Faculty of Technology Management and Technopreneurship

THE IMPACT OF PACKAGING CRITERIA ON HIGH-TECH COMPANIES' PERFORMANCE

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THE IMPACT OF PACKAGING CRITERIA ON HIGH-TECH COMPANIES' PERFORMANCE

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DECLARATION

I declare that this thesis entitled "THE IMPACT OF PACKAGING CRITERIA ON HIGH-TECH COMPANIES' PERFORMANCE" is the result of my own research, unless otherwise indicated in references.

Signature: ……

Name: NISA NADIAH BINTI MOHD SHAIFOLAZHAM

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APPROVAL

I/We hereby declare that I/we have examined the report "THE IMPACT OF PACKAGING CRITERIA ON HIGH-TECH COMPANIES' PERFORMANCE". In my/our opinion, this thesis corresponds to the partial fulfilment of the award of the Bachelor of Technology Management (High Technology Marketing) degree with honours.

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Date: 26th JANUARY 2024

DEDICATION

This thesis is dedicated:

To Allah S.W.T., for blessing me with strength and guidance. To my loving parents, Mohd Shaifolazham Bin Tokiran and Ro'aini Binti Ab Halim, for their unwavering love and support throughout my academic journey. To my family, friends and loved ones who have stood by me with understanding and encouragement. To my supervisor, Dr. Norun Najjah Binti Ahmat, for her teaching and mentorship. To the mental health professionals who have supported me as a schizophrenia survivor. To everyone struggling with mental health issues, for their resilience and courage. This dedication is a tribute to the support, resilience, and love of those who have touched my life.

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I would like to take a moment to acknowledge my journey as a survivor of schizophrenia and the unique challenges I have faced throughout my academic career. I am beyond grateful for the support and understanding I have received throughout my journey.

I want to thank my family from the bottom of my heart, especially my parents, Mohd Shaifolazham Bin Tokiran and Ro'aini Binti Ab Halim, their unwavering support, love, and belief in my potential served as a constant source of inspiration and drive throughout my journey. Their encouragement and sacrifice have contributed greatly to who I am today. My gratitude goes out to my siblings, friends, loved ones, and mental health professionals for their unwavering support, patience, guidance, and encouragement during my battle with schizophrenia.

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ABSTRACT

Driven by increased customer demand for creative products and technical breakthroughs, Malaysia's technology industry has grown significantly in recent years. As Malaysian high-tech companies strive to develop advanced technologies, they face numerous challenges, particularly in the packaging area. A key factor in the success of high-tech products is their packaging, encompassing not only the physical protection of products but also the overall user experience and brand perception. Understanding the impact of packaging criteria on Malaysian high-tech companies is crucial to ensuring efficient product delivery, reducing risks, and maintaining customer satisfaction, particularly after the COVID-19 epidemic. Effective packaging criteria for high-tech products in Malaysia require careful consideration of various factors. These products are often fragile, sensitive to environmental conditions, and may require extended functionality. The packaging must adequately protect the product during storage, transportation, and handling, enhance the overall user experience, and reflect the brand image. Furthermore, as high-tech companies in Malaysia operate in a competitive market, packaging can serve as a strategic tool to differentiate their products, create a positive impression, and ultimately influence purchasing decisions, especially during a pandemic. Research objectives include analyzing current packaging criteria, assessing the challenges faced by high-tech companies, and proposing optimized packaging criteria to improve product quality, customer satisfaction and overall company performance. The study recognizes the importance of packaging design, material, aesthetics, functionality, usability, sustainability, innovation, and the use of packaging as a marketing tool in high-tech companies in Malaysia.

Keywords: *technological advancement, high-tech industry, consumer demand, packaging criteria, marketing tool, physical protection*

ABSTRAK

Didorong oleh permintaan pelanggan yang meningkat untuk produk kreatif dan penemuan teknikal, industri teknologi Malaysia telah berkembang dengan ketara dalam beberapa tahun kebelakangan ini. Sementara perusahaan teknologi tinggi Malaysia berusaha untuk mengembangkan teknologi terkini, mereka menghadapi berbagai tantangan, terutama dalam kriteria pengemasan. Pengemasan memainkan peranan penting dalam kejayaan produk teknologi tinggi, melibatkan perlindungan fizikal produk, pengalaman pengguna keseluruhan, dan persepsi jenama. Memahami impak kriteria pengemasan terhadap perusahaan teknologi tinggi Malaysia adalah penting untuk memastikan penghantaran produk yang efisien, mengurangkan risiko, dan mempertahankan kepuasan pelanggan, terutama dalam konteks pandemik COVID-19. Kriteria pembungkusan yang berkesan untuk produk berteknologi tinggi di Malaysia memerlukan pertimbangan yang teliti terhadap pelbagai faktor. Produk ini selalunya rapuh, sensitif kepada keadaan persekitaran, dan mungkin memerlukan kefungsian lanjutan. Pengemasan harus menyediakan perlindungan yang mencukupi semasa penyimpanan, pengangkutan, dan penanganan, sambil meningkatkan pengalaman pengguna keseluruhan dan mencerminkan imej jenama. Selain itu, kerana perusahaan teknologi tinggi Malaysia beroperasi dalam pasaran yang kompetitif, pengemasan boleh berfungsi sebagai alat strategik untuk membezakan produk mereka, mencipta kesan positif, dan pada akhirnya mempengaruhi keputusan pembelian, terutama dalam konteks pandemik. Objektif kajian ini termasuk menganalisis kriteria pengemasan semasa, menilai cabaran yang dihadapi oleh perusahaan teknologi tinggi, dan mencadangkan kriteria pengemasan yang dioptimum untuk meningkatkan kualiti produk, kepuasan pelanggan, dan prestasi keseluruhan perniagaan. Kajian ini mengakui kepentingan reka bentuk, bahan, estetika pengemasan, fungsionaliti, kegunaan, kelestarian, inovasi, serta penggunaan pengemasan sebagai alat pemasaran dalam perusahaan teknologi tinggi di Malaysia.

Kata Kunci: *kemajuan teknologi, industri teknologi tinggi, permintaan konsumen, kriteria pengemasan, alat pemasaran, perlindungan fizikal*

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LIST OF SYMBOLS AND ABBREVIATIONS

AI	-	Artificial Intelligence
AR	-	Augmented Reality
CE	-	Circular Economy
COVID-19	-	Coronavirus Disease 2019
DV	-	Dependent Variable
EPP	-	Expanded Polypropylene
ESD	-	Electrostatic Discharge
HO	-	Hypothesis
HTCP	-	High-Tech Companies' Performance
IoT	-	Internet of Things
IV	-	Independent Variable
NFC	-	Near-Field Communication
PD	-	Packaging Design
PI	-	Packaging Innovation
PM	-	Packaging Material
RO	-	Research Objective
RQ	-	Research Question

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Technological advancements and increased customer demand for creative products have led to a significant expansion of the technology industry in recent years. As high-tech companies strive for cutting-edge technologies, they face numerous challenges, especially when it comes to packaging. High-tech product success is greatly influenced by packaging, which includes not only the physical protection of the items but also the user's whole experience and perception of the brand. Understanding the impact of packaging criteria on technology companies is critical to ensure efficient product delivery, reducing risk, and maintaining customer satisfaction.

Criteria for effective packaging of high-tech products require careful consideration of various factors. These products are often fragile, sensitive to environmental conditions, and may require advanced functionality. Packaging must provide adequate protection during storage, transportation, and handling, improve the overall user experience, and reflect the brand image. Additionally, as high-tech companies operate in a competitive market, packaging can serve as a strategic tool to differentiate their products, create a positive impression, and ultimately influence purchasing decisions.

This chapter introduces the final project “The Impact of Packaging Criteria on High-Tech Companies' Performance”. This section gives a summary of the study's history, background, problem statement, research questions, objectives, scope, limits, and significance. By examining these aspects, this chapter lays the foundation for subsequent chapters that detail the research methodology, data analysis and results.

1.2 Study Background

The high-tech industry is characterized by rapid technological advancement and fierce market competition. In this dynamic environment, packaging has evolved from a functional necessity to a strategic asset for high-tech companies. Packaging criteria for high-tech products differ significantly from traditional packaging due to the unique characteristics and requirements of these advanced technologies. High-tech companies are constantly looking for innovative packaging solutions to meet the growing needs of their target markets, improve product performance and differentiate themselves from competitors.

Additionally, packaging is an important marketing tool for high-tech companies. It forms the first point of contact between the consumer and the product, influencing the initial perception and user experience. Packaging design, materials and functionality contribute to the overall brand image, causing high-tech companies to carefully consider packaging criteria. Therefore, understanding the impact of packaging criteria on the performance of high-tech companies is essential to tailoring packaging strategies to product characteristics, market needs and expectations of the customers.

By studying the impact of packaging criteria on the performance of high-tech companies, the purpose of this study is to contribute to the existing body of knowledge in this area. It aims to provide information and practical recommendations that can benefit both researchers and industry practitioners. Through a comprehensive analysis of packaging criteria and their implications, this research will enable high-tech companies to optimize packaging strategies, improve product quality, reduce costs, and ultimately improve customer satisfaction.

1.3 Problem Statement

The lack of comprehensive research that specifically addresses the impact of packaging criteria on the performance of high-tech companies hinders the ability to make informed decisions about packaging strategies, leading to potential challenges, hidden products such as product damage, increased costs, and reduced customer satisfaction (8 Challenges to Overcome in Your Packaging Process, 2022).

Packaging is widely recognized as an important aspect of the tech industry, as evidenced by Apple's paper and packaging initiative. This initiative, launched in 2015, prompted Apple to reassess its approach to materials and pursue a closed supply chain. (Apple's Paper and Packaging Strategy, 2017). It also serves as an example for others to take responsibility for their environmental impact and work with stakeholders. (Apple's Paper and Packaging Strategy, 2017). However, there is a lack of extensive research that examines the specific impact of packaging criteria on the performance of high-tech firms. The current knowledge gap limits high-tech companies' understanding of how packaging decisions affect their operations, efficiency, and overall performance and hinders the development of effective packaging strategies.

The lack of comprehensive research on packaging criteria in the high-tech industry has practical implications, preventing high-tech companies from optimizing their packaging strategies to meet the unique needs of their products and target markets. As a result, these companies may experience adverse consequences such as increased product damage, higher costs associated with ineffective packaging solutions, and lower customer satisfaction.

To address this issue, an in-depth study of the impact of packaging criteria on high-tech companies is required. This study's objective is to examine the connection between the criteria of packaging and various performance indicators such as product protection, cost efficiency and customer satisfaction. Closing this knowledge gap can provide valuable information that will help develop effective packaging strategies that meet the needs of high-tech companies, allowing them to optimize their packaging strategies, reduce risks, and improve operational efficiency and customer satisfaction.

1.4 Research Question

RQ 1 - What packaging criteria are currently used by high-tech companies?

RQ 2 - What challenges do companies face when implementing effective packaging strategies?

RQ 3 - Why the companies need the impactful recommendation of packaging criteria on product quality, customer satisfaction, and overall business performance in high-tech companies?

1.5 Research Objectives

To solve the research problem, the following objectives were formulated:

RO1 - To analyze the current packaging criteria used by high-tech companies.

RO2 - To evaluate the challenges faced by high-tech companies in implementing effective packaging strategies.

RO3 - To propose the impactful or optimized packaging criteria on product quality, customer satisfaction, and overall business performance in high-tech companies.

1.6 Scope of Study

The study's primary focus is on high-tech companies in the electronics sector.It considers a wide range of high-tech products, including consumer electronics, computer hardware, telecommunication devices, electronic appliances, and related goods. The research primarily explores the impact of packaging criteria on product quality, customer satisfaction, and business performance in these sectors.

The target respondents in this research will be employers and employees that are responsible in the packaging operation of the high-tech companies in Kuala Lumpur and Melaka, Malaysia. The target market for this study is the 20 high-tech companies in Kuala Lumpur and Melaka, Malaysia, including those in the industry of electronics and appliances industry. From each of Malaysia's 20 high-tech companies, the researcher will then select 10 participants for the study who are aware about the packaging needs in this sector. The researcher will then distribute the questionnaire to the target respondents by an online survey, such as Google Form.

The study limitation is only focusing on the impact of packaging criteria on the high-tech companies' performance. Therefore, this study cannot cover all the other industries because the research is only limited to the high-tech industry, so the outcomes of literature, theoretical proposition, data analyzed, and conclusions made can only be generalized to the high-tech industry. In addition, the impact of packaging criteria in other industries will have different impacts, therefore, the results of this study cannot be considered as the impact of packaging criteria on all industries.

1.7 Study Limitation

This study has several limitations that should be noted. First, the study is being done in a constrained amount of time, which can restrict the scope of the analysis and the capacity to consider every potential factor. Second, the research will concentrate on a certain geographical area, which may restrict the results' generalizability to a broader context. In addition, the availability of data and collaboration between high-tech companies can cause problems in the research process. Despite these limitations, the study aims to provide valuable information about the impact of packaging criteria on the performance of high-tech companies.

1.8 Significance of Study

The results of this study will contribute to the existing knowledge on packaging criteria in the high-tech industry. High-tech companies will benefit from the information provided as they can understand the impact of packaging criteria on their products and business performance. By identifying the best packaging practices and issues, companies can improve their packaging strategies, improve product quality, reduce costs, and ultimately increase customer satisfaction. In addition, future research on packaging can be built on the findings of this study in high-tech companies and promote further research and progress in this field.

1.9 Summary

This chapter introduces a final project that examines the impact of packaging criteria on the performance of high-tech companies. The introduction emphasizes the significance of packaging in the technology industry and its role in protecting products and satisfying customer needs. The background of the study highlighted the strategic importance of packaging in high-tech companies and the need to understand its impact. The problem statement identified a research gap regarding the impact of packaging criteria on high-tech companies and led to the formulation of the research question and objectives. The scope of the study was outlined, along with the limitations inherent in the research. Finally, the study's notable contribution to the body of knowledge and its consequences for high-tech enterprises were elaborated.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The goal of this chapter is to present an extensive evaluation of the literature on the current packaging criteria employed by high-tech companies, the challenges faced in implementing effective packaging strategies, and proposed impactful or optimized packaging criteria to enhance product quality, customer satisfaction, and overall business performance. In addition, the dependent and independent variables will be defined to develop the hypothesis. A conceptual framework will be created todescribe the study at the conclusion of this chapter.

2.2 Packaging

Packaging serves as a critical component for high-tech companies as it encompasses various functions. It not only for protection, safety, improved usage, appealing appearances, ideal design, meeting unique client needs during storage, transportation, and handling but also acts as a communication tool to convey brand identity and influence consumer perceptions (Tiuttu, 2020). Effective packaging is essential to ensure product integrity, enhance brand image and promote positive consumer experience.

2.3 Criteria for Packaging

To analyses the current packaging criteria of high-tech companies, several factors must be considered. Studies by Smith et al. (2019) have highlighted the importance of durability and reliability in high-tech packaging. High-tech products often contain fragile components and require packaging solutions that can withstand potential shock, vibration, and environmental hazards. The use of durable materials and effective shock absorption techniques is essential to ensure the safety and integrity of the product. Below are the packaging criteria:

Protection and Safety: Packaging criteria must focus on the protection and safety of high-tech components, tools and devices during transport and storage. It must prevent

damage from moisture, dust particles and temperature fluctuations that can affect the performance and functionality of products (Faes Packaging Solutions, 2022).

Control of Cleanliness and Contamination: Packaging must meet the requirements of "clean production and assembly" in the high-tech sector. The risk of contamination should be minimized by ensuring that components, tools, and equipment are delivered in a clean and controlled environment. Special measures, such as insulation, cooling plates and dust protection, may be required (Faes Packaging Solutions, 2022).

Customization and Tailored Solutions: Packaging needs to be customized to meet the unique demands and specifications of the high-tech sector. To solve complex problems and provide optimal protection for expensive and vulnerable devices, tailored solutions may be required (Faes Packaging Solutions, 2022).

Logistics and Supply Chain Efficiency: Packaging is designed to help improve efficiency and add value to the supply chain. Its design must enable smooth handling, transportation, and storage, ensure reliable delivery, and minimize delays or disruptions (Faes Packaging Solutions, 2022).

Compliance with Industry Standards: Packaging must comply with industry standards and regulations applicable to the technology sector. It must meet specific requirements and standards in terms of product quality, performance, and environmental aspects (Faes Packaging Solutions, 2022).

Sustainability and Environmental Impact: While protection and functionality are paramount, packaging must also consider sustainability and minimize environmental impact. Care must be taken to use environmentally friendly materials, recyclable packaging solutions and efficient use of resources (Faes Packaging Solutions, 2022).

Clear Communication and Information: Packaging must contain clear and concise information about the contents, handling instructions and any special requirements. This ensures correct handling and reduces the risk of errors or mishandling during transport or assembly (Faes Packaging Solutions, 2022).

Cost-effective: The packaging must not only meet the required criteria but also be cost-effective. The company must optimize materials, design, and processes to achieve effective packaging solutions without compromising quality or protection (Faes Packaging Solutions, 2022).

By taking these packaging criteria into account, companies can increase their efficiency, maintain high product quality, and meet the demands of the constantly evolving high-tech market.

2.4 Packaging Design and Aesthetics

Design and aesthetics play a crucial role in high-tech companies. Research by Chen et al. (2020) highlights the importance of innovative and visually appealing packaging design in creating a strong brand identity and improving product differentiation. While the colour and size of the container have little effect on the customer's impression of the product's benefits, suitable packaging materials, shape, and labelling have a very positive effect on this perception (Bahrainizad & Rajabi, 2018). Attractive packaging design can capture consumer attention, increase perceived value, and positively influence purchasing decisions.

Another critical criterion is the incorporation of user-centered design principles. The end-user should be considered while designing packaging, considering their needs, preferences, and usability. Chen et al. (2020) highlighted the significance of innovative and visually appealing packaging designs in high-tech companies. Unique and attractive packaging can create a memorable brand experience and differentiate products in the competitive market. Understanding the value of packaging design and optimization may help manufacturers across a range of sectors reduce overhead costs while also boosting sales and giving a company a strong competitive advantage. It's never too late to start today. Maintaining package specs and design properly is essential to a company's success (*Hit or Miss: How Package Design Can Impact Company Performance*, n.d.-b).

