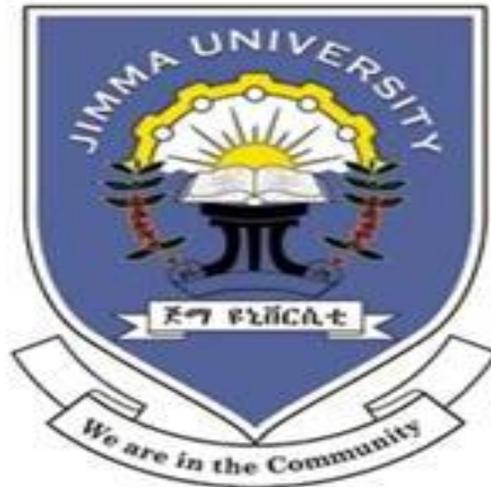The Effect of New Product Development on Organizational Performance: the case of Biscuit Manufacturing Companies in Addis Ababa.

A Thesis Submitted to the School of Graduate Studies of Jimma University in Partial Fulfillment of the Requirements for the Award of the Degree of Master of Business Administration (MBA)

BY:
ABDULHAKIM ENDRIS MOHAMMED

JIMMA UNIVERSITY

COLLEGE OF BUSINESS & ECONOMICS

MBA PROGRAM

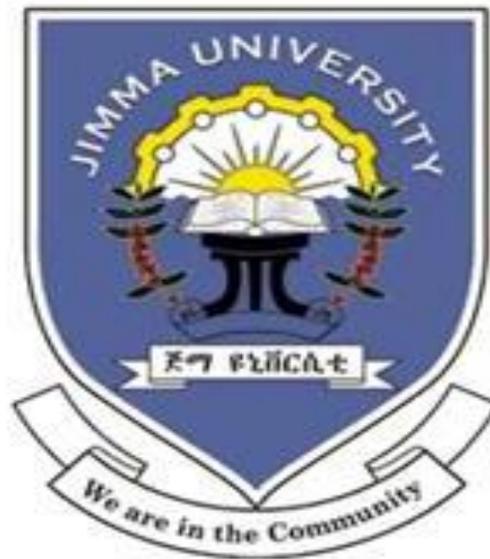**July, 2020 G.C**

ADDIS ABABA, ETHIOPIA

The Effect of New Product Development on Organizational Performance: *the case of Biscuit Manufacturing Companies in Addis Ababa.*

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Under the Guidance of

Zerihun Ayenew (Associate professor)

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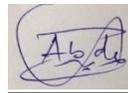
Research Topic:

"**The effect of new product development on organizational performance**: *The case of biscuit manufacturing companies in Addis Ababa*."

Submitted by:

<u>Abdulhakim Endris Mohammed</u>   July – 2020 G.C

Signature   Date

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Co-advisor	Signature	Date
External Examiner	Signature	Date
Internal Examiner	Signature	Date
Chairperson	Signature	Date
School of Graduate Studies	Signature	Date

July, 2020 G.C

ADDIS ABABA

Declaration

I hereby declare that this research work entitled

"**The effect of new product development on organizational performance:** *the case of biscuit manufacturing companies in Addis Ababa*" submitted to Research and Postgraduate Studies' Office of Business and Economics College is original and it has not been submitted previously in part or full to any university or institutions.

Researcher's Name	Date	Signature
Abdulhakim Endris Mohammed	July – 2020 G.C	

Certificate

This is to certify that the thesis entitled "**The effect of new product development on organizational performance:** *the case of biscuit manufacturing companies in Addis Ababa* " submitted to Jimma University for the award of the Degree of Master of Business administration (MBA) and is a record of bona fide research work carried out by Mr. Abdulhakim Endris Mohammed under my guidance and supervision.

Therefore, I hereby declare that no part of this thesis has been submitted to any other university or institutions for the award of any degree or diploma.

Adviser's Name   Date   Signature

Zerihun Ayenew (Associate Professor)   July - 2020 G.C

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Acronyms

CAD	Computer Aided Design
CEO	Chief Executive Officer
EFDA	Ethiopian Food and Drug Authority
ETB	Ethiopian Birr
FBPIDI	Food, Beverage and Pharmaceutical Industry Development Institute
FMCG	Fast Moving Consumer Goods
GTP-II	Growth and Transformation Plan - Two
MD	Managing Director
NPD	New Product Development
OP	Organizational performance
PD	Product Design
PL	Product Line
PLC	Private Limited Company
PQ	Product Quality
PS	Product Size
Q – Q	Quantile - Quantile
R&D	Research and Development
SC	Share Company

Abstract

New product development has become potentially valuable way of securing competitive advantage by improving organizational performances. The main purpose of this research is to assess the effect of new product development on organizational performance in the case of biscuit manufacturing companies in Addis Ababa. Quantitative research approach, descriptive research design and cross-sectional field survey was applied for this study. Probability sampling technique specifically stratified random sampling method was applied in order to select sample respondents from the total population. Primary data was collected using structured questionnaire. Data were analyzed using descriptive statistics (mean and standard deviation) and inferential statistics (Pearson correlation and multiple linear regression) with the help of SPSS Version 20. The findings indicated that three of the independent variables such as product quality, product size and product design have moderate and positive relationship and; significantly affects the organizational performance. Whereas, product line which is the fourth independent variable have weak relationship and insignificant effect on the performance of target organizations. Therefore, the new product development dimensions product quality, product size and product design affect the profitability and sales volume, which in turn affects the performance of the case company. In other word, the overall performance of the case companies has affected by their new product development. Based on the findings, the researcher recommends that biscuit manufacturing firms shall improve the quality of their product, respond to the dynamic changes in customers need in product size and product design through introduction of new products to improve the performance of their organization.

*Key words: **New product development, Product quality, Product size, Product line, Product design, Organizational performance***

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

New product development is all embracing and ranges from products that are totally new to the world to minor modifications (Barclay *et al.,* 2000). Kotler and Keller (2009) noted that new product development is the development of original products, product improvements, product modifications and new brands through the firm's own product development efforts. Booz, Allen and Hamilton (1982) also identified new product in six categories as new to the world, new product lines, additional to the existing lines, improvement and revision of existing products, re-positioning and cost reductions.

According to Kuwashima (2012), empirical researches of new product developments began in earnest in the 1960s with the "grand approach." These researches clarified general success factors through the comprehensive analysis of successful project profiles. In the 1970s, the "focus approach" came to fore where analysis focused on specific themes in product development. The latter half of the 1980s the "focus" shifted to the "process approach" where the relationship between management of product development process and performance was analyzed in detail. Loch and Kavadias (2008) noted that new product development first developed as one of the four Ansoff Matrix, product-market strategies of company growth, which involves extensive research and development and; expansion of the product range.

New product development process is "the set of activities beginning with the perception of market opportunity and ending in the production, sale and delivery of a product" (Ulrich & Eppinger, 2004, p. 2). Belliveau *et al*. (2002, p. 450) also stated that new product development is "the overall process of strategy, organization, concept generation, product and marketing plan creation and evaluation and; commercialization of a new product". Therefore,

development of new product is an interdisciplinary activity requiring contribution from nearly all the functions of a company (Ulrich *et al.*, 2004). Encompasses a large number of topics and challenges in a firm such as strategy formulation, deployment, resource allocation, coordinated collaboration among people of different professions and nationalities, systematic planning, monitoring and control (Louch & Kavadias, 2008).

Satisfying the needs of customers is not solely a marketing problem or a design problem or a manufacturing problem, it is a product development problem (Louch and Kavadias, 2008). A number of remarkable studies emphasized the influence of NPD on organizational performance. For instance, Nwokah *et al.* (2009) used variables such as product quality, product size, product line and product design, Udegbe *et al*. (2013) used product quality Benson *et al*. (2015) used new and improved product and found out that NPD positively affects organizational performance. Whereas Regina (2011) witnessed product quality and speed to market as dimension of new product development significantly affecting profitability. In addition, Chu-Mei Liu, (2014) also witnessed its effect on operational performance, Heather D. (1990) on financial performance and Chux (2010) on market share. On the contrary, Sharma and Lacey (2004) identified financial market losses from product losses failures being larger in magnitude than financial market gains from product development successes. Because, NPD is a risky and uncertain process (Cooper, 2001). Developing new products that will succeed in the marketplace goes way beyond simply coming up with a great new idea, a great new invention or a great new design rather it involves complicated and time-consuming processes and activities (Robin & Beebe, 2007).

Brown and Eisenhardt (1995) stated that both academician and practitioners acknowledge that NPD is a critical process to most firm's long-term survival and business growth. However, this field of study has received less attention by academic researchers in developing economies (Udegbe *et al*., 2013). Thus, this study might be beneficial to academia by filling the empirical gap and to industries by helping create a product that are capable of facing competition and remains in the growth stage for as long as possible through creating market, consumer satisfaction and customer loyalty which in turn result growth in sales and revenue (Udegbe *et al*., 2013).

According to Wong and Tong (2013), new product success factors remain elusive as different scholars use different methods and criteria to measure success. For instance, Etsegenet (2018) studied effect of new product development on commercial bank of identified new product success factor effecting customer satisfaction such as reliability, trust, perceived ease of use, perceived usefulness and relative advantage. Whereas Ermias (2019) found out market orientation, knowledge management, NPD team composition, NPD process, product attribute and features, delay on launching time, technological advancement and support from top level management affecting the performance of Nefas silk paint factory. Whereas Selam (2019), on the other hand, identified customer involvement, top/senior management commitment and new product quality on her study on the effect of new product development on customer satisfaction at Horizon Addis tyre S.C. However, various studies identified lists of NPD success factors. The one which are relevant to this research are product quality, product size, product line and product design.

According to Douglas (2014), the introduction of new products into the market place is a key activity for fast moving consumer goods (FMCG) manufacturing companies. Based on the EFDA data base (2019) from biscuit is one of the fast-moving consumers goods developed continuously and companies are registering new products often. According to FBPIDI data base (2019), there are five industrial scale biscuit manufacturers in Addis Ababa namely Horra food complex, Kality foods share company, KOJJ food complex, NAS foods PLC and Misrak bread & flour factory. EFDA (2019) database shows that the first four companies have developed and registered more than 15 new products eac whereas Misrak flour & bread factory developed only two types of biscuits since establishment (EFDA database, 2019).

In the light of the above, this study was undertaken to assess the effect of new product development on organizational performance in the case of biscuit manufacturing companies in Addis Ababa (i.e. Horra food complex, Kality foods share company, KOJJ food complex, NAS foods PLC).

1.2 Background of the company

Horra Food Complex, which is one of Sheikh Mohammed H. Al-Amoudi investments, considered as Ethiopia's modern flour, pasta and biscuit factory located in south-west of Addis Ababa, Dalleti. Horra Food Complex established in 2012 G.C. Horra Food Complex PLC has over 500 employees. The company has organized its management in seven department such as production, quality, technique, procurement, human resource, finance and sales. Horra foods has developed more than 15 brands in both cream and plain biscuit such as king, kinda, dream and glucose.

Kality Food Share Company established in 1946 G.C. KFSC located in Kality, Addis Ababa, having more than 500 employees. The share company owned by Romel General Trading PLC and SGI Ethiopia. The company has flour milling, biscuit production, pasta, macaroni and bread manufacturing plant. The company has organized in five major departments; production and technique, finance, commercial, quality, human resource development. KFSC, Cerealia, has developed more than 20 types biscuits including galleta.

K.O. JJ Food complex is established in 1995 G.C by Kassa Oma JJ with initial investment capital of 30 million ETB. K.O. JJ food complex P.L.C is located in Asko, Addis Ababa. The company has 385 employees in four major departments such as supply chain, human resource, marketing and production. The company has product offerings like flour, pasta and biscuits such as; Yoyo, Viva, Yene, Sarem, Arif etc.

NAS Foods PLC was established in 2000 G.C in Legetafo, 20 km from Addis Ababa, by Mr. Salah I. Nasreddin and currently co-owned and managed by Kuramo capital. NAS is a pioneer biscuit manufacturer with a capacity of 50,000kg/day. The company has more than 350 employees. NAS Foods has organized in seven department such as production, quality, technique, commercial, sales and marketing, finance and human resource department. NAS has developed more than twenty-five different biscuit including Glucose and Hip Hop.

1.3 Statement of the problem

Organizational performance as the actual results or output of an organization as measured against organization's intended outputs (Tomal & Jones, 2015). For an organization to compete effectively in the dynamic and competitive business environment, to achieve set goals, to satisfy the constantly changing desires, needs of customers, incomes, lifestyle, level of education, sophistication and technology; the marketing policies have been dynamic and the product offerings to the market are constantly under review and frequent changes as product is the cornerstone of the firm's marketing mix: every other element rests on it (Nwokah *et al*., 2009).

