PACKAGING DESIGNS USING GREEN RECYCLED MATERIALS

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Table of Contents

CHAPTER ONE: INTRODUCTION 4
1.0 Introduction 4
1.1. Economic efficiency of recycling 5
1.2 Research Questions 5
1.3 Contribution of research 6
LITERATURE REVIEW 6
2.0 Overview 6
2.1. Elements of great package design 8
2.2. Creative Design Elements 9
2.3 Operations management 10
2.4 Consumer Behavior Analysis 14
2.5. Service Design 17
DATA FINDINGS AND ANALYSIS 20
3.1 Findings on consumers' preferences concerning the packaging elements that capture their attention 20
3.2. Monitoring 22
3.3 Human Resource Job Design 23
3.4. Location 23
3.5 findings on technology use and implication on production 23
3.6. Successful packaging elements in organization 25
3.7 Findings on Inventory Management and maintenance at Gilroy 25
3.8. Findings on facility layout as an element of successful design operation 26
3.9 Planning of Production process 32
DISCUSSION 34
CONCLUSIONS 35

MANAGERIAL IMPLICATIONS 37
LIMITATIONS 38
RECOMMENDATIONS 39
FUTURE RESEARCH DIRECTIONS 39
Appendix: 44

CHAPTER ONE: INTRODUCTION

1.0 Introduction

In the recent years, the environment has received huge social attention (Green, & Helsen, 2014). The protection of environment has taken a pivotal position largely due to the rapidly diminishing natural resources and the environmental hazards presented by depletion of these resources. According to Fuller, (2014), there are three viable methods that are increasingly utilized in safeguarding the environment: resource use management; pollution control and waste management. Waste management through recycling has taken precedence in the recent times due to the limited nature of resources on the earth (Kamphuis, et al (2006). Buchanan, (2011) also observes that conventional means of waste disposal are increasingly associated with pollution and other environmental impacts. Recycling of more eco-friendly and green packaging solutions has been propagated as a sustainable waste management alternative due to the fact that it is economically affordable, environmentally effective and socially acceptable.

Most packaging wastes have been found to end up on landfills (Mahalik, & Nambiar, 2010). The most conventional disposal method for packaging wastes in most countries is the use of landfills (Roderick, 2011). However, a number of studies have established that disposal to landfill results in greater environmental impact than package waste reuse and recycling options (Packforsk, 2010). The prevalence in use of landfills for disposal of packaging waste has forced many countries to begin the process of implementing a raft of programs aimed at integrating sustainable treatment methods (Roderick, 2011). For example, in Europe, the European Directive on Packaging Waste (94/62/EC) established a target to recover approximately 50% - 65% package waste and recycle about 25%-45% of the waste. Each material category constituting the package waste (plastic, paper, glass and metals) had a minimum target of 15%, which was set with a view to ensuring that Member States gave each material category equal emphasis (Green, & Helsen, 2014). The low threshold of only 15% was also instituted with the acknowledgement that some materials could be recycled more effectively than others.

1.1. Economic efficiency of recycling

Many studies have sought to examine the economic value of waste recycling policies which are currently implemented in most first world countries (Heyde, and Kremer, 2009; Stickdorn, 2012; Mayne, 2012). According to Vilfredo Pareto, efficiency denotes a situation where it is virtually impossible to make one individual better off without making anyone else worse off (cited in Pollard, Kirk, & Cade, 2012 p. 46). However, Pareto's criterion of evaluating efficiency is not an effective yardstick for measuring most organizational activities or projects, since some activities tend to leave one person worse off (Joo et al., 2011). In such instances, the compensation principle, which was advocated by Kaldor (1939) and Hicks (1939), serves as a better definition of the concept of efficiency. The compensation principle states that economic efficiency alludes to a situation where the sum of all the benefits is great and sufficient to effectively offset all the costs, whether or not the benefits are utilized in compensating those who bear the costs (Ragaert, et al., 2014).

Murray & Delahunty, (2010) have examined two dimensions of the economic efficiency of recycling: the marginal benefits (MB) and the cost efficiency perspectives. The marginal benefits essentially refers to the inherent value of recycled materials upon their production as well as excluded environmental cost such as reduced depletion of primary resources, reduced impact on environment. On the other hand, cost efficiency is attained when all marginal costs and potential means of achievement are equal (Packforsk, 2010). Murray & Delahunty found that the economic efficiency of recycling waste was only feasible when a policy with a goal of capitalizing on social welfare was implemented by governments with a view to maximizing the remaining benefits to a given civilization. The study further found that such an initiative would presumably stem from a process that was aimed at by bringing equality between the marginal advantages heralded through recycling and the marginal costs of recycling waste products (Green, & Helsen, 2014).

1.2 Research Questions

This dissertation will try to answer the following research questions:

- What are the consumers preferences concerning the packaging elements that capture their attention?
- Which are the successful packaging elements?
- What materials can be used in packaging? Which of them are recycled and what is the contribution to the environment?
- Do consumers have advanced ecological conscience? How do they behave to the environment?
- What are the stages that a company has to pass through to design successfully its operations?

1.3 Contribution of research

This study will help establish a synergy between operation management and efficient production of sustainable package design products. Use of green recycled materials is especially paramount to the study as it will provide a means of saving the environment from the detrimental effects of toxic emissions and waste that typically destroy the ozone layer. The study will also provide an efficient means of enhancing production of package design products by integrating fundamental element of operation management and by focusing on consumer driven factors of production.

LITERATURE REVIEW

2.0 Overview

The current market environment is increasingly bombarded with new products that compete to attract consumers' attention (Pollard, Kirk, & Cade, 2012). According to Pollard, Kirk, and Cade, (2012), consumers are presently faced with over 20,000 product choices in an average thirty minute shopping period. With such heightened levels of product competition, packaging has increasingly become a viable option for organizations that focus on gaining a competitive edge over others in the market.

Fuller, (2014) contends that a comprehensive understanding of consumer buying process and the role of packaging in leveraging this process is crucial to the establishment of the right packaging (Roderick, 2011). A thorough understanding of the fundamental packaging elements that can enhance a product's competitive advantage and the factors that influence consumer buying behaviour are also crucial to the process of establishing the most appropriate packaging for a product (Murray & Delahunty, 2010).

The role of product packaging in the contemporary market environment cannot be overemphasized. Siegrist et al (2007) argue that packaging has become a viable sale promotion tool that is employed by organizations worldwide to gain a competitive advantage over rival organizations. The quality, wrapper, color, shape and other elements of packaging play a significant role in shaping consumer buying behaviour (Kamphuis, et al., 2006). In this regard, therefore packaging is viewed as the ultimate selling proposition, with the ability to stimulate consumers and enhance impulse buying behaviour. According to Roderick, (2011), packaging engenders consumer attention and directs it towards a particular brand to enhances its image, and stimulate customer's perception about the product. Packaging has also been found to enhance the distinctive value of a product (Pollard, Kirk, & Cade, 2012). Through the various packages assumed by different product producers, consumers can more easily compare and contrasts different products before selecting their preferable product. In this sense, packaging is deemed to contribute to consumer buying behavior (Roderick, 2011).

While previous studies have established a causal link between packaging design and consumer impulse buying (Siegrist et al 2007; Pollard, Kirk, & Cade, 2012), there is no agreement on how various elements of packaging contribute the classification of packaging materials (Murray & Delahunty, 2010). However, other researchers have delved into an examination of the fundamental elements of packaging and their effects on consumer buying decision (Pollard, Kirk, & Cade, 2012; (Raymond, 2009).

