UNIVERSITY OF NAIROBI

DESIGN-LED INNOVATION FOR IMPROVED PAINT MANUFACTURING:

A Case Study of Companies in Nairobi

WANAKUTA HENRY MUKHWANA

School of the Arts and Design

UNIVERSITY OF NAIROBI

A Thesis Submitted in Fulfilment of the requirements for the Award of the Degree of Doctor of Philosophy of the University of Nairobi

SUPERVISORS:

Dr. Samuel Mwituria Maina

Dr. Lilac Osanjo

Prof. Robert Rukwaro

DECLARATION

I declare that this thesis is my original work and has not been submitted elsewhere for examination, award of a degree or publication.

Signature_____ Date _____

Wanakuta Henry Mukhwana

Reg. No: B80/50035/2015

This thesis has been submitted for examination with my approval as University of Nairobi Supervisor

Dr. Samuel Mwituria Maina

Signature.....

Date.....

This thesis has been submitted for examination with my approval as University of Nairobi Supervisor

Dr. Lilac Osanjo

Signature.....

Date.....

This thesis has been submitted for examination with my approval as University of Nairobi Supervisor

Prof. Robert Rukwaro

Signature.....

Date.....

DEDICATION

I dedicate this Thesis to my baby daughter Amber Armani, family and many friends. A special feeling of gratitude to my loving parents, Pastor Francis Wanakuta and Mama Marsella Wanakuta whose words of encouragement and push for tenacity ring in my ears. My sisters Nancy, Lucy, Patricia and Grace, my brothers Paul and John who have never left my side and are very special. I also dedicate this Thesis to my church family who have supported me throughout the process.

ACKNOWLEDGEMENTS

I wish to thank the School Academic Board members who were more than generous with their expertise and precious time throughout the research journey. A hearty special thanks to Dr. Lilac Osanjo, Dr. Samuel Mwituria Maina and Prof. Robert Rukwaro; my supervisors, for the countless hours of coaching, review, reflecting, encouraging and most of all patience throughout the entire process.

I would like to thank all the mentor-teachers, with a special mention of Prof. Mugendi M'Rithaa of Cape Peninsula University, South Africa, Prof. Paul Syagga of The University of Nairobi, Prof. Odoch Pido and Dr. Donna Pido all of The Technical University of Kenya. Your commitment and willingness to review my research work, provide assistance, feedback and mentorship made the completion of this research possible as well as a learning experience.

Finally I would like to acknowledge and thank my school; The School of the Arts and Design for allowing me to conduct my research and providing any assistance requested. My brother in the PhD journey Dr. Michael Munene, sailing with you through these waters made the journey bearable. Thank you for unwavering support.

Table of Contents

CHAPTER TWO: DESIGN AND INNOVATION

CHAPTER THREE: RESEARCH METHODS

List of Tables **Page**

List of Figures **Page**

List of Appendices

LIST OF ABBREVIATIONS AND ACRONYMS

COMESA: Common Market for Eastern and Southern Africa

CSR: Corporate Social Responsibility

DC: Design Council

DFIs: Development Finance Institutions

EAC: East African Community

GDP: Gross Domestic Product

GoK: Government of Kenya

HR: Human Resources

KITP: Kenya's Industrial Transformation Program

KNBS: Kenya National Bureau of Statistics

METSCo: Mining Equipment, Technology and Services Company

NITA: National Industrial Training Authority

ODI: Overseas Development Institute

OECD: Organization for Economic Cooperation and Development

R&D: Research and Development

SME: Small and Medium Enterprises

STEM: Science, Technology, Engineering, and Mathematics

SWOT: Strength Weaknesses Opportunities Threats

WDO: World Design Organization

ABSTRACT

Companies are obligated to reconsider their business approach and transform their capabilities as they adjust to the impacts of deregulation, globalization and the knowledge economy. There is an everlasting necessity for deliberate processes to facilitate organisational performance through alignment of vision, mission, strategy, culture, people, processes and products. Previous empirical research has shown *Design-led Innovation* as a methodology which businesses can utilize to innovate by developing capacities to be able to interact, iterate and discover novelty propositions within markets, in effect, modifying their operational and strategic fundamentals. This process in the Kenyan context however, is perceived to be utilized imprecisely as exemplified within the paint manufacturing industries.

This research sought a detailed contextual understanding of Design-led Innovation, and the appropriate process of integrating it in the manufacturing sector in Kenya. Espousing a Naturalistic Inquiry, otherwise acknowledged as Constructivism or a constructivist conception, the research was embedded within the fields of design and business. Using a mixed research methods of qualitative and quantitative, a sample of eight paint manufacturing companies in Nairobi, were selected and considered for data. This was done in a bid to answer the research questions that include: Do the paint manufacturing companies in Kenya utilize Design-led innovation? To what extend do the paint manufacturing companies utilize Design-led innovation? What are the customer preferences and satisfaction levels with paint products as impacted by Design-led innovation? What is Design-led innovation and its potential value to business as informed by the Kenya paint manufacturing companies context. How can Kenyan paint manufacturing companies adopt design-led innovation how can Kenyan manufacturers use Design-led Innovation? Multiple data sources including semi-structured interviews and questionnaires

were considered and used to gather data from the target populations. The data was analysed using thematic coding. Key findings indicated that the paint manufacturing companies utilize design-led innovation at distinct levels, a factor attributed to various dynamics and parameters, one of which was lack of proper understanding of the process in question. The study more so found out that the process of Design-led innovation took place within organizational contexts, at distinct levels over a period of time, involved many participants. Design-led innovation in companies was found to unfold into complex bundles of ideas and divergent paths of activities within the organizational units. Customers and retailers were also targeted to validate the process benefits in terms preferences, where companies that are deemed to be design-led had their products preferred by users.

The design-led innovation imperatives identified within these companies, helped to build a contextual theory as well as a framework with which the research recommends adoption within paint manufacturing companies, for the full benefits of Design-led innovation to be realised. The study concludes that Design-led innovation offers limitless potential for Kenya's manufacturing via activation of trusted proven design methodologies such as the framework formulated. More so, the study recommends the adoption of a contextual framework to address inconsistencies of design-led use as seen within the paint manufacturing companies. It further recommends that researchers seek directions to imbue contextual design-led processes within different contexts to enable development of receptive products and brands.

CHAPTER 1

INTRODUCTION

1.1 Introduction

Many industries have witnessed accelerated and enhanced globalization, in both pace and magnitude in the latter half of the 20th century (Ohmae, 2000). At the dawn of the new millennium, such a trend of globalization in the international economic scene has been marching on unabatedly and has stirred up fierce competition even in industries previously regarded as being free from the onslaught of foreign rivalry. Consequently, Powell notes that such globalization unmercifully forces many firms, multinational corporations and local players, to reassess their competitive strategy and consciously create, renew, and hopefully sustain their competitive advantages in the global market place (Powell, 1996).

Building on the treatment of the basis of sustainable advantage and relevant literature in strategy, the Kenyan paint manufacturing industry can be categorized into three generic types of competitive advantage: ownership-based, access-based, or proficiency-based (Kiragu, 2011). That is, the companies that are deemed superior on the market, have achieved competitive advantage through ownership or possession of certain valuable assets, factors, or attributes (for example, strong market position, unique resource endowment), or reputation. Some have also achieved competitive advantage in the form of superior access to factor market and product market (for example, exclusive relationship with supplier or distribution channel). Moreover, some claim they enjoy competitive advantage through their own superior knowledge, competence or capabilities in conducting and managing their business processes; producing quality products at lower costs and delivering the right products and/or service to its customers in the right place at the right price and time through the right channels (Kiragu, 2011).

Simply put, to achieve any advantage in this business, a firm has to look

deeply and systematically into what it has, what it knows and does, and what it can get. These three types of generic competitive advantages are not only important for a firm's superior performance in general but are also important for its sustained success in global competition in particular. Winning in global competition, more than ever, requires a firm to establish a defensible position (Porter, 1990) and sustain its ownership based competitive advantage, to create and improve access to foreign suppliers and distribution channels as well as access to the state-of-the-art or the best of the breed technologies (Chandler, 2001); and to excel in the learning race and nurture core competence and skills that can be leveraged in the global market place.

In the same breath, the Kenya Vision 2030 features prominently as a values based process of exploring what people value most and how to ensure these values are retained for our future. Core to it is economic freedom, through creativity, innovation, education and entrepreneurial skills among others. The vision aims at creating a globally competitive and adaptive human resource base to meet the requirements of a rapidly industrializing economy.

1.2. Background of the Study

As mentioned before, the Kenya Vision 2030 is a new innovative blueprint for Kenya whose ambition is to positively transform the country's social and geopolitical space for an enhanced order by the year 2030. This vision's main aim is to drive the country towards competitiveness and prosperity and thus foster an improved life for its citizens by 2030, through radical actions on select flagship projects (GoK, 2007). The vision aspires to transform Kenya into a middle income country that provides a high quality of life for its citizens as well as providing a clean and more secure environment for its citizens. The vision seeks to meet the Millennium Development Goals for Kenyans (GoK, 2007).

There are three key pillars on to which the vision is anchored on namely: Economic, Social and Political Governance. The need to attain and maintain

an economic growth rate of ten percent per year till the year 2030, is the ambition for the economic pillar. In retro effect, generating a variety of material and resources that satisfy the millennium development goals. The vision identified a number of flagship projects and subsequent action plans to be worked on over the vision period so as to facilitate successful realisation of the intended goal (GoK, 2007).

Consultative meetings and subsequent deliberations amongst experts, stakeholders, policy-makers and investors brought forth six priority areas with great potential to raise the gross domestic product to ten percent and sustain it through a number of years. One of the areas was manufacturing (GoK, 2007).

As posited by the Ministry of Industrialization, the manufacturing sector in the Vision 2030 is of great importance in that it is tasked with creation of job opportunities and wealth for Kenyans. Its specific role none the less is to contribute to the GDP by at least ten percent per annum (GoK, 2007).

Various action plans are proposed in the vision, which have potential to inspire radical changes within the manufacturing sector. These action plans in reference to this research, stand as gap that Design-led innovation can bridge, being de-facto merger of industrial, interactive and brand design by reforming manufacturing companies strategy and operations for competitiveness, thereby helping at great lengths to transform Kenya into universally competitive and prosperous nation, and sustaining the same through many years. The action plans include:

i. Strengthening the capacity and local content of domestically manufactured goods
ii. Increasing generation and use of Research and Development results
iii. Raising percentage of products in the local market from 7% to 15%
iv. Developing niche products for existing and new markets.

In the same breath the Government of Kenya recently came up with the big four agenda, where manufacturing is tasked with sparking Kenya's industrial transformation and job creation (KAM, 2018). This would be achieved by:

i. Elevating contribution to GDP from 9.2% in 2016 to 15% by 2022,
ii. Increasing the value and volume of exports,
iii. Increasing manufacturing consumer benefits
iv. Economic and exports diversification

1.3 Statement of the Problem

The past few years, has seen many manufacturing companies in Kenya face increased competition from foreign and domestic firms. An important aspect attributed to this competition has been a lack of growth in the responsiveness of firms to the needs of customers for innovative products and services. The business strategies for competitiveness in most cases are deemed inefficient and fail measure up to those of other globally established competitive cases. In effect, this limits their capacities to cope with challenges that a changing business climate brings forth.

The challenges exhibited in the paint manufacturing companies entail less-developed capabilities to identify and respond to user needs, shifting levels of production rapidly, quickly developing new products, developing responsive product characteristics, improved manufacturing processes and feedback mechanisms. These trends have rendered their success and survival more and more difficult to ensure. It goes then without saying that despite the prominence that the manufacturing sector has been accorded in Kenya's development agenda, its slow growth in the last few years, as contributed to by the aforementioned factors is a matter of concern. This study therefore investigates the paint manufacturing businesses frameworks and methodologies that can enable them to innovate.

1.4 Research Questions

The main research study question was:

i. What is Design-led innovation and its potential value to businesses?

1.4.1 Specific Research Questions

i. Do the paint manufacturing companies in Kenya utilize Design-led innovation and to what extent?
ii. What are the customer preferences and satisfaction levels with paint products as impacted by Design-led innovation?
iii. How can Kenyan paint manufacturing companies adopt design-led innovation

1.5 Main Objective of the Study

The main objective of the study was:

i. To investigate design led innovation in the Kenyan context and its potential value to businesses.

1.5.1 The specific Objectives were:

i. To profile the utilization and the extent of use of Design-led innovation by paint manufacturing companies in Kenya.
ii. To evaluate the level of customer preference and satisfaction levels with paint products as impacted by perceived design-led innovation.
iii. To propose a practical Design-led innovation implementation framework that manufacturing companies in Kenya can adopt for competitiveness.

1.6 Justification of the Study

This study therefore sought to present a compelling case for Design-led innovation as a unique innovative methodology that enables companies to developing new capabilities to understand and approach changing markets, through modification of their operational and strategic elements. This, utilizing its ability that enables shifting focus from what should be the

solutions and instead developing a critical understanding of the problems on hand. In essence, proposing a unique innovation methodology and approach that is solutions-oriented which starts with the people and ends with new solutions that are targeted at meeting their needs.

1.7 Research Significance

This research encourages the adoption of the Design-led innovation process within the manufacturing sector in Kenya for it to become competitive and more productive as one of the fundamental objectives of the Kenya vision 2030 and the millennium development goals. There is adversely limited literature that explores the link between Design and Business, beyond the technological novelties as building blocks of innovation. Consequently the effect of design within this sector is relatively unknown. This contribution to knowledge will enable the business and design communities in realising how design-led innovation can be effected within their strategy as a means to attain sustainable business competitiveness within their market context. This research will deliver important comprehensions for business leaders and design practitioners alike, by posting real substantiations and testimony as to the value of design-led innovations received by real companies striving for change.

This research will contribute to the expanding body of knowledge in innovation by design, the design theory and innovation theory and application within industry. The research will strive to provide a substantial resource that helps understand how businesses should act or react to design-led innovation and the opportunities that are expected to materialise, impacted by design imperatives throughout the business strategies.

On the flipside, this research contributes to the existing body of knowledge on paint manufacturing competitive strategy in Kenya. It presents the relationship between competitive forces and challenges and issues, and the ensuing competitive strategies adopted to mitigate them. The study findings give an

insight into how paint manufacturers have been able to build and maintain market positioning.

1.8 Assumptions

It was assumed that the companies accessed for data either consciously or subconsciously practised Design-led innovation and that they accordingly responded in a candid and valid manner. It was also assumed that the inclusion criteria of the samples were appropriate to ensure that all the participants were subjected to a similar experience regarding the phenomenon of the study and thus project a clear representational picture for the themes under the study. It was also assumed, the research products were practical and contextual as informed by selected cases.

1.9 Research Scope

The research theoretical scope covered the fields of design, innovation and business. The study concentrated on process and product innovations as catalysed by design-led innovation. Methodologically, the study explored the theoretical underpinnings of the study phenomenon, then sought to explore its utilization within the paint manufacturing companies, with customer preferences and satisfaction levels considered to evaluate its impact. Triangulation of the imperatives of design-led innovation in the said companies, with views from design-led innovation experts helped the research to develop a contextual theory and further develop a context responsive framework that is the ultimate product of the study. The study was conducted within the county in Nairobi in Kenya. A detailed scope is to be section 3.3.1 on page 64.

1.10 Limitations of the study

This study has some limitations. These limitations are due to resource constraints and because the research study focuses on a particular geographical region, uses a particular methodology and makes assumptions which are embedded within the philosophical stance on which the study is based.

First, information about the business and market behaviours of the manufacturing sector in Kenya is limited, and information is obtained from similar market settings for comparison. This study focuses only on paint manufacturing companies in Nairobi (i.e. geographical region); however, other companies (i.e. large and small) and cultural contexts and markets should be covered in future research to strengthen and validate the findings due to innovation varying depending on industry sector. Further, the role of regulators, public agencies, or other bodies is not captured. They can have control over policy, infrastructure, and contracts and can have far-reaching effects on the proposed innovation paradigm. Time and cost limitations have also influenced the specific geographical location and the firm selection of this study.

Second, the interviews were conducted by a single informant in each company. Although the results herein do not indicate any problems, the study cannot definitely eliminate a possible common method bias and a loss of data and information. Using interviews and focus group methods (i.e. qualitative method) and multiple respondents (from different managerial levels or functional units) in each firm could have provided more insights into the study. Self-reporting is further relied upon, whereas objective measures can heighten the external validity of the findings.

Third, the conceptualisation of constructs of the research concept determinants, innovation practices and business growth performance in this study covers the most commonly mentioned dimensions, yet it cannot claim to cover all relevant dimensions. Future research needs to explore cognitive orientation (i.e. quantitative versus qualitative and analytical versus intuitive).

Further, items under each construct are modified. Even though these items are evaluated, triangulated and presented, this study cannot claim definite non-ambiguous or unbiased relations among constructs. A future replication study using these scale items is recommended to address the issue in future.

Fourth, whilst the data was collected from different companies and had reached a great source of variance, the generalizability of the findings is still limited to those industries covered in the research context. A cross-sectional approach is applied and as such any causality suggested is tentative. Future research espousing longitudinal data would appear more desirable to take account of patterns over a longer period of time to support the causal relations in this study.

The following precautions were taken to minimise the impact of above-mentioned drawbacks on the validly of this research:

i. To avoid the bias, lack of rigour and ad-hock theorisation associated with single case studies, multiple case studies of eight companies were conducted.
ii. Instead of building an all-inclusive theory, only broad theoretical propositions are spelt out.
iii. Analytical generalisations that emerge from work, rather than statistical generalisations are derived and presented.
iv. A more analytical and less descriptive approach to the presentation of results is adopted.
v. To avoid the problem of too many uncommon variables between the cases, companies that had many common characteristics are selected.
vi. The information that the respondents provided was crosschecked with the prior information reviewed in literature.

1.11 Delimitations of the Study

Universally, research is guided by objectives. However, there is need to delimit the research for various reasons. This research was limited to company executives of paints manufacturing companies, which are deemed to have incorporated the design-led process imperatives within their strategy. The executives were selected because they make decisions within the enterprises as managers or owners. It is recognized that that there is a lot of imitation of

innovations within these companies, however, the selected executives were assumed to be have been sources of the innovation initiatives within their enterprises.

There is considerable research on design process and its impact on the success of process and products taken from the point of view of designers who are able to outline the process of design. However, this research approached design from the perspective of "non-designers." The approach is supported by theorists who appeal to designers to research on design by non-designers as a way of contributing information, developing the design discipline and informing design training. This orientation is different from that taken by most design researchers who examine design from the perspective of designers and engineers.

1.12 Definitions of Terminologies

Design: Design is defined as a process that includes actions involved in hypothesising, outlining, executing, commissioning and revising multifaceted systems. (Freeman and Hart, 2009). In line with the objectives of this research this is the definition that the researcher has adopted. Design is also a procedure, effected by a proxy, which aims at describing an object with regard to the setting in which it will exist, the constituent objects attributed to it, the desirable interactive properties, its application and delimitations that constraint the tolerable purposes (Freeman and Hart, 2009).

Within the context of innovation, Design is a methodology that can be applied in the creation of better products, services, processes and business models. It can provide contextual insight and help to define innovation opportunities and strategies. Design can help businesses to develop and communicate ideas, and provide them with the means to deliver better solutions to market. (Freeman and Hart, 2009)

Innovation: Innovation is defined as a set of nonconformities in multifaceted structures that include the tangibles and also market contexts, production

utilities and understanding and the social contexts of an organisation. This definition clearly fits the purpose of this research and thus is adopted by the researcher.

Innovation is also a form of technologies that are discovered and introduced for the purpose of bridging a market gap for or meeting the user need for commercial gains (Utterback, 1974). Innovation in this context covers wide areas like introduction of new processes/practices, new technology/equipment, new materials, etc. (Utterback, 1974)

Manufacturing: In the context of this research, this is the practise of transforming raw materials, modules or parts into complete products which meet customer's expectations or specifications. (Business Dictionary 2015). In the context of innovation, it is an organization-wide effort that involves fundamental rethinking and radical redesign of related processes and systems to achieve dramatic improvements in performance measures such as cost, quality, service, and speed. (Hammer and Champy, 1993)

Design Thinking: Design Thinking is defined as a problem solving methodology which recognizes that design today is about much more than products. Design Thinking encourages executives to adopt a designer's mind-set by applying a designer's way of thinking and creating solutions by developing strategies, piloting them, implementing and evolving them. (World Intellectual Property Organization, 2015)

In the context of innovation and manufacturing, Dunne & Martin (2006) and Martin (2009) posit that design thinking proposes something of value to managers, which can match established analytical techniques. Martin (2009) perceives design thinking as merging abductive, inductive and deductive thinking and contends that managers are undone by present-day management edification which neglects the former.

Design Ladder: The Danish Design Ladder is an archetypal developed by the Danish Design Council as a technique of categorising the varying levels of impact or incorporation design can have in a business. It consents independent companies to be likened on a modest yet sensibly definite scale with regard to their perception and utilisation of design. (Kretzschmark, 2003).

Empathy: This is the act of being sympathetic, recognising, being thoughtful to and living through the feelings, thoughts, and experience of another, either the past or present fully disposed in an accurately clear modus. (Webster Dictionary, 2016).

In Design, empathy is, as explained in IDEO's Human-Centred Design Toolkit, a deep understanding of the problems and realities of the people you are designing for. It involves learning about the difficulties people face, as well as uncovering their latent needs and desires in order to explain their behaviours. It requires an understanding of the people's environment, as well as their roles in and interactions with their environment. (IDEO, 2009)

Within innovation, Empathy helps in gaining a deeper appreciation and understanding of people's emotional and physical needs and the way they see, understand and interact with the world around them. It also helps to understand how all of the said factors impact on their lives generally, specifically within the contexts being investigated. Unlike traditional innovation marketing research, empathic research is not concerned with facts about people (such as their weight or the amount of food they eat), but more about their motivations and thoughts (for instance, why they prefer to sit at home watching TV as opposed to going out for a jog). It's inherently subjective, since there is a fair amount of interpretation involved in finding out what people mean rather than what they say (Jane, 2005).

1.13 Organization of Study

First of which is, Chapter one, that the introduction and background to the study. The remaining five chapters are organised as follows:

Chapter two charts the key concepts of preceding research on design and innovation. Design and Innovation concepts and meanings are explored at length to create an understanding, and a basis for the Conceptual framework of this research. The research issues and insights in the design and innovation management literature are identified and discussed. The chapter further establishes the constructs for design innovation practices and business growth performance for companies. From the literature the study develops the conceptual model with links to research questions and hypotheses to build a case for a contextual theory. This chapter also covers the world review of design-led innovation, to support and reinforce the imperatives and variables of the study. Chapter two also presents the conceptual framework supporting this study. A synopsis of the literature review on the concept of Design and innovation provided insights into the theory and concepts, which informed the research. Exemplars alluded to, validated the established theory and concepts.

Chapter three presents the research methodology, the theoretical underpinnings and the justifications for the research paradigm and methodology are detailed, as are the specific research design and methods followed throughout this study. This chapter further demonstrates how data was collected and analysed data to examine the proposed research objectives and questions. This arising from the conceptual model that provided detailed information regarding the research inputs and outputs, data collection and analyses, and measurement implications.

Chapter four reports on the analysis of the field data and their relevance to the study. This chapter provides detailed information about data that was prepared and the actual steps in the analysis process. It features descriptive statistical analysis and open-ended questions analysis. This chapter also evaluates the

interpretation and discussion of the results. The research question and objectives and the extent to which these findings from the previous chapters and empirical research studies address the hypothesised conceptual model are examined.

This chapter also presents the discussion of findings. It outlines the role of stakeholders as far as the research phenomenon is concerned in terms of nurturing and promoting its utilisation. This was to serve as an eye opener and a starting point in charting a discourse for the research topic.

Chapter five presents conclusions and recommendations of the study. A complete list of references and appendices is also appended in this chapter to provide relevant details of referred information throughout this study.

CHAPTER 2
DESIGN AND INNOVATION

2.0 Overview

This chapter highlights an array of preceding research on design and innovation. Design and Innovation are explored at length to create an understanding and a basis for the Conceptual framework of this research.

Literature review was conducted with an objective of reviewing and revisiting previous studies on elements of this research. This in effect, was to establish key data collection necessities for the primary research to be done. It also formed part of the evolving research design process. (Denscombe, 1998). The method espoused was in line with present practice as grounded in research work. This stage in effect was to satisfy the universal need for researchers to make known to themselves the existing research preceding collecting their own data (Glaser & Strauss, 1967, Easterby-Smith, Thorpe, & Lowe, 2002).

An acknowledgement of preceding work in this area aided three further purposes. First, by issuing course in the design of data collection tools, it protected against the risk of excess load at the primary data collection stages of the research. Second, in working with the findings from existing literature into a formal review, it helped uphold a sense of the topic's outlook throughout the study. Finally, this activity raised the prospects for enunciating a critical analysis of the definite meaning of the data collected during the data analysis stages.

A variety of secondary data sources aided as the key bibliographic tools for identifying appropriate work for analysis. Personal recommendations and reference pearling also led to a substantial part of the publications being designated for analyses. Suitable publications were discovered in the literature of a number of academic domains including innovation, business studies, management, human psychology, organisation science, psychology, science

and technology, and strategic management. Most of these publications take the form of research papers.

A synthesis of the previous work provided a synopsis of the research topic. Material derived from the review led to the development of a classification of components of the phenomena under study and provided the setting for identifying data collection necessities, as well as developing the data collection tools for the primary research.

2.1 The Theory of Design and Innovation

The topic of this research espouses design and innovation, brought together to create a phenomenon that is the basis of the study. It is thus imperative to have a basic understanding of the origins and the discourse of the two ideas. Firstly, the innovation theory is traced back to initial studies about the capital system. It is documented that it was Bacon, at the start of the 17th century, who brought forward a science-created notion on the role of the growths in science and technology in society. However his sentiments were not welcome by one Bernal of his generation, who insisted on the supremacy and usefulness of novel discoveries as undisputed origins of societal wealth as opposed to their own creation. Far ahead, in the 18th century came Adam Smith, who suggested technological change as key in the development within industrial production. Fast forward in the first half of the 19th century, Marx advanced a theory that technological developments and enhanced industrial production had exiled the worker, thereby instigating confusion in the social order. Recently, it was Schumpeter, in the first half of the 20th century, who alluded to innovation as maintaining the capitalist engine in motion. In line with him innovations need to be imperious for economic growth, commercial profit, and hence public wealth. (Schumpeter, 1934). This theory has henceforth been developed by neo-Schumpeterian economists such as Freeman and Dosi. (Freeman, 1982). Lately, contributions from various disciplines including Design, Management, and Marketing have advanced the modern theory of innovation.

It is therefore important to note in relation to anchoring this study in theory that, throughout the sequence of the development of the theory of innovation, many scholars of the past with dissimilar approaches including the classical economists, the Marxists, the neo-classical theorists, the Schumpeterians, post-Keynesians, and post-Schumpeterians have had noteworthy contributions. However, two characters in the history of innovation appear; Adam Smith who lays the foundations of the standard understanding of technical change and economic growth and Joseph Schumpeter who thought-provokes Smith's opinions with a vibrant theory of economics grounded on sequences of innovation.

Smith (1993) lays the foundation for this study phenomenon by being the first conventional economist to learn about technical change and its influence on economic growth. He inferred that economic development is a steady, self-propagating process (Smith, 1993). He did this by building his theory on the 18th century doctrine of natural law. Very vital to note is that he posits that inside the control of the natural legal system, each member of the society is permitted to follow his self-interest, in order to give rise to a harmonious, helpful commercial order (Smith, 1993). This is in line with the foundations of design thinking. Further according him, development has a propensity to turn out to be cumulative, whose domino effect is an increase in saved capital. He designates this as Capital Accumulation, which is an important element in economic development and an upsurge in the extent of the market that ultimately gives rise in an increase in national income and growth in population. Smith's classical theory remarks developments to occasioning improvements in art, which lead to further specialization and productivity gains (Smith, 1993).

A step back view at the Schumpeterian investigation shows it conveying an exceptional point of view to Smith's classical theory, by issuing the most inclusive and stimulating analysis since Marx of the economic development and social transformation of industrializing capitalism (Elliot, 1985).

Schumpeter (1934, 1939, 1942, 1954a and 1954b), is seen to reject the classical and neo-classical justification of economic development as a steady, harmonious process. To him, in line with the design aspect in this research, far from gradual and smooth way, development happens when there is a high degree of risk and uncertainty within an economic setting (Meier and Baldwin, 1957).

Just like the outstanding role of design as a driver of social change in the modern world, Schumpeter's versatile theory discloses a disruption of equilibrium of the flow in a continuously developing, stationary economy by clusters of innovations. It is then evident that Schumpeter accepts as true that, there is no chance of profiting in the equilibrium state thus innovations are necessary to generate profit. He posits that Innovations hence increase economic activity by triggering other visionaries. The economic activity reaches a mature state and eases itself and economy returns to the state of equilibrium" (Schumpeter, 1939). He therefore believes that innovations lead to the development and growth of the economy, occasioning prosperity and wealth creation (Schumpeter, 1939). This is the bottom line of this research.

2.1.1 Categories and Levels of Innovation

2.1.1.1 Types of Innovation

For this research, innovations will be based on the Schumpeterian understanding, where he (Schumpeter, 1934) categorises innovations in two major categories: Product and process innovations. Product innovations comprise the conception of a new good which more sufficiently gratifies existing or previously satisfied needs. Product innovations further espouse the design of completely new products, which provides a state of monopoly to the innovator. A process innovation replaces "one production or consumption good by another, which serves the same or approximately the same purpose, but is cheaper…" (Schumpeter, 1934). It is thus seen that, process innovations include introduction of new materials or supplies that have the ability of producing a unit of a product that is relatively cheaper. Though certain post-

Schumpeterian investigations on the theory of innovation opine organisational innovations as a distinct innovation category, Schumpeter (1934) embraces organisational innovations in process innovations. So collectively for this study process innovations include organizational innovations.

There are five types of innovations that comprise the following two major categories in line with Schumpeter's theory and as relevant to this research:

Process innovations:

i. New technique of production,
ii. New source of supply of raw material or semi- finished goods,

Product innovations:

i. New good,
ii. New quality of a good that open a new market,
iii. New industry structure.

2.1.1.2 Levels of Innovation

From the foregoing it has been seen and regarded that innovations happen in different degrees of novelty. This disposition is established by Schumpeter (1934), who infers swarming secondary innovations, which contest for a share in the humongous monopoly of profits of the first new product. However, the levels of novelty differ from minor, incremental improvements to radical changes that completely change the reception of a product or a process in an industry (Tidd et al., 2005). Figure 2.1 signifies the two dimensions of innovation, different echelons of novelty and types of innovation.

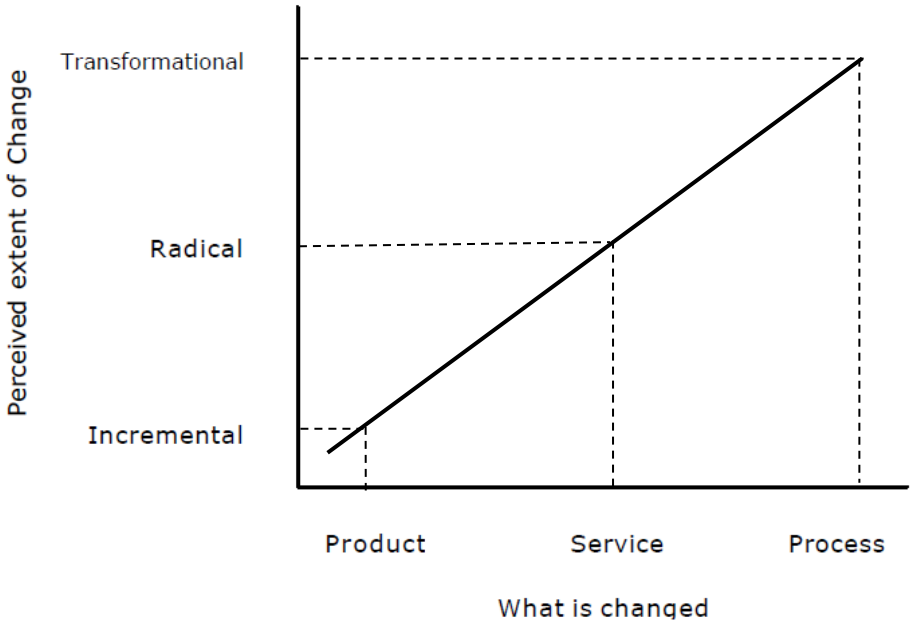

Figure 2.1: Dimensions of innovation space

Source: Tidd et al., 2005

In trying to understand further the levels of innovation, this study trails Rothwell and Dodgson (1994) who link up the eminence of incremental innovations to the extraordinary levels of technological change. In line with the two, during the course of high rates of technological change, there is comparatively few radical innovations in each industry. They deduce that once a radical innovation is presented to the market, it guides to various incremental innovations, and major or minor re-design dissimilarities developed on the radical innovation. Figure 2.1 parallels their identification on the technical change that includes a radical innovation and resultant incremental innovation. This process in line with this research resonates with the supposed outputs of the process of design thinking, which infers on a continuous iterative process to refine innovations.