Product development is a broad field of endeavor dealing with design, creation and marketing of new product. These organizational adjustments in response to new customer preferences even make it necessary to modify existing products, introduce new ones or eliminate products that are unsuccessful. (Yanelle, 2005).

Empirical evidences on the relationship between product development and performance of companies shows successful firm performance through development of new products (Haeussler *et al.,* 2012; Nwokah *et al.,* 2009; Udegbe *et al*, 2013 and Benson *et al*., 2015), increase in market share through NPD (Chux, 2010), success on financial performance (Heather, 1990; Kariuki, 2018 and Sagatoych, 2013), firm growth through NPD (Goedhuys & Veugelers, 2008), and customer satisfaction through developing new products (Awwad & Akroush, 2016; Selam, 2019 and Etsegenet, 2018). However, the failure rate of NPD and identifying the factors which contribute to product failure and way outs to reduce failure rate are the most challenging questions to business executives and marketers. Studies indicate that failure for NPD to improve organizations performance is estimated as high as 80 percent in most industries (Louch & Kavadias, 2008). The studies show that approximately 45 percent of new products fail in the technical phase while 35 percent of new products failed after launch due to lack of market acceptance (Louch & Kavadias, 2008). Poolton and Barclay (1998, p. 27:197) suggested that "if companies can improve

their effectiveness at launching new products, they can double their bottom line as it is one of the areas left with the greatest potential for improvement."

Continued increase in manufacturing companies in the country, following GTP II, necessitates to continually consider how new product development affects their performance and how consistent their NPD is with dynamic changes. So far, the situation in the countries manufacturing industry, specifically FMCG, appears not to have stimulated interest among Ethiopian researchers and academics except some recent researches conducted by Etsegent (2018), Selam (2019), Ermias (2019) and Mesfin (2019) who has witnessed the effect of NPD on customer satisfaction and identified NPD dimensions (success factors). But none of them addressed the FMCG, agriculture-based labor-intensive manufacturing sector and; food and beverage industry. A preliminary observation on those sectors exhibits that biscuit manufacturing shows phenomenal growth both in size and number (FBPIDI, 2019). The performance of some biscuit manufacturers has made that possible by effective product development, yet performance of NPD is often under measured (Putzer & Macheill, 2015). It is demonstrated that very few managers were aware of key research findings into success versus failure in NPD (Poolton & Barclay, 1998). Therefore, unless clearly substantiated and ascertained by a concerted empirical effort these will be just a belief, hunches and conjectures. Thus, creating a wide gap in existing literature which needs to be bridged. These situations triggered the basic motive to this research work.

The rationale for the conduct of this study is to clearly identify the effect of new product development on organizational performance, identify NPD dimensions (success factors) and provides information, knowledge and direct empirical search light to the industry thereby enriching existing literature on the effect of new product development on the performance of biscuit manufacturing companies. Udegbe *et al.* (2013) studied the impact of product quality on organizational performance while studying "Impact of product development and innovation on organizational performance" and recommended further study using additional dimensions such as product quality, product size, product line and product design. Thus, this study applied those four variables, unlike Udegbe *et al.* (2013)

as NPD dimensions in order to assess the effect of new product development on organizational performance in the case of biscuit manufacturing companies in Addis Ababa.

In order to address the aforementioned problems, the following basic research questions were raised;

    i.   What is the effect of product quality on organizational performance?
   ii.   How does product size affect organizational performance?
  iii.   How does product line affect organizational performance?
  iv.   What is the effect of product design on organizational performance?

1.4 Objectives of the study

1.4.1 General objective

The general objective of this study is to assess the effect of new product development on organizational performance, the case of biscuit manufacturing companies in Addis Ababa.

1.4.2 Specific objectives

- To explore the effect of product quality on organizational performance.
- To describe the effect of product size on organizational performance.
- To explain the effect of product line on organizational performance.
- To reveal out the effect of product design on organizational performance.

1.5 Significance of the study

This study may be used as an input to the organizations under the study for continual improvement and to the broader realm of business through its offerings supported by analysis, discussion and appropriate recommendations on the subject matter. The study will add value to academic research by filling the empirical gap in the area of new product development and organizational performance. This study can also be a stepping stone for further research through suggesting future research areas and serving as a reference. The findings of the study might be useful to the government and policy makers in regard to advising and formulation of guidelines towards maintaining and/or improving the performance of the firms.

1.6 Scope of the study

This study has an objective of assessing the effect of new product development on organizational performance in the case of biscuit manufacturing companies in Addis Ababa. Despite number of fast-moving consumer goods manufacturers, developing plenty of new products, the study focuses only on industrial scale biscuit manufacturers. From a number of biscuit manufacturers in the country this study is delimited to biscuit products in biscuit manufacturing companies found in Addis Ababa namely Horra food complex, Kality foods share company, KOJJ food complex, NAS foods PLC.

Different studies identified different performance indicators for new product development (independent variable) and organizational performance (dependent variables). Hence, only four variables such as product quality, product size, product line and product design were considered to measure the effect of NPD while organizational performance measured through the perception of respondents on profitability and sales volume.

1.7 Limitation of the study

Due to time and financial constraints, the study population was restricted to those biscuit manufacturing companies that are located in Addis Ababa. Findings and conclusion of the study might be different if the study includes those similar companies out of Addis Ababa. The research focused only four new product development dimensions. Others factors were not considered and the remaining success factors, which are not included in this research, are indicated in chapter five, for further study.

1.8 Organization of the paper

The research is organized in five chapters; The first chapter gives introduction about the research including the background of the study, background of the company, statement of the problem, research questions, objective of the study, significance of the study, scope of the study, limitation of the study and organization of the thesis. The second chapter is review of related literature on the subject matter through theoretical and empirical review and gap then put conceptual frame work for the study. The third chapter deals on the methodology that the researcher applied in the study including research approach, research design, sampling design, data type and source, data gathering tool and collection method, data analysis technique, validity, reliability and ethical consideration. The fourth chapter is data analysis, interpretation and discussion of the findings. The fifth chapter summarize the findings then concludes. Recommendations and future study areas are also part of this chapter.

CHAPTER TWO

RELATED LITERATURE REVIEW

This chapter reviews related literature on the study so as to have an insight on the research topic and briefly expose the reader to some of the major areas on the subject matter under consideration. This chapter is presented in two sections. The first part deals with theoretical literature review and the second section deals with empirical review of different research findings and conceptual frame work.

2.1 Theoretical literature

2.1.1 Over-view on new product development

New product is any product that is new in nature, form and intended for a certain target market (Robin & Beebe, 2007). New product development process is defined as a process by which a firm transforms data on market opportunities and technical possibilities into information assets for commercial production (Clark & Fujimoto, 1991). Ulrich and Eppinger (2007) stated that new product development is the set of activities beginning with perception of a market opportunity and ending with production, sale and delivery of a product. Levitt (1966) also defined new product development as a means of extending the lives and expanding the markets of existing products by adding new features, styles, packaging and pricing. Harmancioglu *et al*. (2007) noted that it is a system incorporating the dynamic and vigorous interactions between internal and external elements.

According to Cooper (2001), Crawford *et al*. (2003) and; Kumar and Phrommathed (2005) a new product can be classified into several different categories; the first is new-to-the-world products which are the first of their kind and create an utterly new market (Cooper, 2001).

"Revolutionize existing product categories or define wholly new ones" (Crawford *et al.*, 2003, p.12). The second is new category entries that is an imitation of an existing product ("me-too") and provides entrance into new markets for a company. Even though the product already exists in the market it can be considered a new product (Cooper, 2001). The third category is addition to product lines which is new items to the firm but they fit within an existing product line that the firm already produces (Cooper, 2001). These are new products that supplement the firm's established product lines and contains products that are line extensions (Kumar & Phrommathed, 2005). The fourth category is product improvements. These "not-so-new" products can be replacements of existing products in a company's product line. However, they provide enhanced performance or greater perceived value over the old product (Crawford *et al.*, 2003, p. 12). Repositioning, the fifth category, is selecting a new market place, solving a new problem and/or serving another market need (Cooper, 2001). The final or the six category is cost reduction. New products that provide a cost reduction while offering similar benefits, performance and can replace existing products in the line at a lower cost (Cooper, 2001).

Development of new products is an interdisciplinary activity requiring contribution from nearly all the functions of a company (Ulrich *et al.*, 2004). Chux (2010) added that NPD demands the integration of many actors of different knowledge and expertise in order to develop a high technological product. According to Urban and Hauser (1993), marketing must offer research and development (R&D) and together with engineering must work to innovate the process of manufacturing as well as design new products. Finance interacts with R&D, manufacturing, and marketing when financial resources are required (Urban & Hauser, 1993).

2.1.2 Stages in Product development process

New product development process is "a disciplined and defined set of tasks and steps that describe the normal means by which a company repetitively converts embryonic ideas into salable products or services" (Belliveau *et al.*, 2002, p. 12). These ensures that the ability to

produce a steady flow of successful new products consistently as it is the key factors in corporate success (Barclay *et al*., 2000). New product development process model consists of the different process and steps but similar in the key activities and functions. Even though all new product development process models use the different step terminologies, the process begins with perception of market opportunities and typically involves identification of customers' needs, design development process, product and market testing and market launch. However, "in practice many of activities of the phases will be going on simultaneously and interaction will be common" (Urban & Hauser, 1993, p. 50).

2.1.3 Theories related to New Product Development

This study was anchored on two theories, such as; Ansoff Growth matrix and Resource based view which is discussed as follows;

Igor Ansoff Growth Matrix model

The Igor Ansoff Growth Matrix model (1957) is a strategic planning tool that provides a framework to help executives, senior managers and marketers. Device strategies for future growth by helping a business to determine its product and market growth strategy. It is a business technique provides a framework enabling growth opportunities to be identified as it helps firms to device the strategies they adopt and each of these growth options draws on both internal and external influences. The matrix offers a structured way to assess potential strategies for growth. The four strategies are: *market penetration, product development, market development and diversification*. Market penetration involves selling more established products into existing markets, often by increased promotion or price reductions or better routes to market like ecommerce. Product development involves developing new products or services and placing them into existing markets. Market development entails taking existing products or services and selling them in new markets. Diversification involves developing new products and putting them into new markets at

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the same time. Diversification is considered the riskiest strategy because the business is expanding into areas outside its core activities, experience and target (Joy *et al.,* 2013).

Resource based view

Resource based view theory has its origin from the work of Penrose (1959). A resource-based view (RBV) emphasizes the firm's resources as the fundamental determinants of competitive advantage and performance. The model assumes first that firms within an industry (or within a strategic group) may be heterogeneous with respect to the bundle of resources that they control (Bridoux, 1997). Second assumption is that resource heterogeneity may persist over time because the resources used to implement firm's strategies are not perfectly mobile across firms.

The Resource Based View (RBV) of the firm is a dominant perspective of strategic management that seeks to find out why some firms consistently outperform others (Lilly & Juma, 2014). RBV invokes the concept of competitive advantage to explain firm's performance (Barner *et al*., 2001). The Resource-Based theory (RBT) of the firm suggests that enterprises have a bundle of capabilities and resources that provide a more sustainable competitive advantage and contribute to higher returns (Peteraf & Barney, 2003). Resource Based View theory is based on the idea that the effective and efficient application of all useful resources that a company possesses helps determine its competitive advantage and its performance. It assumes that organizations must be successful in obtaining and managing valued resources in order to be effective (Barner, Wright & Ketchen, 2001). In this way, the firm product development strategy is determined by the resources available and the capability to deploy them in the best way to obtain a good performance.

Prior to formulation of the resource-based theory, the notion was that the relative position of a firm in a specific industry determined each firm profit potential (Barney, 2016). Later, researchers argued that the use certain internal factors, that is, an organization's resources and capabilities play a significant role in the maximization of a firm's performance. RBV holds and states that sustained competitive advantage can be achieved more easily by

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exploiting internal rather than external factors and product development strategy is one way to achieve this competitive advantage through development of new products to target the already existing markets. Therefore, RBV could be considered as an "inside-out" process of strategy formulation: starting from the internal resources of the firm, their potential for value generation has to be assessed in order to define a strategy allowing the firm to achieve the maximum value in a sustainable way (Grant, 1991).

Resources are defined as the basic inputs into the production process such as capital equipment, enterprises' intangible and tangible human resource. Whereas capabilities are the ability of an enterprise to make full use of these resources (Harrison *et al.*, 2010). Each organization has varying amounts of resources and capabilities and the exploitation of these determines the performance of a firm (Lin, Peng & Kao, 2015).

