. In one way or another usage of these tools ends up with the designers affecting the information architecture and other structural and logical aspects of the applications and developers or architects affecting the the visual presentation and ergonomics of the application. Some companies and teams avoid this by employing long winded and costly methodologies. They use tools such as graphic design software, wireframes, mockups and diagrams to develop the designs and then the designs are converted to code by a frontend developer. Typically, several iterations of this process needs to be followed through to complete a project.

In this paper, the term ‘artist’ is used to define an individual-who-is contributing to the aesthetics of a web engineering project and the term ‘web engineer’ is used to define a person who designs, creates and maintains logical components of a web application using the proposed framework or a similar tools and other frameworks.

In order for the proposed methodology to solve the problem successfully, after its implementation the artist should be able to change all the aesthetics aspects of the application without coding knowledge and the aid of a front end developer. Furthermore, web engineer’s work must not affect the aesthetics such as component ergonomics on web pages.

There have been several theoretical approaches in tackling this problem. (Fraternali, 1999) has established that Model Driven Engineering Engineering (MDE) techniques have the highest code automation capabilities reducing human involvement in the implementation and that it covers both the
structural data components and the hypertext components across all phases of the Software Development Life Cycle (SDLC). (Picek and Strahonja, 2007) further substantiates this showing that MDE supports maintaining logical consistency across components, adaptability, improved stakeholder communication and improved design communication. The analysis of different MDE approaches by (Aragon, Escalona, Lang and Hilera, 2013) shows that WebSA, WUML and WebML presents promising solutions to the problem being addressed and that WebML is the most practical and comprehensive solution.

This research proposes a suitable methodology and a framework to solve the identified problem in an industrially applicable manner getting inspiration from WebML proposal by (Ceri, Fraternali and Bongio, 2000) and other related literature.

Challenges in applying Separation of Concerns (SoC) in the industry

- The primary challenge is maintaining logical consistency across and within different areas of the application which are designed and created by separate users with minimum side effects impacting the work of the other stakeholders.
- The proposed solution should be time saving and cost effective in order for it to be applicable in the industry.
- The solution should facilitate changeability and extensibility of the application after the initial development.
- The solution should not require stakeholders to go through a steep learning curve to be able to use it.

Any other aspects apart from the identified constraints above, should be handled in a manner that enforces practical applicability.

Proposed Solution

In order to solve the problem, an MDE approach should be employed as identified above. A code generation engine and a Computer Aided Software Engineering (CASE) tool should be developed adhering to the framework proposed. Consequently,

Aesthetic aspects such as

- Page layout and component ergonomics
- Layout of components on a page
- Placement of static multimedia content - logos, other images, videos etc.
- Other CSS Styles - colours, fonts etc.
- Context aware styling, personalized styling.*
- Javascript for animations and events would be designated to the artist.

Logical aspects such as,

- Structure of data and data types
- Processes, process inputs and outputs
- Types of users, access and security policies, context aware data and process outputs, personalization of data and process outputs* would be designated to the web engineer.

Concerns related to the information architecture such as,

- Sections, Pages, Links between Pages
- Components - which data to display on which pages in which form. Which process inputs should be taken on which pages and on which pages should the outputs be displayed in which form should primarily be handled by the web engineer. However the artist could also be given ability to alter only if and where necessary.
- Code generation boilerplate could be chosen by either type of team member. This is further discussed under implementation.

*The model proposed below could be extended to implement these features. CASE Tool providers should provide a GUI enabling these features.
Minimal Model
This section discusses the adoption of a minimal model for the code generation. A structured schema needs to be used to define the model. XML, as proposed by (Ceri, Fraternali and Paraboschi, 1999) or Javascript Object Notation (JSON) could be used for this purpose. However, JSON is more suitable than XML due to the flexibility and simplicity.

Data: Any Web Application handles data. The data model should be structured as individual entities or classes with fields representing data. It is useful to store the data type of these fields even though it is not mandatory since most programming languages used in web scripting does not define strict data types. If derived data such as calculations, aggregates, and values imported from related data objects should be displayed on the application they should also be modelled along with the relevant data objects. Relationships among these data objects could be modelled for integrity checks but is not mandatory.

Processes: The input list, their data types and the output data type of each process should be modelled. The data type could be a primitive type like text, number or a complex type such as location, image or a data type defined by the user in the data model. The inner workings of the process is irrelevant for the problem and does not need to be defined in the model since knowing the inputs and outputs is sufficient for the frontend code generation.

Site Map: The conflict between logical and aesthetic components mostly occurs when designing the presentational and navigational components. The WebML hypertext Model could be used for modelling the site map. The Site Map model should contain the areas, pages, components, links and the attributes related to them. Components such as Data Units, Multi Data Units, Index Units should be mapped to data elements or process outputs defined above. Entry units should be used to create or edit data and to obtain inputs by mapping them to data elements and to process inputs. Non contextual links should be used for linking pages and contextual create the connections among pages and components.

The model recommended above could be considered as Platform Independent Model (PIM) introduced by (Moreno, Romero and Vallecillo, 2008). The proposed framework avoids the use of a Platform Specific Model. Other models such as user model, permission model, context model, adaptation model could be added by extending this model to facilitate the production of complex web applications. As long as the methodology, framework and the guidelines in the paper are followed such extensions will not affect the SoC.

Methodology and Framework
The methodology proposed in this section could be followed with or without development of new tools.

1. Data used in the system should be modelled in a structured manner.
2. Structure of the inputs and outputs of the processes performed by the system should be modelled.
3. The Sitemap should be modeled.
4. The model should be used to generate frontend code. The templates used for code generation needs to be chosen.
5. A special CASE tool, created in compliance with the proposed methodology could be used to define the CSS and frontend javascript.
6. Existing coding tools could be used to implement the inner workings of processes.

The team doesn’t necessarily have to follow the order. They could start from one of the first three steps and go back to any step in the sequence whenever necessary.
When changes are made and committed to the model the team members should be notified if it affects their work.

The artist could be allowed to tweak the information architecture of the sitemap model if and where necessary.

It is imperative that neither the architect nor the designer tampers with the Hypertext of the project. It should solely be handled by the Code Generation Engine.

The generated code should have means to deal with the backend, ideally using API calls.

The backend code including database scripts and processes could also be generated using similar Model Driven techniques with the same or an extended model and is beyond the scope of this paper.

Implementation of Code Generation Engines and CASE Tools

This section provides guidelines to code generation engine developers and CASE tool providers. Diagram 1.1 presents a suitable architecture for implementation of the proposed solution framework.

Diagram 1.1 : Implementation of the proposed methodology and framework

True power of MDE comes from code generation as pointed out by the mentioned literature. Therefore in order to harness the maximum benefits of this proposal a code generation engine should be created along with CASE tools compliant with the proposed methodology and framework.

The CASE tools should allow Web Engineers to declaratively define the model of the application. If the users are code savvy they could be allowed to define the model using a text editor. They could also be allowed to define it using a class diagram or an Entity Relationship Diagram (ERD). However this requires the user to have prior knowledge in UML class diagrams or ERD standards. It is possible to allow users to define the data on a GUI which would be mapped to the adopted JSON format. Regardless of how the users defines the model, finally it should be transformed to match the minimal model in JSON format before being fed to the code generation engine. Each time the user makes changes using the CASE tool or text editor it should be committed to the JSON Model and the application code should be regenerated. Measures should be taken to make the code generation as efficient as possible by only regenerating the changed components. Other users should also be notified of these changes if it affects their work, especially in the case of deletions. This allows users to work simultaneously on the project. Optionally model grammar could be checked to ensure integrity and avoid erroneous code being generated.
Using UML diagrams as proposed by (Moreno, Fraternalli and Vallecillo, 2006) and (Hennicker and Koch, 2001) for process and sitemap modelling creates unnecessary complexity and a learning curve for the users. A GUI based CASE tool or a text editor could be used to define the inputs, outputs and optionally their data types. The developed CASE tools could present a GUI for modelling the sitemap (both presentation and navigation). The model created by the user should then be mapped to the JSON model similar to the data model. The WebML standard provides a suitable notation for a sitemap modeling GUI.

Whether or not the artist should be allowed to tweak the information architecture of the sitemap, varies from project to project and depending on the skills and duties of the artist. The CASE tool could allow artists to alter the information architecture only if and where necessary. To avoid the information architecture being altered as a side effect of changing the look and feel as in CMSs and WYSIWYG applications would be avoided by limiting these changes, ensuring the changes are intentional and committing these changes to the JSON model and regenerating the code without allowing the CASE tool or the user to directly alter the Hypertext.

For code generation custom code generation engine capable of converting the adopted JSON model to code could be developed. Alternatively these engine could port the model to match with existing code generation frameworks and generate the code. The frontend of the generated web application code should have means to deal with the backend ideally using API calls. Backend of the application including database creation scripts, data access functionality and business logic could also be generated using the same or an extended model. Backend code generation is beyond the scope of this paper. However this does not affect the problem in discussion as long as the frontend code is generated following the guidelines in this proposal and further external alterations are not permitted.

A common reason for MDE techniques for not being well adopted in the industry is that the code generation reduces the flexibility of representing data in different ways as revealed in the survey by (Fraternali, 1999). Existing MDE CASE tools have rigid code generation templates. For instance, a collection of data with a label and a number could be represented as a chart, a bar graph, a line graph or any other graph. A location could be displayed simply as text, a link to a map or as a pin on a map. To handle this users should be given the ability to choose from a set of different code generation boilerplates which is more suited to represent the data in a component or a field. Using such boilerplates enables integration of frontend libraries without altering the Hyper Text manually.

Additional project management features and testing features could be integrated to the CASE tools.

**Discussion**
This approach requires a minimum of two members in a team to build a web application. More members could contribute and should be categorized into one of the two types of users. Implementation of this proposal not only ensures Soc it also allows the stakeholders to be independent of the changes and choice of technologies. The stakeholders only have to familiarize themselves with the CASE tools. At the point of code generation different technologies and versions could be selected. Downsides to this approach are the fact that it would be an overkill for simple informational websites and the fact that the web engineer needs to have started working on the project before the artist could start contributing. Even though the logical model does not need to be complete, some pages and components needs to be present for the artist to begin the aesthetic design.

**Conclusion**
There have been several approaches addressing the implementation of SoC for Web Engineering projects. However, these solutions have not been well received by the industry. Abstracting out the model of a web application and creating code generation engines and CASE tools compliant with the proposed framework enables application of SoC for web engineering projects in the industry. This eliminates the need for wireframes, mockups and diagramming tools. Artists could directly contribute
to projects without the need of a frontend developer, while not affecting the logical components of the application. The author proposes a minimal yet extensible model representing data, processes and the sitemap of the application. Code generation engines and CASE Tools should be built adhering to the framework and guidelines specified in the paper. Code generation engines could be developed to generate code using any language and framework enabling the users to be technology independent. To ensure industrial applicability factors such as allowing the users to choose code generation boilerplates should be taken into consideration.

This approach requires two or team members and is an overkill for simple informational websites.

References


Simulation of the polygon penetration algorithm to find the depth of penetration of a object

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Abstract—Here, in this research work, we perform the simulation of an algorithm called as the polygon penetration algorithm to find the depth of penetration of an object into an obstacle, while the object is being transported from the source point to the destination point in the real time in the surrounding environment of the robot. Here, we develop a C program/code to do the simulation. The simulation results show the effectiveness of the method developed by us.

Keywords—Polygon, Penetration, Euclid, Depth, Object, Convex, Centroid, Simulation.

Introduction

In robotics, the path planning & the navigation are 2 important criterias while transporting an object from the source to the destination. In computational geometry, the visibility polygon or visibility region for a point p in the plane among obstacles is the possibly unbounded polygonal region of all points of the plane visible from p.

The visibility polygon can also be defined for visibility from a segment, or a polygon. Visibility polygons are useful in robotics, video games, and in determining positions to locate facilities, such as the best placement of security guards in an art gallery. If the visibility polygon is bounded then it is a star-shaped polygon.

The paper is composed as takes after. In segment 2, a brief presentation about the fine motion planning is given. Next the PPA insight is exhibited in section 3. This is followed by the proposed algorithm and the justification in section 4 & 5 respectively. The developed .C code is presented section 6, which is followed by the conclusions and the references.

Fine Motion Planning

In the robotics world, the fine motion planning plays a very important role while picking up the object from the source & while keeping the object at the destination point. It has to be noted that at these points, i.e., at the source & the destination points, the fine motion comes into picture as even a small amount of distance overshooted by the tool or the gripper will give erroneous results. Hence, in short, this FMP is the motion planning which plays a important role in the accurate positioning of the object [1].

It is that type of motion planning technique which comes into picture when a mobile part or an object comes into physical contact with the surrounding environment of the robot, i.e., when the robot is about the pick the object and when it placing the object. Moving at slow speed is also called as fine motion planning. Fine motion can be defined as the motion in which a mobile part or an object comes into physical contact with the surrounding environment of the robot. One of the fine motion planning could be implemented using the polygon penetration algorithm which is used at the destination point or it can come in between the source and the destination as shown in the Fig. 1 below [1].
Polygon Penetration Algorithm [PPA]

The PPA is defined as an algorithm by which we can find the depth of penetration of an object into the obstacle during its transportation from the source to the goal. A brief insight into how the polygon penetration algorithm is developed is presented as follows [1].

Proposed Algorithm

A algorithm known as the Polygon Penetration Algorithm [PPA] can be formulated to find the depth of penetration of an object into the obstacle. The polygon penetration algorithm is as follows [1]......

Algorithm:

Step 0: Consider a convex polygon P with number of vertices = n, say n = 6.

Step 1: Set k = 1,

\[ d_0 = \text{maximum real and } > 0 \text{ (to be specified).} \]

Generally, centroid G of the convex polygon, P which is a known quantity.

\[ d_0 = G, \text{ i.e., let the object maximum penetrate upto the centroid.} \]

Step 2: Determine the edges of the convex polygon P along with its coordinates as

\[ P = \{(x_k, y_k), (x_{k+1}, y_{k+1})\} \]

Step 3: Compute the parameters of the edge and the depth of penetration using the equations as shown below.

\[ a = y_k - y_{k+1} \]
\[ b = x_{k+1} - x_k \]
\[ c = x_k y_{k+1} - x_{k+1} y_k \]
\[ d = \frac{a x_0 + b y_0 + c}{\sqrt{a^2 + b^2}} \]

\((x_0, y_0) = \text{coordinates of the point p on the mobile object (known).}\)

Step 4: If the computed value of d; i.e., \(d < d_0\), then set \(d_0 = d\).

Step 5: Set \(k = (k + 1)\); i.e., increment the values of \(k\).

If \(k \leq n\), go to step no. 2, ELSE STOP.

Input to the Algorithm

The input to the algorithm is nothing but the coordinates of the point \((x_0, y_0)\), i.e., the vertices of the polygon (or edges).

Output of the Algorithm

The output of the algorithm is nothing but \(d_0\), i.e., the Penetration distance/depth of penetration, \(d_0\).
Justification of the PPA

The results of the algorithm is presented point wise one below the other as follows [1].