Product packaging goes beyond being a mere outer shell for a product where it acts as an extension of the product and the brand itself (Stanley, n.d.). The right packaging design can significantly impact consumer behaviour by attracting their attention, positively influencing their purchase decisions, and fostering brand recognition. When customers are drawn to the colours, fonts, and designs of the packaging, it creates a memorable and positive association with the brand, making it easier for them to recognize and choose the brand in the future. Additionally, packaging plays a crucial role in facilitating repeat purchases, as customers may come across the packaging display and recall the positive experience they had with the

product (Silayoi & Speece, 2004). By leveraging attractive and distinctive packaging, businesses can build brand loyalty, grow a consistent customer base, and enhance overall customer satisfaction.

2.5 Functionality and Usability of Packaging

Figure 2.5.1: Functions of Packaging

(Source: S, S., 2021)

Apart from visual appeal, packaging should be functional and user-friendly. High-tech companies need to consider factors such as ease of opening, resealability, and convenience in packaging design. Packaging that provides a seamless and convenient user experience enhances customer satisfaction and contributes to positive brand associations (Smith et al., 2019).

Consumers' perception of packaging usability has a positive effect on impulse buying (Bahrainizad & Rajabi, 2018). Consumer support package features lead to higher purchase intentions, and perceived product importance is an underlying mechanism that explains the positive effect of consumer support package features on purchase intention (Scheiner et al., 2021).

2.6 Sustainability and Eco-Friendly Packaging

CRITERIA FOR SUSTAINABLE PACKAGING	DIMENSIONS OF SUSTAINABLE PACKAGING			
	Functional	Technologically Feasible	Environmental	Economic
1. Safe and healthy for all individuals throughout their life cycle	X		X	X
2. Meets market criteria in terms of its performance and costs				X
3. Obtained, produced, transported, and processed using renewable energy		X	X	X
4. Produced using renewable or recycled raw materials and clean production technologies		X	X	X
5. Made of harmless materials in all possible end-	X		X	

of-life scenarios				
6. Physically designed and validated to optimize used materials and energy consumption		X	X	X
7. Fully recovered and utilized in industrial and/or biological cradle-to-cradle cycles	X		X	

Table 2.6.1: Matrix of Criteria and Dimensions of the Sustainable Packaging

(Source: Matrix of Criteria and Dimensions of the Sustainable Packaging., n.d.-c)

The adoption of sustainable and eco-friendly packaging practices is gaining prominence in high-tech companies. Gupta et al. (2020) emphasizes the importance of using recyclable materials, reducing packaging waste, and minimizing the environmental impact. Sustainable packaging not only aligns with consumer preferences for environmentally conscious products but also enhances brand reputation and supports corporate social responsibility initiatives.

When it comes to customers' purchasing decisions, packaging plays a crucial role, particularly in contexts where there is a lot of choice and pressure to decide quickly. Customers are becoming more and more conscious of a brand's ethics while making purchases. Therefore, it might be advantageous for firms to understand how customers feel and behave when it comes to eco-friendly packaging (Magnier & Crié, 2015). Companies that produce plastic packaging are increasingly focused on plastic

pollution in the oceans. The results of the consumer study showed that although people were aware of the issue of plastic pollution in the ocean, they knew less about the properties of different packaging materials. When shopping, many people do not pay attention to the packaging, which is the most environmentally friendly. They believe that retailers should be responsible for reducing environmental damage from packaging and educating customers about the benefits of packaging (Mitchell, 2021). Through perceived value, perceived risk, and green purchase, green packaging has a major indirect impact on customers' intentions to make green purchases in the context of online and offline commerce (Pan et al., 2021).

2.7 Challenges in Implementing Effective Packaging Strategies

Implementing effective packaging strategies in high-tech companies comes with various challenges. One significant challenge is keeping up with rapid technological advancements. Johnson and Smith (2018) highlight the difficulty of aligning packaging design with evolving product specifications and features. Flexibility in packaging solutions is crucial to accommodate changes in product dimensions and requirements.

Another challenge is striking a balance between product protection and sustainability considerations. Green et al. (2021) discusses the complexities associated with integrating sustainable packaging materials and practices while ensuring product safety and compliance with industry standards.

2.8 Packaging as An Important Marketing Tool

Packaging is an important tool in the marketing mix that is often overlooked by companies, but it spends twice as much each year as advertising and sales promotions. Packaging has two functions: it protects and contains the product, and it acts as an interface for selling the product to the end consumer. The product label on the package also identifies the company that sells the product. Good packaging requires research into target markets, the retail environment, and the external environment, including social changes and technological developments. Consumers' purchasing behaviour is influenced by their image and value perceptions. It examines packaging colour and how it affects sales through colour associations in consumers' minds. Major packaging suppliers monitor consumer trends and technological advancements and know that packaging is a "silent seller" (Sara, 1990). Innovative

packaging options provide the possibility of enhanced supply chain capabilities, providing preservation and protection prior to reaching the final consumer. Additionally, it provides enhanced chances for better information sharing and consumer communication.

Packaging serves as a powerful marketing tool for high-tech companies. It acts as a tangible representation of the brand and provides an opportunity to communicate the product's features, benefits, and value proposition. Nasrulla et al. (2021) shed light on the impact of packaging criteria on the brand value of technology products. In addition to helping items stand out from the competition, strategically designed packaging may affect consumer perception and purchase behaviour.

2.9 The Influence of Packaging on Consumer Behaviour

Packaging's impact on consumer behaviour is an important aspect of marketing and product positioning. As the consumer's initial point of contact with the product, packaging influences perception and purchase decisions. When implemented effectively, packaging can evoke emotions, create a sense of desirability, and build a strong bond with the consumer. Research shows that packaging design, colours, and graphics can evoke emotions, create brand associations, and influence purchasing decisions (Chen et al., 2020). Packaging elements such as product images, descriptions, and user reviews can effectively communicate product benefits and increase consumer trust (Wong, n.d.).

The key to managing this period of incredible potential is packaging. It is still seen as a crucial factor in purchase decisions and is promoted as a tool for brand marketing that extends beyond tangible goods and may engage with clients virtually as well as in person (Rambabu & Porika, 2020). Packaging really influences children's product preferences. Therefore, they should provide business and service marketing professionals with relevant information to make decisions about the influence of children on the purchasing behaviour of parents (Ogba & Johnson, 2010).

Moreover, packaging also influences consumer perceptions of the brand itself (Dillon, 2023). Well-designed and consistent packaging aligns with the brand's identity and values, fostering brand loyalty and recognition. Consumers can associate positive experiences with a brand based on their interaction with packaging, leading to repeat purchases and word of mouth. On the other hand, poorly designed or

inconsistent packaging may lead to a negative perception of the brand and discourage potential customers from making a purchase. Packaging and branding have a positive effect on parents. However, children were only influenced by packaging, and not brand. Furthermore, it was found that children influenced their parents during store visits (Taghavi & Seyedsalehi, 2015).

Packaging can also influence consumer behaviour by providing practical information and enhancing the overall product experience (Vieira et al., 2015). Clear and informative packaging can help consumers make informed decisions about the product's features, usage, and benefits. Additionally, functional, and user-friendly packaging can enhance convenience, ease of use, and storage, positively impacting consumer satisfaction. According to research by Chandon & Wansink (2010), themes and messages on product packaging may help differentiate a company from competitors and have a bigger effect on consumers than advertising.

The excitement associated with unwrapping a recently purchased item is comparable to that experienced when receiving presents. Outstanding product packaging is a fantastic method to raise consumer interest in a product and can even boost sales. While the element of surprise that comes with a gift might be enjoyable, most customers would rather know what they're getting before they buy (White, 2019).

2.10 Proposed Impactful and Optimized Packaging Innovation

To enhance product quality, customer satisfaction, and overall business performance in high-tech companies, several impactful and optimized packaging innovations can be proposed:

a) Integration of Smart Packaging Technologies: By integrating technologies like augmented reality (AR), near-field communication (NFC), and QR codes, packaging may convey more information about the product, enable interactive experiences, and enhance customer engagement (Rogers et al., 2022).

b) Personalization and Customization: Offering personalized packaging options can create a unique and tailored experience for customers. Customizable packaging designs or personalized messages can increase customer loyalty and satisfaction (Nasrullah et al., 2021).

c) Improved product protection: High-tech products often require special packaging to protect sensitive components and ensure safe transport. The integration of advanced shock-absorbing materials, shock-absorbing mechanisms and tamper-evident features can improve product safety and integrity.

d) Optimal Size and Weight: Packaging size and weight can significantly impact logistics costs and the environmental footprint. Optimizing packaging size and weight can lead to cost savings, greater supply chain efficiency, and reduced carbon emissions.

In this current technological revolution, it is crucial for packaging manufacturers and consumers to adopt sustainable practices that revolutionize various aspects of the packaging industry, including customer experience, manufacturing processes, delivery, and environmental protection. The convergence of technology and sustainability in the packaging industry offers companies a unique opportunity to rethink traditional practices, explore new business models, and deliver innovative solutions that meet both the productivity needs of high-tech companies and the environment (Iverson, 2023).

2.11 Proposed Conceptual Framework

The aim of this study is to investigate the impact of packaging criteria on high-tech companies' performance. There are three independent variables (IV) which are packaging design, packaging materials, and packaging innovation. The dependent variable (DV) is the high-tech companies' performance. The IV is the variables that are being tested to measure the DV. The figure 2.11.1 shows the conceptual framework inthis research.

Packaging criteria on high-tech companies' performance.

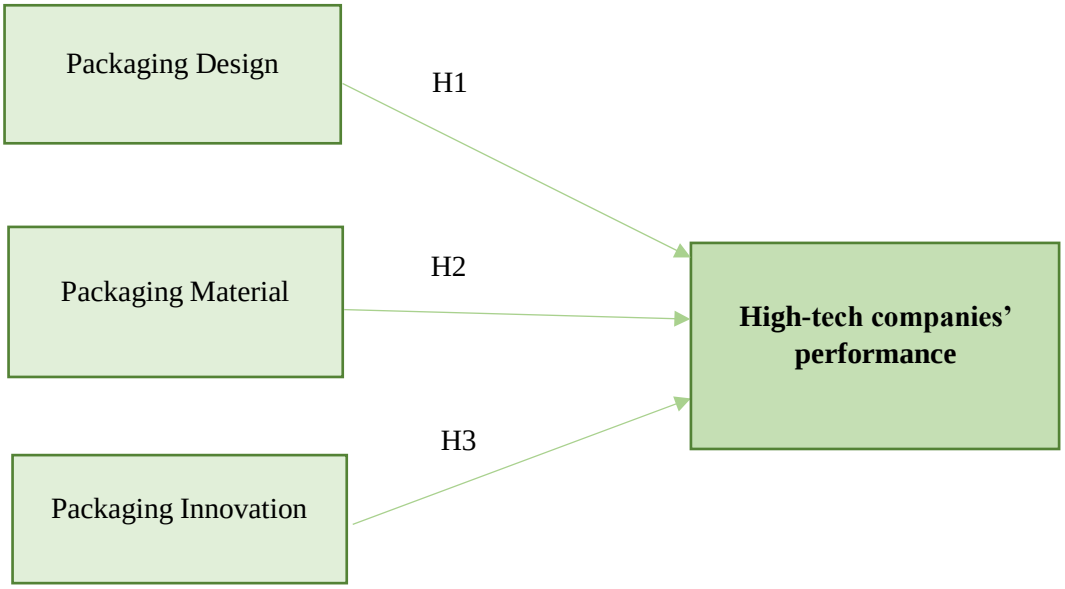

Figure 2.11.1: Conceptual Framework

(Source: Figure 1. Conceptual Framework of Relationship Between Independent ..., n.d.)

Independent Variables (IV):

Packaging Design: This variable focuses on the design elements of packaging, including aesthetics, functionality, and ergonomics. In addition, it is important to consider product protection, packaging quality, cost-effectiveness, alignment with overall business goals and the type of packaging used. Be it boxes, blister packaging, anti-static bags, bubble wrap or personalized packaging. It explores how packaging design influences the perception of high-tech products and affects consumer behavior (Smith, 2021).

Packaging Materials: This variable examines the materials used in packaging, for example, non-sustainable materials such as cardboard, plastic, foam, metal or sustainable materials, recyclable materials, and environmentally friendly alternatives. It examines how the choice of packaging materials influences environmental impact and consumer preferences.

Packaging Innovation: This variable examines the level of innovation in packaging, including technological advancements, interactive features, and smart packaging

solutions. It assesses how innovative packaging influences product differentiation, brand image, and consumer engagement.

Dependent Variable (DV):

The dependent variable in this research is the high-tech companies' performance. It includes various performance indicators such as customer satisfaction, brand loyalty and overall business success. The focus is on understanding how packaging criteria, including design, materials, and innovation, directly and indirectly affect the performance of high-tech companies (Li Wang, 2017).

By examining the relationships between the independent variables (packaging design, packaging materials, and packaging innovation) and the dependent variable (high-tech companies' performance), the purpose of this conceptual framework is to shed light on the high-tech industry's use of packaging criteria and their strategic importance.

2.12 Hypothesis

Hypothesis 1 (H1)

H0: There is no significant relationship between packaging design and the high-tech companies' performance.

H1: There is a relationship between packaging design and the high-tech companies' performance.

Hypothesis 2 (H2)

H0: There is no significant relationship between packaging material and the high-tech companies' performance.

H1: There is a relationship between packaging material and the high-tech companies' performance.

Hypothesis 3 (H3)

H0: There is no significant relationship between packaging innovation and the high-tech companies' performance.

H1: There is a relationship between packaging innovation and the high-tech companies' performance.

2.13 Summary

In conclusion, this chapter explains keywords and terms. Information is collected from secondary data such as websites, journal articles, books, and thesis. Independent and dependent variables were also specified to develop the hypothesis. To better comprehend the interactions between variables, conceptual frameworks have also been developed. The study's methodology will be covered in the upcoming chapter.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

This section describes the research methodology used in the study conducted in Malaysia, specifically in Kuala Lumpur and Melaka. The research methodology provides a systematic approach to collecting and analyzing data to achieve the objectives of the study. Research design, data collection strategy, sampling strategy, research instrument, data processing methods, and statistical data analysis are only a few of its components. The study seeks to guarantee the validity and reliability of the outcomes using a strong methodology.

3.2 Research Design

Research design is a strategy that uses empirical data to answer research questions. According to Nayak and Singh (2015), research design is a process whose purpose is to create an action plan to satisfactorily answer the research questions identified during the exploration phase, including the selection of research methods, operating structures of interest, and the development of appropriate sampling strategies.

There are also three other kinds of study designs which are explanatory, descriptive, and exploratory (DeCarlo, 2018). Specifically, the analyst usesexploratory research to identify phenomena and gain a deeper understanding of a topicof interest. Descriptive research is intended to accurately describe situations, events, orpeople relevant to research issues. Explanatory study is to investigate a problem or scenario to clarify the variables relationship.

Therefore, in this study, descriptive research will be employed to ascertain the impact of packaging criteria on high-tech companies' performance in Malaysia. This is because descriptive research can be conducted by utilizing specific data collection methods such as surveys.

3.3 Data Collection Method

There are three methodologies to choose from which are quantitative methods, qualitative methods, and mixed methods. The quantitative method is the most fundamental level, and it is concerned with gathering and analyzing organized data that can be represented statistically (*Qualitative Vs. Quantitative Data: What's the Difference? And Why They're so Valuable | FullStory*, n.d.). Furthermore, quantitative research methods are more objective than qualitative methods. However, the qualitative technique is applied through discourse analysis, case studies, focus groups, interviews, and literature reviews to comprehend people's ideas, conceptions, or experiences (Thattamparambil, 2020). In essence, it is a survey of people's viewpoints and encounters. Furthermore, the mixed method is a data collection and analysis methodology that combines quantitative and qualitative methods (H, 2022).

The quantitative approach was selected for data collection in this study. Quantitative analysis is a method of collecting data and obtaining results through statistical analysis. The quantitative method can be used to observe situations or events that influence something. Thus, the impact of packaging criteria on high-tech companies' performance can be measured quantitatively.

A survey was the main technique of data collecting employed in this thesis. Surveys use structured questionnaires to collect data from respondents (Saunders et al., 2018). The purpose of the questionnaire is to gather data on the packaging criteria used by high-tech companies, the challenges they face, and proposed impactful or optimized packaging criteria. Surveys provide a practical and effective way to collect data from many participants over a period.

3.4 Primary and Secondary Data Source

The two types of data sources employed in this study are primary and secondary. According to Ajayi (2017), primary data are details that researchers have personally gathered utilizing methods such as interviews, case studies, surveys, and observations. It is common practice to select and customize primary data sources to fit the needs of a particular investigation. A questionnaire will be distributed through Google Forms to collect primary data for this study.

Additionally, secondary data refers to information that has already been gathered, often by another party. Publications from the government, websites, books, journal articles, and internal documents are a few examples of secondary data sources. (Ajayi, 2017). To obtain secondary data for this research, the researcher turned to Google Scholar as well as other sources including Emerald Insight and ResearchGate. Because the researcher must cover the full process when collecting primary data, the procedure of gathering secondary data is quicker and easier. In addition, this study also uses websites, journal articles, books, and previous thesis in gathering the secondary data. Although processing the primary data takes longer, the finished data will be more reliable and accurate. As a result, both data sources will be used in this study.

3.5 Sampling Method

Purposive sampling was used as the sample strategy for this investigation. To achieve the goals of the study, participants must be chosen using a purposeful sampling strategy (Creswell, 2014). Participants in this study will be the employers and employees from the high-tech companies in Malaysia involved in the packaging strategies and decision-making process for packaging. Using purposeful sampling, one may be confident that the sample contains people with relevant knowledge and skills.

In this investigation, the non-probability sampling approach was applied. When not every person of the population has an equal chance of being picked, this is known as non-probability sampling (McCombes, 2019). Units are chosen from a population through a subjective process called non-probability sampling. This is because the investigator must investigate the impact of packaging criteria on high-tech companies' performance, thus, the researcher needs to purposely select the respondents that are responsible for the packaging operation in the high-tech companies such as from the electronics firms.

In this study, approaches for purposeful sampling will be employed since the researcher will only give questionnaires to workers or employers who are familiar with the packaging criteria for the success of high-tech enterprises. The target market for this study is the 20 high-tech companies in Kuala Lumpur and Melaka, Malaysia, including those in the industry of electronic products. From each of Malaysia's 20 high-tech companies, the researcher will then select 10 participants for the study who are aware about the packaging needs in this sector. Additionally, to disseminate online

surveys and collect data, the researcher will use Google Forms. The survey's participants will voluntarily fill it out.

