

917629

## **Exploring the Effect of Innovation on Leading Technology Firms**

Student number: 917629

Supervisor: Edmund Derbyshire

<b>Statement of Originality</b>	
<p>I hereby declare that this dissertation is substantially my own work.</p> <p>I do not consent to my dissertation in this attributed format (not anonymous), subject to final approval by the Board of Examiners, being made available electronically in the Library Dissertation Repository and/or Department/School/Subject Group digital repositories. Dissertations will normally be kept for a maximum of ten years.</p> <p>I understand that if I consent, this dissertation will be accessible only to staff and students for reference only.</p> <p>This permission may be revoked at any time by e-mailing <a href="mailto:dataprotection@port.ac.uk">dataprotection@port.ac.uk</a>.</p> <p><b>Word count:</b> 6002</p>	
<b>Signature:</b> Mohammad Hakki	<b>Date:</b> 6/6/2021

### **Acknowledgments**

I would like to thank my family and friends for the continuous support that they have provided during these unprecedented times as they really pushed me forward and encouraged me during the composition of this dissertation. I would like to also thank Edmund Derbyshire, my supervisor, for his continuous support, guidance and proper feedback throughout this dissertation. He continuously encouraged me to think outside the box and endeavour new learning techniques.

### **Abstract**

Technological innovation is a significant aspect of an organization's performance for big technology companies such as Amazon and Apple. The application of different innovations in an organization can significantly affect the firm's performance. The study aimed to identify how different types of innovation affect performance of Amazon and Apple companies. The study also wanted to explore how research and development (R&D) enhance innovation in Apple and Amazon companies. The study identified that product, process, marketing, and organizational innovation affect overall organizational performance. Among the four innovation types, product and process innovation significantly impact the firm's productivity, leading to improved profitability. Innovation is identified as the most driving force for the overall firm's performance. Besides, research and development are critical to organizations that seek future growth. It allows organizations such as Amazon and Apple to find new technologies that can improve their performance and increase customer satisfaction. In essence, R&D enables organizations to cope with the dynamic business world in the highly competitive global markets. However, the study recommends future research on specific impacts of these four types of innovation that affect overall firm performance.

**Keywords:** Innovation, improved productivity, improved competitiveness, firm performance.

## Table of Contents

<b>Abstract.....</b>	<b>4</b>
<b>1.0 CHAPTER ONE: INTRODUCTION.....</b>	<b>7</b>
<b>1.1 Research Background.....</b>	<b>7</b>
<b>1.2 Statement of Research Problem .....</b>	<b>8</b>
<b>1.3 Research Objectives.....</b>	<b>9</b>
<b>1.4 Rationale .....</b>	<b>9</b>
<b>2.0 LITERATURE REVIEW .....</b>	<b>10</b>
<b>2.1 Introduction.....</b>	<b>10</b>
<b>2.2 Underlying Theory: Theory of Technological Determinism.....</b>	<b>10</b>
<b>2.3 Types of Innovations.....</b>	<b>12</b>
2.3.1 Product Innovation.....	12
2.3.2 Process Innovation .....	13
2.3.3 Marketing Innovation.....	14
2.3.4 Organizational Innovation .....	15
<b>2.4 How Research and Development (R&amp;D) Enhance Innovation.....</b>	<b>16</b>
<b>2.5 Research Gap .....</b>	<b>17</b>
<b>3.0 CHAPTER THREE: RESEARCH METHODOLOGY .....</b>	<b>18</b>
<b>3.1. Theoretical Element.....</b>	<b>18</b>
<b>3.2. Methods.....</b>	<b>19</b>
<b>3.3. Ethical Consideration .....</b>	<b>20</b>
<b>4.0 CHAPTER FOUR: RESULTS, DISCUSSION, AND ANALYSIS.....</b>	<b>20</b>
<b>4.1 Chapter Overview .....</b>	<b>20</b>
<b>4.2 Discussion of Major Findings .....</b>	<b>20</b>
4.2.1 Product Innovation.....	21
4.2.2 Process innovation .....	22
4.2.3 Marketing Innovation.....	23
4.2.4 Organizational Innovation .....	24
4.2.5 How Research and Development Enhance Innovation in Big Technology Companies .....	25

<b>4.3 Factors Influencing Effectiveness of Innovations .....</b>	<b>26</b>
<b>4.3.1 Product Innovation .....</b>	<b>26</b>
<b>4.3.2 Process Innovation .....</b>	<b>27</b>
<b>4.3.3 Marketing Innovation.....</b>	<b>28</b>
<b>4.3.4 Organization Innovation .....</b>	<b>29</b>
<b>5.0 CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS .....</b>	<b>30</b>
<b>5.1 Conclusion .....</b>	<b>30</b>
<b>5.2 Recommendations and Further Studies.....</b>	<b>31</b>
<b>References .....</b>	<b>32</b>
<b>Appendix.....</b>	<b>42</b>

## **Exploring the Effect of Innovation on a Firm through Technology**

### **1.0 CHAPTER ONE: INTRODUCTION**

#### **1.1 Research Background**

Technology has been increasingly changing every day, with new aspects added on the existing and new changes enhanced in this sector. Technological advancements have been one of the primary strategies that help big firms in the world to enter new markets and gain significant market share. According to Sambrook, Rowley, & Baregheh (2009), innovation introduces new ways and things in society to further humanity's progress. Innovation is a critical aspect since it helps solve problems and enable firms to adapt to the dynamic business world, among other elements (Sambrook, Rowley, & Baregheh, 2009). In this dynamic business world, organizations can struggle significantly to achieve the intended performance levels without innovations, which may hinder companies from gaining a competitive edge (Anderson et al., 2014). Four types of innovation implemented by most organizations include product innovation, process innovation, marketing innovation, and organizational innovation. Therefore, this analysis will focus on how these innovations impacts Apple and Amazon overall performance.

These four innovation types have been a considerable part of the manufacturing sector by helping big companies increase their competitiveness (Lima & da Silva Müller, 2017). Also, Bach et al. (2019), contend that since technological innovations are closely related to firms' performance, this topic has become an exciting area for researchers. This research will explore the product, process, marketing, and organizational innovations and their impact on overall performance of Amazon and Apple. It will connect the significance of these four types of innovation and make companies achieve their competitive advantage.

## **1.2 Statement of Research Problem**

Many organizations worldwide have not identified and acknowledged technological innovation's significance, especially technology firms. It is implied that these firms have not seen the importance of applying important policies in their workplace to trigger innovations among employees at the economic level (Rajapathirana & Hui, 2018). A significant indicator of the lack of acknowledged technological advances in most firms is their poor market performance, both locally and internationally (Chae et al., 2019). Contrarily, Chae et al. (2019), reveal that these four types of innovation are usually connected to an improved firm's performance at the economic level, marked by increased productivity, increased firm's competitiveness, value creation, and enhanced overall corporate performance. Many studies focus on specific aspects involved in technological innovation, leaving some critical elements. For example, most researchers have focused on technological innovation on employee satisfaction (Flor et al., 2019).