2.1.4 Relationship between New Product dimensions and Organizational Performance

2.1.4.1 Product Quality and Organizational Performance

Quality has become a top competitive priority and a prerequisite for the success of many firms operating in the global market place (Mahmood & Fatima, 2014). A primary reason fueling the drive for quality is that consumers around the globe are increasingly demanding better quality with lower prices. Kotler (1984) stressed that quality must be perceived by customers and that it must start with customer needs and end with customer perceptions. Quality is defined as "fitness for use" (Juran, 1989, p. 629). Crosby (1979) defined quality as "conformance to customer requirements". Cooper (1979) also defined as "product superiority/ uniqueness". Product quality is customer perception of the extent to which a product or service meets or exceeds their requirements relative to competing alternatives (Sethi, 2000). Teboul (1991) also identified quality as a means of winning market share, enhancing sales and creating barriers to entry. Deming (1982) emphasized that "top

management must satisfy customer needs". Different approaches of defining quality reflect two central issues: customer needs and the need-satisfying marketing offer.

Quality is concerned with organizational actions designed to ensure consistency or quality in approach, process and output (Lee, 2003). Zhang (2005) noted that quality has developed into an important part of corporate strategy that only those organizations with advanced quality systems achieve superior organizational performance and remain competitive in the marketplace. Prajogo and Sohal (2003) also argue that an organization's performance is also influenced by the extent to which quality is emphasized in the entire organization's systems and processes. More recent studies conducted by Yusof and Aspinwall (2000), Sousa and Voss (2002), Carter *et al*. (2010), Chin and Sofian (2011) and; Almansour (2012) have also reported that quality has a positive impact on business performance and organizational performance. Udegbe *et al*. (2013) and Nwokah *et al.* (2009) operationalized the effect of new product development on organizational performance applying product quality as one dimensions of new product development. Selam (2019) also witnessed product quality as one of new product dimension in her study on the effect of new product development on customer satisfaction.

Garvin (1987) considered quality as a multi-dimensional construct in terms of eight critical dimensions that companies could compete on such as; performance (the primary operating characteristics of the product), features (special supplements to the primary operating characteristics of the product), reliability (the probability of the product failure within a specified time frame), conformance (the degree to which the product's design and operating characteristics meet predetermined standards), durability (the amount of usage the product offers before it must be replaced), serviceability (the speed, courtesy and competence of service people and the speed and ease of repair of the product), aesthetics (how the product looks, feels, sounds, smells or tastes) and perceived quality (quality as seen by the customer inferred from the marketer's reputation and image). Kotler and Keller (2012) also thought that the quality of the product consists of several indicators namely performance, features, reliability, compliance, durability, service ability and perceived

quality. Thus, most of these product quality dimensions (performance, features, reliability/consistency, conformance, durability and perceived quality) become applicable for this study to assess the effect of new product development on organizational performance as quality is one of NPD dimensions.

2.1.4.2 Product Size and Organizational Performance

Increased competition is forcing brand managers of consumer goods to alter the portfolio of the package sizes they offer (Elliott, 1993). Th greater the supply of a product (i.e. large package), the lower the transaction (replacement) costs for using the product and the greater the volume people are willing to use (Lynn, 1992; Worchel, Lee and Adewole 1975). In other word, the unit costs often vary inversely with packaging size because products from large packages are generally less expensive (per unit) than those from small packages, they may be used in greater volume (Wansink, 1996). Wansink (1996) also studied the effect of package size and fill level, cost, price promotion on usage volume found out that package sizes can be modified to either accelerate or decelerate (conserve) usage. The larger packages should encourage greater usage volume per usage occasion.

Different packaging sizes potentially appeal consumers with somewhat different involvement. For example, for some low involvement food products, such as generics, low price is made possible through cost savings created by reduced packaging and promotional expenses. Since generics are usually packaged in large sizes, this directly caters to the needs of consumers from larger households who are more likely to be specifically looking for good deals (Chernev & Hamilton, 2009). They find the low price of the generics, in larger packaging, is an attractive offer with excellent value for money (Prendergast & Marr, 1997). In addition, this could imply that when product quality is hard to determine, the effect of packaging size is stronger. Thus, elongating the shape within acceptable bounds should result in consumers thinking of the package as a better value for money. However, many other aspects of packaging could also conceivably affect perceived volume such as

aspects of package shape, color, material and aesthetic appeal. As yet, though, there is little research available on any of these other aspects (Chernev & Hamilton, 2009).

The increasing impact of product size on retailer costs raises the question of how assortment size influences buyers' choice of a retailer. Thus, a retailer concerned with creating a cost- efficient size might want to know whether reducing the number of items in its assortment will lead to a decline in store attractiveness and lower the likelihood of consumers choosing the store. In the same vein, a retailer concerned with broadening its customer base might want to know whether increasing the choices in product size will result in greater store preference (Chernev & Hamilton, 2009). Packaging size can be described as a coordinated system of preparing goods for transport, warehousing information and sell. It is fully integrated into government business, institutional, industry, and personal use (Diana, 2005).

Biscuit manufacturers pack their products in various sizes (big and small), dimensions, weight, volume, pieces per packet, different packets per cartons, different serving sizes etc. These appeal to and meet the needs of their customers, thereby helping the firm to make more profit, an increase in sales volume and customer loyalty. Bix *et al*. (2003) cited on Naser A. and Maryam M. (2012) bulk commodities can be divided into packages that are a more suitable size for individual households helping for portion control and inventory. Size and color play important role in packaging and packaging graphical characteristics such as color type are important factors (Rundh, 2009). Udegbe *et al*. (2013) suggested that product size as a factor for organizational performance in his recommendation/ implication on his study entitled "New product development process and its impact on business performance in Nigeria". However, Nwokah's *et al*. (2009) study revealed that the relationship between product size, product design and profitability, sales volume and customer loyalty was not significant. Thus, four indicators were applied to assess the effect of product size (one of NPD dimension) on profitability and sales volume (organizational performance indicators). These are, biscuit dimension (length, width, diameter and thickness), biscuit weight, packaging strategy (Packaging material, packing type and orientation) and packaging size (pieces per packet, packets per carton and volume).

2.1.4.3 Product Line and Organizational Performance

Product line is the number of alternative products available within a product category at any given time (Sela *et al.*, 2009). A product line is a group of products that are closely related because they function in a similar manner are sold to the same customer groups, are marketed through the same types of outlets, or fall within given price ranges (Tewodros, 2018).

Large assortments allow consumers to find the products they want at a relatively low cost of searching, thereby better addressing consumer preferences and reducing uncertainty (Chernev & Hamilton, 2009; Oppewal & Koelemeijer, 2005). However, recent researches by Iyengar and Lepper (2000) and Sela *et al.* (2009) has questioned the assumption that more variety always benefits consumers because it decreases consumers' motivation to make a choice, generates lower satisfaction and leads people to select options that are easier for them to justify. Increasing the assortment size leads to a cognitive overload, confusion among consumers, results in weaker preferences and a lower choice probability (Oppewal & Koelemeijer, 2005).

A company may expand downward to plug a market hole that otherwise would attract a new competitor or respond to a competitor's attack on the upper end and/or it may add low-end products because it finds faster growth taking place in the low-end segments in two ways: by line filling or line stretching. Product line filling involves adding more items within the present range of the lines. Product line stretching occurs when a company lengthens its product line beyond its current range. Nwokah *et al.* (2009) in their study of "Product development and organizational performance" they identified a significant and positive correlation between product line and organizational performance measures such as profitability and sales volume. Company's product mix has four important dimensions such as; width (the total number of product lines or category that a company offers to sell e.g. hard biscuit, soft biscuit), length (total number of products or varieties within a company's product lines), depth (total number of different products a company offers within a certain product line) and consistency (close relationship between different product

lines or category) (Tewodros, 2018). Thus, these four indicators were applied to assess the effect of new product development on organizational performance since product line is one of NPD dimensions and implication on Udegbe *et al*. (2013) research work under the subtopic 'future study'.

2.1.4.4. Product design and Organizational Performance

Product design is defined as the totality of features that affect how a product looks, feels, and functions (Joy *et al.,* 2013). A well-designed product offers both functional and aesthetic benefits to consumers which could become an important source of differentiation (Koter & Keller, 2011). Thus, a product design will always aid to determine a consumer's choice of purchase amongst products of same brands and categories. A well-designed product can also be a point-of-difference in the marketplace aiding consumer acceptance, serving as a source of competitive advantage and becoming a powerful marketing asset for the organization (Joy *et al.,* 2013).

One of the major reasons for product or service development is to provide satisfaction for basic needs of customers. Therefore, product must be design in such a way that it will provide the necessary satisfaction for the customers in cost efficient way (Bagshaw, 2015). Morris (2009) stated that product design impacts every functional area of an organization. Thus, operations and marketing should be involved because sufficient information must be generated to clearly determine customer wants. This must be conveyed to those responsible for designing, marketing and producing a particular product or service. Furthermore, Pullman and William (2011) stated that the market demand for a product and its use must be clearly determined during the process design with data from sales personnel, marketing manager and others decision makers within the organization.

Product form creates first impression that how beneficial and distinctive the product is when compared to other products (Berkowitz, 1987). A consumer would become loyal to

the product if the product fulfils the needs of the consumer. Also, the form of the product greatly affects the perception about the product and brand in consumers mind (Bitner, 1992 and Solomon, 1983).

To be sustained in the global scenario, organizations' focus is to design a production system that can fulfil all the demand orders within due dates at a reasonable cost (Malhotra, 2008). Since the 1930s the product design has been more creatively and strategically employed to achieve the market share (Berkowitz, 1987; Nussbaum, 1988). Kotler and Rath (1984) discussed design as a strategic tool for companies to gain competitive advantage but Nwokah *et al.* (2009) identified that there is no significant relationship between product design with sales volume and profitability.

The study utilized four product design dimensions (i.e. product composition, packaging design, labelling and communication and; ease of use) to observe the effect of new product development on the performance of case organization since product development is one of NPD success factor/dimension.

2.1.5 Organizational Performance

Organizational performance is defined as a measure of the degree to which a firm has attained its set goals and objectives given by three components that are: financial performance, product market performance and shareholder return (Richard *et al.*, 2009). Organizational performance is related to the ability of the firm to gain profit and growth in order to achieve its general strategic objectives (Hult, Hurley & Knight, 2004). It is a consequence of the interaction between actions taken in relation to competitive forces that allow the firm to adapt to the external environment thereby integrating competence and usefulness (Miller, 1998).

Organizational performance can be measured by a number of actions that can be broadly divided into financial performance (i.e. income such as sales growth, economic added value, sales value, sales growth, gross profit and cash flow) and nonfinancial performance (i.e. market performance: customer satisfaction and customer loyalty). Jauch and Glueck (1999) disclosed that the performance of a company can be seen from the aspect of quantitative and qualitative. Quantitatively the performance of a company can be seen from the company's achievement compared to what it did in the past or compare it with its competitors in a number of factors such as net profit, stock price, dividend rate, share earnings profit, return on capital, equity returns, market share, sales growth, number of working days lost due to strike labor, production cost and efficiency. Qualitatively questions asked to find out whether the objectives, strategies and plans are comprehensively integrated with a company is consistent, appropriate and work well or not.

Poolton and Barclay (1998, p. 27:197) posited that "if companies can improve their effectiveness at launching new products, they can double their bottom line. Schumpeter (1934) connected higher profits with the ability for firms to innovate whereas Clark and Fujimoto (1991) found out performance in development projects has been determined by a firm's product strategy and its capabilities in overall processes and organization. Nwokah *et al.* (2009), Udegbe *et al*. (2013), Benson *et al.* (2015), Udegbe (2014), Idris (2017) and Masaku (2017) investigated that there is positive relationship between new product development and organizational performance.

Researchers applied different firm performance measurements while assessing the effect of new product development on organization performance. Nwokah *et al.* (2009) and Udegbe *et al*. (2013) applied perception in profitability, sales volume, customer satisfaction and customer loyalty whereas Regina *et al.* (2011) used profitability. In addition, Benson *et al.* (2015) studied using the total output turn over, sales volume, profitability and capacity utilization. Thus, this study analyzed the effect of new product development on organizational performance through measuring the perception on profitability and sales volume of the target respondents as an indicator for firm performance.

2.2 Empirical literature review

Selam (2019) has studied new product development success factors that affect customer satisfaction in Horizon Addis tyre S.C. Customer involvement, top/senior management commitment and new product quality were the independent variables and customer satisfaction was the dependent variable. Quantitative research method was applied though collection of primary data, from customers in Addis Ababa, using questionnaire. Non-probabilistic sampling technique specifically judgmental sampling used to select 134 respondents from the total population of 200. The data collected was analyzed and tested by using correlation and regression analysis. The research finding indicate that all the three new product success factors, aforementioned, positively correlate with customer satisfaction and also significantly affect the performance of the case company.