- Point p lies inside P if and only if \( d_0 > 0 \) (positive), i.e., object has collided, i.e., the object which is held by the gripper or the tool has collided with the object.
- Point p lies outside P if and only if \( d_0 < 0 \) (negative), i.e., object has not collided. Here, no collision has taken place.
- Point p lies on P if and only if \( d_0 = 0 \), i.e., the object has just touched the obstacle.
- \( d_0 \) : Specifies the amount of penetration of a point \((x_0, y_0)\) into an edge of a convex polygon P.
- Valid for only convex polygons for which each interior angle of the polygon are \( \leq \pi \) radians.
- Also can also be used for non-convex polygons, because non-convex polygons can always be modeled as a union of convex polygons.
- The main aim of using PPA is only to find whether the object has collided with the obstacle or not and we are only interested in the sign of ‘d’ and not the value of ‘d’.

Development of the .C Code for Simulating PPA

In this section, we present the program that we have developed for the polygon penetration algorithm.

```c
/*
Description : To find the depth of a point within a polygon using the polygon penetration algorithm.
*/

#include<stdio.h>
#include<math.h>
#include<dos.h>
#include<iostream.h>
#include<conio.h>
#include<graphics.h>

void main()
{
int k,n,a,b,c,x[10],y[10],xy[20],i,gd = DETECT,gm;
float d[10],d0 = 150000;

int k,n,a,b,c,x[10],y[10],xy[20],i,gd = DETECT,gm;
float d[10],d0 = 150000;

cout<<"Enter the no. of vertices for the polygon : ";
cin>>n;

cout<<"n Enter the co-ordinates of vertices :";
a = 0;
for(k=1;k<=n;k++)
{
    cout<<"nx"<<k<<" : ";
cin>>x[k];
    xy[a] = x[k];
a++;
    cout<<"yx"<<k<<" : ";
cin>>y[k];
    xy[a] = y[k];
a++;
}
x[n+1] = x[1];
y[n+1] = y[1];
```
xy[a] = y[1];
cout<<"ENTER THE CO-ORDINATES OF THE POINT P TO FIND ITS DEPTH\n";
cout<<"x0 = ";
cin>>x[0];
cout<<"y0 = ";
cin>>y[0];
d0 = 0;
for(k=1;k<=n;k++)
{
    a=y[k]-y[k+1];
    b=x[k+1]-x[k];
    c=(x[k]*y[k+1])-(x[k+1]*y[k]);
    d[k]=(a*x[0]+b*y[0]+c)/sqrt(a*a+b*b);
    if(d[k]<d0)
    {
        d0 = d[k];
        i = k;
    }
}
if(d0 < 0)
cout<<"THE POINT P LIES OUTSIDE THE POLYGON";
else
    cout<<"THE POINT P LIES INSIDE THE POLYGON";
getch();
initgraph(&gd,&gm,"c:\tc\bgi");
drawpoly(n+1,xy);
putpixel(x[0],y[0],WHITE);
outtextxy(x[0]+5,y[0],"P");
gotoxy(100,450);
cout<<"THE MINIMUM DEPTH VALUE IS "<<d0;
getch();
closegraph();

Fig. 2: Giving simulation inputs to the algorithm

Conclusions
In this paper, the development of the polygon penetration algorithm is presented. The work can be extended even to the concave polygons also and the mathematical model can be developed, which can be used for programming the robotic system in such a way that the obstacles are detected well in time & avoid the damage to the robotics system. If the point p is inside P, then object is penetrated, if the point p is outside P, no collision has occurred. This is also one of the method to detect collision.
Fig. 3: Output of the algorithm depicting that p is outside P

The main advantages of developing this PPA is to find the collision of a point on the part with an obstacle and sense the presence of obstacles, to perform a planned fine motion of the tool, PPA is used, to help in detection of a obstacle and when we want to control the collision, to avoid collision of the part with the obstacle and to compute the safe distance to avoid collision, to find whether a part has touched the goal surface or not, to find the depth of a penetration of a part or object into the convex polygon (obstacle or surface), to simulate a motion planning problem, to find whether a part has just touched the goal surface or not, to find the magnitude and direction of the reaction force F after the tool touches the surface using a force simulated sensor and use this information to prevent further penetration of the object into the obstacle & to use it to simulate a force sensor for detecting a collision between a vertex of a part or robot and a polygonal surface during a guarded move.

References

“South Asia: Financial Integration ideas & Performance of its Economy/Corporates vs. Peers from other Developing markets”

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ABSTRACT

To understand where South Asia stands vis a vis peer regions, this paper looks at the performance comparison of South Asian economy vs regions like BRICS, ASEAN, NEXT-11, MINT, East Europe, etc, including projections from 2015-2020. It then compares performance comparison of South Asia's Top-200 companies vs companies from peer developing countries that make up BRICS, ASEAN, NEXT-11, MINT, etc. Once the relative standing of this region vs peers is established, it looks at several financial integration ideas that can help leverage this economic opportunity into savings mobilization for capital. Apart from conventional integration product ideas, it also looks at several unconventional financial integration ideas like medical tourism health insurance scheme, solar energy on-grid scheme, master ETF & feeder fund structure, start-up exchange, frameworks, etc between South Asian financial markets. It also looks at a SAARC Asset Class portfolio idea (CDCF portfolio) and compares it to market indices, and shows how it can increase the upside from multiple return enablers, while minimizing the downside due to low-correlation constituents. Lastly, it addresses the main Geo-political challenge of the South Asian region by offering a solution of Anchor partner countries to be investors in such financial integration ideas.

Keywords: (up to 4 keywords). South asia, financial integration, capital market

PAPER

Lee Kuan Yew, credited for converting Singapore into an economic success, once described ASEAN as “Unpromising Start, Promising Future”. This phrase can also describe the South Asian bloc (SAARC), which has seen few successes as geopolitics slowed progress. While other blocs of developing countries look more popular, all is not rosy with them either; be it due to slowdown, inflation, unemployment, commodity prices, etc. In comparison, South Asia doesn’t look too bad. SAARC is an ideal combination of Emerging and Frontier markets with high growth and low correlation to each other. While India is the largest, others like Bangladesh, Sri Lanka, Pakistan and Nepal are not small either. In fact, they are larger than the smaller economies in the peers like Next-11 or ASEAN. Even these groups are skewed towards Korea, Mexico, Thailand, Indonesia, etc. Moreover, the other (Ex-India) markets of South Asia have seen an improvement in their metrics relative to India. Return on Equity and Profit Margins of top companies in Pakistan and Bangladesh have improved relative to India; while Sri Lankan companies have seen buoyant topline growth. These fundamentals cannot be ignored. Investors may argue why they should look at SAARC asset class, and it is better to look at India or Frontier markets (FM) separately as asset classes. However, this combined package helps counter volatility of a single-market exposure. A South Asia portfolio can increase the upside from multiple growth enablers, while minimizing downside due to low-correlation constituents. India benefits from the growth and low-correlation of SAARC’s FMs, while the FMs benefit from India’s size. Such an asset class may also hasten country-specific funds for South Asian FMs, as current FM funds have only a small allocation to them.

Performance of its Economy vs. Peers: Economic projections show the opportunity of SAARC vs peer regional groups of developing markets like BRICS, ASEAN, Next-11, CIVETS, East Europe, EAC, etc. IMF’s country-wise projections show SAARC outpacing others in Real GDP during 2014-2020. Not only is the projected growth in SAARC touted to be higher than any other peer group, but that of SAARC Ex-India is also higher than any other peer group. This shows the growth opportunity
of the other markets comprising SAARC. SAARC’s growth ranks highest even in nominal GDP, not only in real GDP. Nominal GDP has its relevance, as we are showcasing investment opportunity. Equity/debt performance is derived from the profits/EBITDA, which is derived from the revenues. Revenues can be impacted by both price and quantity, wherein price is an indicator of inflation in that country. Difference between nominal and real GDP is this price factor (inflation), which is relevant when showcasing an equity/debt investment opportunity of local companies.

Not only is the growth higher, SAARC’s projected GDP CAGR in the next 6 years will exceed the historical GDP CAGR of the previous 6 years, both in terms of real GDP and nominal GDP. This differential is even wider in case of SAARC ex India. No regional group but for BRICS, Next-11 and East Africa is set to see a significant positive differential, not even ASEAN, the Asian regional peer. Nevertheless, BRICS would be impacted by slowing growth in China, Brazil and South Africa. ASEAN would see high growth in Myanmar, Vietnam and Philippines, but these comprise a small proportion within ASEAN. East Europe ex Russia would see a pick-up due to revival in the former-Yugoslav republics.

But growth is not sufficient; what also matters is the Size created. Size creates the rationale to invest big-time in that market, as it offers economies of scale and operational efficiencies. The incremental GDP that would be created in the next 6 years is the largest in SAARC, after only BRICS. That scale of output will need capital to fuel it, translating into opportunity for finance. BRICS ex China, on the other hand, is far lower due to pressures in Russia. No other group, not even ASEAN or Next-11, would create the sheer economic size as SAARC.
Not only is SAARC a large consumer base, it is building production capabilities across knowledge, services and manufacturing sectors. Even incremental capital formation is amongst the highest in SAARC. Using IMF data for proportion of projected investment to GDP and real GDP, we estimate the capital formation between 2014 and 2020. The incremental investment in SAARC is one of the highest, reflective of the growth in Real GDP and its incremental size, as seen in the earlier graphs. Next-11 is only marginally ahead. BRICS is ahead, but BRICS ex China ranks way lower. Even ASEAN would see lower investments than SAARC. SAARC ex India may be smaller in size, but those countries will see an even higher rate of capital formation than India. SAARC also has a locational advantage in terms of exploiting value-chain opportunities to enhance its economic prospects even further. Next-11 comprises countries which hardly have any proximity or synergy with each other’s economies.

But economic growth and size are not sufficient; what also matters in savings. Savings will determine how much purchasing power the population has for its future, especially to spend on discretionary products and services. SAARC ranks high in savings growth, savings rate, and aggregate savings as of 2020, in comparison to peer regional groups. Financial market penetration is still low in this region, so there is headroom to expand in order to mobilize local savings into financial markets and fuel this expected growth. Using IMF data for proportion of projected gross savings to GDP, we estimate the savings pool in these regions as of 2020. The size of the bubble in the graph denotes the size of the savings pool in $ billion as of 2020. Apart from savings size and growth, we also look at the savings to GDP ratio which is the savings rate. Savings rate is crucial since it has a double-benefit; not only is GDP increasing leading to savings growth, but the proportion saved is also increasing.
Quadrant 1 in the graph denotes regions which would see high CAGR in savings, but the savings rate is a bit lower. Quadrant 2 shows regions with both high savings growth and savings rate. Growth in savings is amongst the highest in both SAARC and SAARC Ex-India. While SAARC ex India will also see high growth in savings, it is in Quadrant 2 because Pakistan has comparatively lower savings rate. The current savings rate of Pakistan is a glaringly low 13%. This needs to increase, given Pakistan’s weight within SAARC.

But savings is not sufficient; what also matters is the distribution of the income. UNDP data shows that SAARC nations have a lower Gini’s Coefficient as compared to other regions. This is based on a simple-average of country coefficients, not a weighted average. This shows the relatively higher level of income concentration in other markets, which restricts their addressable consumer base itself.

**Performance of its Corporates vs. Peers:** As this economic story unfolds, it should translate into a financial story. This is a key reason to look at the SAARC asset class. Performance of Top-200 listed companies in each of NSE India, KSE Pakistan, DSE Bangladesh and CSE Sri Lanka (as per Jun 2015 MCap) shows that the ROE and Margins of companies in Pakistan and Bangladesh have improved; while Sri Lanka has seen buoyant topline growth. Moreover, this was at much lower leverage than Indian companies, indicating they still have further room to raise capital if needed for expansion. (Nepal, Maldives and Bhutan are not covered in Bloomberg).
ROE is highest in Pakistan and Bangladesh. Moreover, Pakistan maintained its ROE while it has declined in other countries. Profit margins and asset turnover are driving the ROE in Bangladesh, indicating efficient management of operations. Pakistan has also seen improved ROE owing to asset turnover and profit margins, indicating efficient management of resources. Taking on leverage can take this growth further, as long as it is in acceptable limits. Leverage creates capacity to fuel future growth, and grow the ROE in the long-term.

If one compares its corporate performance to peer markets from other developing countries – which make up groups like BRICS, ASEAN, MINT, etc – the performance of South Asian markets has still been better. This looks at Bloomberg data of performance of Top-200 listed companies in each of these developing markets (as per Mar 2014 MCap), including Vietnam, Indonesia, Thailand, Philippines, Egypt, Mexico, Nigeria, Turkey, China, Malaysia, Russia, Brazil, apart from the South Asian markets.

Profit margins of corporates of Sri Lanka, Bangladesh and India improved from 2011 to 2014. Even Pakistan, which saw a marginal dip in 2014, has maintained margins above the average of other developing countries.

Pakistan, and other markets in South Asia, have seen ROE improve, due to better asset turnover and leverage. Leverage still remains low in South Asian markets in comparison to most developing markets, which shows further headroom to raise debt and grow the business without breaching acceptable debt/equity levels. This is a key observation, given the over-leveraged nature of most corporate sectors in the world today.
Lastly, while the size of the companies in this region are still small to the developing market peers, in terms of profit per company; it is important to note that these metrics have been improving in South Asian markets in recent years while that in peer markets like Thailand, Malaysia, Indonesia, Mexico, Turkey, Egypt, Russia, Brazil, etc has seen this taper off. Approx. 20-30% of the economic output in markets like Bangladesh, Pakistan and India comprises of Industries segment, but the larger proportion of this is comprised of SME and MSME. Large corporates thus form a small portion of their industrial base; and it is well accepted that larger companies are able to create more jobs incrementally, become more competitive due to better access to technology and innovations, and pay higher taxes to the government raising fiscal income. The smaller companies in South Asia have to become big, if the economic opportunity has to translate into socio-economic growth for its people.

Most SAARC markets have low-correlation to each other, as measured by the quarterly returns of the indices from Dec 2009 to Jul 2015. This is owing to the low business and investment linkages between them. Their growth drivers are mostly internal, like domestic consumption or exports in specific sectors to the West. As the intra-SAARC linkages deepen, the correlation may gradually increase. But till that time, it will help reduce the downside risk as the volatility of one is countered by the others, while the portfolio gains from their growth.

Purpose of Financial Integration ideas: The objective is to discuss possible financial products/activities which this region could explore to help realize this economic opportunity. Such products can mobilize investment flows into regional markets, by providing scope for diversification, yield and risk mitigation; building product depth of the markets; and reducing information opacity.
Ideas discussed include both conventional and unconventional ones. Unconventional ideas convert SAARC’s unique challenges into ideas for financial markets. Products also have to be viable. Hence, a focus is on how to deepen awareness of new/markets so that asset flows increase.

1. **SAARC Asset Class – SAARC “CDCF” Portfolio Basket Idea**

In a region which is unexplored as an asset class, performance will be the kingmaker. One such idea includes the writer’s CDCF Portfolio basket for the SAARC asset class, which selects the best fundamental-performers on a rolling basis. The purpose is to identify a portfolio idea to represent the SAARC asset class, by picking the top performing stocks based on an investment framework. This looked at a concentrated portfolio idea which can perform better than benchmarks. This ‘Consistent Dividend Consistent Fundamental’ idea was on the premise that investing in a concentrated portfolio of consistent dividend paying stocks which have achieved consistency (on rolling-basis) in their fundamental performance at low leverage is better. We conduct a similar CDCF basket experiment in SAARC, using Bloomberg data for 3,151 companies, made up of NSE India, KSE Pakistan, DSE Bangladesh and CSE Sri Lanka. The outcome from 3 rounds of back-testing done for CY2012, CY2013 and CY2014 throws interesting results of the basket’s NAV vis a vis the popular benchmarks. While the NAV’s composition was overtly skewed towards India in the initial periods of the back-testing cycles, the last couple of quarters have seen Pakistan gain within the basket. The tables below show a comparison of the CDCF Basket’s returns and volatility per year with some of the relevant benchmark indices.