A lack of significant research on the impact of innovation on firms is one of the critical factors that have caused reduced awareness of the different types of innovation's significance on firms as whole but not specific elements (Müller et al., 2018). Most firms in the market value technological innovation as a tool for improving progress and products rather than enhancing a firm's growth through effective strategies (Foley, 2018). Rauter et al. (2019), states that limited number of studies have focused on the innovation's impact on a firm's performance, creating a significant research gap that will make part of this study's focus to build a bridge. Therefore, this study will focus on the effect of the different types of innovation on a firms' performance



globally and their significance in creating a competitive advantage. The study will focus on specific aspects such as productivity, competitiveness, value creation, and enhancing corporate performance in the market.

### **1.3 Research Objectives**

RO1: To explore the impact of technological innovation on technology firms, specifically on Apple and Amazon.

RO2: To determine whether innovation can help develop a successful business and its efficiency and effectiveness in Apple and Amazon.

The study will focus on two specific questions as a way of answering the broad question.

RQ1: How can different types of innovation help optimize the overall performance in leading technology firms like Apple and Amazon?

RQ2: To what extent can research and development (R&D) enhance innovation in leading technology firms like Apple and Amazon?

### **1.4 Rationale**

Various aspects have triggered this research focusing on Amazon and Apple as the main context for the study. Therefore, the study wants to identify how Amazon and Apple can use technological innovation in the four perspectives to improve their overall performance and competitiveness in the available markets. It is essential to examine a firm's overall performance for this context because it increases awareness concerning the general importance of technological innovations in firms. Mainly, it would provide important information that would

help all firms provide practical consequences to enable managers to increase their efforts and focus on innovations as an essential tool for strategic growth.

## **2.0 LITERATURE REVIEW**

### **2.1 Introduction**

Innovation has become a critical aspect of everyday life and has caused significant impacts on many firms across the globe. Today, technological innovations enhance company growth and the economy by developing new changes for organizations and the workforce (Asensio-López et al., 2019). Therefore, this chapter presents some of literature analysis related to Apple and Amazon's innovative performance.

### **2.2 Underlying Theory: Theory of Technological Determinism**

Thorstein Veblen developed the technological determinism theory as one of the significant economic philosophies in its structural performance (Dafoe, 2015). It explains factors that help technological innovation to enhance culture or society. The theory's primary argument is that technology defines human factors' outcomes and performance in any natural context. The theory can apply in research to explain how technology affects business performance in the business context as a culture adopted by technological firms, such as Apple and Amazon (Tou et al., 2019). Nevertheless, Sherman (2019), argues that while technological innovation provides some positivity to an organization, it has some numerous drawbacks. For example, Sherman (2019), mentions that many organizations are using the available technology to develop similar products.

Such an act forces organizations producing quality products sell their products at a throw away price.

One of the factors associated with technology in improving a firm's outcomes in a specific cultural context is increased production capacity (Tou et al., 2019). Technology determinism theory explains that technological progress improves performance by influencing a company to become an industrial capitalist society by developing new production ways. According to the theory, technical information is a considerable aspect of society since it reduces unpredictable and uncertain implications (Gatautis, 2017). Moving from uncertainties indicates that technology has played a significant part in identifying new solutions, allowing firms to achieve differentiation and achieve a competitive edge.

Value creation is another significant factor that helps define technology's role in improving outcomes in a particular cultural context. According to the theory, it implies an overall reputation change (Tang et al., 2018). Technology is an effective tool for improving outcomes in a particular cultural setting through enhanced corporate performance. It explains that technology influences change using various levels in that specific context (Tang et al., 2018). According to this research, the technology uses several levels to influence change in the selected cultural context. Therefore, technology determinism theory is significant in helping to understand the issue addressed by this study.

## **2.3 Types of Innovations**

These large companies' innovations include product, process, marketing, and organizational innovations (Canh, 2019). Product innovation refers to creating new products, changing the existing ones' product design, or using new components when manufacturing an established product. It aims at developing new products, improving quality, and enhancing a product's overall performance (GutCheck, 2019). Process innovation refers to technological advancements in facilities, internal skills, technologies utilized, and the delivery of products and services (Innovating Society, n.d.). Marketing innovation refers to deploying new marketing techniques associated with project changes, packaging, product distribution, promotion, or product pricing strategies (CEO Pedia, 2019). Finally, organizational innovation refers to implementing new methods in the business practices, organization of the workplace, or creating relations with external partners (Demircioglu, 2016).

### **2.3.1 Product Innovation**

According to Ghelber (2019), product innovation involves new ways that organizations use to solve problems that face many customers. In some cases, there may be a gap that needs new products, or at times a product in the market by other firms or the same firm require advancement. In this case, product innovation is critical since it would allow the company, such as Apple and Amazon, to develop a new product that could serve customer needs or improve the market's existing product by bringing it differently. Some factors are critical and need consideration when undertaking product innovation (Boon & Edler, 2018). First, it is necessary to determine if the product is relevant for countless customers. It applies significantly in new

products that address contemporary issues. Again, the firm undertaking the product innovation should consider whether the product is better than the one provided by competitors. It applies well in product advancement for products in existence (Boon & Edler, 2018). It involves considering product design, usability, and technology, among others. Finally, the firm should consider this aspect because it helps in product launch.

Product innovation is a critical aspect since it can help a firm create new niches in a crowded market. Also, product innovation is not meant to create an entirely new product to serve completely new market problems (Boon & Edler, 2018). For instance, Apple made the first iPhone in a previously non-existing market, which led to the satisfaction of existing customer needs (Pérez & Molina, 2017). Additionally, Apple improved its iPhone cameras' quality in iPhone 11 Pro, marking a product innovation move (Ghelber, 2019). Also, this implementation led to new demands that customers did not know existed in them. Besides, Amazon re-invented Kindle using new models like the introduction of the touchscreen. Therefore, innovation may occur when a company improves an existing product or add new features to the same product.

### **2.3.2 Process Innovation**

Process innovation is a critical aspect for Amazon and Apple. Process innovation focuses on improving the technologies and facilities involved in production and product or service delivery by improving internal operations rather than the production process's external parts (Mikalef &

Krogstie, 2020). Process innovation leads to reduced costs in the production process and a decline in production time (Innovating Society, n.d.). Apple and Amazon can venture into this innovation by finding new ways of improving their production process to increase productivity and value creation (Guo, Paraskevopoulou, & Santamaria, 2019). These companies can improve their technologies within the production process. Nonetheless, this would involve using new technologies such as artificial intelligence and the Internet of Things to enhance the entire process's production process.

### **2.3.3 Marketing Innovation**

Marketing innovation refers to the several ways firms use to create and launch new products in the market (Ungerman, Dedkova, & Gurinova, 2018). Ideally, this innovation helps firms to find new ways of growing their companies. Since customer needs are dynamic, marketing innovation plays a critical role in technology companies, among other firms (Three-Barins.com, n.d.). Contrarily, marketing innovation creates a broad range of outcomes for companies. Different marketing innovation systems can help technology firms such as Apple and Amazon. Amazon can apply marketing techniques to launch a product and present it to the customers in a unique way (Arnett, Goldfinch, & Chinta, 2018). Marketing innovation helps to develop new markets and develop a broad customer base in the markets they operate.

Amazon can find new markets like entering a new country to offer its services. Besides, Apple can find new markets where its products do not exist. In this way, these companies can create an increased customer base. Diversification is another critical market innovation that can help Amazon and Apple increase customer base and sales. It is categorized in Ansoff's matrix, which

involves pursuing new markets and products (Three-Barins.com, n.d.). Diversification could benefit these companies by allowing them to provide a wide range of products in the market to maximize their sales. Although diversification is the riskiest marketing innovation, it yields more outcomes than other processes (Mergel, 2015). For instance, Apple adds on its products to provide cloud storage services, which helps the firm increase its market. Cloud computing attracts new customers thereby increasing sales. Besides, since Amazon operates numerous online shops, it can add up on the existing products by developing a new product and include it in the shops to attract new customers.