Other studies have also found that by carefully integrating key aspects of a product to packaging during its design phase, consumers are likely to be influenced to engage in impulse buying (Siegrist et al 2007; (Raymond, 2009). For example, a study by Heyde, and Kremer, (2009) found that some of the pertinent information valued by consumers include brand image,

effect of product on environment, side effects of the product on consumer, and brand attachment (Buchanan, 2011).

2.1. Elements of great package design

In a study on product packaging and consumer perception (Senauer, et al (2012) found that a well- designed package employed striking designs and messaging. The effect of striking designs and messaging was exemplified by the emotional response elicited from customer. Usually, such packaging involved use of graphics and clever copy in tandem with the aim of persuading users to notice the product and then move on to picking the product for a closer examination. The study further found that colorful illustrations, appropriate mix of bright colors with interesting copy as well as use of captivating layouts had immense influence on customers (Stickdorn, 2012).

Siracusa et al, (2008) observes that some of the vital ingredients of a well designed package include product differentiation, product usability and product design or form. The ability of a product to remain distinct from its competitors and other products is vital to increased sale of the product. They further contend that a key prerequisite for any prominent product packaging is the product's appearance. Consequently, the ability of a manufacturer to win the visual battle by compelling customers to take a closer look of a product is essential to the product's success. However, Buchanan, (2012) argues that visual looks entails more than simply using the most colorful design; the colors must be appealing and must of necessity complement the general appearance of the product. Visual looks can also be enhanced through incorporation of relevant and captivating imagery and through effective use of clear and legible writings that are easy to read (Roderick, 2011).

While visual looks may attract customers to a product (Packforsk, 2010), ultimately customers will be endeared and maintained through efficient functionality in packaging design (Buchanan, 2011). Roderick, (2011) argues that manufactures must be able to merge usability into design in order to elicit heightened user experience which will help in customer retention. He posits that some of the key considerations when merging usability into design include designing packages that are reusable, keeping the design and packaging simple, and taking into consideration product shape and size.

Senauer, et al (2012) undertook a study to determine packaging elements that endeared customers to a product. The study found that customers valued clear branding instilled with a specific message of the product from the manufacture. Respondents were of the view that clear branding could manifest through the language of the brand, logo placement and brand positioning. Brand language could be serious or fun-loving, depending on the target market.

Siracusa et al, (2008) contends that information is a fundamental element of a well designed package. The modern buyers thrive on information and therefore insist on knowing the ingredients of a product and where the product is made (Fuller, 2014). Other pertinent information sought for by health conscious customers include product side effects, nutritional information on consumable products, and warnings on cleaning or medication products. Product manufactures can capitalize on customer's information needs by placing any distinctive product information on a prominent location where it can easily be spotted by customers (Stickdorn, 2012).

2.2. Creative Design Elements

Buchanan, (2012) posits that creating elegant designs that enhance a product package require a comprehensive understanding of the product and consumer needs or expectations. Consequently, all designers must be conversant with the basic elements of any creative product design, which include line, color, shape, space, typography, dominance, balance, scale, texture and harmony (Kamphuis, et al (2006). This view is supported by Polaine, et al., (2013), who observe that color and lines are most basic to all creative package design since lines divide space and direct focus to a specific location while colors help to establish the mood within a piece and in the process tell a story. The import of color also stems from the fact that it can be applied alone or used with other creative elements of package design such as texture, topography, shapes, and lines.

Shapes integrate lines and color and are essentially defined by boundaries. In creating designs shapes tend to emphasize the package, hence the need for creative designers to discern how the other elements can combine to create shapes that are both attractive and meaningful (Green, & Helsen, 2014). The significance of space as an element of creative design has been examined by (Roderick, 2011) who contends that while positive space is common in most

creative designs, negative space ranks as the most commonly misunderstood and underutilized element of creative design in packaging. The overall image in any creative packaging design is established when both positive and negative space are used in tandem to create a meaning.

Texture is a significant component of creative design as it helps to create an immersive world that is defined by three dimensional appearances (Stickdorn, 2012). Packforsk, (2010) observes that it is counter- intuitive to think of texture when a product is not going to be touched by consumers. This underscores the value of texture as an aspect of impression formation. Texture is complemented by typography, which embodies the fonts used to communicate a message. While word usage is essential in conveying a product message, the manner of conveying such message is even more crucial as a component of packaging. Typography, which addresses the style of writing, is thus important in packaging design (Joo et al., 2011).

The scale and size of the object to be packaged, as well as the shape, type and other elements of the object are equally important in creative designing. While symmetrical shapes with similarly sized shapes would appear dull and boring, the level of variation should be premised on the packaging content. Green, and Helsen, 2014) argue that professional packaging content would benefit from subtle variation in scale while bold differences are preferable in creative enterprises. All the various elements of creative design package should be synchronized to work in harmony. Heyde, and Kremer, (2009) observe that harmony is the ultimate objective of creative design and involves ensuring that all elements accord with one another.

2.3 Operations management

Operations management is both an art and a science. It entails the "study of concepts, procedures, and technologies used by managers, administrators and employees in the operation of all organizations" (Senauer, et al 2012 p. 121) . Siracusa et al, (2008) observe that the cardinal reason for the existence of operations management is to promote organizational activities that elicit value to the organization through efficient management of human resource, systems resources and technology. Some of the fundamental activities of operational management include: planning, control, organizing, directing or leading, staffing and motivation (Joo et al., 2011).The dynamic nature of today's global environment has made it necessary for organizations to be efficient in managing service projects. This sudden demand is partly fueled by vibrant

changes in the business arena and by the unpredictable relationships stemming from the various entities in most organizations (Siracusa et al, 2008).

2.3.1. Categories of operations management

Various categories of operations management exist, ranging from type of human resource, nature of equipment used and the product size (Kamphuis, et al 2006; Fuller, 2014). Since this study involves packaging and use of eco-friendly recyclable material, greater focus will center on classification criteria of business operations in accordance with the final output or product, in this case either goods or services. According to the new classification system, operations are of two major types: manufacturing systems and service systems (Green, & Helsen, 2014).

2.3.2. Manufacturing systems

Manufacturing involves the conversion of raw materials into a range of new products in line with customer demands (Pollard, Kirk, & Cade, 2012). The output or final products from any transformation due to manufacturing systems is usually products or tangible goods such as automobiles, food products, textile products, glasses etc (Raymond, 2009).

2.3.3 Service systems

Buchanan, (2012) has defined service as any activity that assumes a more or less intangible form. The intangible nature of such activities can be exemplified through interactions between customers or clients and service providers, with a view to solving the customer's needs. Service constitutes both experience as well as the outcome. The experience and outcome comprise a service package or product (Heyde, and Kremer, 2009). In most instances the output of service systems is manifested in products or service packages such as transportation, healthcare, travel agency and hotel lodging (Siracusa et al, 2008).

Raymond, (2009) contends that there are no obvious differences between manufacturing and service systems since the transition typically occur gradually (Siegrist et al 2007; Packforsk, 2010). This study will focus on designing an operations system that lays greater emphasis on both manufacturing and service systems. It will analyze the various categories of variability that

may impact on the success of operations in a packaging industry. Greater attention will be given to the planning and control activities for a variety of project sizes.

2.3.4. Planning and control

The main objective of planning and control is to put in place clear strategies or steps aimed at transforming the inputs into outputs that match the demand. Inputs will be derived from customer needs and specifications.