The tables also show the correlation and alpha of the basket with the indices.
2. **SAARC Master ETF with Country-wise Dual Feeder/Investment Funds**

   This is a Master-feeder fund structure using ETF and Open-end fund concepts, to channelize monies from multiple countries to equities of multiple countries. It is like any foreign-equity based fund which is sold to more than one country, with a few tweaks in view of SAARC’s unique challenges so that it can plug-and-play into specific markets the investor wants. The single fund can be broken into a master and dual feeder/investment structure, wherein country-wise feeder funds feed the monies into the single entity from the different countries, and the investment from the single entity into different countries is done from country-wise investment funds – hence the usage of “dual”, as a dual feeder-investment fund structure works with the master fund.

3. **Medical Tourism Health Insurance Product**

   A medical tourism health insurance scheme can democratize access to critical healthcare through medical tourism, yet in an affordable way through insurance scheme. Demand for specialized healthcare is increasing, along with relative unaffordability by majority of the population and dispersed availability of facilities. A product like this can make healthcare accessible and affordable, while mobilizing local monies into an investment portfolio for investing in SAARC asset class. The rationale is to provide ‘Access’ and ‘Affordability’ for quality healthcare to every citizen across SAARC by creating a common insurance pool.

4. **Solar Energy Bonds**

   Funding products for solar energy on-grid projects can help mitigate one of its critical challenges – energy. If infrastructure or power bonds can be workable solutions to raise funds for greenfield electricity generation projects, they why not solar energy bonds to raise funds for large-scale solar energy development parks? Solar Energy bonds would largely work the same way. The relevant nodal agency in the countries developing the projects can issue the solar bonds to the public. The bond would be based on that country’s prevailing reference interest rate, and a mark-up premium over that interest rate which gives the bond-holder the appeal of higher yields. Issuance would be limited to one country, since the interest rates have to be accordingly.

5. **Mutual Fund Passporting Scheme**

   This explores the possible sale of mutual funds of one member country to the other member countries, by working on uniformity of fund prospectus contents, guidelines for distributors, etc. This is useful where country B offers limited investment opportunities, and hence country A opens up more investible opportunities to the investors in country B, aiding new asset mobilization and potential investment returns from regional markets. A mutual fund passport can take off at a bilateral level, if it is not possible to launch across all countries at one-go.

6. **SDR Cross-Border Listing (like GDR listings)**

   This explores a listing structure for foreign equities in the local markets through the depository receipt route. Listing in another country’s exchange is a popular method of cross-border integration, facilitating capital-raising by those who need it from the country which has surplus capital. But this also means “single-stock” exposure, which may not be the best course at the initial stage in SAARC’s financial market integration given that the awareness of each other’s economies and companies is still low.
7. Cross-Country Index Futures
This looks at cross-country index futures, either on bilateral basis or on a SAARC asset class, as a product that can connect the local investors with the regional markets. Mini-future contracts have also been introduced by the exchanges which have smaller lot sizes as compared to the original contracts. A SAARC asset class index future can also explore the option to list on exchanges in international financial centres, not just the regional exchanges.

8. Incubation for Start-ups for a SME listing platform
This looks if a boost to SAARC-based start-ups through incubation services can help them scale up, and thus emerge list on a SAARC SME listing platform eventually. This will help increase the pipeline of quality-investible companies in the future, thus fuelling market size in future. Many start-ups are focusing on emerging business themes in their countries, and hence can become an ideal proxy of benefiting from the sectors of opportunity in each of those markets. London Stock Exchange’s Elite Programme is an example of a consultative approach used by a stock exchange for mentoring new companies (though this looks at SME firms).

9. Trading Link between SAARC Exchanges
Trading Link connects regional exchanges, to facilitate trading in all the listed securities by both regional investors and global institutional investors. For regions which are keen to attract institutional interest, this technology-based solution ensures minimal latency at lowest cost. Trading Link as a concept has a practical usage for global institutional investors. If any region wants to evince more interest from global investors, this is one sure way. Structure of a typical Trading Link operates in a Hub-and-Gateway system, like the ASEAN Link.

10. SAARC International Financial Centre SEZ
Implementing a harmonious framework across each country has its own challenges of countering bureaucracy, delays, and lack of will. However, making a separate IFC wherein it would house the requisite regulatory framework for specific integration projects might be an option - if it separates out the country’s existing set of regulations with the new regulations needed to participate in regional integration. This still means achieving a harmonious framework agreeable across all members, but it separates it for the integrated products specifically.

11. Thematic Publications, Inv Frameworks
The purpose is whether thematic publications, investment frameworks can help disseminate information on the region’s emerging opportunities and ideas. This can help address the lack of investor awareness of the regional markets and of SAARC’s opportunity. The existing research reports brought out by the brokerage houses in these countries has a limitation for the SAARC objective. They focus on a specific country, not on the region per se. Deepening the awareness of the region’s investors about the regional economy is a critical imperative to deepen the interest in integrated products; only then will the acceptability increase.

12. Turnkey Consulting, Training for New Products/Markets
Every integration idea need not be a product; it can also be a service. Consultancy to introduce new products in the smaller markets is a precursor to launching integrated products in those markets. This also involves investor education for the local investors. These can build acceptability once integrated products are eventually launched.

Geopolitical realities in South Asia: Any integrated product has to take into consideration ground-realities. Bringing in an anchor partner might help counter implementation challenges in a geopolitically-sensitive SAARC. Such a country has to be one with (a) strong economic partnerships with SAARC members individually, (b) has government/institutional-backed entities involved in investments businesses, (c) is eyeing earning investment returns from making overseas investments from its forex reserves, and (d) is in proximity to SAARC to leverage mutually beneficial regional value-chain opportunities in future. Given these criteria, Asian countries like China, Japan or South Korea come to mind, apart from Western countries like USA, UK or Germany. All of them have economic interests in varying degree with most of the SAARC members individually, and may hold
sway over them to an extent. If any of them do participate, they can gain by investing in the capital markets of a resurging SAARC economy. That does not harm its bilateral economic projects with the individual members, hence that should not be perceived to pose any threat to its bilateral projects. If at all, it is gaining a new avenue of investment returns from SAARC asset class. SAARC members may resist inclusion of an influential non-member like China, Japan or USA, due to fears that it will influence regional decision-making. However, one can draw the lines on the roles in the MoUs itself, making it clear that the role of such an anchor partner is only as a pure-play investor in the SAARC asset class. While this is easier said than done; however, any integration project in SAARC will always face headwinds.

China, Japan or USA may need this proposal as much as SAARC: It is important to remember that all these nations are also seeking external investment opportunities today, to offset to their domestic slowdown to some extent. Hence, they may have an interest in a SAARC project if it can yield attractive investment returns. Let us take China’s case, since China is a disproportionately large bilateral partner of most SAARC members. China is seeing some slowdown as increase in wage rates led to some global manufacturers shifting production. China has already shown its intent towards earnings returns from overseas investments. An investment in a region like SAARC may add value to its investment portfolio.

**Conclusion:** Given the current state of maturity in the region’s markets, some ideas may be implementable now; while some may be implementable in the future as the markets mature. A South Asia asset class can increase the upside from multiple growth/return enablers, while minimizing the downside due to low-correlation constituents. South Asia has young demographics with a relative absence of long-term social security – thus, a longer earning life with a search for long-term inflation-beating investment products. Recent years have seen an increase in cross-border private investment flows in search of better yields. But the number of foreign portfolio funds investing in geographies of South Asia is still lower than those who have allocation to Russia, Brazil or China. Any change in allocation weights may move those monies, at least part of it, into developing countries with relatively better outlook. These funds are critical counter-parties in financial markets. All in all, it is an opportune time to look at South Asia. Recent years have seen new governments in member countries stressing their commitment towards economic development and regional relations. It makes it a hot iron to strike now.

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Image Identification from BoW to Create article

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Image processing and Natural language processing apply to identify images and documents uniquely. However, this achievement is identify historically valued places around Sri Lanka and produce article around those area. We addressing this problem because existing system only provide location through GPS in Sri Lankan context. They are not providing much information. In this method, we train the images regarding those places through SIFT detector BOW feature. We show that system will give 80% of accurate for the given training dataset and can increase the accuracy of system when number of training dataset is increasing. NLP help to produce the article for the identified places.

Keywords: Bag of Word, SIFT detector, Natural Language Processing

1. Introduction

Digital image processing and natural language processing are the current computer technology in world. There are so many research methodology based on these areas. Most of the mobile and web applications use these methodologies to gather information and share them among the people.

Anuradhapura and Polonnaru are the ancient, historical, religious valued places in Sri Lanka. Many local and foreign visitors are visited those places. Some of these places are named as world heritage. There are so many books published based on these places. If we visit those places we need to buy books to identify their historic and religious value. Because there are no information context available around those places. There are might be some sign board, but there are not giving much information. Most people use their mobile phone to search information around places by capturing the image of them. There are so many application available to fulfil that purpose except sri lanka. Some information sources may be available but they are not accurate and up to date.

With the use of technologies people are taking pictures of places they are visiting and try to identify and find information about them and share them with social Medias. But Sri Lankan context we don't have such an application to identify places and gather information. Most of the time people are using Google search, Google image search, Location based services, Image Net [1] to find information. If they are currently at the place there are some sign boards with information, but they are not enough. Currently there is no way to find stories about those places. Apart from that current approaches are unable to provide information about places or monuments which are located in same place and unfortunately most people are don't know about them very much. Location base services are providing only the general information about the place, but not the specific ones which are related to them. Think a situation where you received a picture with attractive place or monument which you don't know and you need to find more about it, With the current context what you can do is show it to a person who is familiar with the place and get the information about the place or share it with social media and get responses. There is no way to do that automatically in current Sri Lankan context. This is also an issue which we identified and want to address.

There are so many resources available but they have duplicated information and inaccurate data. With the modern developments with natural language processing techniques we can reduce and avoid this to a measurable level. Using semantic and other advanced natural language processing techniques we can create and provide accurate and meaningful data to users by removing redundant information [2]. Most of existing solutions are only focused on location based and static based solutions. The proposed solution is not only focused on location based data but also image processing, natural language processing and will consider many more facts. It is intended to identify a place in very accurate manner and provide accurate information as well as the related places which are bond to them accordingly.
The proposed system comprises an image processing component which provides two major functionalities. One is to derive information from the image (descriptors and Exif data) and store them in the system as a vocabulary. Other one is used to search and predict the places or monuments in the images using above stored vocabulary. We use Bag of Word to search the places.

Natural language processing engine is use to create unique, up to date document about a place or a monument. Basically we get the information from the existing historical articles over the internet. Also user can express their ideas through our system. We consider both information when we create the article. This whole system will be a community driven system where users can interactively contribute and search information. System will create a profile for each user and this community will be the major source for collecting information which consists with articles, stories and images about places and monuments.

The reminder of this paper is organized as follows. Section 2 briefly reviews others approaches relevant to BOW and Image processing system. SIFT detector and BOW classification describe in section 3. Section 4 present implementation of image processing engine and NLP engine. Section 5 presents numeric results before the conclusion and further work.

2. Related Work

Low-level local image features, SIFT detector [3] and support bag of word (BOW [4]) are the core of state-of-the-art visual classification systems. These may be enhanced by multi-scale spatial pyramids [5] on histogram of oriented gradient [6] features. Some recent works consider exploiting the hierarchical structure of dataset for image recognition and achieve impressive improvements in accuracy and efficiency [7]. Related to classification is the problem of detection, often treated as repeated one-versus-all classification in sliding windows [8], [9]. In many cases, such localization of objects might be useful to improve classification accuracy performance. However, in the context of large scale visual classification with hundreds of thousands of classes, these common approaches become computationally intractable.

To address this problem, Fergus et al. [10] study semi supervised learning on 126 hand labeled Tiny Images categories, of 315 categories. Lie et al. [11] do research with and 2 million images. On a small subset of 10 classes, they have improve BOF (Bag Of Feature) classification by increasing the visual vocabulary up to 80K visual words.

Where is the Picture [12], Jeffrey's Exif Viewer [13], Online summarize tool [14], Summry [15], Picture.lk [16] are some of the feature works applications use online. Find the places using GPS and summarize the content user given are similar approaches can see through these application.
3. SIFT Detector and BOW classification

Feature matching is at the base of many computer vision problems, such as object recognition or structure from motion. Current methods rely on costly descriptors for detection and matching. We can use SIFT and BOW Feature.

The SIFT key point detector and descriptor [17], although over a decade old, have proven remarkably successful in a number of applications using visual features including object recognition [18], image stitching [19], visual mapping [20], etc. However it imposes a large computational burden especially for real time systems such as visual odometry or for low power devices such as cell phones.

The BOW set of local image patches is sampled using some method (e.g. densely, randomly, using a key point detector) and a vector of visual descriptors [21] is evaluated on each patch independently. This method is a good for near similar images. Not good for different types images. Also this is not implemented for identify [22] rotated images on the same location.

SIFT use to detect key points. So it can't identify images globally. Using “Bag of Word” it can be solved. So we assumed SIFT is best detector and it has three main processes. Which are detecting the key points, compute descriptors and matching key points.

SIFT uses a cascading filtering approach, Where the Difference of Gaussians, DoG, is calculated on progressively downscaled images.

The determinant of a hessian matrix expresses the extent of the response and is an expression of the local change around the area [23]. SIFT detection is non-maximal-suppression of the determinants of the hessian matrices. It shows in above equations.

$$G(x, y, \sigma) = \frac{1}{\sqrt{2\pi\sigma}}e^{-\frac{1}{2} \frac{x^2+y^2}{\sigma^2}}$$

$$\nabla^2 G(x, y, \sigma) = \frac{\partial^2 G}{\partial x^2} + \frac{\partial^2 G}{\partial y^2}$$

In these way we calculate the key points. Each keypoint has location, orientation, and scale. Then we compute descriptors. The purpose of a descriptor is to provide a unique and robust description of a feature. Descriptor can be generated based on the area surrounding an interest point. The SIFT descriptor is based on Haar wavelet responses [25] can be calculated efficiently with integral images.

The SIFT descriptor describes an interest area with size 20s. The interest area is divided into 4 x 4 subareas that is described by the values of a wavelet response in the x and y directions. The wavelet
response in the x and y direction is referred to as "dx" and "dy" respectively, the wavelets used to calculate their response is illustrated in Figure 3.2.

![Wavelets Response](image)

Figure 3.2: The wavelets response. Black and white areas corresponds to a weight -1 and 1 for the Haar kernels [26]

4. Implementation of Image Processing and NLP Engine

Proposed solution is mainly depend on two parts. They are Image processing engine, NLP engine.

4.1 Image Processing Engine

Load whole images from database and compute descriptors using SIFT detector and add those descriptors together using BOW KMeans Trainer. We use Bag of feature to compute descriptors. Because SIFT support to detect key points. Then we cluster those descriptors and create the vocabulary. We save this vocabulary as "XML" file.