3.6 Research Strategy and Instrument

A research strategy is a thorough plan of action that gives ideas and efforts direction (Jenny, 2023). It enables methodical and timely research with comprehensive reporting and high-quality results. A solid research design not only directs the study but also aids in choosing the most effective method for gathering and analyzing data. As a result, a survey as a study method will be employed in this research. This is due to the survey strategy's ability to gather information using a quantitative approach and its value in illuminating a trait across a big population (*Understand Qualitative Vs Quantitative Research | SurveyMonkey*, n.d.).

The study project will use a structured survey questionnaire to collect data. The questionnaire will include several prepared questions that will gather pertinent data on the packaging criteria used by high-tech enterprises, the challenges they have encountered, and any suggested effective or optimized packaging criteria. It includes both open-ended questions that allow participants to provide detailed, quantitative replies and closed-ended questions with preset response options. The organized questionnaire will guarantee consistency in data gathering and facilitate effective data analysis.

To get primary data, the researcher must design a questionnaire and give it to the respondents. The three portions of the questionnaires are Section A, Section B, and Section C. Questions concerning the respondent's demographics, including gender, job, department, and others, are included in Section A. Questions concerning packaging criteria for high-tech companies are found in Section B. Challenges in implementing effective packaging strategies covered in Section C. Finally, the impactful or optimized packaging criteria is finally covered in Section D.

Next, the researcher will add 5-point Likert Scale in Section B, C and D. This is because 5-point Likert Scale is a psychometric response scale, the degree of agreement of respondents to a statement is generally divided into five points :(1) strongly disagree; (2) Disagree; (3) Neutral; (4) Agree; (5) Strongly agree. Moreover, the questionnaire will be created by using Google Form. Table 3.6.1 shows that the Likert scale in five points.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Table 3.6.1: Five-point Likert Scale

(Source: Test, 2023)

3.7 Pilot Test

To make sure that all participants in the study understand the questions and receive better results, the researcher will do a pilot test. Before a suggested study is fully implemented, a pilot test is a tiny, preliminary study that is employed in research (Academy, 2022). The pilot test's objective is to ascertain which respondents' things are unclear. Additionally, it will highlight any gaps or flaws in the questionnaire that may be fixed by the researcher before it is sent to respondents.

20 participants will be chosen by the researcher for a pilot study. In these pilot testing, all recommendations and comments from participants are considered and incorporated into the final questionnaire. The responders will then get the updated questionnaire.

3.8 Statistical Data Method and Analysis

A Statistical Package for Social Science (SPSS) version 27 will be used to analyze the data. Data analysis software like SPSS is comprehensive and efficient (Noels, 2018). The researcher's interpretation of the findings is also straightforward. Several techniques, including descriptive analysis, the data in this study will be analyzed using linear regression analysis and Pearson correlation analysis.

An appropriate statistical analysis will be carried out on the gathered data. We will use descriptive statistics to summarize and characterize the data connected to gathering demographic information from respondents, including frequencies, percentages, means, and standard deviations as it is among the most important types of data analysis and may provide actionable insights from raw data. If necessary, we will use inferential statistics to explore associations between variables or test hypothesis, such as Pearson correlation analysis and regression analysis. The statistical

analysis's findings will shed light on the connections, trends, and patterns found in the data.

A test statistic called the Pearson correlation coefficient is used to determine the statistical relationship or correlation between two continuous variables (Statistics Solutions, 2021). It is known as the best measure of correlation between variables of interest since it is based on covariance. To ascertain the link between independent and dependent variables, Pearson correlation analysis was utilized. The correlation from -1 to 1 shows that it changes from being very weak to being extremely strong. Table 3.8.1 below shows the Pearson Correlation Coefficient, or r.

Correlation Coefficient (r) Value	Indication
Between ±0.8 to ± 1.00	High correlation
Between ±0.6 to ± 0.79	Moderately high correlation
Between ±0.4 to ± 0.59	Moderate correlation
Between ±0.2 to ± 0.39	Low correlation
Between ±0.1 to ± 0.19	Negligible correlation

Table 3.8.1: Pearson's Correlation Scale

(Source: Table 4 .8: Pearson's Correlation Scale, n.d.)

The link between a group of independent variables and a dependent variable is formally described by regression analysis (Frost, 2023). It may be used to estimate the degree of correlation between variables and simulate the long-term relationship between them. Regression analysis has four primary objectives: description, estimate, prediction, and control *(Understanding and interpreting regression analysis*, 2021). The relationship between dependent and independent variables can be explained through regression. The process of estimating involves using the observed values of the independent variables to determine the value of the dependent variable. Regression analysis can be useful for predicting outcomes and changes in dependent variables based on the interactions between dependent and independent factors. The last benefit of regression is the capacity to regulate the influence of one or more independent variables while analyzing the relationship between one independent variable and the dependent variable. The packaging design, packaging material, and packaging

innovation are the three independent factors in this study. In this study, the multiple linear regression analysis will be employed, and the equation shown below (Thakur, 2023).

$$\mathbf{Y = a + bX1 + cX2 + dX3 + \in}$$

Where,

- **Y** – Dependent variable (the impact of packaging criteria on high-tech companies' performance)
- **X1, X2, X3** – Independent variables which are (packaging design, packaging material and packaging innovation)
- **a** – Intercept or constant
- **b, c, d** – Slopes which is the regression coefficient
- **є** – Residual (error)

3.9 Validity

The degree to which an instrument measures what it is intended to measure, and functions as intended is known as its validity (*Instrument, Validity, Reliability*, 2018). The accuracy of the analysis's findings is ensured by the use of verified measuring instruments. How effectively the independent variable may be used to explain the observed effect is referred to as internal validity. When the impact of the dependent variable is completely attributable to the independent factors, internal validity is achieved. This is the level of manipulability of a result.

3.10 Reliability

One way to conceptualize reliability is consistency (*Instrument, Validity, Reliability*, 2018). A measurement is considered reliable if the same results can always be obtained with the same technique and under the same conditions (Middleton, 2022). The Cronbach's Alpha method is used in this study to assess the research's dependability. Values for the alpha coefficient range from 0 to 1. A result of $0.6 \leq \alpha < 0.7$ is required to demonstrate research dependability. If the result is less than 0.6, there is an issue with the data. The Cronbach's Alpha coefficient values are displayed in the table below. The Cronbach's Alpha scale may be seen in the table below:

Cronbach's Alpha Coefficient	Internal Consistency
$\alpha \geq 0.9$	Excellent
$0.7 \leq \alpha < 0.9$	Good
$0.6 \leq \alpha < 0.7$	Acceptable
$0.5 \leq \alpha < 0.6$	Poor
$\alpha < 0.5$	Unacceptable

Table 3.10.1: Cronbach's Alpha Coefficient

Source: (*Cronbach's Alpha: Definition, Interpretation, SPSS - Statistics How To*, 2023)

3.11 Research Framework

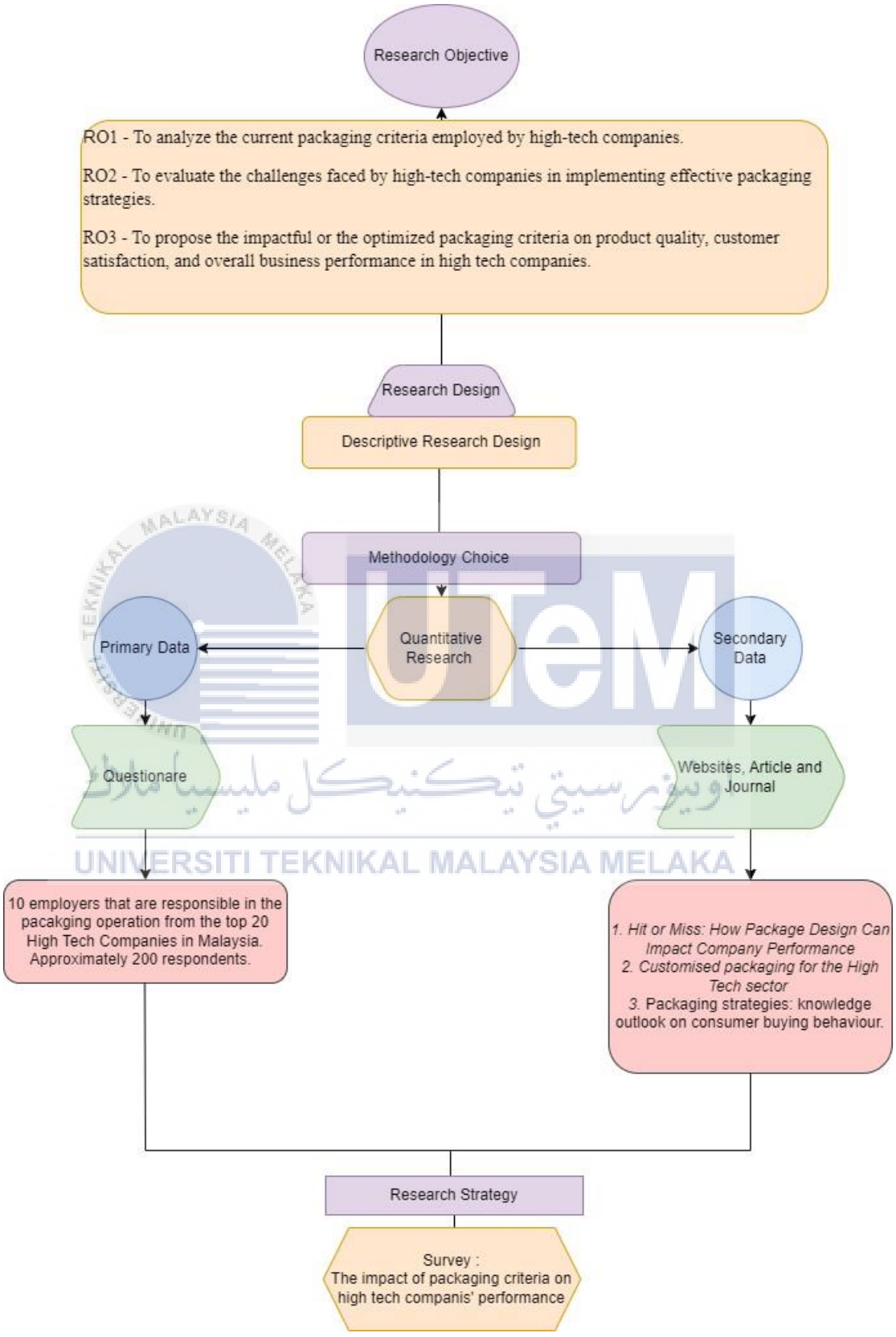

Figure 3.11.1: Research Framework

3.12 Summary

In summary, the research technique used in this study takes a methodical approach to collecting and analyzing data relevant to the packaging criteria employed by high-tech companies. The survey method, using a structured questionnaire, effectively collects data from a targeted sample of high-tech companies. Purposive sampling ensures that the sample includes relevant participants with expertise in packaging strategies. The data will be analyzed using descriptive and statistical analysis to provide information about the research objectives. A survey served as the primary data source for this study, and online articles and journals served as secondary data sources. To assess the validity and reliability of the research, the researcher also conducts a pilot test and determines Cronbach's Alpha. The data will be analyses using the Social Science Statistical Software Package (SPSS) version 27.

CHAPTER 4

RESULT AND DISCUSSIONS

4.1 Introduction

The information gathered from the disseminated questionnaire was examined and refined in this chapter. This chapter uses respondent demographic profiles, survey reliability tests, descriptive analysis, and multiple regression to identify relationships among constructs. Data analysis was based on the Statistical Package for Social Sciences (SPSS) version 27.

4.2 Pilot Test

A pilot test was designed to test the validity of the questionnaire in collecting the required data. It evaluates the performance of the test and ensures the reliability of the questionnaire. Internal reliability is assessed using measures such as Cronbach's Alpha. In this pilot test, 20 respondents were randomly selected from a population of 200 to complete the questionnaire. All items in the table have demonstrated both reliability and validity.

CASE PROCESSING SUMMARY

		N	%
Cases	Valid	19	100.0
	Excluded[a]	0	.0
	Total	19	100.0

a. Listwise deletion based on all variables in the procedure.

Table 4.2.1: Case Processing Summary for 20 Respondents

(Sources: SPSS Data Analysis)

This information provides an overview of the processing of the case. This shows that only 19 cases were analyzed. All 19 cases were found to be valid and were

included in the analysis, and no one was left out. The statement "Excluded[a]" means that no cases were excluded based on the specified criteria. In this case it was necessary to list all variables used in the process. Therefore, all 19 cases were included in the analysis without excluding some cases due to missing data on the variables used.

RELIABILITY STATISTICS	
Cronbach's Alpha	N of Items
.725	19

Table 4.2.2: Reliability Test for 20 Respondents

(Sources: SPSS Data Analysis)

The reliability analysis performed on the data set, as shown in the Reliability Statistics Table 4.2.2, shows Cronbach's Alpha coefficient of 0.725. Given the 19 items analyzed, this suggests a significant level of internal consistency between the questionnaire items. Although the resulting value is slightly above the generally accepted threshold for high reliability $0.6 \leq \alpha < 0.7$, it still indicates a reliable set of questionnaire items.

4.3 Descriptive Analysis

4.3.1 Background of the Respondents

The key characteristics of the data gathered from the questionnaire were described using descriptive statistics. Data analysis is used to ascertain the demographic features of the 200 respondents in connection with the influence of packaging rules on the success of high-tech enterprises. Descriptive statistics is one of the methods that use tables, graphs, and research reviews. In addition, data analysis revealed basic demographic information from the 200 respondents who filled out the questionnaire as shown in Table 4.3.1.A.

DEMOGRAPHIC	DEMOGRAPHIC DETAILS	FREQUENCY	PERCENTAGE (%)
1. Gender	Male	115	57.5
	Female	85	42.5
2. Age	20-29	91	45.5
	30-39	70	35
	40-49	36	18
	50 and above	3	1.5
3. Race	Malay	61	30.5
	Indian	65	32.5
	Chinese	73	36.5
	Others	1	0.5
4. Education Level	Secondary School	13	6.5
	Diploma	81	40.5
	Bachelor Degree	84	42
	Master's	21	10.5
	PhD	1	0.5
5. Type Of Company	Small	43	21.5
	Medium	98	49
	Multinational Corporation (MNC)	59	29.5
6. Type Of Products/Services	Entertainment	68	34.3
	Communications	61	30.5
	Appliances	71	35.5
	Others		
7. Please Specifically State	Office Equipment and Hardware (Computer, Printers, Paper Shredders, Monitor, PC,	27	13.5

Your Products/Services	Laptop, Keyboard, Laptop Accessories, Networking Devices, Mouse)		
	Home Entertainments (Television Sets, Audio Systems, Video Recorders, DVD Players, Smart TVs, TV Accessories, Speakers, Home Theatre Systems, Blu-Ray Players, Mp3 Players, Radio, Microphone Sets)	57	28.5
	Communication Devices (Smartphones, Cell phones, Tablets, Smartwatches, Sim Cards, Smartphone Accessories, Chargers, Earphones, Headphones)	33	16.5
	Home Appliances (Refrigerator, Washing Machines, Microwave, Ovens, Air Conditioners, Kitchen Stoves, Water Heaters, Dishwasher, Kitchen Stoves, Dryer, Freezers, Multifunctional Cooker, Waffle Makers, Rice Cooker, Vacuum Cleaner)	55	27.5

	Beauty Appliances (Hair Straightener, Hair Dryer, Hair Curler)	17	8.5
	Others (Gaming Consoles, PlayStation, Controllers, Gaming Peripherals, Virtual Reality Devices, Virtual Reality Accessories)	11	5.5
8. Job Title/Position	Supervisor	28	14
	Associate	37	18.5
	Manager	16	8
	Executive	52	26
	Others	67	33.5
9. Department/ Division	Operations (Logistics, Manufacturing, Quality Control, Quality Assurance, Supply Chain Management)	43	21.5
	Marketing (Sales, Retail)	75	37.5
	Product Development (R&D)	51	25.5
	Production	16	8
	Others	15	7.5

	(Finance, Customer Service, Management)		
10. Years of experience in the high-tech industry	Less Than 1 Year 1 – 6 Years 7 – 12 Years More Than 12 Years Others	32 73 58 37	16 36.5 29 18.5
11. Please specify the type of packaging commonly used for electronic products in your manufacturing company.	Boxes Blister Packaging Anti-Static Bags Bubble Wrap Customized Packaging	191 79 32 3 2	62.2 25.7 10.4 1,0 0.7
12. What are the primary materials used in your electronic product packaging?	Cardboard Plastic Foam Metal Bubble Wrap	179 158 64 9 13	42.3 37.4 15.1 2.1 3.1
13. Packaging criteria give impacts on high-tech companies' performance. Do you agree?	Yes Others	200	100

Table 4.3.1.A: Total Demographic Information Summary

4.3.1.1 Gender

GENDER					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	85	42.5	42.5	42.5
	Male	115	57.5	57.5	100.0
	Total	200	100.0	100.0	

Table 4.3.1.1.A: Distribution of Respondents by Gender

(Source: Data Analysis of SPSS)

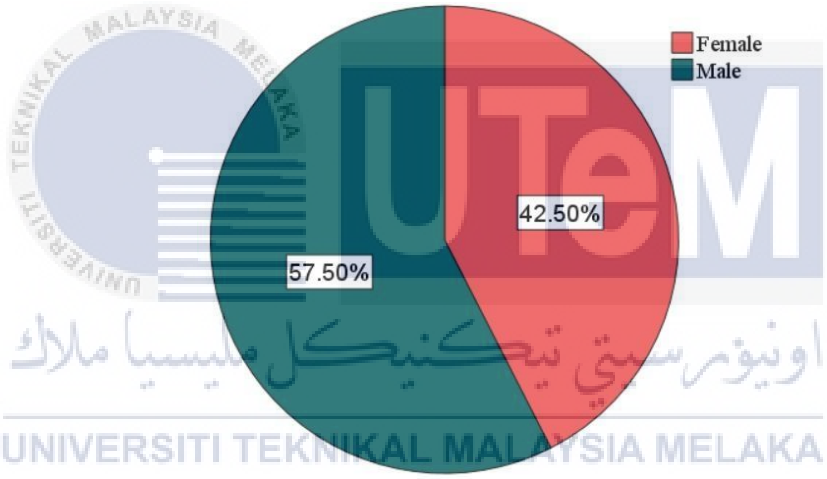

Figure 4.3.1.1.A: Distribution of Respondents by Gender

(Source: Data Analysis of SPSS)

Based on a study of SPSS data, Figure 4.3.1.1.A shows the gender distribution of respondents. The research reveals that of the 200 respondents listed in Table 4.3.1.1.A, 85 respondents (42.5%) were female, and 85 respondents (57.5%) were male. This demonstrates that there were more male respondents in the sample than female respondents.