2.3.5. Planning process and categories

Planning has been defined as the process of goal setting, that involves a justification for the goals selected and the incorporation of activities aimed at implementing the chosen goals taking into consideration the costs, schedule of completion and other pertinent factors that can potential impact on the execution of such goals ((Raymond, 2009; Senauer, et al 2012). Most organizations employ three main types of planning depending on the time frame of activities (Kamphuis, et al 2006; Hair, et al., 2008; (Murray & Delahunty, 2010).

Strategic planning: this is mainly a top management activity and typically involves formulation of long term organizational goals

Tactical planning: this is usually undertaken by the middle level management and typically involves formulation of medium term activities (Raymond, 2009).

Operational planning: this is often undertaken by middle or lower level management and typically focuses on short-term objectives of an organization such as daily activities (Ragaert, et al., 2014).

2.3.6. Planning process

According to Murray & Delahunty, (2010) the planning process entails three fundamental steps:

Formulation: this phase involves preparation of a draft plan that contains a number of proposed goals or objectives.

Review: this phase aims to ensure that there is best possible allocation of information resources, with a greater emphasis on objectives that are in accordance with an organization's long term goals.

Tracking: this phase involves actively monitoring key performance indicators (KPI) that have been identified by an organization, to ascertain whether the KPI are in line with agreed-upon objectives (Green, & Helsen, 2014).

2.3.7. Control process and Categories

Control refers to the process of guiding organizational systems towards certain predefined or pre-established standards by comparing actual performance with the planned benchmarks (Joo et al., 2011). Ragaert, et al., (2014) posit that control involves rigorous activities aimed at managing resources such as personnel, tools and equipment, with the continuous comparison to the benchmarked performance and effecting corrective action where deviation is evidenced in order to ensure that projects achieve the set objectives.

Control activities have been categorized into four types:

Output: this includes activities such as schedule, functionality and budget.

Behavioural: includes activities such as formal process and plans

Clan: includes informal communication, exchange developer and site visits

Input control: includes activities such as team selection, and selection of project manager.

Planning and control are both integral to operational management and essentially inseparable (Fuller, 2014). They involve aligning customer need to an organizations operational capacity (Fuller, 2014). Planning and control activities are therefore appropriate means of ascertaining an organization's level of commitment to operational activities and the subsequent anticipated success from such activities (Hair, et al., 2008).

2.4 Consumer Behavior Analysis

Consumer behaviour analysis is premised on customer buying behaviour and essentially views a consumer from three different perspectives: as a buyer, user and payer (Raymond, 2009). Relationship marketing is equally a vital element that fosters a better understanding of the true meaning marketing through re-affirmation of the key role performed by buyer or customer (Packforsk, 2010). Equally vital to the process of consumer behaviour is a better understanding of the pertinent factors such as personalization, customer relationship management, customization, customer retention and one-to-one marketing (Siegrist et al 2007).

Consumer behaviour analysis is usually facilitated by information left by customers when they visit websites. Such information provides crucial leads concerning the customer's behaviour and ultimately enhances business performance through an understanding of the past, present customers. From the customer behaviour trend in the past and future, information can also be used to speculate on the anticipated buying behaviour of future customers (Mahalik, & Nambiar, 2010). It is thus imperative that researchers mine substantial databases of customer behaviour information in order to gain an in-depth understanding of customer's historic behaviour and use such information to forecast on the anticipated behaviour of future customers (Pollard, Kirk, & Cade, 2012). Raymond, (2009) in his analysis of business websites concluded that a comprehensive analysis of consumer behaviour is also vital for businesses that publish information on websites as such information can enable websites to tailor revise and improve their websites in line with customer's expectations and thus increase the return on investment as well as its profits. Siegrist et al (2007) in their analysis of various strategies employed in consumer behaviour analysis found that most successful organizations utilized two main strategies: behavioural segmentation and customer-focused marketing.

2.4.1. Behavioural segmentation

Behavioural segmentation is a strategy that focuses on dividing consumer markets in accordance with the prevalent behavioural patterns. This strategy is instrumental in acquisition and retention of potentially lucrative customers, who are bound to help organizations realize profits (Hair, et al., 2008). Joo et al., (2011) conducted a study to establish the fundamental gains of performing behavioural segmentation in organizational websites. The study found that some

of the benefits attributed to behavioural segmentation include: enhancement of actionable business intelligence and influencing meaningful insights at reasonable costs; the possibility of developing highly targeted and cost effective marketing campaigns and the precise identification of the best point of contact establishing credible and potentially rewarding dialogue.

Another related study aimed at establishing the value of business websites as a potential source of information for consumer behaviour analysis found that business websites were regarded as the best platform for the accurate identification of potentially profitable future consumer and a credible avenue for establishing credible and potentially rewarding dialogue between the organization and the consumer (Heyde, and Kremer, 2009).

Murray & Delahunty, (2010) also observe that by conducting a thorough consumer behaviour analysis, organizations can better understand their customer's need and know who their customers are. Such knowledge can significantly help in avoiding needless costs that are often incurred in the process of undertaking advertising and marketing campaigns which target wrong customers. Other equally important benefits of consumer behaviour analysis include the fact that it helps to ascertain loyalty of customers to a business organization (Packforsk, 2010). Loyalty is a crucial factor in business success, given that customer retention reduces the needless costs associate with attracting new customers through marketing strategies and advertising. Loyal customers are also deemed to understand a product in a better way that than new consumers, and they are thus better placed to provide viable information that can assist in creating innovative products or services (Raymond, 2009). Lastly, behavioural segmentation is also premised on the notion that a better understanding of an organization's clients' is an effective way of ensuring that the organization stays ahead of the competition (Ragaert, et al., 2014). Information obtained from customers in the course of performing consumer behavioural analysis can also be used to understand what is working on business websites and what is not (Green, & Helsen, 2014).

2.4.2. Customer-focused marketing

Customer-focused marketing is founded on the premise that all forms of marketing are tailored towards the fulfillment of a customer's needs and expectations. It is therefore plausible to surmise that the effective understanding of a customer and the subsequent fulfillment of their

need is founded upon the establishment of a relationship with customer based on an in-depth understanding of their product or service needs.

Ragaert, et al., 2014) have classified customer-focused marketing strategies into three major categories:

a. Marketing as a conversation:

This strategy involves establishing direct interaction with customer with a view to understanding what they need and how their needs can be fulfilled (Sanders and Piter 2013). The strategy entails a four step process: action-reaction-feedback-repeat (Pollard, Kirk, & Cade, 2012).The emphasis on conversation is grounded in the fact that customers can lead organizations to produce only what is relevant and likely to increase profits by addressing particular need and expectations of customers (Hair, et al., 2008). In order to enhance conversation and increase profits Buchanan, (2012) advocates that frequent marketing promotions are equally an important avenue of communicating with customer s and understanding their needs. Conversation through marketing has also been seen as the most appropriate avenue of satisfying customers, increasing chances of their retention and fostering customer loyalty (Mahalik, & Nambiar, 2010).

b. Active customer

This is a strategy that focuses on making customers feel in control of the marketing situation and its dynamics (Murray & Delahunty, 2010). Ordinary customers are transformed into active buyers or customers who are capable of making wide and far reaching choices for themselves by actively participating in market initiatives such as promotions. Through such participation, customers are enlightened about the best products and services on offer and which their money can afford. Such interaction is also vital given that it enhances customer retention which in turn leads to customer loyalty (Joo et al., 2011). It can thus be surmised that retention of customers implies keeping them delighted by ensuring that they remain active and enthused by an organization’s products (Siegrist et al 2007).