The bag-of-features method is largely inspired by the concept of bag-of-words (BoW) [21] which has been used in text mining. In the BoW model, each word is assumed to be independent. In the BoF model, each image is described by a set of orderless local features [23] which includes four key concepts. Local features, Codebook representation, Feature quantization and Image representation are the four concepts. In the local features BoF concept represent as a collection of local properties which is extracted from image descriptors which is calculated through SIFT patches are small rectangular regions centered on interest points. Local features are gathered together and represent them as a codebook. Using K-nearest neighbor (KNN) classifier each feature of the codebook is quantized to one visual word. All these codebook are map with visual words and represent them using BoF frequency histogram identify as an image representation.

Then we load the training data set which are in database and compute descriptors of those images. Here we indicate training dataset as the set of images in different angels. These images taken from the historical, religious valued places around in Sri Lanka. When we select training data set we should include each category images. Places are indicating using word category. Then we add those descriptors using BOWImg Descriptor Extractor and save it as XML file.

Prediction is done using SVM. Load vocabulary file and training data set descriptors file to train SVM through Parameters. To find parameters whenever system give best result use loop. System compute the descriptors of the searched images and predict the result, it is a decimal value which indicate this photo is in which category. System give the result to the user using category table in database.

Clustering (KMeans Algorithm)

To cluster the descriptors of the image by using KMeans algorithm. It is an algorithm to classify features of objects into K number of group. K is positive integer number. The grouping is done by minimizing the sum of squares of distances between data and the corresponding cluster centers [27]. The purpose of K-mean clustering is to classify the data.

Let's discuss how this algorithm works. If the number of data is less than the number of cluster then we assign each data as the centroid of the cluster. Each centroid will have a cluster number. If the number of data is bigger than the number of cluster, for each data, we calculate the distance to all centroid and get the minimum distance. This data is said belong to the cluster that has minimum distance from this
data. Since we are not sure about the location of the centroid, we need to adjust the centroid location based on the current updated data. Then we assign all the data to this new centroid. This process is repeated until no data is moving to another cluster anymore.

4.2 NLP Engine

User’s document of proposed system will be saved in a separate table then each documents is applied through the semantics dictionary for detect and replace same word. Whole user’s documents split by sentence by sentence and store into another table by using Document ID and sentence ID. After that each and every sentences word length is consider for comparing sentence with another sentence for identify the similarities and dissimilarities. When comparing two sentences if length is equal then we have to check the First sentence and second sentence same word id words. Otherwise we have to compare those two sentences Subject, verbs and objects to create the summary of user’s documents.

Users documents are loading into the NLP Engine for getting the summary. Therefore normally user documents are calling one by one and store split the user document by sentences after that those sentences are store in array for do some calculation and store in a separate table for future calculation. semantics dictionary identify the similar meaning words in user documents and only keep the one words by replacing other similar meaning words and store into the another table of database.

Compare one sentence with other sentences to identify the similarities and dissimilarities using developed algorithm using python language. To do that need to calculate the lengths of the two sentences.

In summarization, split the most common sentences from user document is more than 60% common for all the user document then those sentences should take for a one of the summary sentences. Likewise other sentences should be check for the summarization.

5. Experiments and Results

We first conduct experiments using the training data. We analyze the performance by considering the different codebook sizes and Kmeans weights.

5.1. Image processing engine

Ruwanwelimahasaya

Isurumuniya

Jethawanaramaya

Kuttam Pokuna
Fig 5.1: 5 samples from 5 categories in coral database

The Corel database is utilized in this experiment which comprises 500 images from 5 categories [28]. The images are with the size of 256 x 384 or 384 x 256 pixels. The average retrieval precision is used to quantify the performance.

The precision is defined as the percentage of the retrieved images belonging to the same category as the query image. If we choose a Kuttam Pokuna image from the database as a query, and 30 of the first 50 (we totally have 50 dinosaur images) retrieved images belong to the category of Kuttam Pokuna. The retrieval precision is 0.8.

We study the effectiveness of different sizes of codebook and K-means weights on the performance for the image-based SIFT-LBP descriptor. We choose the size of codebooks from 50, 100, 150, 250. The comparison results are shown in Fig. 9. By examining the figure, we can see that size 200 gains the best results on 4 out of 5 categories.

Fig. 5.2. Comparison of retrieval results with different codebook sizes. Size 200 gives the best performance in most of the 5 categories.

5.2 Accuracy Test for NLP engine

First we have manually calculated the total no of common sentences for each category. Here after, we have test our system and again calculate the system generated common sentences for each category. Then we manually find fault sentences that system generate for each category. After that we will find the Precision, Recall and F1 value for each category these factor help us to calculate the accuracy of our NLP engine.

Manually calculate the Total no of common sentence for each category = x
System generate the Total no of common sentence for each category = y
System generate the Total no of fault sentence for each category = z

Precision = (y - z)/y
Recall = (y - z)/x
F1 = 2(Precision * Recall)/(Precision + Recall)

In our User acceptance testing we are using four categories of user documents data and find the summarization for each category manually and automatically.

The above table shows the precision, recall and F1 for each category.
6. Conclusion and future work

In this paper, we have developed BOW to gather information regarding places and produce the article about it after identify the places through images. Overall accuracy of the system is 80%. Accuracy is depend on the training dataset. If we use more images the accuracy will be increased. The problem we faced through this system is, How to identify the outlier images and what can we do to identify them? We overcome this by using BOW and by creating a place where users can help others to find places or monuments by commenting on images which are unidentified by the system. When it comes to creating a single document about the place it was very difficult to merge information from different documents about same thing. We overcome this by doing extraction of common information from documents and showing it first and then list down the different things on documents under author name.

Acknowledgement

This work was done when I’m doing my research at Moratuwa University. I would like to thanks everyone including my supervisor Dr. Lochandaka Ranthunga. Also I would like to thanks my friends and family members.

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[27] K-Means Clustering Tutorial By Kardi Teknomo,PhD

Syntax acquisition by the Sinhala child

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Abstract
Human beings aren’t having the proper competence of language at birth. This research conducted to find how does the child acquire the syntax of language and learn the process of using language in various contexts, and the influence of imitation, comprehension and production on language acquisition. A sample of six children in the age of 1 ½ - 4 years whose first language is Sinhala were selected proportionally to represent word stages as the first research methodology. Grammatical context was studied with the data collected through recordings of children’s natural speech. Secondly, 20 regular constructed utterances, 10 different couple of pictures and 10 different pictures were used to study the influence of imitation, comprehension and production respectively. Thirdly, data obtained through a questionnaire from 50 parents having 1 ½ - 4 children were analyzed. Key findings of the research denote that the Sinhala child obtains the competence of acquiring the syntax of the language with biological and language environmental influence. Additionally, it reveals that the structure of a language directly affects for the order of acquisition. Additionally, imitation and comprehension and the influence of adult directly affect for acquisition. Accordingly, it reveals that the biological competence of acquiring syntax by small child develops with the interaction of the environment and all common universal factors generous to all languages and the parameters specialized for some languages should be developed through the behavioral process.

Key words: syntax acquisition, Sinhala language, child, nature, nurture

1. Introduction
“Language is a system of arbitrary vocal symbols, by means of which human beings as members of a social group and participants in a culture, interact and communicate” (Balagalle, 1995:11). It is the main fact which specifies the human being from others. Although the adult is capable of producing the language correctly with grammatical rules, the child doesn’t have this ability at birth. He learns the language steadily. Many researches have been done in different languages by different researches about the process of acquiring the ability to produce words and utterances as well as to understand the language. Although some researches have been done on second language acquisition of Sinhala language a few researches have addressed the first language acquisition process in Sinhala language. Additionally, a complete research has not done on syntax acquisition of Sinhala child.

This research is carried out in order to find the process of developing the acquisition ability of Sinhala language in first word stage, second word stage, third word stage and complex word stage by Sinhala child. Furthermore, the grammatical structure, word order, the grammatical structure of negative utterances, imperative utterances and questioning utterances and over-generalization of language is studied. Additionally, the influence of comprehension, imitation and production for the acquisition process has been studied. Finally, the influence of care takers for the acquisition of Sinhala child is been studied. All the data are analyzed with the theoretical background and is revealed the realistic process of acquisition by Sinhala child.

The rest of the paper is arranged as follows. Section two explains the research background of language acquisition on Sinhala language as well as on other languages. Section three explains how it solves the problems identified and the hypothesis. Section four presents the experiment results and a discussion on the results. Finally section five concludes the paper.
2. Literature Review

Although a large number of experiments have been done on first and second language acquisition based on various languages, a few experiments have been done with the basis of Sinhala language. (most of the researches have done on second language acquisition. So, the researches which can be used directly for our research are rare. Therefore, we will consider about the researches in the world on this research area based on other languages.

Yanelan huthenloacher, Marina Silva, ekiina Sayimarmann and Subhan Levin researched about the relation among syntax acquisition and the differences of children in 2002. They selected a sample of children who are lived in various social economic levels. And also there they found about whether there is an influence of the input given by parents in pre language acquisition age for the post language acquisition period. A sample of children in 4 years old were used. They highlighted their logic with the data collected by the group of researchers including Hole in 1984. They realized that the children produced the complex utterances as well simple utterances. And the children removed connectives in English language. And also, they revealed that the main differences among children were directly affects for the language acquisition process and the influence of parents is not a very effective factor. In the second level, they realized that the ability of producing pre utterances is directly affects for the ability of producing complex utterances.

Koyenig and Ekolas (2003) and Koyenig and Haris (2005) realized that the child concerns about the care takers as he is receiving the competence of language. Furthermore, it was revealed that the child uses unknown words and some sentence structures with uncertain words to describe the things. And also, it was revealed that when the care takers try to correct the wrong words of children the child tried to use it again instead of the correct word. Accordingly, it was identified that the parental language usage and behavior directly affects for the acquisition process.

In 2007, Estigeribiya studied about the acquisition of yes/no questions by the child. It was revealed that the structure of the child’s yes/ no question structure was similar to the structure of adults’ sentence structure to a certain extent and with the practice and the time the complexity of the structures were differed. Additionally, it was revealed that the child creates the utterances form right to left at first and the parental speech affects for the acquisition of structures for the child.

Accordingly, there are many researches on the above subject area on the basis of various languages. There are few researches on Sinhala language in this field. D.M.K.C.Dissanayake has done a socio linguistic research about baby talk and the acquisition process. It was based on Sinhala language. According to the findings, the baby talk is considered as a special language and the acquisition process affects for each child according to the class and parental input. Furthermore, it was revealed that the child’s glossary is mainly similar to the words produced by care takers. Although the research has not addressed the process of acquisition with a theoretical background, it helps to identify the special features of the infant language.

Additionally, some researches have done on learning and acquisition of Sinhala language as a second language. A comparative study on the above field has done by D.N.Alosiyas in 2005. According to the findings, the hypothesis of Krashen (1985) has rejected to a certain extent. The findings suggested that language learners have a law competence of Sinhala language than native speakers. Although the hypothesis of Krashen was correct for speaking it was false for Sinhala writing competence. Accordingly, it was revealed that the writing ability can be developed by learning while the speaking ability can be developed by acquisition.

Finally, Krishantha Fecricks in 2011 has done a research on learning of mother language with the basis of Sinhala language. It was revealed that the word order of the first language directly affects for the word order of second language.

Accordingly all the researches have been done on different aspects of language acquisition process. But, it is clear that a complete research has not done to identify the real process of language acquisition process by Sinhala child. So, our research considers about the above matter.
3. Methodology

3 methodologies were used for this research for the data collection. In the first stage, 6 children whose first language is Sinhala were selected according to the gender, and age. The age group was 1-4 years old. 3 girls and 3 boys were selected to represent the three word stages including second word stage, third word stage and complex word stage. And the sample was tested for 3 months by recording their natural conversations in their homes as 3 hours per one week. And all the recordings were transcribed and analyzed.

In the second step, the influence of imitation, comprehension and production was tested with the same sample with different 3 methods. For imitation, 20 structured Sinhala sentences with different grammatical categories were used to test the imitation. And 10 different pictures were used to test the production and ordered the sample to produce 3 sentences per one picture. For, comprehension, they were given 20 pictures and 2 sentences per one picture and ordered to select the correct sentence relevant to the image given.

In the third step, the parental / care takers opinions on syntax acquisition and the language competence of Sinhala child were tested with a structured questionnaire. It was given to 50 parents/care takers who are having the children of 1-4 years. Finally, the data collected from the above 3 stages were analyzed with theoretical background.

4. Findings and Discussion

“Language is the central factor in the social life of the infant” (Clark, 2009:21). With the development of the power of thinking the child starts to think about the objects of the world symbolically. Although the thinking is not logical he produces the language by imitating. Consecutively, the child acquires a glossary of words. In the first year, the infant produces one word per a time and follows a regular pattern. After few months with the continuous practice, he produces the words similar to the adult language. Lately, he acquires the ability of producing the group of words. According to Easker Drom, the child is capable to produce about 40-50 words within 5-6 months within the first word stage and instantly the child enters to the multi word stage (1987). The table shows the usage of words within one hour by the Sinhala child. Within this period the child protects the contour of intonation. Furthermore, in every time the meanings of the utterances are not similar to the adult utterances. The context of the single words of the child is wide while the adult’s one word is containing a definite context.

Eg: (aiya:)

(aiya : enna)

(aiya : ko?)

(aiya : denna)

The meaning of the child’s word produces multiple meanings with the context. The table shows the meanings of the single words by concerning 100 single utterances. And it was revealed that these utterances include some grammatical features. The contour of pitch and the time range is somewhat high in this stage. Pronouncing the last phoneme for a long time is the specific feature of this year. The diagram shows the manner of pronunciation for the word “amma ::”.

Diagram 1

manner of pronunciation for the word “amma ::”.

250
The Mean Length of Utterance (MLU) is important for the measurement of the linguistic productivity of the child. The following details show the MLU value of the Sinhala child’s utterances.

**Child 1 (1:3)**

<table>
<thead>
<tr>
<th></th>
<th>Week 1</th>
<th>week 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of utterances</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Produced</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No of allophones</td>
<td>111</td>
<td>115</td>
</tr>
<tr>
<td>MLU value</td>
<td>1.11</td>
<td>1.15</td>
</tr>
</tbody>
</table>

**Child 2 (1:4)**

<table>
<thead>
<tr>
<th></th>
<th>Week 1</th>
<th>week 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of utterances</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Produced</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No of allophones</td>
<td>116</td>
<td>120</td>
</tr>
<tr>
<td>MLU value</td>
<td>1.16</td>
<td>1.20</td>
</tr>
</tbody>
</table>

Accordingly, it is revealed that the child produces the utterances which have some specific characteristics in the first word level.

After entering into the second word level, the child obtains the ability of producing utterances by joining two units. In the first few months, the utterances represent only few similar matters and the features of Sinhala child’s utterances can be shown as follows.

<table>
<thead>
<tr>
<th></th>
<th>do :</th>
<th>o:na</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>pa :</td>
<td>o:na</td>
</tr>
<tr>
<td></td>
<td>ta</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Location</th>
<th>bavva</th>
<th>uda</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>me :</td>
<td>happa</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Repetition</th>
<th>tava</th>
<th>o:na</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a:ye</td>
<td>denna</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rejection</th>
<th>mata</th>
<th>apa :</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>baba</td>
<td>bx :</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Negation</th>
<th>atta</th>
<th>nx:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>bavva</td>
<td>nx:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>visibility</th>
<th>me:n</th>
<th>maiyo</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>me:</td>
<td>bo:le</td>
</tr>
</tbody>
</table>

| invisibility          | bu:n   | giya  |
vatta giya

Showing a:n bavva

something me: bo:le

Indefinateness happek
dotta kenek

Examples me : bo:le
be : pa:ta

Quantity maiyo godai

Table 1
similar matters and the features of Sinhala child’s utterances in the first stage

The child acquires the ability to produce the complex utterances with the context and one utterance includes several meanings. The utterances in this age, includes grammatical features. In the third word level, the child produces the utterances by joining three units as well as the number of units produced is also increased. The following table shows the development of the utterances in different ages.