4.3.1.2 Age

AGE					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20 – 29	91	45.5	45.5	45.5
	30 – 39	70	35.0	35.0	80.5
	40 – 49	36	18.0	18.0	98.5
	50 and above	3	1.5	1.5	100.0
	Total	200	100.0	100.0	

Table 4.3.1.2.A: Distribution of Respondents by Age

(Source: Data Analysis of SPSS)

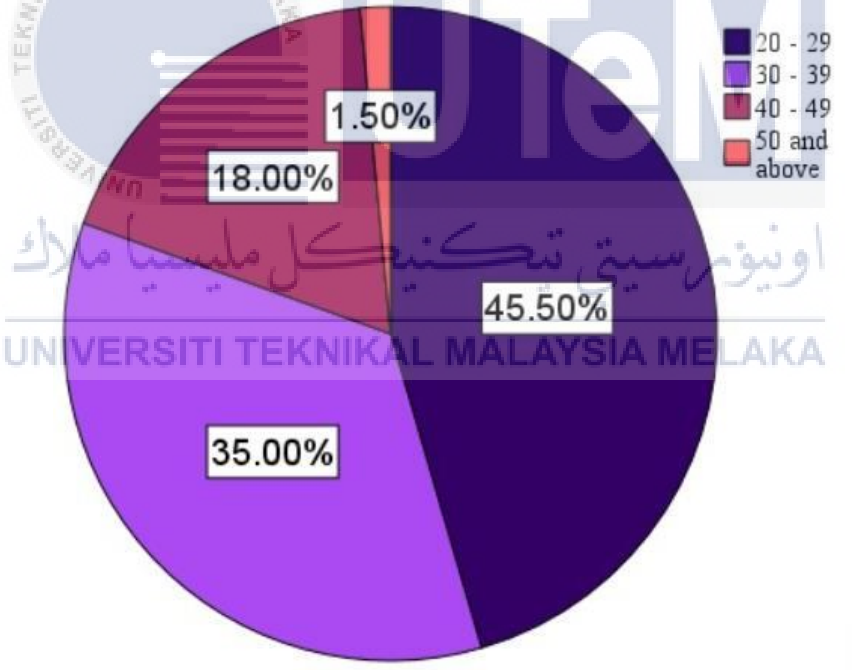

Figure 4.3.1.2.A: Distribution of Respondents by Age

(Source: Data Analysis of SPSS)

Table 4.3.1.2.A and Figure 4.3.1.2.A present the age distribution of survey participants. The largest proportion of participants were aged 20-29, accounting for 45.5% and 91 respondents of the total sample. Following closely, the age group 30-39 accounted for 35.0% and 70 respondents of the participants. In addition, the age group 40-49 accounted for 18.0% and 36 respondents of the total respondents. A smaller share, only 1.5% and 3 respondents, were people aged 50 and older. Overall, these data show that the respondents are mainly from the youngest age groups, especially from 20 to 29 years old.

4.3.1.3 Race

RACE					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Malay	61	30.5	30.5	30.5
	Indian	65	32.5	32.5	63.0
	Chinese	73	36.5	36.5	99.5
	Others	1	0.5	0.5	100.0
	Total	200	100.0	100.0	

Table 4.3.1.3.A: Distribution of Respondents by Race

(Source: Data Analysis of SPSS)

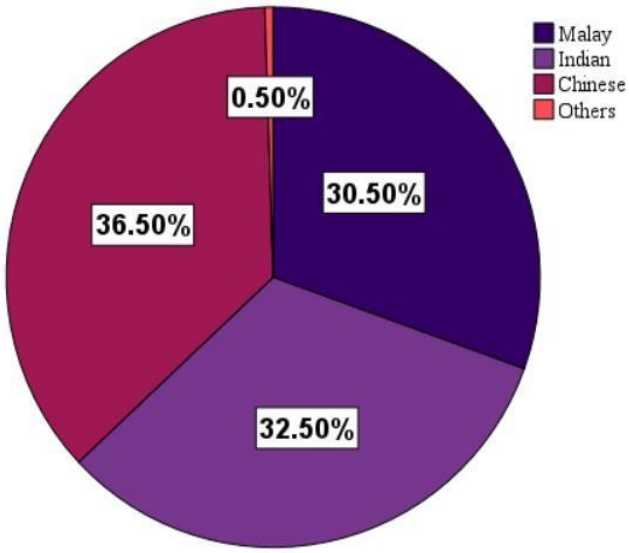

Figure 4.3.1.3.A: Distribution of Respondents by Race

(Source: Data Analysis of SPSS)

From the data on racial demographic characteristics of respondents presented in Table 4.3.1.3.A and Figure 4.3.1.3.A, it's evident that the vast majority of respondents are from various racial backgrounds. The largest group is people of Chinese descent, who make up 36.5% of all respondents (73 out of 200). Out of the 65 respondents, ethnic Indians made up 32.5% of the total number of respondents. 30.5% of the respondents were Malay, making up 61 individuals. There is a small representation in the other category, which only includes 0.5% (1 individual). Thus, the data in Table 4.3.1.3.A and Figure 4.3.1.3.B illustrate the different racial distribution among the respondents in this study.

4.3.1.4 Education Level

EDUCATION LEVEL					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Secondary School	13	6.5	6.5	6.5
	Diploma	81	40.5	40.5	47.0
	Bachelor’s degree	84	42.0	42.0	89.0
	Master's	21	10.5	10.5	99.5
	PhD	1	0.5	0.5	100.0
	Total	200	100.0	100.0	

Table 4.3.1.4.A: Distribution of Respondents by Education Level

(Source: Data Analysis of SPSS)

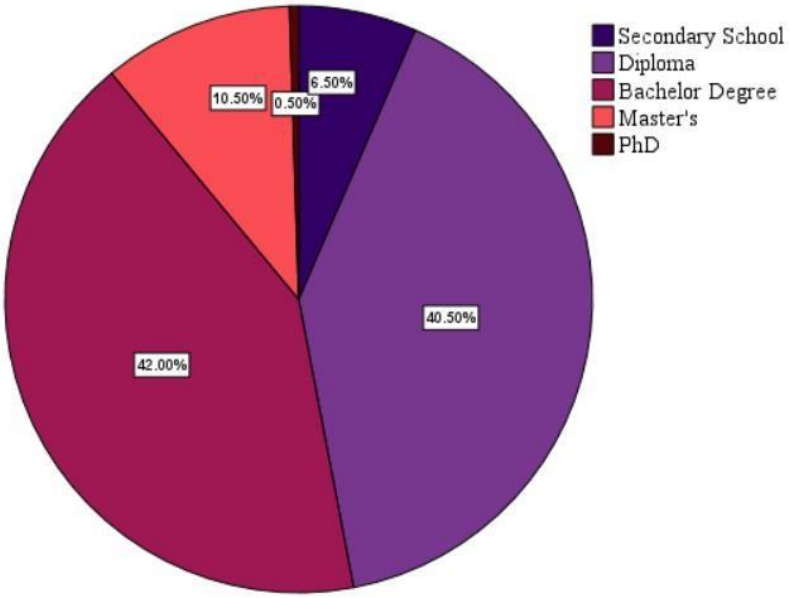

Figure 4.3.1.4.A: Distribution of Respondents by Education Level

(Source: Data Analysis of SPSS)

The data in Table 4.3.1.4.A and Figure 4.3.1.4.A show the educational level of the respondents. This shows a different distribution between different levels of education. Most respondents had a bachelor's degree score of 42.0% with 84 respondents and a Diploma score of 40.5% representing 81 respondents. A minority has a Master's of 10.5% with 21 respondents, while a minority has completed education up to the Secondary School level of 6.5% with 13 individuals. The presence of people with a doctorate is minimal and amounts to only 0.5% similarly to 1 individual. Overall, these data highlight the diversity of respondents' qualifications, ranging from lower to higher education.

4.3.1.5 Type of Company

TYPE OF COMPANY					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Small	43	21.5	21.5	21.5
	Medium	98	49.0	49.0	70.5
	Multinational Corporation (MNC)	59	29.5	29.5	100.0
	Total	200	100.0	100.0	

Table 4.3.1.5.A: Distribution of Respondents by Company Type

(Source: Data Analysis of SPSS)

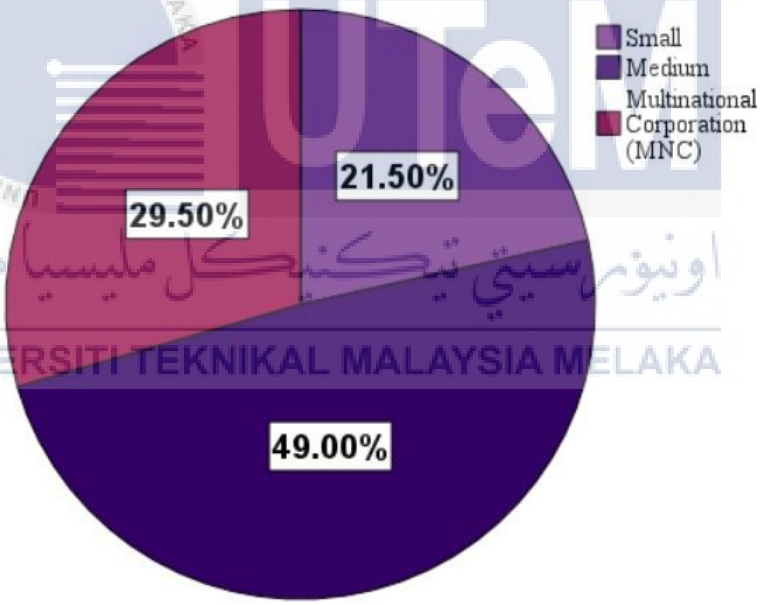

Figure 4.3.1.5.A: Distribution of Respondents by Company Type

(Source: Data Analysis of SPSS)

The data in Table 4.3.1.5.A and Figure 4.3.1.5.A demonstrates the respondents' distribution according to the kind of firm they work for. It seems that almost half of the respondents, 49% with 98 individuals, work in medium-sized companies. Accordingly, 29.5% with 59 respondents work in Multinational Corporation (MNC)

companies, correspond to a total of 59 individuals. Small businesses employ 21.5% with respondents of 43 individuals. Overall, these data reflect a diverse representation of respondents from different company sizes, with the largest proportion of participants coming from medium-sized companies.

4.3.1.6 Type of Products/Services

TYPE OF PRODUCTS/SERVICES					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Entertainment	68	34.0	34.0	34.0
	Communications	61	30.5	30.5	64.5
	Appliances	71	35.5	35.5	100.0
	Total	200	100.0	100.0	

Table 4.3.1.6.A: Distribution of Respondents by Type of Products/Services

(Source: Data Analysis of SPSS)

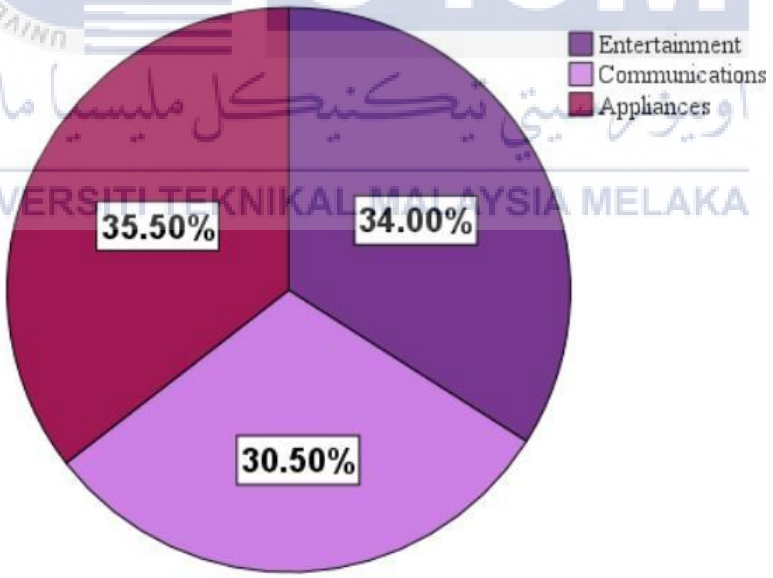

Figure 4.3.1.6.A: Distribution of Respondents by Type of Products/Services

(Source: Data Analysis of SPSS)

This data comes from Table 4.3.1.6.A and Figure 4.3.1.6.A, this gives a general picture of how respondents were distributed throughout their organization according to the kind of product or service. It turns out that most respondents, namely 35.5% which is 71 out of 200, are associated with companies specializing in the production of Appliances. Entertainment product services accounted for 34% of respondents with atotal of 68 respondents and mass media products accounted for 30.5% respondents with a total of 61 respondents. This data reflects the distribution of respondents across different product service categories within their organizations.

4.1.3.7 Product Specifications

PRODUCT SPECIFICATIONs					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Office Equipment and Hardware	27	13.5	13.5	13.5
	Home Entertainments	57	28.5	28.5	42.0
	Communication Devices	33	16.5	16.5	58.5
	Home Appliances	55	27.5	27.5	86.0
	Beauty Appliances	17	8.5	8.5	94.5
	Others	11	5.5	5.5	100.0
	Total	200	100.0	100.0	

Table 4.3.1.7.A: Distribution of Respondents by Product Specifications

(Source: Data Analysis of SPSS)

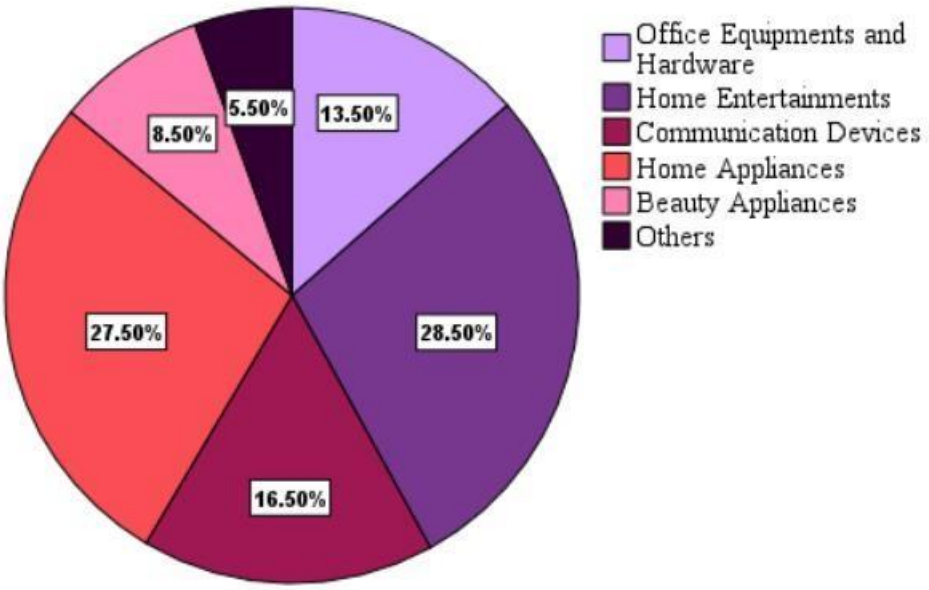

Figure 4.3.1.7.A: Distribution of Respondents by Product Specifications

(Source: Data Analysis of SPSS)

Table 4.3.1.7.A and Figure 4.3.1.7.A show the respondents' distribution based on the kind of goods or services offered by their business. When analyzing the respondents' areas of expertise, it is noticeable that Home Entertainment becomes the predominant category with 28.5% of respondents comprising 57 individuals. This is followed by Home Appliances with 27.5%, which corresponds to 55 respondents. Communication equipment accounted for 16.5%, with 33 respondents participating, and Office Equipment and Hardware accounted for 13.5%, with 27 respondents participating. In addition, there is a Beauty Appliances segment that covers 8.5 of respondents with 17 respondents and finally the other category covers 5.5% of 11 individuals.

These product categories and services are important in high-tech companies and describe various aspects of the activity. Office equipment and supplies are the essential tools for efficient office organization, including computers, printers, monitors, keyboards and more. Home entertainment includes a wide range of devices designed for leisure and relaxation such as televisions, audio systems, VCRs, DVD players, smart TVs, TV accessories, speakers, home theatre systems, Blu-Ray players, MP3 players, radios, and microphone sets. Communication devices make it easier to connect and engage with each other such as smartphones, mobile phones, tablets,

smart watches, SIM cards, smartphone accessories, chargers, headphones, and earphones. Household appliances play an important role in everyday life and provide comfort and convenience. This category includes refrigerators, washing machines, microwaves, ovens, air conditioners, stoves, water heaters, dishwashers, dryers, freezers, slow cookers, waffle makers, rice cookers and vacuum cleaners. Beauty products are used for includes personal care and styling devices such as hair straighteners, hair dryers and curlers that assist people in their personal beauty routine. Finally, the "Other" category includes a game console, controllers, gaming peripherals, virtual reality (VR) devices and virtual reality accessories that enable entertainment activities and technological exploration beyond the standard categories listed above.

Understanding the distribution of respondents in these categories provides insight into the different areas of activity at the technology companies highlighting the relevance of packaging criteria in these diverse sectors.