Rothwell and Dodgson (1994) further extrapolate re-designs or re-innovations as combining the existing with the new. They posit and as relevant to this research that, a re-design is a form of product innovation that at first utilises largely prevailing technology, but opens up a new and fast growing usage for

the user.

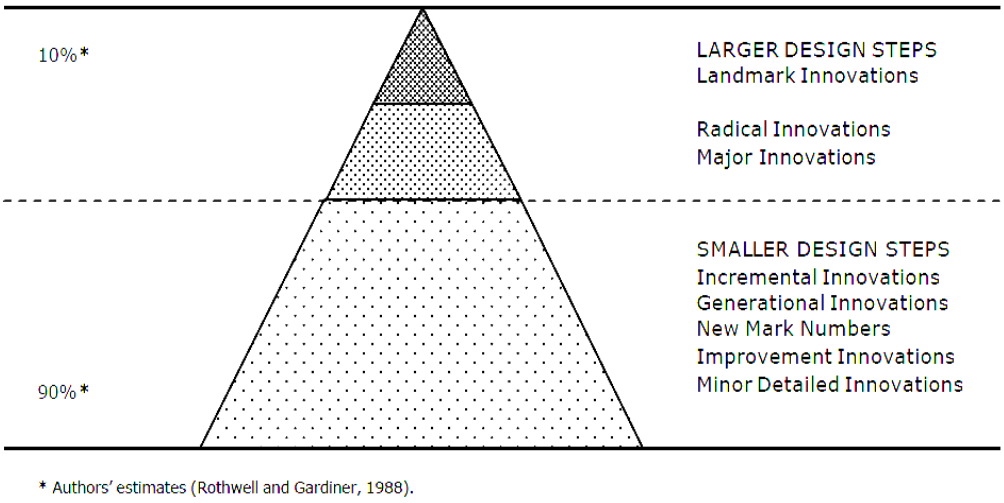

Figure 2.2: Levels of technical change

Source: Rothwell and Gardiner, 1988

2.1.2 Design in the Innovation Context

The American Heritage Dictionary (2000) defines Design as a focussed or creative arrangement of parts or details. In this sense the design action espouses a myriad subservient areas and activities, which looks into a diversity of concerns. Figure 2.3 by Walsh et al (1992) shows the areas of the design sphere with a graphical explanation of the links between separate areas.

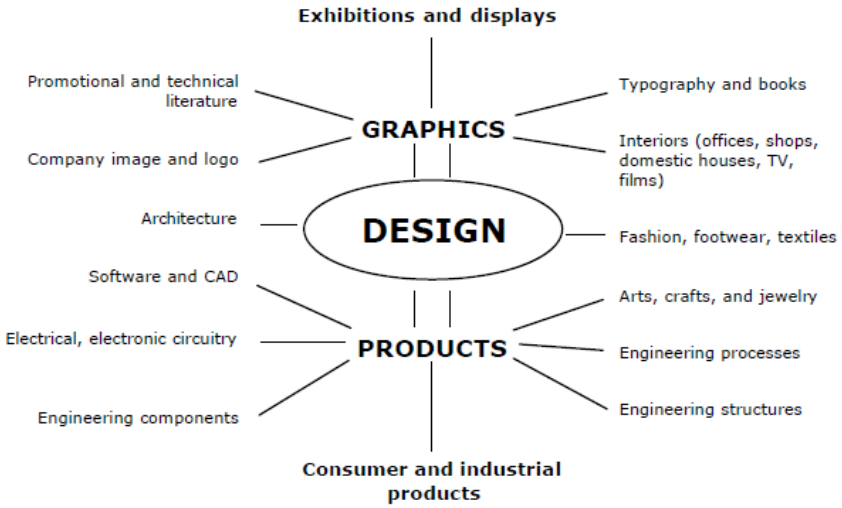

Figure 2.3: The main areas of design

Source: Walsh et al., 1992

Safe from the fact that the theory of innovation is derived from the theory of

economics and studies on technical change, and technical change or invention is mostly recognized to trigger innovations, this as earlier seen from the foregoing literature, a number of studies refer to design as the core of the innovation process (Freeman, 1982; OECD 2014). They emphasize the responsibility of design as the core of the innovation process. For instance, Freeman (1982) posits innovation occasions resources such as R&D and design; OECD (2014) highpoints the central critical role of design in the innovation process. In line with OECD (2014), design is the core of innovation, highlighted in the instance when a new entity is conceptualised, developed, and moulded in prototype form.

In the same discourse of design being core to innovation, Lorenz, (1990) highlights the emergent dominant role of design at a strategic standpoint. In line with him, the deep-rooted artilleries for realising actual differentiation have become archaic, that comparative advantage can no longer be sustained for long through reduced costs, or higher technologies (Lorenz, 1990). Hence going forward, the design element is no longer a discretionary part of marketing and corporate strategy, but a necessity at the very core.

2.1.2.1 Product Design

This study seeks to present design as key for process and product development. Design has been presented as the central activity of new product development and it comprises several concepts. OECD (2014) in this line uncovers these concepts as instigating design; exemplifying the original discovery, analytical design; the study of new amalgamations of prevailing products and components, re-arrangements of procedures and designs of new equipment within the existing state of the art.

Walsh et al. (1990) in the same breath infers that design can bear a strategy for market success by refining the quality of a product with incremental variations over time. With these views it is thus prudent to extrapolate product design as a strategic process comprising the knowledge about a product from which it

can be conceived and positioned in the marketplace.

Marketing literature also submits that design is an instrument for attaining competitive strategies. For instance, Porter (1990) refers to the usual forms of competitive strategy as price, focus and differentiation. According to him, a competitive strategy on price aims to reduce costs and deliver supplier participation in product development process, with reduced costs. It follows then that a company that pays attention to competitive strategy leans towards addressing exclusive market based consumer demands and specialization, a fact that resonates with the framework of design-led innovation. Lastly, Porter also implies that in a competitive strategy based on differentiation, design is a tactical device for product positioning in the targeted market segment (Porter, 1990). It means implicitly that design delivers differentiation in features that espouse quality, robustness, precision, ease of use, product appeal, and price, which convey competitive advantages to the product, which are the basic essentials for a successful product.

2.2 Building New Definitions

Design innovation, on face value seems to clasp two basic explanations; innovation *in* design, denotes novelties brought together in the design of a product or artefact, innovation *by* design, encompasses a new product or artefact or a novelty in a product or artefact attained by design function.

2.2.1 Design definition

Design, in its broad sense comprises a wide range of values that make it challenging to centre on a broad definition. Nevertheless, in the literature dealing with design, there are numerous descriptions speaking about design from diverse viewpoints.

The term ‘design’ has its sources from the Medieval Latin of 14th Century, from the term ‘*sign’*, which, in its verb form ‘*signare’*, implies ‘*to mark out’*. The term ‘*signare’*, a derivative to the verb ‘*de+signare’*, which implies to

create, fashion, execute, or construct according to plan, having the synonyms to create, to contrive and to intend. The verb form of the term *design* was synchronously relocated to Middle English as '*de•sign*' denoting '*to outline, indicate, mean'*, synonymous to the verb '*sign*'." (Britannica Webster's, 2002).

The initial utilization of the noun form of the word '*design'* seems to be by 1588. The word '*design*', is clarified as, (1) 'a purposeful activity'; 'a *specific purpose held in view by an individual or group* or a *thoughtful purposive planning*', and (2) 'a project or a scheme'; '*a conceptual project in which means to an end are set down* or a *deliberate obscured project or scheme'.* More modern elucidations to the word appear with the usage of identical words. 'Design', indistinguishable with the word '*plot' (in plural form)*' means '*an initial sketch or outline illustrating the pertinent features of something to be accomplished'*. One more synonymous word for '*design'* is '*delineation'*, which means '*a fundamental outline that administers operations, developing, or unfolding'*. '*Design'* is equally used in matching to *'pattern* or *motif* which implies *the arrangement of elements or details in a product or work of art'*. The word 'design' is also described as "a creative activity, in the sense, *the creative art of executing aesthetic or functional design."* (Britannica Webster's, 2002).

2.2.1.1 Theoretical Definitions of Design

As aforementioned and explored, Design notion has numerous meanings which come from diverse standpoints, which lead to descriptions at functional and strategic levels as posited by the select definitions here by various organizations and personalities.

WDO (2017) strategically define design as a problem-solving method that pushes innovation, creates business accomplishment and leads to an improved quality of life via innovative products, systems, services, and experiences.

OECD (2014) conveys a functional viewpoint by describing design as drawings aimed at outlining procedures, technical provisions and operational

features vital for the development of new products and processes.

In line with Heskett (1980), "… design is a process of creation, invention and definition separated from the means of production, involving an eventual synthesis of contributory and often conflicting factors into a concept of three-dimensional form, and its material reality, capable of multiple reproduction by mechanical means."

Marzano (2000) extrpolates design in a higher strategic level as having a duty in sustaining and advancing the development of civilization, harmonising technology and socio-cultural values. In line with him, by facilitating interaction design makes new achievements likely, encourages the evolution of values and eventually, support in the pursuit of growth, breakthrough and maturity (Marzano, 2000).

Porter (1990) defines design as a crucial strategic tool for competitive strategy. In essence, design is dedicated to producing contextual characteristics with place, apart from competing propositions within the market that espouse improved quality, articulated via durability, precision, ease of operation and distinctive aesthetics at an appropriate price (Porter 1980).

Walsh et al. (1992) settle on a comprehensive definition of design as the configuration of materials, elements and components which contributes to a product's attributes of performance, appearance, ease of use, method of manufacture etc.

Buchanan (1992) describes design as the human power of envisioning, development, and creation of products that serve human beings, accomplishing their individual and collective purposes. To him, design is an art of invention and disposition with a collective scope that makes it appropriate to the formation of any artefact.

2.2.2 Design Innovation Meaning

In discoursing design as a strategic device for competitive advantage and consequently market success, this research bore so much on Walsh et al. (1992) who point to a comparable idea. They reference new designs augmenting product quality but encompassing no methodological change, through which they then talk over, incremental expansions in the quality of a product or service that are minimally risky and expensive, short term, hence constitute less a venture for the producer. (Walsh et al. 1992).

Oakley's (1990) description of design similarly features the definition of design innovation tendencies. In line with him, and as popular with this research, design effort is geared at helping turn an invention into a popular innovation or to prolong the utility of a current innovation. He further describes this effort as a "*fine-tuning to attain a result that fits our needs more precisely".* Here, Oakley (1990) demonstrates his definition as shown in the Table 1. He also opines that ninety nine percent of the new products in the market originate from an existing novelty. In this regard he emphasizes the significance of design effort in introducing novelties by outspreading the expediency of the existing innovation.

Table 2.1: Example products whose market potentials have been multiplied by design

Basic Innovation	Designed Innovation
Bicycle	BMX Bicycle
Cassette tape system	Walkman stereo (etc.)
Hovercraft	Hovermower

Source: Oakley, 1990

2.2.3.2 A Contextual Explanation for Design Innovation

In the light of the afore mentioned insights, design innovations thus comprise the incremental novelties in the design of an existing product or service, or radically new products or services attained by design effort with no or minimal technical novelty. The design effort captured in this description refers

to a design process with a pragmatic role of industrial design and offerings of a variety of design practices.

Though literature does not include a commonly established definition of the concept, design innovation, a number of investigations highlights the prominence of design in refining the quality of a product or service minus technical change. In line with Walsh et al. (1992), via re-design, incremental innovations are attained with less risk, less expense and short time. Rothwell and Gardiner (1988) posit the flexibility of the design of a product to meet the changing needs of a range of user segments. Porter (1990) finds design effort as the only competitive strategy, which, via differentiation and positioning, aids in attaining a competitive edge in market. Oakley (1990) stresses that design activity prolongs the utility of a new or existing innovation and supports the products to user needs more precisely.

Design activity thus helps convert technological innovations into product or service innovations or add to the incremental novelties in the quality of a product or service. Design innovation has a vital role in the competitive strategy of any business that designs and creates new products. This is a consequence from the fact that innovation *by* design, when likened to innovation driven by technological novelty, is less risky, less expensive, less time consuming and more advantageous in obtaining the qualities that are perceived by the end-user (Porter, 1990; Walsh et al., 1992; Oakley, 1990).

A pertinent issue which requires explanation is the difference between ‘technological innovation’ and ‘design innovation’. As earlier outlined, technological innovation involves a methodological change or novelty, in contrast design innovation presents a novelty attained through design effort with no or minimal technical novelty. The difference behind this distinction is the approach taken toward innovation. This difference can be explained in uncomplicated terms that, technical change embodies a scientific approach, while novelties attained by design effort represents a variety of trans-

disciplinary approaches from the humanities to the arts. Figure 2.4 exemplifies design innovation as related to other categories of innovation.

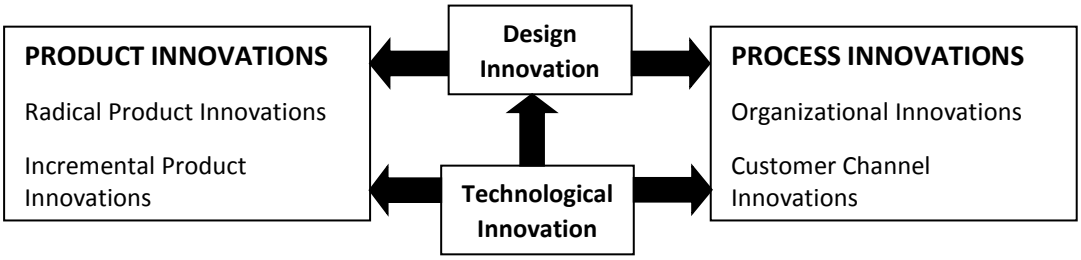

Figure 2.4: The categories of innovation and their cross-relations

Source: Mutlu, 2003

Design innovation has capacity to grow into a new mind-set that understands the emergent practises to design, their influence on innovation, and a connection to close the theoretical gap between the design literature and the innovation literature and economics. Design innovation practical applications promises long term paybacks along with the benefit of satisfactorily responding the changing consumer needs.

2.3 A Review of Design Engagement in Business

Just as reviewed in the introduction of this study, companies are obligated to reconsider their business approach and transform their capabilities as they adjust to the impacts of deregulation, globalization and the knowledge economy, (Martin, 2007). There is thus an everlasting necessity for deliberate processes to facilitate organisational performance through alignment of vision, mission, strategy, work processes, culture, and people. The foregoing literature has revealed the importance of design as being derived from the external viewpoint a designer takes in the direction of problem solving (Cross, 1982), by integrating user needs with technological and business capabilities (Brown, 2008). This view has been corroborated in strategy based design structures globally (Design Council, 2002).

2.3.1 Design Engagement in Business Processes

The foregoing literature has established that technological innovation alone today is inadequate to guarantee business and product differentiation, hence competing in today's globalized and enigmatic market is difficult (Keeley et al., 2013). It follows then that innovation contained by production industries today must walk around the whole business model, not just the technology. This is properly put forward by Chesbrough (2007) who implies a superior business model being more often what beats a better idea or technology. This knowledge has previously led to the study into the role of design as an imperative asset that connects innovation and strategic value to company performance (Dell et al., 2010).

2.3.2 History of Design in Business

Typically design has stereotypically had a much reduced role in the strategy development that defines and drives innovation within a company, (Brown, 2008). In this sense the responsibility of a designer is situated in the end stages of new product development, focusing on ergonomics, styling, manufacturability and product differentiation. The importance of design is traditionally perceived as a low significance. There is a deficiency of knowledge about its perceptible benefits of design. Lorenz (1990) defines these obstacles in assimilating design into other areas of business as listed below:

i. Design is disregarded by more usual strategic conceptions used by managers ;
ii. Experts and researchers have failed to create a compelling typology for design as a strategy;
iii. Design is stereotypically situated within the low-ranking levels of engineering and marketing;
iv. Design is perceived as a 'right brain activity' and overlooked as not being verbal, linear or analytical; and
v. Design can be replaced by old-fashioned departments within a company.

In this respect, Trueman and Jobber (1998) conducted surveys on one hundred and eight product-driven company managers concerning their views towards design, as well as traditional processes of new product development. The managers revealed the value of design having traversed through four foundational levels (product, company, production and strategy) of a company set-up; recognised within their work as Value, Image, Process and Production (VIPP). They describe the levels in which design can be incorporated throughout a company as outlined:

i. **Product value:** Design is connected to product value, reliability and quality, with styling and aesthetics that are related with good design (Lorenz, 1990).
ii. **Image**: Here design deals corporate and company identity, image and brand (Porter, 1996).
iii. **Production level:** Here design plays a role in elevation of the company design profile, multiplying production proficiency at the front-end to minimize complexity (Lorenz, 1990; Amit & Zott, 2001).
iv. **Process Level*:*** Design fosters the relationship found between organisational strategy and the process of developing new products. Design identifies the opportunities from market feedback, R&D, senior design management and multidisciplinary design teams. (Holloway, 1997; Pozzey et al., 2012).

Escalating from a product oriented application on design's level of assimilation within a business, the Danish design ladder posits a framework which clusters company's maturity in design on the basis of their utility of design. (Kretzschmar, 2003).

i. Stage 4: Design as Strategy
ii. Stage 3: Design as Process
iii. Stage 2: Design and Styling
iv. Stage 1: No design

The upper a company is on the ladder, the superior the strategic performance design will pay. The Danish design ladder visualizes

product design within Stage 2; Design and Styling. Conventionally this was the range of design in business. Design-led innovation nevertheless, helps companies in exploiting design as a strategy, highlighted in Stage 4.

Bucolo and Matthews (2011) illustrate the deployment of the Danish design ladder inside business programs. In effect to help companies in devising a more established approach to design within their business. Organisations thus should purpose to incentivize organisational performance via alignment of vision, mission, strategy, work processes, culture, and people.

2.4 Design Thinking

Design Thinking is a methodology that exploits the designer's ability, empathy and approaches to fuse people's needs with what is technically feasible and what business strategy can translate into customer value and market opportunities (Brown, 2008). Design thinking elevates a customer-centric outlook by employing human-centred design, experimentation and concept prototyping, creating an avenue for design to have an impact across the innovation process (Verganti, 2008; Norman, 2010).

Design thinking is founded upon abductive reasoning (Cross, 1982; Martin, 2007, 2009). Thagard and Shelley (1997) posit abductive reasoning as reasoning in which descriptive hypothesis are composed and assessed. (Thagard & Shelley, 1997). Cross (1982) resists that abductive reasoning is typically constructive thinking, dissimilar from the more frequently recognised inductive and deductive kinds of reasoning…something uncharacteristic to design (Cross, 1982).

Thagard and Shelley (1997) define the aspects of abductive reasoning. The following section posits these aspects in quote form from their work.

2.4.1 Explanation is not deduction

A universal framework of abduction involves an account or explanation of ideas or concepts, and is richer than deduction (Thagard & Shelley, 1997). This element frequently makes mention to Peirce's idea of the logical leap of the mind (Martin, 2007; 2009). Exemplified in a McDonald's Restaurant example, Martin (2009) explains design thinking as the variance between valid and reliable information in the sense that, the McDonald brothers didn't know that their "*Speedee"* Service System would work. They had imperfect but not irrelevant data about it. They knew that their competitors; carhop restaurants had the appeal of relatively quick service, but had some drawbacks. Their logical leap; their inference, was that their patrons liked the basic concept but would like it a lot more if the restaurant were a drive-through with a narrower, more standardized menu. The brothers had no 'proof,' only their instinctive reasoning (Martin, 2010)

2.4.2 Hypotheses are layered

In a situation that hypotheses clarify other hypotheses, choice of the outstanding overall clarification relies on considering these relations (Thagard & Shelley, 1997). McGrath's (2010) illustrates incessant experimentation and business model prototyping as a key to stay relevant in ever changing business surroundings;

"In highly uncertain, complex and fast-moving environments, strategies are as much about insight, rapid experimentation and evolutionary learning as they are about the traditional skills of planning and rock-ribbed execution. Modelling, therefore, is a useful approach to figuring out a strategy, as it suggests experimentation, prototyping and a job that is never quite finished" (McGrath, 2010).

2.4.3 Abduction is sometimes creative

Creative abduction many times comprises the building of unique hypotheses concerning newly formed ideas (Thagard & Shelley, 1997). Conventionally, the idea of prototyping is a risk mitigating procedure used in new product

development. Design thinking utilizes this method to minimize the risk of a business model idea by trying it at the market place. Thagard and Shelly (1997) note, "We can toss around an idea, play with it for a while and see what happens, and just try it out to see how it feels. In this way, strategy formulation becomes less of a linear, technocratic process of data analysis and more of a creative, iterative, emergent and innovative process of creating innovative breakthrough strategy by design".

2.4.4 Hypotheses may be revolutionary

Belief reconsideration happen where the institution of new hypotheses leads to denunciation of previously held theories (Thagard & Shelley, 1997). Verganti et al. (2009), emphases on the association amid breakthrough technology and breakthrough innovation with product emotion and symbolism, emphasised via the case study of the Nintendo Wii, a video game system (Dell et al., 2010; Verganti, 2008).

The Wii effectively combines a radical innovation in customer appeal with a radical innovation in technology. It has redefined the meaning of playing with a game console, not as passive immersion in a virtual world targeted to young players but as active entertainment in the real world for people of all ages and demographics. At the same time, Nintendo achieved this result through the use of a breakthrough technology (Dell et al., 2010).

2.4.5 Completeness is elusive

In the wide-ranging analysis of business model design literature, Shafer et al (2005) determined that "an organisations business model is iterative and incessant since competitive circumstances vary in time and companies have to constantly adapt to stay relevant."

An organisation's business model is never complete as the process of making strategic choices and testing business models should be ongoing and iterative. While there are certainly no guarantees, we contend that the probability of

long-term success increases with the rigor and formality with which an organisation tests its strategic options through business models (Shafer et al., 2005).

2.4.6 Simplicity may be complex

In Kyffin and Gardien's (2009) design-led innovation, they visualised an unstable tendency in the complexity of innovation, and consequently suggested a new approach to it. They allude that, "the range of innovation has enlarged intricacy, where products, services, user needs and technologies need to be assimilated while coalescing the various stakeholders together in the processes. Nonetheless, the course of innovation is over and over again perceived as being linear, with research results, new technologies or user insights channelled through cutting-edge development and new business processes into the market."

Still in this field, authors, (Zott & Amit, 2001) regularly talk about the Apple company as being a trademark success story, in innovation texts, business model design texts and even government design and innovation change programs globally. This is for the reason that Apple creatively utilizes design via abductive reasoning, geared on making simplicity from complexity, to save the users from that trouble. Quoted from the Apple Website on design (Chesbrough & Schwartz, 2007; Verganti, 2008):

"Simplicity is often equated with minimalism. Yet true simplicity is so much more than just the absence of clutter or the removal of decoration. It's about offering up the right things, in the right place, right when you need them. It's about bringing order to complexity. And it's about making something that always seems to just work. When you pick something up for the first time and already know how to do the things you want to do, that's simplicity"

2.4.7 May be visual and non-sentential

Abductive interpretation is better known as using graphic or other iconic

illustrations (Thagard & Shelley, 1997). It is then graphic as the illustrations of both what gets clarified and what the clarifying does, use constructions that resemble what they represent (Thagard & Shelley, 1997). This instrument allows a practitioner to envisage a business model, permitting regular iterations through a modest but commanding communication language that associates company employees to academic theory. Backing up this model, Osterwalder & Pigneur, (2010) indicated that:

"This concept can become a shared language that allows you to easily describe and manipulate business models to create new strategic alternatives. Without such a shared language it is difficult to systematically challenge assumptions about one's business model and innovate successfully"

From this analysis, it is imperative that design thinking can empower practitioners to constantly discover complex market situations, to translate meaningful insights back into the firm. Design thinking constructs a foundational capacity in a firm to effectively explore, accept, understand and learn intricate settings to unravel distinctive and perplexing problems. From end to end design thinking, a company's design function is not restricted to product or marketing. By espousing an all-inclusive systems perspective, design thinking generates strong value propositions that interweaves through business model development to guarantee that the value received is superior to the sum of the parts.

2.5 Empathy Building

Empathy is (1) 'an aptitude', (2) 'an association of modules' and (3) 'a process'. (Kouprie and Sleeswijk Visser, 2009). Empathy as an ability is having the capacity to ascertain and comprehend another person's state of mind, concepts and contexts, and it bears a perceptive (understanding) and a sentimental (feeling) element (Baron-Cohen and Wheelwright 2004). Both elements must be advanced via user data in the New Product Development

process. Amassing empathy with users in design processes is not mystically realised at one intuitive instance. Founded on psychological philosophies, empathy is a practise that navigates through diverse phases. Its relevance to design comprises of four following phases; discovery, immersion, connection and detachment (Kouprie and Sleeswijk Visser, 2009).

2.5.1 Discovery:

The designer makes preliminary interaction with the user, either personally or by reviewing provoking information from user studies. The designer's inquisitiveness is elevated, ensuing in his readiness to explore and discover the user, his state of affairs and experience.

2.5.2 Immersion:

The designer goes wandering around in the user's world, to develop his understanding of the user; the contextual diverse aspects that influence the user's experience. In this instance, the designer is liberal and of interest in the user's point of reference.

2.5.3 Connection:

The designer bonds with the user by recollecting unequivocally upon his own memoirs and experiences in order to be able to formulate an understanding.' He creates a link in an emotional level with the user by evoking his own feelings that reverberates with the user's experience. At this phase both affective and cognitive components are important; the affective to *understand feelings*, the cognitive to *understand meanings*.

2.5.4 Detachment:

The designer disengages from his emotional link and steps back into the role of designer to make sense of the user's world. By stepping back out to reflect, he deploys the new insights for ideation.

2.6 Design-led Innovation Theory and Background

Design led innovation concept started to develop in 1980s when Jim Utterback and Bengt-Arne Vedin were part of a team of Swedish and American investigators undertaking a research to figure out foundations of future growth. To their amazement, the most prosperous companies in the research sample were those stressing design, as opposed to technology, in their innovation (Utterback, 1974). During the late '90s, Verganti (2008) started exploring popular innovation practices in Italian design conscious manufacturers. He later on expanded the research scope globally and the outcome established that radical innovation of product meanings, eventuates to products with long lives, momentous, sustainable profit margins, brand value, and company growth.

Verganti (2008) in this process identified three techniques to innovation 'market-pull', 'technology push' and 'design-led approach', as illustrated in Figure 2.5. Market-pull innovation was found to begin with analysis of user needs and then searching for technologies with the ability to satisfy them. Here, the market is the leading origin of innovation. More so, new product development is a straight result of categorical needs as articulated by the consumers. The principal supposition of this method is that user needs are clear features which can be identified, captured, and translated into new products that satisfy them. (Iansiti and Khanna, 1995).

Technology push methodology was found to stem from the company's research and development functions. Through realising and development of new technologies, new products are created. (Abernathy and Clark, 1985). Design push approach is complementary to market pull and technology push.
In the 'design push' approach, innovation comes from a third knowledge source, one that puts together knowledge about user need and technological opportunities (Verganti, 2009). These are Design-led innovations which are proposals that end up being what people were waiting for, once they interact with them (Verganti, 2009)

Design-led, companies are thus supposed to have investigators who visualise or envision and study new product meanings via a broader, detailed examination of the evolution of society, culture and technology serving as interpreters who are able to envision how people give meaning to things through an intense design discourse. The Design-led discourse here espouses a circle or a setup of people, for instance artists, cultural organizations, media, retail and delivery firms, designers, architects, technology suppliers, and research and educational institutions, who are engaged in a continuous conversation about new products, people's needs and values (Verganti, 2008).

Nevertheless, listening is just a single part of the strategy. The company must contact an internal exploration experiments that ultimately enable it to create its own visions and proposals that conceives radically new meanings to a products (Verganti, 2008). Companies that conceive design-led innovations highly value their collaborations with these interpreters and understand that knowledge about meanings is spread all through their external settings. In effect they are immersed in a combined research laboratory where interpreters pursue their own investigations and are engaged in a continuous mutual dialogue (Verganti, 2008).

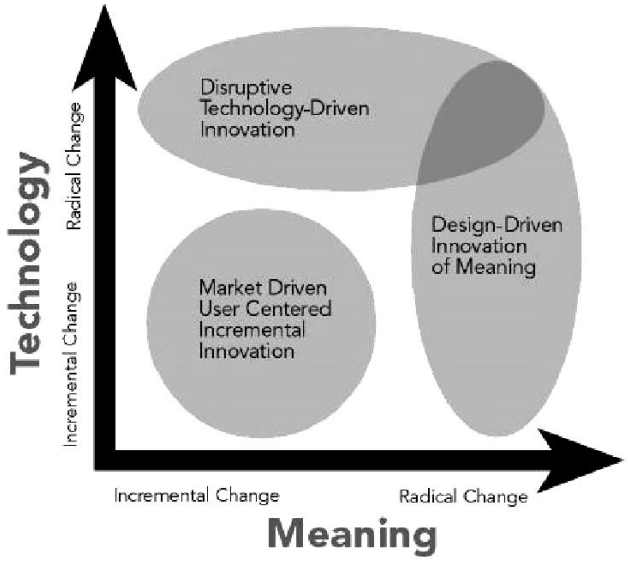

Figure 2.5. Design Driven Innovation

Source: Roberto Verganti 2009

Basing on Verganti (2009) views, the design-led discourse is suggested to have three dissimilar process steps. The first one is *"listening"*, that is concerned with active participation in a distinctive design discourse and collaboration with different translators, to be able to collect data espousing new possible product meanings. The capacities that companies must horn in this step are how to find, attract and develop a close relationship with key interpreters who research the possible trends and develop distinctive ideas about how meanings could change in the context which the company wishes to examine. The second action is *"interpreting"*. This is the in-house procedure where the knowledge attained from previous stage is fused and incorporated in the company's own trademarked understandings, technologies, and assets. The results of this process would be a radically new product meaning. The third action is *"addressing"*. A company presents the results of its interpretation about a radically new meaning to the marketing divisions and ask them to use their inducing power to familiarise the prospective customers of the new product meaning, which is often unanticipated and at times confuses.

2.6.1 Perceived efficiency of Design-led Innovation

Design-led innovation has been observed to support companies to develop a 'sustainable competitive advantage' by comprehending the strategic value provided by design within a business environment (Bucolo and Mathews, 2011). By adopting and assimilating design at an all-inclusive business level, a company can be deemed design-led ((Bucolo and Mathews, 2011).

At the moment, the essential ideologies of design have stayed constant, notwithstanding the incessant advancement of its utility in industry and business (Norman and Verganti, 2011). The core principles that work within the design thinking methodology, like cyclical iterations, prototypes and solutions, are active in this process. As a substitute, these fundamental design principles have been generalised to strategy-level business functions, letting a business's vision and value proposition, inform design resolutions.

Foreseeing the efficiency that it brings, the conceptual Design-led Innovation framework should thus illustrate a cyclic iterative procedure that can aid companies to explore, capture and realise the strategic value that design can advance to a business (Bucolo and Mathews, 2011). Significant to this framework is the association between operational and strategic functions within a business, including the internal and external application of these activities. The principal opportunity or value proposition is situated at the heart of these axes and is utilized as the paramount uniting theme that brings together all segments of a business (Bucolo and Mathews, 2011).