#### **2.3.4 Organizational Innovation**

Demircioglu (2016) defined organizational innovation as implementing new methods in business practices, organization of the workplace, or creating relations with external partners. Organizational innovation helps companies save money, time, and internal resources, leading to a competitive advantage over the competitors. Most companies are taking advantage of organizational innovation through artificial intelligence (AI), process automation, cloud computing, and open office, among others (Jovana, 2019). AI helps companies reduce costs and improve productivity when it comes to these aspects (van der Aalst et al., 2019). Most technology companies such as Amazon and Apple use AI technologies to streamline the production process and improve their productivity. For instance, Apple uses AI, which has increased its efficiency by helping workers predict customers' preferences in the market, leading to improved customer experience with its products (Alam et al., 2019). This technology enables these companies to enhance sustained customer service.

According to Jovana (2019), organizational innovation can lead to improved quality and enhanced customer service. It is critical for these technology companies because they operate in a highly competitive market that requires continuous innovation (Arruda Filho et al., 2019). Organizational innovation helps companies produce improved products, processes, and other operation methods (Jovana, 2019). It would help Amazon and Apple to increase their productivity. However, organizational innovation is challenging and depends on several factors, such as the strategies adopted by a company and corporate culture. Besides, the market within which an organization operates plays a critical part in enhancing organizational innovation. Organizational innovation is also closely related to process and product innovations (Höflinger et al., 2018). Organizational innovation also goes hand in hand with technological innovation since it triggers the company's adoption of new technologies (Alam et al., 2019). Therefore, organizational innovation would help Amazon and Apple develop these new processes to improve their productivity and sustainability in the market.

#### **2.4 How Research and Development (R&D) Enhance Innovation**

According to Ross (2019), research and development (R&D) is a critical part of a company that focuses on developing knowledge for product development, design, and enhancing the existing products and processes. On the other hand, Akcali & Sismanoglu (2015) contends that R&D allows firms to identify new technologies and methods that help in improving a firm's operations. It leads to improved processes, such as cutting on marginal costs and increasing productivity, which outweigh competitors. According to Ross (2019), R&D helps develop and gain a competitive advantage by identifying processes that are not easily replicated by rivals.



R&D leads to the development of new products or services, especially in technology and computing companies.

## **2.5 Research Gap**

Although numerous studies have discussed the featured innovations: product, process, marketing, and organizational innovation, there still lacks a clear link between these types of innovation and overall organizational performance. Most of them focus specifically on the organization's identified areas but do not analyze how these innovations affect the general firm's operations and performance. For instance, marketing innovation analyzed by most studies illustrates how this type of innovation affects positioning and product acceptance but fails to identify how the invention can affect a firm's internal operations. (Boon & Edler, 2018). This research aims to fill this gap with detailed information on the effects of the four types of innovation on overall organizational performance due to this identified difference. The study will provide a detailed analysis of how each type of innovation affects specific areas and how it transforms to the overall organizational effectiveness to justify its significance in Amazon and Apple.

### 3.0 CHAPTER THREE: RESEARCH METHODOLOGY

#### 3.1. Theoretical Element

<b>Theoretical Element</b>	<b>Definition</b>	<b>Application</b>
<b>Approach: Deductive</b>	The research will use a deductive approach to develop hypotheses based on an existing theory and design a research strategy to test the hypotheses (Pandey, 2019).	This approach is typically associated with scientific investigation. The main advantage of using deductive reasoning in this research is that it can explain the causal relationship between variables and concepts (Ruggiano & Perry, 2019). However, the approach may limit creativity because it relies on assumptions that all disciplines in natural phenomenon work simultaneously.
<b>Philosophy: Positivist</b>	This research philosophy implies that the social world is understood objectively, and scientists dissociate themselves from personal values and independent works (Kock et al., 2017).	With this research philosophy, genuine knowledge is positive and derived exclusively from the experience of the natural environment and its relations and properties. The positivist approach applies directly to this research because it is a method of gaining empirically-based knowledge.
<b>Method: Action Research</b>	Action research is often used to improve practice, evaluate, and provide critical reflection. The research will involve an inquiry by developing or drawing the findings of other researchers to interpret consequences.	This methodology approach was chosen to help the research develop a new knowledge related to the topic being investigated. The research will focus on collection of information at regular intervals, which mean that it will focus on longitudinal time horizon. This approach would allow the researcher to look at changes over time.

### 3.2. Methods

This study aims at identifying how some technological aspects employed at Apple and Amazon helps them thrive in the current competitive markets. Therefore, the analysis will use descriptive research design, a qualitative design to identify how Apple and Amazon employ the product, process, marketing, and organizational innovations to remain viable in the current technological universe. The research design will depend on secondary sources such as Apple and Amazon's websites to acquire adequate information concerning the given topic.

According to an Allen (2017) secondary data helps researchers gain first-hand information about a particular company or organization under study. Additionally, Sileyew (2019) concurs that secondary data sources are available incredible websites, governmental records, a company's journals, and online publications. According to (Learning & University Libraries, 2015), secondary sources are important because they are always readily available.

This method has been chosen because it will provide adequate information concerning the product, process, marketing, and organizational innovation for Apple and Amazon companies for the analysis to achieve the critical objectives. By focusing on a quantitative approach, the research will review previous journals, articles, publications, books, technical trade journals, business documents, statistical documents, public records, and records regarding Apple and Amazon's business activities. The advantage of using secondary data is that it will reduce the cost of other resources being used to gather information. (Cypress, 2018).

### **3.3. Ethical Consideration**

The most important part of this research is an ethical consideration that will ensure the research has followed all guidelines and principles of conducting a study. Relying on secondary data is a highly ethical practice because it maximizes the value of an investment in data collection. It reduces the burden of respondents' inclusion and ensures replicability of the results. Therefore, this research must exhibit greater transparency of secondary research procedures and integrity (Ruggiano & Perry, 2019). The value of using secondary data will only be realized if the benefits outweigh the risks, such as disclosure of crucial information and re-identification of individuals. Hence, to achieve this value in this research, the researcher must meet four primary ethical conditions. First, data must be re-identified before they are released. Second, the consents of the companies involved can be reasonably presumed. Third, the results of this study must not allow re-identifying the companies involved. Fourth, using data from the companies must not result in damage to reputation or cause distress.

## **4.0 CHAPTER FOUR: RESULTS, DISCUSSION, AND ANALYSIS**

### **4.1 Chapter Overview**

The literature review provided some relevant sources for this study that helped explore the significance of four innovation types. A detailed analysis of the existing data will provide a synthesis of the information.

### **4.2 Discussion of Major Findings**

Innovation is regarded as one of the most significant aspects that create competitive advantage in a widely changing business environment (Atalaya, Anafarta, & Sarvanc, 2013). Many organizations have regarded innovation as a differentiation tool, which creates a competitive

edge. Innovation leads to improvements in a company's products and processes, creating continuous advancements that make a firm achieve faster and efficient growth and mainly increase profitability than non-innovators.