The study conducted by Etsegenet (2018) has an objective of identifying effect of new product development on customer satisfaction in commercial bank of Ethiopia. It conceptualized and developed five dimensions of new product development (independent variables): reliability, trust, perceived ease of use, perceived usefulness and relative advantage. The new products included in this study were mobile banking, internet banking and POS machines. Both descriptive and explanatory research designs were utilized. Non probability sampling technique specifically convenience sampling method was applied to select 400 sample from the total population of 360,008. Primary Data were collected using questionnaire and analyzed by both descriptive (mean and standard deviation) and inferential (Pearson correlation and multiple linear regressions) methods. The findings indicated that all independent variables significantly affect customer satisfaction.

Idris's (2017) study was designed to investigate the impact of product innovation on organizational performance. Organizational performance was measured by profitability, market share and competitive advantage. The data was collected from the production department, research and development department, sales department, marketing department, and quality and control department. Population of this study is made up of the

entire staff of Nestle Plc., Agbara Lagos which are 2294 staff. Stratified random sampling was adopted to select a total of 340 copies of useable questionnaires were completed. Regression and correlation analysis were conducted using SPSS package. The findings show that the impact of product innovation on organizational performance was higher in the company when consumers perceive product innovation as stronger, more favorable and more unique. Creativity/quality of the innovation process exerts a positive influence on product and organizational performance.

The general objective of Masaku's (2017) study is to determine the effect of new product development on growth in the case of Keroche Breweries, Kenya. The study used a cross sectional design and data was collected through questionnaires and document analysis to establish the sales volume from the year 2002 to 2012 G.C. The target population consisted of 43 managers and supervisors in Keroche breweries. Census method was used to collect data from 43 managers. Data was analyzed using descriptive (mean and standard deviation) and inferential statistics (regression and correlation analysis) with the help of SPSS V22. Findings showed that new product development positively and significantly affect sales explained by the independent variable at 33.3%.

Marcus *et al.* (2017) studied the impact of new products development on the profitability of Nigerian deposit money banks. Hypotheses were developed on the relationship between product innovation, product availability and techniques for marketing. The target population comprises an entire staff of 24 Nigerian major licensed commercial/deposit money banks. Judgment random sampling applied to select 100 respondents from Nigeria cities of Abuja, Lagos, Kaduna and Benin where 82 were returned. The study is a survey research in which primary (questionnaire) and secondary data (text books, journals and periodicals) were applied. Data analyzed using simple descriptive percentage and Chi-square method derived from kendall coefficient of concordance. The findings revealed that there is a relationship between new product development and profitability in Nigerian deposit money banks and; poor knowledge of the benefits derived from new product innovation is responsible for low rate of profit maximization in banks.

The purpose of Mohammed *et al.* (2015) review is to discuss the critical role of innovation in the overall improvement in the organizational growth and performance specifically focusing on the new product development as an important innovative factor for success. The authors reviewed literatures and interviewed about the role of innovation through developing new product and how that is improving the organizational performance. Through a richer explanation and empirical assessment, the study contributes to generate clarity and better understanding of how new product development responds positively to the organizational performance. The findings reveal that pursuing NPD is more effective and beneficial in organization's financial performance in competitive environment. The results reveal the positive effects of innovations on firm performance.

Udegbe (2014) studied New product development process and its impact on business performance in Nigeria. The research sample consists of 180 Nigerian manufacturing industries. The sample in the study were designed using convenience sampling method, 2 copies of the questionnaire were administered in each of the 180 manufacturing industries that served as sample. Out of the total sample of 360, 230 useable questionnaires were returned representing a response rate of 63.89%. Data were analyzed with the use of statistical methods such as factor analysis, correlation analysis and reliability analysis. Based on the data analysis, the findings observed that that culture, strategy and the ability of the personnel affect not only the new product development business plan but also the business performance.

The study of Chu-Mei Liu (2014) tends to explore the effects of Product Development on Operating Performance in textile industry, Taiwan, with quantitative questionnaire survey. Total 450 copies of questionnaires were distributed to the supervisors, employees and customers and 347 copies were valid, with the retrieval rate 77%. Each retrieved copy is regarded as a valid sample for this study. Regression Analysis is applied to understanding the relations between Product Development and Operating Performance whereas ANOVA is utilized for discussing the effects of demographic variables on the relations between Product Development and Operating Performance. The findings show that more successful product development could better enhance operating performance in textile industry.

Furthermore, the study concludes that technical innovation, functional innovation and marketing innovation presents remarkably positive effects on the operating performance.

Udegbe *et al*. (2013) study was designed to investigate the relationship between organizational performance and product development by innovation. The data was collected from the marketing managers, operation managers and those managers who have been involving greatly in product development and innovation process. A total of 185 useable Likert scaled questionnaires were completed though research sample of 120 firms in Nigeria. The result of the study was interpreted using SPSS package for the analysis of some appropriate statistical methods such as factor analysis, regression and reliability analysis. The findings show that the impact of product development on organizational performance was higher in Nigeria. Quality of the innovation process exert a positive influence on product development and organizational performance.

Product differentiation: a tool of competitive advantage and optimal organizational performance in Unilever Nigeria plc is a work of (Joy *et al.,* 2013). Product quality, product design, unique product and product innovation were the dimensions used to assess the effect of product differentiation (independent variables) on competitive advantage (measured by sales growth and higher market). Survey research was adopted using questionnaires. Simple random sampling technique were applied to select 323 respondents from the population of customers/consumers of the products of Unilever Nigeria Plc located in Ota, Ogun State. Based on Pearson correlation and simple linear regression analysis the study found out that there is an existence of positive significant relationship between higher product quality, new product innovation, product design, unique product features and sales growth of an organization as well as a significant positive relationship between and customer satisfaction.

Chux (2010) conducted a study identify the relationships between increase in market share through product development and innovation. The population from where samples (respondents) were drawn included product developers, marketers, advertising

practitioners and salespersons in organizations and; direct sellers of commodities. There was need to visit the salespersons of organizations and direct sellers. Direct sellers were interviewed to ascertain if there was any correlation between higher profits and the introduction of a new product. Questionnaires, interviews and direct observation (when new products are brought to the attention of direct sellers and salespersons) were the techniques used for data collection in this study. Direct sellers were observed to underscore their joys and/or disappointment at new products. The results of the survey were interpreted using the Likert model through SPSS analysis. According to the findings, product quality, customer influence and promotion have a positive effect on market share and companies reported high volume of sales. The study concluded that there is a strong correlation between the product quality through innovation and customer involvement; as well as between product quality through innovation and improvement in product promotions.

Nwokah *et al*. (2009) examined product development and corporate performance in the Nigerian brewing industry. Data were gathered from 32 officials from marketing, R&D and production departments in four breweries located in the south-south and south east geographical regions of Nigeria through the use of questionnaire. The data were analyzed using spearman rank order correlation co-efficient. The data revealed among other things that product development facets of product quality and product lines / product mix were positively and significantly correlated with the corporate performance facets of profitability, sales volume and customer loyalty. The study also revealed that the relationship between product size, product design and profitability, sales volume and customer loyalty was not significant.

Goedhuys and Veugelers (2008) identified innovation strategies of Brazilian manufacturing firms in particular internal technology creation and external technology acquisition and; their effect on successful process and product innovations. The study used the World Bank's Investment Climate Survey (ICS) data collected in Brazil in 2003. The survey collected data for the period 2000, 2001 and 2005 through intensive interviews of firms while analysis was done through Chi-sq test, bivariate probit for significance in

correlation. The results indicated that innovative performance is an important driver for firm growth in particular the combination of product and process innovations that significantly improves firm growth.

Benson *et al*. (2015) studied the effect of product development strategy on performance in sugar industry, in Kenya, using development of new product and improvement of existing products as an independent variable, Whereas total output turnover, profitability, sales volume and capacity utilization as a measurement tool for performance. 120 questionnaires were issued to senior and middle level managers in nine sugar companies in both public and private by non-probability sampling approach. The collected data (60% return rate) was analyzed using cross-sectional survey research design. Resultant performance was positive in total output turnover, sugar sales quantities, capacity utilization was moderate while profitability after tax gave fluctuating results. Performance was fairly responsive to improvement of product processes procedures but poor in introduction of new products revealing a weak relationship between product development strategy and all aspects of performance.

Cusumano and Nobeoka (1991) examined recent empirical research conducted or published on product development in the automobile industry. Their objective was to identify what has been learned and what is yet to be learned about the effective management of this activity. The study focused on 22 organizations from Japanese manufacturers while the basic framework used to compare the studies examined variables related to product strategy, project structure or organization and project as well as product performance. Evidence from the study indicated that Japanese automobile producers have demonstrated the highest levels of productivity in development and overall sales growth using particular structures and processes to achieve this.

2.3 Conceptual framework

The conceptual model below presents the relationship between independent variable, new product development dimension/success factor (such as product quality, product size, product line and product design) and dependent variable, organizational performance and its measures (such as perceived profitability and perceived sales volume).

INDEPENDENT VARIABLE   **DEPENDENT VARIABLE**

(New product development)

```
┌─────────────────────┐
│   Product Quality   │ ─────────╲
└─────────────────────┘           ╲        ┌──────────────────────────┐
                                   ╲       │   Organizational         │
┌─────────────────────┐             ╲      │   Performance            │
│    Product Size     │ ─────────────╲     │                          │
└─────────────────────┘               ╲    │  Perceived Profitability │
                                        ──→ │                          │
┌─────────────────────┐               ╱    │  Perceived Sales Volume  │
│    Product line     │ ─────────────╱     └──────────────────────────┘
└─────────────────────┘             ╱
                                   ╱
┌─────────────────────┐           ╱
│   Product Design    │ ─────────╱
└─────────────────────┘
```
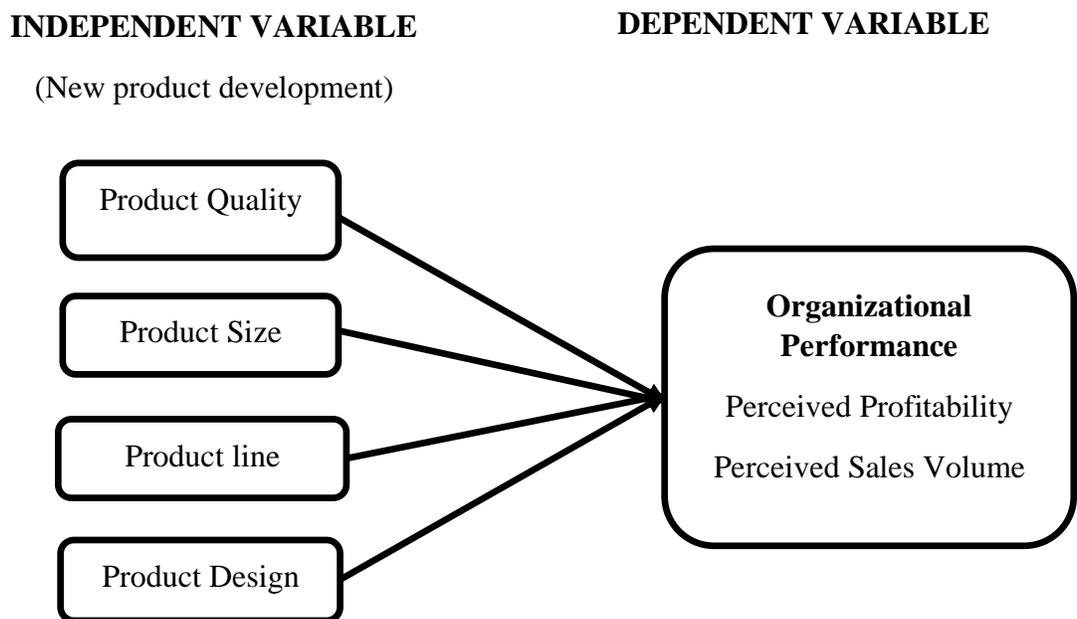
Figure 2. 1: Conceptual framework

Source: Adapted from Nwokah *et al*. (2009) and Udegbe e*t al*. (2013)

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter deals with research approach, research design, sampling design, data type and data source, data gathering tools and collection method, data analysis technique, validity, reliability and; ethical consideration.

3.2 Research Design

Research design are plans and procedures for research that span the decisions from broad assumptions to detailed methods of data collection and analysis (Creswell, 2009). An appropriate research design is essential as it determines the type of data, data collection technique, the sampling methodology and the budget (Hair *et. al.*, 2003).