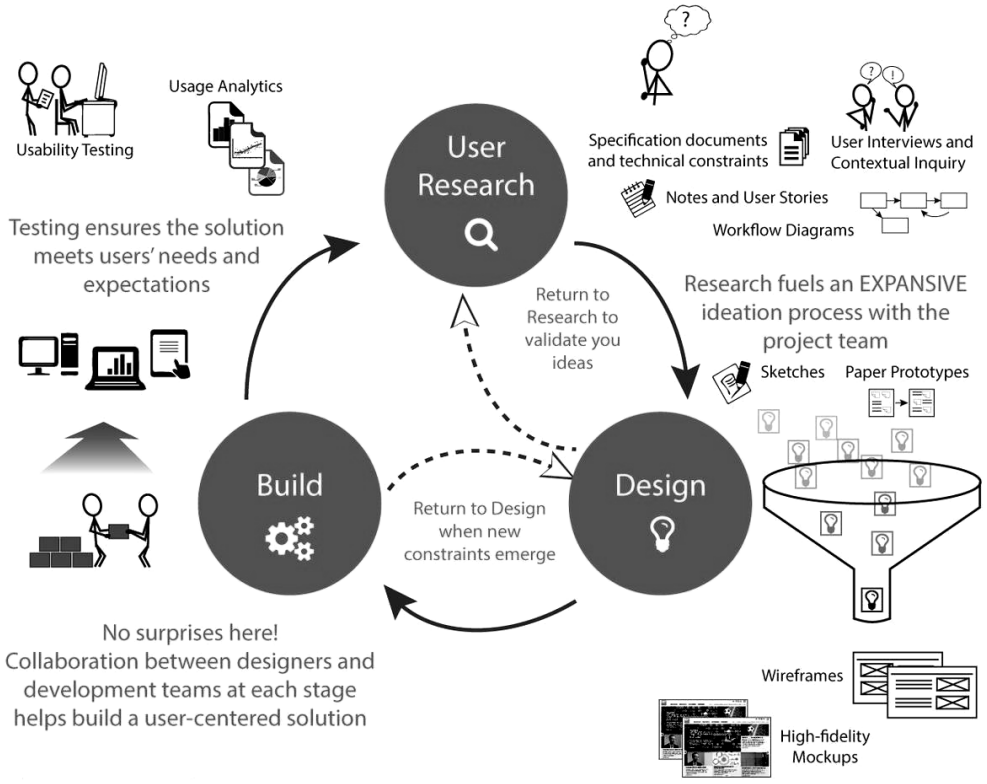

Figure 2.6: Design-led Innovation Concept

SOURCE: Author based on literature review

2.7 Market Orientation by Design

In a customer-centred organization structure, the organization groups its customers by industry, application, usage situation or some other non-geographic similarity. Homburg *et al*. (2000) and Narver and Slater (1990)

view a customer-focused organizational structure as a pre-requisite to acquiring and disseminating market information in order to create value for the customer. This shift away from a product-focused or geographical-region organizational structure is driven by customers, who do not want generalists who will sell to everyone, but rather a person who is focused on their needs and requirements (Homburg *et al*., 2000).

These observations are consistent with the central notion of market orientation. According to Gheysaria *et al*. (2012) market orientation proposes behavioural norms for collecting, sharing and answering to market information, as well as necessitates organizational systems and processes to assess customer needs and market intelligence distribution. Moreover, market orientation requires flexible and adaptive organizational systems with the commitment of top management (Gheysaria et al., 2012). Notably market orientation is concerned with generation, dissemination, and responsiveness to information (Helfert, 2002). Therefore the term "market orientation" is employed to describe an organization's general attentiveness and sensitivity to consumer needs. It entails the following imperatives:

i. Collaboration

Collaboration is often closely linked with network thinking as appears to drive the understanding that no business is an island and in order to prosper internal and external collaboration is required (Ritter et al. 2004). At the external level this interdependence (Bat and Purchase, 2004) manifest in inter firm boundary spanning to achieve the desired collaboration for attaining mutual goals. In essence the strategic imperative to collaborate with other firms requires some form of boundary spanning (Smirnova et al., 2011). Importantly, Hult (2011) posits that this external boundary spanning (inter-firm collaboration) and competition co-exist in a marketing organization's network. The result is a dynamic and complex nature of collaboration in the external network. According to Le Meunier-Fitzhugh and Piercy (2009) the success of the boundary-spanning collaboration organization depends on how well the

marketing activities, customer value–creating business processes, networks, and stakeholder focus are moulded together to form an integrated organization.

ii. Cross-functional Co-ordination

As mentioned in the previous section, another form of boundary spanning collaboration is to be found in how a firm integrates functions in order to achieve desired value creating outcomes. Smirnova et al. (2011) view inter-functional collaboration as a measure of the internal alignment and partnership between departments in the firm, which in turn contributes to the creation of sustainable advantages via improved external partnerships and facilitating demand chain integration. The authors (Smirnova et al. 2011) cite evidence (Morgan and Piercy, 1998; Ellinger, 2000 and Piercy, 2009) in demonstrating that effective inter-functional collaboration has become an important strategic issue as it contributes to aligning organizational objectives, values and priorities for both internal and external actors. The associated leverage of resources and knowledge yields synergies between departments that enhance the development of internal social capital (Menguc and Auh, 2005). Similarly, the danger of weak inter-functional integration, which occurs when accumulated market knowledge at the firm level stays isolated within one department, is that it often yields an "internal sickness" (Atuahene-Gima et al. 2006).

Inter-functional boundary spanning activity also attracts criticism. Often the inter-functional integration is considered among two highly related departments such as marketing and sales (Gosselin and Bauwen, 2006). Many studies focus only on markets while the issue of inter-functional alignment is critical for firms in transitional economies to promote market orientation (Smirnova et al., 2011). Other sources of criticism may well exist.

According to Smirnova et al (2011) the most often used conceptualization of inter-functional boundary spanning refers to the degree to which the functions

and departments within the firm communicate with each other and work cooperatively. This view is consistent with the behavioural operationalization by Kohli and Jaworski (1990) and Narver and Slater (1990) that internal collaboration relates to inter-functional coordination as a latent construct of market orientation. Importantly, Eng (2006), Henneberg et al. (2009) and Piercy (2009) showed that the alignment external business relationships lies in the interactions of internal boundary-spanning functions. It is thus safe to employ these results to argue that for firms to enhance their performance they need to develop inter-functional interactions to serve customers better; thus developing a customer orientation.

2.7.1 Market Orientation

Market orientation was first defined in literature as an organization-level culture comprising values and beliefs about putting the customer first in business planning (Shapiro, 1988; Deshpande and Webster, 1989; Kohli and Jaworski, 1990).

Additionally, some authors also emphasized that market orientation is the set of beliefs that puts the customer's interest (or understand the latent needs of customers) first (Deshpandé et al., 1993; Narver et al., 2004), while not excluding those of all other stakeholders such as owners, managers, and employees, in order to develop a long-term profitable enterprise (Deshpandé et al., 1993). Since then, market orientation has been studied both as a cultural phenomenon, and a set of behaviours and actives relating to:

i. Organization-wide market intelligence (covers both customers and competitors) generation through decision support systems, marketing information systems and marketing research efforts,
ii. Market intelligence dissemination within the firm,
iii. Action-oriented responsiveness to the information (Gatignon and Xuereb, 1997; Deshpande, 1999).

2.7.1.1 Towards four variables of market orientation

During the development of market orientation, some scholars put the emphasis on certain perspective around cultural and behavioural approaches, e.g. they view the market orientation from a market information processing perspective. Hunt and Morgan (1995) define market orientation as:

i. The systematic gathering of information on customers and competitors, both present and potential,
ii. The systematic analysis of the information for the purpose of developing market knowledge, and
iii. The systematic use of such knowledge to guide strategy recognition, understanding, creation, selection, implementation, and modification.

Meanwhile, in a recent studies as adapted by this research, some researchers stated market orientation as the process of obtaining information from the marketplace (customers, competitors, supply chain partners, and environmental trends), analysing and evaluating of market information, and using the information throughout the organization. (Moorman, 1995; Jaakkola et al., 2009; Song et al., 2009).

Furthermore, some scholars also state market orientation around cultural and behavioural approaches in a wide range which combine different perspectives. Narver and Slater (1990) proposed that market orientation has three dimensions: customer orientation (the firms understand their buyers in order to create superior value for them continuously), competitor orientation (firms' understanding of the short-term strengths and weaknesses and long-term capabilities and strategies of both the key current and the key potential competitors) and inter-functional coordination (the coordinated use of firm resources to create superior value for target customers). It means that gathering, analysing and using information of customers as well as competitors is important. Inter-functional coordination supports sharing of information, which is necessary in order to achieve an effective use of information.

There is one statement from Lafferty and Hult (2001) which embraces above perspectives. Based on the research of several similarities in the prior perspectives, they formed four general areas of agreement which was reflected as to what constitutes the basic foundation of market orientation, including:

i. An emphasis on customers;
ii. The importance of shared knowledge (information);
iii. Inter-functional coordination of activities and relationships;
iv. Being responsive to market by taking the appropriate action (Lafferty and Hult, 2001).

2.7.2 Market orientation as Consumer driven

Nevertheless, to counter criticism that market orientation (conceptualized as being consumer-driven) was too reactive, both Jaworski et al. (2000) and Beverland et al. (2006) identified two forms of market orientation. When utilizing a market-driven approach, businesses adopt a reactive stance and focus on trying to learn, understand and respond to stakeholder (customer, competitor, owners, managers and employees) perceptions and behaviour (Jaworski et al., 2000). Backman et al. (2007) stated that consumer-driven concept is aimed towards a certain customer group or business opportunity. Secondly it's an approach that involves proactive strategies that aim to change the structure of the marketplace or the rules of the game (Jaworski et al., 2000). A company must have the imagination to envision markets that do not yet exist and the ability to stake them out ahead of the competition (Hamel and Prahalad, 1991). Organizations using these strategies in New Product Development (NPD) do not only strive to meet customer needs but also search for products that pioneer new markets.

In this instance consumer-driven approach would focus on evolutionary product changes driven by feedback from business buyers and end-consumers (Beverland et al., 2006) while it would include a competitor focus, deriving ideas from the marketplace, and gaining access to distribution channels (Song and Parry, 1996; Liu et al., 2003; Beverland et al., 2006).

Besides, according to Kumar et al. (2000), firms whose success has been based on radical business innovation indicates that such firms are better described as driving-market. While consumer-driven processes are excellent in generating incremental innovation, they rarely produce the type of radical innovation which underlies market driving firms. Consumer-driven strategy entails high risk, but also offers a firm the potential to revolutionize an industry and reap vast rewards (Kumar et al., 2000).

2.7.3 How Market Orientation affects New Product Development (NPD)

2.7.3.1 Types of NPD process

NPD is the process, including concurrent marketing, engineering, cross-functional working, advanced tools, early involvement etc. (Thomas, 1993; Wheelwright and Clark, 1992), by which an organization uses its resources and capabilities to create a new product or improve an existing one (Cengiz et al., 2005).There are primarily two types of NPD process, liner sequential NPD process and parallel process (Schilling and Hill, 1998). Before mid-1990s, research focused on liner sequential NPD process. Most firms use a sequential process for NPD, wherein development proceeds sequentially from one functional group to the next. These functional groups include R&D (Research and Development), marketing, manufacturing, and logistics work independently and in sequence. This sequential process includes a number of stages where decisions are made as to whether to proceed to the next stage, send the project back for further work, or kill the project (Schilling and Hill, 1998).

However, the sequential process results in long development times and an inefficient NPD process (Mentzer, 2001). A solution to this problem is to use a parallel process instead of a sequential process. A parallel process shortens overall development time, and enables closer coordination between stages. It is an integrated approach to new product development that can also lead to compressed cycle time. Time losses between the product and process design

stage typically are reduced or eliminated, which should lead to compressed cycle time (Mentzer, 2001).

2.7.4 The Variables of Market orientation

As Lafferty and Hult (2001) state, market orientation embraces four areas. Combining with NPD theories, these four areas will be reviewed with the connection of new product development.

i. Identifying customers' needs

The traditional emphasis of marketing orientation was customer oriented, focusing on consumer needs and making profits by creating customer satisfaction. Narver and Slater (1990) stated that the customer orientation element requires a sufficient understanding of the customer in order to create products or services of superior value for them. Recent work suggests that customers have a crucial role to play in understanding how and why innovation works. Close contact with customers and effective communications of their needs leads to a better understanding of the value of product features. Besides, firms' orientation towards customers is likely to influence how they respond to changes in the marketplace, in particular, the extent to which firms develop and introduce new products (Lewis, 2001).

In consumer-driven approach, firms respond to environmental changes as they arise, but do not attempt to force change back into the environment (Narver et al., 2000; Sandberg, 2002). Even in those instances where latent needs are uncovered by the firm, there is still no active attempt to create or change behaviours among the customers (Narver et al., 2000). This kind of firms would not step outside the immediate voice of the customer and attempt to shape consumer preferences or modify them (Jaworski et al., 2000). Mainstreaming market orientation includes development of capabilities in market sensing and customer linking (Day, 1994), which lead to deeper insights into customers' both expressed and latent needs.

Kohli and Jaworski (1990) also indicate that effective market intelligence involves not just current needs but also future ones. It requires that a company has deep insight into the needs, lifestyles and aspirations of today's and tomorrow's customers (Hamel and Prahalad, 1991). This enables development of innovative solutions to satisfy those needs (Narver et al., 2004). Furthermore, firms don't just engage in educating customers about product attributes and benefits (Carpenter and Nakamoto, 1989; Kumar et al., 2000). They tend to change the rules of the "games", or create new customers/ markets (Hamel and Prahalad, 1994).

In summary literature has established customers as one of the key sources for new product development projects, and understanding customer needs is required to ensure product success. While customer involvement in product development may not always result in the desired results, interaction with customers can reduce uncertainty and develop foresight to meet their future needs better. Customer orientation is a key element of a market orientation strategy, and various methods to identify customer needs have been proposed. However, global markets with a large number of customers necessitate distinctive efforts to understand customer needs for new product development (NPD) purposes. In a market-driven context, a company has numerous customers who make decisions regarding the product's functionality, instead of only one. Requirements flow continuously from various internal and external stakeholders.

Customers have needs related to their problems and what products enable them to do. Needs depend on a situation, have different priorities, and can be identified without knowing how to address them. In quality function deployment, a customer's need is the customer's own description of a desired product benefit. Customer needs often correlate with the customer's values and behaviour. A deep understanding of needs helps when selecting the best technology and features for products.

The methods for gathering customer needs include interviews, observations, focus groups, becoming a user, customer advisory boards, websites, panels and groups. Furthermore, brainstorming, innovation summits, customer integration into a product development team, discussions with customers, ethnography, identifying lead users, and market surveys are used. Customer studies can be quantitative or qualitative. Quantitative research enables numerical analysis and presentation and has a good bias resistance, whereas qualitative techniques provide insights, ideas and understanding about problems. Qualitative techniques are commonly used in customer need identification, and a typical study includes interviewing between ten and fifty customers.

Obtaining tacit and complex knowledge from customers is hard, and organizational boundaries make it even harder. In business-to-business (B2B) markets, a large number of parties must be considered, such as users, deciders, buyers and gatekeepers. The business-to-consumer (B2C) market challenges, in turn, include having a huge number of individual customers and understanding the behaviours of different consumer groups.

ii. Collecting information

A firm's capability of generating, disseminating and exploiting market information strongly influences new product development (NPD) and its outcomes (Han et al., 1998; Langerak et al., 2007).

Consumer-driven approach to NPD emphasizes close relationships with entities both internal and external to the organization in order to get information about customers' needs and wants, competitors and changes in the market. Thus, a consumer-driven product development management emphasizes the significance of creating and exploiting market knowledge in designing and developing superior products Srivastava et al., 1999; Kohli and Jaworski 1990). What's more, market information processing capabilities and generative learning also permits quick identification and response to changing

customer needs (Baker and Sinkula, 2005). In order to develop the new product and make the NPD succeed, the organization needs to understand the strengths and weaknesses of its competitors, monitoring competitors' actions and investigate competitors' supply chain partners (Laffery and Hult, 2001).

In summary and as relevant to this research, users, as customers, can be valuable sources in developing sustainable business models. Sustainable business models must develop internal structural and cultural capabilities to achieve firm-level sustainability and collaborate with key stakeholders to achieve sustainability for the system that a firm is part of. Here, one of the major stakeholders is users.

They reveal who the key customers are and what values they want to have. In addition, they are willing to develop and even offer their own innovation ideas to firms. In a similar vein, the significance of users for business model development is emphasised by customer segments, customer relationships and channels that should be aligned, considering potential trade-offs, to conceptualize an effective business model. By adopting user innovation that consists of user-own information and knowledge, therefore, firms can generate a novel value proposition, leading to sustainable innovation. Here, it should be noted that business innovation is not just changing the product and service offerings for the customer. It involves changing "the way of business", rather than "what firms do" and must go beyond process and products.

Accordingly, innovation for sustainability should be pursued from the perspective of sociotechnical systems, not in terms of the technical system. Quite naturally, the role of users as sources of innovative ideas for sustainable business models should also be analysed within the framework of sociotechnical systems. For example, in the case of living laboratories, users shape the innovation in their own real-life environments, unlike the traditional approaches to users where the insights of users were captured and interpreted by experts. Innovation occurs in value network constellations and users play a

significant role. This notion indicates that it is worth investigating the role of users in the process of business model innovation, which is expected to help facilitate the adoption of user innovation models by firms for designing sustainable business models.

iii. Inter-functional coordination (IFC)

Inter-functional coordination is the coordinated use of firm resources to create superior value for target customers (Narver and Slater, 1990). This coordinated integration draws on the information generated and through the coordinated use of firm resources, disseminates the information throughout the organization (Laffery and Hult, 2001). Moye and Langfred (2004) stated that sharing information among different apartments may not only reduce different conflicts such as task conflict and relationship conflict but also create a common understanding. Moreover, argument shows that manufacturing strategies and design inputs should be closely integrated throughout the NPD effort (Narver and Slater, 1990). Meanwhile, as many companies are becoming more consumer-oriented, their world-class competitors are using advanced technology to create new businesses that few marketers could have imagined (Hamel and Prahalad,1991). Neither technology nor marketing can be the sole departure point for creating new competitive space. Consistent with Slater and Narver's (1998) arguments that market orientation goes beyond being customer led, a firm's competitor orientation and inter-functional coordination are positively associated with its NPD creativity (Wei, 2006). Creative new ideas and innovations usually come from interactions among people (Leenders et al., 2003).

Integration leads to greater product design quality, where design quality is a holistic concept comprised of both product performance and conformance attributes (Swink and Song, 2007). The inter-functional coordination embedded in the consumer-oriented culture (Narver and Slater, 1990) also provides a unifying focus of creating superior value for customers (Baker and Sinkula, 1999; Atuahene-Gima, 1996) with a comparative impetus with

competitors' activities, and helps to achieve a holistic approach to NPD practices, thus improving new product performance (Langerak et al., 2007).

In a nut shell, it is possible to develop many techniques to manage companies. Overall, the goal of all techniques is to improve earnings through satisfying customers. Inter-functional Coordination (IFC) is one of these approaches. IFC can be identified as the spirit of a company. It brings many advantages for a company because it is established on the cooperation and coordination all of activities and processes in the company. It has a positive influence on the internal environment; however, it also affects external environment positively. Previous researches show the positive influence of IFC on customer success. The high level of positive correlation is shown especially in ethics and goodwill, control (strategy) and all items of the narrower conception of IFC; (fundamental information acquisition, coordination activities, information coordination).

iv. Take action

According to Kohli and Jaworski (1990), responsiveness is the action taken in response to intelligence that is generated and disseminated. Some scholars argue that organizational responsiveness results from firms' gathering, sharing, and interpretation of environmental information (Wei and Wang, 2010). The other elements have no value if the organization is not able to respond to market intelligence and the market needs (Lafferty and Hult, 2001).

All departments need to be responsive and this can take the form of selecting the appropriate target markets, designing, producing, promoting and distributing products that meet current and anticipated needs. What's more, Homburg et al. (2007) argue that maintaining and enhancing a firm's responsiveness to environmental changes may create a competitive advantage and thereby enhance a firm's financial and product performance. Firms pursuing an innovation strategy may pay close attention to novel products and new services in the marketplace (Hurley and Hult, 1998).

So without putting innovations on the market, the implementation process is not complete and, therefore, innovation cannot be considered realized. Therefore, activities related to preparation of the market and relevant marketing activities for promotion of a new product have to take place in parallel with solution of technical problems. Even though a prepared product is technically perfect, there is no guarantee that people will accept it and utilize it in the long term. Therefore, if innovation should be successful, it has to be not only feasible, but also its result; the new product, has to be acceptable. It has to catch the interest of customers and invoke their willingness to buy it. Therefore, an important aspect affecting the perception of its output, e.g. behaviour of customers on target markets, cannot be forgotten in innovation activities.

Overall, taking action process has the task of understanding and managing innovations within companies and markets where the primary objective of an innovation rests in development of new or modification of old products, in order to improve profitability. The inevitable component of profitability is income and its amount depending on whether a company is able to satisfy customers' needs better than its competitors. In today's knowledge-based society, correct information can help a company to act against its competition, especially if such company has built a strong feedback system that is able to quickly convert knowledge into values for a customer. Marketing decisions also have to be supported by information that helps marketing managers to decide what to produce, when to produce it, and for how much. Such necessary information is provided by the take action phase.

2.7.4.1 Summary of Market Orientation by Design

Although, process names may vary for the phases of market orientation, in all, the design thinking processes lean towards introduction of an inclusive model that considers building an effective solution by *placing the consumer at the core of the development process*. Therefore, these procedures share the following characteristics:

i. **Reflective**: It aims to understand the consumer's problem and reflect it in a form of a design challenge or a brief that can later be transformed into a prototype.

ii. **Iterative**: The team and clients contribute to a continuing improvement for the created prototypes in order to reach the most efficient solution output.

iii. **Measurable**: Product success on the market is measured and feedback is collected to evaluate its efficiency and use the feedback in improving the future versions of the product. On the basis of the elaborated concepts above a conceptual framework is conceived.

The chapter charted the key concepts of preceding research on design and innovation and its relationship to business market orientation. Design and Innovation concepts and meanings were explored at length to create an understanding and a basis for the conceptual framework of this research. The research issues and insights in the design and innovation management literature were identified and discussed to further aid in formulation of the conceptual framework. The chapter further established the constructs for design-led innovation practices and business growth performance for companies. Further established and developed was the conceptual model with links to research questions to build a case for a contextual theory. The bottom-line as explored in this chapter is that in Design-led innovation, the traditional way designers think has been enriched with a user-centred and empathic focus, a collaborative way of working, and 'self-conscious reflection on the design process'. Various fundamental attributes of this that enables the aforementioned qualities have also been discovered. They are outlined here.

i. Puts people first

As documented in literature, a lot innovations fail because they simply don't fulfil the needs of people. Therefore the strategy within Design-led innovation starts by understanding people. Through the connection with business and

technology, businesses end up with services that are not only profitable and feasible but also truly meaningful for people.

ii. Combines business and creativity

Design forms a bridge between two worlds. On the one side the world of facts and truths which are predictable and measurable. On the other side the world of intuition and creativity with a focus on discovery and improvisation. Design-led innovation aims to find new solutions in the overlap between these two worlds, within the boundaries of current opportunities.

iii. Proven method for new challenges

Design as an approach exists since the industrial revolution. However the challenges to which design is being applied are changing. The approach is expanding from physical product- towards intangible service-oriented issues. Design challenges shift from the designing of comfortable car towards the design for better mobility in the urban city.

iv. Solves the true issue

In Design, the challenges are complex. In most cases the solution isn't obvious or clear. When dealing with such challenges it is essential to understand the true cause. By dedicating time and effort into uncovering the true cause, design-led innovation uncovers opportunities that open the path for solutions that can stand the test of time.

v. Is at home in the unknown

Conventionally, when someone cannot create any more value by optimizing existing parameters, the solutions is to apply a different approach. In diverse situations, the strength of management lies in making existing situations as efficient and predictable as possible. Design-led innovation on the other hand excels in successfully navigating uncharted territories to discover new opportunities that do not exist yet.

As a result, of the mentioned attributes, businesses are bound to benefit in various ways as outlined in the following table.

Table 2.2: Benefits of Design-led Innovation

Benefits for the Design Projects	**Benefits for Customers or Users**	**Benefits for the Business**
i. Legitimate ideas from the customers or users, of high originality and value. ii. Better knowledge about customers or users' needs e.g. changing existing views or validating ideas or concepts. iii. Better idea generation through collaboration iv. High quality service definitions. v. More successful innovations through reduced product failure risks. vi. Better decision making e.g. quality and speed. vii. Lower development and production costs. viii. Reduced development time or time to market. ix. Continuous improvement.	i. Better fit business and customers or user's needs. ii. Better service experience. iii. High quality targeted service. iv. More differentiated service. v. Higher satisfaction of customers or users. vi. Customer/ user loyalty. vii. Educated/ informed customers	i. Improved creativity ii. Improved customer focus i.e. better dissemination of findings about customers or user's needs. iii. Better cooperation and collaboration amongst different people or organizations and across disciplines. iv. More successful innovations e.g. rapid diffusions. v. Improved innovation practises, processes and capabilities. vi. More support and enthusiasm for innovation and change. vii. Better relations between businesses and customers. viii. Better public relations.

Source: Author based on Literature review 2018

2.8 Towards a Conceptual Framework for Design-led Innovation

This section presents the conceptual framework supporting this study. A synopsis of the literature review on the concept of Design and innovation in the previous chapter provided insights into the 'theory' and 'concepts', which inform the research and aid in the development of tools for data collection. As discussed in the previous chapter, design-led innovation is a relatively new

concept within the context of this study which should be adopted, tried and tuned to suit manufacturing companies' humanistic priorities, economic aspirations, and technological reliability.

From the foregoing literature, Design-led innovation has been defined as a methodology that transforms the role of a designer by working transversely within an organization to radically change its view of the value proposition as offered to customer, to co-design (Chesbrough & Schwartz, 2007), and to generate a unique and sustainable competitive advantage (Bucolo & Matthews, 2011b).

Design-led innovation in the same breath has equally been depicted as a process that permits a company to cogitate and assess radically new propositions from multiple perspectives that typically span user needs, business requirements, and technology demands (Bucolo et al., 2012). Crucial to this process is that design is fundamental to a company's vision, strategy, culture, leadership, and development processes. Design-led innovation has been exemplified as a process that delivers a conceptual structure anchored by a design thinking framework, which assists in the development of novelty ideas through collaboration across the entire organization in that it integrates the operational functions with the strategic vision by coalescing internal and external bases' (Bucolo et al., 2012).

2.8.1 The Conceptual Framework

In this part, based on the literature, a new conceptual framework of how market orientation is carried is built up, associated with design thinking imperatives. This model will be used in the empirical analysis part of the thesis. The sequence of the afore-mentioned variables as depicted in the framework are related to the context in which the new product development (NPD) process is carried out (Figure 2.7).

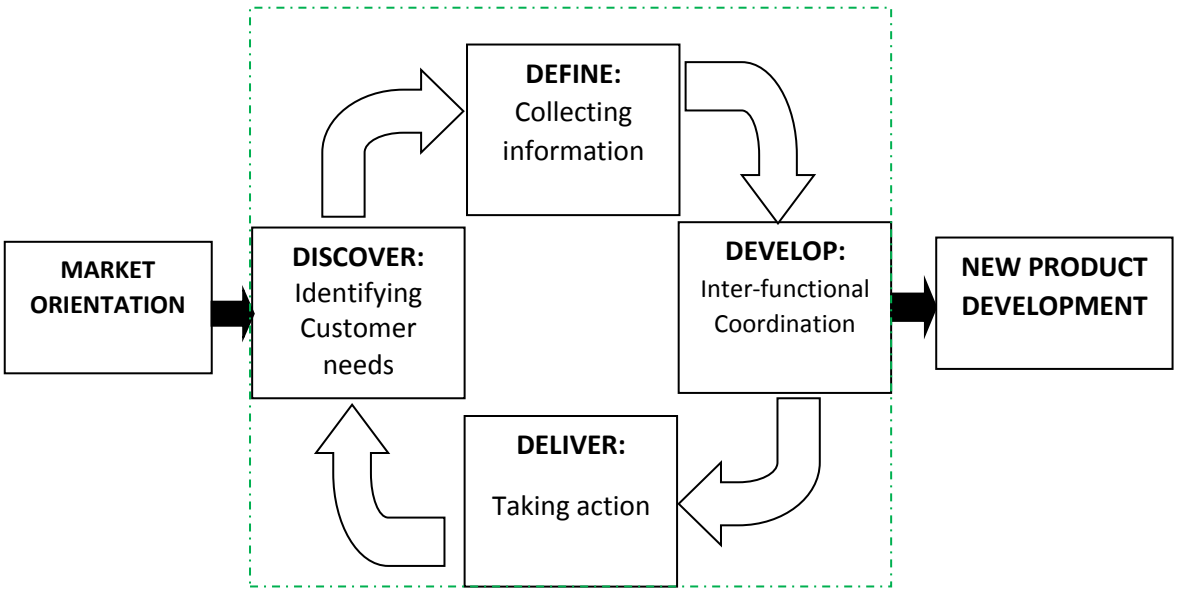

Figure 2.7: The Conceptual Model

Source: Author

On the basis of the reviewed literature and the formulated conceptual model, the design-led innovation variables that were sought in the case study companies were as follows below and as elaborated in Table 2.3:

i. **DISCOVER:** Opening up to new opportunities and getting inspired with new ideas by evaluating socio-economic characteristics, personality variables, market trends and mechanisms, understanding of customer needs and contextual circumstances, exploring and reaching potential markets.

ii. **DEFINE:** Transforming stories into meaningful insights for product development. Involves integration of customers' needs into product and process innovations and fit between market needs and company resources.

iii. **DEVELOP:** Generation of ideas through brainstorming includes analysis of product parameters, process mapping, product planning and development, prototyping, analysis of competition, flexibility and speed.

iv. **DELIVER:** Test prototypes with potential customers, incorporate feedback, Iterate continuously, evolve the innovation

Adapted from (Edgett and Parkinson, 1994; Soderquist *et al.*, 1997; Heydebreck 1997; De Brentani, 2001; Lindman, 2002).

Table 2.3: Description of Variables accessed

INDEPEDENT VARIABLE	DEPENDENT VARIABLE	DESCRIPTION
i. DISCOVER	**Identifying customer needs**	Establishing unique and differentiated offerings rooted in consumer needs and market details. This ensures unique innovative product value proposals.
ii. DEFINE:	**Collecting information**	Transforming stories into meaningful insights for product development. This ensures from the start that the product being created is user-oriented and feasible.
iii. DEVELOP:	**Inter-functional coordination**	Generation of product ideas through brainstorming. This process ensures that products that are conceived adequately solve the intended problem. It also reduces the risk of trial and error by vividly outlining features of value.
iv. DELIVER	**Taking action**	Ensuring products are generating and maintaining value both internally and for customers. This also ensures ease and consistency of manufacturing through reduction of errors.

Source: Author based on Literature review 2018

2.8.2 Summary and relevance Market Orientation

After reviewing the development of market orientation and different perspectives of market orientation, authors consider the most fruitful concepts as the ones stated by Lafferty and Hult (2001) and Jaworski et al. (2000). The former claim that the four general areas constitute the basic foundation of market orientation.

Compared with the previous studies, these four areas cover almost all the dimensions stated by the scholars. To be specific, how each area covers the dimensions will be discussed. First area is the emphasis on customers. As reviewed before, the cultural and behavioural approaches are the main streams in market orientation. Meanwhile, as Mavondo and Farrell (2000) note that, the cultural and behavioural approaches share the notion that the consumer is central in the manifestation of market orientation. Second area is the importance of shared knowledge (information), covering the statement of Moorman (1995), Jaakkola et al. (2009), Song et al. (2009), Gatignon and Xuereb (1997) and Deshpande (1999). These scholars all claim that information is one important part of market orientation. Specifically, the information here contains customers, competitors, supply chain partners, and environmental trends information (Moorman, 1995; Jaakkola et al., 2009; Song et al., 2009). Third area is the inter-functional coordination of marketing activities, feasibility studies and relationships. Fourth area is being responsive to market activities by taking the appropriate action. Similarly, it covers the statement of Narver and Slater (1990), Moorman (1995), Jaakkola et al. (2009), Song et al. (2009), Gatignon and Xuereb (1997) and Deshpande (1999). All of these scholars state that using the information throughout the organization is an elementary part in market orientation. Narver and Slater (1990) considered that the inter-functional coordination is essential for market orientation. Gatignon and Xuereb (1997) and Deshpande (1999) put the emphasis on the action-oriented responsiveness to the information.