<table>
<thead>
<tr>
<th>Age</th>
<th>No. of utterances within 1 hour &amp;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3 child</td>
</tr>
<tr>
<td>One word stage</td>
<td>20</td>
</tr>
<tr>
<td>Second word stage</td>
<td>60</td>
</tr>
<tr>
<td>Three word stage</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 2 The development of the utterances in different ages

The deep structure of the utterances is similar to the adult utterances and the grammatical features are highly included. Changing the word order, usage of intonation, negation, usage of exceptional word orders, are the specific features of this age stage. Finally, the child enters into the complex utterance stage and there the child expands the previous utterances with a complex structure with more correct grammatical features. The vocabulary is rich and the MLU value increases around 3.16. With reference to the development of the utterances from the one word stage the complexity can be identified.

Expressions

MLU 1.21 (bavva)
MLU 1.31 (bavva uda)
MLU 1.92  (ape: bavva uda)
MLU 2.54  (ara ape: bavva uda)

Questions
MLU 1.21  (bavva)
MLU 1.31  (bavva ko: ?)
MLU 1.92  (amma: bavva ko: ?)
MLU 2.54  (amma ape: bavva: ko: ?)

Orders
MLU 1.21  (onnx)
MLU 1.31  (jo: o:nx)
MLU 1.92  (baba:ta jo: o:nx)
MLU 2.54  (baba:ta tava jo: o:nx)

Cancelling
MLU 1.21  (apa:)
MLU 1.31  (akkun apa:)
MLU 1.92  (baba: akkun apa:)
MLU 2.54  (amma: baba: akkun apa:)

Negation
MLU 1.21  (nx:)
MLU 1.31  (kukku nx:)
MLU 1.92  (baba: kukku nx:)
MLU 2.54  (baba: bo:tale kukku nx:)

Table 3
Development of MLU value in different stages

The order of words is similar to the standard word order of the Sinhala language and different sentence structures are used in different occasions in order to express the same meaning. Although a large amount of complex sentences are produced in this stage the child produces some complex sentences in two word and three word stages too. The following graph shows the percentage of the utterances produced in various stages.
Accordingly it was revealed that the child acquires the knowledge of the language at birth and gradually it develops in various stages and the grammatical knowledge in different ages develops with the help of interaction with parents and imitation.

With the development of the grammatical knowledge, the structure of the utterances produced in various stages is differed. And the grammatical context of these expressions develops with the time and the practice. It reveals from the over generalization regards to the features such as singular/plural, tense and gender of Sinhala words.

Imitation, comprehension and production are the three behavioral processes which are affected for the acquisition process. In the second stage, we researched about the above three factors.

It was revealed that the ability of imitating develops in different word stages and in some cases, although the child has the structure of the complex utterance in mind he cannot produce that complex structure as the spoken ability is not developed properly. Additionally the amount of words in the utterances produced in second word stage gradually develops in different stages. Accordingly although the imitation affects for the acquisition process, it affects for the competence of producing utterances with respect to the time, ability of speaking and memorizing and the development of the capacity.

Comprehension is also affects for the acquisition process. It was revealed that the experience, memory, capacity of the memory affects for the language comprehension. If the complexity of a sentence is low the competence is also low. And also, for the comprehension of a sentence the length of the utterance is affected. But for the creation of an utterance it does not highly affect. Production is also correlates with this factor. Accordingly, the child’s comprehensive level was at a law level in the one, second word levels and it was developed with the regular maturity of the child.

The competence of production depends on the age and the capacity of memory. As the competence of production deals with the meaning comprehension is also correlates with this fact. It was revealed that the competence of production developed with the development of the child. Accordingly, it was revealed that the above three factors directly affect for the acquisition process.

In the third step, the parental/ care takers’ input is a very affective fact for the language acquisition of child. As the child acquires his first language with structured conversations and inter-functionality the guidance of the adult is a key factor of the above process. According to Wales in 1981, mother plays a major role in this process and therefore they are aware of the behavioral process. With the collected data from 50 parents, the starting period of using language is 10-12 months from the birth.
and the maturation and development is also caused for the language competence. This confirms the findings of Arnold Gegel who researched about the influence of development fact for the acquisition. He revealed that the innate factors directly affects for the acquisition process without the influence of other environmental factors (Hafield, 1962:49). So, it could confirm that the physical development is affected for the language competence. And also, it was revealed that the average age of starting to produce sentences by combining words is 1 ½ years from the birth. Furthermore, it was revealed that most of the parents use various tricks for the development of the language acquisition of the Sinhala child. But, some parents did not use any trick for this process and their children’s progress of language usage was at a low level than other children whose parents used some methods. The 4 table shows the methods used by parents and the amount of parents. The child produces the utterances with repetition and reducing function words and it helps for the development of the language competence. And also it could reveal that the input affects for the acquisition process and the interaction among caretakers and children is a main factor for the above process. The table 4 shows the influence of input for the language competence.

<table>
<thead>
<tr>
<th>Child who spends time with parents</th>
<th>No of utterances produced</th>
<th>No of new words</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child who spends time with parents</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>Child who spends time with caretakers</td>
<td>17</td>
<td>05</td>
</tr>
</tbody>
</table>

Table 4 Influence of input for the language competence

With the data collected, 7 parents expressed that the Sinhala child uses the language naturally and according to 13 parents the child uses the language with their experience. Although the 30 parents’ opinion was that the Sinhala child acquires the competence with both innate competence and experiences. According to J.A.Hadfield the environment plays a major role while the innate factors are not important. But the behavioralism suggests that the behavior is mostly affected and the environment does not affect. But, with our research findings it was revealed that the environment makes a great influence for the process. Furthermore, it revealed that the external factors including the gender and family background affect for the acquisition. And in the age of 3 years the child acquires the ability of producing the parental utterances more correctly. It was revealed that the parents allow children to learn a second language and the child does not having the same competence for using the second language.

5. Conclusion and Future work

This study presented the acquisition process followed by the Sinhala child. It revealed that the child acquires the competence of producing the utterances with the influence of language environment and biological influence. And it was revealed that the imitation, comprehension and production affect for the acquisition process respectively. The influence of caretakers/parents was also a major fact for the acquisition process in Sinhala language society. Accordingly, this research which was conducted with the basis of Sinhala language, will covers a certain empty space in linguistic research area and this will open the approach for new researches to find about the influence of personal factors (social and economical) as well as the influence of input in acquisition process on the basis of Sinhala language.
Acknowledgement

I would like to extend my gratitude to all the members of the sample who helped in collecting data. I also thank Mr. Krishantha Fedricks (senior lecturer) who supervised me.

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The involvement of women as home-based workers in Indonesia: profile, contributing factors, and implications to their life condition

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Abstract

Indonesia has experienced the process of economic globalisation for decades. Along with economic globalisation, the size of the informal economy in Indonesia has been changing over time. Now, in Indonesia, approximately more than fifty percent of women who work in non-agricultural sector are occupying informal employment. One form of informal employment that are held by most women is home-based work. This paper aims to explore the involvement of women in home-based works in Indonesia in the context of globalisation. This paper is a literature study adopting qualitative analysis technique on the results of previous research and other secondary documents. Even though the real condition of the informal economy in Indonesia tend to be invisible and no more than statistical estimates, this study found that home-based works are occupied by women from poor households with low education level. It is also found that they produce various types of product and are involved in diverse industries. Women’s involvement in home-based works cannot be separated with the context of globalisation. There is an indication of the phenomenon of “housewifisation of labour” involving the discourse of patriarchal ideology and capital accumulation. Their involvement in home-based works influences their life condition at least on three issues: income, working time, and health. However, it tends not to influence the gender relation within the household.

Keywords: globalisation, informal economy, home-based works, women

Introduction

Indonesia has experienced the process of economic globalisation for decades. Its integration into the global economic system was started in 1967 when the New Order regime adopted a liberal economic policy. Indonesia’s role in globalisation was later strengthened by the structural adjustment programmes adopted in 1983 and 1998, as responses to the economic crisis in those periods. As a logical consequence of the expansion of investment integration (Hirst & Thompson 2002), current economic globalisation in Indonesia can be simply identified with its foreign investment rate. The total inflows of foreign direct investment to Indonesia in 2015 reached $22.6 billion. Indonesia also recognised as the major host countries for investment with other several developing countries (UNCTAD, 2016).

In the setting of developing countries, such as Indonesia, economic globalisation has dramatically changed the assumptions about the formal and informal economy in terms of geographic coverage, actors, and the power dynamics (Meagher 2013). In contrast to the formal one, informal economy refers to the production activities, companies (informal sector) and jobs (informal employment) which are not legally registered and beyond the reach of local labour regulation (ILO, 2013). The informal economy has a significant role in the Indonesian economy, and its existence increases the chance of the poor to participate in the labour market. Along with economic globalisation, the size of the informal economy in Indonesia has changed. (Alatas & Newhouse 2010) estimated that by 2003, the informal economy was sustaining 42 percent of employments. However, during 2003-2007, due to Indonesia’s 6.3 percent annual GDP growth, the formal sector was estimated expanding by an average of 1.3 percent annually. Various studies show that women are the majority in the informal economy. In Indonesia, approximately 72.9 percent of women who works in non-agricultural sector are occupying informal employment (ILO, 2013). One form of informal employment that are held by most women is home-based work, and in some countries, particularly in Asia, it represents a significant share of total employment (WIEGO, 2017). The concept of home-based work can be referred to two subcategories (ILO, 2015): (1) self-employed workers who are independent in designing, producing, marketing their
products but cannot be considered as small businesses, (2) putting-out workers who is dependent to be subcontracted by intermediaries and paid on piece-rate basis. Therefore, this paper aims to explore the involvement of women in home-based works in Indonesia in the context of globalisation.

**Method and Materials**

This paper is a literature study using an inductive - deductive approach in observing the selected problem. It attempts to explore the facts about women home-based workers in Indonesia, and then relate them to relevant concepts of *housewifisation of labour* (Mies, 2007), *global feminization* (Standing, 1999), *women and employment* (Mayoux, 2000, Salway Et al., 2005). This study adopts qualitative analysis technique to the results of previous research. In the implementation, this paper also uses quantitative data to reinforce the arguments. Secondary source analysis is also conducted on formal regulation and law documents. The unit of analysis in this research is Indonesia, so the researcher limits his analysis to data and information on the informal economy, home-based works, and gender analysis in Indonesia.

**Results**

*The profile of women home-based workers in Indonesia: number, characteristic, and the type of works*

The real condition of the informal economy in Indonesia tend to be invisible and no more than statistical estimates. Rothenberg et al., (2016) argued that it was arduous to measure the size of the informal sector in Indonesia since the regulation and definition of ‘informality’ frequently change. Therefore, the size of home-based work as part of informal employment and the representation of women in this kind of job is difficult to identify. Moreover, Doane (2007) stated that in census data, women in South-east Asia are usually classified as housewives or considered to be only earning secondary income for the household. Thus, women home-based workers tend to be excluded from the category of “workers”. However, there are several case studies on home-based workers in Indonesia that are successful in revealing their conditions.

Studies have shown that there is a strong relationship between poverty and informal economy. Households tend to be poor when their breadwinners are occupying informal employment. In Indonesia, home-based works are often occupied by women from poor household who often appear as the “main breadwinners or co-breadwinners in the family” (Doane 2007). Home-based works become part of their livelihood strategies in the condition of limited work opportunity. It is also evident by the finding by Allen et al. (2015) that in six provinces in Indonesia, putting-out work is dominated by women from poor households. Moreover, their spouses predominantly work also in informal sector occupying low-skilled services, agricultural works, etc.

In terms of education, depicting the exclusion from formal labour market, the family of home-based workers tend to be less educated. Allen et al. (2015) found that Indonesian women putting-out workers tend to have lower levels of education than the overall population. Furthermore, their spouses are also poorly educated (Cameron et al., 2001). Similar with other informal employment, home-based works itself does not require a high level of education. The nature of the jobs, which is not requiring special skills and knowledge, do not consider the degree of education in the recruitment process. Besides, women home-based workers, especially in putting-out work, enter this kind of employment through informal networks. It is discovered by Allen et al. (2015) that women are involved in putting-out work schemes for social networks such as friends and neighbours who can act as co-workers and employers. Likewise, Sofia (2008) found that kinship became a major factor in the recruitment of home-based workers in the putting out the system.

Similar to home-based workers in other countries, women home-based workers in Indonesia produces various types of product and are involved in diverse industries. They are participating in labour-intensive activities in textiles, food, garment, footwear, electronic, household crafts, pharmaceuticals, etc. (WIEGO, 2017). While self-employed women are working alone and tend to be more independent, women putting-out workers are in the supply chain of various level of production of a commodity (Allen et al. 2015). Some women work directly with employers, and some women work through intermediaries. The first group are usually located in small and medium scale industry, while the latter
related to the large industry (Dewayanti and Chotim, 2004). The size of the industry also determines the types of commodities produced by women putting-out workers.

Discussion

What are the factors contributing to the involvement of women as home-based workers in Indonesia?

The involvement of Indonesian women in home-based work cannot be separated with the phenomenon of “housewifisation of labour” (Mies 2007) which is involved the discourse of patriarchal ideology and capital accumulation. In economic globalisation, this phenomenon occurs throughout the world and uses the construction of patriarchy on women, homes, and domestic sphere as a strategy of capital accumulation. By reinforcing the domestic sphere as the primary locus of work, discourse about the “work-family balance” is presented to charge women as labour and housewife at the same time.

Along with the economic globalisation, the transfer of business activities from developed to developing countries, such as Indonesia, occurs very rapidly. There is a pressure from the market to the capital owners to get a cheap, flexible, and productive way to produce competitive products. Therefore, many companies shift to informal employment arrangements, through outsourcing or subcontracting (Carr & Chen 2002) to ensure the capital and profit accumulation during their production process. Standing (1999) argued that there is a direct link between the need for more flexible labour market which then formed as informalisation and the increasing number of women workers around the world. Indeed, the Indonesian women’s involvement in home-based work certainly is influenced by the trend of informalisation of work.

From the political side, Indonesian government supporting the trend by reforming the labour regulation. The protective labour regulation is eroded and changed to the more market-oriented law (Standing, 1999; Mies, 2007). At least since 2003, as a part of structural adjustment programmes which suggests liberalisation of economic and market –including the labour market, the Government of Indonesia through the Labour Act No. 13/2003 provides an opportunity for investors to do informalisation of their activities. In chapters 64 and 65, companies are allowed to delegate some of their non-core production function to another company (outside their facilities) which is commonly known as outsourcing system. However, in the law, the distinction between core and non-core activities is unclear. Moreover, the monitoring system is weak since it is decentralised to 514 district and municipality governments. Thus, in the implementation, the law experiences a variety of abuses. This loose law is the primary source of the emergence of putting-out work from the formal sector.