The aim of this research is to assess the effect of new product development on organizational performance in the case of biscuit manufacturing companies based in Addis Ababa. Thus, the study adopted both descriptive in order to observe and describe the behavior scientifically without influencing it any way and explanatory research design to see the causal, cause and effect, relationship between the four new product development dimensions and organizational performance. Descriptive research involves gathering data that describe events and then organizes, tabulates, depicts and describes the data collection Kothari (2004), uses to gather information about the present or existing condition Creswell (1994), it uses to answer the what, how and why Sekaran and Bougie (2013) and it also enables collection of data by measurement of central tendency, variation and correlation (Shajahan, 2008) whereas explanatory research design is used to determine how events occur and which ones may influence particular outcomes (Dawson & Bob, 2006). Cross-

sectional field survey applied because it measures independent and dependent variables at the same point in time by using a single questionnaire (Creswell, 1994).

3.3 Research Approach

Research approach is a way to systematically solve the research problem. It may be understood as a science of studying how research is done scientifically (Kothari, 2004). It assumes there is a logical order the researcher needs to follow in order to achieve a certain result (Jonker & Pennink, 2010). There are three kinds of research approach, qualitative research approach, quantitative research approach and mixed approach. Quantitative research approach seeks to quantify the collected data for analyzing and finding a final course of action. Qualitative research forms a major role in supporting decision-making primarily as an exploratory design and also as a descriptive design. In order to address problems of these study quantitative research approach were utilized using close ended questionnaires with five-point Likert scale.

3.4 Sampling Design

3.4.1 Target population

A population refers to an entire group of individuals, events or objects having a common observable characteristic (Mugenda & Mugenda, 1999). It shall have at least one aspect in common (Kombo & Tomp, 2006).

The total population of this study encompasses the top management, middle level management, lower level managements, sales and marketing team of biscuit manufacturing companies in Addis Ababa (i.e. Horra food complex, Kality Foods Share company, KOJJ food complex and NAS foods plc). Samples has drawn from this total population as

population is a group of individuals, object or items from which samples are taken for measurement (Kombo & Tomp, 2006). Therefore, the total population size were 268 staff from the management, the sales and marketing team.

3.4.2 Sampling Frame

Sample frame is defined as a list of items or people forming a population from which a sample is taken (Cooper & Schindler, 2006). The sampling frame was drawn from biscuit manufacturing firms in Addis Ababa. The study was undertaken in management, sales and marketing team.

3.4.3 Sampling Technique

Sample technique is defined as the process by which the entities of the sample have been selected (Cooper & Schindler, 2006). There are two types of sampling techniques probability and non-probability sampling techniques. It is very important to choose a sample that is truly representative of the population so that the conclusion derived from the sample can be generalized back to the population of interest. Hence, this study used probability sampling technique particularly stratified random sampling. In stratified random sampling a sample obtained by separating heterogeneous population into homogenous groups called strata. The strata for the study was selected based on level of managerial position for the management team and entire sales and marketing department team. Then a sample from each stratum was selected based on their proportion applying the equation used by William G.C. (1977) as shown in the sample size (3.4.4) part of this chapter. A stratified random sampling allows us to take into account that the different subgroups of people in the population and helps guarantee that the sample accurately represents the population on specific characteristics.

3.4.4 Sample Size

Sekeran (2001) defines a sample size as a portion of the population that has attributes as the entire population. According to Malhotra and Peterson (2006), the larger the sample size of a research the more accurate the data will be generated. According to Mugenda and Mugenda (2003), a sample size should be as large as possible so as to produce the salient characteristics of the accessible population to an acceptable degree. They have also indicated that a descriptive study should include at least 30% of the total population.

Even though there are several approaches to determining the sample size, this study utilized Yamane's (1967) simplified formula to calculate and determine the sample size based on a 95% desired confidence level and a 5% desired level of precision.

$$n = \frac{\mathcal{N}}{1 + \mathcal{N}(e^2)}$$

Where; n = sample size

                   $\mathcal{N}$ = total population

                   e = level of precision

Therefore,

$$n = \frac{268}{1 + 268(0.05^2)}$$

$$n = 160.5 \approx 161$$

From the total 268 study population of different department 161 representative samples were selected which represents 60.1% of the total population.

Samples from each stratum were calculated using the equation below (Chukwuma, Ezenyilimba, & Agbara, 2018);

$$nh = \left(\frac{\mathcal{N}h}{\mathcal{N}}\right) * n$$

Where: nh = sample size for stratum h

$\mathcal{N}h$ = population size for stratum h

$\mathcal{N}$ = total population size

n = total sample size

Table 3. 1: Sample Size Determination

Sample Size distribution	Target population	Sample size	% sample proportion
Top management	34	20	12
Middle level management	48	29	18
Lower level management	88	53	33
Sales & marketing force	98	59	37
Total	268	161	100

Source: Survey data result (2020)

3.5 Data type and data source

There are two sources of data; primary and secondary sources. According to Biggam (2008), primary data is the information that the researcher finds out by him/herself regarding a specific topic. The main advantage with this type of data is that it is collected with the research's purpose in mind. It implies that the information resulting from it is more consistent with the research questions and objectives (Etsegenet, 2018). Thus, Primary data was utilized as a part of this study whereby the respondents were the management (top

management, middle level management, lower level management), sales and marketing team since they are in charge of developing, implementing, evaluating the company objectives and most importantly they are part of the R&D team (i.e. they are responsible for developing, implementing and evaluating new products in their respective organizations). Biscuit manufacturing companies based in Addis Ababa namely Horra food complex, Kality foods share company, KOJJ food complex and NAS foods PLC, (EFDA and FBPIDI database, 2019), were the case company in which data were collected.

3.6 Data gathering tool and collection method

3.6.1 Data gathering tool

According to Kothari (2003), a questionnaire is a carefully designed instrument and also provide bias free and a relatively cheaper information through giving adequate time to respondents. In order to explore the effect of new product development on the organizational performance of the case companies a questionnaire was adopted from previous studies of Nwokah *et al*. (2009) and Joy *et al.* (2013).

The questionnaire has a total of 32 questions, of which 26 with five point Likert scale (i.e. 1=strongly disagree, 2=disagree, 3= Neutral, 4=agree, 5=strongly agree) to indicate their degree of agreement or disagreement with each of statements since opinions can be captured best with five to seven-point scales (Aaker *et al*., 2000; Malhotra, 1999). The questionnaire was structured in three sections; section one has six questions dealing with the general information of the respondents and the firms. Section two is comprised of 18 questions on new product development dimensions and Section III consists of eight questions on organizational performance.

3.6.2 Collection method

Pilot testing was conducted as an initial draft survey which then was discussed with advisors, researchers and executives. A pilot test involving a group of 17 respondents (10% of the sample respondents) applied to evaluate the wording, format, sequencing of questions, completeness, precision, accuracy and clarity of the questions towards addressing the research. The changes and suggestions of the respondents were then incorporated to the questionnaires to ensure that all aspects were sufficiently covered.

A "drop-and-get later" technique was utilized to oversee the surveys since the questions covers a wide spectrum of disciplines and every area of the company. To motivate a timely and complete response the case companies were promised a summary of research findings, the promise will be fulfilled at the end of the study. To ensure a high response rate a representative was selected from each company who were contacted via telephone, text messages and other reminders.

3.7 Data Analysis Technique

After the data collection the questionnaires are inspected for completeness, coded and the data being captured. The collected data tabulated systematically and analyzed with the help of Statistical Package for Social Sciences (SPSS) Version 20.

To fulfill the stated objective of the study, descriptive statistics (mean and standard deviation) and inferential statistics (Pearson correlation coefficient and multiple linear regression) were applied in order to ascertain whether there is statistically significant relationship exists between new product development and organizational performance and; to determine the joint relationship between independent variables on dependent variables.

The regression model for the study was;

$$OP = \beta° + \beta1PQ + \beta2PS + \beta3PL + \beta4PD + \varepsilon$$

Where; OP = Organizational performance, PQ = Product quality, PS = Product size,

PL = Product line and PD = Product design

$\beta°$ = Constant or intercept

$\beta1 - \beta4$ = Regression Coefficient for each independent variable

ε = Stochastic or disturbance term or error term

3.8 Validity & reliability test

3.8.1 Validity

Validity of the instruments is the extent to which it measures what it intended to measure. Kothari (2004) stated that validity measures the accuracy of the instrument in obtaining anticipated data that could meet the objectives of the study. Bryman and Bell (2007) also defined validity as how much any measuring instrument measures what it is intended to measure. They also suggest that the important issue of measurement validity relates to whether measures of concepts really measure the concept or not. There are several ways of establishing validity such as content validity, convergent validity, concurrent validity, predictive validity, construct validity and convergent validity. Content validity was applied to verify whether the instrument used for this study was valid or not. Content validity was verified by discussing with the research advisors, researchers and executives who looked into the appropriateness of the questions and the scales of measurement. The comments and findings were incorporated accordingly.

3.7.2 Reliability

Kothari (2004) states that reliability is a measure of the degree to which a research instrument yields consistent results after repeated trials. Nunnaly (1978) also stated that reliability is the consistency of a test, survey, observation or another measuring device. The level of reliability of the instrument indicates the consistency of the variables. Cronbach's alpha is an index of reliability associated with the variation accounted for the true score of the underlying construct and it can only be measured for variables which have more than one measurement question. Therefore, the reliability of the questionnaire is analyzed by using Cronbach's alpha statistics. Cronbach's alpha value of 0.5 is a sufficient value but 0.7 is a more reasonable and widely accepted value.

The values of Cronbach's Alpha for each variable are shown in the table 3 below. Values of Cronbach's Alpha were in the range from 0.701 and 0.805 for each variable and; 0.835 for overall, table 3.2. Therefore, the level of Cronbach's alpha was considered to be consistent and reliable enough to proceed with the data analysis.

Table 3. 2: Cronbach's alpha output summary

S No.	Variable	Cronbach's Alpha	No. of Items
1	Product Quality	.805	6
2	Product Size	.742	4
3	Product Line	.770	4
4	Product Design	.709	4
5	Organizational Performance	.701	8
6	Overall	.835	26

Source: Survey data result (2020)

3.9 Ethical consideration

Ethics is an integral part of the research process. Honoring the rights and privacy requirements of participants is crucial to create an open atmosphere during the data collection. Therefore, every person involved in the study was entitled to the right of privacy, dignity of treatment, and no personal harm were caused to subjects in the research through a formal letter of introduction with a questionnaire explaining the purpose of the study. This was preceded by seeking permission from the human resource and administration departments so that the study can be carried out in their company and promised that the information they provide is intended purely for academic purpose, remains strictly confidential and their identity will not be revealed, Appendix 1. All assistance, support and sources from which information was drawn were acknowledged.

CHAPTER FOUR

DATA ANALYSIS, INTERPRETATION AND DISCUSSION

This chapter presents the data analysis using both descriptive and inferential statistics, interpretation and discussion of the research findings.

4.1 Response Rate

A total of 161 questionnaires were distributed to the four biscuit manufacturing companies in Addis Ababa. The study managed to receive a total of 136 filled questionnaires which constituted a response rate of 84.47%, table 4.1. According to Edwards *et al*. (2002), a response rate of 80% and above is viewed as sufficient to enable the researcher to draw adequate conclusions.

Table 4. 1: Response rate

Response rate	Frequency	Percentage
Questionnaire distributed	161	100
Questionnaire Returned	136	84.47
Not returned	25	15.52
Discarded	0	0
Valid	136	84.47

Source: Survey data result (2020)

4.2 General Information Analysis

In this section, the basic information of the respondents is presented to better understand the target population. Gender, age, education level, work experience and their current title.

Gender of Respondents

Table 4.2 below shows that the male respondents formed majority of the target population with a percentage of 70.6% and the rest 29.4% is female. This implies that majority of the employees in the managerial position, sales and marketing team in biscuit manufacturing companies. are male. Considering the overall involvement of females in education and the nature of the job in the manufacturing sector (i.e. shift work, location etc.) the student researcher found their percentage satisfactory to contribute for the study.

Table 4. 2: Gender of respondents

Variable	Category	Frequency	Percent
	Male	96	70.6
Gender	Female	40	29.4
	Total	136	100

Source: Survey data result (2020)

Age Groups

The study required that the respondents indicate the categories in which their age fell. According to the table 4.3 below, 47% of respondents were in the age between 31 to 35 years. 22.1% of the respondents age were in between 36 to 40 years. Respondents who are 30 years old and below accounts 19.1% from the total population. 8.1% of the population were aged between 41and 45 years and 3.7% is above 50 years old. This implies that the sample population is largely dominated by respondents who are at the age group below 40 years covering 88.2% of the total number of respondents indicating that most of them are energetic, creative and have direct involvement in NPD of their company.