c. Determination of future customer behaviour

According to Ragaert, et al., (2014) determination of a consumer's future behaviour is done through a comprehensive analysis of the actual behaviours exhibited by past and current consumers of a product. They note that consumer's actual behaviour is distinct from demographic behaviours which typically define implied consumer characteristics. Actual consumer behaviour is particularly important when collected on an organizations website, given that such a platform readily provides avenues for observing consumer behaviour in regard to online purchase and the nature of product purchased over the internet (Raymond, 2009). Summary data can easily be generated and used to indicate the purchasing trends of consumers and to make projections on expected buying behaviour of consumers (Siegrist et al 2007).

d. Resource allocation for marketing

Resource budgetary allocation is a fundamental component of any successful organization (Hair, et al., 2008). Consequently, organizations involved in allocating resources for marketing promotions usually factor in the budgetary concerns. The essence of this pragmatic approach is to ensure that marketing activities are allocated resources in line with the anticipated profit margins. Through customer interaction with an organization, credible data that is reflective of the actual consumer demands can be created and used as a viable source that informs budgetary allocation. In this sense, effective marketing implies avoiding any unprofitable ventures or promotional activities, which will only lead to resource misuse (Sanders and Piter 2013).

2.5. Service Design

The importance of having a well coordinated service design has been underscored by Polaine et al (2013) who point out that services are essentially about interactions with other people, their behaviors and motivations. Using the example of an empty seat in a passenger train, which they contend has no value, Polein et al, (2013) posit that value is only conferred on a service when it is utilized. Raymond, (2009) has incorporated a different view of service design by arguing that service embodies a series of close-nit interactions between consumers and service systems availed through a variety of touch points in the course of a customer's journey. In this case, services are basically activities undertaken by other people for satisfaction, utility and support of other individuals (Buchanan, 2012). The concept of design and its juxtaposition

with services has been explored by various researchers (Mahalik, & Nambiar, 2010; (Buchanan, 2012). Buchanan, 2012) examines the traditional ramifications of the concept of design and notes that design has been explored widely in four broad avenues: design of material object, design of visual and symbolic communication, design of complex environments or systems for working, living, learning or playing, and the design of organized services and activities.

Polaine, et al., (2013) examines the contemporary application of the notion of design taking into consideration the fundamental change in scope that currently goes beyond designing of artifacts. They argue that the current scope of design encompasses user experience with specific emphasis on whether they use services, products, spaces or a combination of all of them. Moreover, design also extends to the processes and systems that undergird user experiences (Siegrist et al 2007). Finally, the contemporary view of design identifies the notion as an organizational or business driver that should be incorporated upfront in projects (Ragaert, et al., 2014).

The contemporary business environment is saturated with fields of design that have conveniently integrated the service design approach. These fields include: graphic design product design, interaction design, strategic management, design ethnography, operations management, and social design (Murray & Delahunty, 2010).

The import of implementing a service design approach in a packaging industry stems from the positive findings from previous studies, which have shown that organizations with well coordinated and efficiently run service design sectors tend to register significant growth and success (Heyde, and Kremer, 2009; Sanders and Piter 2013; Green, & Helsen, 2014). For example, according to a Factfinder Report of 2007 by Design Council of United Kingdom, design-led businesses performed better than FTSE 100 by over 200 percent in the past decade (Murray & Delahunty, 2010).

2.5.1. Creating sustainable service design

Raymond, (2009) argues that strategic service designed geared towards sustainability should be exemplified in the development of sustainable services, communication and products. This view is shared by Packforsk, (2010) who states that an assimilated service design that captures

various strategies need to effects systems of services, products and communication that is coherent and in tandem with the prevailing perspectives of sustainability. At the same time, the assimilated service design should also be socially appreciable and economically feasible. Joo et al., (2011) in an elaboration of the concept of assimilated service design, proposed a toolkit that can be adopted by organizations that are keen on implementing sustainable service design. The sustainable service design toolkit essentially advocates a four phased process for implementing sustainable service design: opening phase, which contains presentation and briefing; Exploring phase 1, involves presentation, brainstorming 1 and group discussion; Exploring phase 2, which entails presentation, brainstorming 1 and group discussion; and, Closing phase, which finalizes with group discussion and evaluation of the design (Kamphuis, et al., 2006).

2.5.2. Service design methods and Tools

A number of service design frameworks have been proposed by researchers but most of them seem to concur that service design is a nonlinear and iterative process. Fuller, (2014) proposes that a fundamental strategy for structuring intricate service design process entails a four step procedure of exploration, creation, reflection and implementation. The same views are shared by the British Design Council who employs different wordings to refer to the four step process but nonetheless maintain the description of each step. According to the British Design Council, the four main steps involved in service design are: Discover, Define, Develop and Deliver (Buchanan, 2011).

Other relatively complex frameworks incorporate several stages, each with an elaborate process. For instance, the Development Impact and You toolkit (DIYtoolkit), has eight main steps: Look ahead, develop a clear plan, clarify my priorities, collect input from others, know the people I'm working with, generate new ideas, test and improve, Sustain and implement. DIYtoolkit has specifically been tailored to help development practitioners adopt, invent and adapt innovative ideas that can guarantee better results.

The analytical tools of sustainable service design provide a framework for understanding the iterative nature of service design and basically serve to entrench the notion that service is

never fully actualized in functioning organization and that the design process is continuously under implementation (Sanders and Piter 2013).

DATA FINDINGS AND ANALYSIS

This section will use information collected from a prototype organization dubbed Gilroy packaging design company to demonstrate the efficacy of utilizing operational management principles to enhance packaging design. Particular emphasis will be placed on utilization of green recycled materials in the packaging design process.

3.1 Findings on consumers' preferences concerning the packaging elements that capture their attention

The study findings reveal that Gilroy packaging design company was established with a focus on quality of packaging design products and emphasis on quality. The company policy clearly accentuated the inherent value of quality packaging to ensure that it forms a benchmark for assessing packaging products which are designed and released by the company. Consistent with previous literature, Quality is fundamentally linked to the pursuit of continuous product development and improvement and is one effective strategy of satisfying customers (Kirk, & Cade, 2012). Therefore, in order to create sustainable quality enhancement in the design of product packages, Gilroy Company pursues excellence in operational modes. This entails implementing ethical management principles through effective product leadership.

The management of Gilroy Company reiterated that customers valued product quality and so their role was to strive to ensure successful delivery of quality packaging design products to customers. In order to entrench their position and mandate in the overall success of the company the management employed quality management strategies, through close monitoring of processes to ensure the output was consistent with the established benchmarks. The management also ensured that employees working in various product stations and operational units were sensitized on the importance of quality enhancement in order to enforce the notion of quality and ensure that all the employees individualized it.

3.1.2. Alignment of product design to customers' needs

The study also found that customer preferred products that matched their needs. Gilroy Company attributed its success to matching of design elements to customers' needs and preferences. The company focused on ensuring that product designs were aligned to customers' specific needs, for example, by matching packaging designs to the lifestyle of intended customers (target group). Appropriate use of technology bolstered effective design of packaging materials and played an instrumental role in the success of research and development initiatives in the company. One prominent feature of technology that enhanced efficiency of the packaging design process was automation. Since the automation process is inherent in modern technological systems (Green, & Helsen, 2014), it produced sustainability benefits that increased operations at Gilroy Company. For instance, Gilroy Company utilized heated glue pots, which are typically used in hot-melt adhesive dispensing apparatus to facilitate the packaging design process. The heated glue pots are usually energy-intensive hence, energy-intensive subsystems had to be equipped with sensors and timers to reduce fuel wastage and enhance efficient use of energy.