CHAPTER 3

RESEARCH METHODS

3.0 Overview of Research Methodology

The study adopted a case study investigation. The methodological approach employed in the study is appended in the form of research instruments which were sent out to the Design innovation experts and Business executives in two phases. Appendix B contains the Phase I instrument used by Design experts in the world. The Phase I study entailed the enquiry of the relevant knowledge to the institutional context of Design-led innovation. The Phase I instrument provides the framework for the descriptive analysis thereon undertaken. Appendix C contains the Phase II research Instrument which sets out the methodological approach adopted for the case studies. This research instrument consisted of:

i. a guidance note on undertaking individual case studies,
ii. a standard reporting structure for writing up case studies, and
iii. a standard interview template for undertaking and recording interviews

The methodology was designed around the use of critical incidents as a device for pin-pointing dynamics and processes of Design-led innovation in an illuminative fashion. Critical incidents are illustrative events which provide a window into looking at the performance, operation, and philosophy of a phenomenon. The Critical Incidents analysis is designed as a bridge between the formal descriptions of what case studies are required to do and what they actually do. The case study approach was therefore essentially founded on the use of critical incidents as illustrations of the dynamics of the phenomenon under study. In addition, the experts reviews were meant to augment and give structure to fieldwork. The findings were also based on documentary review and face to face interviews with informants across the cases.

Triangulation of data sources was critical to the study. In the case of the synthesis the research benefited from the investigator triangulation resulting into viable conclusions across the eight case study reports.

3.1 Research design

The study which in itself is a Naturalistic inquiry adopted a case study method designed to determine the processes and dynamics Design-led innovation. Given the twin requirement to both generate and confirm theories of Design-led innovation, an inductive approach was combined with the use of deductive reasoning to facilitate proper organisation of the data generated from the field work. The triangulation of data sources was a guiding principle of the research design.

Rationale for the research design was informed by the following:

i. The interview template was a useful guide for the kinds of questions and issues which needed to be answered.
ii. The dynamic dimensions of the case studies enabled exhaustive research in key diverse areas under the study.
iii. The data produced by the study was rich and informative. Where the correspondents responded to the study methodology correctly the findings were always of high quality and useful. The strength of the methodology is highlighted by this result.
iv. As an exercise in directed induction, the methodology worked well. This is especially the case given the magnitude of the task and the scale of the study across the study setting.

3.1.1 Research Methodological Framework

This case study research; a naturalistic inquiry, is categorised as a methodology by Crotty (1998), together with experimental research, ethnography and action research and is observed from both interpretive and positivist theoretical perspectives (Charmaz, 2006). This methodology was effectively espoused for this study in order to interpret research participants' meanings, to produce a substantive theory (Charmaz, 2006).

This study adopted researcher-centred methods which were qualitative, in which the investigator gathered all the data from case study respondents

principally through, in-depth interviews encompassing active, rather than passive, listening. He also used open ended semi-structured questionnaires for a special category or respondents; the experts. The ensuing data analysis techniques employed were those promoted by Charmaz (2006) and helped make sure that any uncertain theories were grounded in the data collected. The techniques employed included constant comparison and hermeneutic-dialectic as described by Guba and Lincoln (1985). This research was restricted to a particular group of respondents thus it adopted more of a convenience, than purpose or theoretical, sampling strategy (Charmaz, 2006). This was comparatively due to the need to make sure all participants' views and understandings were represented, (Charmaz, 2006). Lastly, the literature associated with this research was revisited throughout the study.

The substantive theories developed emerged in view that they were provoked or grounded on data generated during the investigation process (Lincoln and Guba, 1981; Cohen et al., 2007; Charmaz, 2006).

This inquiry had a number of inferences. Firstly, the fundamental themes established were ideographic. That is, they apply to particular cases, since the interpretations made and theorising attained was specific to the context and investigator (Lincoln and Guba, 1994; Charmaz, 2006). Secondly, research design is evolving. Thirdly, since the research participants and the researcher were in a state of joint concurrent shaping, the result of data collection puts into account the multiple interactions that took place and time-based nature of findings. Fourthly, there was the genuine use of intuitive or tacit knowledge at all stages of the enquiry process since the distinctions of the numerous realities could be appreciated only in this way, as tacit knowledge reflects more impartially and precisely the value patterns of the investigator (Lincoln and Guba, 1989).

The research begun with the choice of suitable data collection methods for generating rich, social contextual and situational data (Lincoln and Guba

1989). Naturally, through rigorous interviews and the utilisation of elicited and extant texts. The data was subsequently coded. Ideas that became clear during this process were noted in the form of memos. Theoretical sampling was used to gather additional data to perfect and generate additional key codes or categories emerging from the data.

Through this procedure the researcher used constant comparison and memo writing methods, the former helping to ensure data is not forced into codes, codes into categories and categories into concepts, while latter allowed data to be compared at increasingly higher levels of theory (Lincoln and Guba, 1985). Finally, the investigator conducted a further literature review to re-evaluate the research process and products.

3.2 Data Sources

The research sought secondary data through literature review, to help build constructs for the research. The scope covered the fields of design, innovation and business. The study explored paint manufacturing companies, for data about utilization of design-led innovation. This in a bid to establish the mechanisms and the extent to which the process has been used. Customer preferences and satisfaction levels were considered to evaluate the impact of the design-led process on paint products. The research sought for the data from the paint products retailers and paint products users. More so, data from design-led innovation experts helped the research to develop a contextual theory and further develop a context responsive framework that is the ultimate product of the study.

3.3 Sampling Design

3.3.1 Case Study and location

Grounded on the features of industry that utilizes design-led innovation a criteria was developed to choose the paint manufacturing companies as follows:

i. Their product or service conveys a new meaning to the prevailing materials or products (Verganti, 2008),
ii. Their product or service is home-grown and has an exceptional position (brand identity) in the market (Verganti, 2008)
iii. Their product innovations have a journey that actively involve the end user (Verganti, 2008)

Since so little prior knowledge about the design-led innovation process exists, it was necessary to do prior research and conduct interviews with the experts in this field to certify that the mentioned criteria are relevant and core to the design-led innovation process.

The companies in Nairobi were identified through research, study and analysis of their product innovations and product impacts. This involved field visits to their production centres using the mentioned pre-determined criteria and inquiring from managers about the journey to their product innovations. Figure 3.1 shows the map of Nairobi and its divisions.

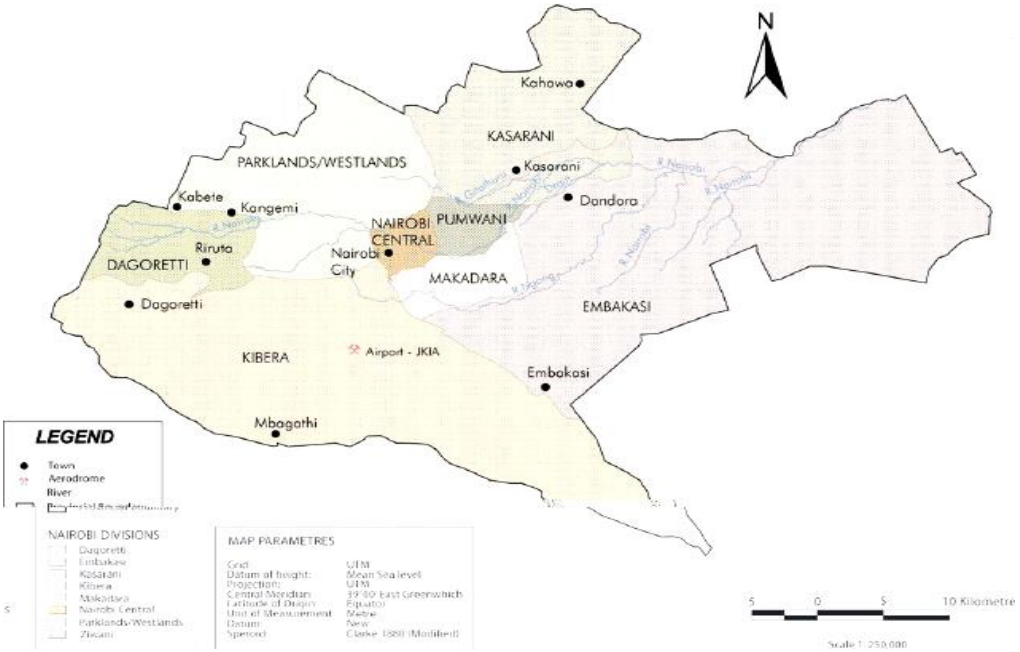

Figure 3.1: The Map of Nairobi. 2013

Source: Author 2018

3.3.2 Unit of Analysis

The research units of analysis include:

i. Design-led Innovation experts
ii. Paint manufacturing companies in Nairobi
iii. Paint retailers in Nairobi
iv. Paint users in Nairobi

3.3.3 Population Frames and Sample sizes

Table 3.1 Sampling methods

POPULATION	SAMPLING METHODS	TARGET POPULATION
1. Companies	Convenience sampling	33
2. Design-led experts	Purposive sampling	10
3. Paint Retailers	Area Sampling	34
4. Paint users	Random sampling	40

Source: Author 2018

Prior desktop review and reconnaissance by the researcher on companies that are perceived to practise Design led innovation, established the Paint Manufacturing companies in Kenya exhibit tendencies that interest the study topic. Thus the researcher decided to focus on them as the main area of study. According to the Kenya Business Directory 2016, there are 33 paint manufacturing companies in Nairobi (see Appendix A).

The researcher purposively sampled eight companies that are deemed to be industry leaders, for data about how they are perceived to utilize Design-led innovation. They are profiled in Table 3.2. The population also composed of Design Innovation experts from Kenya and other parts of the world.

Table 3.2 Target perceived Design led Companies in Nairobi

	NAME OF COMPANY	EXAMPLES OF PRODUCT
A	Smart Paints Ltd	• Smart Colours premium paints
B	Classic Paints	• Special Effect paints

C	Galaxy Paints	• Super Cover
D	Glory Paints	• Glory Emulsion Sealer
E	Sadolin	• Sadolin fire resistant paints. • Sadolin Extreme weather guard.
F	Basco Products	• Duracoat range of fragrant paints
G	Crown Berger	• Permacoat Emulsion with Teflon. • Permacoat ultra guard rain proof silicon paint
H	Solai Paints	• Weather gourd

Source: Author 2018

The researcher also sought to gather qualitative data from ten (10) design innovation experts from different parts of the world, selected for their standing in the design world and scholarly exploits, using expert sampling; a sub-type of purposive sampling, since there lacks empirical evidence that would necessitate use of a sampling frame. Six out of 10 experts responded. The snowballing sampling system was used to select the experts. Prior research and consultations with design personalities enabled the researcher identify and access one expert in the study setting. He then snowballed his colleagues in the field to give responses for the research. These design experts were purposively sampled in their diversity as design entrepreneurs, design scholars, design associates, design managers and design directors with either a business background or design background working within the design industry in various parts of the world. This, in a bid to understand different stakeholder views and understanding about design-led innovation, within their contexts.

They gave qualitative insights about design-led innovation and the dynamics of introducing and managing this process in businesses. Of the ten experts targeted and contacted, six gave their responses. The population is profiled in Table 3.3.

Table 3.3: Design Innovation experts

	Expert Accessed	Capacity and Country
1	Prof. Mugendi M'Rithaa	Industrial Designer Kenya
2	Dr. Gianfranco Zaccai	Design Innovation Entrepreneur U.S.A
3	Prof. Hakan Edeholt	Design Scholar NORWAY
4	Prof. Richie Moalosi	Industrial Designer BOTSWANA
5	Dr. Brandon Gien	Design Director, Australia
6	Thomas Gurvey	Design Scholar Canada
7	Fabrizio Ceschin	Design Scholar United Kingdom
8	Carlo Vezzoli	Design Scholar Italy
9	Prof. Elpay Er	Design Scholar T Urkey
10	Mr. Srini Srinivasan	Design Manager, INDIA

Source: Author 2018

The researcher also gathered data from paint products retailers and paint users using a semi-structured questionnaire. For gathering data about preferred paint products in terms of sales from paint products retailers, *area or geographical sampling* was utilized. This method is utilized when no complete frame of reference is available. The total area under investigation is divided into small sub-areas which are sampled at random or by some restricted random process. Each of the chosen sub-areas is then fully inspected and enumerated, and may form a frame for further sampling if desired (Oxford University Press, 2003).

In this case, the entire area containing the populations; Nairobi County was subdivided into 17 (seventeen) segments or clusters, administratively known as sub-counties, and from each, two accessible elements (paint retail shops) in the population associated with the target population were randomly accessed as sampling units. They were sampled using convenience sampling mechanism. Responses were acquired and formed the basis for the results presented.

The segments are as follows:

1. Dagoretti North
2. Dagoretti South
3. Embakasi Central
4. Embakasi East
5. Embakasi South
6. Embakasi North
7. Embakasi West
8. Kamukunji
9. Kasarani
10. Kibra
11. Lang'ata
12. Makadara
13. Mathare
14. Roysambu
15. Ruaraka
16. Starehe
17. Westlands

In gathering data from the paint products users about their preferred paint brands, the research adopted random sampling method. The paint retailers were asked to mention groups of people who form their main customers. The researcher then clustered them into four groups; the Interior Designers, Interior Decorators, Building contractors and home owners. Ten members from each cluster were conveniently targeted them for the survey, whose purpose was to evaluate customer preferences in paint products as well as establish the satisfaction levels.

Cluster sampling and random sampling was utilized because:

i. No authoritative reliable listing of elements is available and it would be expensive and time consuming to prepare it.
ii. The location and identification of the sampling units was difficult.

Specifically in this research:

i. The target population was divided into professional clusters as identified by the paint retailers in terms of main consumers of paint products. The clusters included: Building contractors, Interior Decorators, Interior Designers, Home owners

ii. The clusters were treated as sampling units

iii. Ten samples from each cluster were conveniently accessed and surveyed using random sampling method

3.4. Research tools and Data Collection Techniques

The research tools used were observation, interviews, and questionnaires to collect data as summarized in Table 3.4.

Table 3.4 Data collection tools and techniques

Research Tools	Data sought using the research tool	Advantages	Disadvantages
Observation	Allowed the researcher to define existing circumstances using the five senses, providing a "written photograph" of the situation under study in the study sites. Was useful in identifying and contextualizing case companies and their products	1. 'Gathered data where and when an event or activity was happening.' 2. 'Didn't rely on people's willingness to give information.' **3.** The researcher openly saw what people did as opposed to relying on what is said and done.'	1. Predisposed 'to observer bias.' 2. Perceived 'Hawthorne effect where people perform better when they know they are being observed.' 3. 'Didn't increase understanding of why subjects behaved the way they did.'
Interviews	Interview guides were used to collect data from company managers about their dynamics in perceived adoption of design-led innovation and in-country design innovation experts for data about the fundamentals of Design-led innovation. The data was recorded using a	1. Were beneficial for attainment of insight and context into the topic under study. 2. Permitted respondents to define what was imperative to them' as far as the topic of study was concerned. 3. Were convenient for collecting	1. Were 'Susceptible to interview bias.' 2. Were time consuming and costly, when equated to other data collection methods. 3. They sometimes seemed invasive to the

	voice recorder.	quotes and stories for elaboration and analysis of concepts.	respondents.'
Questionnaires	Semi-Structured questionnaires were used collect qualitative data about the dynamics of design-led innovation from design innovation experts from the rest of the world. Semi-structured questionnaires were also used to gather data from paint retailers and paint users in a bid to establish the user preferences and satisfaction levels of paint users.	1. Administration was 'relatively affordable and stress-free even when gathering data from people spread over wide geographic area'. 2. Limited the chance of surveyor bias as the same questions were asked of all respondents.' 3. All the people involved were conversant with the method. 4. Some respondents felt more contented answering to a survey than partaking in an interview.' 5. Organisation of closed-ended responses was a stress-free and forthright process.	1. Some respondents failed to complete the survey appropriately subsequently. 2. 'Research matters could not have had equal meaning to all respondents.' 3. 'Due to lack of close contact with respondents, it was not easy to probe for additional details.' 4. Survey questions were systematic and hard to write, develop and hone.'

Source: Author 2018

3.4.1 Data analysis Techniques

Qualitative and quantitative methods of analysis were used. Content and thematic analysis were used to evaluate the qualitative data gathered from interview and survey responses.

To analyse the qualitative data, the transcribed field notes were coded to form categories of theme consistent with the study, as posited by Miles and Huberman (1994). Responses were categorized using constructs consistent with the research theme.

Results are presented in descriptive forms. Descriptive methods of analysis sought to empirically establish situation the uptake and effective use of design-led innovation.

The interview guide (Appendices B and C) sought to study the contextual attributes of Design-led innovation in terms of descriptions, characteristics and use in the Kenyan context. Literature review presented, identified the key imperatives of the design-led innovation as highlighted in the design process; empathy, discovery of the problem, define, develop, deliver. These themes formed the codes with which the researcher classified the data as revealed by the interview data from paint manufacturing companies.

The characteristics of the process, the implementation and utilisation as well as the expected impacts of the process was also captured. Contextual factors; organizations, networks among other multiple realities were unearthed.

All interviews were recorded and transcribed, and the transcripts were verified by comparing them with the tape recordings. Subjects were interviewed exhaustively for thematic saturation. No new information was identified through new codes from the transcripts.

Themes were validated in two ways; through triangulation of the case studies to establish cross-case realities and corroboration with insights of the process dynamics from questionnaire responses from design innovation experts.

3.4.2.1 Content and thematic analysis process

All notes and transcripts were read to gain an overview of the body and context of the gathered data. The reading process was followed by a three-step coding process that consisted of open, axial and selective coding procedures. The open coding step led to the initial identification and marking of descriptive names for specific units or segments of meaning in relation to the

research aims. These identified units of meaning to a large extent bore relation to and showed consistency with the questions that were asked during the interviews. All these labelled units of meaning, as preliminary qualitative indicators, were again evaluated during the axial and selective coding steps for coherence and relevance to compile a final list of codes. Each category was systematically labelled in accordance with the relevance of the data and theoretical framework and from the literature review as presented in Table 3.5. The related units of meaning from the notes and transcripts were systematically assigned to the final categories. After a brief introduction of each of the main components, a discussion followed that includes verbatim responses (excerpts) as examples where appropriate and applicable to enhance and substantiate views of respondents in relation to the categories of themes. The discussions described the contextual experiences of the respondents and continued with an evaluative and interpretive discussion in relation to the research aims.

Table 3.5 Thematic coding patterns used for data analysis

STUDY THEME	**ATTRIBUTES UNDER STUDY**	**INTERVIEW DATA SOURCE**	**STUDY THEME CODES**
DESIGN-LED INNOVATION	i. DEFINITIONS ii. CHARACTERISTICS iii. USE IN THE KENYAN CONTEXT	PAINT COMPANIES	i. DISCOVER ii. DEFINE iii. DEVELOP iv. DELIVER
	i. CONCEPT DYNAMICS	DESIGN INNOVATION EXPERTS	i. CHARACTERISTICS ii. PROCESS UTILISATION iii. PROCESS IMPACT iv. STAKEHOLDER ROLES

Source: Author based on literature review 2018

3.4.2 Data Presentation Techniques

For this study, data was presented in various forms which include:

i. **Excerpts:** The recorded conversations were culled and presented as excerpts while emerging themes were presented as concept diagrams.

ii. **Narrative:** Field notes were grouped accordingly under various constructs and headings according in line with the research objectives.

iii. **Photography**: They are presented accompanied by descriptions to explain the circumstances and their relevance to the research.

iv. **Comparative Analysis:** Is applied to data collected from the eight businesses who are a unit of analysis. The analysis provides a quick summary of the design-led data for comparison of results according to the objectives of the research.

v. **Diagrams:** Are developed and presented mainly to illustrate more effectively certain issues, and the constructs of the research. They are used to illustrate the relationships of factors and paradigms that define the research.

3.4.3 Pre-testing of the Instruments validation and reliability

i. **Validation**: Is a measure of accuracy or incorrectness of the data acquired through using the research instrument (Burns & Grove 2001). The instrument's validity can be regarded as the extent to which "… the instrument actually reflects the abstract construct being examined" (Burns & Grove, 2001).

ii. **Reliability**: Joppe (2000) views reliability as the extent to which data correctly denote the total population under study. The reliability of this study was based on the fact that the instruments were valid and pre-tested to secure precision. Review of the variables was done and benchmarked with literature to ensure that they reflect the study accordingly.

To test the validation and reliability of the tools, a pilot test of the instruments was conducted. The instruments were validated as they elicited responses fitting the research context.

3.4.4 Data Quality

Validity was given great importance in this research because of its nature. Care was taken to capture data accurately and diligently. Some of the additional measures used to ensure data quality are as outlined below.

Construct validity: Deals with instituting precise dynamics for concepts being studied. The approach to the research was extensively discussed with research experts to minimize the effects of misconceptions in construct validity.

Internal validity**:** The relationships and the dynamics of the concepts under study were examined from different sources to ascertain their validity before being deemed as genuine and true findings.

External validity**:** The subjects under study were selected through a non-discriminatory process based on certain extensive field work. Through triangulation, the findings were critiqued in order to minimize errors in reported findings.

3.4.5 Research Logical Framework

A Logical Framework (also known as a log frame) is a tool for planning and managing development projects. It looks like a table (or framework) and aims to present information about the key components of a project in a clear, concise, logical and systematic way. The log frame model was developed in the United States and has since been adopted and adapted for use by many researchers in various diverse ways. A log frame summarises, in a standard format:

i. What the research is going to achieve in terms of the objectives
ii. The data required to achieve the objectives

iii. The sources of the said data

iv. The methods of collecting the said data

v. The methods of analysing the said data

vi. The expected outputs from analysis of the said data

Table 3.6: Research Logical Framework

OBJECTIVES	DATA NEEDS	DATA SOURCES	DATA COLLECTION METHODS	DATA ANALYSIS METHODS	DATA OUTPUT METHODS
MAIN OBJECTIVE To investigate design led innovation in the Kenyan context and its potential value to businesses.	Definitions Examples Dynamics Frameworks	a. Journals, Magazines, Design and Innovation Books, b. Design Innovation experts c. Eight Paint Manufacturing companies	a. Analysis of Design-led firms Reports b. Semi -structured Questionnaire.	a. Content and thematic analysis.	a. Excerpts b. Diagrams c. Narrative
1. To profile the utilization and the extent of use of Design-led innovation by paint manufacturing companies in Kenya.	Availability of indicators as far as Design-led Innovation variables within the case studies are concerned.	a. Eight Paint Manufacturing companies	Semi-structured interviews.	a. Coding of Transcribed field notes to form categories of innovation levels. b. Content and thematic analysis.	a. Excerpts b. Cross-case analysis c. Diagrams d. Narrative

2. To evaluate the level of customer preference and satisfaction levels with paint products as impacted by perceived design-led innovation.	Evaluation of the paint preferences by users as informed by sales from retailers Identification main paint users, their preferences and levels of satisfaction	a. Paint products retailers b. Paint products users	a. Semi-structured questionnaires	a. Quantitative methods of analysis.	a. Pie chats b. Bar graphs
3. To propose a practical Design-led innovation implementation framework that manufacturing companies in Kenya can adopt for reformed strategy and operations.	A draft business model that includes and appreciates Design led innovation that promises reforms in the manufacturing sector.	a. Analysed data and reviewed literature on Design-led innovation b. Conceptual models and frameworks of exemplars of Design-led companies	a. Case studies. b. Observation. c. Illustrated presentations (photo voice)	a. Analysis of notes to build categories and levels of innovation for the framework form.	a. Diagrams b. Flow charts

Source: Author 2018

3.4.6 Ethical Considerations

The researcher sought permission from the School of the Arts and Design, after a successful defence allowing him to collect data. The study also took precaution to keep the data confidential and also help explain to the respondents the purpose of the study.

The following additional procedures were taken to guarantee that the investigation was ethical: The informants were not coerced into contributing to the study.

i. Some respondents who decided to against being recorded during data collection for the study owing to security concerns and fear of being misquoted were granted their wish without bias.
ii. Data collected was treated with privacy so as to protect and maintain the integrity of the informants and their affiliations.
iii. Discretion on personal and company details by informants was optional and treated with due confidentiality where it was demanded.
iv. Names of the informants (or their organisations) were not be used in the findings if doing so could damage their reputation or make vulnerable their work.
v. The informants were not deceived but were told the truth about the intent of the research.
vi. Respondents were not induced into the research by giving them any inducements to participate. Instead the importance of the study was emphasized to them.

CHAPTER 4
RESULTS AND DISCUSSION

4.1 Overview

This chapter deals with analysing the field data and their relevance to the study as well as answering the research objectives and question. Chapter four expounded in detail the course, rationale and role of the methods in the research design. In this chapter, the captured data from the research is presented, analysed, described and interpreted in a systematic manner as the next step of the research process. The citations and analysis process here are intended to present data in a comprehensible and interpretable manner for the purpose of identifying trends and relations in accordance with the research objectives.

4.2 The profiles of Design-led innovation as utilized by paint manufacturing companies in Kenya.

4.2.1 DISCOVER: Identifying Customer Needs

This stage involves establishing unique and differentiated offerings rooted in consumer needs and market details. This ensures unique innovative product value proposals.

i. Company A: Smart Paints

Company A was founded in the year 1978. They boast of taking every to ensure quality consistency achieved by a competent technical and support team that strives towards customer satisfaction. Their products include industrial paints, decorative paints, automotive paints and jotun paints.

Asked about his market and how he reaches out to it, the response of the executive of Company A was:

"...we look at our competitors' products. We see what's out there, what's the price and we take the product off the shelf and bring it back here and we try and evaluate and perceive what is the value of it. What is the quality of the product, and based on the quality of the product, we always endeavour to make a product that is better than the original product..."

Within the context of this business, the executive alluded that the goal of the business is to develop better forms by saying;

"... The other thing at the moment that concerns us is that in the local market, the demand of the consumer is more on the more wholesome and healthy products...."

Company A has been discovering and reaching potential markets by scrutinising its competitors' products and then producing novelties that outmanoeuvre them.

Company A is attentive to understanding customer needs and shaping their products to suit customer wants. The executive informs;

"...at the end of the day it is a consumer who drives any business and the consumer trends are changing very quickly from one product range to another. We on the other hand understand the need for quality products in the market and that is how we have gone forward in innovation as a brand and as one of the market leaders. Well, certainly (our products are) *not the most expensive, but maybe the second most expensive. So we offer good value, and we are trying, and we are consciously trying to keep our prices low to avoid the risk of letting sales volumes dropping..."*

ii. Company B: Classic Paints

Company B has been in existence since 1991. Over the years they have developed a distinct reputation for expertise and proficiency to become one of the leading paint manufacturers.

Years of experience, covering the initial creative process followed by thorough documentation and design implementations, combined with real knowledge of various cultures and operational requirements have resulted in a company capable of creating unique value propositions for its customer base.

Company B boasts of a talented design team that brings a diverse experience, fresh perspective and originality; combined with exceptional technical expertise and extraordinary attention to detail.

Company B does not just try to realise the needs of its customers. It has put in place investments to institute its customers' needs in its product development process. The company executive said;

"...So we've invested heavily to keep up with what consumers want. So any investment that we've made, nearly half of that has worked for our customers."

Their biggest customers are involved from the very start, when the new products are planned. This implies that they utilise very thorough planning from beginning. The executive explained;

"...now the customers have introduced a new product development form for every single presentation...and they want to know the problems of all the ingredients at that stage, they want to know, all the information..."

Elucidating the duty of customers in their product development process, the executive posits;

"...we have got some fantastic in-house ideas, and then it's a case of us making them feasible and taking them away and presenting them to other people, to customers and taking it from there really .....I mean if you don't go to the customer with new ideas, then somebody else will, and it is that pro-activity that has kept us ahead of the competition in innovation..."

iii. Company C: Galaxy Paints

Company C was incorporated as a limited liability company in 2004, to manufacture, distribute and sell all types of surface coatings, decorative, industrial and protective paints, automotive, wood glues, contact cements and all types of adhesive.

At Company C, as per their Manager, resources and energies that go behind self-promotion are used to better themselves, their products and finding better ways to fulfil and exceed the expectations of all our customers and clients. Company C claims to continuously formulate and develop new innovations in the manufacturing of paints, thinners, varnishes and other finishing products to suit Kenya's competitive market.

It claims to work as equal partners with global companies of paint manufacturing and operate in the most varied markets in East and Central Africa. According to them, they are among the leading paints manufacturing companies having managed to sell our quality products to all retailers including leading supermarkets hardwares and wholesalers.

Company C has a good understanding of the behaviour of their customers. It provides competition by offering their products at the low possible prices. The company, however, has made it clear to them that high quality cannot come at low prices. The executive said,

"...Supermarkets are lusting now as well. If ever supermarkets want this, they have to pay for it. If they don't pay for it, we don't give them it. It is as simple as that. What we manufacture is what they pay for..."

The company's perspective is now mutual with its customers. The executive informed,

"*...the superstores are, though, beginning to realise what we have been telling them that the way forward is to make premium things and to make them a bit different from other competitors…"*

iv. Company D: Glory Paints

Established in 1992, Company D has since grown into a significant player in the supply of surface coatings in the Kenyan market. Driven by an urge to excel, Company D manufactures quality paints for all applications. Among the products the company manufactures are: Decorative Paints, Automotive Paints, Wood & Timber Finishes, Primers, Thinners and Adhesives.

The company boasts of a well-equipped Research and Development laboratory, Quality control laboratory and State of the Art manufacturing machines which enables it to offer world class products. Company D has a well trained and experienced workforce.

Company D's vision is to become one of the top coatings company Continent-wide by leveraging its expertise in the higher growth emerging markets. Its mission is to be leader in product innovation and customer satisfaction.

The Company is well aware of the needs and contextual situations of their customers. This is apparent with the invitation of the public to have an input in the process of products conception. This company institutes customers in their product innovation process. In an ingenious way, it engages the customers into its processes. The executive explained;

"…The public can come along in our processes. If they want, they can bring their own 'tastes' too so we get a huge amount of ideas from the general public on what kind of products they would like and so we quickly see what is popular…"

v. Company E: Sadolin Paints

Company E has been manufacturing Paints since 1993. The company has a wide range of paints and paint related products for customers including internal and external paints, specialized and textured paint finishes, roof paints, floor paints and wood varnishes. The products are aimed both at the consumer decorative paint market as well as the industrial market.

Currently Company E supplies good to the majority of the outlets on the Kenya. The company has has five outlets in Kenya namely Nakuru depot, Kisumu depot, Kisii depot, Nairobi depot and Thika depot. Their aim is to grow slowly but surely to extend bases in various other towns around Kenya.

Company E, which targets the local market, understands the needs and circumstances of the potential markets and makes and moulds its product accordingly. As a result it hopes that its business in these quarters would grow significantly. The executive explained;

"…We think our business would grow ….. over there… In 3 years' time it is there that I see the growth to occur

Company E shows motivation and capacity to source and scope potential markets regardless of its small size. Asked about the markets for their products, the executive alluded;

"…it is very much the small shops. It is not in general shops or supermarkets. We are still targeting them..."

vi. Company F: Basco Products

Basco Products has been manufacturing paint since 1976 and has grown into one of the leading paint manufacturers in the Eastern Africa region. The company has a wide range of paints and paint related products for customers including internal and external paints, specialised and textured paint finishes, roof paints, floor paints and wood varnishes. The products are aimed both at the consumer decorative paint market as well as the industrial market.

The company's vision continues to be a testament to their relentless efforts to bring quality, convenience and accessibility to their customers. In line with this, the executive says: *"to become the most admired and preferred paint company in East Africa providing expert solutions and inspiration through innovative, value added products and services, while enhancing stakeholder value."*

Basco Products has a very high rate of success, almost 100% as the product idea and product samples are vetted by the customers. All candidate new products are shown by the product development manager to representatives of its major customers. Only when they approve of it that a product is developed

seriously and so the customers are very much integrated into the product innovation processes at Basco Products.

Basco Products demonstrates high calibre in exploring and reaching potential markets. At the time of investigation, it was supplying to many of these wholesaling multiples.

vii. Company G: Crown Paints

Established in 1958, Crown Paints has grown to a company with an annual turnover of 7.3 Billion Kenya Shillings. Having established the Kenyan home market with depots and showrooms in Nairobi, Mombasa, Kisumu and Nakuru, focus has spread to take on East Africa. This includes a factory in Uganda, branded Regal Paints and is currently the number two paint brand in Uganda. Two depots have been opened in Tanzania, namely Dar es Salaam, Arusha and Mwanza. Plans are in place for Ethiopia and Southern Sudan. Crown Paints is not only in Decorative Paints but also in Automotive Paints. To bring rapid technology improvements, Crown Paints sort and obtained international brand partnerships for product lines which provide customer solutions to problems e.g Flooring, Flowcrete UK.