Table 4. 3: Age groups

Variable	Category	Frequency	Percent
	Less or equal to 30	26	19.1
	31 -35	64	47
Age	36 - 40	30	22.1
	41 - 50	11	8.1
	above 50 years	5	3.7
	Total	136	100

Source: Survey data result (2020)

Level of Education

As indicated in table 4.4 below, the study also sought to establish the respondents' highest level of education. According to the findings 72%, majorities, of respondents were degree holders and 26.5% of the respondents were post graduate and above. Only 1.5% of them were college diploma and below. Since the majority of the respondents' educational background played a great role in understanding, analyzing and responding the questions which in turn avoid inconsistency of responses.

Table 4. 4: Level of Education

Variable	Category	Frequency	Percent
	College Diploma & below	2	1.5
Level of	Graduate level	98	72
Educational	Post graduate & above	36	26.5
	Total	136	100

Source: Survey data result (2020)

Work experience

As indicated in table 4.5 below, 63.2% of the respondents had more than 10 years of experience. This indicated that the target companies are staffed with experienced employee who have gained adequate training, exposure and experience in related fields. 33.1% of employee had worked for a period of 6 to 10 years in the same field and 3.7% of

respondents had less than 5 years and of course above 1 year of experience. This depicts that majority of the respondents 96.3% had an experience of 6 years and above implying that there is a highly experienced team in the case organization who can really understand and contribute a lot to this study.

Table 4. 5: Work Experience

Variable	Category	Frequency	Percent
Experience of employees	1-5 years	5	3.7
	6-10 years	45	33.1
	above 10 years	86	63.2
	Total	136	100

Source: Survey data result (2020)

Job Title

In the table 4.6, the current job title of the respondents is presented. A total percent of managerial position of respondents are 61.8% and respondents from sale and marketing team were 38.2%. This shows that relatively proportional data was collected with no traceability problem. Managerial workers are more in number witnessing immense contribution on the study because they are well aware of the day by day activities through reports, meetings and other way of information flows to the position they hold.

Table 4. 6: Job Title

Variable	Category	Frequency	Percent
Job title	Sales & Marketing team	52	38.2
	Lower level management	45	33.1
	Middle level management	26	19.1
	Top level management	13	9.6
	Total	136	100

Source: Survey data result (2020)

4.3 Descriptive Statistics

This section presents the descriptive statistics results in the form of mean and standard deviation. There are different dimensions of new product development that can affects the performance of an organization. Hence, this descriptive analysis describes and explains the data collected through the questionnaire. Descriptive analysis has also the ability to explain the broad dimension of new product development while making analysis and interpretation of the results of mean and standard deviation of the four dimensions (i.e. product quality, product size, product line and product design). As stated in chapter three, five-point Likert Scale were utilized to measure their agreement and disagreement on each question. Here scales are reassigned based on Best (1977), cited by Yonas (2013), classification; 1 - 1.8= Strongly Disagree, 1.81 – 2.6 = Disagree, 2.61 – 3.4= Neutral, 3.41 – 4.20= Agree and 4.21 – 5 = Strongly Agree

Below in the descriptive statistics; mean and standard deviation for each question under each new product dimension, independent variables, are presented and discussed separately.

4.3.1 Descriptive statistics for Product quality

In the table 4.7 below; responses with mean value of 4.03 indicate that respondents agreed on the effect of their product characteristics on the final product quality. The standard deviation for this statement is 0.807 suggesting that there is slight variation in agreement of the respondents. This implies that characteristics of products varies batch to batch and from company to company. Mean value of 4.28 for product feature shows that respondents strongly agreed that the feature of the new product improved the quality with slight variation, SD= 0.497, in responses. The higher mean value, M=4.45, recorded on the consistency of new product implies that respondents strongly agree that consistency of their

new product highly improved the company product quality. The standard deviation for this statement is 0.594 showing slight variation in responses. The second highest mean value of 4.39 tells that respondents strongly agree that the new product conforms to the standard specifications set by the organizations with slight variation in agreement, SD=0.547. This implies that the company product is consistent and up to the required standard quality which also proofs the operational consistency of the new product. The minimum mean value of respondents, M= 3.92 observed in the effect of shelf life. Even if the respondents agreed with its effect on quality and preferability, maximum variation in responses, SD=1.075, witness that there are disagreements on the shelf life of the new product. The statement related perceived quality have a mean score value of 3.94 Respondents agreed that company product meets the expected or perceived quality with a slight variation in agreement, SD=0.805.

The respondents' average response regarding the product quality was rated as overall value of M= 4.1679. This implies that respondents perceived that product quality as a significant asset to their organizational performance because according to Best (1977), the mean score between 3.41 – 4.20 is in the range of "Agree". The value of the standard deviation, SD = .50776, implies that the response of respondents was not much more dispersed from the average value. Hence, this shows that participants' responses are homogeneous and not widely spread from the mean.

Table 4. 7: Descriptive statistics for Product Quality

	N	Mean	Std. Deviation
The new product characteristics affects the quality of the company product	136	4.03	0.807
The new product feature has improved the quality of the company products	136	4.28	0.497
The consistency of the new product improved the quality of the new products	136	4.45	0.594
The new product conforms with the standard specification of the company	136	4.39	0.547
The shelf life of new products makes company's product preferable	136	3.92	1.075
The new products frequently launched meets customers perceived quality	136	3.94	0.805
Product Quality Average	**136**	**4.1679**	**.50776**
Valid N (listwise)	136		

Source: Survey data result (2020)

4.3.2 Descriptive statistics for Product Size

Responses in table 4.8 below shows that new product dimension and weight have a mean value of 3.92 (SD= 0.7) and 3.98 (SD= .821), respectively. Meaning that respondents agreed that the new product length, width, diameter, thickness and weight has improved the performance of their respective company. Hence, there is slight variation in the agreement of responses. Respondents like the new packaging material, packing type and orientation and; packaging size (such as; pieces per packet, packet per carton and volume) and strongly agree on the effect of the new product packaging strategy and packing size addressing the target market and improving the sales volume with a mean value of 4.5 and 4.54, respectively. The standard deviation (SD= 0.531 for packaging strategy and SD= 0.595 packing size, respectively) shows that there is variation from product o product or from company to company.

Generally, the respondents' average response on product size was rated as overall mean value of M= 4.2353 which is in the range of "Strongly Agree" (Best, 1977). This implies that respondents believe that product size has an advantage to the performance of their organization. The value of the standard deviation, SD= .49232, implies that the standard deviation value of respondents was not dispersed much indicating that the responses are not widely spread from the mean value meaning that the participants' responses are homogeneous.

Table 4. 8: Descriptive statistics for Product Size

	N	Mean	Std. Deviation
The dimensions of the new product have resulted better performances	136	3.92	0.7
The weight the new product has benefitted the company	136	3.98	0.821
The new packaging strategy designed to meet the need of the target market	136	4.5	0.531
The new packaging size improved the sales volume	136	4.54	0.595
Product Size Average	**136**	**4.2353**	**.49232**
Valid N (listwise)	136		

Source: Survey data result (2020)

4.3.3 Descriptive statistics for Product Line

According to table 4.9, respondents are satisfied with the effect of product length (total number of products with in a company production line) as shown in mean value of 4.25. Even though, they strongly agree on expanding product length there is also slight variation, SD= 0.541, in responses. Product depth (total number of products or varieties within a certain product line) has contributed strongly in addressing variety of customer preferences and cover wider spectrum of the market as witnessed by the mean value of 4.46, respondents agreed strongly, with a slight disagreement in responses, SD= 0.556. The same is true for product width (total number of product lines or categories) because respondents agreed strongly, M= 4.54, on the contribution of expanded product lines on increasing sales volume and making more profit. On the other hand, standard deviation for this response is 0.595 suggesting that slight differences. Response with the highest mean value of 4.71 for the statement that the new products launched frequently updated based on customers demand shows that the respondents have strongly agreed on the consistency and close relationship between different line and category that their respective companies have of course with slight variation in responses, SD= 0.5.

The respondents' average response on product line was rated an overall mean value of M= 4.4890. This implies that the respondents strongly agreed that product line has a positive effect on the performance of their organization (Best, 1977). The value of the standard deviation, SD = .40468, implies that the responses of the participants are homogenous and not widely dispersed from the mean values.

Table 4. 9: Descriptive statistics for Product Line

	N	Mean	Std. Deviation
The different types new products enhanced the company performance	136	4.25	0.541
The different variety of new product addresses the customers preference	136	4.46	0.556
The category of new product designed to address different target groups	136	4.54	0.595
The new products launched frequently updated based on customers demand	136	4.71	0.5
Product Line Average	**136**	**4.4890**	**.40468**
Valid N (listwise)	136		

Source: Survey data result (2020)

4.3.4 Descriptive statistics for Product Design

Responses with mean value of 4.7 for the composition of the new product shows that it has strong effect on preferability of the company product, table 4.10. The standard deviation on this statement, SD= 0.461, shows slight variation on responses as not all respondents are curious on the composition of the products. Respondents strongly agreed, M= 4.79, with slight variation, standard deviation of 0.411, the effect of new product design on improving the sales volume and makes it preferable by respondents. Similarly, the respondents strongly agreed, M= 4.43, for the labelling and communication of the new product with slight difference in standard deviation, SD= 0.592. Implying that the labelling of the new product improved communication with customers and also improved the volume of their company sales. The mean value of 4.41 for products is easy to use indicates customers are using the products easily. In addition to this, standard deviation of the 0.537 indicates that there is low variation from overall mean.

Overall, the respondents' average response on product design was rated as overall mean value of M= 4.5809. This implies that respondents also strongly agreed that product design have positive effect for organizational performance. The standard deviation value of respondents, SD= .36878, shows that there is homogenous and narrow dispersion with values closer towards the mean value.

Table 4. 10: Descriptive statistics for Product Design

	N	Mean	Std. Deviation
The new product composition makes companies product preferable	136	4.7	0.461
The company's' new packaging design is preferable in the market	136	4.79	0.411
The new labeling improved the communication with customers	136	4.43	0.592
The overall design of the new product has acceptance through its ease of use	136	4.41	0.537
Product Design Average	**136**	**4.5809**	**.36878**
Valid N (listwise)	136		

Source: Survey data result (2020)

4.3.5 Descriptive statistics for organizational performance

In the table 4.11 below, companies are making profits and selling more new products they developed as it is indicated by the mean value of 4.68 and 4.44 for the statement related with quality of new products with profitability and sales volume, respectively. Standard deviation for these (product quality) responses is 0.467 and 0.555, respectively, suggesting that profitability and volume of sales are varies from product to product and company to company. Response related with the product size and its effect on profit, M= 4.64, and sales volume, M= 4.45, shows that respondents agreed strongly that the product size their products improved the profitability and frequency of purchase, which in turn improved the performance of their respective organization. The standard deviation for product size related with profitability, SD= 0.482, and sales volume, SD= 0.542, that there is slight variation from mean response suggesting that differences in profitability and sales volume. Responses with mean value of 4.31 for profitability and increase in sales, M= 4.38, through addition of product line were exhibited. Implying that respondents strongly agree that the new product developed by their respective company has expanded their sales and enhanced their profitability. Standard deviation for this response is 0.565 and 0.503, respectively, suggesting that there is variation from mean response. As it is shown with mean value of the respondents agreed on the heightened profitability, M= 4.47, and sales performances, M= 4.54, through the design of the new product. The standard deviation of 0.57 and 0.556 indicates that there is slight variation of profitability and sales volume, respectively, from company to company.

The respondents' average response about the organizational performance was rated as overall mean value of M= 4.4899 implying that respondents are strongly agreed with prevailing practice of new product development to improve the profitability and sales performance of their respective organizations. The value of the standard deviation, SD= .30202, implies that the responses of the respondents are homogenous and is not widely dispersed from the mean value.