3.1.3 Findings on stages that a company has to pass through to design successfully its operations

The study found that organizations pass through various stages as part of successful product design process. As a component of the operation decision management, supply chain management was crucial to the success of packaging design at Gilroy. In this regard, the company's management and staff promoted close cooperation with suppliers and customers. The supply chain management being a vital operational area also helped the company to attain a competitive advantage over other rival companies. Gilroy Company will promote diversity in the supply chain by striving to incorporate supply companies owned by women and minorities. This was enhanced through inclusion of all suppliers from around the globe. Additionally, the supply chain of Gilroy Company involved direct sourcing of packaging design components, parts, contract manufacturing, as well as research and development. The supply chain also included indirect sourcing of services and office equipment.

3.1.4 Training and provision of other support services to suppliers

Gilroy Company also offered support to potential suppliers in order to ensure that they meet supplier requirement standards. The support services included provision of training on the company' s expectations, effective management of work conditions and management of environmental activities that provide an enabling atmosphere for successful cooperation and compliance with the set standards of Gilroy company.

3.2. Monitoring

As part of the operational management initiatives, Gilroy Company was involved in conducting periodic follow up assessments to establish whether the supplier organizations that had been selected complied with the stipulated requirements. The assessments were undertaken by trained Gilroy's employees and the results emerging from such assessments were communicated to various suppliers to ensure that they took any appropriate action as needed. Additionally, trained Gilroy's employees were involved in undertaking intensive assessments of labour conditions 5- 8 times in a year and motivated supplier companies to conduct self evaluation to reduce chances of gross anomalies which were likely to stem from lack of internal oversight.

3.2.1 Integration of industrial perspective in the examination of supply chain issues

The study found that while Gilroy Company strives to become a market leader in the design of packaging products, it was still cooperating with other market players in order to enhance the efficiency of operations. One strategy of enhancing efficacy of operation involved joining the Global e-Sustainability Initiative Supply Chain. Such a move ensured that the company maintained its viable strategy of using only green recycled materials for product packaging. Membership with the Global e-Sustainability Initiative Supply Chain also ensured that the company developed appropriate tools for effective delivery of products and services as well as the development of systems, processes and management practices that will help members to handle supply chain issues.

3.2.2 Substance management

As part of the process of fostering product sustainability, Gilroy Company also put in place mechanisms for monitoring all components delivered by various suppliers to ensure that

they did not fall in the broader category of items that have been restricted, banned or targeted for reduction in order to eliminate usage due to the threat posed by such items to the environment. As a mandatory requirement, Gilroy Company also put in place regulations that required all suppliers of its products to provide comprehensive lists of raw materials that constitute the final products supplied. Where necessary, the suppliers were also required to provide the Gilroy Company with end-of-life treatment strategies.

3.3 Human Resource Job Design

The study also found that as part of the process of effective management, Gilroy Company employed a diversified work force, which included fulltime, part-time and employees on contractual terms of employment. Due to the different needs and expectations of this workforce, the management of Gilroy Company ensured that they perform their duties in flexible working conditions such as teleworking or discharging their duties from remote working environment. This was intended to bolster employee morale and increase work performance. In addition, as part of the process of enhancing employee productivity, the management of Gilroy Company sensitized all employees to embrace various development opportunities. The company put in place attractive bonus systems and incentives that were aimed at rewarding innovativeness and motivating employees to enhance their work performance.

3.4. Location

Location was another viable area of operation management decision and it included Gilroy's location and the location of other companies. The operational management strategy entailed locating various centers of research in technologically developed nations. Gilroy also fostered close cooperation with companies in various locations in order to gain significant access to new markets in various territories.

3.5 findings on technology use and implication on production

Another strategy involves using design machines to enhance the packaging design process. The study found that use of technology was more feasible due to the minimum errors attributed to the process. Technology was also found to save time and address consistency issues

through uniformity of packaging designs. Therefore, Gilroy Company largely enhanced the production process by incorporating technology to quicken packaging design process. However, in order to ensure that package design products conformed to production benchmarks in the organization, there were various personnel assigned in every critical area of production to monitor the output and ensure that the products conformed to the expected standards.

According to the study findings, the ultimate objective of operational management at Gilroy was to increase production output, enhance the quality of production and reduce the operational costs. Realization of these cardinal objectives was possible when optimum and correct processes were selected and the processes were laid out in the most efficient manner. The management of Gilroy therefore, employed the critical path method to map individual activities in the packaging design process and to depict the flow of raw materials and finished products in the multi-step production process. The critical Path method helped convey vital information concerning each activity, including issues such as the longest and shortest possible completion times, the appropriate input for each segment of the process, the labour requirements and the anticipated outputs. Consequently, through the effective use of the critical path method as a process selection strategy, the management of Gilroy better understand non-value adding activities, slack time, and available opportunities that could be utilized to streamline packaging design production process.

The packaging design industry is a dynamic sector with immense competition (Roderick, 2011). This was found to have significant implication on Gilroy's operational strategy, since there was no need for the company to implement processing strategies that aligned with the prevailing market trends and at the same time those that featured unique characteristics that would have established a competitive advantage in the company. The rapid introduction of new technologies, cutting edge products and new solutions in the modern market environment also implied that Gilroy Company would need to be flexible in approach and adapt swiftly to such changes in the market environment. The process of adapting would be enhanced by incorporating new technologies in all the vital production processes.

The study further found that Gilroy Company enhanced its operations by utilizing the global manufacturing network, which provided the company with timely feedback on market

changes and facilitated quick response to various demands and technological changes. The integration of suppliers from various parts of the world also optimized resource utilization since the suppliers were better placed to introduce pertinent changes to raw materials for packaging design.

3.6. Successful packaging elements in organization

Studies indicate that the estimated lifecycle of a unique packaging design product is relatively short- lasting about 2 years (Kirk, & Cade, 2012). One calendar year may also be characterized by a massive introduction of various new packaging design products (Kirk, & Cade, 2012). In order to address problems that might be occasioned by rapid progress and shift in demand for packaging design product, the company scheduled production of various lines of production to run concurrent with research and design processes focusing on new products. Scheduling of operational activities and taking appropriate interventions in anticipation of new activities thus served as an essential operation management strategy.

3.7 Findings on Inventory Management and maintenance at Gilroy

3.7.1 Inventory management

The optimization of inventory levels was found to constitute a key operational management decision. The optimization process took into consideration suppliers' input in the package design product development process. This not only minimized wastage of resources, but also enhance the process of customer needs assessment to bolster the efficiency of future production. The efficient management of packaging design inventories was also enhanced through diversification of supplier location. Moreover, since a key operational strategy of Gilroy involved establishing its inventory of packaging design products based on demand, the management also had to ensure that minimum levels of inventory were maintained.

3.7.2 Maintenance

In regard to inventory maintenance, the study established that Gilroy Company ensured that employees were provided with relevant training and developmental needs to meet the

demands of their different specialties and to help the company gain competitive advantage in the package design production industry. Additionally, the company closely monitored emerging trends and technologies in order to ensure that staffs were always abreast with the latest technologies in the market.