According to a senior manager, Kenya will remain the hub for the region with a second factory in Western Kenya. Quality will remain the key, and innovation the forward drive. Crown Paints' heritage and quality has been the key to the company's consistent performance and growth, supported by its 450 loyal employees, partners and dealers. Crown Paints undertakes formal market research. Its basic product, the celebration was developed after considerable market research. The product development executive of the company informed.

"... in one of our meetings, someone asked our manager why he did not consider supplying to the supermarkets. So that is how he got the idea and then he researched the market and looked at the supply base..."

viii. Company H: Solai Paints

Solai Paints was founded in the year 2006. It has its office located in Westlands. Solai Paints manufacture all sorts of interior and exterior building finishes including emulsion paints, Metallica textures, Coloured Cement based render of 2mm-3mm, Italian textures (Crocodile and other animal skins, Zephyro, Dune and many others), Natural stone paint with no added colour (available in red, yellow, brown, Maroon. white, cream, Biege, Black, Grey chips of Smooth, medium texture), Wall pro Acrylic, ready to apply coloured paste form Wall pro Mirror- coloured crystals for interiors

Solai Paints has not tried to integrate its customers into product innovation processes. The enterprise, sees its role as a shaper or moulder of public taste rather than being driven by the preferences of its customers.

During the interview, the entrepreneur gave many examples of products for which there are no other competitors because there are no other similar products.

4.2.2 DEFINE: Collecting information

This stage involves transforming stories into meaningful insights for product development. This ensures from the start that the product being created is user-oriented and feasible.

i. Company A: Smart Paints

Company A doesn't contact formal market research. The executive believes that delivery of good quality goods at a reasonable price, guarantees sales thus and thus market research is not as necessary. He posits;

"...you don't need masses of data and research and hire these research companies to go in and get the product to the market. We know the quality in terms of what we need and what we lack in comparison and we go far and

ahead of the game in the far side of the quality of the products, and the consumer sees the quality side of the products…"

ii. Company B: Classic Paints

This company's innovative clout is underwritten by the needs of the market as described by the company executive. The product development executive of the company says that; *"…we may receive a brief from a customer who would say that we've got a rough idea of what we need. So we look at it. At times so our processes are customer led….*

Company B has regularly tried to multiply its market by asking people to purchase its products. The product development executive said:

"…What we try to do is to encourage people to use our products in their different forms and ways..."

iii. Company C: Galaxy Paints

This company works hard to make its ideas functional. It plans the innovation process precisely without the contribution of its customers. The executive said.

"We meet at lunch time every day…. If I have an idea or if someone else had an idea, we talk if we can do this or we can do that. To be honest with you, it normally comes from me not fully developed the first time; you have to make it work. And the company staff make it work. And there are able to do it because we plan the whole thing from the beginning…."

iv. Company D: Glory Paints

Company D relies on official market research to recognise its market and its business dynamics. The executive said:

"…Yes we do that and in fact we brought in a market research company in the very beginning and it is a story to tell. So we got this market research company to go out and do market research and around the same time when it was going on, we discovered the trends and the dynamics of the market. The results gave us a headway…"

In order to fulfil this ambition of developing its niche, it has stretched its resources to the extreme. The enterprise boasts of a fit between the needs of its market and firm's resources as the executive has put everything at their disposal for the benefit of the business. He says:

"...I would like a reasonable amount of money for basic living. I would like a reasonable living standard and I would like a pension and both of these things are not looking achievable at the moment…"

v. Company E: Sadolin Paints

Company E which has its roots as modest but is gradually growing. It has tried to match its market needs with its limited resources.

Company E realises that its successful products are copied by its rivals. It also understands that legal protection such as patent and copyrights are of no use to safeguards its products from competitor imitation. It relies on inimitable high quality of its products to safeguards itself. The executive informed,

"*…What we did is that when we created a new product we registered the design but made no difference. When we realised it was being copied we were told that if we go after them there is 50-50 chance that we can stop them. So we leave it at that. It is a fairly small market and everybody knows what everybody else is doing and we know the one who copied our product is also making a copy of our product, same colour same texture but we can't do anything about it. It is very difficult to stop it. So what you do is to give good quality, good service and be confident that people will keep coming back…"*

vi. Company F: Basco Products

The enterprise has been able to achieve a good fit between market needs and its resources essentially because it is part of a growing multi-site organisation, which is financially well endowed.

Product planning at Basco Products is simple yet meticulous. Once the product development manager gets an idea, he produces a sample himself. He then

makes a presentation to production, technical, marketing and finance people. After this internal presentation, the new product, is next shown to the buyers from major superstores. After their concurrence, the best possible route to manufacture it, in initial smaller quantities, is decided. As the demand for the product grows, production is scaled up to take advantage of economies of scale.

vii. Company G: Crown Paints

Crown Paints has grown very rapidly in recent years. It has always tried to achieve a good fit between its resources and the needs of its market. The product development executive from Crown Paints informed.

"…We have a good market in Kenya and massive growth potential internationally but we need to plan it properly in terms of capacity and labour and we are in early stage of that. Let us see how it develops…"

viii. Company H: Solai Paints

In case of Company H, there has been no market research to identify market needs and there is no budget for marketing.

4.2.3 DEVELOP: Inter-functional coordination

This stage involves generation of product ideas through brainstorming. This process ensures that products that are conceived adequately solve the intended problem. It also reduces the risk of trial and error by vividly outlining features of value.

i. Company A: Smart Paints

Company A sees giant paint companies as their main rivals and has the approach of using its dynamism to outmanoeuvre the large competition. The executive explicated;

"…there are gaps in innovation where we can very quickly score, sometimes years before many of the big companies can start them even as a mere plan…"

Company A exhibits great product development speed. It highly flexible in product development too, due to its small size, The company executive comments:

"…in terms of innovation we have a distinct advantage over other big manufacturers, because our ability to adjust to change and to change quickly is far greater than of other larger manufacturers who tend to be heavily geared up and plan equipment for specific products. The ability to innovate our technology or products is a far crucial process than for other big manufacturers…"

ii. Company B: Classic Paints

Company B produces its products with speed. The company executive posited;

"…It takes only 3 months to 6 months, to develop a new product although if it is new, with new technology, it can even be longer. If it's just a changeover of an old product, one in, one out, you can do it in about 3 months or so."

Is quite informal but distinct. The creative department spearheads travels around and attempts to churn novel product ideas. The company manager said that *he has travelled at length over the years and worked in many countries… he still travels a lot and interacts with users and watches all the trends.*

iii. Company C: Galaxy Paints

Regarding this, the executive explained how the various departments react and interact to external forces, he explained,

"…We always do surveys. We check the pricing. We find out the multiples. Honestly, we try to control the market. We check out what these other guys are doing. What everybody else is selling? Type of products etc…"

Company C has its origins as a supplier to small businesses. The change of the paint market in Kenya, which marginalised the small enterprises and brought in an era of supremacy of mega stores, necessitated a reconsideration in Company C and the company went on a search of the new giants of the market

and effectively structured itself as one of the chief supplier to them. The executive informed:

"...What has happened is this. Our company was predominantly a corner-shop supplier, in the last 3 years we have concentrated a lot on the supermarkets. We now supply quite a number and we are exploring further opportunities..."

iv. Company D: Glory Paints

No evidence for this process.

v. Company E: Sadolin Paints

Company E has a fast new product development pace. When asked how long it takes from having an idea to develop a product for the customer, the entrepreneur replied *"...about 5, 6 months."*

vi. Company F: Basco Products

At Basco Products, it is generally understood that new product development is essential for growth and survival as the paint industry has fair amount of turnover of products due to changing public habits, tastes and preferences and emerging new information its effects on health. Many of Basco Products's products begin to decline in sale over time and it is necessary to try and come up with new products on a regular basis to survive as a company. As the final customers of Basco Products are quiet affluent, apart from the requirements of tests, the health consequences of company's products are also considered and the company has been trying to incorporate that in its new product development agenda.

vii. Company G: Crown Paints

Success of Crown Paints is due to its tremendous product development speed. The product development executive of the company claimed,

"...A product that does not exists as an idea today in 6 months' time a consumer can buy it is fantastic and that is our strength..."

viii. Company H: Solai Paints

No evidence for this process. Company H attributes its remarkable success as an innovator and as a business to being small and flexible.

4.2.4 DELIVER: Taking action

This stage espouses measures put in place to ensure products are generating and maintaining value both internally and for customers. This also ensures ease and consistency of manufacturing through reduction of errors.

i. Company A: Smart Paints

Company A rarely conducts markets tests to measure the market potential of its products. The executive said; *"…We just get an idea, stick it together, put it in the market and see how it succeeds. That's basically how we do it, and we don't market test it anyway…"*

ii. Company B: Classic Paints

No evidence for this process

iii. Company C: Galaxy Paints

This company takes a relatively short time to develop its products, an indicator of its high product development speed. It attributes its flexibility to its labour intensive methods. The executive alluded:

"…You cannot do it that easily. Whereas we did it because of our flexibility … it is a different ball game, down the road…"

This company tries to research the market using their own people and resources for relevant information for innovative novelties. The respondent said; *"We always do surveys. We check the pricing. We found out the multiples. Honestly, we try to control the market. We checked out what these guys were doing. What everybody else was selling? Type of products etc."*

iv. Company D: Glory Paints

No evidence for this process.

v. Company E: Sadolin Paints

The methods used by Company E to judge what kind of products would succeed in its market are quite informal. The executive informed; *"…You are watching the market all time. You are talking to the customer all the time but also by looking at your own sales. What is making money? What is not making money? What can you do, to better that? My best inspiration is usually in the shelves. There is no science to it really. We try to create a variation keeping in mind the market. We put one of products in show there and there was great feedback but how many will buy it off the shelves we do not know…"*

vi. Company F: Basco Paints

Basco Products receives user feedback from the buyers. The comments that these people make are taken on board when the products unacceptable to them are to be modified.

Market research carried out at Basco Products is quite rudimentary. The product development manager gets his new product ideas from trade journals, magazines, customers and suppliers and works on them.

vii. Company G: Crown Paints

Along with market research Crown Paints also conducts focus groups and carry out gap analysis to gauge the potential of its products and to educate the superstores on what they should be selling. The product development executive of the company informed;

"…We have constantly got to do gap analysis, market research and we have been showing them what we think they (the superstores) *are missing…"*

viii. Company H: Solai Paints

Company H uses customer feedback to modify its offerings. The new products that it develops are put in the market, often in very small quantities to begin with to see if they sell and then ramped up, modified or discontinued according to how the sales occur.

From the study of the case study companies, it became imperative to do a comparative analysis in order to map out the points of convergence and divergence as far as the utilization of the imperatives if design-led innovation is concerned. Table 4.2 breaks down based on the pre-defined criteria as shown by the design-led imperatives in the first column of the table.

Table 4.2: Comparative Analysis of the case studies

COMPANY	A. SMART	B. CLASSIC	C. GALAXY	D. GLORY	E. SADOLIN	F. BASCO	G. CROWN	H. SOLAI	
DLI Actions	2	3	1	2	3	4	3	2	REMARKS
DISCOVER *Identifying Customer Needs*	*Perceives itself as attentive to understanding customer needs and wants though doesn't contact formal market research.*	*The creative department spearheads travels around and attempts to churn novel product ideas*	*Tries to research the market using their own people and resources for relevant information for innovative novelties*	*Well aware of the needs and contextual situations of their customers. Invites the public to have an input in the process of products conception.*	*Targets the local market, understands the needs and circumstances of the potential markets and makes and moulds its product accordingly.*	*The product development manager gets his new product ideas from trade journals, magazines, customers and suppliers and works on them*	*Undertakes formal market research. Its basic product, was developed after considerable market research*	*There has been no market research to identify market needs and there is no budget for marketing.*	*All the eight case study companies exhibit this variable, albeit with different methodologies .*
DEFINE *Collecting Information*	*No evidence of process of interpretation of customer needs. Relies on innovation gaps exhibited by larger companies.*	*Innovative clout is underwritten by the needs of the market, by getting briefs from the customers who outline what they need.*	*Works hard to make its ideas functional. It plans the innovation process precisely without the contribution of its customers.*	*Institutes customers in their product innovation process. In an ingenious way, it engages the customers into its processes, to diversify its offerings*	*No evidence of a formal process of interpretation of customer needs*	*Once the product development manager gets the idea, he then makes a presentation to production, technical, marketing and finance people.*	*Conducts focus groups and carries out gap analysis to gauge the potential of products.*	*Attributes its remarkable success as an innovator and as a business to being small and flexible.*	*Six out of eight companies show responsiveness to this variable still with different approaches.*
DEVELOP *Inter-functional Coordination*	*No evidence of a formal process of product development with use of customer needs ideas.*	*Ideation process is customer-led. It has put in place investments to institute its customers' needs in its product development process*	*Meet at lunch time every day to brainstorm ideas and to make them work. They plan everything from the beginning.*	*No evidence of the process of ideation of the products and subsequent prototyping.*	*No evidence of the process of ideation of the products and subsequent prototyping. Relies on inimitable high quality of its products to safeguards itself.*	*Once the idea crystalizes, the product development manager produces a sample himself.*	*Success of Crown Paints is due to its tremendous product development speed.*	*New products are put in the market, in small quantities to see if they sell and then ramped up, modified or discontinued.*	*Five out of eight companies show tendencies that respond to this variable in different approaches.*

DELIVER *Take Action*	*Rarely conducts markets tests to measure the market potential of its products.*	*Lacks evidence of competition analysis, utilization of market tests and deploys user feedback to perfect their innovations.*	*Lacks evidence of analysis, utilization of market tests and deploys user feedback to perfect their innovations.*	*Lacks use of feedback to modify their innovations in implementation .*	*Creates product variations keeping in mind the market. Puts products in show for feedback but unaware if the products will be bought.*	*Product idea and product samples are vetted by the customers whose feedback is taken and considered*	*Educates the superstores on what they should be selling.*	*There has been no market tests and deployment of feedback to identify market needs and there is no budget for marketing.*	*Is the least performing variable with two out of eight companies showing reactions that respond to this variable.*
SUMMARY	*Enjoys ability to discover and reach prospective markets. Conducts competition analysis and has a good understanding of customer needs and user situations. Does not carry out market research or market tests.*	*Exemplifies integration of customers into the product innovation processes. Shows ability to explore and reach potential markets, It demonstrates an understanding of customer needs and user circumstances as well as high*	*Exhibits capacity to explore and reach potential markets, understanding of customer needs and user circumstances as well as having a high speed and flexible product development process. Undertakes*	*Fairly market oriented exhibits all indicators of market orientation except, the ideation process and use of feedback to modify their innovations in implementation .*	*Shows ability to explore and reach potential markets, understanding of customer needs and user circumstances, use of competition analysis, high speed and flexibility and use of market tests. Does not show integration of customers into*	*Integrates customers into product innovation processes, shows ability to explore and reach potential markets, understands customer needs and user circumstances and uses feedback to modify innovations.*	*Highly market oriented organisation. Shows ability to explore and reach potential markets, product planning from inception, undertakes market research and uses market tests to gauge the customer reactions to*	*Has good market orientation. Demonstrates ability to explore and reach potential markets, use of competition analysis, high speed and flexibility in product development and deployment of user feedback to modify an*	*Design-led innovation in these companies is exploited in varied approaches, some which are not standard as outlined in the literature review. This in effect causes them to fail to fully realize the perceived benefits of using this*

		speed and flexibility in new product development. It however exhibits casual market no indication of utilisation of competition analysis or deployment of market tests.	*market research but does not integrate its customers into its product innovation processes. No competition analysis, utilization of market tests. Uses feedback to perfect innovations.*		*product innovation processes, neither product planning from inception, market research and deployment of user feedback to modify an innovation.*	*However, does not carry out competitor analysis or use market tests.*	*its products.*	*innovation.*	*process. There is therefore a deliberate need to use a standardized contextual framework to address the inconsistencies unearthed within the case studies.*

Source: Author based on field Survey (2019)

4.3 Design led innovation in the Kenyan context and its potential value to businesses

This study endeavoured to bring forth an understanding of design-led innovation as a methodology that helps firms understand user needs, in order to in cooperate them in the process of product development. Literature review and data analysis helped build the constructs, and also brought forward structures for envisioning and creating a contextual theory.

4.3.1 Contextual Overview of Design-led Innovation

"Design is planning and acting consciously in order to achieve a certain future preferable situation"—Expert **Hakan Edeholt from Norway** (Appendix F)

Design led Innovation contextual is a business philosophy or approach that uses the customer journey, as a reservoir of ideas for reinventing and realigning business strategies and operations for sustainable competitive advantage, in a changing market climate. This definition is based on reviewed literature and innovation expert views.

Within the perspective of this study literature review identified Design-led innovation to constitute categories like technological innovation, product (radical or incremental) innovation, process innovation, and other sub-categories of innovation. Design-led innovation thus comprise

i. The incremental novelties in the design of an existing product or service,
ii. Radically new products or services obtained by design effort with no or minimal technical novelty.

The design effort in this case refers to a design activity with a central role of industrial design and contributions of a variety of design practices. From its origins back in the day as a new means of collaboratively extending design to other areas of practice, to the customer centred iterative problem solving tool

that it is today, Design-led innovation is both a philosophy and method has evolved tremendously. It is built on a design thinking framework.

Dr. Gianfranco Zaccai; one of the experts responding to this research alludes that Design-led innovation enables businesses to grow from a niche or boutique to having an important market position, by innovating in a multi-dimensional way (Appendix F). This is enabled by Design Thinking; the framework that anchors design-led innovation which is interesting in itself, as it is the quintessential combination of both creative and critical thinking. Focused on solutions instead of just the problem on hand, design thinking utilises the principles of divergent thinking, which really is about brainstorming ideas with minimal restrictions. In other words, design thinking involves a lot of ideation, collaboration and participation; very much a solutions-oriented approach. It is a process, which starts with the people you're designing for, and ends with new solutions that are targeted at meeting the needs of these people.

Design-led innovation begins with developing an understanding of customers' or users' unmet or unarticulated needs. The most secure source of new ideas that have true competitive advantage and hence, higher margins, is customers' unarticulated needs. Customer intimacy; a deep knowledge of customers and their problems helps to uncover those needs. Design–led innovation minimizes the uncertainty and risk of innovation by engaging customers or users through a series of prototypes to learn, test and refine concepts. Design thinkers rely on customer insights gained from real-world experiments, not just historical data or market research. Gien (2017) from Australia says:

> *If the focus is on growth, then a business needs to use a design-led approach to establish new markets, new business avenues, revenue streams etc. and then apply a design based methodology around this strategy to ensure long term traction. (Appendix F)*

When asked about the future of businesses that embraces Design-led innovation, Srinivasan (2017), a leading product design and manufacturing expert in India alludes:

> *"Design led innovation is a necessity for the modern world and growing countries. As people change their behaviour on usage of products and services, businesses need to adapt to handling these changes and requirements through innovative products and services. It's an ongoing process that keeps the economy alive and kicking." (Appendix F)*

Asked the same question, Moalosi (2017) of the University of Botswana responds:

"Evidence from elsewhere has shown that when businesses that embrace design-led innovation, always stay ahead of the competition. {..} Great design can change lives, communities and organisations for the better. It can create better places to live, bring communities together, and can transform business and public services. Design is a way of thinking that helps large organisations, small and medium-sized enterprises, social enterprises and charities change the way they work…" (Appendix F)

4.3.2 The Contextual Process of Design-led Innovation

From the foregoing insights by the experts, Design-led innovation is aimed at the creation of new meanings for products services. In this sense, Design's role is the creation of a conversation between a firm, its customers, and a critical network of interpreters who are engaged in discovery and shaping of new ideas. The design paradigm bears a model which places the responsibility for product vision squarely on the firm and establishes a pivotal role for third-party interpreters in the design discourse.

From the perspective of the case study companies, basic steps in the design discourse are listening, interpreting, and addressing. Listening is a common ingredient in any design process, interpreting focuses on generating the firm's own vision and ideas for new meanings to be offered in the market.

Addressing is a stage that the firm clarifies and refocuses the discourse with interpreters based on the firm's vision.

The participatory nature of design-led innovation is distinct from a more passive approach where requirements and needs are assumed to be latent within the customer base. This process, borrowed from the literature review, the context of case study companies aiming for radical shifts in products meanings, and the insights from the experts is inferred and outlined as below.

i. PURPOSE DEFINITION

Defining the purpose is the lighthouse that guides all organisation planning and execution. Achieving clarity of purpose requires, in essence, a reframing of business vision and values. It is long term oriented and sits at a high level in relation to business strategy.

Clarity of purpose is best achieved through a culture of questioning and open discussion of organisation purpose, vision and direction. All staff must be encouraged to challenge the organisation's avowed purpose, as part of an ongoing practice of validation and reframing. The most customer oriented companies participating in the study identified the importance of cultural alignment with organisational purpose, and the importance of involving all staff in the process of defining and redefining purpose. This whole-of-organisation approach brings innovation to all business functions and levels of responsibility. An organisation that constantly refines and clarifies its purpose is better able to adapt to new developments such as changing markets and the discovery of new customer needs.

Clarity of Purpose also provides greater effectiveness in allowing a company to critically judge its progress, and prioritise projects and associated investment of resources. A richer understanding of success enables companies to be more holistic in allowing creativity and managing

risk, ensuring that the measurement of risk and uncertainty is well understood by all.

The design led difference

Questioning your organisation's purpose is a critical first step for any efficient organisation. Organisations that question and create an environment where staff are enabled to be critical of a chosen path can reframe their purpose. This reframed purpose should be linked to a clear understanding of the market. Aligning staff with a vision of the organisation's desired future renews focus and energy on core priorities of the business.

Organisations need to have a clear purpose communicated openly internally and externally to ensure cultural alignment. This creates an opportunity for a new direction to be explored and the company purpose to be reframed. The key then is to conceptualise this alignment of purpose with business activities as a design exercise which may result in multiple configurations.

Guidelines to achieve Clarity of Purpose

i. *Ask senior management team what makes your organisation unique?*
ii. *Ask what business activities refine your point of difference?*
iii. *Ask what activities you would be willing to give up as they do not relate to your point of difference?*
iv. *With the responses, reframe your vision and mission and the types of activities you should be undertaking.*

ii. IMMERSION AND EMPATHY

It goes without saying that businesses need to be customer focussed to survive. The competitive edge shown by the industry leaders in this study however highlights the need for immersion in the world of the customer,

beyond arms-length market research. Immersion achieved deep customer insights and in turn uncovers new business opportunities.

Immersion in the world of the customer is a process of deepening empathy, and has significant implications for organisational alignment. Where immersion is the goal, responsibility for understanding the customer is no longer solely that of the operational marketing department but is organisation-wide, embedded in the culture and formally supported. Immersion in one's market is also important for organisations to constantly test and build on their value proposition. More importantly, in order to remain relevant, expand into the export market and have a presence on the ground in their relevant overseas markets, organisations need to look beyond the world of the customer and gain empathy with all stakeholders in the global value chain.

The outcomes of this approach are significant; manufacturers are able to clarify their organisational purpose by identifying exactly who their customer is, what they value, and why. From understanding the customer's motivations (the why) you may then explore value-laden business offerings (the what), corresponding business models (the how) and strategic partnerships (the who). This rich relationship with customers and stakeholders builds competitive resilience, as it is harder to replicate compared to technological gains. Key competitive insights will also lead to opportunities for market disruption.

The design led difference

Immersion and deep empathy with the customer's world necessitates meaningful engagement with customers as co-creators. While they are not responsible for innovation, they are heavily invested in the outcomes. The design approach to customer immersion imagines futures that customers cannot imagine for themselves. This goes beyond traditional market

research process and begins with listening to your customers and stakeholders to reveal latent needs and opportunities.

Guidelines to Immersion and Empathy

i. *Ask who are all your customers and stakeholders and what problem(s) are you trying to solve for them?*

ii. *Is there a common view across the organisation of who is the customer?*

iii. *How much do you know about your customers, not in terms of what features they want, but in challenges they are facing?*

iv. *When was the last time you listened to your customer?*

v. *Create a definite representation of your customer beyond market segmentation.*

vi. *Can you develop a journey map of how your customer engages with your organisation over time and identify areas which can be improved?*

iii. BE THE GAME CHANGER

The scale and pace of the global market is such that competitive advantage through technological innovation is increasingly hard-won and short-lived. To be globally competitive the some of the companies observed in this study created business models that envisage not only new products but also markets and services. This is a psychological shift from prediction via a rear view mirror, towards looking beyond the current market and envisaging new values and opportunities; organisations react not to what customers say they want, but are brave enough to consider entirely new directions.

The participating firms highlighted the significance of the pivotal moment of realisation in which their relevance as a business was called into question. This realisation - this 'jolt' when "one day my world changed" – created the opportunity for radically new directions to be explored. Realising the worth of this catalyst, several firms have chosen to

deliberately trigger these reflections periodically, testing the validity of their business model by challenging the status quo.

This kind of productive scepticism needs to be supported by organisational leadership that is open-minded and tolerant of failure. The ability to persevere toward ambitious goals through uncertainty and discomfort allows firms to remain globally competitive. Business creativity by definition challenges present-day assumptions; accordingly manufacturers need to accept failure and change as learning opportunities.

The design led difference:

The combination of designing an organisational purpose and identifying deep customer insights places firms in the position to envisage entirely new opportunities or disruptions, rather than reacting to old market opportunities. Disruption dubbed changing the game, is utilised as a productive trigger of competitive behaviour by facilitating reflection and reframing. Creating a level of freedom within a business to explore new directions fosters a healthier view and approach toward risk and change.

Organisations need to explore and experiment (be creative) with radically new futures of their business around the insights generated. They should move from reacting to the market and concentrating on technology and performance to challenging the status quo focussing on the customer needs and in so doing create business model futures which envisages not only products, but also markets and services.

Guidelines to Changing the Game

i. *Adopt new approaches to address your customers' challenges.*

ii. *Imagine completely new directions which may disrupt your existing organisation. Embrace new ideas early on as they will promote discussion.*

iii. *Explore these directions with your customers and then validate your ideas through your customers and use them to build on those ideas.*

iv. *Map back these developments to your purpose to find alignment.*

iv. EVOLVE YOUR BUSINESS MODEL

A working principle behind all companies interviewed was the focus on innovative business models integrated with innovative products as drivers of competitive success. All cited alignment around the company's purpose and the ability to innovate through influence or ownership within the business value chain as being important. It is within this territory that the biggest gains around value capture may be achieved.

The differentiation from standard business model integration is in the incorporation of design principles into practice. In the same way manufacturers prototype product designs and iteratively refine their design and manufacture, so too should organisations be prepared to transform any aspect of their business model through a process of iterative trials and reflective refinements. There is no one correct business model; alternative models are developed in tandem and trialled in different markets in the act of learning by doing.

Moving away from a product-based view of business toward a more integrative outlook where innovations may come from any part of the business model means that the management of business functions is no longer relevant. Investment in the intangibles such as brand, customer engagement, leadership and staff development are crucial. Applying design to a business model in this way encourages the application of design within a wider context throughout your organisational structures and processes. This is all supported by good leadership, focused attention to detail in

execution and the ability to veto activities if they are not creating value for the organisation.

The design led difference

Broadening the focus beyond the immediate situation (in this case from innovating at the product to the business model level) is an integrative practice of design. The business models are informed from identified organisational purpose, insights gained from disrupting accepted business practice, and integration. The use of the design approach in experimenting and adapting its business model enables a business to become agile, prioritise investment and uncover new opportunities.

Organisations that innovate through integration along the value chain will be globally competitive. They should not only on ideas and design solutions based around known user needs and specifications but also broadening the focus beyond the immediate situation. The final outcome will not only be a new product but an integrated business model; a technology platform and service model with new internal capabilities.

Guidelines to Business model evolution

i. *Translate your ideas into new business models of your organisation.*
ii. *Avoid focusing on features and solutions, but on the activities and systems you require.*
iii. *Compare this to your current business model to identify what activities and systems will need to be added to, deleted or transformed.*
iv. *Prototype your new business model concept with your customers.*
v. *Engage your customers with some storytelling about your new business and start piloting new approaches that illustrate how you will add value to your customers.*

v. MAKE CHANGE THE NEW CONSTANT

Manufacturing firms need to become habitually dynamic to remain globally competitive. Evolution and renewal of a manufacturing organisation ensures its continuing relevance in the market and should be undertaken as a matter of course. Organisational renewal can manifest in, or arise out of new ways of operating, new organisational capabilities and measures of success or failure, and organisations need to be agile and flexible enough to manage such changes.

Of course, day-to-day operations cannot stop while business models, products and processes are being redesigned; thus any change should be piloted alongside and incorporated into business as usual. This approach is particularly important in light of the concern by many manufacturers that they are too busy surviving to invest additional effort and resources in trying new things. Indeed, for most organisations, consciously departing from a hard-won 'sweet spot' for the sake of innovation – when there is never a guarantee of success – seems counter intuitive. To master the art of organisational evolution, therefore, businesses need to persevere and develop the dynamic capabilities needed.

The design led difference

This type of organisational learning can only be achieved through putting into practice (known as thinking by doing or prototyping within design). It results in an ingrained tailored approach and set of organisational values to innovation that cannot be easily transferred or copied. The process may appear ambiguous at first, but through an experiential learning model, design led innovation becomes more than an innovation program and becomes part of the DNA of the organisation.

Organisations need to be dynamic, agile and flexible and embrace change in order to remain relevant in the face of fierce global competition. They should change from investing in incremental technology enhancements or

new technologies to investing in customer engagement, re-designing the business model and enhancing leadership capability.

Guidelines to Change is the new Constant

i. *Consider new approaches to address your customers' challenges.*
ii. *Visualise completely new directions which may disrupt your existing organisation.*
iii. *Embrace new ideas early on as these ideas are there to promote discussion.*
iv. *Explore these directions with your customers.*
v. *Validate your ideas through your customers and use them to build on those ideas.*
vi. *Map these developments to your purpose and try to find alignment.*

4.4 The profile, utilization and the extent of use of Design-led innovation by paint manufacturing companies in Kenya.

4.4.1 COMPANY A: Smart Paints

The main characteristics of this company is small-size, minimal design awareness, strategy and innovation remains a prerogative of top management; no internal design, design is not established as core for competitiveness. It exhibits an incoherent design process

The company lacks ability and motivation to establish own design teams. In this instance, they combine their limited research and development ability with external views to form a basis for innovation and product development. With this model, a project team, and a flexible process has to be used. Based on it, an internal design team can work with external interpreters efficiently.

Furthermore, with limited business scale, this company model has exhibit collaborations with other external sources. Their role is to iterate their professional opinions in the various stages of product development process at any time.

4.4.2 COMPANY B: Classic Paints

The main characteristics of this company are small-size; good design awareness guided by top management. Design is utilized for competitiveness as it exhibits a flexible design process.

Although the company has a short history and is small sized, the top managers have recognized the value of design and view it as a competitive factor. There is a creative department that is involved in the collection of product ideas, which are themselves underwritten by the needs of the market. Their product development is guided by a design process, where ideation is customer-led.
Even though the Classic paints fail to utilize competition analysis and market tests, to deployment of feedback, it exhibits very strong customer orientation. A deliberate, accurate and appropriate design innovation framework would aid in solving this problem.

4.4.3 COMPANY C: Galaxy Paints

The main characteristics of this company are good design awareness in their product development, design is viewed as a core competitiveness factor; though characterized by an incomplete or non-standardized design process.
Design work in this company is mostly experienced in the package design, corporate identity and advertisement, and fairly on product development as a strategy. In this instance, the role and value of design, design does not play a strategic role in their business, thus it is not exploited exhaustively as competitiveness factor.

The design process is inappropriately utilized, thus unable to appropriately control schedule of activities and quality of outcomes.

4.4.4 COMPANY D: Glory Paints

The characteristics of this company is fair design awareness, design is not viewed as a core competitiveness factor, and an inconsistent design process is visible.

This company doesn't take a leading place in markets. They are easily satisfied with their current design ability, and do not wish to invest more in developing it. Their reactive awareness of design is the result of its industry environment, in which the importance of design is being demonstrated and confirmed through successful products and market competition. Contributed by the design function, leading companies have won markets through successful products.

As 'followers' in such markets, this company only utilizes design for styling and emphasize developing design ability to a limited degree. Design neither is integrated into business strategy, nor is viewed as an element of core competitiveness.