Table 4. 11: Descriptive statistics for Organizational Performance

	N	Mean	Std. Deviation
The new product quality improved the company's profitability	136	4.68	0.467
The company's product size boosted the profit	136	4.64	0.482
The company's product line enhanced the profitability of the firm	136	4.31	0.565
The product design of the company heightened the profit	136	4.47	0.57
The quality of company's new product increased the sales volume	136	4.44	0.555
The new product size improves customers purchasing frequency	136	4.45	0.542
The diversity in the product line expands the sales	136	4.38	0.503
The product design of the company boosted the sales performance	136	4.54	0.556
Organizational Performance Average	**136**	**4.4899**	**.30202**
Valid N (listwise)	136		

Source: Survey data result (2020)

4.4 Inferential Statistics

Inferential statistics are used in research to make judgements of the probability or inferences from the data to more general conditions that extend beyond the immediate data alone. Inferential statistics used to determine the relationship between organizational performance and the new product development dimension (i.e. product quality, product size, product line and product design) are presented as follows;

4.4.1 Correlation Analysis

Correlation is a word which describes the statistical measure of association or the relationship between two phenomena or continuous variables in terms of how strong the relationship is and in what direction the relationship goes. According to Field (2009), correlation is a very useful means to summarize the relationship between two variables with a single number that falls between $r = +1.00$, a perfect positive (direct) relationship,

and r = -1.00, a perfect negative (inverse) relationship. The general symbol for the correlation coefficient is "r". As stated by Almaquist *et al.* (2015) a correlation coefficient between $\pm$ 0.9 to $\pm$ 0.7 is termed as strong, $\pm$ 0.6 to $\pm$ 0.4 is termed as moderate and $\pm$ 0.3 to $\pm$ 0.1 is termed as weak. Thus, in order to see the strength of the relationship between the dependent variable and independent variables a Pearson correlation analysis was computed and presented in the table 4.12 below;

Table 4. 12: Correlation Analysis

		Product Quality	Product Size	Product Line	Product Design	Organizational Performance
Product Quality	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	136				
Product Size	Pearson Correlation	.430**	1			
	Sig. (2-tailed)	.000				
	N	136	136			
Product Line	Pearson Correlation	.275**	-.240**	1		
	Sig. (2-tailed)	.001	.005			
	N	136	136	136		
Product Design	Pearson Correlation	-.017	.358**	-.441**	1	
	Sig. (2-tailed)	.844	.000	.000		
	N	136	136	136	136	
Organizational Performance	Pearson Correlation	.495**	.637**	-.192*	.458**	1
	Sig. (2-tailed)	.000	.000	.025	.000	
	N	136	136	136	136	136

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).
Source: Survey data result (2020)

As it shown in table 4.12 above, the Pearson correlation value for the relationship between product quality and the organizational performance was the second highest value having moderate, positive and significant relationship as indicated by the obtained value of r=0.495, N=136 & P<0.01.

The finding on table 4.12 above further indicates that the highest and significant relationship is found between product size and organizational performance. Pearson

correlation value of r=0.637, N=136 & P<0.01 shows that product size has moderate and positive relationship with organizational performance.

The result of Pearson correlation coefficient in the above table 4.12 indicates that product line has negative relationship with organizational performance. Concerning the strength of the correlation, there is a negative and weak relationship between the independent variable and the dependent variable with a Pearson correlation coefficient value of r= -0.192, N=136 and P<0.05.

The study further found out Pearson correlation coefficient value of r= 0.458, N=136 & P<0.01 for the relationship between product design and organizational performance showing that there is a moderate, positive and significant relationship between them, table 4.12

4.4.2 Multiple Regression analysis

The cumulative effect of independent variables (i.e. product quality, product size, product line and product design) over dependent variable (organizational performance) is also analyzed by using multiple linear regression. Regression analysis is a statistical method used for the purpose of prediction of the values of dependent variable, given the values of the independent variable, and the determination of a statistical relationship between two or more variables (Kothari, 2004). In multiple regression, the effect of each independent variable on dependent variable is estimated while taking into account all independent variables effects on dependent variable (Almaquist *et al*. 2015). According to Kothari (2004), multiple linear regression analysis is applicable if there are more than one independent variable. Hence, multiple linear regression was utilized in this research in order to analyze the cumulative effect of independent variables over the dependent variable (organizational performance).

4.4.2.1 Assumption Test

Assumption tests such as normality test and multicollinearity test were conducted and presented as follows prior testing multiple linear regression.

4.4.2.1.1 Normality Test

Normality test is used to determine whether sample data has been drowned from a normally distributed population. The variables in the multiple linear regression models must follow normal distribution. Both skewness and kurtosis test and; normal Quantiles - Quantiles (Q-Q) plot test was applied to check whether the data is normally distributed or not.

The skewness and kurtosis measures should be as close to zero as possible. However, data are often skewed and kurtotic. A small departure from zero is therefore no problem, as long as the measures are not too large compared to their standard errors. As a consequence, the measure is divided by its standard error to get the value which should be somewhere between -1.96 and +1.96. The test result presented in the table 4.13 below shows that the data are little skewed and kurtotic for all variables but it does not differ significantly from normality as the value is neither below – 1.96 nor above + 1.96. Therefore, the data are approximately normality distributed, in terms of skewness and kurtosis.

Table 4. 13: Normality - Skewness and Kurtosis test

Variables	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
Product Quality	136	-0.018	0.208	-0.721	0.413
Product Size	136	-0.165	0.208	-0.809	0.413
Product Line	136	-0.342	0.208	-0.451	0.413
Product Design	136	-0.365	0.208	-0.635	0.413
Organizational Performance	136	-0.112	0.208	-0.792	0.413
Valid N (listwise)	136				

Source: Survey data result (2020)

As it is indicated in Almaquist *et al.* (2015) the decision-making criteria for normality is that the points shall follow the diagonal line, it can be concluded that the value is normally distributed. Conversely, if the points do not follow the diagonal line, it can be concluded that the residual value is abnormally distributed. Visual inspection of the Q-Q plot for the organizational performance are approximately normally distributed, figure 2 below.
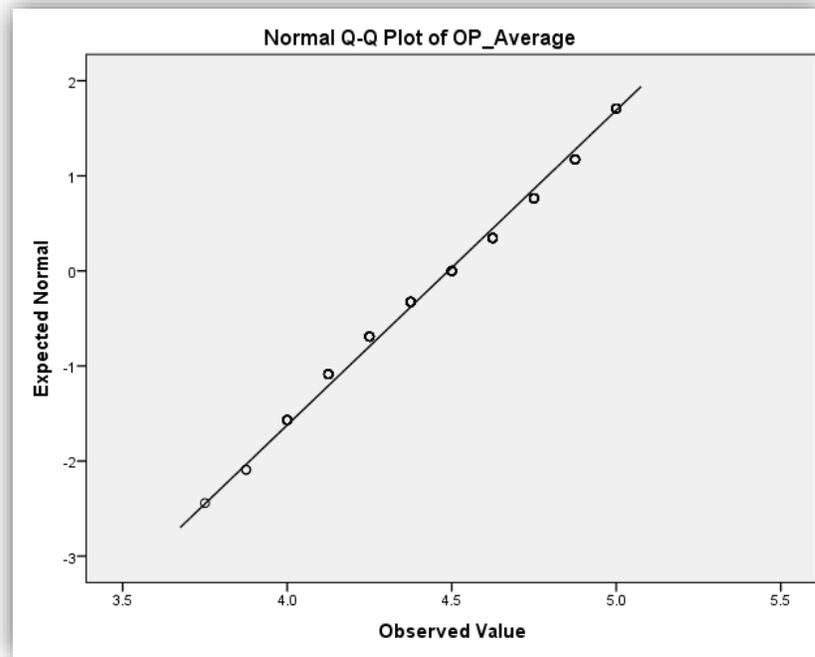
Figure 4. 1: Linearity Test

4.4.2.1.2 Multi-collinearity test

Multi-collinearity test is used to check if the independent variables in the model are strongly associated with each other or not. If independent variables are strongly associated with each other, it means they are essentially measuring the same thing, which can affect the final multiple regression model fitting. Therefore, the result of multi-collinearity test should show no or very small multi-collinearity among the independent variables. In order to be valid for multiple regression analysis. Tolerance of a variable is used as a measure of

collinearity. The result in the table 4.14 below shows that the collinearity between independent variables has no strong association since the value of tolerance for all independent variable is greater than 0.1 (0.3 preferably) (Tabachnick & Fidel, 2001). And all Variance Inflation Factor (VIF) is less than ten (Almaquist *et al*., 2015).

Table 4. 14: Multicollinearity test

Model		Collinearity Statistics	
		Tolerance	VIF
1	Product Quality	0.662	1.510
	Product Size	0.628	1.593
	Product Line	0.676	1.479
	Product Design	0.737	1.357

a. Dependent Variable: OP_Average

Source: Survey data analysis (2020)

4.4.2.2 Multiple linear regression analysis

4.4.2.2.1 Model Summary

Regression model summary is one output of multiple regression analysis that measures the amount of total variation on dependent variable due to independent variable. This table provides the R, R^2, adjusted R^2 and the standard error of the estimate which can be used to determine how well a regression model fits the data.

The study established that there was a strong relationship (R= 0.749) between new product development and the performance of the organization as shown in table 4.15 below. The study also recorded an adjusted R-squared value of 0.548 implying that new product development accounts for 54.8% of the total variance in the performance of biscuit manufacturing companies found in Addis Ababa. In other word, 54.8% of the organization performance can be explained by variation in new product development leaving 45.2% unexplained.

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Table 4. 15: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.749[a]	0.561	0.548	0.20304

a. Predictors: (Constant), PD_Average, PS_Average, PQ_Average, PL_Average
b. Dependent Variable: OP_Average

Source: Survey data result (2020)

4.4.2.2.2 ANOVA Test

Analysis of Variance (ANOVA) was done to verify the goodness of fit of the regression model. If the F ratio is large and probability is less than 0.05 then it is termed statistically significant (Saunders, 2012). The regression model recorded a significance level of 0.000. This implies that the model had goodness of fit and was very ideal for determining how new product development affects the performance of the organization. The regression model in the table 4.16 below had a significance value (p-value) of less than 5% and F - value (41.924) indicating that the model was statistically acceptable and the value of the variation explained by the model is not due to chance.

Table 4. 16: ANOVA

	Model	Sum of Squares	Df	Mean Square	F	Sig.
	Regression	6.914	4	1.728	41.924	.000[b]
1	Residual	5.401	131	0.041		
	Total	12.314	135			

a. Dependent Variable: OP_Average
b. Predictors: (Constant), PD_Average, PS_Average, PQ_Average, PL_Average

Source: Survey data result (2020)

4.4.2.2.3 Regression Coefficients

Beta-coefficient basically measures the variance of dependent variable caused by independent variable in the model. Coefficient of determination explains the extent to which changes in the dependent variable can be explained by the change in the independent variables or the percentage of variation in the dependent variable that is explained by all independent variables (product quality, product size, product line and product design).

As it is shown in the table 4.17 below, there is a positive association between all independent variables and organizational performance, except product line. However, there is a negative association between product line and organizational performance. Besides this, the last column designated by "sig." shows the p-values of all the three new product dimensions are below 0.05 (p<0.05) which means that the association between the three determinant variables (i.e. product quality, product size and product design) and organizational performance is statistically significant. Whereas product line has p-value above 0.05, (p= 0.288), meaning that there is no significant association between product line and organizational performance in biscuit manufacturing companies in Addis Ababa.

The results of multiple linear regressions, table 4.17, revealed that product quality has a positive and significant effect on organizational performance with a beta value (β =.22), at 95% confidence level (p < 0.05). This implies that, a unit increase in product quality will increase the organizational performance by 22%.

Taking all other independent variables at zero the unstandardized coefficient of beta and p-value of product size has positive and significant effect at (β = .215, p < 0.05). This implies that, if product size increase by 1 percent organizational performance will increase by 21.5%.

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Product line has negative and insignificant effect with β = - .056, table 4.17. This implies that when product line decreases by 1 percent then an organizational performance will decrease by -5.6%. p value > 0.05 shows that its contribution to organizational performance is also insignificant.

The findings presented also show that product design has a positive and significant effect on organizational performance with (β = .251), at 95% confidence level (p < 0.05). This implies that, if product design increases by 1 percent organizational performance will increase by 25.1%. By having the highest beta coefficient value product design highly predicts the variation in organizational performance.

Table 4. 17: Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.765	.404		4.364	.000
Product Quality	.22	.042	.37	5.211	.000
1 Product Size	.215	.045	.35	4.797	.000
Product Line	-.056	.053	.075	-1.067	.288
Product Design	.251	.055	.306	4.54	.000

a. Dependent Variable: OP_Average

Source: Survey data result (2020)

Overall, beta values have been used to compare the contribution of each independent variable in order to identify the most significant factors influencing the organizational performance in biscuit manufacturing companies based in Addis Ababa. Hence, product design had the highest influence on organizational performance followed by product quality and product size whereas product line had insignificant effect on organizational performance with a p>0.05. A low p-value (< 0.05) indicates that there is sufficient evidence to conclude that the coefficient does not equal zero. Changes in the predictor (product quality, product size, product line and product design) are associated with changes

in the response variable. Therefore, the estimated regression equation is used to predict the value of organizational performance for any given values (responses) to the independent variables. As interpreted above, for every one-unit increase in product quality, product size and product design there will be an increase in organizational performance by 22%, 21.5% and 25.1%, respectively. Whereas for every one-unit increase in product line there will be a 5.6% decrease in the performance of biscuit manufacturing companies based in Addis Ababa. Constant is basically the intercept. Therefore, the value of constant ($\beta° = 1.765$) cannot be ignored but it does not affect the result in a direct or indirect way. It just shows that even if the independent variable has zero value, there will be still some value of the dependent variable.