3.8. Findings on facility layout as an element of successful design operation

In designing the facility layout of Gilroy Company a range of factors were taken into consideration including the anticipated total capacity or size of the infrastructure, the enclosure or field within which the building was established as well as other internal spacing considerations. Furthermore, in order to enhance efficiency of production, Gilroy adopted a facility layout that emphasized optimum traveling or holding time of goods that were in a semi finished state. This implies that the distance between one processing station or division and another was either be reduced or facilitated with technological equipment such as conveyance belts to facilitate speedy delivery of semi-finished products to other processing divisions.

Another integral component of the facility layout involved eliminating all unnecessary form of noise and air pollution. The study established that noise and air pollution could hamper the production processes by making the environment uncomfortable for working. In order to address the challenges inherent in a stuffy working environment and noise pollution, one strategy that Gilroy used involve locating work stations that require intensive labour input far from work stations that have noisy machinery that were performing automated process. Other vital equipment were also be spread out to ensure that a safe work environment was maintained. Employees were likely to be more productive in a safe and well spread work environment due to the health benefits that such an environment presented.

The layout of the facility also took into consideration installation of sufficient lighting sources, which served number of functions including: facilitating the process of monitoring areas that cannot effectively be illuminated with the natural light; deterring intruders from accessing vital areas and the general facility compound. The lighting sources also enabled

employees working within various product divisions to accurately assess production output processes.

Another critical element of the facility layout that was taken into consideration concerned integration of safety and security elements in the facility layout in order to prevent loss of property or injury to the work force. In this regard, the Gilroy incorporated certain key components of crime prevention, namely: natural access control, natural territorial reinforcement and natural surveillance into its design layout to enhance security and safety of assets and personnel. As part of the process of implementing the concept of natural access control, the company will include in its design facility layout manned entry and exit points. All employees, visitors, suppliers and other personnel accessing the building were checked on a routine basis. In addition, various personnel accessing the building were required to wear special badges that identified whether they were employees, visitors, or suppliers or customers.

The facility layout also integrated the concept of natural territorial reinforcement by designating appropriate areas for different persons accessing the building. For example, visitors such as customers had specific packing lots, waiting bays and service areas, while employees had wider access to other areas of the facility such as different work stations and offices. The company instituted rules and procedures, which regulated entry to high risk and sensitive areas. Natural territorial reinforcement was enforced in some locations within the facility by using cautionary words such as "No unauthorized personnel allowed beyond this point".

The company also implemented the concept of natural surveillance by ensuring that obstructions that could potentially prevent a clear view of the facility environment were reduced as much as possible. Barriers in the work station that might have been used for hiding by intruders were also eliminated. The removal of unnecessary barriers in the work station also facilitated speedy movement of packaging design products and eliminating cases of occupational injury by employees.

In addition to ensuring that the safety and security of people in the facility was taken into consideration, the site or premises was also constructed, designed and maintained in a manner

that would control risks engendered by obstacles. Particular emphasis was placed on risks that were related to factory design of packaging products and product flow issues .

3.8.1 Environmental conditions and Hygiene status

Hygiene was embraced as part of daily operational practice in the organization. Three forms of hygiene status of packaging products were considered in relation to the environment: Good manufacturing practice; High Risk areas and, High Care Area. Additionally, the company emphasized on use of operational processes that were cognizant of the imminent risk posed by the environment and any associated controls within the organization. In this regard, all the control mechanism and environmental factors were tailored in accordance with packaging product risks.

High risk area: A physically segregated area with flammable agents was considered high risk due the potential for ignition and its remote location. All frequent practices or activities relating to personnel, packaging environment, equipment, and ingredients were minimized in high risk areas to forestall any destruction or pollution of packaged products in such areas.

High Care Area: High care areas constituted areas where designed package products were stored as they await transportation out of the industry. The design of a high care area focused on ensuring that all practices or activities relating to personnel, packaging environment, equipment, and ingredients were put in place to minimize any destruction or pollution of packaged products that underwent designing.

Good manufacturing and design practices area: This area included regular working areas and packaging section of the industry. The section was designed with due consideration to the fundamental hygienic conditions required of areas that involve human interaction with design and packaging products.

3.8.2 Product Flow

The design of product lines and flow of packaging products took a linear flow from the moment the raw materials were introduced to the facility to the moment a finished packaging product was

manufactured. There was an appropriate level of segregation integrated for high risk and high care packaging design products within the linear flow process.

In addition, an open plan design, which involved physically partitioning some premises, was introduced with a view to segregating pertinent organizational activities and employees. The segregation was bolstered by having an actual plan of the facility as well as different production lines. The plan served as an appropriate tool for review and confirmation of the manner in which segregation had been done and in particular with regard to the airflow and utilities provision, personnel, waste, equipment provision and the nature of materials used for packaging design. The facility design plan also took into consideration employee movement from the entrance to the facility, to their area of work and any other movement that the employees were likely to undertake while in the facility. In the event a packaging product was transferred from a low risk area to a high risk area, due measures were taken to ensure that appropriate procedures and practices were effected to minimize any risk of destruction.

3.8.3. Premise design

In designing relevant and important features of Gilroy premises, attention was devoted to drainage, building fabrication, staff facilities, waste disposal, and temperature controlled areas. The temperature controlled areas included utilities such as water and steam, employee hand washing facilities, and atmospheric controlled regions in the facility.

Additionally, since the facility was meant for design of packaging products, the building fabrication involved toughened materials such as tampered glass and concrete materials to withstand security breaches such as intrusion while at the same time allowing natural surveillance by the employees in the organization. The waste disposal mechanism were located in areas that were not frequently used or occupied by staff in order to prevent any risk of toxic chemical inhalation.

3.8.4 Premise construction

The structures which contained packaged products were built using durable materials that were not only easy to maintain, but which could also be cleaned and disinfected effectively. In

particular, some of the fundamental conditions that were addressed in order to guarantee both the safety of personnel as well as the security of other assets in the facility include proper installation of ceilings and overhead fixtures, secure doors with effective locking mechanisms, floors, windows, surface of walls, working surfaces and partitions.

The working surfaces were sealed to ensure that they were smooth, easily washable and impervious. The surface was also made safe for movement through elimination of all forms of cracks and damages. Use of guard rails, sealing of junctions and integration of services such as ducting passing through ceilings and walls also strengthened vulnerable surfaces and ensured that the construction process took into consideration the rigors inherent in packaging design and production processes.

3.8.5. Floor plan and drainage

Other pertinent considerations in the premise construction phase of the design process included floors that were resistant to chemical materials and impervious to moisture. The floors were also designed in a way that ensured they slope towards drainage routes. This reduce any possibilities of water retention and the existence of static water pools. Another vital component of drainage mechanism involved ensuring that drains were designed to flow from areas considered high risk to low risk regions to avoid possibility of experiencing backflow.

3.8.6 Window installation

The study findings also revealed that window installation was properly done in the company. There was an effective screening that ensured that externally opening windows , which were near packaging areas did not allow entry by unauthorized persons and ingression of insects and other animals that could interfere with operational activities in the facility. In particular, no glass material was utilized in sensitive or high risk production areas. Where glasses were used, efforts was made to ensure that they were shatterproof or they were effectively coated with reinforced film. This ensured that there was a balance between the surveillance objective of facility design and the safety element of using materials that do not pose threat of breakage and injuries.