4.3.1.8 Job Title/Position

JOB TITLE/POSITION					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Supervisor	28	14.0	14.0	14.0
	Associate	37	18.5	18.5	32.5
	Manager	16	8.0	8.0	40.5
	Executive	52	26.0	26.0	66.5
	Others	67	33.5	33.5	100.0
	Total	200	100.0	100.0	

Table 4.3.1.8.A: Distribution of Respondents by Job Title/Position

(Source: Data Analysis of SPSS)

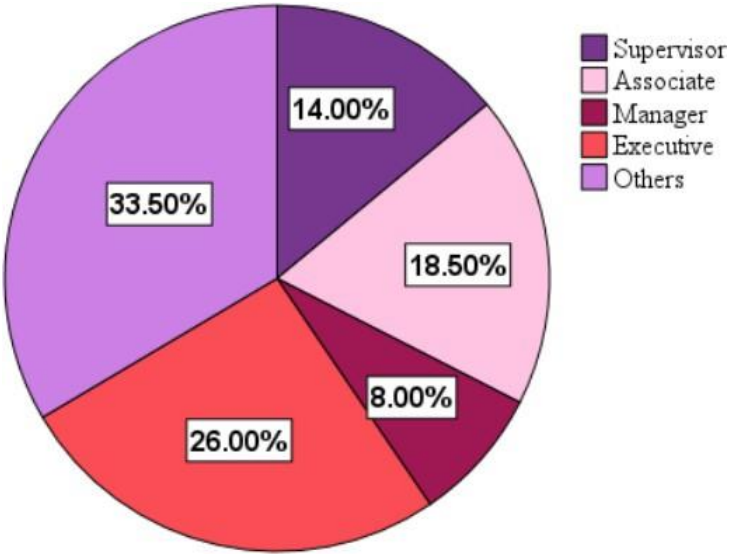

Figure 4.3.1.8.A: Distribution of Respondents by Job Title/Position

(Source: Data Analysis of SPSS)

Table 4.3.1.8.A and Figure 4.3.1.8.A depicts the distribution of respondents categorized by several job titles or positions, including Supervisor, Associate, Manager, Executive, and a variety of other roles such as Administrators, Maintenance, Technicians, Assistants, Analysts, Engineers, Designers, Officers, Operators and Specialists. Of the 200 participants surveyed, the data shows that executives make up the largest segment at 26% with 52 individuals, followed by associates at 18.5% with 37 individuals. Supervisors made up 14% of 38 respondents,while managers made up 8% with 16 individuals. Notably, the "Other" category, whichincludes a variety of roles beyond those explicitly listed, accounts for 33.5% of the total respondents with 67 individuals, showing significant diversity in job titles and positions in the subject being surveyed. This breakdown provides insight into the diverse professional roles and different perspectives of respondents.

4.3.1.9 Department/Division

DEPARTMENT/DIVISION					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Operations	43	21.5	21.5	21.5
	Marketing	75	37.5	37.5	59.0
	Product Development	51	25.5	25.5	84.5
	Production	16	8.0	8.0	92.5
	Others	15	7.5	7.5	100.0
	Total	200	100.0	100.0	

Table 4.3.1.9.A: Distribution of Respondents by Department/Division

(Source: Data Analysis of SPSS)

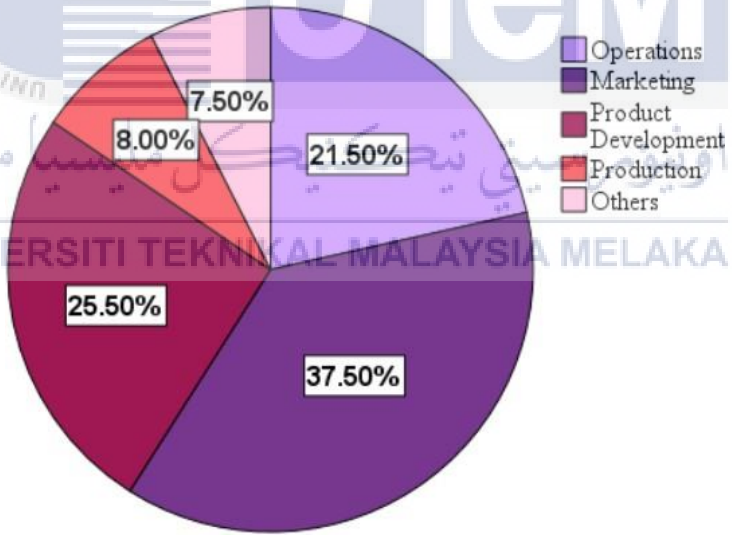

Figure 4.3.1.9.A: Distribution of Respondents by Department/Division

(Source: Data Analysis of SPSS)

The data presented in the Table 4.3.1.9.A and Figure 4.3.1.9.A gives an impression of the composition of respondents in different departments of the organization. Operations accounted for 21.5% with 43 respondents, which included logistics, manufacturing, quality control, quality assurance and supply chain

management. Marketing is 37.5% with 75 individuals which includes activities related to sales and retail. Product development accounts for 25.5% with 51 individuals related to research and development (R&D). Production made up 8% with 16 individuals that focused on activities such as manufacturing and more. The Other category 7.5% with 15 individuals include various departments such as finance, customer service, management, and other unspecified areas. This distribution helps to understand the distribution of respondents within these segments and reflects the different roles and functions in the organizational structure.

4.3.1.10 Years of Experience in High-Tech Industry

YEARS OF EXPERIENCE IN HIGH-TECH INDUSTRY					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 1 year	32	16.0	16.0	16.0
	1 - 6 years	73	36.5	36.5	52.5
	7 - 12 years	58	29.0	29.0	81.5
	More than 12 years	37	18.5	18.5	100.0
	Total	200	100.0	100.0	

Table 4.3.1.10.A: Distribution of Respondents by Years of Experience in High-Tech Industry

(Source: Data Analysis of SPSS)

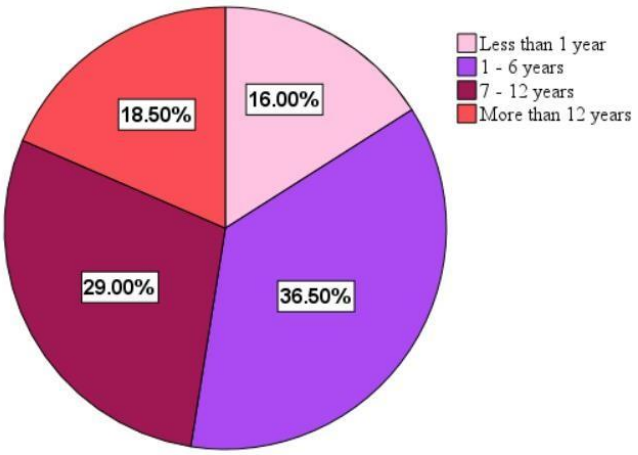

Figure 4.3.1.10.A: Distribution of Respondents by Years of Experience in High-Tech Industry

(Source: Data Analysis of SPSS)

The data analysis from Table 4.3.1.10.A and Figure 4.3.1.10.A highlightsthe diversity of respondents' years of experience in the technology industry. Diversitywas evident of 16.0% with 32 participants had less than one year of experience, 36.5%with 73 individuals had 1 to 6 years of experience, and 29.0% with 58 individuals had7 to 12 years of experience. In addition, 18.5% have more than 12 years of experiencein this field. This ratio of 200 respondents highlights the mix of early-career professionals, mid-level professionals and professionals that provides a comprehensive view of the distribution based on their experience in the high-tech sector.

4.3.1.11 Type of Packaging Commonly Used for Electronic Products in Company

TYPE OF PACKAGING COMMONLY USED FOR ELECTRONIC PRODUCTS IN COMPANY				
		Responses		Percent of Cases
		N	Percent	
Valid[a]	Boxes	191	62.2%	96.0%
	Blister Packaging	79	25.7%	39.7%
	Anti-static Bags	32	10.4%	16.1%
	Bubble Wrap	3	1.0%	1.5%
	Customized Packaging	2	0.7%	1.0%
Total		307	100.0%	154.3%
a. Dichotomy group tabulated at value 1.				

Table 4.3.1.11.A: Distribution of Respondents by Type of Packaging Commonly Used for Electronic Products in Company

(Source: Data Analysis of SPSS)

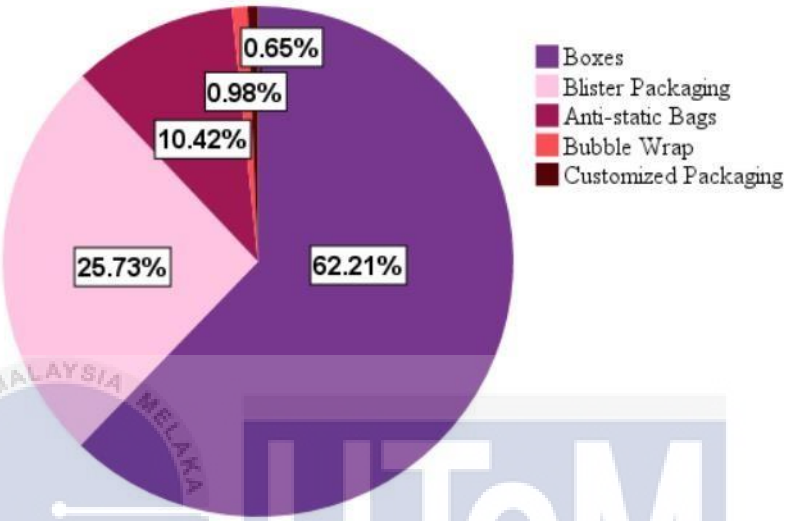

Figure 4.3.1.11.A: Distribution of Respondents by Type of Packaging Commonly Used for Electronic Products in Company

(Source: Data Analysis of SPSS)

Based on Table 4.3.1.11.A and Figure 4.3.1.11.A, analyzing data on electronics packaging preferences within a company reveals a clear hierarchy of choices. Of the various options examined, boxes were the preferred option with 62.2% with 191 individual responses and 96% valid options. In second place are blister packs, accounting for 25.7% with 79 individuals associated with 39.7% valid answers,while anti-static bags account for 10.4% with 32 out of the total 200 respondents, with16.1% valid answers. Despite these strong preferences, other products such as bubblewrap and individual packaging were rarely used, accounting for only 1.7% with 6 individuals of the total responses. This data shows a trend toward the use of traditional

packaging methods such as cartons, as well as a clear preference for blister packs and moderate use of anti-static bags in the packaging of electronic products by companies.

4.3.1.12 Primary Materials Used in Electronic Product Packaging

PRIMARY MATERIALS USED IN LECTRONIC PRODUCT PACKAGING?				
		Responses		
		N	Percent	Percent of Cases
Valid[a]	Cardboard	179	42.3%	89.5%
	Plastic	158	37.4%	79.0%
	Foam	64	15.1%	32.0%
	Metal	9	2.1%	4.5%
	Bubble Wrap	13	3.1%	6.5%
Total		423	100.0%	211.5%
a. Dichotomy group tabulated at value 1.				

Table 4.3.1.12.A: Distribution of Respondents by Primary Materials Used in Electronic Product Packaging

(Source: Data Analysis of SPSS)

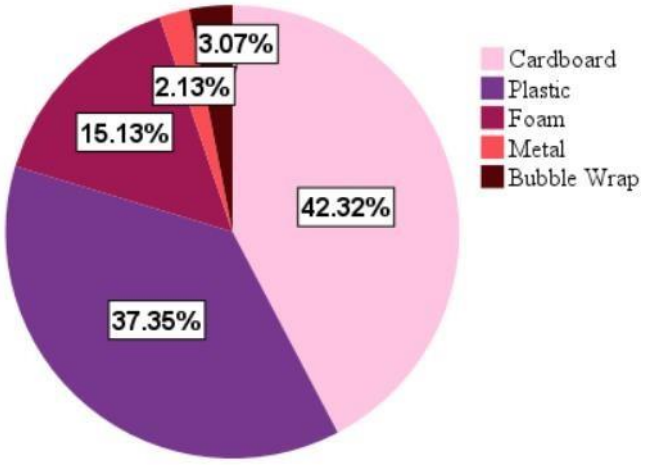

Figure 4.3.1.12.A : Distribution of Respondents by Primary Materials Used In Electronic Product Packaging

(Source: Data Analysis of SPSS)

Table 4.3.1.12.A and Figure 4.3.1.12.A show the data analysis of the primary materials used in electronics packaging shows a hierarchy of priorities within the industry. Cardboard appears to be the dominant choice with 42.3% and 179 respondents of all cases, or 89.5% of the dichotomous group receiving a value of 1, indicating a significant reliance on this material for packaging purposes. Next was plastic, which accounted for 37.4% with 158 respondent cases and 79.0% in the dichotomous group. These two materials, cardboard, and plastic, dominate the market, showing their importance and wide application in electronics packaging. At the same time, the proportion of foam, metal and bubble wrap is lower in percentage terms where foam accounts for 15.1% with 64 respondents, metal 2.1% with 9 individuals and bubble wrap 3.1% with 13 respondents of the total number of cases or times in the dichotomous group, grouped by values, 32.0%, 4.5% and 6.5%, respectively. This study highlights the widespread reliance on cardboard and plastic and recognizes the use of optional materials with on a much smaller scale, in the high-tech sector.

4.3.1.13 Impact of Packaging Criteria on High-Tech Companies' Performance

PACKAGING CRITERIA GIVE IMPACTS ON HIGH-TECH COMPANIES' PERFORMANCE. DO YOU AGREE? PLEASE SPECIFY IF YOU DO NOT AGREE.					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	200	100.0	100.0	100.0

Table 4.3.1.13.A: Distribution of Respondents by Impact of Packaging Criteria on High-Tech Companies' Performance

(Source: Data Analysis of SPSS)

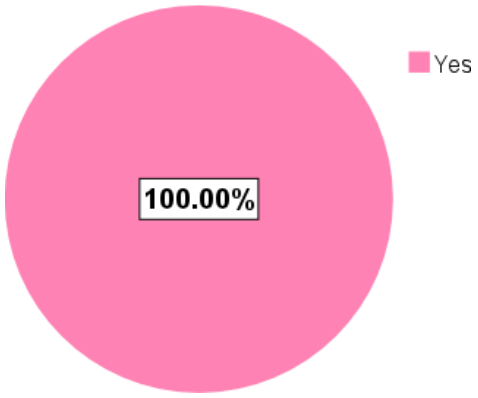

Figure 4.3.1.13.A: Distribution of Respondents by Impact of Packaging Criteria on High-Tech Companies' Performance

(Source: Data Analysis of SPSS)

Based on the information on Table 4.3.1.13.A and Figure 4.3.1.13.A, the answers of 200 participants were gathered from a survey or examination of the effect of packaging criteria on the success of high-tech enterprises. Incredibly, all respondents in the 200-person data set clearly agreed that packaging criteria generally have an impact on the performance of these companies. Overall, there were no differing assumptions or people showing otherwise. This consistent agreement highlights respondents' strong belief that the selection and application of packaging criteria has a major effect on high-tech firms' performance and success.

4.3.1 Research Question Analysis

4.3.2.1 Dependent Variable: High-Tech Companies' Performance

DESCRIPTIVE STATISTICS					
	N	Minimum	Maximum	Mean	Std. Deviation
(RO1, 2). The current packaging strategy contributes significantly to the cost-effectiveness of our operations.	200	2	5	3.67	.750

(RO1, 3). The current packaging criteria align well with industry standards and requirements.	200	2	5	3.90	.675
(RO3, 2). The current measurement of customer satisfaction related to packaging is effective.	200	2	5	3.67	.611
(RO3, 3). Key performance indicators for business performance are directly impacted by packaging criteria.	200	3	5	4.13	.604
Valid N (listwise)	200				

Table 4.3.2.1.A: Descriptive Statistic of High-Tech Companies' Performance

(Source: Data Analysis of SPSS)

The data provided in Table 4.3.2.1.A reflects the findings of an investigation on the connection between packaging criteria and the performance of high-tech companies. By analyzing 200 participants' responses to various packaging strategy statements, these criteria have a significant impact on perceived operational efficiency, compliance with industry standards, and impact on key business performance indicators. Respondents expressed relatively positive attitudes toward aligning current packaging criteria with industry standards (average score of 3.90) and its impact on critical business performance indicators (average score of 4.13). However, opinions regarding the effectiveness of packaging-related customer satisfaction measurement seem to be somewhat more varied (average value of 3.67), although there is still a positive trend. These findings imply that packing techniques are important in influencing people's opinions of operational efficiency and business performance in the technology industry, albeit with varying consensus among respondents.

4.3.2.2 Independent Variable: Packaging Design

DESCRIPTIVE STATISTICS					
	N	Minimum	Maximum	Mean	Std. Deviation
(RO1, 1). The current packaging criteria effectively protect products during transportation and handling.	200	2	5	4.08	.515
(RO2, 5). The globalization of markets has a substantial impact on the consistency of packaging quality across different regions.	200	2	5	3.96	.583
(RO3, 4). Optimized packaging criteria should balance cost-effectiveness and align with overall business goals.	200	2	5	4.10	.593
(RO3, 5). Integration of optimized packaging criteria into the overall business strategy is a priority for our high-tech company's performance.	200	3	5	4.23	.622

(RO3, 6). In your opinion, the type of packaging used affect the perception of your electronic products in the market.	200	3	5	4.20	.540
Valid N (listwise)	200				

Table 4.3.2.2.A: Descriptive Statistics of Packaging Design

(Source: Data Analysis of SPSS)

The data provided in Table 4.3.2.2.A shows the perception of packaging design in a high-tech company. The independent variable "packaging design" is evaluated according to various criteria. Respondents, 200 in total for each criterion, expressed strong opinions about the effectiveness of current packaging in protecting products during transportation and handling, reflected in an average score of 4.08 with a standard deviation of 0.515. Recognition of the impact of globalization on the consistency of packaging quality across regions with a mean of 3.96, and standard deviation of 0.583, respondents strongly supported the idea of optimizing packaging criteria that balance cost efficiency and alignment with overall business goals with a mean of 4.10 and standard deviation of 0.593. Additionally, integrating packaging criteria into a company's business strategy was viewed as critical to improving performance with a mean of 4.23, and a standard deviation of 0.622, indicating a strong agreement. In addition, respondents believed that packaging type directly influences market perception of electronic products with a mean of 4.20, and standard deviation of 0.540. Overall, the results highlight the importance of aligning packaging design with business objectives and the impact it has on market perception of the product, suggesting a strong focus on strategic packaging within the company.