The statistical regression equation of the model

$$\mathcal{OP} = \beta° + \beta1\mathcal{PQ} + \beta2\mathcal{PS} + \beta3\mathcal{PL} + \beta4\mathcal{PD} + \varepsilon$$

becomes;

$$\mathcal{OP} = 1.765 + .22\mathcal{PQ} + .215\mathcal{PS} - .056\mathcal{PL} + .251\mathcal{PD}$$

Where; $\mathcal{OP}$ = Organizational performance

$\mathcal{PQ}$ = Product quality

$\mathcal{PS}$ = Product size

$\mathcal{PL}$ = Product line and

$\mathcal{PD}$ = Product design

4.4.3 Discussion of the Findings

The study was conducted with the aim of assessing the effect of new product development on organizational performance in biscuit manufacturing companies based in Addis Ababa. The organizational performance is the dependent variable whereas the new product development is the independent variable of the study measured by four dimensions (product quality, product size, product line and product design). Both descriptive and inferential statistics were conducted to analyze the collected data. Descriptive analysis was computed based on mean and standard deviation for the average values of each variables. The arithmetic mean values show that all the variables scored strongly agree except for product quality, scored agree. Standard deviation results for all variables are homogenous having a result which is not widely dispersed from the mean. Inferential analysis was also computed using Pearson correlation analysis to evaluate the relationship between the variables and multiple linear regression analysis to evaluate the linear relationship between the dependent and the independent variables. Results are discussed as follows;

The value of Pearson correlation coefficient for one of new product development dimensions such as product quality is r=0.495. These result shows that there is a moderate, positive and significant relationship with organizational performance at the level of 0.01. In addition, the regression analysis result shows that product quality have statistically significant values (p=<0.05, i.e. p=0.000) with a positive beta value, β = .22, explaining direct effect on the performance of biscuit manufacturers in Addis Ababa. The results agree with the findings of Udegbe *et al*. (2013) and Nwokah *et al.* (2009) who found out higher impact of this new product development facet on sales volume, profitability and other organizational performance measurements. Joy *et al.* (2013) also proves that there is an existence of positive and significant relationship between higher product quality and the sales growth of an organization.

Product size have a moderately positive relationship with organizational performance with the value of Pearson correlation coefficient r= 0.637 and significant correlation at the level

of 0.01. In addition, the study established that product size, $\beta=$ .215, has statistically significant values with a (p<0.05, i.e. p= 0.000) and a positive beta value explaining its direct effect on the performance of biscuit manufacturers in Addis Ababa. This is different from the findings of Nwokah *et al.* (2009) who found insignificant relationship between product size and organizational performance.

A weak and negative relationship was observed between product line and organizational performance at a Pearson correlation values of r= -0.192. The study also established that product line has statistically insignificant value of (P= 0.288, i.e. p>0.05), with a beta value of $\beta=$ -.056 explaining how the variable affects the performance of biscuit manufacturing companies negatively. These results disagree with the findings of Nwokah *et al.* (2009) in which product development facets of product lines were positively and significantly correlated with the corporate performance indicators of profitability, sales volume and customer loyalty.

A Pearson correlation value of r=0.458 was witnessed between product design and organizational performance showing that there is a moderate, positive and significant correlation (at the level of 0.01) between this dimension of new product development and organizational performance. Product design affects performance of biscuit manufacturing companies positively and significantly with p<0.05, (p= 0.000), with a positive beta value of $\beta=$ .251. This is in agreement with the findings Joy *et al.,* (2013) who studied the effect of product design and quality as independent variable in their research on product differentiation: a tool of competitive advantage and optimal organizational performance. The findings tall with Selam's (2019) research on customer satisfaction in the case of horizon addis tyre. However, it is against the findings of Nwokah *et al.* (2009) who exhibited insignificant relationship between product design versus organizational performance indicators such as; profitability, sales volume and customer loyalty.

Pearson correlation test conducted for each independent variable and dependent variable shows a moderately positive correlation except for product line. All the new product development dimensions except product line have statistically significant values (p<0.05)

which is suitable for explaining the relationship between new product development versus organizational performance and how the selected independent variables affect performance of biscuit manufacturing companies found in Addis Ababa. The model summary revealed that the independent variables explains 54.8% of change in dependent variable. The other factors not studied in this model accounts for 45.2% of changes in the performance of target companies. The model is fit at 95% level of confidence and the F-value is 41.924. Therefore, the overall multiple regression model can be said that statistically significant.

In general, the findings of this thesis are consistent with most and differ from some of the previously constructed empirical researches. The aforementioned results are in agreement with the findings of Benson *et al.* (2015), Udegbe *et al*. (2013), Marcus (2017), Masaku (2017), Joy *et al.* (2013) and partially in agreement with the findings of Nwokah *et al.* (2009) in terms product quality and product lines. However, the findings are partially in disagreement with Nwokah *et al.* (2009) findings in terms of product size and product design versus profitability and sales volume. The findings on this study confirmed or validated the existing body of knowledge, literature and empirical data by revealing that it is one of the fundamental instruments that helps the company to increase sales volume and earn more profit which in turn improve organizational performance. The difference in the result might have been created because the adoption of NPD practice depends on product character, culture aspects and ecosystem of countries or regions where a company operates (Echeveste *et al.,* 2017).

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

This chapter presents summary of findings, conclusion and recommendations drawn from the findings. The chapter also recommends areas that will require further research to enhance greater understanding of the subject area and also highlights limitations of the study.

5.1 Summary of the findings

The main objective of this research is to assess the effect of new product development on organizational performance. Four independent variables (such as; product quality, product size, product line and product design) were identified as NPD dimension and/or success factor. Whereas Perception on profitability and sales volume were identified as a measurement tool for the dependent variable (i.e. organizational performance).

This study started by introducing and discussing the background on the new product development, the problems that drove this research work with raising basic research questions that the research aimed to answer and defined the scope of the research. Conceptual frame work was designed based on the theoretical and empirical reviews of theories and previous studies, respectively. The study is adopted quantitative research approach and descriptive research design with cross sectional field survey. Management, sales and marketing team of biscuit manufacturing firms based in Addis Ababa were the target population of this study in which stratified random sampling techniques were applied to determine the sample size. Primary data collected through structured questionnaire with five-point Likert scale fulfilling the validity, reliability and ethical requirements. Data were

analyzed, interpreted and discussed using descriptive statics (mean and standard deviation) and inferential statics (Pearson correlation and multiple linear regression).

Descriptive statics result shows that respondents strongly agree on the product size, product line and product design on profitability and sales volume. Respondents also agreed that profitability and sales volume is affected by the new product quality of their respective organization. Pearson correlation coefficient result revealed that there is moderate, positive and significant relationship between product quality, product size, product design and organizational performance whereas weak and negative relationship between product line and organizational performance. The multiple linear regression results established that all independent variables have statistically significant value ($p<0.05$) and positive beta value except product line. As per the model summary the cumulative effect of these variable account for 54.8% of the total variance in the firms' performance implying that there are other factors that affecting the performance of biscuit manufacturing firms in Addis Ababa.

5.2 Conclusion

This research aimed to assess the effect of new product development on organizational performance, the case of biscuit manufacturing companies in Addis Ababa. Based on the quantitative analysis; product size, product quality and product design have positive relationship and statistically significant value with profitability and sales volume meaning that any change on those new product dimension will directly affect the profitability and sales volume of the case company which in turn affects the overall performance of the organization. Whereas product line has negative and statistically insignificant relationship. Thus, the study concluded that three of new product development dimensions (success factors) such as product quality, product size and product design positively and significantly affect the performance of biscuit manufacturing companies found in Addis Ababa.

5.3 Recommendation

Based on the major findings of the study, the following activities are recommended for the organization;

- The company should work on improving the new product development indicators that are affecting organizational performance such as product quality, product size and product design through applying and revising all the dimensions under each variable.

- The case company should work on improving the new product quality dimensions such as the new product performance, features, consistency, compliance, durability, and perceived quality continuously through planning, implementing, monitoring and evaluation of the process and products to improve organizational performance.

- The case company should revise, introduce and diversify product size dimensions (i.e. product dimension, product weight, packaging size and packaging strategy) intensively to increase the performance the case organization.

- The case company should revise, update and customize the product design dimension such as the new product composition, the packaging design, labelling and communication and also the overall design of the product through its ease of use continuously in order to cope up the dynamic market environment and improve their performances.

- New product development should be an integral component to the case companies to improve the performance of their organization through investment in research and development to promote the company's superior and further adoption of market responsive strategies to offer companies competitive advantage.

5.4 Future area of research

Since the study only focused on biscuit manufacturing firms found in Addis Ababa, further study on similar industries found in other parts of the country, outside of Addis Ababa, is strongly recommended. The study has highlighted various relevant issues that this research did not cover. Therefore, future researchers are recommended to study similar area using other dimensions of new product development which might affect the performance of an organization. Last but not least, this study has focused on the newly developed products therefore the researcher recommends future researches on new product development practices, process and strategies.

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Appendix

Appendix 1: Questionnaire

RESEARCH QUESTIONNAIRE
JIMMA UNIVERSITY ABH CAMPUS

COLLEGE OF BUSINESS AND ECONOMICS
MBA PROGRAMME

Dear respected respondents;

This questionnaire is designed to collect data from biscuit manufacturing companies to study "The effect of new product development on organizational performance." in partial fulfilment for the award of Master of Business administration. The survey questions expected to take 5 to 10 minutes. Kindly and humbly answer all the questions to the best of your knowledge. Your genuine and honest response are valuable and will have a paramount importance for the successful accomplishment of the study. The information you will provide is intended purely for academic purpose and will remain confidential. Your identity will not be revealed as well.

Finally, I would like to extend my gratitude and appreciation in advance for spending your valuable time in filling out the questionnaire and highly appreciate your timely response.

Regards

Abdulhakim Endris Mohammed

Instruction: Please put a tick (√) mark in the answer box corresponding to your response

1. Name of the Biscuit manufacturing Company? (Optional) ………………………

2. Gender: Male [ ] Female [ ]

3. Age: ≤ 30 [ ],   31-35 [ ],   36-40 [ ],   41 -50 [ ],   51 & Above [ ]

4. Level of education

  college Diploma and below [ ]   Graduate Level [ ]   Post Graduate and above [ ]

      Any other (Please specify) ………………….

5. Work experience?

        Less than 1 year [ ],   1 - 5 years [ ],   6-10 years [ ],   Above 10 years [ ]

6. Job title?   _____

Section II. Effect of New Product Development on Organizational Performance

In reference to your answer for the following questions about the effect of new product development on organizational performance, please indicate the extent to which you agree or disagree with the statements on how each dimensions of product development affecting the organization's performance.   Guideline; 1 = Strongly Disagree, 2=Disagree, 3 = Neutral, 4=Agree, 5=Strongly Agree.

S.No.	New Product Development Dimensions	1	2	3	4	5
A	**Product Quality**					
1	The new product characteristics affects the quality of the company product					
2	The new product feature has improved the quality of the company products					
3	The consistency of the new product improved the quality of the new products					
4	The new product conforms with the standard specification of the company					
5	The shelf life of new products makes company's product preferable					
6	The new products frequently launched meets customers perceived quality					
B	**Product Size**					

S.No.	New Product Development Dimensions	1	2	3	4	5
7	The dimensions of the new product have resulted better performances					
8	The weight the new product has benefitted the company					
9	The new packaging size improved the sales volume					
10	The new packaging strategy designed to meet the need of the target market					
C	**Product Line**					
11	The different types new products enhanced the company performance.					
12	The different variety of new product addresses the customers preference					
13	The category of new product designed to address different target groups					
14	The new products launched frequently updated based on customers demand					
D	**Product Design**					
15	The new product composition makes companies product preferable					
16	The company's' new packaging design is preferable in the market					
17	The new labeling improved the communication with customers					
18	The overall design of the new product has acceptance through its ease of use					

Section III. Organizational Performance

This section contains statements on measuring organizational performance. Please indicate the extent to which you agree or disagree with the statement on each dimensions of new product development towards improvement of organizational performance of your company. Guideline; 1 = Strongly Disagree, 2=Disagree, 3 = Neutral, 4=Agree, 5=Strongly Agree.

S. No.	Organizational Performance Elements	1	2	3	4	5
A	**Perceived profitability**					
1	The new product quality improved the company's profitability					
2	The company's product size boosted the profit					
3	The company's product line enhanced the profitability of the firm					
4	The product design of the company heightened the profit					
B	**Perceived sales volume**					
5	The quality of company's new product increased the sales volume					
6	The new product size improves customers purchasing frequency					
7	The diversity in the product line expands the sales					
8	The product design of the company boosted the sales performance					