#### **4.2.1 Product Innovation**

The impact of product innovation is widely identified in the overall firm's performance. Product innovation affects the firm's profitability, both in the short-term and long-term (Stoneman, Bartoloni, & Baussola, 2018). Profitability is a significant aspect of organizational performance. Organizations usually focus on increasing their profitability in the regular part. Product innovation is closely related to R&D and patents, determining the firm's market value (Boon & Edler, 2018). A firm's value is a significant feature that presents an organization's reputation and position in the market. The effect of innovation on productivity is illustrated by the responsiveness of a company's productivity to the innovative sales share. Besides, product innovation determines the intensity and extent of a firm's competitiveness in foreign markets. It significantly affects a company's market value due to introducing new products (Stoneman, Bartoloni, & Baussola, 2018).

Another research conducted by Su & Tang (2016) identified that firms that focus on product innovation tend to become more productive than those focusing on cost-cutting. Although there is not enough evidence to support the difference between these two aspects, product innovation usually increases productivity, leading to overall profitability. Product innovation has helped many technology firms such as Amazon and Apple improve their overall productivity and profitability. For example, Apple developed iPhones that replaced mobile phones, which

increased its sales and revenues in 2015 by \$155 billion from previous year's sales (Mullaney, 2016). The product also constitutes two-thirds of the firm's overall revenue. It indicates that product innovation can lead to improved firm performance. It leads to increased sales revenue and subsequent profitability to the firm, improving its financial position.

Su & Tang (2016) stated that product innovation involves the use of R&D and adopting advanced technologies in a firm to generate knowledge. These activities cut across the entire firm and include managerial methods, organizational practices, and other significant methods (Su & Tang, 2016). According to the study, productivity is a considerable force that enhances competitiveness. Firms that adopt product innovation, such as Amazon and Apple, usually achieve increased productivity (Su & Tang, 2016), making them more competitive in the market. Product innovation is, therefore, a significant contributor to firm performance.

#### **4.2.2 Process innovation**

Process innovation is a significant aspect of a firm since it leads to a positive and significant impact on a firm's productivity increase (Belgur, 2020). The improvement of the facilities and technologies used in the production process causes increased productivity of the overall firm's output. In the same case, technological advancement within the firm involves changing technologies to new ones that will improve product quality (Vivero, 2010). High-quality products would lead to increased sales and customer satisfaction. Ideally, high quality product is achievable by involves improving the product features that will cause a significant sales volume and subsequent profitability increase (Majed et al., 2018). Since most firms, such as Amazon and Apple, focus on improving their profitability to increase their reputation, achieving improved

profits is a significant mark of their overall performance. Process innovation helps in improving internal processes, which transforms to increased productivity of the firm (Mooi, Rudd, & de Jong, 2020). In the same case, process innovation leads to reduced production costs and reduces the time taken for the production process to complete (Mooi, Rudd, & de Jong, 2020). Amazon uses process innovation by using new technologies in their production process, which leads to reduced production costs and overall profitability (Connelly, n.d.). Many firms, including these two, usually use these technological advances to eliminate barriers that hinder particular products' consumption. Therefore, Process innovation is a critical driver of enhanced firm performance since it helps companies improve their internal processes that enhance product quality and enhance productivity.

#### **4.2.3 Marketing Innovation**

Chen (2020) defined marketing innovation as implementing new marketing approaches that significantly differ from the company's previous methods and have not been used before in the same company. A study conducted by Handoyo (2016) concluded that marketing innovation has a significant impact on a firm's competitive advantage. It translates to the fact that marketing innovation affects the marketing outcome since it affects the marketing approaches leading to improved marketing performance. Twin (2021) stated that competitive advantage refers to those specific factors that allow a firm to produce goods and services more effectively than its competitors. Other results obtained from Gupta, Malhotra, Czinkota, & Foroudi (2016) indicated a significant relationship between a brand and its resellers. The researchers stated that the positive relationship leads to a competitive market. The authors also concluded that marketing innovation leads to brand building, which translates to competitive advantage. Marketing

innovation involves presenting a product to the customers uniquely than the competitors, creating a brand image in the market.

Chandrakhanthan & Karthika (2019) stated that innovation is undertaken to create a competitive advantage over the rivals, which allows the firm to attain a superior position over the competitors. Marketing innovation is significantly used by big firms, such as Amazon and Apple, to position their products in customers' minds. It is significant to note that a firm becomes more competitive when it presents a product more differently and effectively than other companies operating in the same market. For example, Apple has been one of the most outstanding marketers all through (Moorman, 2018). Marketing innovation has enabled Apple to stay at the forefront of other firms in the market by creating a competitive advantage over its rivals. Besides, Amazon also applies marketing innovation that keeps it in the frontline of the market. It uses a high runner strategy to present its products in the market, which uses data on the products in the highest demand in each of its categories (Baldwin, 2020).

#### **4.2.4 Organizational Innovation**

Organizational innovation involves implementing new methods within an organization that affects business practices, the workplace organization, or how a firm relates to other entities outside it. The organizational work environment contains three critical features: motivation to innovate, organizational orientation towards innovation, and supporting creativity and innovation (Gunday, Ulusoy, Kilic, & Alpan, 2018). This innovation affects the organizational structure of a company. Organizational that adopt organizational innovation usually support their employees



to continue innovating by motivating them. Continued innovation motivation to employees leads to new ideas in the organization that may improve firm performance since it would lead to improved quality and uniqueness (Purcell, 2019). If a firm presents unique products in the market that serves customer needs, they would likely gain more market share and improve their performance in the industry.

Additionally, organizational innovation incorporates an organizational structure that supports innovation. It leads to creating an innovative environment by supporting a corporate culture that includes innovation as a critical aspect of the organization. Organizational innovation supports creativity in the organization, causing improved innovation. Innovation leads to enhanced competitiveness (Gunday, Ulusoy, Kilic, & Alpkan, 2018), which would allow Apple and Amazon to create uniqueness in the market, increasing their effectiveness in the industry.

#### **4.2.5 How Research and Development Enhance Innovation in Big Technology Companies**

Research and development (R&D) form a significant part of an organization's operations by seeking knowledge for developing, designing, and enhancing products, services, technologies, and internal processes (Ross, 2019). Apple and Amazon are known for their increased adoption of R&D for future growth. Amazon has invested heavily in R&D, which it sets to achieve future growth (Loeb, 2018). R&D provides innovative ways for companies that transform to future benefits. R&D allows for experimentation that makes customers get obsessed with making purchase decisions (Dolata, 2017). User-driven innovations have led to increased internet advancement that improves innovation resources for Amazon (Watanabe & Tou, 2019). Research and developments have, therefore, led to improved performance of Amazon and Apple.

However, Kylliäinen (2019), contends that research and development enables companies to create a competitive advantage as it leads to an improved connection between the current situation and the desired one, leading to innovation.

### **4.3 Factors Influencing Effectiveness of Innovations**

While the mentioned innovation plays an integral part in an organization, some may fail to operate if implemented. Ideally, there are numerous reasons why executed innovation might fail. Among the reasons, poor decision-making is the main challenge affecting the effectiveness of an invention. Therefore, this section identifies why the proposed innovations may not provide better performance for Apple and Amazon.