4.3.2.3 Independent Variable: Packaging Material

DESCRIPTIVE STATISTICS					
	N	Minimum	Maximum	Mean	Std. Deviation
(RO2, 1). Overcoming challenges related to packaging strategies is very easy for our company.	200	2	5	3.13	.708
(RO2, 2). The company effectively addresses environmental impact issues associated with packaging.	200	3	5	4.08	.561
(RO2, 6). The choice of packaging materials has an impact to the environmental sustainability goals of your electronic manufacturing company.	200	3	5	4.35	.640
(RO3, 1). Packaging criteria significantly influence specific aspects of product quality.	200	2	5	4.24	.560

(RO3, 7). Using sustainable or eco-friendly packaging materials important for your electronic products.	200	3	5	4.47	.600
Valid N (listwise)	200				

Table 4.3.2.3.A: Descriptive Statistics of Packaging Material

(Source: Data Analysis of SPSS)

The dataset appears in Table 4.3.2.3.A to be derived from a survey or questionnaire conducted at an electronics manufacturer, possibly aimed at understanding perceptions and opinions about packaging materials and their impacts. The data set includes responses from 200 company employees to several statements about packaging materials. Each statement is marked with a code, e.g. (RO2, 3) followed by the specific question number. These statements cover various aspects such as the ability to easily overcome packaging strategy challenges, environmental impact issues, the impact of packaging materials on environmental sustainability goals. The response range, mean, median, and standard deviation of the spread of responses around the mean are shown in the data, providing a numerical summary of descriptive statistics for each statement. For example, in statement (RO2, 6) regarding the impact of packaging materials on environmental sustainability goals, the average response was 4.35 with a standard deviation of 0.640. This implies that respondents believe there has been a notable impact of packaging materials on a company's environmental sustainability goals, and that responses are relatively consistent around this perception. The data set provides a comprehensive overview of how individuals within the company view the role of packaging materials across a variety of dimensions, providing insight into beliefs on environmental sustainability, product quality and the strategic importance of choosing the right packaging materials in the context of electronics firms.

4.3.2.4 Independent Variable: Packaging Innovation

DESCRIPTIVE STATISTICS					
	N	Minimum	Maximum	Mean	Std. Deviation
(RO1, 4). Our company actively considers and adopts industry trends and innovations in packaging criteria.	200	2	5	4.07	.694
(RO1, 5). The current packaging system is flexible enough to adapt to changes in product specifications or market demands.	200	3	5	3.91	.639
(RO2, 3). Internal organizational challenges (e.g., resistance from departments) significantly hinder packaging strategy implementation.	200	2	5	3.39	.787
(RO2, 4). Technological advancements play a crucial role in overcoming challenges related to packaging strategies.	200	2	5	4.11	.690

(RO3, 8). Your electronic manufacturing company open to adopting new packaging materials or innovations in packaging technology.	200	3	5	4.21	.507
Valid N (listwise)	200				

Table 4.3.2.4.A: Descriptive Statistics of Packaging Innovation

(Source: Data Analysis of SPSS)

The data illustrates perceptions around packaging innovation within a company, exploring various aspects of the concept. Across the various statements, there was a consistent trend in which most respondents expressed a positive bias towards certain aspects of packaging innovation. For example, the data shows a high average score of 4.07 out of 5 for actively considering and applying industry trends and innovations in packaging criteria, indicating a progressive up to date trendstrongly. Similarly, the level of openness to adopting new packaging materials or innovating packaging technology achieved a particularly high average score of 4.21, indicating a proactive stance in applying new ideas in this field. However, despite these overall positives, the organization's internal challenges were still perceived as obstacles to some extent, as demonstrated by the relatively lower mean score of 3.39.However, respondents emphasized the importance of technological advances in addressing these challenges, achieving an average rating of 4.11. Overall, the data paints a picture in which the company shows a strong and open interest in packaging innovation, although internal challenges remain important factors to consider in this process. The process of developing packaging strategies continues.

4.4 Reliability Analysis

Cronbach's Alpha analysis proved to be the most suitable method for evaluating the internal consistency and reliability of the study variables; it was employed in this study. SPSS was chosen as the platform for conducting this analysis. The resulting Cronbach Alpha value is important because it serves as an indicator of reliability. Any score below 0.6 is regarded as insufficient or unsatisfactory, while any value equal to or higher than 0.7 is seen as showing strong dependability. The following table shows the Cronbach Alpha values obtained from this study, which provides an estimate of the reliability of the tested variables.

CASE PROCESSING SUMMARY			
		N	%
Cases	Valid	200	100.0
	Excluded[a]	0	.0
	Total	200	100.0
a. Listwise deletion based on all variables in the procedure.			

Table 4.4.1: Case Processing Summary of 200 Respondents

(Source: Data Analysis of SPSS)

RELIABILITY STATISTICS	
Cronbach's Alpha	N of Items
.835	19

Table 4.4.2: Reliability Statistics of 200 Respondents

(Source: Data Analysis of SPSS)

The data analysis shown in Table 4.4.1 and Table 4.4.2 provide information about the integrity and internal consistency of a data set. The case processing summary

highlights that there were no exclusions due to incomplete data through list-wise deletion among the 200 cases reviewed, representing the complete data set for analysis accumulation. On the other hand, the Reliability Statistics section shows Cronbach's Alpha coefficient of 0.835, reflecting a good degree of internal consistency across the 19 assessed items. This enhances the data set's dependability for further analysis or research endeavours by demonstrating a dependable link between the variables that were investigated.

4.5 Pearson Correlation Analysis

CORRELATIONS					
		DV	IV1	IV2	IV3
DV	Pearson Correlation	1	.626**	.594**	.559**
	Sig. (2-tailed)		.000	.000	.000
	N	200	200	200	200
IV1	Pearson Correlation	.626**	1	.659**	.600**
	Sig. (2-tailed)	.000		.000	.000
	N	200	200	200	200
IV2	Pearson Correlation	.594**	.659**	1	.499**
	Sig. (2-tailed)	.000	.000		.000
	N	200	200	200	200
IV3	Pearson Correlation	.559**	.600**	.499**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	200	200	200	200
**. Correlation is significant at the 0.01 level (2-tailed).					

Table 4.5.1 Pearson Correlation Analysis

(Source: Data Analysis of SPSS)

The data in Table 4.5.1 shows a strong and consistent pattern of positive correlations between the dependent variable (DV) and each of the independent variables (IV1, IV2, IV3). The correlation coefficients of DV with IV1, IV2 and IV3 are 0.626, 0.594 and 0.559, respectively. The relationships shown here are all statistically significant at the 0.01 (two-tailed) level, indicated by a p-value of 0.000.

Similarly, the independent variables exhibit positive and statistically significant relationships with one another. IV1 correlates with IV2 at 0.659, IV1 with IV3 at 0.600 and IV2 with IV3 at 0.499. All these correlations also show a significance level of $p<0.01$.

Essentially, these data show significant positive connections among the independent factors themselves and strong and positive relationships between each independent variable and the dependent variable. Though the research does not establish cause and effect, these results point to a link between the variables looked at, indicating that changes in one variable may correspond to changes in other variables.

4.6 Multiple Regression Analysis

A method for assessing significance that considers several independent and dependent variables is multiple regression analysis. Multiple regression analysis is used in this study to examine the impact of three independent factors, packaging design (IV1, PD), packaging material (IV2, PM), packaging innovation (IV3, PI) and one dependent variable high-tech companies' performance (DV, HTCP). Therefore, the following table presents the results of the multiple regression analysis.

MODEL SUMMARY				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.697[a]	.486	.478	.33396
a. Predictors: (Constant), IV3, IV2, IV1				

Table 4.6.1: Model Summary

(Source: Data Analysis of SPSS)

Table 4.6.1 presents the results of a multiple regression study that illustrates the correlation between three independent variables which are packaging design (IV1), packaging material (IV2) and packaging innovation (IV3) and their combined influence on the performance of high-tech companies (DV, HTCP). A summary of the model shows useful indicators: a correlation coefficient (R) of 0.697 indicates a relatively strong linear relationship between the predictors and the performance of high-tech companies. The coefficient of determination (R-squared) is 48.6, indicating that almost half of the differences in performance between these companies can be explained by differences in packaging design, materials, and innovation. The adjusted R-squared of 47.8% remains close to the R-squared value, even when the number of predictors is taken into consideration, the model's predictive power is still rather good. In the meantime, the estimate's standard error is 0.33396, which is quite minimal and suggests that the model's predictions and the actual data are well aligned. Therefore, these results suggest a significant relationship between packaging-related variables and the performance of high-tech companies, although there may be other unaccounted factors that may also affect their performance.

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	20.679	3	6.893	61.807	.000[b]
	Residual	21.859	196	.112		
	Total	42.539	199			
a. Dependent Variable: DV						
b. Predictors: (Constant), IV3, IV2, IV1						

Table 4.6.2: ANOVA

(Source: Data Analysis of SPSS)

The ANOVA Table 4.6.2 displays the findings from a multiple regression analysis looking at the impact of packaging design (IV1), packaging material (IV2) and packaging innovation (IV3) on the performance of high-tech companies (HTCPs). The model shows overall significance ($F = 61.807$, $p < 0.0001$), showing that the

dependent variable is strongly influenced by at least one of the independent factors. The regression analysis explained a significant portion of the variance in HTCP, namely 20,679 units of variance (SS). This means that the predictors (packaging design, materials, and innovation) together have significant predictive power regarding the performance of high-tech companies. The relatively small residual variance (21,859) suggests that most of the HTCP variability is explained by the model and a minimal portion remains unexplained.

In summary, this analysis confirms a significant and reliable relationship between the examined packaging elements (IV1, IV2, IV3) and the performance of high-tech companies and provides valuable information to improve their performance through strategic packaging decisions.

COEFFICIENTS[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.437	.315		-1.384	.168
	IV1	.406	.101	.300	4.005	.000
	IV2	.345	.087	.276	3.986	.000
	IV3	.307	.083	.241	3.714	.000

a. Dependent Variable: DV

Table 4.6.3: Coefficients

(Source: Data Analysis of SPSS)

Coefficient Table

a) Unstandardized Coefficients: These coefficients show the raw slopes of the regression equation.

b) Standardized Coefficients (Beta): These coefficients represent standardized slopes that allow comparison of the relative importance of predictors within a model

c) T-value: Indicates the significance of the coefficient of each predictor. A higher absolute t-value implies a larger effect.

d) Sig. (p-value): This value determines the significance of each predictor. A value below the selected alpha level (usually 0.05) indicates significance.

This multiple regression analysis in Table 4.6.3 examined the influence of three different factors, packaging design (PD), packaging material (PM) and packaging innovation (PI) on the performance of high-tech companies (HTCPs). The coefficient table reveals important information about these relationships. Each factor has a statistically significant impact on HTCP. Packaging design appears to be particularly influential as it has a standardized coefficient (beta) of 0.300, meaning that changes in packaging design correspond to a 0.300 change in the standard deviation of the HTCP. Likewise, packaging material (beta) of 0.276 and packaging innovation (beta) of 0.241 show a significant influence, although slightly less than for packaging design. The small p values associated with all three factors ($p < 0.05$) highlight their important role in determining the performance of high-tech companies. Consequently, this analysis highlights the importance of packaging related elements (design, materials, and innovation) to the success and performance of high-tech companies operating in the technology industry.

Equation formed from the provided coefficients:

$$\mathbf{y = a + bx_1 + cx_2 + dx_3}$$

$$HTCP = -0.437 + 0.406 \times PD + 0.345 \times PM + 0.307 \times PI$$

Where HTCP represents high-tech companies' performance, PD represents packaging design, PM represents packaging material, and PI represents packaging innovation.

The equation shows that, all other variables being equal, the productivity of high-tech companies is expected to increase by 0.406 units for each increase in packaging design (IV1). Likewise, the expected increase in productivity of high-tech companies for each unit increase in packaging materials (IV2) and packaging innovation (IV3) is 0.345 and 0.307 units, respectively.

Low p values (all 0.000) indicate that all three independent variables of packagingdesign, packaging materials and packaging innovation significantly predict the performance of high-tech companies in this model.

This analysis shows that improvements in packaging design, materials and innovation are associated with higher performance High-tech companies connected companies when we consider these variables together.

4.7 Hypothesis Testing

Hypothesis 1 (H1) - Packaging design IV1, PD

H0: There is no significant relationship between packaging design and the high-tech companies' performance.

H1: There is a relationship between packaging design and the high-tech companies' performance.

Reject H0, if p value is lower than 0.05, t value higher than 1.96

From Table 4.6.1,

The coefficient for IV1 (packaging design) is 0.406.

The t-value associated with IV1 is 4.005 and the significance level Sig. is 0.000 which is less than any traditional significance level such as (0.05).

A coefficient that is significantly different from zero as indicated by a low p value suggests that there is evidence that rejects the significance level null hypothesis H0 in favor of the alternative hypothesis H1.

Thus, there is a significant relationship between packaging design and the performance of high-tech companies.

Hypothesis 2 (H2) - Packaging material IV2, PM

H0: There is no significant relationship between packaging material and the high-tech companies' performance.

H2: There is a relationship between packaging material and the high-tech companies' performance.

Reject H0, if p value is lower than 0.05, t value higher than 1.96

From Table 4.6.1,

The coefficient for IV2 (packaging material) is 0.345.

The t value associated with IV2 is 3.986 and the significance level Sig. is 0.000.

Here as with packaging design, the low p value suggests that the null hypothesis H0 may be rejected in favor of the Alternative hypothesis H1.

Thus, there is a significant relationship between packaging material and the performance of high-tech companies.

Hypothesis 3 (H3) - Packaging innovation IV3, PI

H0: There is no significant relationship between packaging innovation and the high-tech companies' performance.

H3: There is a relationship between packaging innovation and the high-tech companies' performance.

Reject H0, if p value is lower than 0.05, t value higher than 1.96

From Table 4.6.1,

The coefficient of IV3 (packaging innovation) is 0.307.

The t value associated with IV3 is 3.714 and the significance level Sig. is 0.000.

Like the previous variables, a low p value indicates that the null hypothesis H0 can be rejected in favour of the alternative hypothesis H1.

Thus, there is a significant relationship between packaging innovations and the performance of high-tech companies.

Hypothesis	Result
Hypothesis 1	Accepted
Hypothesis 2	Accepted
Hypothesis 3	Accepted

Table 4.7.1: Hypothesis Results

4.8 Summary

To summarize, this chapter's results were deliberated over. With SPSS version 27, analyses such as multiple linear regression, descriptive analysis, Pearson correlation analysis, and reliability analysis were computed. Following the investigation, the researcher ascertained how the secondary dependent and independent variables related to one another. The three hypothesis of this study were able to be accepted since the researcher additionally tested the theories. The researcher will go over the study's suggestions and findings in the upcoming chapter.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter gives the right answers to all the questions in the different subtopics and discusses the findings of the calculations that were explained in the previous chapter. This chapter also provides an explanation for accepting or rejecting a hypothesis. Additional suggestions for the related study were sent to the following researcher.

5.2 Descriptive Analysis Summary

Demographic	Demographic Details	Frequency	Percentage (%)
1. Gender	Male	115	57.5
2. Age	20-29	91	45.5
3. Race	Chinese	73	36.5
4. Education Level	Bachelor's degree	84	49
5. Type Of Company	Medium	98	93
6. Type Of Products/Services	Appliances	71	35.5
7. Please Specifically State Your Products/Services	Home Entertainments (Television Sets, Audio Systems, Video	57	28.5

	Recorders, DVD Players, Smart TVs, TV Accessories, Speakers, Home Theatre Systems, Blu-Ray Players, Mp3 Players, Radio, Microphone Sets)		
8. Job Title/Position	Others	67	33.5
9. Department/ Division	Marketing (Sales, Retail)	75	37.5
10. Years of experience in the high-tech industry	1 – 6 Years	73	36.5
11. Please specify the type of packaging commonly used for electronic products in your manufacturing company.	Boxes	191	62.2
12. What are the primary materials used in your electronic product packaging?	Cardboard	179	42.3
13. Packaging criteria give impacts on high-tech companies' performance. Do you agree?	Yes	200	100

Table 5.2.1: Descriptive Analysis Summary of Demographic Respondents

(Source: Data Analysis of SPSS)

The descriptive analysis summary report in Table 5.2.1 presents key demographic data and survey responses. Most respondents were male 57.5%, predominantly between the ages of 20 and 29 (45.5%), and Chinese 36.5%. Almost half had a bachelor's degree 49% and worked in medium sized companies 93% specializing in the supply of household appliances 35.5%. Home entertainment products dominated 28.5%. Marketing related roles (sales, retail) were predominant 37.5%, with 33.5% categorized as "other" in job titles where several job titles or positions of other roles such as Administrators, Maintenance, Technicians, Assistants, Analysts, Engineers, Designers, Officers, Operators, Specialist including a variety of roles beyond those explicitly listed. Most respondents, 36.5%, had 1 to 6 years of experience in high technology industry. Boxes were the most common packaging type with 62.2%, and cardboard being the main material 42.3% used to package electronic products. Notably, according to the respondents, 100% agreed that the performance of high-tech enterprises is significantly impacted by packaging criteria. This synopsis offers a thorough rundown of the various respondent demographics and comes to an agreement about the significance of packaging requirements in the technology sector.

5.3 Summary of the study

The purpose of this study is to determine the impact of packaging criteria on high-tech companies' performance. To determine the impact of packaging criteria on high-tech companies' performance, three independent variables were selected from previous research, namely packaging design, packaging material and packaging innovation. These variables are used to determine the solution described in the research problem statement.

RO1 - To analyze the current packaging criteria employed by high-tech companies.

RO2 - To evaluate the challenges faced by high-tech companies in implementing effective packaging strategies.

RO3 - To propose the impactful or the optimized packaging criteria on product quality, customer satisfaction, and overall business performance in high-tech companies.

Hypothesis are developed to examine the relationship between three independent variables (packaging design, packaging material and packaging innovation) to examine dependent variable high-tech companies' performance.

5.4 Discussion of research objectives (RO) and hypothesis (H) testing

To accomplish the study's research goal, the hypothesis is assessed in this part, along with the relationship between independent and dependent variables. Therefore, the results were examined to determine whether the study achieved its objectives.

5.4.1 RO1: To analyze the current packaging criteria employed by high-tech companies.

To determine Objective 1, the descriptive analysis question "Please state the type of packaging commonly used for electronic products at your manufacturing company." and "What are the main materials used to package your electronic products?" has been used to the respondents for RO1: To analyze the current packaging criteria employed by high-tech companies. This summary highlights the type of packaging and material choices in packaging design currently used for electronic products in the company. Through descriptive analysis, this study has found that packaging design, packaging materials and packaging innovations are used by high-tech companies.