In addition, the Indonesia’s economic liberalisation which is concentrated in urban areas in Java and Bali islands –out of seven big islands– and the Asian financial crisis in 1998, have led to the increasing of informal sector which taken forms as micro and small enterprises in rural areas. The statistics show that there was increasing coverage of micro and small enterprises in the period of crisis. In 1998 from 2.217 million industries, 96 percent of them are small, and household crafts industries which absorb 5.302 million workers, while in 1999, from 2.538 million of business units, 98 percent of them was small and household crafts industries and can absorb 6.119 million workers (Dewayanti and Chotim, 2004). Although some enterprises are registered in the government’s database and actively pay taxes, the employment relationship is often informal, and the production process is mostly operated in or near the house because of their limited financial capacity. They do not provide labour protection, standard minimum wage, and a day off (such as parental leave) for the workers. Meanwhile, self-employed works also emerge as coping strategy that was conducted by women to help the financial condition of households (Doane 2007).

On the other hand, discourse on "work and family balance" in Indonesia is still pervasive. It was strongly supported by the policies of the New Order government, a military authoritarian regime, ruled in 1967-1998 (Izzati 2016). The government implemented gender politics that confirms the role of women as
complementary of male power status. The ideology of state-ibuism which tried to analogue the state as domestic construction became the basis of the emergence of Indonesian women's organisations: Dharma Wanita and Family Welfare Empowerment. These two organisations are the embodiment of segregation of roles of women and men, in which the men are represented by the military personnel and women through the institutions in charge of supporting the pursuit of men’s work in development. In several cases, the religious rhetoric on the division of labour in the household also plays an important part. It is common in Indonesia if religious leaders and public figures indirectly campaigning their interpretation on women’s reproductive role in the household.

These trends then influenced the Indonesian “women and men's experience and their interpretation of reality” (Levy 1996) on gender role division in the household. There is a justification for the informalisation of work—the creation of home-based work—carried out by women. In this case, the community—not only women—feel benefited by the presence of a job with flexible hours and are done at home, so women will be able to carry out their housework. A similar trend was found by Gallaway and Bernasek (2002) that a woman's decision to work tend to be decided by the size of the responsibilities of housework they have. The presence of infant or toddler will make them tend to choose jobs that can be done at home so that the “work and family balance” can be achieved.

What are the implications of this trend for their life conditions and for gender relations in the household?

Due to its nature as informal employment which is beyond the governmental regulation home-based works tend to burden women with many risks. The absence of protection systems and the place of work which is isolated from information and opportunity to join labour union make the life condition of women who are involved in this employment vulnerable. Besides, gender relation in the household is also influenced.

However, there are little differences of problems experienced between women putting-out workers and women self-employed workers. Women putting-out workers can be assumed have more disadvantaged condition since they are more dependent on their employer and there are tendencies for them to be exploited and abused by the system of putting-out works. Meanwhile, women self-employed workers are freer to determine the time allocation, the control over resources, etc. The issues encountered by putting-out workers are also more complicated than self-employed workers do. At least, there are three issues on the condition of women home-based workers that are experienced differently between putting-out workers and self-employed workers.

First, the income issue. In Indonesia, there is no regulation on a minimum standard of home-based works. The district and municipality governments are only responsible for determining minimum wage standard of formal employment through negotiation process among workers union, companies, and government. Thus, putting-out workers in Indonesia have lower income than the minimum standard. The condition tends to be worsened by the high patriarchal perception on putting-out works as secondary sources of income for the household. In their study, Rahmawati et al. (2013) found that factory owners in Batik shirts industry assumed that putting-out work is a secondary job that does not require special skills and can be done at home, so it is reasonable that the wage received is also small. In many cases, women putting-out workers are usually paid by piece-rate and magnitude of rate is determined by the employer and intermediaries without any space for negotiation (Allen et al. 2015). The level of education automatically does not become a variable in determining the wage. As part of the patriarchal perception, Sofia (2008) in her research also found that there is wage discrimination given to women and men, where women earn lower wages than men.

Second, the working time issue. While formal employment has limited working hours, due to its nature as works that is carried out in the domestic sphere, the time allocation in home-based works is not fixed and fully under the authority of the workers (Mies 2007). Women home-based workers may assume

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31 Ibu means mother in Indonesian language
that the flexibility of working time is an advantage because they can do another household works, but, in some cases, it leads to self-exploitation. As found by Sofia (2008) that the Bag crafters, who are paid by piece-rate, will tend to exploit themselves to work overtime because they pushed the desire to get the maximum results. In some cases of self-employed women, they are not only responsible for the production process, but also the marketing process. Related to the discourse of “housewifization of labour”, for Indonesian women home-based workers, time poverty can be worse since they have to balance between a productive and reproductive role in the household.

Third, the health issue. As stated by Mayoux (2000), that the poor women who work tend to experience worse health status, both for themselves and their children. With the absence of work safety standard, both self-employed and putting-out workers and their family members are vulnerable from materials they are working on. Allen et al. (2015) found that women putting-out workers in Indonesia are vulnerable from products having a detrimental effect on health directly. For instance, shortness of breath is usually experienced by putting-out workers who are gluing foam pads on helmets for motorbikes. Health condition is also related to the self-exploitation issue. Self-exploitation experienced by women putting-out workers Indonesia leads to worsening health status. There is also a tendency to stress in women putting-out workers in Indonesia being unable to meet targeted results. In many cases, while they face health problems caused by their works, they do not access health services due to lack of health insurance and their limited financial capability.

Related to gender relations within the household, Salway et al. (2005) stated that women's earnings would not directly make them have the same power as men because socio-culturally the meaning of women and men's employment have been different. Moreover, in Indonesia context which has a strong patriarchal view, men is still considered as the supreme decision maker in the household. Thus, women's work is not necessarily accompanied by the independence of women in the household. Moreover, women who are occupying home-based workers tend to have a greater dependency to the patriarchal order. Their involvement in home-based works perpetuates the construction of women subordination and exploitation in the household (Izzati 2016; Mies 2007). Their primary obligation is doing reproductive roles, and the income earned by them is considered as additional income since it does not necessarily increase their well-being. Therefore, it can be assumed that in Indonesia, home-based works does not necessarily give a significant influence on gender relations between women and men in the household.

Conclusion
The involvement of women in home-based work in Indonesia is still invisible from statistical data. Therefore, it is difficult to understand the number and holistic characteristic of them. However, many studies have resulted valuable findings in the understanding of their profile and type of work. Home-based works tend to be occupied by women from low-income and less educated household. These findings describe the exclusion of poor women to the formal labour market (Salway et al. 2005). Indonesian women home-based workers are involved in the various type of industry, such as textiles, food, garment, footwear, electronic, household crafts, etc. They are located on a different level of global supply chain and entering the employment from the informal channel.

The idea of “housewifisation of labour” of global capitalist system plays a major role in influencing women to be involved in home-based works. In Indonesia, a strong patriarchal ideology which is maintained during the New Order regime meets with the realm of the globalisation of Indonesia’s economy requiring flexibility in labour markets and causing an economic vulnerability in the rural areas in Indonesia. Informalisation of work then become a common incident which is accepted by women, community, and the capital owners. Findings from Allen et al. (2015) that about 80 percent of women putting-out workers in Indonesia have a little awareness of gender equality supported this notion. Moving the works from factories to houses become customary that is not only underpinned by the legal framework, but also the needs of women to be staying at home. Home-based works in some degrees are accepted as a livelihood strategy for poor women who cannot leave their home.
However, the invisibility of this employment tends to make women home-based workers, especially putting-out workers, the victims of capital accumulation. Exploitation of income, time, and health become the most dominant suffering of women who have to do production and reproduction role at the same time. The condition of women home-based workers is then worsened by their isolation to information and labour union. Moreover, home-based works are not changing the gender relation in the household; even it perpetuates the bond of patriarchal ideology to women’s participation in the labour market. As what is stated by Mayoux (2000) that when there is an increase in incomes derived from women family members, there may be no change in control of the revenues, men continues to be the driver of the financial source.

Reference


5 from http://www.sciencedirect.com]
THE PHASE TRANSFORMATION OF QUARTZ FROM $\alpha$ TO $\beta$ AS EXAMINED BY IN-SITU HIGH-TEMPERATURE X-RAY DIFFRACTION

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Abstract

The simultaneous determination of composition and lattice constants due to the phase transition of quartz has not been received considerable attention yet. The effect of heating on composition and lattice constants of quartz has been investigated by high-temperature X-ray diffraction technique. The X-ray diffractograms were initially recorded with progressive heating at around 25, 200, 400, 600, 800 and 1000 °C. The phase transition of quartz was further investigated by obtaining X-ray diffractograms at 1 °C intervals between 570 °C and 575 °C. Results indicated that the composition variation was initiated close to the transition temperature where the phase conversion was eventually occurred between 572 °C and 574 °C. The phase transition was enduring until the $\alpha$-phase was completely converted to $\beta$-quartz and the transformation was accomplished at around 574 °C. The stability of the crystal lattice was further established through an infinitesimal rearrangement of the $\beta$-quartz structure to stable quartz- $\beta$-high. A significant expansion of the unit cell volume was observed at 600 °C (117.21 Å$^3$, 4.54%) from the initial volume (112.12 Å$^3$). It is also found that the unit cell volume expansion is accounted from the elongation of lattice constant in all crystallographic directions. A substantial increase in unit cell volume was observed during the initial stage of the heating and insignificantly changed during the phase transition period and beyond the completion of the transformation.

1. Introduction

The phase transformation of quartz from $\alpha$ to $\beta$ has been received substantial attention throughout past few decades (Heaney and Veblen, 1991). The $\alpha$$-$$\beta$ transformation, therefore, comprehensively investigated under different aspects including transition mechanism, thermodynamic stability, phase configuration (structure), phase symmetry and transformation kinetics, etc. The early discovery of $\alpha$$-$$\beta$ phase transition of quartz by Le Chatelier in 1889 based on thermal expansion experiments provided the platform on numerous research attempts on a similar topic that has been intensively implemented under different analytical techniques and mathematical models (Le Chatelier, 1889). The bending of the primary bonds instead of breaking was initially thought to be the mechanism of phase transformation in quartz (Gibbs, 1925, Bragg, 1925). According to the definition by Buerger, the $\alpha$$-$$\beta$ phase transition is, however, regarded as a classic second-order displacive phase transition (Buerger, 1951). The discovery of phase transition through an intermediate (incommensurate phase) eliminates the concept of classic second-order displacive transition mechanism where the incommensurate phase eventually separates $\alpha$ and $\beta$ stability fields (Dolino et al., 1984, Dolino, 1988, Hatta et al., 1985). The transformation is further described in terms of two consecutive steps where the initial transition from $\alpha$-quartz to the incommensurate phase is a weak first order while the subsequent transition from incommensurate phase to the $\beta$-quartz is a second order transition (Heaney and Veblen, 1991). Moreover, several investigations were executed frequently under different analytical techniques to understanding the phase transition of quartz in-depth that include neutron scattering (Tucker et al., 2001, Tucker et al., 2000, Dolino et al., 1984), Raman scattering (Shapiro et al., 1967), transmission electron microscopy (Heaney and Veblen, 1991), nuclear magnetic resonance (Spearing et al., 1992), and X-ray powder diffraction (Damby et al., 2014, Pagliari et al., 2013), etc. Despite the mechanism and thermodynamic stability of the phase transition, the simultaneous estimation of composition and unit cell constants close to the phase transition temperature, however, has not been received considerable attention yet. The temperature dependence of $\alpha$ and $\beta$ quartz makes the process reversible, hence, the reverse conversion from $\beta$ to $\alpha$ frequently occurs below the phase transition temperature. As a result, the simultaneous determination of the composition and lattice constants by conventional analytical techniques is somewhat complicated. The main objective of the present investigation is, therefore, to
estimate the mineralogical composition and lattice constants (a, b, c and unit cell volume) related to the phase transition of quartz. As the most imperative characterization technique, high-temperature X-ray powder diffraction (Rigaku Ultima IV X-ray diffractometer equipped with high-temperature attachment) is employed to investigate the phase transition of quartz in detail. The X-ray diffractograms are recorded in situ at specified temperatures with progressive heating. The composition and lattice constants (a, b, c and unit cell volume) are estimated by analyzing relevant X-ray diffractograms at different temperatures with aid of PDXL 2 software, ICDD (International Center for Diffraction Data) database and Lattice Geometry equations (Cullity, 1956). Besides, the Thermogravimetric analysis (TGA/DTA) is also employed as a supportive tool for determining the phase transition temperature and thermal behavior of quartz in terms of weight loss. The similar technique (in situ high-temperature X-ray diffraction), however, has not been previously used for investigating composition and lattice constants of quartz during the phase transition to the best of our knowledge.

2. Methods and materials

A suitable amount of finely powdered quartz (> 99%) was initially placed inside the groove of the platinum sample holder of high-temperature attachment (HTA) of Rigaku Ultima IV X-ray diffractometer (with copper target [CuKα radiation] and scintillation counter as the detector, see Fig. 1). The X-ray diffractograms were subsequently recorded at specified temperatures (25, 200, 400, 600, 800 and 1000 °C) at a heating rate of 10 °C per minute with measurement conditions similar to the scan rate of 4.0 deg min⁻¹ and sampling width of 0.05 deg (X-ray tube conditions; voltage: 40 kV; current: 30 mA and X-ray power: 1.2 kW and slit combination of Divergence slit: 2/3°, Scattering slit: 2/3° and Receiving slit: 0.45 mm). The detailed analysis of the phase transition phenomenon was executed by narrowing down the temperature range as desired. Therefore, the quartz sample was heated between 570 °C and 575 °C where the X-ray diffractograms were recorded at 1 °C intervals. The composition change of quartz parallel to phase transition was estimated quantitatively using PDXL 2 software and ICDD database by considering Relative Intensity Ratios (RIR) of both phases. The lattice constants (a, b, c and volume) due to the phase transition were estimated by applying the d-spacing values of selected X-ray peaks (based on the Miller indices) in Lattice Geometry equations (Cullity, 1956) given below. Besides, the phase transition temperature and the thermal behavior of quartz in point of weight loss during the heating process were determined using TGA/DTA analyzer (SDT Q600 V20.9 Build 20).

\[
1/ d^2 = 4/3 [(h^2 + hk + k^2) / a^2] + (l^2 / c^2) \tag{1}
\]

\[
V = a^2c \sin 60 \tag{2}
\]

where h, k, and l are the Miller indices of diffraction plane and d is the distance between adjacent planes that responsible for diffraction of the X-ray beam at a specific diffraction angle of 2θ. Besides, a, b and c are the lattice constants and V is the unit cell volume.

The percentage unit cell volume expansion of quartz at each temperature was calculated according to the following equation.

\[
UVE = [(UV_T - UV_{25}) / UV_{25}] \times 100 \% \tag{3}
\]

where UVE is the percentage unit cell volume expansion while UV_T and UV_{25} are the unit cell volume at temperature T (T = 200, 400, 570, 571, 572, 573, 574, 600, 800, 1000 °C) and unit cell volume at 25 °C respectively.

3. Results and discussion

The X-ray diffractograms recorded at specified temperatures are employed in estimating the mineralogical composition and lattice constants (a, b and c) related to the phase transition of quartz. The rough estimation of the composition is achieved by X-ray diffractograms obtained from 25 °C to 1000 °C where the α-quartz is the only polymorph present below the transition temperature while β-
high above the transition temperature. The significant change in peak positions (diffraction angles) of both α and β quartz is hardly observed except several diffractions (X-ray diffraction peaks). The Miller indices, however, occasionally differ even for a similar peak position of both polymorphs (e.g. major diffraction peak at around 26° (2θ) for both polymorphs aroused from two different Miller planes where (011) plane for α-quartz and (101) plane for β-quartz respectively, see Fig. 2a). The exact composition changes relevant to the phase transformation of quartz are determined using X-ray diffractograms obtained between 570 °C and 575 °C (Fig. 2b).