3.8.7. Door installation

The installation of doors will took into consideration factors such as maintenance, location, nature of door and the condition. Doors that open directly to the production area were limited as much as possible, given that they presented a high risk of asset loss or opportunities for unauthorized entry. In few instances where such doors existed, they were screened or equipped with self closing mechanism. Another important consideration that was taken in regard to doors involved ensuring that the materials used in making the doors could easily be cleaned and maintained. This did not only guarantee maintenance of proper hygiene standards by the organization but helped address other pertinent security concerns.

3.8.7 Equipment Location

The placement of equipment and other assets that were used for operational purposes at Gilroy was done with safety as the principal consideration. Any equipment that was likely to pose risk as an obstacle to facility users and employees moving with packing design products from one work station to another was removed and relocated to areas where such risk was minimized. The placement of equipment also took into consideration other factors such as convenience and ease of use. Specifically, plant equipment that facilitate production of goods in different work stations were located in way that guarantee smooth flow of processes from one area of activity to the next.

Other factors that were taken into consideration during placement of equipment include the ability to allow for cleaning and dismantling so that functional parts could be assessed, cleaned or disinfected when appropriate. A separate location or room was also created for storage of redundant equipment. This helped avoid storages in production area where redundant equipment would have presented risk of contamination, injury or obstruction of free movement within the facility. Other vital factors that were taken into consideration during equipment placement include positioning for ease of access during inspection, cleaning and regular servicing of equipment components or parts.

3.8.8.Working surfaces

The choice of surface material took into consideration factors such as non-corrodibility and easily cleaned surface material. The surface was also made impervious to water or other

soluble agents. In addition, effort was taken to ensure that the surfaces were not coated or painted with materials which was likely to degrade quickly or present any risk of physical hazard to employees or other users of the facility.

3.8.9. Equipment design

An important factor that was taken into consideration during equipment design was its usage. Regulations were put in place to ensure that equipments were only used for the intended purpose. Moreover, prior to usage, all equipments were commissioned and a comprehensive review of the Hazard Analysis and Critical Control Point (HACCP) plan done to ascertain any changes that could impact on efficacy of their use. Other pertinent factors that were taken into consideration when designing equipment include minimization of risk presented by microbiological contamination by ensuring that the equipments had good surfaces that were accessible for cleaning and removal of residual material. Use of materials that were corrosion free was also fostered to avoid painting of certain plant materials that could interfere with quality of design packaging products. In order to enhance the longevity of equipment usage, the moving parts were e lubricated regularly.

Drainage issues were also addressed by ensuring that all equipment could freely be drained and that there were no glaring issues of stagnant regions. This bolstered longevity of equipment and their components. The equipment were also designed to endure hosing and alkaline washing solutions. In order to ensure the safety of facility users, the management had to ensure that all equipment, which require assembling prior to commissioning, were assembled as far as was feasible outside the facility production area.

3.9 Planning of Production process

Planning of production process is integral to design operations as it enables production of high quality products at a relatively lower cost. Therefore, it was imperative that before the management of Gilroy embarked on other operational procedures, all plans were codified and reviewed regularly to leverage or minimize costs of production. To realize the planning goal, the management of Gilroy had to identify and categorically specify all the crucial processing steps that would contribute to transformation of materials and their components to finished products as

planned. The process of organizing or planning of the steps was also undertaken in a systematic and appropriate fashion in order to eliminate any possibilities of labour duplication or needless handling of raw materials or their components.

It was also vital to ensure that the plan guaranteed a steady or consistent and even flow of package design products through various phases of the production process. At the core of planning process was the need to ensure that materials, assemblies and subassemblies did not pile up unnecessarily between steps. Workers were preoccupied to avoid instances where they were kept waiting for various raw materials or finished products. One strategy that was utilized to address such issues entailed elimination of incoming and finished goods inventory in order to enhance efficiency and reduce costs. The concept of Just-in-time (JIT) enhanced flexibility in planning for production process and guaranteed that changes to the process were considered and implemented where there was need to enhance efficiency.

3.9.1 Specification of production steps

The study also established that before the management of Gilroy undertook any production, it began by identifying and specifying the finished product. This involved implementing a plan , which comprised a series of precise appearance, tolerance, measurements of the finished packaging product as well as all the subassemblies and every component that would be purchased to facilitate completion of the packaging product. Moreover, in order to establish the feasibility of production during the initial testing, the management of Gilroy often conducted a “pilot run”. The pilot run provided an avenue for correcting any production errors and ensured that the product was producible.

Once the production feasibility of all materials and their components had been ascertained, a comprehensive documentation of each production process was undertaken. The documentation provided for:

- The operation number assigned to a specific process in view of the overall production process.

- A comprehensive illustration of actual processing expected of each production step, a description of the required gauge settings and the machinery to be utilized in production
- A plan of the finalized production clearly indicating the product assembly or components after the completion of every process step.
- A comprehensive identification of the components and raw materials that will be utilized in the production process
- The ascription of a part number to a completed assembly.

3.10 Sequencing of Processing Phases

Sequencing of processing phases were integrated and constantly monitored, as a final process aimed at ensuring that the operational procedures worked effectively, In order to prevent possibilities of duplicating steps in various stages of production, all raw materials and components were processed early in the production process. The processing was undertaken before any assembly was completed. Similarly, subassemblies were also conducted early in the production process to ensure that all necessary operations were undertaken on subassemblies and that operations on the final assembly were swiftly concluded. Whenever necessary, steps were added to the operational process to improve product quality, save time or reduce the cost of production.

DISCUSSION

Gilroy's focus on quality is consistent with previous studies, which have examined quality as an aspect of consumer preferences. For example, Siegrist et al (2007) in their study on the fundamental elements of packaging and their effects on consumer buying decision, found that packaging was a crucial vehicle through which an organization could communicate information on the products and organization to a consumer, sensitize consumers on product quality and leverage the market field by sharing distinctive information about a product, which could help create and sustain a competitive advantage.

Process Selection is another key factor that was found to significantly influence consumers' ecological conscience. According to Ragaert, et al., (2014) process selection refers to

the techniques which are employed in delivering goods and services. Such techniques may largely influence other key operational management decisions such as layout of facilities, capacity planning, design of work systems and equipment design (Heyde, and Kremer, 2009; Mayne, 2012). In order to enhance the success of process selection Gilroy Company had to review and balance the costs, output, efficiency and quality of each design output. The process of review and balancing also ensured that the options selected were in tandem with the production goals. For instance, use of packaging design strategy that involves assigning only a few employees the responsibility of designing packaging materials and passing the materials down to various packaging lines was found to present the advantage of a unique touch on each product. However, the process was also found to be too slow to meet market demands. Moreover, the involvement personnel at every stage of the packaging design process was found to slow down the production process and fail to meet market demands on time. There are also challenges that were presented by errors of inconsistency in packaging design.

Mahalik and Nambiar, (2010) argue that the initial activities in any organization pave way for subsequent activities and thus largely influence the final project outcomes. The commencement phase of any organization activity or project may suffer the greatest impact, while the other phases may suffer gradually decreasing impact throughout the progress of an activity or project (Sanders and Piter 2013). Similarly the costs incurred during the process of implementing an activity or organizational project at the initial phase is likely to be lower than the costs incurred in the subsequent phases of an activity (Pollard, Kirk, & Cade, 2012).