The first objective was to gain insights into the most packaging criteria employed by high-tech companies. Understanding this relationship between packaging elements and their importance is critical to improving product quality, profitability, and environmental protection.

Packaging is used everywhere in our daily lives, highlighting its role in food preservation, minimizing food spoilage, extending shelf life, improving shape, reducing cost, and increasing convenience (Ajwani-Ramchandani et al., 2021). This highlights the diverse importance of packaging, particularly in high-tech industries where product integrity and customer satisfaction are of utmost importance.

Today, the current packaging landscape in the high-tech sector is characterized by static control efforts (Current Trends in Protective Packaging of Computers and Electronic Components, n.d.). This depends on a combination of special packaging materials and innovative processing technologies. The main goal is to provide high-

reliability devices on a scale and reduce costs (Current Trends in Protective Packaging of Computers and Electronic Components, n.d.).

The field of semiconductor packaging is constantly evolving and strives to incorporate new packaging designs, concepts, and materials to minimize electrostatic discharge (ESD) damage (Current Trends in Protective Packaging of Computers and Electronic Components, n.d.). This lawsuit is consistent with industry-wide efforts to address this issue, as discussed in the article "Current Trends in Protective Packaging."

In addition, the article notes that the press's expansion has increased the activism of some organizations and increases the scope of its activities by implementing static prevention equipment and materials. This demonstrates the industry's dedication to resolving ESD concerns and guaranteeing the dependability and safety of products.

In a comprehensive analysis of the packaging criteria used by high-tech companies, including design. The purpose of this study is to provide the ground for a thorough comprehension of how packaging affects companies' performance experience in the high-tech products sector.

5.4.2 RO2: To evaluate the challenges faced by high-tech companies in implementing effective packaging strategies.

The mean score analysis was used to achieve objective 2, which was based on the questionnaire data. As a result, the researcher summarized the mean of the responses to the dependent variable and independent variable using a Likert scale of 1 to 5, with the responses being strongly disagree (1), disagree (2), neutral (3), agree (4), and strongly agree (5).

	N	Mean
(RO2, 6). The choice of packaging materials has an impact to the environmental sustainability goals of your company.	200	4.35
Valid N (listwise)	200	

Table 5.4.2.1: Mean Score Analysis

(Source: Data Analysis of SPSS)

Demographic	Demographic Details	Frequency	Percentage (%)
11. Please specify the type of packaging commonly used for electronic products in your manufacturing company.	Boxes	191	62.2
12. What are the primary materials used in your electronic product packaging?	Cardboard	179	42.3
13. Packaging criteria give impacts on high-tech companies' performance. Do you agree?	Yes	200	100

Table 5.4.2.2: Descriptive Analysis Summary of Demographic Respondents by Q11, Q12 and Q13

(Source: Data Analysis of SPSS)

Based on the mean score analysis in Table 5.4.2.1, it can be concluded that packaging criteria impacts the performance of high-tech companies. The highest average is “The choice of packaging materials has an impact to the environmental sustainability goals of your company.” And furthermore, according to Table 5.4.2.2, the researcher found that boxes have the highest frequency at 191 with 62.2% and cardboard materials have the highest frequency at 179 with 42.3%. This result showed that most packaging used by respondents was boxes and cardboard. Therefore, this result can be used to show that “the choice of packaging materials (boxes and cardboard) has an impact on environmental sustainability goals of your company.”

Previous studies reflect the dominance of paper and cardboard as raw materials for primary packaging, with outer boxes often made of corrugatedcardboard (Landi et al., 2020). This trend highlights the material choices in packagingdesign currently used for electronic products. This is supported by (Current Trends in

Protective Packaging for Computers and Electronic Components, n.d.), which states that the selection of boxes serves a dual purpose: not only do they protect the product from accidental vibrations and shocks, but they also facilitate the handling and transport. However, there are concerns about the environmental impact of these materials, indicating a potential area for improvement in high-tech environmentally friendly packaging practices. For this reason, a lot of businesses are searching for more ecologically friendly packaging that is lighter, recyclable, and renewable (Landi et al., 2020.).

Furthermore, these logistics-related operations pollute the environment and take a lot of resources. In fact, throughout pre- and post-consumer logistical operations, packaging is one of the primary causes of resource consumption and environmental effects (Reuters, 2017). The European Commission CE published statistics on packaging and packaging waste (PPW EC, 2018a) to lessen the environmental effect of packaging. The EU initiative mandates that suppliers and makers of packaging adopt green practices as a means of assuming environmental responsibility. According to Landi et al. (2020), this law compels businesses to reconsider not just the effectiveness, security, and ease of their logistical operations but also how they may minimize the number of resources they use and the consequent environmental impact of packaging.

Some industries, like the market for household appliances, have unique package designs that must adhere to rules and regulations. As a result, the package design needs to be adaptable in terms of material choice and geometric dimension. Efficiency and sustainability assessments of the best option are necessary (Landi et al., 2020.) New package designs must frequently be created in response to shifting materials, standards, goods, and needs. Furthermore, consumers are requesting alternative, greener packaging options (Gong et al., 2019). To assist package design for effectiveness and sustainability, there are still insufficient methods and resources (Landi et al., 2020).

Moreover, one of the primary issues causing this predicament is packaging waste, which is also central to the United Nations Sustainable Development Goals. (Ajwani Ramchandani et al., 2021). From table 4.3.1.12.A, it is stated that Plastichas the second highest frequency of 158 with 37.4%. The production of plastics also

generates significant amounts of waste in industries. In 2011, Around 280 million plastic tons were manufactured worldwide, with 58 million tons coming from Europe (Landi et al., 2020). Because natural degradation takes time, space, and quantity, society's use of packaging waste, especially plastic, has a negative impact onthe climate disaster (Ajwani Ramchandani et al., 2021).

It is therefore clear that the materials used in packaging, such as cardboard or plastic, have impact on the environment. Technology companies can influence sustainability by choosing materials from responsibly sourced sources, recycled content, or biodegradable alternatives. For example, packaging made from biodegradable polymers, plant-based materials or certain coatings can help reduce environmental impact.

In summary, the mean value of "The choice of packaging materials has an impact to the environmental sustainability goals of your company." is high because the use of packaging boxes including cardboard and plastic materials impacts the environmental sustainability goals of high-tech companies'. This can be supported as all 200 respondents unanimously agreed that packaging criteria have a discernible impact on the performance of high-tech companies. These findings underscore the critical link between packaging decisions, environmental sustainability goals, and overall company performance in the high-tech industry.

5.4.3 RO3: To propose the impactful or the optimized packaging criteria on product quality, customer satisfaction, and overall business performance in high-tech companies.

H1: There is a relationship between packaging design and the high-tech companies' performance.

According to the results of coefficient in the Table 4.6.1.3, the t-value associated with IV1 is 4.005 and the significance level Sig. is 0.000 which is less than any traditional significance level such as 0.05 ($p = 0.000 < 0.05$). Thus, there is a significant relationship between packaging design and the performance of high-tech companies.

There is a relationship between packaging design and the high-tech companies' performance. Do you agree? Please specify if you do not agree.					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	200	100.0	100.0	100.0

Table 5.4.3.1: Distribution of Respondents by HO1

(Source: Data Analysis of SPSS)

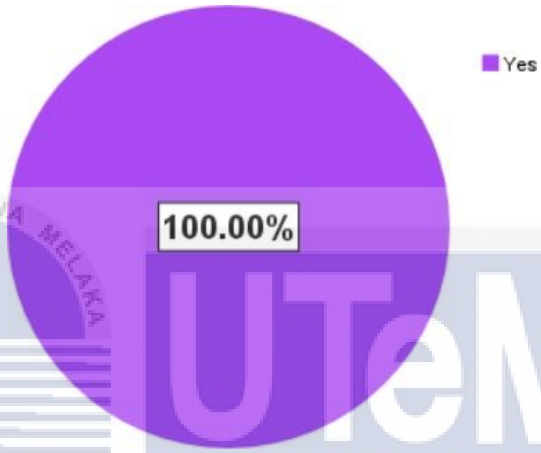

Figure 5.4.3.1: Distribution of Respondents by HO1

(Source: Data Analysis of SPSS)

These findings are interpreted as showing a statistically significant correlation between a high-tech company's performance and its packaging design. The alternative hypothesis, H1, accepts a relationship in place of the null hypothesis, H0, which states that there is no link.

To further support this result, Table 5.4.3.1 and Figure 5.4.3.1 shows the distribution of respondents based on their Approval (Yes) or Rejection (No) with a statement on the connection between packaging design and the performance of high-tech companies. In this table, all 200 respondents agree, 100% agree that there is a relationship between packaging design and the performance of a high-tech company.

This can be support based on the **2.3 Criteria for Packaging,** an emphasis on custom and tailor-made solutions is important to meet the specific needs of the high-tech industry (Faes Packaging Solutions, 2022). Packaging design plays a central role

in solving complex problems and ensuring optimal protection of expensive and vulnerable devices. The statistical relationship between packaging design and high-tech company performance highlights the significant impact packaging design can have on the product quality.

This aligns with the **2.10 Proposed Impactful and Optimized Packaging Innovation** where providing personalized packaging options and customizable designs creates a unique, relevant experience for customers, driving increased loyalty and satisfaction (Nasrullah et al., 2021). The statistical relationship between packaging design and high-tech company performance highlights the significant impact packaging design can have on customer satisfaction.

Addressing aspects of packaging focuses on the customer emphasizing ergonomic and user-friendly designs. Evaluating the ease of disassembly, accessibility and reuse of packaging design aligns with both customer satisfaction and sustainability goals. User-friendly packaging design not only improves the overall customer experience but also contributes to broader environmental considerations, reflecting a comprehensive approach to packaging optimization.

Another impactful packaging design is providing additional product information, interactive experiences, and increased customer loyalty. The packaging should provide clear and concise information about the contents, handling instructions, and any special requirements. This ensures proper handling and reduces the risk of errors or mishandling during transportation or assembly (Faes Packaging Solutions, 2022).

In addition, finding the optimal packaging size and weight represents another aspect of packaging design, Packaging size and weight can significantly impact logistics costs and environmental footprint. Optimizing packaging dimensions and weight can lead to cost savings, improved supply chain efficiency, and reduced carbon emissions.

The impact of optimized packaging criteria goes beyond customer satisfaction and affects product quality. The statistically significant relationship between packaging design and high-tech company performance implies that packaging design can contribute positively to improving product quality. This in turn reinforces the idea

that packaging is an important part of the overall business performance of high-tech companies.

Finally, a positive relationship is established between effective packaging design and customer satisfaction, supporting the idea that investing in optimized packaging criteria can meet customer expectations. A broader range of overall company performance is also considered, as packaging criteria play a significant part in the success of high-tech companies. These results highlight the importance of paying close attention to packaging design, as it can positively impact on many different aspects that contribute to the overall success of high-tech companies.

In summary, H1 is accepted, the analysis statistics and the distribution of respondents confirm that there is a significant relationship between packaging design and the performance of high-tech companies. This conclusion is confirmed by the high consensus among respondents based on Table 5.4.3.1 and Figure 5.4.3.1 that clearly displays the respondents' distribution according to how much they agreed with the hypothesis.

H2: There is a relationship between packaging material and the high-tech companies' performance.

According to the results of coefficient in Table 4.6.1.3, the t value associated with IV2 is 3.986 and the significance level Sig. is 0.000 which is less than any traditional significance level such as 0.05 ($p = 0.000 < 0.05$). Thus, there is a significant relationship between packaging material and the performance of high-tech companies.

There is a relationship between packaging material and the high-tech companies' performance. Do you agree? please specify if you do not agree.					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	200	100.0	100.0	100.0

Table 5.4.3.2: Distribution of Respondents by HO2

(Source: Data Analysis of SPSS)

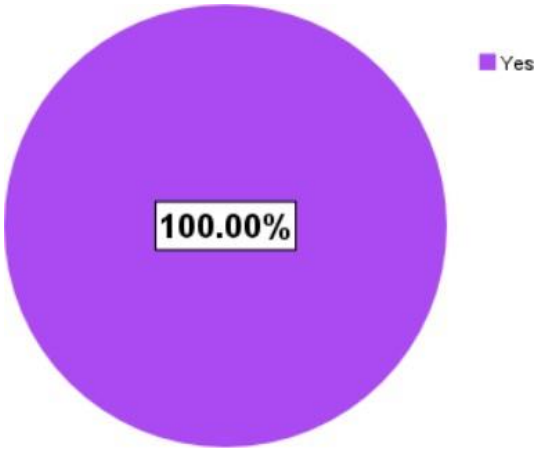

Figure 5.4.3.2: Distribution of Respondents by HO2

(Source: Data Analysis of SPSS)

These findings are interpreted as showing a statistically significant correlation between a high-tech company's performance and its packaging design. The alternative hypothesis, H2, accepts a relationship in place of the null hypothesis, H0, which states that there is no link.

To further support this result, Table 5.4.3.2 and Figure 5.4.3.2 show the distribution of respondents based on their Approval (Yes) or Rejection (No) with a statement on the connection between packaging material and the performance of high-tech companies. In this table, all 200 respondents agree (100% agree that there is a relationship between packaging design and the performance of a high-tech company.

Moreover, based on the **2.3 Criteria for Packaging**, packaging material requires a multi-dimensional approach where protection and safety are the top priority (Faes Packaging Solutions, 2022). The connection between packaging materials and the protection of high-tech components is important during transport and storage. To ensure the protection and safety of these components, it is important to propose packaging materials for effective packaging. At the same time, sustainability and environmental impact must be considered therefore the use of environmentally friendly materials and recyclable packaging solutions should be considered (Faes Packaging Solutions, 2022).

This aligns with the **2.10 Proposed Impactful and Optimized Packaging Innovation** where advanced shock-absorbing materials and shock-absorbing mechanisms help ensure product integrity and quality. Packaging materials directly

impact the safety of high-tech products during storage and transportation by preventing damage and ensuring functionality. This focus concludes that ensuring product quality for customers by using the right packaging material is important for high-tech companies that want to offer reliable and long-lasting products.

Other than that, an adoption of Expanded Polypropylene (EPP), EPP is Expanded Polypropylene (EPP) is a type of lightweight foam made from plastic called polypropylene. It's formed by heating the plastic and trapping air inside, creating a structure that's good at absorbing energy and resistant to chemicals. EPP is often usedin things like car parts, packaging, and sports equipment because it's strong, light, andcan absorb impacts. EPP material is ideal for protecting sensitive electronic components that need to be kept out of the water and exposed to abrupt temperature fluctuations because of its great resistance to impact, compression, and temperature, as well as its waterproof nature. It is also a fantastic replacement for metal boards, wires, and clamps because it secures components while shielding them from damage (Shock Absorption & Protection, n.d.)

Another important factor is recognizing that packaging is often a customer's first physical interaction with a product. Carefully selected packaging materials make unpacking even more fun and leave a lasting positive impression. Environmentally friendly packaging can meet the preferences of environmentally conscious consumers and contribute to greater satisfaction. Determining the elements that raise consumer happiness is crucial, such as easy unpacking packaging solutions and sustainable packaging materials.

Furthermore, efficient packaging that takes both materials into account can help save logistics, storage, and material costs. While meeting the necessary criteria, the packaging used by high-tech companies should also strive for cost-effectiveness. It should optimize materials, to achieve efficient packaging solutions without compromising on quality and protection (Faes Packaging Solutions, 2022).

A positive customer experience through appropriate packaging promotes customer loyalty and a positive reputation, which in turn impacts the overall success of the company. Aligning the packaging strategy with business goals such as profitability, environmental sustainability and customer loyalty will have a positive impact on business results. It is critical to evaluate how packaging material can

optimize logistics, distribution processes and explore cost-effective solutions to maintain quality standards while minimizing environmental impact.

In summary, H2 is accepted, the analysis statistics and the distribution of respondents confirm that there is a significant relationship between packaging material and the performance of high-tech companies. This conclusion is confirmed by the high consensus among respondents based on the Table 5.4.3.2 and Figure 5.4.3.2 that clearly displays the respondents' distribution according to how much they agreed with the hypothesis. The study thus establishes a statistically significant connection between packaging material and the performance of high-tech companies. Taking a holistic approach and meeting the packaging material criteria means prioritizing protection, sustainability and cost-effectiveness for product quality, customer satisfaction and overall business performance. Effective packaging material not only protects high-tech components, but also improves customer experience and has a positive impact on a company's long-term success and sustainability.

H3: There is a relationship between packaging innovation and the high-tech companies' performance.

According to the results of coefficient in the Table 4.6.1.3, the t value associated with IV3 is 3.714 and the significance level Sig. is 0.000 which is less than any traditional significance level such as 0.05 ($p = 0.000 < 0.05$). Thus, there is a significant relationship between packaging innovations and the performance of high-tech companies.

There is a relationship between packaging innovation and the high-tech companies' performance. Do you agree? Please specify if you do not agree.					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	200	100.0	100.0	100.0

Table 5.4.3.3: Distribution of Respondents by HO3

(Source: Data Analysis of SPSS)

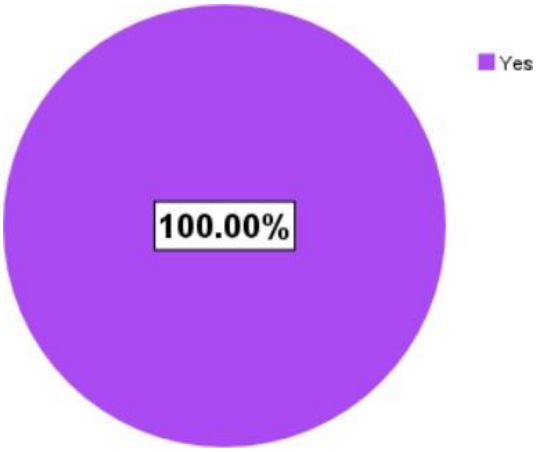

Figure 5.4.3.3: Distribution of Respondents by HO3

(Source: Data Analysis of SPSS)

These findings are interpreted as showing a statistically significant correlation between a high-tech company's performance and its packaging design. The alternative hypothesis, H3, accepts a relationship in place of the null hypothesis, H0, which states that there is no link.