4.4.5 COMPANY E: Sadolin Paints

The main characteristics of this company are poor design awareness in their product development, design is hardly viewed as a core competitiveness factor as characterized by an incomplete or non-standardized design process.
The company does not seem to understand the role and value of design, design does not play an essential role in their business development, and is not viewed as a core competitiveness factor.

Since the role of design is not so important to a product, the design process is inappropriately utilized to control schedule and quality of outcomes.

4.4.6 COMPANY F. Basco Products

There is good design awareness in the whole company. Based on it, design is viewed as a core competitiveness factor and internal design departments have already been set up.

Generally, this company pays special focus on product development, within the product type, they develop their product offerings well and generally take leading positions in markets.

With breakthrough technology, continuous innovation in styling and product concepts are viewed as essential to keep their leading place. Based on one specification, a family of products is established to cover various consumers and markets. Also because there are no sophisticated technologies to be applied in developing new products, the cycle of product development is very short. This leads to a large demand for their products. The company is equipped with experienced design leaders, the internal design departments just focus on managing projects and external liaisons, as well as communicating with external design and other functional departments.

4.4.7 COMPANY G: Crown Berger

This company not only has excellent performance in markets, but also represent the leading design product development. The function and value of design are recognized by all the employees and are emphasized especially by their top management. Though their internal design ability has been well-developed, they still collaborate with external design consultancies to enhance their design ability and to expand markets. Usually, a long-term relationship with external design is established.

During the process of developing a new product, design takes a leading role in planning projects, generating ideas, controlling quality, managing projects and coordinating feedback and other functional departments. In the practice of this company, design is so important that top-level managers are directly

responsible for design work and related issues. In this instance, the company's model can be viewed as design-oriented. As Tore Kristensen defined, "design oriented means that the firm's core values are infused by design ideas and design is institutionalized into the firm's strategic orientation. In addition, the firm has a top level manager responsible for design (Kristensen, 1998).

4.4.8 COMPANY H: Solai Paints

The main characteristics of this company are lack of design awareness in their product development, design is not viewed as a core competitiveness factor; as characterized by an incomplete or non-standardized design process.

In this instance, though their top management do not understand the role and value of design, design does not play an essential role in their business, and is not viewed as a core competitiveness factor.

Since the role of design is not so important to a product, the design process is inappropriately utilized to control schedule and quality of outcomes. In addition, because design is not involved in product development processes as a subsidiary function, they manufacture their products on a trial and error basis, since they are not sure if they will sell or not. This is a risky behaviour within a competitive business climate.

4.4.9 Summary of Comparative Analysis

Data analysis shows that Design-led innovation is utilized at distinct levels with the case study companies as shown in figure 4.10 and 4.11

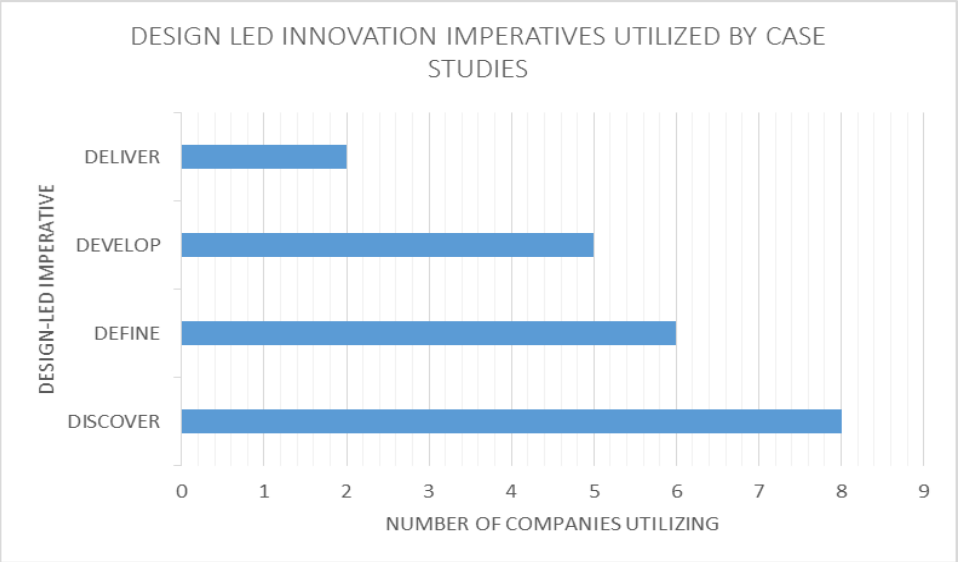

Figure 4.10: Analysis of Design-led Imperatives as used by case-studies

Source: Author, based on field Survey

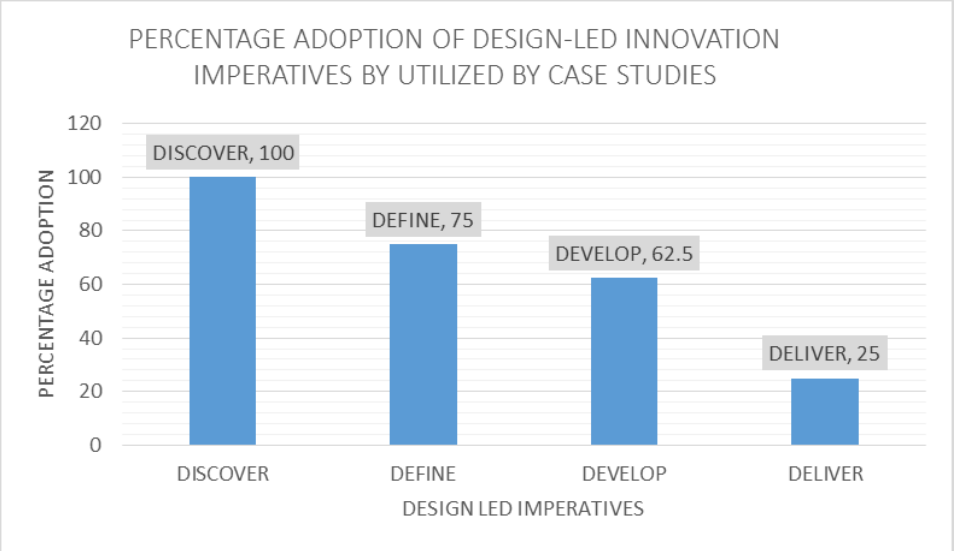

Figure 4.11: Percentage Analysis of Design-led Imperatives as used by case-studies

Source: Author based on field Survey

Based on the data gathered and presented, it is possible to theorize three interrelated mechanisms that helped the companies to enable their products resonate with users. While the specific mechanisms could vary from firm to firm, they however are driven by some commonalities explicated by the conceptual framework of this study. First of these mechanisms is the temporal structuring rule that allows companies to experiment with new ideas and

options even as they go about their day-to-day work. Second are forums for mutual engagement where actors and ideas connect. Third is prototyping to establish proof of concept and to concretize promising ideas through the development and deployment of products.

During temporal structuring people are engaged with problems, with their colleagues, operating in emergent contexts, working with new contexts, ideas, materials that their creative capacities are heightened. For instance crown paints conducts focus groups and carries out gap analysis to gauge the potential of products. Such a mechanism is part of an organization's culture, and actors have the leeway to deviate from existing organizational norms. An institutionalization of the possibility to deviate is important as there is likely to be interpretive asymmetry between 'tacit knowing' and 'decontextualized knowledge' that is created. Moreover, thinking is not separated from action, but occurs through action. This can lead to the generation of new ideas as it empowers reflection-through-action during work. In other words, the process is generative not only because it taps into the creative inputs of a distributed set of people but also because it encourages creativity and reflection at the moment of work.

Mutual Engagement sessions are private moments of serendipity during work that generates ideas and insights that can be pursued and realised in the context of the business. This is clearly exemplified by Galaxy paints who meet at lunch time every day to brainstorm ideas and to make them work. They plan everything from the beginning. All of this is done in a setting where it is expected that the idea being demonstrated will not be complete. By demonstrating something that is in-the-making, actors trigger attention not only to 'what is' but also to 'what can be'. In turn, when participants encounter ideas that do not fit organizational norms and business goals, they are likely to become more reflexive about their own ideas and practices, which in-turn may be modified.

In short, mutual engagement spaces are institutionalized forums for bringing actors and ideas together. In the process, new opportunities emerge in real time that can then be realized over time. The dynamics that unfold in these forums twists the famous Weickian phrase “How can I know what I think until I see what I say?” to “How can I know what I think until I see what others have to say and show?”(Weick, 1984).

Prototyping by one definition as earlier elaborated, entails early semi-concretized representations of what was just an idea. Somewhere between ephemeral thought and stabilized practice, prototypes are key mechanisms whereby actors “think with their hands”. Prototypes have been established to be based on a transformation of what may be readily available to create a quick and dirty working model to establish proof of concept. Solai paints vividly exemplify this imperative. Within their new product development processes, new products are put in the market, in small quantities to see if they sell and then ramped up, modified or discontinued. Prototyping, in this sense, modify the Weick’s observations on knowing to the following “How can we know what we think until we see, what we have built?”

Going beyond the demonstration of proof of concept, these prototypes represent a basis for enactment between multiple actors with different frames of reference. It is through such interactions that user preferences, organizational capabilities and overall meaning emerge. In this sense, prototypes are not just models of what may be in the minds of some actors. Instead, they become models for the development of new possibilities that emerge in and through actions and interactions.

Amongst the most important set of interactions that unfold is between those who develop a prototype and potential users. In developing a prototype, producers are driven by their intuitions and are enabled and constrained by the resources available to them. On the other side, functionality is often discovered in use of the prototypes. By trying out new features, users signal to

the company the ones that they consider the most useful. These features are then integrated into the design of the core product. It is through such co-creation processes that users' preferences emerge even as capabilities are formed.

It follows then that prototyping is a process for actors to probe and create a world that is both possible and desirable with each prototype but an intermediary step that adds to an emerging platform of options. In other words, prototypes could be considered as working models – something that is not be to merely copied, but instead to afford a demonstration of the feasibility of the principle, and of the methods which make it feasible.

The triangulation survey of the eight companies, confirms all propositions taken from the analysis of case study results on design-led innovation. The case study companies boast of rich learning and knowledge construction processes both in innovation and in routine manufacturing. An insatiable appetite for new knowledge and willingness to travel an extra mile to gain it are also quite visible; the search of product ideas and to learn about new trends.

4.5 Summary of Individual Case Studies of Paint Manufacturing Companies in Kenya on Design-Led Innovation

From vague ideas to fully formed new products, the process of innovation in the case studies passes through distinct phases, idea generation, idea validation, and idea implementation, a process built around the design process.

i. DISCOVER: Stimulating Products ideas

From the foregoing analysis, the seeds of innovation, in the form of fuzzy product ideas, are seen to sprout from a variety of sources, from within and without. Smart paints for instance, perceives itself as attentive to understanding customer needs and wants though doesn't contact formal market research. Classic paints relies on the creative department which

spearheads travels around in attempts to churn novel product ideas. Galaxy paints equally tries to research the market using their own people and resources for relevant information for innovative novelties. In a different move, in Basco Products, the product development manager gets his new product ideas from trade journals, magazines apart customers and suppliers and works on them.

.

The entrepreneur in Galaxy paints alludes to lunchtime meeting, where team members bring out ideas about products from the beginning. At the other end, customers, prompted by their own market experience that keeps a tab on consumers and competitors, present these companies with new ideas to pursue. This is evident as portrayed by Classic paints, whose executive noted that their biggest customers are involved from the very start, when the new products are planned.

There is no evidence of any formal processes in the case studies, but there is ample indication of 'reaching out' to pluck ideas from outside rather than 'churning' them internally. Most remarkable is an absence of 'not invented here' attitude. The businesses are willing to try ideas without being fussy about their source.

ii. DEFINE: Transforming stories into product insights

As observed, once a product idea has been identified as desirable and worth pursuing, it goes for validation. Validation of market potential comes first. The second phase is that of validation of production feasibility. Here the product development people along with the manufacturing, finance, design, packaging and marketing personal, assess the capacity of enterprise to produce it with the parameters in which it is likely to solve the problems identified. Six of the case study companies exhibit this process though not as refined as suggested in the literature review. For instance in Classic paints, Innovative clout is underwritten by the needs of the market, by getting briefs from the customers who outline what they need. This process is done albeit differently in other

companies for instance in Basco Products, once the product development manager gets the idea, he makes a presentation to production, technical, marketing and finance people. In Crown Paints focus groups are conducted and gap analyses established to gauge the potential of products.

The principal entrepreneur in most cases is often the most prolific moulder of ideas, for instance in Smart paints he alludes that they look at their competitors' products, to evaluate their value, with a view to create superior products. However, other individuals, very often, members of the product development teams, demonstrate creativity in equal measures.

iii. DEVELOP: Product development and Testing

The product is made in very small quantities, in an experimental way, or prototypes. Then, the way a prototype is tested in a lab to establish functionality, here it is tested 'literally' by a group of individuals to give their verdict on how they find it. The entrepreneur in Basco Products Once the idea crystalizes, the product development manager produces a sample himself. In company H, new products are put in the market, in small quantities to see if they sell and then ramped up, modified or discontinued. That they put products on show for feedback and assessment of its market potential.

Within the case studies, there is idea validation, though largely informal, works well because a number of people, representing a variety of internal functions interact continuously with potential clients, closely scrutinising the potential products. The process is akin to the cubist perspective in painting explained in the following way "*Picasso and Braque wanted to represent the fact that our knowledge of an object is made up of all possible views of it top, sides, front, back. They wanted to compress this inspection, which takes time, into one moment, one synthesised view*".

iv. DELIVER: Product Implementation and Evaluation

In the implementation stage of new product development, the new product is produced in market-scale quantities. Implementation is concurrent in the sense that though the product has been launched, it is still being developed. The product development team is actively absorbing the early market response and effecting changes both in the content of the product and the way it is produced. It is also cross functional in the sense that production people too are involved in full strength as the product, though still experimental in a way, is being produced for the real market. In Basco Products, product samples are vetted by the customers whose feedback is taken and considered. In Sadolin paints products are created in variations and then supplied to their major clients in small quantities are they get feedbacks.

The main principle behind such 'test marketing' is that a group is a representative sample of the real market and if this group likes a new product in significant numbers, the product has potential.

In the delivery or Implementation phase, there is intensive and continuous consultation amongst all stakeholders, as new challenges surface and are addressed. The companies continue to monitor customer reactions after the launch and are able to make changes for even as it is being produced, packed, and put on the shelves. Early customer reactions continue to influence product changes until they get it right.

4.6 Evaluation of the levels of customer preference and satisfaction with paint products as impacted by perceived use of design-led innovation.

The research endeavoured to establish the customer preference and satisfaction levels as impacted by design-led innovation application, to corroborate and validate the afore-explored perceived benefits by the case study companies. The paint retailers and paint users were the target populations and data from them was gathered via a structured questionnaire.

4.6.1 Years of use of Paint brands

The respondends were asked to indicate the number of years they have used the prefered paint brand. The responses were tabulated and converted into percentages. Table 4.2 represents the years the respondents have used their preferred brand.

Table 4.3: Number of years of use of Paint

YEARS OF USE	RESPONSE NUMBER OUT OF 47	% RESPONSE
10 years and above	4	10
6-9 years	26	65
3-5 years	7	17.5
0-2 years	3	7.5

Source: Author based on field survey

4.6.2 Main Customers for the Paint Retailers

The Paint retailers were requested to indicate groups of people who form the bulk of their customers.

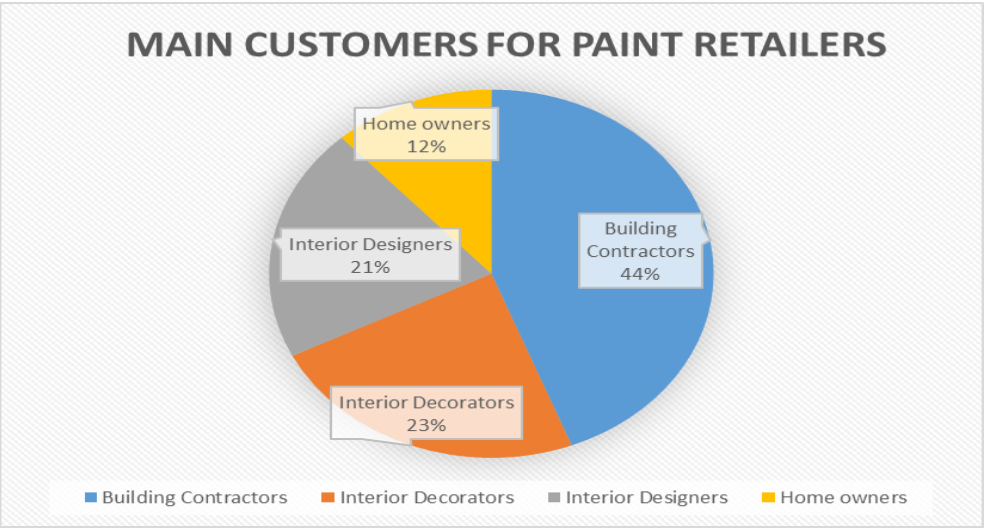

Figure 4.12: Main Customers for Paint reatilers

Source: Field survey 2018

The results showed that Building contractors were the leading customers with a response rate of 44%, followed closely by interior designers and interior decorators with 23% and 21% respectively. Home owners followed closely with 12% score. This formed the basis for the next step of the research where these groups of people were targeted in a bid to confirm their paint brand preferences and satisfaction levels from the same brands.

4.6.3 Paint Brands Preferred by Buyers

The respondents who were paint products retailers were asked to indicate the brand of paint preferred by the customers in relation to most sales. The paint brands featured are those that formed the case studies of the research. The responses were aggregated and converted into percentages and presented.

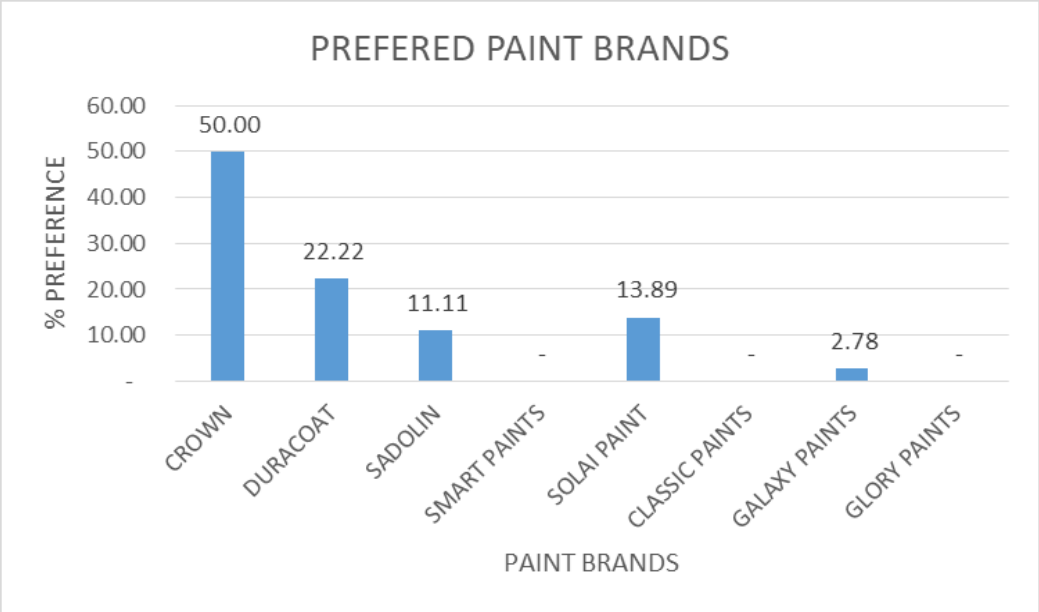

Figure 4.13: Preferred Paint Brands

Source: Field survey

The results indicate that respondents prefer the brands as shown in figure. The most preferred paint brand is Crown. This is shown by a percentage score of 50% followed closely by Duracoat at 22%. The respondents also indicated that Sadolin and Solai and Galaxy paint brands are preferred by buyers although

they are not highly preferred. This is shown by a score of 11%, 13% and 2% respectively. The least preferred paint brands are Smart paints, Classic paints and Glory paints that didn't score any.

4.6.4 Paint Brands Preferences by Users

The respondents who were paint products users in their diversity were asked to indicate the brand of paint they preferred for use in their projects. The paint brands featured are those that formed the case studies of the research. The responses were aggregated and converted into percentages and presented.

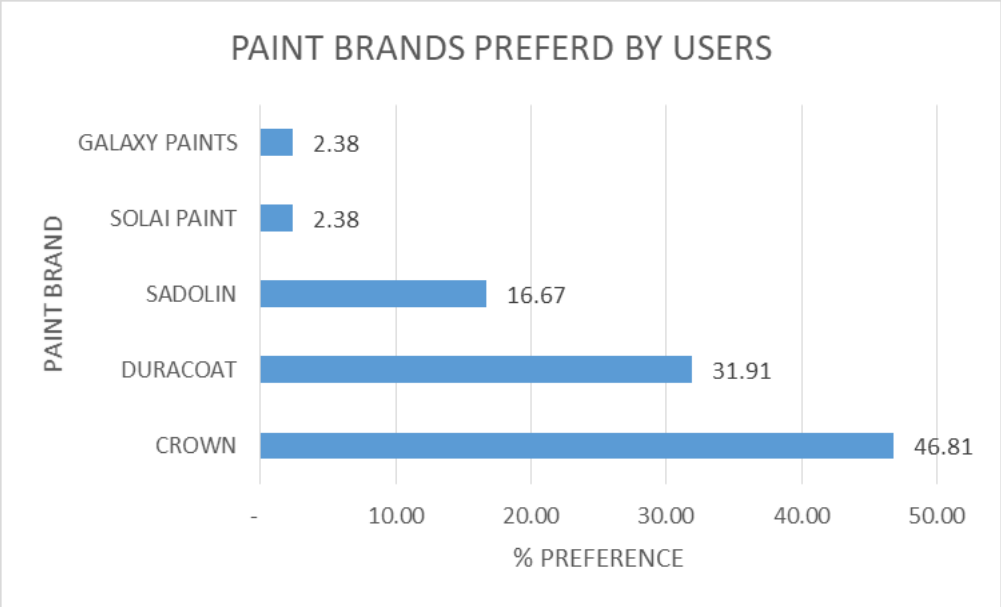

Figure 4.14: Preferred Paint by Users

Source: Field survey

The results indicate that respondents prefer the brands as shown in figure. The most preferred paint brand is Crown. This is shown by a percentage score of 46% followed closely by Duracoat at 31%. The respondents also indicated that Sadolin and Solai and Galaxy paint brands are preferred by buyers although they are not highly preferred. This is shown by a score of 16%, 2% and 2% respectively. The least preferred paint brands are Smart paints, Classic paints and Glory paints that didn't score any.

4.6.5 Reasons for the Preference

The respondends were asked to indicate the fundamental factors that form reasons as to why they prefer the paints as indicated in the foregoing section.

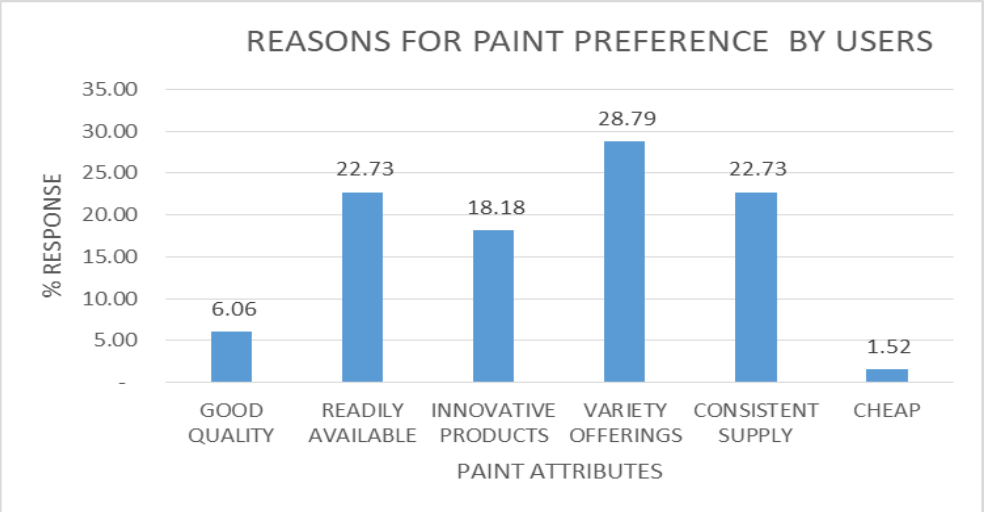

Figure 4.15: Reasons for Preferences by users

Source: Field survey

From the data collected, majority of the respondends reported that variety offering, readily available stock, consistent supply of stocks, innovative offerings, good quality products and fair pricing, influenced their decisions.

4.6.6 Analysis of paint users satisfaction levels

The respondents were requested to indicate if the preferred paint brands in Table 5.4 satisfy their needs in a five point Likert Scale. The range was “Strongly agree” (1)” to “Strongly disagree (5)”.

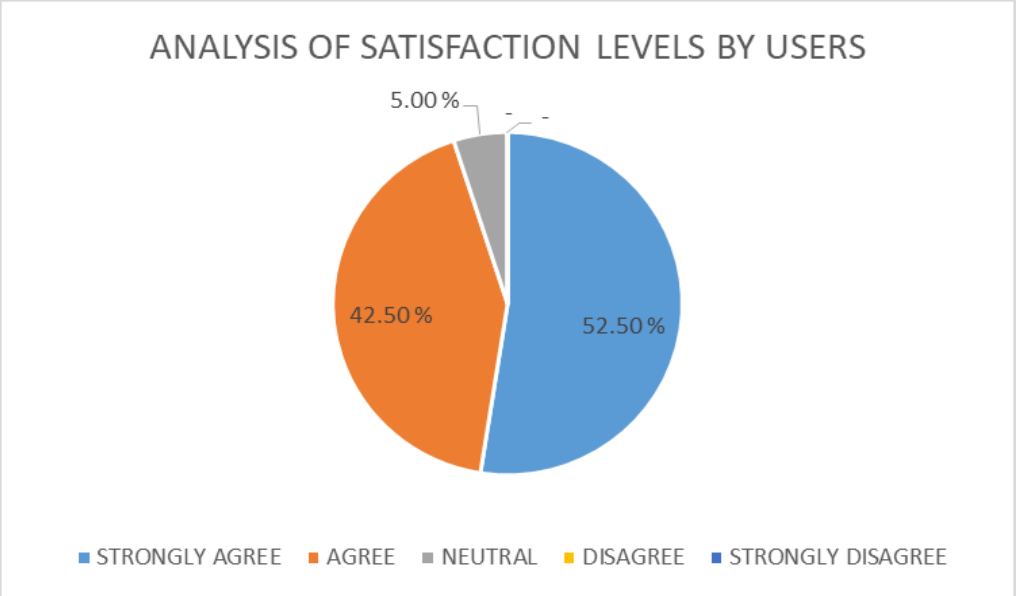

Figure 4.16: Analysis of Satisfaction Levels by users

Source: Field survey

The results indicate that majority of the paint users in their diversity strongly agree that the perferred paint brand adequately satisfy their needs with a score of 52.5%. Equally 42.5% agree that they are satisfied by the paint products with only 5% remaining neutral when asked the same question.

4.6.7 Summary of Findings on Customer Preference and Satisfaction with Paint products

The study revealed that majority of the retailers have been in the paint business for a significant period of time. Majority of the retailers point to the dominance of Crown, Duracoat and Sadolin paint brands in the paint market due to their sales volumes. From the data collected, users prefer Crown, Duracoat, Sadolin, Solai, Classic and Glory in that hierarchy. The most highly preferred paint brand is Crown, while the least preferred paint brand is Glory and Classic.

The study also revealed that majority of the respondents reported that perceived quality, variety, innovative, products, price and availability are very important factors that influence user preference; products of Design-led

innovation. These factors go ahead to guarantee great satisfaction levels as exemplified by the results.

Findings from this study have been established to be consistent with the findings of the main study. Data findings epitomize correlations to the study variables of the main study about design-led innovation and their perceived benefits and impacts to user. The findings have served to validate the process under study and the perceived value, within the context of the dominant case study companies. Denoted as Basco Products and G in the main research, Crown and Duracoat companies were found to be the most design-led, with products and processes that address the user need. Paint users and paint retailers in this section thus validated this notion.

The study concludes that brand loyalty is affected by products and process related factors. The product related factors include quality of the product, innovativeness, price fairness and availability. These are direct products of a consistent application of design-led innovation. Loyalty is also dependent on effective and immediate handling of customer complaints and suggestions through a proper feedback mechanism. This in essence improves the process factors. In order for paint companies to obtain loyalty of customer to their brand, a cordial relationship is important hence the need for efficient customer service management. A customer whose perception on a product is positive remains loyal to that particular brand. On the contrary, a customer holding negative perception of a paint brand or customer care services does not remain loyal to the brand. The study concludes that paint brand loyalty is influenced by a direct, accurate and consistent application of design-led innovation process.

4.7 The practical Design-led innovation Implementation framework that manufacturing companies can adopt for reformed strategy and operations.

Apart from the contextual theory, this study also endeavoured to come up with a contextual framework that is practical and which can be utilized by manufacturing companies to institute design-led innovation in their strategy for sustained competitiveness. The development of the framework was informed by data from the experts of design innovation and the companies that formed the case studies. The case studies informed the touch points with which the process is supposed to pass through, guided by literature review.

4.7.1 Towards the Design-led Innovation Framework

The main objective and specific objective one of this study, were aimed at revealing the contextual touch point of design-led innovation. The information generated helped constitute the design-led framework. The specific objective endeavoured to explore design-led innovation in the Kenyan paint manufacturing companies, in a bid to establish the dynamics of the process as well as revealing knowledge gap in the design-led innovation process. This process led to the actualization of the legitimate need for a framework to enable the companies embed the design-led process accurately.

The specific objective one of this study aimed to inform the research of the existing contextual methodologies, where various imperatives that were deemed accurate on the basis of the reviewed literature and the conceptual model, would be borrowed in order to build a contextual design-led innovation implementation framework (Figure 4.17).

The Design thinking model used in this research to investigate the case studies responsiveness to Design-led innovation, alone is not enough to guarantee efficient utilization of this process with maximum benefit. The Design thinking model acts as a spine on which other contextual infrastructural attachments are supposed to be built upon. There needs to be total overhaul of

the organizational systems, change of cultural orientation and formulation of new strategic directions. These adjustments are supposed to be inclined to capture value from the market, which is the leading source of innovation as posited by this research.

As seen in the literature review, Verganti, (2009) illustrates what companies need to effectively utilize design-led innovation. For instance having a broader detailed examination of the evolution of society, culture and technology, having a circle of or set-up of people for instance investigators who envision and study new product meanings; cultural organizations, designers, delivery firms, technology suppliers etc. who engage in a continuous conversation about products, peoples values and needs. This need directly obligate the management team to contact a thorough analysis of both internal and external functions of the company, realigning the mission and the vision of the company, hiring requisite staff and setting up a platform and infrastructure for innovation ventures. It is also within this time that the management formulates the necessary bodies that will be tasked with the management of innovation. These include the innovation task force and the innovation board.

One of the expert respondents of this research, Gianfranco Zaccai recommends that a company must have an internal champion who is well connected to and informed by both senior corporate management and lines of business and their operational functions that include research and development, marketing, manufacturing, sales etc. but not controlled by any line of business or operational function. (Appendix F)

In the context of this framework, what expert Zaccai proposes as the role of the internal champion is delegated to the innovation task force. The innovation task force formulates the company's strategic direction by fostering the aforementioned initiatives that include scanning for and supporting best practises, this by running some reviews and experiments and then carefully tailoring them to context and needs. The innovation task force then comes up

with contextual methodologies and tools for use in effecting innovation throughout the company.

After formulation of contextual methodologies and tools, the innovation task force moves to the stage of generation of insights and exploration. Essentially this stage involves execution of the contextual design process as demonstrated by case study companies. Expert Zaccai outlines the duty of the innovation task force at this stage as uncovering unmet needs, frustrations and desires including those that maybe disruptive to current business models and entire industry; this as exemplified for instance by Crown paints who contact focus groups and carry out gap analysis in order to generate new ideas. Secondly, to conceptualize, model and meaningfully test possible ways of meeting such challenges. This by learning through this iterative process until the right idea or combination of ideas are identified. This is akin to the process of prototyping such as typified by Solai paints who produce their products in small amounts, channel them to the market for early reactions of which feedback is used in modifications.