The phase transition was initiated at around 572 °C where the appearance of β-quartz phase can be primarily observed (31% by weight). The substantial change in composition was observed when the temperature increased by 1 °C from 572 °C to 573 °C that was further accounted for 71% β-quartz and 29% α-quartz at around 573 °C (Fig. 3). In fact, both polymorphs of quartz were simultaneously existed in different ratios at around 572 °C and 573 °C. The phase transition was accomplished at around 574 °C subsequent to further stabilization of the β-quartz phase to more stable β-high phase by infinitesimal rearrangement of the structure. However, the detection of the incommensurate phase during the phase transition is impossible by X-ray diffraction technique due to the transient existence of the incommensurate phase over 1.3 °C interval at phase transition temperature (Heaney and Veblen, 1991). This can be further exemplified considering the low stability of the incommensurate phase and its inconsistent structural deformations during the phase transition as an intermediate that separates the α and β stability fields (Heaney and Veblen, 1991). Therefore, instead of intermediates involved in the phase transition mechanism (e.g. incommensurate phase), the composition and lattice constants due to the phase transition were cautiously estimated using PDFXL2 software and ICDD database.

The unit cell volume expansion of 2.19% is observed initially when the temperature increased from 25 °C to 400 °C. The maximum unit cell volume expansion, however, observed due to the phase transition of quartz where the volume is increased by 4.54% (117.21 Å³, α-quartz) from the initial unit cell volume at 25 °C (112.12 Å³, α-quartz) (Table 1). Although the unit cell volume increased gradually during the initial stage of heating (from 25 °C to phase transition temperature), the unit cell volume is slightly increased beyond the phase transition temperature due to the further stabilization of the crystal structure acquiring beta-high form. However, during the phase transition, there is a small increment in unit cell volume of alpha quartz even though the values insignificant from each other. Likewise, the unit cell volume of beta quartz is also increased slightly above the phase transition temperature and net unit cell volume expansion is eventually insignificant at high temperatures (Table 1). Despite the composition and lattice constants alteration due to the phase transition of quartz as determined by in-situ high-temperature X-ray diffraction (results obtained by this investigation), the similar unit cell volume variation was reported with neutron diffraction studies by Tucker et al. without differentiating the individual volume expansion of both α and β quartz (Tucker et al., 2000).

A considerable increase in lattice constants (a, b and c) in all the crystallographic directions (x, y and z) was observed throughout the initial stage of the heating until the phase transition was commenced (Table 1). The elongation of lattice constants is hardly observed during the phase transition and above the phase transition temperature, however, minor fluctuations of the unit cell dimensions along three axes are simultaneously occurred (Table 1 & 2). The thermal energy catalyzes the phase conversion of quartz by overpowering the lattice energy required for structural rearrangement of α-quartz to β-quartz. It can be concluded that the unit cell constants along all the crystallographic directions are increased simultaneously during the initial stage of the heating that results in the gradual unit cell volume expansion at the early stage whereas insignificantly increased during and above the phase transition temperature.

TGA/DTA curves revealed that the weight loss of quartz during heating was negligible since there was no significant reduction in weight even at 1000 °C (Fig. 4). However, the DTA curve explicated the fact regarding the phase transformation of quartz and coincides with the results of X-ray diffraction. The endothermic curve between the temperature 37 °C and 570 °C was accounted for the gradual absorption of the thermal energy that eventually influenced on unit cell volume expansion parallel to the elongation of the lattice constants. Likewise, a sharp endothermic drop at around 573 °C is clearly
observed for the rearrangement of the α-quartz structure to β-quartz during the phase transformation (Fig. 4b).

4. Conclusions

The composition and unit cell constant alterations during the phase transition of quartz were estimated by in-situ high-temperature X-ray diffraction technique. A substantial increase in unit cell volume is observed during the initial stage of the heating and insignificantly changed during the phase transition period and beyond the completion of the transformation. The maximum unit cell volume expansion parallel to the elongation of lattice constants was initially observed at around 600 °C (4.54% expansion compared to the initial volume at 25 °C). The unit cell volume was insignificantly changed around 117 Å³ above the temperature of 600 °C. The present study further revealed that the composition of quartz is changed rapidly close to the phase transition temperature. It is also evident that 1°C increment in temperature from 572 °C to 573°C significantly changed the composition where the transformation is eventually accomplished at around 574 °C. The rearrangement of the β-quartz structure to more stable quartz-β-high form is predominantly observed at the completion of the phase transformation. It is hoped that the similar technique will assist in understanding the effect of impurities and other modifications of quartz on phase transition. Besides, the effect of rapid cooling subsequent to the heating of quartz should be investigated further since the present technique unequipped with a specific unit for rapid cooling of the material. The estimation of microstructure parameters related to the phase transformation of quartz is also possible with high-temperature X-ray diffraction and the similar topic is currently being investigated as an extension of the present work.

5. Acknowledgement

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6. References


**Figures**

![High-temperature attachment (HTA); (a). Properly positioned HTA; (b). Furnace chamber of HTA; (c). Platinum sample holder](image)

**Fig. 6.** High-temperature attachment (HTA); (a). Properly positioned HTA; (b). Furnace chamber of HTA; (c). Platinum sample holder
Fig. 7. X-ray diffractograms of quartz; (a). from 25 °C to 1000 °C; (b). from 570 °C to 575 °C

Fig. 8. The mineralogical composition of quartz during the phase transition

Fig. 9. (a). Temperature dependence of unit cell volume; (b). TGA/DTA analysis of quartz
### Tables

**Table 5 Temperature dependence of the lattice constants and % unit cell volume expansion**

<table>
<thead>
<tr>
<th>Temperature (°C)</th>
<th>Phase</th>
<th>a (Å)</th>
<th>b (Å)</th>
<th>c (Å)</th>
<th>UV (Å³)</th>
<th>UVE (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>α</td>
<td>4.903</td>
<td>4.903</td>
<td>5.3856</td>
<td>112.12</td>
<td>0.00</td>
</tr>
<tr>
<td>200</td>
<td>α</td>
<td>4.9238</td>
<td>4.9238</td>
<td>5.3952</td>
<td>113.28</td>
<td>1.03</td>
</tr>
<tr>
<td>400</td>
<td>α</td>
<td>4.9496</td>
<td>4.9496</td>
<td>5.4003</td>
<td>114.57</td>
<td>2.19</td>
</tr>
<tr>
<td>600</td>
<td>β-high</td>
<td>4.9813</td>
<td>4.9813</td>
<td>5.4546</td>
<td>117.21</td>
<td>4.54</td>
</tr>
<tr>
<td>800</td>
<td>β-high</td>
<td>4.986</td>
<td>4.986</td>
<td>5.4451</td>
<td>117.23</td>
<td>4.56</td>
</tr>
<tr>
<td>1000</td>
<td>β-high</td>
<td>4.9781</td>
<td>4.9781</td>
<td>5.4534</td>
<td>117.04</td>
<td>4.38</td>
</tr>
</tbody>
</table>

*UV – Unit cell volume; UVE – Percentage unit cell volume expansion; a,b and c – Lattice constants*

**Table 2 Temperature dependence of the lattice constants (during the phase transition of quartz)**

<table>
<thead>
<tr>
<th>Temperature (°C)</th>
<th>Phase</th>
<th>a (Å)</th>
<th>b (Å)</th>
<th>c (Å)</th>
<th>UV (Å³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>570</td>
<td>α</td>
<td>4.9642</td>
<td>4.9642</td>
<td>5.4552</td>
<td>116.42</td>
</tr>
<tr>
<td>571</td>
<td>α</td>
<td>4.9687</td>
<td>4.9687</td>
<td>5.4616</td>
<td>116.77</td>
</tr>
<tr>
<td>572</td>
<td>α</td>
<td>4.9742</td>
<td>4.9742</td>
<td>5.4523</td>
<td>116.83</td>
</tr>
<tr>
<td></td>
<td>β</td>
<td>4.9984</td>
<td>4.9984</td>
<td>5.4107</td>
<td>117.07</td>
</tr>
<tr>
<td>573</td>
<td>α</td>
<td>4.9733</td>
<td>4.9733</td>
<td>5.456</td>
<td>116.87</td>
</tr>
<tr>
<td></td>
<td>β</td>
<td>4.9956</td>
<td>4.9956</td>
<td>5.401</td>
<td>116.73</td>
</tr>
<tr>
<td>574</td>
<td>β-high</td>
<td>4.9734</td>
<td>4.9734</td>
<td>5.4592</td>
<td>116.94</td>
</tr>
<tr>
<td>575</td>
<td>β-high</td>
<td>4.9816</td>
<td>4.9816</td>
<td>5.4419</td>
<td>116.96</td>
</tr>
</tbody>
</table>

*UV – Unit cell volume*
The Relation between Demographic Factors and the Employees’ Intention to Quit in Free Trade Zones in Sri Lanka

Wasantha Rajapakshe*

Abstract

Most important assets of any organization is employee. Thus, organizations spend a lot for recruitment, selection as well as retention of employees. Therefore, reducing employee voluntary turnover and employee retention is major concern for any organizations. The problem of employee retention is depending on many factors among demographic factors are important. The main objectives of this study were to examine the major demographic factors affecting the employees’ intention to quit in the Free Trade Zones in Sri Lanka. Quantitative approach was employed with structured questionnaire among 950 workers in 13 Free Trade Zones in Sri Lanka and 568 were responded. A research hypothesis was tested to determine whether there is any significant difference between the demographic factors and the intention to quit. Analysis of variance and multiple classification analysis and descriptive statistics were used to test the hypothesis. The results of the analysis of variance show that age, length of service and family income significantly affect to the intention to quit in the Free Trade Zones. Marital status and education do not affect the intention to quit at the 0.05 level of significance. However, the results of the multiple classification analysis shows that employees who were below 22 years old, have service of less than 3 years, have a family income below US $60.00 per month, married employees and pass the GCE (O/L) had a significantly higher propensity to resign.

Keywords: Demographic Factors, Intentions to Quit, Free Trade Zone

1. Introduction

Most important assets of any organization is employee. Performance of any profit or non-profit organizations depend on commitment of the employees who engage in organizational activities. Thus, organizations spend a lot for recruitment, selection as well as retention of employees. Managers more concern about to practice person to-fit-job concept. In addition, invest money for training and development, employee well-being and improving quality of work life. Therefore, reducing employee voluntary turnover and employee retention is major concern for any of those organizations.

After establishing Free Trade Zones (FTZs) in 1978, it was recognized that an increased in the proportion of employment in the Zones majority of them young women. The number of employees in the Katunayake FTZ in 1979 was 5876. It was increased to 53289 by 1992 (Boyenge, 2007). The total workforce in the EPZ’s in Sri Lanka was nearly 258,185 at the end of 1997 and 294,381 in 1998. The total employment in the FTZs were 4.4 percent of the total work force in Sri Lanka. (Central Bank of Sri Lanka, 1999: 61-62). Despite the contribution and the rapid growth of the industry, in recent years there has been recognition that employee retention in the Free Trade Zone has been decreasing rapidly. The total workforce in 2002 was 330,000 reduced to 283, 000 in 2011; 126,366 in 2012 and 86328 in 2016. (Prasanna, et. al, 2013; Padmasiri, et.al, 2014; BOI, 2017).

In order to face the future challenge successfully, the zones need to maintain a skilled labor force. According to BOI sources, although employment opportunities for skilled laborers are available in the export processing zones, the vacancies could not be filled due to a shortage of workers. Board of Investment in Sri Lanka identified 16,000 job vacancies in Free Trade Zones in Sri Lanka in 2014. (Hiru Business News, 2014). In 2017 number of job vacancies have raised up to 35,000. (The Daily News, 2017). Moreover, the unemployment rate was 4.5 percent in 2016 and estimated 4.8 in 2017, even though FTZs generated more employment opportunities. (The Department of Census and Statistics, 2017). According to Central Bank sources, unemployment among females was 7.6 and
among males was 2.9 percent in 2016. Another salient feature of the unemployment in 2016 was higher unemployment among persons with General Certificate of Education, Advanced Level (8.3 percent) and General Certificate of Education, Ordinary Level (5.9 percent). (Central Bank Report, 2016).

This evidence proves that the employee turnover issue is interrelated with a national issue like unemployment. Therefore, solving the problem of employee turnover will help solve this social issue. The success of the FTZs, depends on the ability of its employees and how effectively they are managed in order that they help organizations achieve its objectives. Managers in the FTZs have no clue or tools to help them determine how the employees are doing and whether employees’ satisfaction is at a critical state. Furthermore, many firms may consider the turnover situation as simply part of ‘doing business’ in these FTZs. Once the human resource managers are notified of employee dissatisfaction, it is generally too late because the employee has already left.

Many retention studies have focused on causes and effects in many other factors but pay less attention to demographic factors. To date, comprehensive and substantial studies have not been conducted to determine the direct causes of turnover in the FTZs in Sri Lanka, though some women’s researchers and organizations have undertaken studies on women’s problems in the workplace. This lack of research could be attributed to the fact that, even though low level of employee retention causes financial losses and social issues, the problem is often ignored because the issues are indirect and hidden. Thus, the need for an empirical survey in these zones is essential to identify employees’ real causes for leaving the FTZ in order to formulate policy to maintain employee retention. In this context, it is important to research which demographic factors that may affect employees’ intention to quit. The main objectives of this study are to examine the major demographic factors affecting the employees’ intention to quit, and to make recommendations to resolve the problem.

2. Literature Review

Beach (1990) introduced a specific theory, Image Theory, to understand the employees’ decisions to quit. This theory focuses on new aspects of employee turnover. According to Beach, people have a set of images for different domains of their lives. The main images are work, family, friends, recreation, and ethics/spirituality. Further, images can be clearer or less clear, easy or hard to articulate, and strongly or weakly held. Beach suggested that decisions would be easier and quicker to the extent that the former conditions hold. This image theory concept is much more related to labor turnover in the FTZs. For example, jobs in the FTZ may fit not only with the image of doing a job but also with the peoples’ attitudes towards the Zones.

Many women researchers have concentrated on issues in the FTZs, but in different manners. Thus, women’s studies related to the Export Processing Zones in Sri Lanka have been reviewed to identify the problems in the Zones. Hancock et.al (2011) highlighted that the working conditions and living conditions of the women workers in the Katunayeke Free Trade Zones were under the required standards. Lack of safety, lack of sleep, long working hours, and constant stress from excessive demands to fulfill work production targets have caused major distress in the workers’ lives.