#### **4.3.1 Product Innovation**

While product information is essential for Apple and Amazon, creating new products may be challenging. Product developers of Apple and Amazon face unique challenges. These challenges are; organization's policy, external factors, and economic shifts. According to Boon & Edler (2018), competition is among the vital problem new products face. The researchers maintain that organizations such as Apple and Amazon face challenges when introducing new developments due to the ever-changing technologies. Mainly, these organizations face such challenges because they have different price tags on the latest product.

Time pressure is the main problem affecting new product innovation in Apple and Amazon. Boon & Edler (2018) reason that many companies compete on new product development cycle time to introduce their products to the markets before another organization presents the same

product. The authors also contend that due to fixed time diverse organization set on achieving something, they must ensure that the product is ready by the proposed date to reduce competitions from other institutions who develop the same product (Boon & Edler, 2018). Also, if organizations exercise time pressure, they may make choices that threaten the product's effectiveness. Hence, they may lack proper markets that accept their goods and services.

#### **4.3.2 Process Innovation**

While process innovation assist Apple and Amazon identify a framework that implements the development of new products, it also has some underlying challenges. An analysis by Tsinopoulos et al. (2017) reveals that process innovation may be difficult and costly if people lack enough experience and knowledge. Therefore, the researcher argues that for people to have adequate information on process innovation, they should identify the consequences of product assessments, a proper plan, and product needs to help developers create processes that ensure a product is effectively implemented. If managers lack knowledge and experience on various process innovation, it would be difficult for them to identify some of the risks related to a particular process (Tsinopoulos et al., 2017). Technology is an essential aspect for Apple and Amazon since it allows them with varied ways of implementing process innovation. Also, diverse technology will make sure that institutions achieve set goals and objectives through various process innovations. Majed et al. (2018) reason that if companies introduce new technologies to help process innovation, they should identify proper planning that guarantees effective innovation operations.

Lack of governance is a significant problem affecting process innovation in Apple and Amazon. If there is no process control or governance, management failures may become an underlying issue. Research by Asensio-López et al. (2019) reveals that the primary process innovation issue emerges when developers do not take enough time to identify the practical process that can help an organization use a suitable technique to perform a function. Also, when an institution has poor governance, it may be challenging for them to implement a practical process innovation (Arruda Filho et al., 2019). Therefore, for managers to ensure that governance is not an underlying problem, they need to select developers who create processes that will be implemented easily.

#### **4.3.3 Marketing Innovation**

Marketing innovation is important because it enables a company to identify new marketing methods. Even though marketing innovation plays an integral role in the Apple and Amazon, some problems affect its efficiency. Brown (2020) maintains that various circumstances make marketers face problems while implementing innovations. According to Gupta et al. (2016), if these organizations overcome these challenges, they can reach their targeted audiences. Achieving the target population is not easy, but with the correct tools and experience, marketers can identify essential innovations that can make their products unique and attract more customers.

The main problem affecting marketing innovation includes proper communication with employees (Brown, 2020). Poor communication within an institution can lead to misinterpretation of marketing technologies; therefore, Apple and Amazon cannot identify the best way of marketing their products to their consumers. Additionally, poor communication in an

organization leads to inconsistencies in developing unstable marketing tools that do not track the targeted consumers (Brown, 2020). Therefore, Apple and Amazon need to implement proper communication because it creates an understanding that helps identify the target markets. On the other hand, it leads to teamwork practices that help identify underperforming and successful market channels.

#### **4.3.4 Organization Innovation**

Organization innovation is essential because it helps Apple and Amazon institutions introduce an idea that makes them stand out from other organizations. The main factors that drive innovation in an organization underperform are mainly internal and external factors (Inegbedion et al., 2020). One of the main internal factors that affect Apple's and Amazon's innovation is the connection between employees and managers. When managers and their workers do not understand them, the main activities can suffer a significant blow (Inegbedion et al., 2020). Mainly, misunderstanding in a workplace can be challenging to introduce effective technology because no one will maintain it effectively. According to Sherman (2019), managers need to develop essential techniques that help them handle underperforming employees because they can affect an institution's performance. Additionally, suppose there is an introduction of new technologies (Höflinger et al., 2018). In that case, a manager should teach their employees of implementing and using the available technology to improve the organization's efficiency and increase the number of consumers.

## **5.0 CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS**

### **5.1 Conclusion**

The study's primary purpose was to determine the effectiveness of the different innovation types in optimizing overall performance in leading technology firms such as Apple and Amazon. Besides, it aimed to determine how research and development (R&D) enhance innovation in these firms. The research found that the different innovation types, including product, process, marketing, and organizational innovations, significantly affect organizational performance. Product, process, and marketing innovations lead to improved competitive advantage. Firms that adopt product innovation provide new products in the market that expand their offerings, leading to increased sales revenue. It leads to increased profitability of the firm, which provides an overall benefit to it. Apple has been adding on its existing products by developing new products, which has led to increased market share and sales, transforming to increased profitability. In the same case, process innovation leads to increased profitability due to the change in internal processes and technologies through innovative skills. Marketing innovation allows firms such as Amazon and Apple to present their products uniquely, influencing customer perception and building brand image that leads to the entire firm's competitive advantage. The study also found that organizational innovation supports innovation in firms by providing conducive environments for innovation through organizational structure, which leads to improved productivity and overall firm performance. Finally, research and development would enhance innovation in Apple and Amazon, among other big firms, by creating room for discoveries and improvements.

## **5.2 Recommendations and Further Studies**

The study recommends that innovation is a critical aspect for any business, both big and small companies. A recommendation recognizes innovation to allow a company to achieve growth more rapidly than any other growth strategy. Most people in the world look for new technologies that require innovation to attract customer attention. Technological advancement has made many people shift from traditional methods to modern approaches. Big technology firms should be at the forefront of identifying technologies as they are well known to suit and attract more customers when compared to other industries and they are also known to achieve sustainable competitiveness in the market. The study also recommends firms, both small and big to adopt R&D as a means of identifying new technologies that would lead to uniqueness and improved customer experience. Finally, there is a need for further study on specific constructs affected by the four innovation types that transmit to overall firm performance. Besides, the study recommends a further study on how small businesses could use innovation to attain growth and overall performance, considering the limited ability for significant investments and R&D.

## References

- Abutabenjeh, S., & Jaradat, R. (2018). Clarification of research design, research methods, and research methodology. *Teaching Public Administration*, 36(3), 237–258. <https://doi.org/10.1177/0144739418775787>
- Akcali, B. Y., & Sismanoglu, E. (2015). Innovation and the Effect of Research and Development (R&D) Expenditure on Growth in Some Developing and Developed Countries. *Procedia - Social and Behavioral Sciences*, 195(100), 768–775. <https://doi.org/10.1016/j.sbspro.2015.06.474>
- Allen, M. (2017). *Secondary Data*. Sagepub.com. <http://methods.sagepub.com/Reference//the-sage-encyclopedia-of-communication-research-methods/i13206.xml>
- Anderson, N., Potočník, K., & Zhou, J. (2014). Innovation and Creativity in Organizations. *Journal of Management*, 40(5), 1297–1333. <https://doi.org/10.1177/0149206314527128>
- Arruda Filho, E. J. M., Muylder, C. F. D., Cançado, A. C., Dholakia, R. R., & Paladino, A. (2019). Technology Perspectives and Innovative Scenarios Applied in the Amazon Region. *Revista de Administração Contemporânea*, 23(5), 607–618. <https://doi.org/10.1590/1982-7849rac2019190303>
- Arnett, J., Goldfinch, B., & Chinta, R. (2018). Multi-Dimensional Nature of Innovation at Amazon. *International Journal of Business Innovation and Research*, 15(1), 1-13.
- Asensio-López, D., Cabeza-García, L., & González-Álvarez, N. (2019). Corporate governance and innovation: a theoretical review. *European Journal of Management and Business Economics*, 28(3), 266–284. <https://doi.org/10.1108/ejmbe-05-2018-0056>