CONCLUSIONS

In conclusion, the study findings reveal that the ultimate objective of operational management at is to increase production output, enhance the quality of production and reduce the operational costs. Realization of these cardinal objectives is only possible when optimum and correct processes are selected and the processes are laid out in the most efficient manner. The packaging design industry is a dynamic sector with immense competition. Therefore there is no need for the product design packaging companies to implement design strategies that are aligned with the prevailing market trends and at the same time those that featured unique characteristics that can establish a competitive advantage in the company. The rapid introduction of new technologies,

cutting edge products and new solutions in the modern market environment also implies that product design packaging companies need to be flexible in approach and adapt swiftly to such changes in the market environment. The process of adapting would be enhanced by incorporating new technologies in all the vital production processes

THEORETICAL IMPLICATIONS

A major theoretical implication of this study stems from the juxtaposition of efficient operational management concepts and successful product packaging design. For instance, the study findings reveal that alignment of technology with consumer needs enhances consumer interests in products and services (Green, & Helsen, 2014). This was exemplified by Gilroy Company through utilization of modern information and telecommunication technology to enhance effective monitoring of each activity in the production process. The information and telecommunications technology improved remote and real time reporting of production activities in the company. A significant number of personnel were also involved in the research and development division, which was established in the organization to gauge consumer attitude and views regarding the company's package design products. Significant resources such as money were also invested to facilitate short run operational activities that would enhance research and development initiatives.

This study emphasized implementation of the operational strategy, which involved finalizing activities at each phase rather than focusing on long term (strategic) or medium-term (tactical) strategies of competing activities. The implication of adopting the operational approach stems from the fact that a daily focus on short term events or activities within an organization might facilitate an in-depth understanding of the constraint of flow that are inherent in project activities within a packaging industry (Siegrist et al 2007). Furthermore, a tacit consideration of daily operational activities might help in effecting more control over project activities and available resources (Packforsk, 2010). The categorization centers on the nature of decisions made and the level at which the decision is made. The categorization also focuses on time horizons, modeling assumptions and levels of detail.

MANAGERIAL IMPLICATIONS

Planning of production process is integral to design operations as it enables production of high quality products at a relatively lower cost. Therefore, it is imperative that before the management of packaging and design companies embark on other operational procedures, all plans are codified and reviewed regularly to leverage or minimize costs of production. To realize the planning goal, the management of packaging and design companies need to identify and categorically specify all the crucial processing steps that might contribute to transformation of materials and their components to finished products as planned. The process of organizing or planning of the steps should also be undertaken in a systematic and appropriate fashion in order to eliminate any possibilities of labour duplication or needless handling of raw materials or their components.

The study has also established that before the management of any package design and Production Company undertakes any production, it needs to begin by identifying and specifying the finished product. This involves implementing a plan, which comprises a series of precise appearance, tolerance, measurements of the finished packaging product as well as all the subassemblies and every component that might be purchased to facilitate completion of the packaging product. Moreover, in order to establish the feasibility of production during the initial testing, management of any package design and Production Companies need to frequently conduct "pilot runs". The pilot runs will provide avenues for correcting any production errors and ensure that the products are producible.

Through integration of an accurate customer behavioural analysis framework it is possible for management to generate profiles that capture the interests and needs of several of potential customers and in the process allow organizations to tailor their products in line with customer's needs and expectations (Siegrist et al 2007). Polaine, et al., (2013) posits that through an effective and well coordinated process of customer behaviour analysis, it is possible to deliver the needs and desires of a customer, thus leading to better customer satisfaction. Previous studies have established a causal link between customers' satisfaction and their retention ((Heyde, and

Kremer, 2009; (Ragaert, et al., 2014).Buchanan, (2012) argues that most organizations that implement various marketing strategies including use of social media platforms and company websites no longer focus on the individual customer but rather on the buying behaviour of an organization or collective group. This strategy is justified by the fact that is helps in establishing the customers that can be reliable and who are worth developing through implementation of a raft of strategies aimed at attracting and them to the organization (Murray & Delahunty, 2010).

LIMITATIONS

One major limitation of the study was time. Due to the limited time of the study, the researcher had to focus on one organization from which findings were generalized to the study population. The use of one prototype organization was another limitation, since there was no opportunity for making a comparison of variables from one organization with variables from other similar organizations. Comparison would have facilitated a more accurate analysis and determination of points of variation.

This research was based on a case study approach. The implication is that information obtained from participants reflects their own subjective perceptions and is not based on any objective assessment criteria. Lack of an objective assessment criteria limits the research validity. However, in order to strengthen validity of the study findings, the researcher analyzed the results in light of existing literature and empirical findings in the area of study and recommendations were provided based on the outcome of such analysis.

Another limitation stemming from conducting a case study involving only one prototype organization is the difficulty in generalizing study findings. Since the study only focused on one case (organization), it might be difficult to apply the study findings to other non related organizations. However, related organizations can obtain invaluable lessons from this study, since the participants were employees with insider knowledge of the activities of the organization and could, therefore, offer relevant and invaluable information.

RECOMMENDATIONS AND FUTURE RESEARCH DIRECTIONS

In order to enhance quality in supply chain management, product packaging and design companies need to partner with other companies their supplier network to integrate a similar environmental, ethical and managerial business strategy in order to ensure that there is an effective supply chain management. The ethical requirements will include enforcing appropriate human resource management standards such as training and competencies, fair compensation and appropriate working conditions. The environmental requirements will involve incorporating appropriate environmental management system (EMS) as well as ensuring that the supply companies comply with Gilroy's standards for materials and waste management. On the other hand, the managerial requirement will involve implementing appropriate corporate governance techniques. The corporate governance techniques will be augmented by conduct policy that defines appropriate standards of performance expected from various suppliers of Gilroy packaging and Design Company.

In case new equipment that usually get into contact with packaging material are purchased, manufacturer assurance will need to be provided to ensure that such equipment do not interfere with the quality of products. Such equipment may include holding tanks, conveyor belts, and mixers. The following guidelines will be taken as minimum equipment design principles in order to guarantee the quality of packaging product design at Gilroy Company:

- All surfaces of equipment, which are likely to be in contact with the packaging products must be inert to packaging products.
- All equipment surfaces will need to be accessible for visual examination and cleaning purposes.
- Surfaces that are likely to come into contact with packaging products will need to be made smooth, scratch free and seamless.
- The design of equipment will need to factor pertinent aspects such as prevention or minimization of spillages, which might potentially interfere with package design

products. Simplicity of design will be emphasized with fewer gaps, seams and crevices and inaccessible recesses left on equipment.

- This research was largely focused on a qualitative analysis of one organization. Future research should explore a quantitative approach by integrating findings from more than one organization.
- The present data was collected using the cross sectional research method. Therefore, future studies should adopt a longitudinal research approach, where data will be collected over an extended period. This will enable a comparison of results and monitoring of any changes that might be influenced by other factors.
- Since this study largely relied on descriptive research design, future study on the problem may involve another type of research design and sampling technique in order to generate more findings that might have been omitted in this study as a result of the choice of research design and sampling technique.

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Appendix:

Outline of Main Topics

Packaging designs using green recycled materials
1.1 Introduction
1.2. Economic efficiency of recycling
1.3 Research Questions
Literature Review
2.0 Overview
2.1. Elements of great package design
2.2. Creative Design Elements
2.3 Operations management
2.4 Consumer Behavior Analysis
2.5. Service Design
Operation management Design
3.1 Operation Management Decision
3.2. Monitoring
3.3 Human Resource Job Design
3.4. Location
3.5 Process Selection
3.6. Scheduling
3.7 Inventory Management and maintenance
3.8. Facility Layout
3.9 Planning of Production process
3.10 Sequencing of Processing Phases

Discussion .....
Conclusions .....
Managerial Implications .....
Limitations .....
Recommendations .....
Future Research Directions .....