Weerasuriya, (2005) stated that even though unemployment in Sri Lanka is at a higher rate, it does not reduce turnover in the Zones because of numerous problems. Bharathi (2007) found that there are many problems related to working and living conditions, harassment and sexual violence, duration of employment and health, industrial accidents, assassination of workers, and demonstrations and strikes. According to the study, the great majority of women have less than one-year employment because of the adverse effects of these mentioned factors. Hancock & Edirisinghe, (2012) were identified problems of the employee empowerment. Even though the government has provided many rules and regulations, employers do not practice them. Adams, (2013) reported that incidents of suspected work-related harassments in Sri Lankan Export Processing Zones have increased. Hancock (2017) reported that unsafe and unhealthy working conditions in Sri Lanka’s Free Trade Zone Factories threaten employees’ lives.
The proposed model is based upon some of the ideas presented by Mobley (1977), Steers & Mowday (1981), Hulin (1985) and factors from the literature review. The dependent variable, intention to quit, was drawn from Mobley’s (1977) model. In addition, demographic factors such as age, education, family income, and marital status were drawn from the “individual” factors of Mobley’s model (Mobley, 1977). The demographic factor, “length of service,” is drawn from Bharathi (2007) proposition of labor turnover.

Mobley, et al., (1977); Porter and Steers, (1973); and Price (1975) report a consistently positive relationship between age and turnover. Weerasuriya, (2005) identified that turnover tends to be positively who are in an early period of their employment have greater intentions to quit than others. Related to the family income level, Hancock & Edirisinghe, (2012); Adams, (2013); Hancock (2017); Weerasuriya, (2005); and Bharathi (2007) highlighted that people who stay in the FTZs come from poor families. Mobley (1977) and Kweller (1998) explained that marriage has a correlation with turnover. Mobley (1977); and Stum (1998) paid more attention to childcare and pregnancy. Most of the female workers tend to quit the job because of these family responsibilities. Thus, the hypothesis derived from this literature is as follows.

3. Hypothesis and Conceptual Model on Demographic Factors

Hypothesis 01: Age, education, marital status, length of service and family income make differences in the intention to quit in the Free Trade Zones in Sri Lanka.

The model of analysis for the hypothesis is diagrammed as follows.

<table>
<thead>
<tr>
<th>Demographic Factors (DF)</th>
<th>INTENTION TO QUIT (IQ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>IQ = β₀ + (β₁.Age) + (β₂.Los) + (β₃.Edu) + (β₄.Mrs) + (β₅.Fin)</td>
</tr>
<tr>
<td>Length of Service</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
</tr>
<tr>
<td>Family Income</td>
<td></td>
</tr>
</tbody>
</table>

Where, Age = Age, Los = Length of service, Edu = Education, Fin = Family Income, Mrs = Marital Status

4. Research Methodology

This study is primarily based on primary data. However, to analysis existing literature, secondary data has been used. The sources included government documents and research literature regarding labor turnover generally, and within the Free Trade Zones in Sri Lanka in particular. The population of this study is female factory workers who are currently employed in the Export Processing Zones in Sri Lanka, under the Board of Investment (BOI) in Sri Lanka. The total numbers of factory workers who are working in the thirteen FTZs all over the Island is over 86,000. (BOI, 2017). Required sample size calculated according to the confidence interval of 4 and confidence level of 95%. It is estimated over 600 to be as a sample size. For this purpose 950 questionnaires were distributed among factory workers in FTZs and approximately 60% (568) were responded. To determine an appropriate and representative sample, a random sampling method has been used to select the factory workers.

Under primary data collection, a worker questionnaire was used to obtain data leading to the variables, which are presented in the conceptual model. In developing the questionnaire, earlier research on labor turnover in general, and other studies on the problems of Sri Lanka FTZ workers in particular, were considered to form the basic content of questionnaire. The questionnaire was pre-tested with a small group of workers in the EPZ. Further improvements on the wording and some additional clarifications were made.

To maintain the validity of the test, the variables, which were included in the questionnaire, have been derived through the review of literature, which are related to labor turnover theories and practices. Reliability of the test estimated by using Cornbach’s Alpha coefficient of reliability. Cornbach’s Alpha coefficient of reliability of items in this questionnaire is 0.7481 and Standardized item alpha = .7673.
The questionnaire consists of the demographic factors of respondents and intention to quit from the job. Age, Marital status, length of service, family income and education level considered as a demographic profile.

5. Analysis and Findings

5.1 Demographic Characteristics of the Respondents

Table -01 Demographic Profile

<table>
<thead>
<tr>
<th>Demographic Factors</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (years)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 18</td>
<td>53</td>
<td>9.3</td>
</tr>
<tr>
<td>18 – 22</td>
<td>243</td>
<td>42.7</td>
</tr>
<tr>
<td>22 – 26</td>
<td>169</td>
<td>29.8</td>
</tr>
<tr>
<td>26 – 30</td>
<td>75</td>
<td>13.1</td>
</tr>
<tr>
<td>30 – 34</td>
<td>14</td>
<td>2.4</td>
</tr>
<tr>
<td>34 – 38</td>
<td>14</td>
<td>2.4</td>
</tr>
<tr>
<td>&gt;38</td>
<td>1</td>
<td>0.24</td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>517</td>
<td>91</td>
</tr>
<tr>
<td>Married, and living with spouse</td>
<td>38</td>
<td>6.6</td>
</tr>
<tr>
<td>Married, but not living with spouse</td>
<td>12</td>
<td>2.1</td>
</tr>
<tr>
<td>Divorced or separated from spouse</td>
<td>1</td>
<td>0.23</td>
</tr>
<tr>
<td>Widowed</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Length of Service</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 1 year</td>
<td>173</td>
<td>30.47</td>
</tr>
<tr>
<td>1 - 2 years</td>
<td>127</td>
<td>22.4</td>
</tr>
<tr>
<td>2 - 3 years</td>
<td>66</td>
<td>11.7</td>
</tr>
<tr>
<td>3 - 4 years</td>
<td>58</td>
<td>10.24</td>
</tr>
<tr>
<td>4 - 5 years</td>
<td>49</td>
<td>8.57</td>
</tr>
<tr>
<td>&gt;5 years</td>
<td>95</td>
<td>16.7</td>
</tr>
<tr>
<td><strong>Family Income/ month (US $)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;20.00</td>
<td>234</td>
<td>41.2</td>
</tr>
<tr>
<td>20.01 – 40.00</td>
<td>237</td>
<td>41.7</td>
</tr>
<tr>
<td>40.01 – 60.00</td>
<td>72</td>
<td>12.7</td>
</tr>
<tr>
<td>60.01 – 80.00</td>
<td>14</td>
<td>2.4</td>
</tr>
<tr>
<td>&gt; 80.00</td>
<td>11</td>
<td>1.96</td>
</tr>
<tr>
<td><strong>Educational Level</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade 1 –10</td>
<td>53</td>
<td>9.33</td>
</tr>
<tr>
<td>G.C.E. (O/L)</td>
<td>407</td>
<td>71.66</td>
</tr>
<tr>
<td>G.C.E. (A/L)</td>
<td>106</td>
<td>18.66</td>
</tr>
<tr>
<td>Technical education</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Professional Education</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
The general characteristics of the respondents are presented in Table 01. This data shows that 42.7 percent of the respondents are between 18 and 22 years old, and 29.8 percent are between 22 and 26 years old. Nearly 82 percent are less than 27 years old. This indicates that the majority of workers who are currently working are young women. For marital status, 91 percent are single and the rest are married. For length of service, 31 percent have less than one year of service while 22 percent have between one and two years. Regarding family income per month, 41 percent earned less than US $20 in family income, while another 41 percent earned between US $20.01 and 40.00 in family income.

With respect to their educational level, 72 percent have passed the G.C.E (O/L) and 19 percent have passed the G.C.E (A/L). Only 9 percent have received a primary education. These demographic data indicate that the majority of these workers are young, unmarried, less educated, and from lower income family groups. Regarding the length of service, over 50 percent have less than two years of service in the present position. This indicates that the majority is immature and less experienced. These unmarried female workers have a high propensity for resigning from the job. Further, because of the younger age, they may be less responsible in general. Most of them do not survive their probationary period and resign during it. This condition positively affects intention to quit.

5.2 Data Analysis and Results of the Study

Table 02 presents the statistical analysis of the research hypothesis. Analysis of variance and multiple classification analysis were used to test the differences between employees’ intention to quit and their demographic profiles. For these statistical tests, a level of significance of 0.05 was used. The results of the ANOVA is presented first, followed by the hypothesis testing.

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares</th>
<th>DF</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig. F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Effects</td>
<td>374.478</td>
<td>14</td>
<td>26.748</td>
<td>36.148</td>
<td>0</td>
</tr>
<tr>
<td>Age</td>
<td>16.666</td>
<td>3</td>
<td>5.555</td>
<td>7.508</td>
<td>0</td>
</tr>
<tr>
<td>Marital Status</td>
<td>2.417</td>
<td>2</td>
<td>1.208</td>
<td>1.633</td>
<td>0.196</td>
</tr>
<tr>
<td>Length of Service</td>
<td>143.667</td>
<td>5</td>
<td>28.733</td>
<td>38.83</td>
<td>0</td>
</tr>
<tr>
<td>Family Income</td>
<td>88.038</td>
<td>2</td>
<td>44.019</td>
<td>59.487</td>
<td>0</td>
</tr>
<tr>
<td>Education</td>
<td>1.594</td>
<td>2</td>
<td>0.797</td>
<td>1.077</td>
<td>0.341</td>
</tr>
<tr>
<td>Explained</td>
<td>374.478</td>
<td>14</td>
<td>26.748</td>
<td>36.148</td>
<td>0</td>
</tr>
<tr>
<td>Residual</td>
<td>6181.018</td>
<td>526</td>
<td>0.74</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>6555.496</td>
<td>568</td>
<td>0.783</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 02 shows the results of the analysis of variance of demographic factors and the intention to quit at the 0.05 level of significance. It shows that the main effect of the demographic factors significantly affects the intention to quit at the 0.05 level of significance. However, when the demographic variables are considered individually, it shows that age, length of service and family income significantly affect the intention to quit in the garment industry. Marital status and education do not affect the intention to quit.

Table 03 shows the results of the multiple classification analysis of the factory workers’ intention to quit by demographic factors. The results of the analysis shows that workers who are below 18 years old and between 18 and 22 years had a significantly higher propensity to resign from the job than employees who had age between 22 and 26 and between 26 and 30 years. After adjusting for other independent variables, marital status, length of service, family income, and education, employees who are between 22 and 26 years old have a significantly higher propensity to resign than the employees who are below 18, between 18 and 22, and between 26 and 30. With respect of the length of service, the results of the multiple classification analysis shows that employees’ who have service of less than
one year, 1 to 2 years, and 2 to 3 years had a significantly higher propensity to resign than those who had a length of service between 3 to 4 years, 4 to 5 years, or over 5 years. Even after adjusting for the independent variables, employees who had service of less than one year, 1 to 2 years, and 2 to 3 years had a significantly higher propensity to resign than those who had a length of service between 3 to 4 years, 4 to 5 years, and over 5 years.

Regarding family income, the results of the multiple classification analysis showed that employees who have a family income between US $20.01 to US $40.00 and between US $40.01 to US $60.00 have a significantly higher propensity to resign from the job than employees who have family incomes below US $20.00. After adjusting for other independent variables, employees with a family income between US $40.01 and US $60.00 have a significantly higher propensity to resign from the job than the employees who have a family income below US $20.00 or who have a family income between US $20.01 and US $40.00. With respects to the employees’ marital status, the results show that the employees who are married and living with spouses and employees married but not living with spouses tend to have a higher propensity to resign from the job than single employees. The results of the analysis show that, with regards to education, the employees’ who pass the GCE (O/L) tend to have a higher propensity to resign from the job than employees who have passed grades 1 to 10 and the GCE (A/L).

Table -03 Multiple Classification Analysis of Intention to Quit by Demographic Factors
(Grand Mean = 4.6881)

<table>
<thead>
<tr>
<th>Variable and Category</th>
<th>No.</th>
<th>Unadjusted Deviation</th>
<th>Adjusted for Independents Deviation</th>
<th>Eta</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below 18</td>
<td>53</td>
<td>.1636</td>
<td>.118</td>
<td>.054</td>
<td>.054</td>
</tr>
<tr>
<td>18 – 22</td>
<td>243</td>
<td>5.0600</td>
<td>-2.208</td>
<td>-1.0620</td>
<td></td>
</tr>
<tr>
<td>22 – 26</td>
<td>169</td>
<td>-3.3855</td>
<td>6.2260</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26 - 28</td>
<td>75</td>
<td>-.2217</td>
<td>-8.7350</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>517</td>
<td>-.1096</td>
<td>.107</td>
<td>.143</td>
<td>.143</td>
</tr>
<tr>
<td>Married and Living with Spouse</td>
<td>38</td>
<td>8.6030</td>
<td>-9.8620</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married but not Living with Spouse</td>
<td>12</td>
<td>6.2130</td>
<td>-1.1617</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Length of Service</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;1 year</td>
<td>173</td>
<td>.1816</td>
<td>.176</td>
<td>.180</td>
<td>.180</td>
</tr>
<tr>
<td>1 – 2 years</td>
<td>127</td>
<td>9.6470</td>
<td>6.5790</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 – 3 years</td>
<td>66</td>
<td>3.3000</td>
<td>2.2120</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 – 4 years</td>
<td>58</td>
<td>-.1511</td>
<td>-.1447</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 – 5 years</td>
<td>49</td>
<td>-.1242</td>
<td>-.1707</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;5 years</td>
<td>95</td>
<td>-.2675</td>
<td>-.2468</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Family Income(US $)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;20</td>
<td>234</td>
<td>-8.3955</td>
<td>.109</td>
<td>.121</td>
<td></td>
</tr>
<tr>
<td>20.01 – 40.00</td>
<td>237</td>
<td>5.7300</td>
<td>6.348</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40.01 – 60.00</td>
<td>72</td>
<td>-.1854</td>
<td>-.2073</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade 1 – 10</td>
<td>53</td>
<td>-.1116</td>
<td>.110</td>
<td>.113</td>
<td></td>
</tr>
<tr>
<td>GCE (O/L)</td>
<td>407</td>
<td>9.0290</td>
<td>-5.7990</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GCE (A/L)</td>
<td>106</td>
<td>6.5740</td>
<td>-6.5610</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Multiple R = .236   Multiple R² = .057
The hypothesis states that, *Age, education, marital status, length of service and family income make differences in the intention to quit in the Free Trade Zones in Sri Lanka*. The results of the analysis of variance and the multiple classification analysis related to this hypothesis is presented below.

\[ \text{IQ} = \beta_0 + (\beta_1 \cdot \text{Age}) + (\beta_2 \cdot \text{Los}) + (\beta_3 \cdot \text{Edu}) + (\beta_4 \cdot \text{Mrs}) + (\beta_5 \cdot \text{Fin}) + e \ldots \text{Equation 1} \]

The statistical values from Analysis of Variance of employees \( n=568 \) can be presented in the equation form based on the presented structural equation.

\[ \text{IQ} = \beta_0 + (.054 \cdot \text{Age}) + (.180 \cdot \text{Los}) + (.121 \cdot \text{Fin}) + e \ldots \text{Equation 1} \]

### 6. Conclusion and Recommendations

The research hypothesis was tested to determine whether there is any significant difference between the demographic factors and the intention to quit. The results of the analysis of variance show that the main effect of the demographic factors significantly affects the intention to quit among workers in the FTZs in Sri Lanka at the 0.05 level of significance. However, the results of analysis show that only age, length of service, and family income significantly affect to the intention to quit. Marital status and education did not produce significant results at the 0.05 level of significance. These causes for the intention to quit can be reduced by retention of efficient workers. Therefore organizations have to develop retention plan to attract young women by paying more attention to give better compensation package and make sound career development path. Managers have to pay attention to maintain quality of work life of these young women.

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