- Atalaya, M., Anafarta, N. & Sarvanc, F. (2013). The Relationship between Innovation and Firm Performance: An Empirical Evidence from Turkish Automotive Supplier Industry. *Science Direct*. pp. 226-235.
- Bach, T. M., Dalazen, L. L., da Silva, W. V., Ferraresi, A. A., & da Veiga, C. P. (2019). Relationship between Innovation and Performance in Private Companies: Systematic Literature Review. *SAGE Open*, 9(2), 215824401985584. <https://doi.org/10.1177/2158244019855847>
- Baldwin, G. (2020, March 9). A Guide to Amazon Marketing in 2021. *Omniretail.com*. <https://www.omniaretail.com/blog/a-guide-to-amazon-marketing>
- Belgur, C. (2020, March 13). Process Innovation: Enabling Change by Technology. *KGiSL-GSS*. <https://www.kgisl.com/gss/process-innovation-enabling-change-by-technology>
- Boon, W., & Edler, J. (2018). Demand, challenges, and innovation. Making sense of new trends in innovation policy. *Science and Public Policy*, 45(4), 435–447. <https://doi.org/10.1093/scipol/scy014>
- Brown, S. J. (2020). The Efficient Market Hypothesis, the Financial Analysts Journal, and the Professional Status of Investment Management. *Financial Analysts Journal*, 76(2), 5–14. <https://doi.org/10.1080/0015198x.2020.1734375>
- Canh, N. T., Liem, N. T., Thu, P. A., & Khuong, N. V. (2019). The Impact of Innovation on the Firm Performance and Corporate Social Responsibility of Vietnamese Manufacturing Firms. *Sustainability*, 11(13), 3666. (Gatautis, 2017)
- CEO Pedia. (2019, December 1). Marketing Innovation. [https://ceopedia.org/index.php/Marketing\\_innovation](https://ceopedia.org/index.php/Marketing_innovation)

- Chae, H. C., Koh, C. E., & Park, K. O. (2019). Information technology capability and firm performance: Role of industry. *Information & Management*, 55(5), 525-546.
- Chandrakhanthan & Karthika, R. (2019). Marketing Innovation. *IOSR Journal of Business and Management*. pp. 67-74.
- Chen, Y. (2020). Marketing Innovation. *Journal of Economics and Management*, vol. 15(1), pp. 101-123, ReserachGate.  
[https://www.researchgate.net/publication/4991958\\_Marketing\\_Innovation](https://www.researchgate.net/publication/4991958_Marketing_Innovation)
- Chu, H., & Ke, Q. (2017). Research methods: What's in the name?. *Library & Information Science Research*, 39(4), 284-294.
- Connelly, S. (n.d.). 8 Ways Amazon Changed the World. *Think Monsters*.  
<https://thinkmonsters.com/speakinghuman/media/amazon-game-changing-innovations/>
- Cypress, B. (2018). Qualitative research methods: A phenomenological focus. *Dimensions of Critical Care Nursing*, 37(6), 302-309.
- Dafoe, A. (2015, April 14). On Technological Determinism: A Typology, Scope Conditions, and a Mechanism. *SAGE Journals*. Doi: 10.1177/0162243915579283
- Demircioglu, M. K. (2016). Organizational Innovation. *Springer Link*.  
[https://link.springer.com/referenceworkentry/10.1007%2F978-3-319-31816-5\\_3017-1](https://link.springer.com/referenceworkentry/10.1007%2F978-3-319-31816-5_3017-1)
- Dolata, U. (2017). Apple, Amazon, Google, Facebook, Microsoft: Market Concentration – Competition – Innovation Strategies. *Econstor*.  
<https://www.econstor.eu/bitstream/10419/152249/1/880328606.pdf>
- Dunn, S. L., Arslanian-Engoren, C., DeKoekkoek, T., Jadack, R., & Scott, L. D. (2015). Secondary Data Analysis as an Efficient and Effective Approach to Nursing Research. *Western Journal of Nursing Research*, 37(10), 1295–1307.  
<https://doi.org/10.1177/0193945915570042>

- Flor, M. L., Cooper, S. Y., & Oltra, M. J. (2019). External knowledge search, absorptive capacity, and radical innovation in high-technology firms. *European Management Journal*, 36(2), 183-194.
- Foley, B. (2018). Purposive Sampling 101 | SurveyGizmo Blog, <https://www.surveymoz.com/resources/blog/purposive-sampling-101/>
- Formplus. (2020, December 7). What is Secondary Research? + [Methods & Examples]. <https://www.formpl.us/blog/secondary-research>
- Frenz, M., & Ietto-Gillies, G. (2009). The Impact on Innovation Performance of Different Sources of Knowledge: Evidence from the UK Community Innovation Survey. *Research policy*, 38(7), 1125-1135. <https://doi.org/10.1016/j.respol.2009.05.002>Sambrook,
- Geldes, C., Felzensztein, C., & Palacios-Fenech, J. (2017). Technological and non-technological innovations, performance and propensity to innovate across industries: The case of an emerging economy. *Industrial Marketing Management*, 61, 55-66.
- Gunday, G., Ulusoy, G., Kilic, K., & Alpkan, L. (2018). Effects of Organizational Innovations on Firm's Production Performance. *ResearchGate*. [https://www.researchgate.net/publication/251869516\\_Effects\\_of\\_organizational\\_innovations\\_on\\_firm's\\_production\\_performance](https://www.researchgate.net/publication/251869516_Effects_of_organizational_innovations_on_firm's_production_performance)
- Guo, B., Paraskevopoulou, E., & Santamaria S. L. (2019). Disentangling the Role of Management Control Systems for Product and Process Innovation in Different Contexts. *European Accounting Review*, 28(4), 681-712.
- Gupta, S., Malhotra, N. K. Czinkota, M., & Foroudi, P. (2016). Marketing innovation: A consequence of competitiveness. *Journal of Business Research*, Vol. 69(12), pp. 5671-

5681.

ScienceDirect.

<https://www.sciencedirect.com/science/article/pii/S0148296316302776>

GutCheck. (2019, May 16). New product innovation: What it is, Why it matters, and How to Get it Right. <https://www.gutcheckit.com/blog/new-product-innovation-what-it-is-why-it-matters-and-how-to-get-it-right/>

Handoyo, S. (2016). The Effect of Marketing Innovation, Market Orientation, and Social Capital on Competitive Advantage and Marketing Performance: A study in MSMEs of embroidery Central Java Province. *Journal of Economics Business and Accountancy Ventura* 18(3), pp. 351-364. ResearchGate. DOI: 10.14414/jebav.v18i3.506

Höflinger, P. J., Nagel, C., & Sandner, P. (2018). Reputation for technological innovation: Does it actually cohere with innovative activity? *Journal of Innovation & Knowledge*, 3(1), 26–39. <https://doi.org/10.1016/j.jik.2017.08.002>

Inegbedion, H., Sunday, E., Asaleye, A., Lawal, A., & Adebajji, A. (2020). Managing Diversity for Organizational Efficiency. *SAGE Open*, 10(1), 215824401990017. <https://doi.org/10.1177/2158244019900173>

Innovating Society. (n.d.). Product Innovation and Process Innovation - Characteristics, Differences and Examples. <https://innovatingsociety.com/product-innovation-and-process-innovation-characteristics-differences-and-examples/>

Jovana. (2019). Where to Innovate – Organizational Innovation Explained. *Innovation Cloud*. <https://innovationcloud.com/blog/where-to-innovate-organizational-innovation-explained.html>

Kock, N., Avison, D., & Malaurent, J. (2017). Positivist information systems action research: methodological issues. *Journal of Management Information Systems*, 34(3), 754-767.