To further support this result, Table 5.4.3.3 and Figure 5.4.3.3 show the distribution of respondents based on their Approval (Yes) or Rejection (No) with a statement on the connection between packaging innovation and the performance of high-tech companies. In this table, all 200 respondents agree (100% agree that there is a relationship between packaging design and the performance of a high-tech company.

Moreover, based on the **2.3 Criteria for Packaging**, with respect to protection and safety, cleanliness, and pollution control, it is necessary to recognize the interdependence between innovative packaging, consumer needs and high-tech field. The packaging should meet the requirements for "clean production and assembly" in the high-tech sector. It should minimize the risk of contamination by ensuring that the components, tools, and equipment are delivered in a clean and controlled environment. Special measures such as insulation, cooling plates, and dustproofing may be necessary (Faes Packaging Solutions, 2022).

Additionally, innovation of packaging solutions contributes to smooth handling, transportation, and storage. The packaging should contribute to efficiency and added value in the logistics chain. It should be designed to facilitate smooth handling,

transportation, and storage, ensuring delivery reliability, and minimizing any delays or disruptions (Faes Packaging Solutions, 2022).

This is in line with the **2.10 Proposed Impactful and Optimized Packaging Innovation**, where the integration of smart packaging technologies is important. Additional product value can be achieved by integrating intelligent packaging technologies such as QR codes, near-field communication (NFC) or augmented reality (AR) elements. information, providing interactive experience and increasing customer loyalty (Rogers et al., 2022). High-tech companies that implement smart packaging not only help ensure product quality and improve customer satisfaction butcan also have a positive impact on their company's overall performance.

In addition, it is important to examine how packaging innovations affect customer satisfaction, determine whether they contribute to positive customer experiences, and evaluate the influence of the price of unique packaging elements on customer perceptions and preferences.

Finally, assessing the broader impact of packaging innovation on overall company performance includes analyzing financial performance, market share, and other key performance indicators influenced by the adoption of innovative packaging strategies. This comprehensive approach provides deep insights into the diverse impacts of packaging innovations in high-tech sectors.

Thus, H3 is accepted, and the analysis statistics and the distribution of respondents confirm that there is a significant relationship between packaging innovation and the performance of high-tech companies. This conclusion is confirmed by the high consensus among respondents, based on Table 5.4.3.3 and Figure 5.4.3.3, which clearly show the distribution of respondents by level of agreement with the hypothesis.

5.5 Implication of Study

This study deepens the profound impact of packaging criteria on the performance of high-tech companies. It particularly focuses on studying high-tech companies operating in the electronics sectors, covering a wide range of products from consumer electronics to computer equipment, telecommunications equipment, electrical appliances, other electronics, and related products. The primary goal is to comprehend the impact of packaging criteria on important aspects such as product quality, customer satisfaction and overall business performance in these areas.

The study focused on people directly involved in the packaging operations of high-technology companies. Company based in Malaysia. In particular, the aim is to involve both employers and employees who are responsible for monitoring packaging strategies in these companies. The scope of the study covers 20 high-tech companies in Malaysia, including divisions operating in the field of electronics and home appliances.

The company intends to select 10 participants with knowledge to collect comprehensive information from 20 high-tech companies in electronics and appliances industry in Malaysia located in Kuala Lumpur and Melaka across each field. These people are aware of the complex packaging requirements in this area. This method involves sending questionnaires to these target respondents through a convenient online survey platform such as Google Forms to enable efficient data collection.

Examine the relationship between a set of criteria and key performance indicators in high-tech industries. This study attempts to provide useful information enables more comprehensive assessment and facilitates targeted improvements and resource allocation. These results are expected to provide valuable guidance to high-tech companies and enable them to improve their packaging strategies and thereby improve their operational efficiency in the context of a highly competitive market. The results are expected to help high-tech companies significantly improve their packaging practices, resulting in improved product quality, customer satisfaction and overall business performance.

5.5.1 Managerial Implication

The study's findings on the profound impact of packaging criteria on the performance of high-tech companies open up countless business implications. High-tech Companies can use this information to coordinate global changes within their organization.

Blockchains, artificial intelligence (AI), the internet of things (IoT), big data, robotics, and other technological breakthroughs could help close the loop and make it possible to transition packaging waste from the existing linear economy (CE) to a truly circular economy (CE) (Ajwani-Ramchandani et al., 2021). The packaging should also meet industry standards and regulations relevant to the high-tech sector. It should adhere to specific requirements and standards related to product quality, performance, and environmental considerations (Faes Packaging Solutions, 2022). By strategically aligning packaging strategies with customer expectations and industry standards, high-tech companies can improve their competitiveness.

These days, companies that manufacture high-tech goods serve as the primary source of innovation in industries and communities, continuously laying the groundwork for new demands and requirements. These regulations are crucial in the industrialized world because they encourage investment, economic progress, and wealth (Khamseh et al., 2022). Improving product quality through improved packaging practices becomes a strategic lever to promote a customer-centric philosophy that can increase brand loyalty and positive market perception. Due to the special characteristics of high-tech products, such as their short shelf life, competitiveness in product innovation, rapid and constant change, the use of modern technology, and transformational and managerial management, it is important to ensure product quality before delivering it to customers. This safety is guaranteed by implementing a quality management system and following relevant guidelines (Khamseh et al., 2022).

Integrating packaging related KPIs into a performance measurement system enables more comprehensive assessment and facilitates targeted improvements and resource allocation. Additionally, by investing in packaging innovations and eco-friendly practices, leading companies are not only creating differentiation in the marketplace, but also steering their businesses toward long-term, effective

sustainability work. Flexibility in responding to shifting market demands also requires building a culture of continuous improvement and fostering collaboration throughout the supply chain.

Ultimately, these results highlight the need for a strategic reassessment of packaging as a critical aspect of high-tech companies that can significantly impact performance and positioning their market. High-tech Companies can use this information to coordinate global changes within their organization by improving product quality through improved packaging practices.

5.6 Study Limitation

The study encountered multiple challenges in data collection that significantly impacted the research process. Therefore, the ability to reach a diverse group of respondents is limited, forcing the researcher to rely solely on questionnaire distribution via Google Forms. This restriction has limited the access of those who work directly in the packaging criteria department in high-tech companies, thereby indirectly affecting the research results on the impact of packaging criteria on performance. Activities of high-tech companies. Furthermore, the time limited nature of the study required strict deadlines for data collection, analysis, and discussion, which required compromises in the methods used, which were based solely on the Google Forms submission method. The limitations associated with using an online survey tool impacted the depth and specificity of the information collected and prevented a comprehensive understanding of the nuances of the selection criteria. Adding to these limitations was the general problem of attracting busy high-tech companies. The busy schedules and operational commitments of these companies required constant calls to remind them and encourage them to complete the survey. Despite these proactive engagement efforts, response rates continued to be influenced by time constraints and company priorities. Consequently, this situation exacerbated the difficulties in obtaining timely and meaningful responses, creating additional challenges for data collection, and ultimately affecting the completeness and timeliness of the data. These limitations, which are beyond the control of the researcher, hindered the creation of a thorough and precise knowledge of the connection between packaging criteria and the performance of high-tech companies.

Although it was difficult to reach 200 respondents using only Google form, the researcher was still able to collect data from 200 respondents.

5.7 Recommendations for Future Research

Although research on the impact of packaging criteria on high-tech firm performance has provided important insights, to increase the breadth and depth of the findings, future research directions are guided by several limits. To overcome the limitations identified in this study, future researchers are encouraged to interactdirectly with industry experts familiar with packaging practices in high-tech companies. Collaborating with these experts can simplify data collection and leverage their experience and industry knowledge to speed up the research process and improvethe accuracy of research data.

In addition, direct distribution of the questionnaire or conducting interviews with the target respondents in their companies should be integrated. This direct approach ensures that questions reach the intended recipient, potentially increasing the accuracy and reliability of the results and allowing for nuanced discussion and clarification.

Furthermore, future research could examine the impact of packaging criteria in various areas beyond the high level. Technology improves understanding of the impact of packaging on productivity across all sectors. Expanding the scope of this research could provide comprehensive insights and help companies understand the broader implications of packaging strategy in different industrial contexts. By studyingdifferent industries, researchers can explore further aspects of increasing productivitythrough optimizing packaging criteria and providing valuable advice to business ownersand others.

5.8 Conclusion

The summary of this study provides a detailed insight into the profound impact of packaging criteria on the performance of high-tech companies. The objectives stated at the beginning of this study have been mentioned and explained in detail in this final chapter.

This study critically examines the impact of packaging criteria on the performance of high-tech companies in accordance with the stated objectives of the study. The identified connection directly influences and impacts the overall performance metrics of high-tech companies. The study effectively targets RO1 by examining the general packaging criteria used by high-tech companies in various industries. Additionally, through a comprehensive overview, this study highlights the various challenges these companies face in implementing effective RO2 packaging strategies. RO3 is closely followed and focuses on recommending efficient packaging standards. Moreover, this includes recognizing the significant impact of packaging optimization strategies on important aspects such as product quality, customer satisfaction and overall business performance in the context of the technology industry.

In conclusion, the study's findings conclusively demonstrate the importance of packaging criteria in shaping and determining the performance outcomes of high-tech firms. Throughout this exploratory process, the implications of this research, including managerial implications, have been clarified to emphasize the possible uses and contributions of this study to direct future efforts. Furthermore, this chapter frankly acknowledges the limitations encountered and offers recommendations as essential reference points for further research initiatives. Above all, the researcher firmly believes that the results of this study offer insightful information, not only for academics but also for practitioners and industry stakeholders. A deep understanding of how packaging criteria interconnect and impact the performance of high-tech companies will help a wide range of stakeholders develop strategies and optimize packaging practices to increase efficiency. Productivity, customer satisfaction and market competitiveness in a dynamic high-tech environment technological industry.

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APPENDICES

APPENDIX A – GANTT CHART PSM 1

No.	Activities	PSM 1														
		Weeks (Target within 15 weeks)														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Briefing PSM 1								MID SEMESTER BREAK							
2	Topic Selection															
3	Write up Chapter1: Introduction															
4	Completion of Chapter 1: Introduction															
5	Write up Chapter 2: Literature Review															
6	Completion of Chapter 2: Literature Review															
7	Write up Chapter 3: Research Method															
8	Completion of Chapter 3: Research Method															
9	Final Draft Submission															
10	Report Amendment															
11	Slide Preparation															
12	Presentation Video PSM 1 Preparation															
13	Report Submission															

APPENDIX B – GANTT CHART PSM 2

No.	Activities	PSM 2														
		Weeks (Target within 15 weeks)														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Completion of Questionnaire Construction								MID SEMESTER BREAK							
2	Distribute Questionnaire															
3	Completion of Data Collection and Pilot Test															
4	Data Analysis															
5	Completion of Data Analysis															
6	Write up Chapter 4: Discussion & Analysis															
7	Completion of Chapter 4: Discussion & Analysis															
8	Write up Chapter 5: Conclusion															
9	Completion of Chapter 5: Conclusion															
10	Turnitin and Report Amendment															
11	Final Draft Submission															
12	Format Adjustment and Document Compilation															
13	Slide preparation															
14	Presentation															
15	Report Submission															

APPENDIX C – QUESTIONARE

Bachelor of Technology Management (High Technology Marketing) with Honours

Faculty of Technology Management and Technopreneurship

Universiti Teknikal Malaysia Melaka (UTeM)

Research Project Survey Questionnaire:

THE IMPACT OF PACKAGING CRITERIA ON HIGH-TECH COMPANIES' PERFORMANCE

Dear Participant,

I'm Nisa Nadiah Binti Mohd Shaifolazham, a final year student pursuing a Bachelor of Technology Management (High Technology Marketing) at Universiti Teknikal Malaysia Melaka (UTeM). As part of my final year project, I'm conducting research on "The Impact of Packaging Criteria on High-Tech Companies' Performance."

Your participation in this study is crucial. This questionnaire aims to gather insights into the current packaging practices within the electronic and telecommunication manufacturing industry. Your input will significantly contribute to understanding the strategies, challenges, and potential improvements in packaging criteria used by high-tech companies'.

The questionnaire will take approximately 5 minutes to complete. Your responses will help inform strategies that align packaging choices with industry standards and enhance product quality, customer satisfaction, and overall business performance in the high-tech sector.

Your participation is greatly appreciated as it will aid in bridging the gap between packaging strategies and industry demands. Thank you for contributing your valuable insights to this research endeavor.

Statement of Confidentiality:

All of the information is confidential and only will be using for research purposes.

References:

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SECTION A: RESPONDENT'S DEMOGRAPHICS

This section will provide valuable demographic information about participants, which can be used to analyze responses in the context of different user profiles and segments. You may modify and expand this section as needed to align with my research objectives.

Q1: Gender

- ☐ Male
- ☐ Female

Q2: Age

- ☐ 20-29
- ☐ 30-39
- ☐ 40-49
- ☐ 50 and above

Q3: Race

- ☐ Malay
- ☐ Indian
- ☐ Chinese
- ☐ Others:

Q4: Education Level

- ☐ Secondary School
- ☐ Diploma
- ☐ Bachelor’s Degree
- ☐ Master’s
- ☐ PhD
- ☐ Others:

Q5: Type of Company

- ☐ Small
- ☐ Medium
- ☐ Multinational Corporation (MNC)
- ☐ Others:

Q6: Type of products/services

- ☐ Entertainment (flatscreen TVs, television sets, MP3 players, video recorders, DVD players, radio receivers, etc.)
- ☐ Communications (telephones, cell phones, SIM card, desktop computers, laptops, printers, paper shredders, etc.)
- ☐ Appliances (hair dryer, hair straightener, air conditioners, dishwashers, clothes dryers, freezers, refrigerators, kitchen stoves, water heaters, washing machines, microwave ovens, multicooker, etc.)
- ☐ Others:

Q7: Please specifically state your products/services

_____

Q8: Job Title/Position

_____

Q9: Department/Division

_____

Q10: Years of experience in the high-tech industry

- [ ] Less than 1 year
- [ ] 1 - 6 years
- [ ] 7 - 12 years
- [ ] More than 12 years
- [ ] Others:

Q11: Please specify the type of packaging commonly used for electronic products in your manufacturing company (e.g., boxes, blister packaging, anti-static bags)

- [ ] Boxes
- [ ] Blister Packaging
- [ ] Anti-static Bags
- [ ] Others:

Q12: What are the primary materials used in your electronic product packaging? (Select all that apply)

- [ ] Cardboard
- [ ] Plastic
- [ ] Foam
- [ ] Metal
- [ ] Others:

Q13: Packaging criteria give impacts on high-tech companies' performance. Do you agree? Please specify if you do not agree.

- [ ] Yes
- [ ] Others:

SECTION B: CURRENT PACKAGING CRITERIA ANALYSIS (RO1)

This section is designed to gather the respondent's opinions and perceptions regarding the current packaging criteria analysis in the high-tech industry. To measure the level of agreement with each statement, participants are kindly requested to indicate their agreement level using a Likert scale. Please mark your chosen answer based on the provided scale where (1) strongly disagree, (2) Disagree, (3) Neutral, (4) Agree, (5) Strongly agree.

	Recommendation Systems	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
RO1, 1	The current packaging criteria effectively protect products during transportation and handling.					
RO1, 2	The current packaging strategy contributes significantly to the cost-effectiveness of our operations.					
RO1, 3	The current packaging criteria align well with industry standards and requirements.					
RO1, 4	Our company actively considers and adopts industry trends and innovations in packaging criteria.					
RO1, 5	The current packaging system is flexible enough to adapt to changes in product specifications or market demands					

SECTION C: CHALLENGES IN IMPLEMENTING EFFECTIVE PACKAGING STRATEGIES (RO2)

This section is tailored to collect respondent's opinions and perceptions regarding the challenges in implementing effective packaging strategies within the high-tech industry. To gauge your alignment with each statement, kindly indicate your level of agreement using the Likert scale provided. Please select the option that best reflects your opinion, ranging from (1) strongly disagree to (5) strongly agree. Your insights will significantly contribute to understanding the hurdles faced in optimizing packaging strategies within the high-tech sector.

	Recommendation Systems	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
RO2, 1	Overcoming challenges related to packaging strategies is very easy for our company.					
RO2, 2	The company effectively addresses environmental impact issues associated with packaging.					
RO2, 3	Internal organizational challenges (e.g., resistance from departments) significantly hinder packaging strategy implementation.					
RO2, 4	Technological advancements play a crucial role in overcoming challenges related to packaging strategies.					
RO2, 5	The globalization of markets has a substantial impact on the consistency of packaging quality across different regions.					

RO2, 6	**The choice of packaging materials have an impact to the environmental sustainability goals of your electronic manufacturing company.**						

SECTION D: IMPACTFUL OR OPTIMIZED PACKAGING CRITERIA (RO3)

This section is tailored to gather your insights and evaluations concerning impactful or optimized packaging criteria in the high-tech industry. To gauge your perspective on each statement, please utilize the Likert scale provided below, indicating your level of agreement. Kindly select the most appropriate response from the scale options: (1) Strongly Disagree, (2) Disagree, (3) Neutral, (4) Agree, (5) Strongly Agree.

	Recommendation Systems	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
RO3, 1	Packaging criteria significantly influence specific aspects of product quality					
RO3, 2	The current measurement of customer satisfaction related to packaging is effective.					
RO3, 3	Key performance indicators for business performance are directly impacted by packaging criteria.					
RO3, 4	Optimized packaging criteria should balance cost-effectiveness and align with overall business goals.					
RO3, 5	Integration of optimized packaging criteria into the overall business strategy is a priority for our high-tech company's performance.					

RO3, 6	**In your opinion, the type of packaging used affect the perception of your electronic products in the market.**					
RO3, 7	**Using sustainable or eco-friendly packaging materials important for your electronic products.**					
RO3, 8	**Your electronic manufacturing company open to adopting new packaging materials or innovations in packaging technology.**					

ADDITIONAL COMMENTS

There is a relationship between packaging design and the high-tech companies' performance. Do you agree? Please specify if you do not agree.

☐ Yes

Others:

There is a relationship between packaging material and the high-tech companies' performance. Do you agree? Please specify if you do not agree.

☐ Yes

Others:

There is a relationship between packaging innovation and the high-tech companies' performance. Do you agree? Please specify if you do not agree.

☐ Yes

Others:

Are there any other concerns, information, or ideas related to the impact of packaging criteria on the operations of high-tech companies, for example, regarding the availability or sourcing of specific packaging materials for your electronic products? Please elaborate.

_____