The next step is decision making where the innovation task force connects and presents to the innovation board new potential lines of business and value propositions for evaluation and decision making, while buffering any areas of confusion as ideas are transferred, prototyped and tested in scale prior to full scale launch.

Finally in the execution stage, the project manager is tasked with development and commercialization of product ideas that have been evaluated and approved. This is done by ensuring appropriate product technologies and parameters are responsive to the established consumer needs. The products are then delivered to customers through learning launches where there is review of usability and feedback gathering for refinement of offerings just like Basco paints whose product idea and product samples are vetted by the customers whose feedback is taken and considered. From the afore mentioned

extrapolations and insightful comments, it is clear that successful design-led companies should go beyond using design as a service, and see it instead as a catalyst for culture change and as a tool to drive business strategy and innovation, from the initial stages. However, they do not get there overnight. Creating a culture of design-led innovation is a journey that takes time and commitment as revealed by literature review. Companies should thus consider a step by step mode of introduction of design-led innovation, while conscious of the probable barriers in order to mitigate them effectively, by employing and using an appropriate framework as suggested, informed by the literature reviewed, the data analysis and synthesis of the case studies examined, the contextual theory of design-led innovation explored, expert views which all vividly exemplify recommended features of the design-led innovation framework.

In summary, the framework shown in Figure 4.17 encapsulates core practicing innovation principles that interviewed companies highlighted as significant in their journey towards competitiveness and as captured by literature review.

Underpinning the practice of these principles is the application of design process; a design lens through which the value of design-led innovation becomes apparent. A design lens is shown as the spine of the framework. This design lens comprises common practices utilised within design thinking:

i. DISCOVER

ii. DEFINE

iii. DEVELOP

iv. DELIVER

Neither the innovation principles nor design practices are novel or significant in themselves. It is only when they are integrated together in a manufacturing context that firms are able to strategically maximise their opportunities to

create and capture value and thus remain competitive. Often, this shift is required by firms in mentality, culture and practice to achieve.

The principles contained within the framework need to be adopted together. However they may be applied in varying degrees according to what is suitable for an individual firm's circumstances and context. In practice, this process is not static, it is iterative and dynamic.

All the cases interviewed as part of this study demonstrated excellence in their niches and exhibit a level of business sophistication that challenges that of their competitors, although all are at different stages in the journey to becoming competitive. In each instance it was found that business sophistication emanates from a design-led approach; a focus on value capture (business model design) as well as value creation (making things) which is the key to their respective competitive advantage.

The guiding principles for the framework, contained in each of the themes highlighted were validated by the experience of some or all of the participating companies. The themes were further refined over the course of the study, upon receipt of insights and feedback from workshops and design industry experts that formed part of the study. To this end, the themes that follow provide critical insight into how manufacturers can innovate by design to become more competitive.

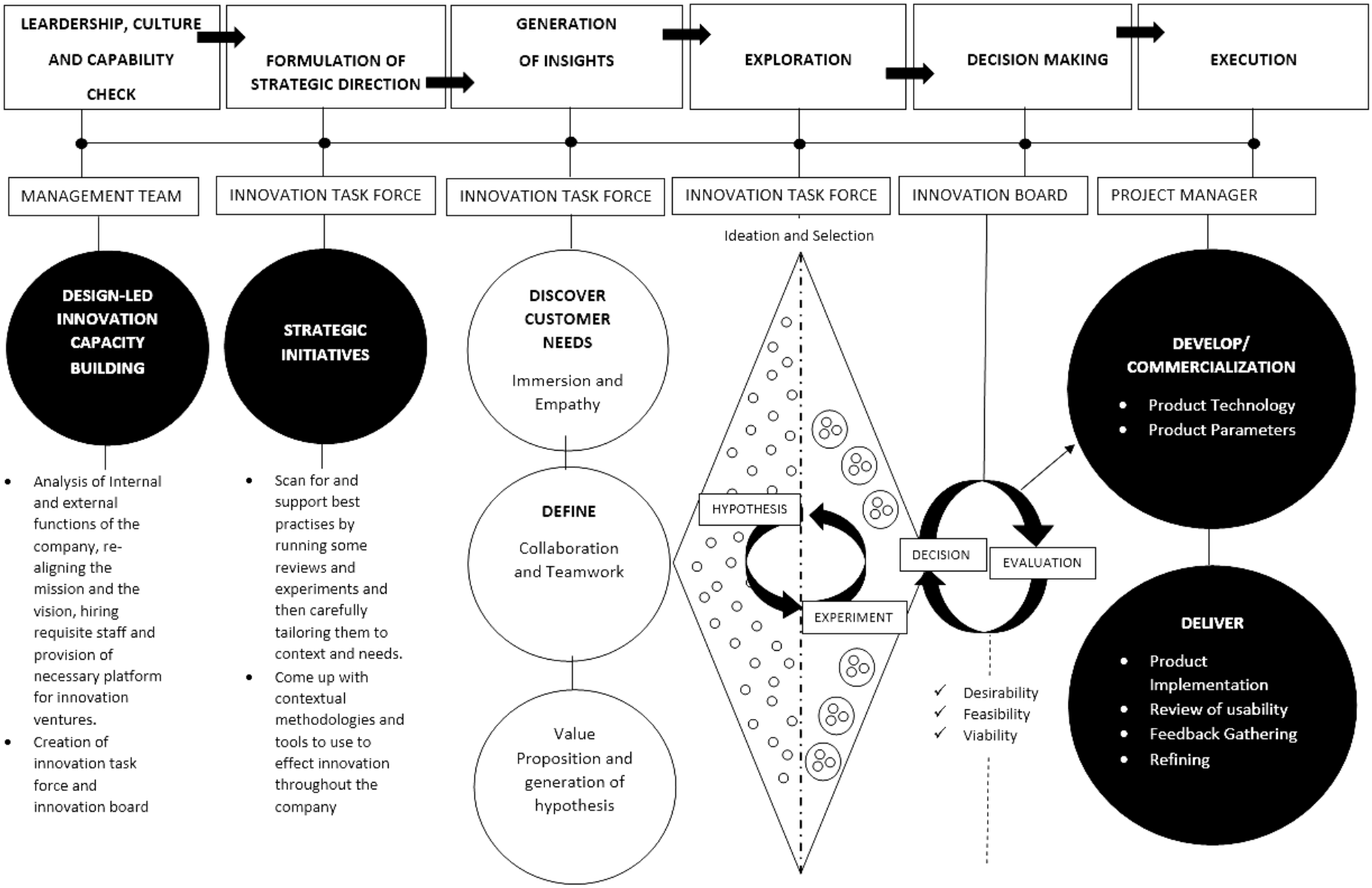

Figure 4.17: Author's Design-led Innovation Implementation Framework

SOURCE: Author based on data analysis

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 Summary and Findings

Vision 2030 in itself is an innovative, values-based approach to making incremental decisions that are based on core values that were initially deemed less tangible, than readily understood traditional methods. That in some sense resonates well with the concept of design thinking. The Vision 2030 process of exploring what people value most and how to ensure these values are retained for our future, helps us understand that economic freedom, community character, heritage, sense of commitment to our environment are central components of humanity.

Kenya's greatest asset is its people. Its potential lies in their creativity, work ethic, education, and entrepreneurial skills among others. Thus the vision aims at creating a globally competitive and adaptive human resource base to meet the requirements of a rapidly industrializing economy. This will be through development of high quality pool of technical, industrial and entrepreneurial human resources.

The three vision 2030 pillars are anchored on a number of foundations including macroeconomic stability; Science, Technology and Innovation, land reforms and human resources development. There is limitless potential as to what design-led innovation can contribute to enable the country achieve this goal. Design-led innovation has been established as an important competitive factor by this study. It is a phenomenon that leverages technology, via a keen understanding of customer needs. The ability of design-led innovation to emphasize the primacy of the end user by identifying customer needs and incorporating this knowledge into products and customer experience will provide companies with strategic and operational edge.

All the case studies accessed during this study demonstrated the customer being the starting point for their innovations, hence it is the expectation and

the desire to fulfil a customer need that drives their innovations. Sometimes new technology may provide the customer with what he or she needs. Often new technology is needed to fully realise the idea. In the case studies however, new technology development is guided by the desire to meet a clearly defined customer need.

Comparative analysis of the case studies, summary and synthesis, established Design-led innovation as a process that allows for improved allocation of technology resources by dispensing with theory and relying on nimble, multi-faceted teams of experts to tackle the complexities of a challenge. It's a progressive notion about the multi-dimensional craft of doing things, as well as a reflection on the interconnectedness of all kinds of design within the economic and commercial fabric of society. More so through collaboration it balances the skills, talents and relative strengths of designers to create both physical and non-physical objects, their refinement, delivery and relevancy within a cultural, social and responsible context. It advances the current range for design thinking by producing tangible, well-crafted solutions to the strategic and difficult challenges businesses face in this new, and complex environment.

In short, this study recommends Design-led innovation as the next level problem solving methodology based on a wider perspective, multi-faceted, multi-talented approach that is still rooted in making things work.

The country needs to redouble its efforts to accelerate progress on the (MDGs) millennium development goals in a more systematic and pragmatic way. In this endeavor, learning from past experiences by identifying key bottlenecks militating against progress, and collectively finding and prioritizing solutions. This is echoed by the narrative of this study with respect to manufacturing as core to vision 2030 and subsequently attainment of the MDGs. In a sense, the national development strategies should prioritize action plans, and frame work interventions that have research proven multiplier effects, across all of the

MDGs. Without any reservation, Design-led innovation stands out with proven potential, as a phenomenon that has the capacity to institute reforms on key flagship projects that embody the vision 2030.

5.2 Conclusion

This research mainly sought to establish how Kenyan paint manufacturers can use Design-led Innovation to leverage their Strategic and operational functions, thus effectively acquire and translate new meanings into receptive propositions, and deliver them to the consumers. Two gaps are reflected here. One is in the scope of knowledge and application of design-led innovation in Kenya. This particularly emphasises establishment of a resource or body of practical knowledge in design-led innovation, based on the distinct nature of paint manufacturing. Another gap is about theories and relationships of design-led innovation and paint manufacturing companies. The gap here is how to compare, contrast and propose mechanisms of adapting established knowledge of design-led innovation, to Kenyan paint manufacturers. The findings of this study demonstrate its contribution in bridging the two gaps.

Combining with findings of four variable criteria for evaluating design-led performance, the practice of design-led innovation in each case is generalized, summarized and structured into a contextual knowledge body. This is not only a platform for further study, but also a resource for efficient guidelines for practice. Concerning the second gap, the two approaches to developing the contextual design-led discourse demonstrates the possibility and scope of successful connection of current literal knowledge of design-led innovation with the Kenyan context.

For practical application in industry, these findings offer successful experience and practical solutions as references. In effect, each company has the ability to re-consider, re-plan and re-define its own strategy and position based on it. By expanding the knowledge body of design-led innovation, this study contributes

to better understanding and enhancing the potential of Kenya's manufacturing, in realizing the Kenyan vision 2030 manufacturing agenda.

5.3 Thesis Statement

The study was about how the manufacturing industries, such as the paint manufacturing companies can improve their strategy in new product development with the help of Design-led innovation as a framework that fosters innovation that satisfies customer needs. The main problem of the study was lack of developed capabilities to identify and respond to customer needs for innovative products and services in the context of paint manufacturing industries. The purpose of the study was to investigate the paint manufacturing industries response to design-led innovation in terms of utilization and perceived importance or benefits of the same.

The study found out that the process of Design-led innovation took place within organizational contexts, at distinct levels over a period of time, involved many participants. Design-led innovation in companies was found to unfold into complex bundles of ideas and divergent paths of activities within the organizational units.

The study concludes that customer loyalty is affected by products and process related factors. The product related factors were found to include quality, innovativeness, price and availability. This is achieved by having customer intimacy; deeply understanding their unmet or unarticulated needs and solving them.

The study proposed a design-led innovation implementation framework for adoption. Fundamental to this framework is the design-led innovation capacity building, discovering customer needs, defining the needs through collaboration and teamwork, developing product technologies, delivering the product and refinement through feedback processing mechanisms.

5.4 Limitations of Findings

On reflection, the methodology would have benefited more from a section which enabled the correspondents to respond separately basing on their responsibilities and tasks; a summary approach to see who did what would have been beneficial.

Some difficulties also emerged over the definition of key terms such as within the research context. As the study was intended to generate theory, the definition of design-led innovation was intended to be re-defined and constructed as the result of the research findings. The correspondents understanding of the purpose of the study was not always as well developed as it should have been.

Very often design-led activities were conflated across different phases of the policy cycle. The methodology had not anticipated this. The distinction between these phases was often blurred in the case studies so it was difficult for the researcher to apply this distinction rigorously. In some cases respondents' replies indicated a lack of precision over the understanding and evaluation of the processes concepts.

5.5 Implications of Findings in Research and Theory

There is adversely limited literature that explores the link between Design and Business, beyond the technological novelties as building blocks of innovation. Consequently the effect of design within this sector is relatively unknown.

The case studies explored in this study illustrated distinct levels and multivariate mechanisms of utilization of Design-led innovation. In bridging this disharmony, this study endeavoured to aid the business and design communities in realising how design-led innovation can be effected within their strategy as a means to attain sustainable business competitiveness within their market context. This research further delivered important

comprehensions for business leaders and design practitioners alike, by posting real substantiations and testimony as to the value of design-led innovations.

This research contributed to the expanding body of theory in innovation by design, the design theory and innovation theory and application within industry. The research has provided a substantial resource that helps understand how businesses should act or react to design-led innovation and the opportunities that are expected to materialise.

On the flipside, this research contributed to the existing body of knowledge on paint manufacturing competitive strategy in Kenya. It has highlighted the relationships between competitive forces and challenges and issues, and the ensuing competitive strategies adopted to mitigate them. The study findings give an insight into how paint manufacturers have been able to build and maintain market positioning.

5.6 Recommendations

This research, has Design emphasised as a driver to develop difference and competitiveness in business. As explored by the case studies, the role of design has evolved from developing new products to developing mechanisms for organisations and businesses to deliver better and innovative products and services for customers. This expanded role of design calls for an accurate integration of design-led imperatives across organisational activities, going beyond focusing solely on products per se.

As revealed by this research, within a manner of design thinking and design-led innovation perspectives, expanded roles are highlighted in academia and business in order to bring design-led innovation to business. Since design can be achieved by managing structured processes in business, researchers should seek to propose directions to imbue contextual design-led process into organisations in order to develop leading products and brands, to sustain the business in the face of globalization and deregulation.

Despite efforts to exemplify successful cases of businesses employing design, this research has identified that design in business still struggles to be integrated within organisational processes as illustrated by the comparative analysis of the case studies for this research. Predominantly, as literature review brought forward, design plays a role at operational level in developing artefacts such as product development, packaging, advertising and communications. In addition, designers are often disconnected from key design decisions, these are made by people with limited design knowledge; while consultancies are still managed and/or instructed by business people.

Without a deliberate endorsement of design-led innovation in an appropriate manner within an organisation through methodologies and frameworks like one proposed by this study, design exploitation and its performance inevitably become problematic. Design-led transformation as explored in this study highlights the need to enhance the internal capability for design conceptualisation and exploitation in order to propose innovative products and brands continuously and thus take a lead in the market. Such a capability can be obtained by collaboration and by learning through multi-disciplinary approach. Most of all, companies and organizations should seek to develop their own contextual design methodology to be adapted to organisational conditions.

The discourse of an expanded role of design; design thinking and design-led innovation provokes organisational supports and transformation toward design-led culture. This concept of design-led innovation is not just limited to product-centric activities but highlights integration of design methodologies, into the entire organisational activities, organisational justification for design systems and supportive activities. To achieve such a culture, diverse approaches and methods should be delineated in terms of at strategic and operational levels: e.g. visualisation/prototyping, co-creation, user (customer)-centred approaches.

This study recommends adoption of a framework that delineates the fundamental key elements to build collaborative projects and disseminate design as a strategy across the organisation, which is proposed and recommended. Most of all, the framework emphasizes collaboration between tasks and in particular components that make up a business. For example, the framework makes it possible to have a springboard for idea generation and decision-making which can be configured contextually to ensure integration and collaboration between tasks, and agenda establishment for design implementation which fortifies collaboration between diverse stakeholders in the up-front stage, a function that is often neglected within brand development.

In addition, this framework notes the commitment of key stakeholders: leaders at strategic and project levels, and internal and external designers who all need to play a pivotal role by starting to form the infrastructure for design-led innovation and elevating the usage of *"designerly"* methodologies.

Through member-checking, overall, this framework exhibits a mechanism for organisational support, consistent with proposing ways for design enhancement in the manufacturing companies. In detail, it is substantiated by this research that this framework is appropriate for the manufacturing industry in order to establish an environment for design-led innovation utilization to ensure sustained competitive advantage.

5.6 Further Areas of Research

The current study is limited by a number of conceptual of methodological challenges. Key among these is company orientation to effecting design-led strategy remains scantily defined. This is a key area for future improvement in subsequent studies. At best, the current study attempts to only gauge managers' general disposition towards the idea. Clearly a more rigorous conceptualization is required. In addition, although the inclusion of Market Responsiveness and Collaboration has demonstrated merit, the study did not

follow an exhaustive process to identify other, perhaps equally relevant, predictor variables.

From a methodology perspective the sampling method and specifically the sample size limits the generalizability of the findings. A stratified and much larger representative sample should yield better results and will be more appropriate for a causal research design. Therefore the study should be viewed as explorative only.

Homburg et al., (1999) showed that a significant proportion of the influence of the market function on strategic decision-making is explained by a range of external contingencies (for instance, market growth and technological turbulence), internal contingencies (such as strategy type and customer orientation) as well as institutional determinants (for example, chief executive officer background). Using multiple regression analysis the Homburg study provided the impetus for empirically orientated work to consider issues regarding the organization of marketing in complex environments where decentralization and the disappearance of hierarchies are common occurrence. Although many subsequent studies have been done, it appears the lack of empirical evidence remains. A key challenge in this context is to move away from the "what" and look for empirical evidence that can explain the "how". The answer to the "what" question is seemingly better understood by practitioners as they seem to grasp that movement towards market orientated approaches to organizing and effecting innovation is needed to optimize their interaction and improve their position in the market. However, practitioners and scholars seem to be rather unsure of "how" to do this. Clearly, future research opportunities abound

Constant changes in the global economic environment require companies to constant revisit traditional assumptions about how businesses create and capture value. Management practice literature has focused largely on better understanding business models and business model innovation. Much has

been written on the benefits of linking design and design thinking to organisational strategies and business transformation. However, very little has been researched and reported on regarding the impact of design led approaches to opportunities such as, social innovation enterprise, an issue that necessitates further research.

Design as an overarching pedagogical framework has been regarded as the avenue to re-envision innovation to develop capabilities required for twenty-first century global business climate. However, despite the adoption of design thinking within other domains, generic design-based education for lifelong learning remains largely unexplored. Comprehensive research on educating a workforce for the knowledge economy, and the role of design in business and educational innovation, should be conducted to create a new approach to building a culture of practice for design-led education, based on the theory of the Innovation Matrix. Research should also be contacted on how the specific knowledge and skills of designers be better articulated, understood, implemented, and valued as core components of strategic innovation in businesses.

REFERENCES

Abernathy, W. & Clark, K.B., (1985). *Mapping the winds of creative destruction*. Research Policy.

American Heritage Dictionary, (2000). *The American Heritage Dictionary of the English Language, Fourth Edition, Houghton Mifflin Company*. United States.

Amit, R and Zott. C., (2001). *Value creation in e-business*. Strategic Management Journal, Vol. 22, No. 6/7

Atuahene-Gima, K., Li, H., and De Luca, L. M., (1996). *The contingent value of marketing strategy innovativeness for product development in Chinese new technology ventures*. Industrial Marketing Management, 35.

Backman, M., Börjesson, S., & Setterberg, S., (2007). *Working with concepts in the fuzzy front end: exploring the context for innovation for different types of concepts at Volvo Cars.* R&D Management, Vol. 37.

Baker, W. E., & Sinkula, J. M., (1999). *The synergistic effect of market orientation and learning orientation on organizational performance*. Journal of Academy of Marketing Science, Vol. 27.

Baker, William & M. Sinkula, James, (2005). *Market Orientation and the New Product Paradox*. Journal of Product Innovation Management. 22.

Baron-Cohen, S., & Wheelwright, S., (2004). *The Empathy quotient*: Journal of Autism and Developmental Disorders

Batt, P. J. and Purchase, S., (2004). *Managing collaboration within networks and relationships*. Industrial Marketing Management.

Beverland, M.B., Ewing, M.T., & Matanda, M. J., (2006). *Driving-market or market-driven? A case study analysis of the new product development practices of Chinese business-to-business firms.* Industrial Marketing Management, Vol. 35.

Britannica Webster's., (2002). *Encyclopedia Britannica Online* / Merriam-Webster's Collegiate Dictionary,Online Edition, Encyclopedia Britannica Inc., http://www.britannica.com.

Brown, T., (2008). *Design Thinking*. Harvard Business Review, June 2008.

Buchanan, R., (1992). *Wicked problems in design thinking*. Design Issues.

Bucolo, S. and Matthews, J., (2011). *Design Led Innovation: exploring the synthesis of needs, technologies and business models.* Proceedings of Participatory Interaction Conference 2011, Sønderborg: Denmark.

Bucolo, S., & Matthews, J., (2011b). *Design Led Innovation – Exploring the Synthesis of Needs, Technologies and Business Models.* In Proceedings of the Participatory Interaction Conference, January 13–15, 2011, Sønderborg, Denmark.

Bucolo, S., Wrigley, C., & Matthews, J., (2012). *Gaps in Organisational Leadership: Linking Strategic and Operational Activities through Design-Led Propositions.* Design Management Journal, 7

Burns, N & Grove, SK., (2001). *The practice of nursing research: Conduct, critique &utilization*. 4th edition. Philadelphia: WB Saunders.

Carpenter, Gregory S., & Nakamoto K., (1989). *Consumer Preference Formation and Pioneering Advantage*. Journal of Marketing Research, 26.

Cengiz, E., Ayyildiz, H.,& Kirkbir, F., (2005).*Critical success factors in new product development.*

Chandler, A.D. Jr., (2001). *Inventing the Electronic Century: The Epic Story of the Consumer Electronics and Computer Science Industrie*s. Free Press, New York, NY.

Charmaz, K., (2006). *Constructing Grounded Theory: A Practical Guide Through Qualitative Analysis. Sage Publications.* Thousand Oaks, CA

Chesbrough, H., & Schwartz, K., (2007). *Innovating Business Models with Co-Development Partnerships.* Research-Technology Management.

Cohen, L., Manion, L., & Morrison K., (2007). *Research Methods in Education (5th Edition). London:* Routledge Falmer.

Cross, N., (1982). *Designerly ways of knowing*. Design Studies, Vol. 4.

Crotty, M., (1998). *The foundations of social research: Meaning and perspective in the research process*. London ; Thousand Oaks, Calif.: Sage Publications.

Day, George S., (1994). T*he Capabilities of Market-Driven Organizations.* Journal of Marketing, 58 (October), 37–52.

De Brentani, U., (2001). *Success factors in new developing new business services*. European Journal of Marketing, Vol. 25 No. 2

Design Council-UK, (2002). *Design Council Briefing, the Impact of Design on Business*. London

Design Council, (2002). *National Survey of Firms*. London

Dell, Acemoglu, and Daron, (2010). *Productivity Differences between and within Countries*. American Economic Journal: Macroeconomics

Denscombe, M., (1998). *The Good Research Guide.* Buckingham. Open University Press

Deshpande, R., (1999). *Developing a market orientation.* Thousand Oaks, CA: Sage Publications, Inc.

Deshpandé, R., Farley, J.U. & Webster, F., (1993). *Corporate culture, customer orientation, and innovativeness in Japanese firms: a quadrad analysis.* Journal of Marketing, Vol. 57.

Deshpande, R. & Webster, F. E., (1989). *Organizational culture and marketing: Defining the research agenda.* Journal of Marketing, 53, 3-15. doi:10.2307/1251521

Dunne, D., & Martin, R., (2006). *Design thinking and how it will change management education: An interview and discussion.* Academy of Management Learning and Education, Vol. 5, No. 4.

Edgett, S. & S. Parkinson., (1994). *The Development of New Financial Services. Identifying Determinants of Success and Failure.* International Journal of Service Industry Management, Vol. 5.

Ellinger, A. E., (2000). *Improving marketing/logistics cross-functional collaboration in the supply chain.* Industrial Marketing Management, 29.

Elliot, J. E., (1985). *Schumpeter's Theory of Economic Development and Social Change:* Exposition and Assessment, International Journal of Social Economics, 12 / 6-7, 6-28.

Eng, T. Y., (2006). *An investigation into the mediating role of cross-functional coordination on the linkage between organizational norms and SCM performance.* Industrial Marketing Management, 35.

Freeman, C., (1982). *The Economics of Industrial Innovation. Second Ed., Pinter Publishers.* London.

Freeman, C., Hart F., (2009). *The Economics of Industrial Innovation, 2nd edition, Frances Pinter.* London.

Gatignon, H. &Xuereb, J.M., (1997). *Strategic orientation of the firm and new product performance.* Journal of Marketing Research, Vol. 36.

Gheysaria, H., Amran Raslia, A., Roghaniana, P. and Norhalim, N., (2012). *A Review on the Market Orientation Evolution*. Procedia .

Gien, B., (2017). *Design-led Innovation Questionnaire*. Australia

Glaser, B. G., & Strauss, A. I., (1967). *The Discovery of Grounded Theory: Strategies for Qualitative Research.* New York: Aldine Publishing Company.

Gosselin, D. P., and Bauwen, G. A., (2006). *Strategic account management: customer value creation through customer alignment*. Journal of Business & Industrial Marketing, 21.

Government of Kenya., (2007). *For details about Kenya's Vision 2030,* http://www. vision2030.go.ke

Guba, E. G., (1981). *Criteria for assessing the trustworthiness of naturalistic inquiries*. Educational Communication and Technology Journal, 29.

Guba, E. G., & Lincoln, Y. S., (1989). *Fourth generation evaluation. Newbury Park, CA:* Sage.

Guba, E. G., & Lincoln, Y. S., (1994). *Competing paradigms in qualitative research.* In N. K. Denzin & Y. S. Lincoln (Eds.), Handbook of qualitative research. Thousand Oaks, CA: Sage.

Hamel, G. & Prahalad, C.K., (1991). *The Future of Management*. Boston: Harvard Business School Press.

Hamel, G. & Prahalad, C.K., (1994). *Competing for the Future*. Harvard Business School Press, Boston: MA.

Hammer, M.Champy, J., (1993). *Reengineering the corporation: a manifesto for business revolution*, Harper Business, New York.

Han, J. K., Kim, N., & Srivastava, R. K., (1998). *Market orientation and organizational performance: Is innovation a missing link?* Journal of Marketing Research, Vol. 62.

Helfert G., Ritter T., and Walter A., (2002). *Redefining market orientation from a relationship perspective: Theoretical considerations and empirical results.* European Journal of Marketing.

Henneberg, S. C., Pardo, C., Mouzas, S., and Naudé, P., (2009). *Value dimensions and relationship postures in dyadic'Key Relationship Programmes'*. Journal of Marketing Management, 25.

Heskett, J., (1980). *Industrial Design*. Thames & Hudson Ltd.

Heydebreck, Peter, (1997). *Technological Interweavement: A Means for New Technology-Based Firms to Achieve Innovation Success.* London Macmillan Press.

Holloway, I., (1997). *Qualitative research in nursing*. 2nd edition. Oxford: Blackwell Publishing.

Homburg, C., Workman, J. P. and Jensen, O., (2000). *Fundamental Changes in Marketing Organization: The Movement toward a Customer-Focused Organizational Structure.* Academy of Marketing Science.

Homburg, C.,Grozdanovic, M., & Klarmann, M., (2007). *Responsiveness to customers and competitors: The role of affective and cognitive organizational systems*. Journal of Marketing, 71.

Howell, C.J., (2008). *The relation of economic status to subjective well-being in developing countries:* Psychological Bulletin, 134,536–560.

Hult, G., (2011). *Toward a theory of the boundary-spanning marketing organization and insights from 31 organization theories.* Journal of the Academy of Marketing Science.

Hunt, S.D. & Morgan, R.M., (1995). *The comparative advantage theory of competition*. Journal of Marketing, Vol. 59.

Hurley, R.F. and Hult, G.T.M., (1998). *Innovation, Market Orientation, and Organizational Learning: An Integration and Empirical Examination*. Journal of Marketing, Vol. 62.

Iansiti, M., Khanna, T., (1995). *Technological evolution, sys-tem architecture and the obsolescence of firm capabilities*. Industrial and Corporate Change.

IDEO (2009): *Human-Centered Design Toolkit*: https://www.ideo.com/work/human-centered-design-toolkit/

Jaakkola, M., Frösén, J., Santala, M. & Vassinen, A., (2009). *Market orientation and business performance: the mediating effect of core business processes.* International Marketing Trends Congress.

Jane Fulton Suri., (2005). *Thoughtless Acts:* https://www.ideo.com/by-ideo/thoughtless-acts

Jaworski, B., Kohli, A. K., & Sahay, A., (2000). *Market-driven versus driving markets*. Journal of the Academy of Marketing Science, Vol. 28.

Joppe, M., (2000). *The Research Process, The Quantitative Report Journal,* vol.8, no.4, pp.597-607. from: http://www.nova.edu/ssss/QR/QR8-4/golafshani.pdf

Keeley NB, Forrest BM, Macleod CK., (2013). *Novel observations of contrasting flow regimes with implications for management.* Mar Pollut Bull

Kiragu. P., (2011). *Crown Berger to Raise Prices.* Star Newspaper

Kohli, A. K., and Jaworski, B. J., (1990). *Market orientation: The construct, research propositions and managerial implications.* Journal of Marketing, 54.

Kretzscmark., (2003). *Design Thinking pedagogy:* The Educational Design Ladder, Innovations in Education and Teaching International.

Kumar, N., Scheer, L., & Kotler, P., (2000). *From Market Driven to Market Driving*. European Management Journal, 18.

Kyffin, S., & Gardien, P., (2009). *Navigating the Innovation Matrix: An Approach to Design-led Innovation*. International Journal of Design, 3(1).

Lafferty, B.A.& Hult, G.T.M., (2001). *A synthesis of contemporary market orientation perspectives.* European Journal of Marketing, Vol. 35.

Lafferty, B.A.& Hult, G.T.M., (2001). *A synthesis of contemporary market orientation perspectives.* European Journal of Marketing, Vol. 35.

Langerak, F., Hultink, E.J. & Robben, H.S.J., (2007). *The mediating role of new product development in the link between market orientation and organizational performance.* Journal of Strategic Marketing, Vol. 15.

Le Meunier-FitzHugh, K. and Lane, N., (2009). *Collaboration between sales and marketing, market orientation and business performance in business-to-business organizations.* Journal of Strategic Marketing.

Leenders, R.T.A.J., Engelen, J.M.L., & Kratzer, J., (2003). *Virtuality, Communication, and New Product Team Creativity: A Social Network Perspective*. Journal of Engineering and Technology Management, Vol. 20

Lewis, M.A., (2001). *Success, Failure and Organisational Competence: A Case Study of the New Product Development Process,* Journal of Engineering Technology Management, Vol. 18.

Lincoln, Y. S., & Guba, E. G., (1985). *Naturalistic inquiry.* Beverly Hills, CA: Sage.

Lindman, Martti Tapio., (2002). *Open or Closed Strategy in Developing New Products? A case study of Industrial NPD in SM*Es. European Journal of Innovation Management Volume 5, Number 4.

Liu, S. S., Luo, Xueming, & Shi, Yi-Zheng., (2003). *Market-oriented organizations in an emerging economy: A study of missing links*. Journal of Business Research,Vol.56.

Lorenz, C., (1990). *The Design Dimension, Basil Blackwell*. Oxford.

Martin R., (2007). *The Opposable Mind, Boston*. Harvard Business School Press

Martin R., (2009). *The Design of Business, Boston*, Harvard Business

Martin, R., (2009). The Design of Business. Boston: Harvard Business School Publishing.

Martin, R., (2010). *Design thinking: achieving insights via the "knowledge funnel.* Strategy &Leadership, 38(2), 37–41.

Marzano, R. J., (2000). *A new era of school reform: Going where the research takes us.* Aurora, CO: Mid-continent Research for Education and Learning.

Mavondo, F.T. & Farrell, M.A., (2000). *Measuring market orientation: Are there differences between business marketers and consumer marketers?* Australian Journal of management, Vol. 25.

McGrath R. G., (2010). *Discovery Driven Growth: A Breakthrough Process to Reduce Risk and Seize Opportunity,* Harvard Business Publishing, Boston, Mass.

Meier, M. G. and Baldwin E. R., (1957). *Economic Development: Theory, History, Policy*. John Wiley & Sons, Inc., New York.

Menguc, B., and Auh, S. (2005). *A test of strategic orientation formation versus strategic orientation implementation: The influence of TMT functional diversity and inter-functional coordination.* Journal of Marketing Theory and Practice, 13

Mentzer, J. T., (2001). *Supply chain management.* Sage Publication. California, US.

Miles, M.B. and Huberman, A.M., (1994). *Qualitative Data Analysis: An Expanded Sourcebook, 2nd ed., Sage Publications,* Newbury Park, CA, 1994.

Moalosi, R., (2017). *Design-led Innovation Questionnaire*. Botswana

Moorman, C., (1995). *Organizational market information processes: Cultural antecedents and new product outcomes.* Journal of Marketing Research, Vol. 32.

Morgan, N. A., and Piercy, N. F., (1998). *Interactions between marketing and quality at the SBU level: influences and outcomes.* Journal of the Academy of Marketing Science, 26

Moye, N. A., & Langfred, C. W., (2004). *Information sharing and group conflict: Going beyond decision making to understand the effects of information sharing on 30 group performance*. International Journal of Conflict Management,Vol. 15.

Mutlu, B.D., (2003). *New User-Centered Methods for Design Innovation*: A Study on the Role of Emerging Methods in Innovative Product Design and Development. Istanbul.

Narver, J. C. and Slater, S. F., (1990). *The effect of a market orientation on*

business profitability. Journal of Marketing Management.

Narver, J., Slater, N., & MacLachlan, D., (2000). *Total Market Orientation, Business Performance, and Innovation*. MSI Working Paper, 100-116, Marketing Science Institute.

Narver, J.C. & Slater, S.F., (1990). *The effect of a market orientation on business profitability.* Journal of Marketing, Vol. 54.

Narver, J.C., Slater, S.F. & Maclachlan, D.L., (2004). *Responsive and proactive market orientation and new-product success.* Journal of Product Innovation Management, Vol. 21.

Norman, D., (2010). *Design Thinking: A Useful Myth*. Core77.

Oakley, A., (1990). *Methodology and people's ways of knowing: some problems with feminism and the paradigm debate in social science.* Sociology.

OECD (2014). *Reviews of Innovation Policy: Industry and Technology Policies in Korea*. Paris: OECD Publishing.

Ohmae. K., (2000). *The Invisible Continent: Four Strategic Imperatives of the New Economy.* Nicholas Brealey, London.

Osterwalder A., Pigneur Y., (2010). *Business Model generation, Hoboken, New Jersey.* John Wiley and Sons Inc.

Oxford University Press, (2003). *Reference Reviews*.

Piercy, N. F., (2009). *Strategic relationships between boundary-spanning functions: Aligning customer relationship management with supplier relationship management.* Industrial Marketing Management, 38.

Porter. M., (1990). *Competitive Advantage of Nations, Free Press,* New York, NY.

Porter, M. E., (1996). *Competitive Strategy: Techniques for Analyzing Industries and Competitors.* FreePress, New York.

Powell T., (1996). *How much does industry matter? An alternative empirical test.* Strategic Management Journal 17

Pozzey, E., Wrigley, C., & Bucolo, S., (2012). *Unpacking the Opportunities for Change within a Family Owned Manufacturing SME: A Design Led Innovation Case Study.* Boston, MA: DMI.

Ritter, T., Wilkinson, I.F. and Johnston, W.J., (2004). *Managing in complex business networks.* Industrial Marketing Management.

Rothwell, R. and Dodgson, M., (1994). *Innovation and Size of Firm, in The Handbook of Industrial Innovation,* Editors M. Dodgson and R. Rothwell, Aldershot Hants: Edward Elgar.

Rothwell, R. and Gardiner, P., (1988). *Re-Innovation and Robust Designs: Producer and User Benefits,* Journal of Marketing Management, 3 / 3, 64-72.

Sandberg Birgitta, (2002). *Creating the market for disruptive innovation: market proactiveness at the launch stage*. Journal of Targeting, Measurement & Analysis for Marketing,Vol. 11(2), pp. 184-196.

Schilling, M.A. & Hill, C.W.L., (1998). *Managing the new product development process: Strategic imperatives*. Academy of management executive, Vol. 12.

Schumpeter, J. A., (1934). *The Theory of Economic Development,* Harvard University Press, Cambridge, Massachusetts.

Schumpeter, J. A., (1939). *Business Cycles: A Theoretical, Historical and Statistical Analysis of the Capitalist Process*, McGraw-Hill, New York.

Schumpeter, J.A., (1942). *Capitalism, Socialism and Democracy. Vol. 36, Harper & Row*, New York, 132-145.

Schumpeter, Joseph A., (1954a). *Economic Doctrine and Method, translated by R. Aris*, Oxford University Press, New York.

Schumpeter, Joseph A., (1954b). *History of Economic Analysis, Oxford University Press*, New York.

Shafer, S.M., et al., (2005). *The Power of Business Model*. Business Horizons, 48,199-207. http://dx.doi.org/10.1016/j.bushor.2004.10.014

Shapiro, B.P., (1988). *What the hell is market oriented?* Harvard Business Review.

Slater, Stanley F. and John C. Narver., (1998). *Does Competitive Environment Moderate the Market Orientation–Performance Relationship.* Journal of Marketing, 58 (January), 46–55

Sleeswijk Visser, F. and Kouprie, M., (2009). *Stimulating empathy in ideation workshops. Participatory design conference.* Indianapolis.

Smirnova, M., Henneberg, S. C., Ashnai, B., Naudé, P. and Mouzas, S., (2011). *Understanding the role of marketing-purchasing collaboration in industrial markets: The case of Russia*. Industrial Marketing Management.

Smith, M., (1993). *The effects of concretely versus abstractly illustrated instruction on learning abstract concepts.* Iowa State University.

Soderquist, Klas, Chanaron, J. J. and Motwani, Jaideep, (1997). *Managing Innovation in French Small and Medium Sized Enterprises*: An Empirical Study, Benchmarking for Quality Management & Technology, Vol. 4 No. 4.

Song, M., & Parry, M. E., (1993). *R&D-marketing integration in Japanese high-technology firms: hypotheses and empirical eviden*ce. Journal of the Academy of Marketing Science, Vol. 21.

Song, M., Benedetto, C.A.D., & Parry, M.E., (2009). *The impact of formal processes for market information acquisition and utilization on the performance of Chinese new ventures.* International Journal of Research in Marketing, Vol. 26.

Song, X. M., & Parry, M. E., (1996). *What separates Japanese new product winner from losers*? Journal of Product Innovation Management.

Srinivasan, S., (2017). *Design-led Innovation Questionnaire*. India

Srivastava, R., Shervani, T. & Fahey, L., (1999). *Marketing, business processes, and shareholder value: An organizationally embedded view of marketing activities and the discipline of marketi*ng. Journal of Marketing, Vol. 63.

Swink, M. & Song, M., (2007). *Effects of marketing-manufacturing integration on new product development time and competitive advantage.* Journal of Operations Management, Vol. 25.

Thagard, P., & Shelley, C. P., (1997). *Abductive reasoning: Logic, visual*

thinking, and coherence. In M. L. Dalla Chiara, K. Doets, D. Mundici & J. van Benthem (Eds.), Logic and Scientific Methods . Dordrecht: Kluwer.

Thomas, R., (1993). *New Product Development: Managing and Forecasting for Strategic Success.* John Wiley, New York.

Tidd, J., Bessant, J. and Pavitt, K., (2005). *Managing innovation: Integrating technological, market and organizational change, 3rd edition*. John Wiley & Sons.

Trueman, M. and Jobber, F., (1998). *Competing Through Design*. Long Range Planning.

Utterback, J.M., (1974). *Innovation in industry and the diffusion of technology*.

Verganti, R., (2008). *Interpreting and Envisioning: An Hermeneutics approach to Radical Innovation.* Industrial Marketing Management.

Walsh, V., Roy, R., Potter, S. and Bruce, M., (1990). *Winning by design: Technology, product design and international competitiveness.* Basil Blackwell, Oxford.

Wei, Y. H., & Wang, Q., (2010). *Making sense of a market information system for superior performance: The roles of organizational responsiveness and innovation strategy.* Industrial Marketing Management.

Wei, Y.H., (2006). *Market Orientation and Successful New Product Innovation: The Role of Competency Traps*. Ph.D at University of North Carolina at Chapel Hill.

Weick. K., (1984). *Toward a model of organizations as interpretation systems. In Making Sense of the Organization*. Oxford: Blackwell Publishing.

Wheelwright, S. & Clark, K., (1992). *Revolutionizing Product Development.* Free Press, New York.

World Intellectual Property Organization., (2015). WIPO

Zaccai, G., (2017). *Design-led Innovation Questionnaire.* U.S.A

APPENDICES

APPENDIX A: PAINT MANUFACTURING COMPANIES IN NAIROBI

1. Alfa Coate Industries, Nairobi
2. Apex Paints (K) Ltd, Nairobi
3. B P C Industrial Lacquers Ltd, Nairobi
4. Basco Products (K) Ltd, Nairobi
5. Beaver Industries, Nairobi
6. BPC Industrial Lacquers Ltd, Industrial area. Nairobi
7. Cardinal Associates Ltd, Nairobi
8. Coates Brothers Ltd, Industrial area. Nairobi
9. Crown Berger Kenya Ltd, Industrial area. Nairobi
10. Fastchem Paints, Kariobangi, Nairobi
11. Flamingo Paints Ltd, Nakuru
12. Galaxy Paints and Coatings Ltd, Industrial area. Nairobi
13. Gempack Solutions Ltd, Nairobi
14. Glory Paints, Nairobi
15. Grand Paints Ltd, Industrial area. Nairobi
16. Industrial Coatings Ltd, Nairobi
17. Kenind Paints Ltd, Nairobi
18. Lody Autopaints and Hardware, Nairobi
19. Mahesh Hardware and Paints Ltd, Nairobi
20. Maroo Polymers Ltd, Nairobi
21. Nayan Products (Kenya) Ltd (Quick), Nairobi
22. Omega Paints, Nairobi
23. Prime Coatings Ltd, Nairobi
24. Rally Paints Investments 2000, Nairobi
25. Sadolin Paints (E A) Ltd, Nairobi
26. Seweco Industrial Coatings Company Ltd, Nairobi
27. Silvar Shine Paints Outlet, ruiru
28. Smart Paint Ltd, Industrial area. Nairobi

29. Smart Paint Ltd, Nairobi
30. Solai Paints Ltd, Nairobi
31. Spectra Chemicals Ltd, Nairobi
32. Tiengo Auto Paints, Nairobi
33. United Paints., Nairobi

APPENDIX B: INTERVIEW SCHEDULE FOR DESIGN INNOVATION EXPERTS

1. Your Profession,

   ……

   Design-led Innovation is about more than new products and services yet very few entrepreneurs are innovating in the "back office" or support functions needed to sustain a growing business. Where and when is Innovation supposed to take place in a business environment?

   .....

   .....

2. If a business wants to grow, it needs to find a way of embedding design-led innovation in its strategic priorities. How can this be accomplished?

.....

.....

3. If a business wants to grow, it needs to build a culture of innovation, using an approach that suits it. Innovation needs to be a measurable, focused activity. But to sustain its growth a business needs to find ways of making innovation a managed process. How can this be accomplished?

.....

.....

4. What is the role of the Government, Design Schools and Businesses in supporting and encouraging the adoption and practice of design-led innovation consistently for sustained growth of the economy?

.....

.....

5. What in your view does the future hold for businesses if they fully embrace design-led innovation in their business processes?

.....

6. Any other comments you wish to add:

.....

.....

Thank you very much for participation

APPENDIX C: INTERVIEW GUIDE FOR COMPANY EXECUTIVES

1. How long has your business been in existance? How can you describe the progress of your company over the last few years and your future aspirations?

   ……
   ……
   ……

   .....

2. Who are your competitors? How well can you describe your business perfomance in terms of innovation relative to available competition?

   .....
   .....
   .....

3. What is your market and what problem(s) are you trying to solve for them? What are your innovation strategies and how do you practise them?

   .....
   .....
   .....
   .....
   .....

4. Is there a common view across the business of who is the customer and his/her importance? How do you reach him/her?

   .....
   .....
   .....
   .....

5. Do you research about your market? How much do you know about your customers, in terms of what features they want, and challenges they are facing?

   .....

   .....

   .....

6. Do you have a process of consulting customers for feedback about their experience with your goods or services?

   .....

   .....

   .....

   .....

   .....

APPENDIX D: QUESTIONNAIRE FOR PAINT RETAILERS

The researcher is a PhD candidate at the University of Nairobi, conducting a research on the impact of paint innovations on customer preferences and satisfaction.

1. What is the name of your business?

   _____
   _____

2. How old is your business?

   _____
   _____

3. Who are your main customers?

- ☐ Building contractors
- ☐ Interior Decorators
- ☐ Interior Designers
- ☐ Home owners
- ☐ Others_____
  _____

4. In your stock assessment which brand of paint products are mostly preferred by customers as informed by sales volumes?

- ☐ Crown
- ☐ Duracoat
- ☐ Sadolin
- ☐ Smart Paints
- ☐ Solai Paints
- ☐ Classic Paints
- ☐ Galaxy Paints
- ☐ Glory Paints

5. Please select reasons for the above preferences as informed by your customers:

i……

ii……..

iii…….

iv…….

v……..

APPENDIX E: QUESTIONNAIRE FOR PAINT PRODUCTS USERS

The researcher is a PhD candidate at the University of Nairobi, conducting a research on the impact of paint innovations on customer preferences and satisfaction.

1. What is your profession?

_____

2. Which brand of paint products do you prefer for use in your projects?

- ☐ Crown
- ☐ Duracoat
- ☐ Sadolin
- ☐ Smart Paints
- ☐ Solai Paints
- ☐ Classic Paints
- ☐ Galaxy Paints
- ☐ Glory Paints
- ☐ Other_____

3. Please select reasons for the above preferences:

i……

ii……..

iii…….

iv…….

v……..

4. The selected paint products in question 1 adequately satisfy my paint and coatings needs.

- ☐ Strongly Agree
- ☐ Agree

- Neutral
- Disagree
- Strongly Disagree

APPENDIX F

QUESTIONAIRE RESPONSES FROM DESIGN INNOVATION EXPERTS

DR. GIANFRANCO ZACCAI QUESTIONNAIRE RESPONSES (U.S.A)

Kindly assist by filling in the questionnaire. The report will strictly be for scholarly purposes only.

Your Profession,

I am a degreed industrial Designer and Architect and serve as President and Chief Design Officer of Continuum LLC, an Innovation Design consultancy I founded in 1983. We have five offices in North America, Europe, and Asia and work on engagements in all continents except Antarctica.

Design-led Innovation is about more than new products and services yet very few entrepreneurs are innovating in the "back office" or support functions needed to sustain a growing business. Where and when is Innovation supposed to take place in a business environment?

Innovation can take place in any and all areas of a business or an enterprise. If the business is new or young and its goal is to gain a small market share of a large market, the innovation can be what I would call “one-dimensional”. For example in a product or service offering a compelling new product, interface, digital experience, delivery system, financing model, or organizational structure can be the winning differntiator at least initially. But for in a mid to large organization with an important or even dominant market position, its goal must be to gain or grow a key segment of a large market, the innovation usually must be multi-dimensional, and may include a combination product, service, interface, digital experience, delivery system, financing, back office, and organizational innovations. In all of these areas the human element must be deeply understood and leveraged.

If a business wants to grow, it needs to find a way of embedding design-led innovation in its strategic priorities. How can this be accomplished?

As previously mentioned for a business to grow from a niche or boutique to having an important market position, it must inevitably face large array of competitors from all directions. To succeed the business usually must innovate in a multi-dimensional way. This may include a combination product, service, interface, digital experience, delivery system, financing, back office, and organizational innovations. In all of these areas the human element must be deeply understood and leveraged and this requires understanding the emotional as well as the "rational" needs and aspirations of all the players from the customer to the stakeholders within the organization and to address such needs in a cost efficient but compelling way. Good designers, working in a leading role of an interdisciplinary team, are ideally suited to provide both the sensibility to uncover such needs and wants and the talent to humanize the touch points and the delivery ecosystem. In order for the designer to have such a role they must have the support of the top leadership of the organization. Conversely, the leaders of the organization must recruit and develop design leaders that are focused on creating a great experience for the customer and all the stakeholders and not focus only on superficial cosmetic improvements.

If a business wants to grow, it needs to build a culture of innovation, using an approach that suits it. Innovation needs to be a measurable, focused activity. But to sustain its growth a business needs to find ways of making innovation a managed process. How can this be accomplished?

We believe that Innovation can be managed to a degree but that it is also important to create a climate where serendipity is also leveraged.

The management part may include the following:

- An individual internal champion for innovation within the organization and well connected to and informed by both senior corporate management and the lines of business and their operational functions (R&D, Marketing, Manufacturing, Sales, etc.) but not controlled by any line of business or operational function.
- An interdisciplinary internal team (or individual) able to connect the internal organization to the external partners.
- One or more external (consultants or corporate) innovation by design (IBD) partners well versed in the human centered innovation design process (Details to follow) and not tied to the current product or service offerings or way of doing business.
- The IBD team ideally is composed of multiple disciplines working as a team. Including Design Researchers, Envisioners, Business Strategists, Technologists, Model Makers and Digital UX Designers and Simulators but the foci are the stakeholders, from the current and possible future customers, to the stakeholders within the client organization.
- Their goal being first to uncover unmet needs, frustrations, and desires including those that may be disruptive to the current business model of an entire industry. Secondly to conceptualize, model, and meaningfully test possible ways of meeting such challenges. To learn from this iterative process until the right idea or combination of ideas are identified.
- The Internal Champion must both connect the IBD to the organizations senior management and Lines of Business while buffering any areas of confusion as the ideas are transferred, prototyped, and tested in scale prior to full scale launch.
- This is not a linear process and ideas that test badly may span totally different applications (e. g. non-sticky glue leading to Post-Its) and stakeholder learnings may lead to insights beyond the original area of focus…. The team must be open to serendipity ands learen to park but not discard such opportunities.

- Talent and luck still play a key role. Nurture talent and provide more chances for luck to shine.

What is the role of the Government, Design Schools and Businesses in supporting and encouraging the adoption and practice of design-led innovation consistently for sustained growth of the economy?

- Governments must recognize that basic research and STEM (Science, Technology, Engineering, and Mathematics) programs are not the sole source of innovation in a creative economy but that other creative and human centric disciplines are key contributors.
- Design Schools must train designers to be more human centric in their approach and more proficient with tools and methods from the STEM areas. Design schools should also seek to inform students in STEM programs as well as Economics and Business about design thinking and form collaborative relationships with design students.
- Businesses must be always on the lookout for areas of improvement by creating better experiences for their current customers and employees in their current business through Human Centric design and be open to making the current business obsolete through disruptive but still human centric design enabled innovations.

What in your view does the future hold for businesses if they fully embrace design-led innovation in their business processes?

- Success and longevity.

Any other comments you wish to add:

- This approach is also applicable to non for profit and governments who seek to better serve people.

DR. BRANDON GIEN QUESTIONNAIRE RESPONSES (AUSTRALIA)

Kindly assist by filling in the questionnaire. The report will strictly be for scholarly purposes only.

1. *Your Profession,*

   ……
   ……

   Design-led Innovation is about more than new products and services yet very few entrepreneurs are innovating in the "back office" or support functions needed to sustain a growing business. Where and when is Innovation supposed to take place in a business environment? There is no perfect answer to 'when is the right time to innovate'.

   In my opinion, businesses should be innovating all the time to ensure they are continually re-inventing themselves and ensuring that they remain relevant to their customer base and competitive in the marketplace. There also needs to be a distinction here between innovation and design-led innovation – two very, very different modes of thinking.

   .....
   .....

2. *If a business wants to grow, it needs to find a way of embedding design-led innovation in its strategic priorities. How can this be accomplished?*

   Very difficult question to answer in a generic sense as all businesses are very different and require a different approach to innovation and in particular, design-led innovation. If the focus is on growth, then a business needs to use a design-led approach to establish new markets,

new business avenues, revenue streams etc. and then apply a design based methodology around this strategy to ensure long term traction.

.....
.....

3. *If a business wants to grow, it needs to build a culture of innovation, using an approach that suits it. Innovation needs to be a measurable, focused activity. But to sustain its growth a business needs to find ways of making innovation a managed process. How can this be accomplished?*

   Again, very difficult to answer this from a generalist perspective! I totally agree that innovation needs to be a 'measurable and focused' and hence the importance of a design-led approach to innovation. The nature of innovation is changing, there is no "one" solution that fits all cases - innovation is adaptive – as it needs to be in a volatile global environment.

.....
.....

4. *What is the role of the Government, Design Schools and Businesses in supporting and encouraging the adoption and practice of design-led innovation consistently for sustained growth of the economy?*

   There is evidence to suggest that whilst traditional measures to drive economic competitiveness productivity have centred on technological change and innovation embodied in capital equipment and basic R&D. More recently however, examination of this issue suggests that investment in non-technological innovation, such as management capability and business model innovation is just as important, if not more so. Design education, in my opinion has a long way to go to catch up to this notion. We are still educating design students to think about design in a material

sense – i.e., things that can be manufactured. Design goes well beyond this and consistent, sustainable growth will follow as soon as businesses truly 'get' design.

.....
.....

5. *What in your view does the future hold for businesses if they fully embrace design-led innovation in their business processes?*

See No. 4 above!

.....
.....

6. *Any other comments you wish to add:*

Thanks for the opportunity to be a part of this. My advice would be to ensure you create a clear distinction between design, innovation and design-led innovation. Governments, particularly here in Australia see innovation by design as a magic bullet that will help grow their economy. Short answer is that without a design framework, innovation is a lost cause. A professional design approach to innovation provides the parameters, guidance and metrics for innovation to flourish.

.....
.....

PROF. RICHIE MOALOSI QUESTIONNAIRE RESPONSES (BOTSWANA)

Kindly assist by filling in the questionnaire. The report will strictly be for scholarly purposes only.

1. *Your Profession,*

Design Education

2. *Design-led Innovation is about more than new products and services yet very few entrepreneurs are innovating in the "back office" or support functions needed to sustain a growing business. Where and when is Innovation supposed to take place in a business environment?*

It can take place when innovating the business systems/services/products/processes, etc. It should be considered early in any development process and all stakeholders should be involved.

3. *If a business wants to grow, it needs to find a way of embedding design-led innovation in its strategic priorities. How can this be accomplished?*

There should be somebody who is experienced and who will lead the innovation in the business. Otherwise, without the personnel in place, the initiative cannot be successful or it can be done unsystematically. Business can also outsource the services of designers who can assist them to embed design in their innovation processes.

1. *If a business wants to grow, it needs to build a culture of innovation, using an approach that suits it. Innovation needs to be a measurable, focused activity. But to sustain its growth a business needs to find ways*

of making innovation a managed process. How can this be accomplished?

All the above cannot be accomplished if an experienced designer is not engaged to put all the necessary tools and processes in place to measure and manage innovation. Read this report on measuring the value of design in the economy: http://www.designcouncil.org.uk/news-opinion/importance-measuring-economic-value-design

2. *What is the role of the Government, Design Schools and Businesses in supporting and encouraging the adoption and practice of design-led innovation consistently for sustained growth of the economy?*

The role of govt is to provide an enabling environment to do business which encourages innovation. Govt can develop innovation policies, intellectual property right policy, innovation fund to support businesses which are innovating. Design schools produce innovators to which seek employment in business which deal with innovation and graduates can start their own start-up companies.

3. *What in your view, does the future hold for businesses if they fully embrace design-led innovation in their business processes?*

Evidence from elsewhere has shown that when businesses embrace design-led innovation, they always stay ahead of the competition. According to the Design Council (2015) Great design can change lives, communities and organisations for the better. It can create better places to live, bring communities together, and can transform business and public services. Design is a way of thinking that helps large organisations, small and medium-sized enterprises, social enterprises and charities change the way they work. Read this Design Economy Report at http://www.designcouncil.org.uk/sites/default/files/asset/document/The%20Design%20Economy%20executive%20summary.pdf

4. *Any other comments you wish to add:*

If feel you need to make your questionnaire quantitative. People are lazy to write and you might not get a lot of responses to your questionnaire. I still feel you haven't addressed a lot of issues on design-led innovation. Perhaps, those have been addressed by other instruments which you will use. You need to read more on the topic.

MR. SRINI R SRNIVASAN QUESTIONNAIRE RESPONSES (INDIA)

Kindly assist by filling in the questionnaire. The report will strictly be for scholarly purposes only.

1. Your Profession,

   Product design and manufacturing support in consumer electronics, medical devices, industrial goods, wearables, housewares.

   Design-led Innovation is about more than new products and services yet very few entrepreneurs are innovating in the "back office" or support functions needed to sustain a growing business. Where and when is Innovation supposed to take place in a business environment?.

   The design led innovation has to take place right from the proposal stage onwards. Starting from the cost estimation to material selections to packaging design, innovation is a must to meet the current day demands on a product design consultant. A very solid back-office support is needed for locating the vendors and component sourcing.

2. If a business wants to grow, it needs to find a way of embedding design-led innovation in its strategic priorities. How can this be accomplished?

   In the current market, design industry is going through tough times and each design agency has to come up with very distinct strategy to stay alive and grow in the business. Such differentiation comes from how innovation can take place in all aspects of the business strategies. One of the key strategies would be to keep the core design in house while finding partners for other peripheral designs who might be specialists in given areas. This strategy helps optimizes the design time and therefore costs, which in turn helps the business to win deals.

3. If a business wants to grow, it needs to build a culture of innovation, using an approach that suits it. Innovation needs to be a measurable, focused activity. But to sustain its growth a business needs to find ways of making innovation a managed process. How can this be accomplished?

   Design industry is adopting various strategies to cope with the change in the economic conditions of today's commerce. Every geography has different demands on design needs based on cultural, emotional and commercial requirements. As an example, local transportation needs are met in USA successfully by a company called Uber, which came up with a brilliant idea of using a Mobile App to order a cab and within a few months became a global success. This led to a series of similar innovative solutions in lesser known economies where the use of Taxis are not affordable. In Bali, Indonesia, they are using Go-Jek a low cost scooter rides for a small fee. It operates similar to Uber, but it was adapted to the local culture of Indonesia.

   What about the regular taxi services? Hit with a huge competition from Uber and others like Uber, they are innovating with their own methods to counter this business challenge. These include local Mobile Apps specific areas and also have a preferred list of clients to whom they serve on discounted rates, etc.

   These examples prove that businesses use innovative design approaches to solve critical day to day business issues to sustain and grow.

.....

4. What is the role of the Government, Design Schools and Businesses in supporting and encouraging the adoption and practice of design-led innovation consistently for sustained growth of the economy?

Design schools and Businesses work in tandem to bring about better products and services to the society. The government on its part need to formulate a good Design Policy with respect to protection of the industry, environment and natural resources. As an example, if there is abundant availability of any material, say Bamboo or Jute, the design policy can be formed to support use of these materials in the production of day to day products. These support could be in the form of incentives, tax breaks, etc. On the other hand, if there is an acute short supply of a material, there can be regulated through stiff penalties or tariff.

Sustaining the available resources to moderate the demand supply equation is an important aspect of successful economies and all the three faculties (Govt, Design Schools and Industry) play significant roles to build a growing economy.

.....

5. What in your view does the future hold for businesses if they fully embrace design-led innovation in their business processes?

   Design led innovation is a necessity for the modern world and growing countries. As people change their behavior on usage of products and services, businesses adapt to handling these changes in requirements through innovative products. Its an ongoing process that keeps the economy alive and kicking.

.....

Any other comments you wish to add:

PROF. HAKAN EDEHOLT QUESTIONNAIRE RESPONSES (NORWAY)

Kindly assist by filling in the questionnaire. The report will strictly be for scholarly purposes only.

1. Your Profession,

   Industrial designer and professor (PhD) in Industrial Design ……..

   Design-led Innovation is about more than new products and services yet very few entrepreneurs are innovating in the "back office" or support functions needed to sustain a growing business. Where and when is Innovation supposed to take place in a business environment?

   "Innovation" as a concept tends to be very tricky. So to me one needs to be more explicit to what one refers to, e.g. like: (i) distinguish it from other related concepts like invention and creativity, (ii) if we talk about the result (the noon) or the mindset/process to get it (i.e. the verb) and (iii) what kinds of innovations we talk about? If we, as seemingly appropriate in this case (?), make a difference between e.g. technical, business and product issues, we arguably have different professions and scholarly traditions underpinning each. Engineering schools tend to focus on "technical innovations", business schools on "business model innovations" and design schools in "product innovations" primarily considering the use(ability) and users of the technology implemented and business offering made. So I would like to, to (i) Where and (ii) When, add (iii) what kind of innovation and by (iv) Whom? If we talk about product innovations I guess it at least part of the time should be (i) where it will be used and sometimes also with the users (and other stakeholders), (ii) preferable as early in the process as possible, (iii) up to you to decide and finally (iv) from a disciplinary perspective I guess "inter-disciplinary" team-work capture

the most common situation (at least when it concerns a bit more complex products). But of course typically you as a designer will like to go beyond pure product development professions and also include other stakeholders like e.g. the actual end-user.

2. If a business wants to grow, it needs to find a way of embedding design-led innovation in its strategic priorities. How can this be accomplished?

   This is quite a strong assumption? I'm not sure that you can't find growing business without "design-led innovation"?? ... at the same time you introduce the concept design and design-led, two concepts that isn't that easy to capture either. Are you talking about design as we designers relate to it or is it used in a more generic understanding of planning and acting consciously in order to achieve a certain and more preferable future situation? Does design-led mean led by designers or more of "by management" merely applying an attitude of "Design Thinking" as e.g. promoted by Roger Martin? I guess "Design Management" is the field to look into then (i.e. not really my field). But regardless the normal answer to this question is probably that you need to have the management with you; but I guess one could question that and look for more creative alternatives too?...

3. If a business wants to grow, it needs to build a culture of innovation, using an approach that suits it. Innovation needs to be a measurable, focused activity. But to sustain its growth a business needs to find ways of making innovation a managed process. How can this be accomplished?

   Again some quite strong assumptions that could be questioned (could you not rephrase them in the direction of some hypothesis instead?). However I don't really have any good advises here, but I guess you can find plenty of it in the references I point to in the paragraph above?

4. What is the role of the Government, Design Schools and Businesses in supporting and encouraging the adoption and practice of design-led innovation consistently for sustained growth of the economy?

   I'm probably not the right person to ask this particular question as my deep believe is that every attempt to sustain economical growth isn't sustainable and therefore not, in the long run, possible to sustain. On the other hand if we can rephrase the question to instead focus on sustaining humanity and the "quality of life" for all global citizens (in contrast to "standard of living" driven by pure consumption), it will be much easier to answer (see also my reply on question 5 below). So I believe that the role for every responsible Government should be the survival of its present ant future citizen. The role of the schools is to nurture professionals that are able to facilitate such crucial undertaking.

5. What in your view does the future hold for businesses if they fully embrace design-led innovation in their business processes?

   *Design as a culture, mind-set and/or discipline tend to be especially fit to find **alternative** (rather than optimized) solutions and/or approaches to different problems and/or predicaments at hand. As we today, with an increasingly rapid changing climate, are facing more destructive and dangerous outcomes we as a human race ever experienced, I think the business will not have any business at all if they not embrace all possible options to find alternative business-models. Because, neither to me nor to many others, Business as Usual (BaU) isn't a feasible alternative any longer.*

6. Any other comments you wish to add:

   I guess I didn't answer exactly as you expected and in this short format it isn't possible to develop the arguments far- and thoroughly enough;

nether for me nor for you. But if my short answers doesn't make sense at all you could perhaps ask Prof Mugendi to explain my stance a bit further (as we have discussed similar issues before ;-) Good luck with your research and hope to meet and discuss these and similar issues sometime in the future.

.....

Thank you very much for participation .. *You're Welcome ;-)*