- Kylliäinen, J. (2019, April 29). The Importance of Innovation – What does it mean for Businesses and our Society? *Viima*. <https://www.viima.com/blog/importance-of-innovation#:~:text=Innovation%20increases%20your%20chances%20to,and%20services%20for%20your%20customers.>
- Learning, T., & University Libraries. (2015). *Scholarly Articles as Sources*. Pressbooks.pub; The Ohio State University. <https://ohiostate.pressbooks.pub/choosingsources/chapter/scholarly-articles-as-sources/>
- Lima, V. A., & da Silva Müller, C. A. (2017). Why do small businesses innovate? Relevant factors of innovation in businesses participating in the Local Innovation Agents program in Rondônia (Amazon, Brazil). *RAI Revista de Administração e Inovação*, 14(4), 290-300.
- Loeb, W. (2018, November 1). Amazon Is The Biggest Investor In The Future, Spends \$22.6 Billion On R&D. *Forbes*. <https://www.forbes.com/sites/walterloeb/2018/11/01/amazon-is-biggest-investor-for-the-future/?sh=785d75a31f1d>
- Majed, S., Nuraddin, S., & Hama, S. (2018). Analyzing the Amazon success strategies. *Journal of Process Management. New Technologies*, 6(4), 65–69. <https://doi.org/10.5937/jouproman6-19264>
- Mergel, I. (2015). Opening Government: Designing Open Innovation Processes to Collaborate With External Problem Solvers. *Article Social Science Computer Review*, 33(5), 599–612. <https://doi.org/10.1177/0894439314560851>
- Mikalef, P., & Krogstie, J. (2020). Examining the Interplay between Big Data Analytics and Contextual Factors in Driving Process Innovation Capabilities. *European Journal of Information Systems*, 29(3), 260-287.

- Mooi, E., Rudd, J., & de Jong, A. (2020, February 26). Process Innovation and Performance: The Role of Divergence. *Emerald*.  
<https://www.emerald.com/insight/content/doi/10.1108/EJM-02-2018-0110/full/html>
- Moorman, C. (2018, January 12). Why Apple Is Still A Great Marketer And What You Can Learn. *Forbes*. <https://www.forbes.com/sites/christinemoorman/2018/01/12/why-apple-is-still-a-great-marketer-and-what-you-can-learn/?sh=24ed30915bd0>
- Mullaney, T. (2016, April 29). Apple Product Innovations that Changed the World. CNBC. <https://www.cnbc.com/2016/04/29/apple-product-innovations-that-changed-the-world.html>
- Müller, O., Fay, M., & Vom Brocke, J. (2018). The effect of big data and analytics on firm performance: An econometric analysis considering industry characteristics. *Journal of Management Information Systems*, 35(2), 488-509.
- Pandey, J. (2019). A deductive approach to content analysis. In *Qualitative techniques for workplace data analysis* (pp. 145-169). IGI Global.
- Purcell, W. (2019, October 31). The Importance of Innovation in Business. *Northeastern University*. <https://www.northeastern.edu/graduate/blog/importance-of-innovation/>
- Rajapathirana, R. J., & Hui, Y. (2018). Relationship between innovation capability, innovation type, and firm performance. *Journal of Innovation & Knowledge*, 3(1), 44-55.
- Rauter, R., Globocnik, D., Perl-Vorbach, E., & Baumgartner, R. J. (2019). Open innovation and its effects on economic and sustainability innovation performance. *Journal of Innovation & Knowledge*, 4(4), 226-233. Sambrook, S., Rowley, J. and Baregheh, A. (2009). *Towards a multidisciplinary definition of innovation* | *Emerald Insight*. Emerald.com. Retrieved from <https://www.emerald.com/insight/content/doi/10.1108/00251740910984578/full/html>

- Ross, S. (2019, July 22). Why You Should Invest in Research and Development (R&D). *Investopedia*. <https://www.investopedia.com/ask/answers/043015/what-are-benefits-research-and-development-company.asp>
- Ruggiano, N., & Perry, T. E. (2019). Conducting secondary analysis of qualitative data: Should we, can we, and how?. *Qualitative Social Work*, 18(1), 81-97.
- Sambrook, S., Rowley, J. and Baregheh, A. (2009). Towards a multidisciplinary definition of innovation | Emerald Insight. *Emerald.com*. <https://www.emerald.com/insight/content/doi/10.1108/00251740910984578/full/html>
- Sileyew, K. J. (2019). Research Design and Methodology. *Text Mining - Analysis, Programming and Application [Working Title]*, 3(5). <https://doi.org/10.5772/intechopen.85731>
- Stoneman, P., Bartoloni, E., & Baussola, M. (2018). Product Innovation and Firm Performance. *Oxford Scholarship Online*. DOI: 10.1093/oso/9780198816676.001.0001
- Su, Z. & Tang, T. (2016, September 2). Product Innovation, Cost-Cutting and Firm Economic Performance in the Post-Crisis Context: Canadian Micro Evidence. *Journal of Centrum Cathedra*. <https://www.emerald.com/insight/content/doi/10.1108/JCC-08-2016-0009/full/html>
- Sun, M & Lipsitz S. R. (2018). Comparative Effectiveness Research Methodology Using Secondary Data: A Starting User's Guide. *Science Direct*, Vol. 36(4), pp. 174-182. Doi: 10.1016/j.urolonc.2017.10.011
- Tang, M., Walsh, G., Lerner, D., Fitza, M. A., & Li, Q. (2018). Green innovation, managerial concern and firm performance: An empirical study. *Business Strategy and the Environment*, 27(1), 39-51.
- Thompson, K. (2015). Positivism and Interpretivism in Social Research from <https://revisesociology.com/2015/05/18/positivism-interpretivism-sociology/>

- Three-Brains.com. (n.d.). Marketing Innovation. <https://three-brains.com/marketing/brand-strategy-skills/marketing-innovation/>
- Tou, Y., Watanabe, C., Moriya, K., Naveed, N., Vurpillat, V., & Neittaanmäki, P. (2019). The transformation of R&D into neo open innovation-a new concept in R&D endeavor triggered by amazon. *Technology in Society*, 58, 101141.
- Tou, Y., Watanabe, C., Moriya, K., Naveed, N., Vurpillat, V., Neittaanmäki, P. (2019). The transformation of R&D into neo open innovation- a new concept in R&D endeavor triggered by amazon. *Technology in Society*, Vol. 58. ScienceDirect. <https://www.sciencedirect.com/science/article/pii/S0160791X19301022>
- Tsinopoulos, C., Sousa, C. M. P., & Yan, J. (2017). Process Innovation: Open Innovation and the Moderating Role of the Motivation to Achieve Legitimacy. *Journal of Product Innovation Management*, 35(1), 27–48. <https://doi.org/10.1111/jpim.12374>
- Twin, A. (2021, March 8). What is Competitive Advantage? *Investopedia*. [https://www.investopedia.com/terms/c/competitive\\_advantage.asp#:~:text=What%20Is%20Competitive%20Advantage%3F,compared%20to%20its%20market%20rivals.](https://www.investopedia.com/terms/c/competitive_advantage.asp#:~:text=What%20Is%20Competitive%20Advantage%3F,compared%20to%20its%20market%20rivals.)
- Ungerma, O., Dedkova, J., & Gurinova, K. (2018). The Impact of Marketing Innovation on the Competitiveness of Enterprises in the Context of Industry 4.0. *Journal of Competitiveness*, 10(2), 132. <https://pdfs.semanticscholar.org/cf38/d8ab4befced2c5cb3828572103d858c077dc.pdf>
- Vivero, R. F. (2010, October 4). The Impact of Process Innovations on Firm's Productivity Growth: The Case of Spain. *Taylor & Francis Online*. <https://www.tandfonline.com/doi/abs/10.1080/00036840010019684?journalCode=raec20>



#~:text=The%20study%20demonstrates%20that%20process,much%20better%20than%200R%26D%20intensity

Watanabe, C. & Tou, Y. (2019). Transformative Direction of R&D– Lessons from Amazon's Endeavor. *Technovation*, vol. 88. ScienceDirect.  
<https://www.sciencedirect.com/science/article/abs/pii/S0166497219300409>

Wilkinson, D. (2021, March 8). Research Support: Research Methodology. *Lib Guides*.  
<https://libguides.wits.ac.za/c.php?g=693518&p=4914913#:~:text=Research%20methodology%20is%20the%20specific,study's%20overall%20validity%20and%20reliability.&text=How%20was%20it%20analyzed%3F>

Wright, S., O'Brien, B. C., Nimmon, L., Law, M., & Mylopoulos, M. (2016). Research Design Considerations. *Journal of Graduate Medical Education*, 8(1), 97–98.  
<https://doi.org/10.4300/jgme-d-15-00566.1>

**Appendix**

1. What are the objectives of the dissertation / research project?

**1. Finding the correlation between innovation and the overall performance of a technological firm such as Apple and Amazon**

**2. Exploring the effect of research and development and how it increases the percentage of innovation in a technological firm**

2. Does the research involve *NHS patients, resources or staff*?

**NO**

3. Does the research involve MoD staff?

**NO**

4. Do you intend to collect *primary data* from human subjects or data that are identifiable with individuals? (This includes, for example, questionnaires and interviews.)

**NO**

5. How will the primary data contribute to the objectives of the dissertation / research project?

n/a

6. What is/are the *survey population(s)*?

n/a

7. a) How big is the *sample* for each of the survey populations, and b) how was this sample arrived at? (Please answer *both* parts of this question.)

n/a

8. How will respondents be a) *identified* and b) *recruited*? (Please answer *both* parts of this question.)

n/a

9. What steps are proposed to ensure that the requirements of *informed consent* will be met for those taking part in the research? If an Information Sheet for participants is to be used, please attach it to this form. If not, please explain how you will be able to demonstrate that informed consent has been gained from participants.

n/a

10. How will *data* be *collected* from each of the sample groups?

n/a

11. a) How will *data* be *stored* and b) what will happen to the data at the end of the research? (Please answer *both* parts of this question.)

**At the end of this research all of the data will be saved both in an electronic copy and a physical copy will be retained and stay under security and protected during the making of this research as well as after it has been completed. In addition, any data collected will be equally stored on the University's Google Drive and the data will be destroyed within 5 years of doing this research.**

12. What measures will be taken to prevent unauthorised persons gaining access to the data, and especially to data that may be attributed to identifiable individuals?

**The acquired data will be only accessed by me and it will be saved on my personal Computer account which requires a password to be accessed. In addition, the data while also be safely stored on the University's google drive. Both servers of my personal computer and the google drive are PSW protected and can only be accessed by myself. In addition, all participants will be anonymous, and the research will not hold any personal information of the participants.**

13. What steps are proposed to safeguard the *anonymity* of the respondents?

**This research does not require the name of the respondent nor their email addresses and they will have the complete privilege of anonymity and it also will not require any participant to reveal any type of personal data**

14. Are there any *risks* (physical or other, including reputational) to *respondents* that may result from taking part in this research? YES / NO (please *delete as applicable*).

**NO**

15. Are there any *risks* (physical or other, including reputational) *to the researcher or to the University* that may result from conducting this research? YES / NO (please *delete as applicable*).

**NO**

16. Will any *data* be *obtained from a company or other organisation*? YES / NO (please delete as applicable) For example, information provided by an employer or its employees.

**NO**

17. What steps are proposed to ensure that the requirements of *informed consent* will be met for any organisation in which data will be gathered? How will *confidentiality* be assured for the organisation?

The information that will be collected will be only accessed by me and the university and will be safely stored on the university's google drive and a proper destruction will be done when the use of the information collected is no longer valid.

18. Does the organisation have its own ethics procedure relating to the research you intend to carry out? YES / NO (please delete as applicable).

If YES, the University will require written evidence from the organisation that they have approved the research.

**NO**

19. Will the proposed research involve any of the following (please put a ✓ next to 'yes' or 'no'; consult your supervisor if you are unsure):

• Potentially vulnerable groups (e.g. adults unable to consent, children)?	YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>
• Particularly sensitive topics?	YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>
• Access to respondents via 'gatekeepers'?	YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>
• Use of deception?	YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>
• Access to confidential personal data (names, YES	YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>

addresses, etc)?

☐
☐

- Psychological stress, anxiety, etc.?

YES

☐

NO

☒

- Intrusive interventions?

YES

☐

NO

☒

If answers to any of the above are “YES”, please explain below how you intend to minimise the associated risks.


20. Are there any other ethical issues that may arise from the proposed research?

**NO**

	Print name	Signature	Date signed
Student	Mohammad Hakki		11/2/2021

---

I / we grant a favourable ethical opinion:

Supervisor	Ed Derbyshire		12/2/21
Peer reviewer (unless University has agreed that supervisor can sign off)	Nicholas Ford	N. A. Ford	22/02/2021

---

#### AMENDMENTS

If you need to make changes please ensure you have permission before recruiting any participants and any primary data collection. If there are major changes, fill in a new form if that will make it easier for everyone. If there are minor changes then fill in the amendments (next page) and get them signed before the primary data collection begins.

## CHANGES TO ETHICS PERMISSION

VERSION: \_\_\_\_\_


Please describe the nature of the change and impact on ethics:

The dissertation will now entirely depend on secondary sources of data. There will not be any collection of primary data.

	Print name	Signature	Date signed
Student	Mohammad Hakki		5/4/2021

---

I / we grant a favourable ethical opinion:

Supervisor	Ed Derbyshire		5/4/2021
Peer reviewer (unless University has agreed that supervisor can sign off)	Nicholas Ford	N.A. Ford	6/4/21

---

(please cut and paste the next section, together with the heading at the top of this page, as many times as required)

VERSION: \_\_\_\_\_

Please describe the nature of the change and impact on ethics: