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Influential Factors of Software Firms' Performance in the Industry of Developing Countries

By

Mohitul Shafir
Partho Protim Saha
Ahnaf Tazwer Araf

Student ID: 2222786, 2222774, 2231659

Autumn, 2022

Supervisor:
Mahady Hasan, PhD
Associate Professor
Department of Computer Science & Engineering
Independent University, Bangladesh

May, 2024

Dissertation submitted in partial fulfilment for the degree of Master of Science in Software Engineering

Department of Computer Science & Engineering

Independent University, Bangladesh

Attestation

We, hereby certify that the report titled "Influential Factors of Software Firms' Performance in the Industry of Developing Countries" has been completed by us. This submission fulfils a partial requirement for the Degree of Master of Science in Software Engineering from Independent University, Bangladesh (IUB). The guidance provided by Dr. Mahady Hasan, my supervisor, has been instrumental throughout this endeavour.

We affirm that all the work presented in this report is original and reflects the knowledge acquired during our research. Every source of information utilized in this project has been appropriately acknowledged within the report.

Signature	Date
Name	

Acknowledgement

First and foremost, we extend our heartfelt gratitude to Almighty Allah (SWT) for bestowing His grace upon us, enabling the timely completion of our project report.

We wish to express our sincere appreciation to the Faculty of Computer Science and Engineering for incorporating the Graduate Project credit into the curriculum, providing us with the opportunity to delve into research-oriented tasks and explore our interests in the field.

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Our heartfelt appreciation goes out to the members of our project team, whose unwavering support has been invaluable during the course of our work. Their assistance in preparing this report and other project-related documentation has been indispensable.

Lastly, we extend our sincerest thanks to our parents and other family members for their unwavering support and encouragement throughout this journey.

Letter of Transmittal

Dr. Mahady Hasan
Associate Professor
Department of Computer Science and Engineering
Independent University, Bangladesh

Subject: **Submission of Graduate Project Report for the completion of Graduation.**

Dear Sir,
We are pleased to submit our Graduate Project Report as part of the requirements for the Master of Science in Software Engineering program. Working under your active supervision has been an invaluable opportunity and a significant achievement for us.
The report, titled "Influential Factors of Software Firms' Performance in Developing Countries," represents a key research endeavour in our pursuit of the Master of Science in Software Engineering degree. Throughout this journey, we have had the privilege of working under the guidance of Ms. Sabrina Alam, Ms. Nujhat Nahar, and Ms. Farzana Sadia, whose mentorship has been instrumental.
Engaging in this project has provided us with invaluable academic and research exposure. Drawing upon our experiences, we have endeavoured to ensure that this report is as informative as possible.

We sincerely believe that this report effectively serves the purpose of our research work. We would be immensely grateful if you could kindly review and provide your valuable judgment. Your feedback is highly appreciated, and we hope you find this report useful and informative in gaining insight into the issue at hand.

Sincerely Yours,

Mohitul Shafir & his team
ID: 2222786, 2222774, 2231659

Evaluation Committee

Supervision Panel

.....	.....
Supervisor	Co-supervisor

External Examiners

.....	.....
External Examiner 1	External Examiner 2

Office Use

.....	.....
Program Coordinator	Head of the Department

.....

Director Graduate Studies, Research and Industry Relations

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Chapter 1

Introduction

Shafir, M.; Saha, P.; Araf, A.; Hasan, M.; Sadia, F. and Rokonuzzaman, M. (2024). Influential Factors of Software Firms' Performance in the Industry of Developing Countries. 19th International Conference on Evaluation of Novel Approaches to Software Engineering (ENASE), April 28-29, 2024 Anger, France.

Radical marketing is a strategic strategy that distinguishes a firm from its competitors by defying traditional marketing rules and using fresh, imaginative tactics. Radical marketing entails risk-taking, creativity, and the implementation of an unusual approach. Unlike standard marketing tactics, qualities, or strategies, radical marketing develops its own protocols. [1].

One of the most difficult challenges in radical marketing is establishing a strong and long-term connection with customers in Dhaka, Bangladesh. This necessitates a focus on communication, trustworthiness, and the capacity to recognise and serve customer needs. In situations when resources are limited, businesses must be willing to stray from traditional marketing and advertising practices in order to differentiate themselves from competitors. Unlike traditional advertising, which tries to reach a broad audience and charges a flat cost regardless of results, radical marketing provides more precise audience segmentation and performance measurement based on goals. This enables businesses to direct a part of their marketing budget towards channels that provide concrete results. To assess whether or not to use an innovation process while launching a new product to the market, weigh the advantages against the adoption costs. Customer unfamiliarity has a negative mediation impact, while the advantage of a new product positively mediates the association between product radicality and firm performance. Businesses must carefully analyze what their product is made of, how it might benefit customers, and which consumer criteria it targets and serves[2].

Software firms in Bangladesh have significant marketing performance gaps, and bringing a new product to the market is a crucial but often overlooked business activity. Firms may develop and deploy unique goods that differentiate them from competitors and result in

long-term profitability by scrutinizing empirical facts and providing an original perspective on the issue. Thus, radical marketing may be characterized as a strategic strategy that deviates from traditional marketing conventions while using fresh approaches. It requires a steadfast commitment to establishing long-term consumer relationships as well as a willingness to diverge from conventional marketing and advertising practices. Companies may design and execute successful marketing strategies that result in long-term success by carefully examining the benefits of innovative products and understanding customer desires.

1.1 Overview

This paper delves into the intricate dynamics of new product development within software firms, with a particular emphasis on the context of Bangladesh. The study recognizes the significance of radical marketing strategies in distinguishing firms from their competitors and explores the challenges faced by businesses in Dhaka, Bangladesh, in establishing robust customer connections. Through an extensive literature review, the paper examines key concepts such as marketing performance measurement, innovation, market orientation, and the role of information technology across various sectors.

Building upon this foundation, the paper presents a set of hypotheses that aim to elucidate the mediation effects of new product advantage and the impact of customer unfamiliarity on the relationship between product radicalness and firm performance. These hypotheses are grounded in prior research and provide a framework for investigating the specific dynamics at play in the software industry of Bangladesh.

Methodologically, the study employs a structured questionnaire administered to a sample of 27 software companies in Bangladesh, encompassing various roles such as project managers, developers, marketing executives, and sales directors. Data collection involves personal interviews, phone interviews, and Google Forms surveys, allowing for a comprehensive understanding of the strategies employed by these companies in new product development and marketing.

The analysis of results reveals intriguing insights into how product radicalness, new product advantage, and customer unfamiliarity interact to influence firm performance in the software industry. Through a nuanced examination of these relationships, the study contributes valuable knowledge to the field, shedding light on the factors that shape the success of new product launches in a rapidly evolving market landscape.

In conclusion, the paper highlights the implications of its findings for software companies in Bangladesh, offering actionable insights for enhancing marketing efficacy and driving innovation. While acknowledging the study's limitations, the paper calls for further research to expand upon its findings and explore diverse contexts beyond the borders of Bangladesh. Ultimately, this research serves as a stepping stone towards a deeper

understanding of new product development strategies in the software sector, with broader implications for innovation and marketing practices worldwide.

1.2 Contribution of the thesis

The contribution of this paper lies in its multifaceted exploration of the factors influencing new product development within software firms, particularly within the context of Bangladesh. By focusing on this specific region and industry, the paper offers unique insights into the challenges and opportunities faced by software companies operating in a rapidly evolving market landscape.

Firstly, the paper contributes to the academic literature by synthesizing existing knowledge on marketing performance measurement, innovation, market orientation, and the role of information technology across various sectors. By providing a comprehensive overview of these concepts, the paper establishes a robust theoretical foundation for understanding the dynamics of new product development in software firms.

Secondly, the paper advances theoretical understanding by proposing hypotheses that explore the mediation effects of new product advantage and the impact of customer unfamiliarity on firm performance. These hypotheses provide a framework for empirically testing the relationships between key variables, offering valuable insights into the mechanisms driving success in new product launches.

Methodologically, the paper contributes to research methodology by employing a structured questionnaire administered to a sample of software companies in Bangladesh. By utilizing a combination of personal interviews, phone interviews, and online surveys, the study ensures a comprehensive exploration of the strategies employed in new product development and marketing.

Furthermore, the analysis of results uncovers nuanced insights into how product radicalness, new product advantage, and customer unfamiliarity interact to influence firm performance in the software industry. By elucidating these relationships, the paper provides actionable insights for software companies seeking to enhance their marketing efficacy and drive innovation.

Overall, the contribution of this paper extends beyond the specific context of Bangladesh to offer valuable insights for researchers, practitioners, and policymakers interested in understanding the factors shaping new product development in software firms. By shedding light on these dynamics, the paper contributes to the advancement of knowledge in the fields of innovation, marketing, and entrepreneurship, with broader implications for industry practices worldwide.

1.3 Organization of the thesis

In Chapter 1, the introduction section describes the entire report by offering a concise overview of the various research projects undertaken, the contribution of the thesis, the organization of the thesis and the thesis project management. Moving on to Chapter 2, an analysis of relevant literature is presented. This comprehensive review serves to establish the theoretical framework and contextual background for the next chapters. Chapter 3 describes one of my published research works, providing insights into an empirical study on the Influential Factors of Software Firms' Performance in the Industry of Developing Countries. This chapter presents the detailed findings from the published paper. Finally, Chapter 4 the conclusion section serves to summarize the collective knowledge presented throughout the report and provides a cohesive understanding of the research outcomes.

1.4 Thesis Project Management

1.4.1 Work Breakdown Structure

The Work Breakdown Structure (WBS) for a thesis report encompasses several key phases, starting with the initiation and planning stage. Here, the researcher defines the topic and objectives, formulates research questions or hypotheses, conducts a thorough literature review, and establishes the study's scope and limitations. A detailed research plan, including methodology and timeline, is then developed. Following this, the research design and methodology phase involves determining the approach, selecting data collection methods, developing sampling strategies, and outlining data analysis techniques. Subsequently, the data collection phase involves gathering primary or secondary data, ensuring its integrity and validity, documenting collection procedures, and cleaning and preprocessing the data for analysis. The analysis phase entails applying statistical or qualitative methods to analyze the data and interpret findings in relation to the research questions or hypotheses. The writing phase involves drafting thesis chapters, ensuring coherence and logical flow, incorporating feedback, revising based on critiques, editing for grammar and style, and finalizing the document with accurate citations and references. Finally, the submission phase entails formatting the thesis according to university guidelines and submitting it to the department for evaluation and approval. Each phase represents a critical aspect of the thesis process, requiring careful planning, execution, and refinement to produce a high-quality research output.

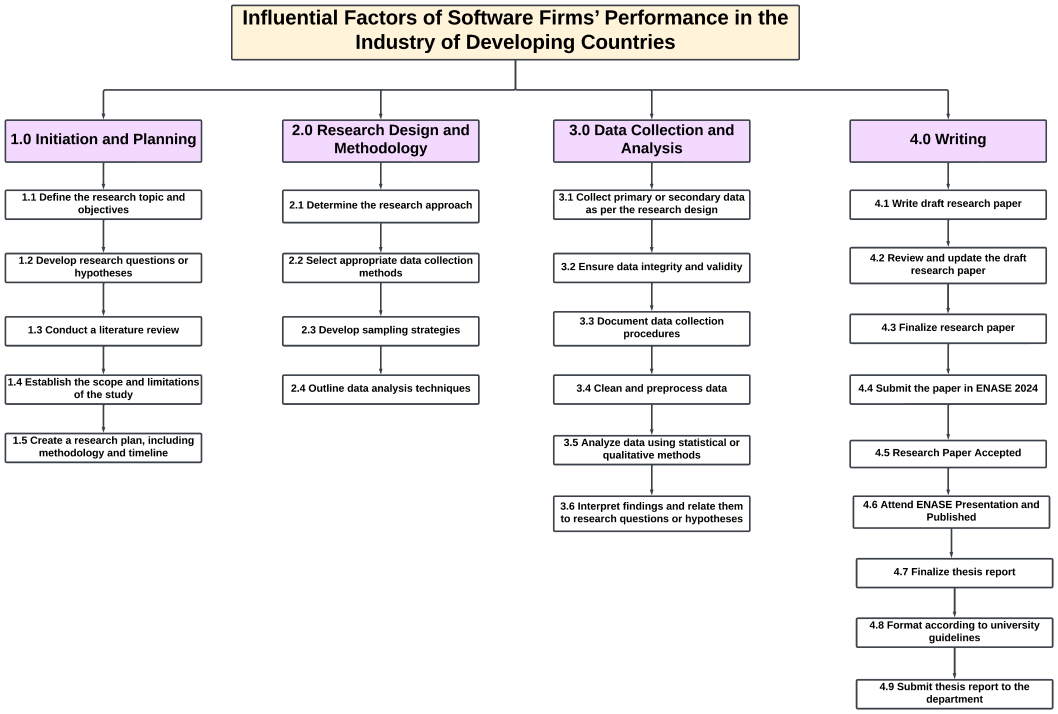


Figure 1.1: Work Breakdown Structure

1.4.2 Gantt Chart

Gantt charts serve as invaluable tools for project and research scheduling, facilitating meticulous planning and sequential task execution. Each activity is meticulously mapped against the requisite number of days for completion, ensuring a structured and coherent progression. The interdependency between tasks is explicit, with the outcome of one task shaping the subsequent steps. Comprising essential elements such as a task list, timeline, and bars, the Gantt chart methodically delineates the research paper's journey within a predetermined timeframe. It commences with pivotal tasks like identifying research gaps, formulating theories, and selecting appropriate methodologies. Subsequently, the focus shifts to the meticulous execution of data collection and extraction to substantiate findings. Rigorous review processes, incorporating references and addressing potential flaws, precede the paper's readiness for publication. Acknowledging the iterative nature of academic scrutiny, revisions and refinements are par for the course. These modifications, informed by peer review feedback and internal critiques, ultimately refine the paper to meet publication standards. Upon completion of the research phase, the culmination of efforts manifests in the comprehensive compilation and submission of the thesis. The Gantt chart offers a vivid depiction of the chronological progression, encapsulating the multifaceted journey undertaken to ensure the research papers' readiness for dissemination and scholarly contribution.

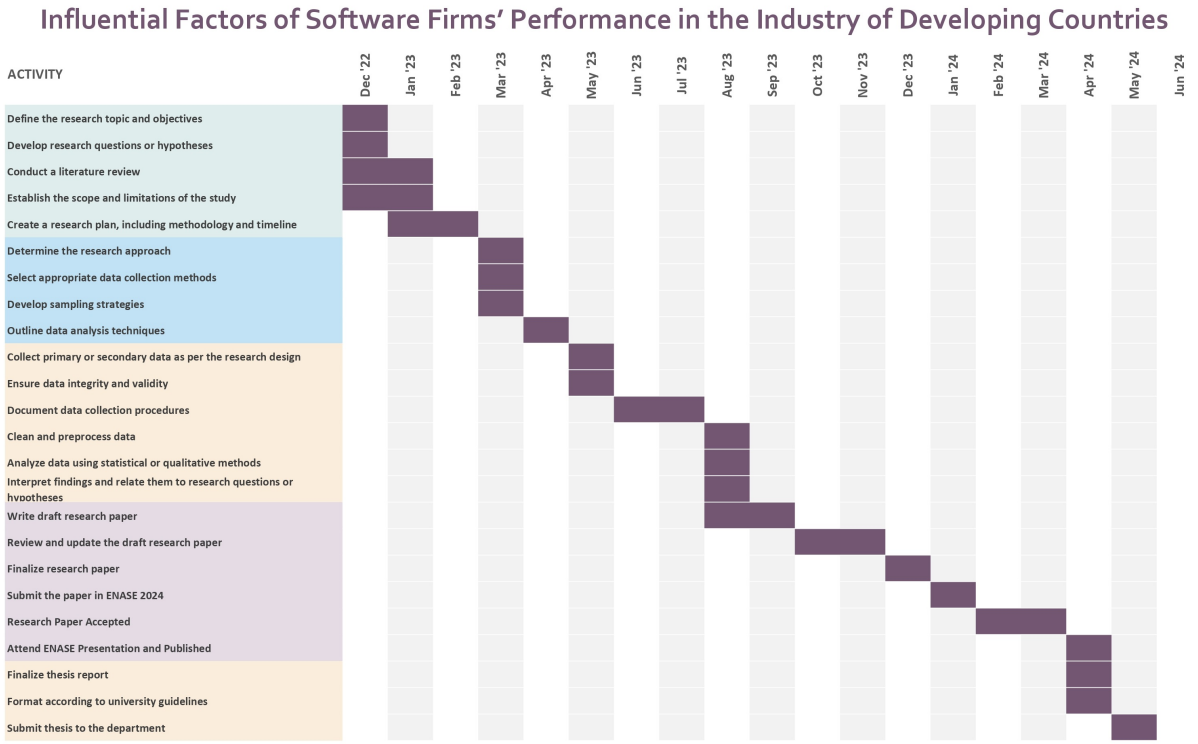


Figure 1.2: Gantt Chart

Chapter 2

Literature Review

2.1 Literature Review of Papers

Organisations use the evaluation of marketing performance as a critical domain to determine the efficacy of their marketing strategies and the resulting return on investment. This academic paper carefully reviews relevant literature about marketing performance assessment, including important books and papers. The main conclusions and suggestions that came from this review are explained, along with a critique of the limits that these conclusions have and the methods used to collect the data.
At the same time, this study attempts to fill a significant gap in the existing literature by examining the marketing focus of software companies in India. The study examines the relationship between market orientation and firm performance using primary data and Partial Least Square (PLS)–Structural Equation Modelling (SEM) made possible by PLS 3 software. It is interesting that there have been no previous studies examining this aspect in the Indian setting.
Based on the responses of 190 participants who are software enterprises, the study reveals a strong positive relationship between firm success and market orientation. The study highlights the importance of combining a creative mindset with a marketing focus in order to promote successful and long-lasting business outcomes. These insights provide crucial direction for businesses looking to strengthen their performance and improve their market standing by putting into practice efficient marketing methods. [3].

A study explored how market perception and action orientation impact the efficacy of advertising for service-oriented companies in Ghana. The study's findings demonstrate that the interaction between action direction and marketplace sensing determines how well marketing performs.
Within the culinary industry of West Java Province, Indonesia, the main goal was to look at the potential mediating function of innovativeness in the relationship between

market orientation and marketing performance. With innovation acting as the mediating variable, the research specifically sought to examine how market orientation, innovation, and marketing performance interacted within the framework of a single mediation model. The study's sample was drawn from 209 restaurants connected to the SME and cooperative services agency.
With the help of SPSS and AMOS v. 23, basic linear regression analysis was used in the study to determine that innovativeness did, in fact, function as a mediator in the relationship between market orientation and marketing performance. Additionally, the results confirmed that market orientation had a beneficial impact on performance outcomes.
The research's results highlight the possibility for culinary sector entrepreneurs to improve their capacity for innovation in order to boost the performance of small and medium-sized enterprises. Furthermore, in order to support operational effectiveness, the study advocates for enhanced attention to and management of creative practices by SME managers and suggests governmental policies targeted at encouraging an innovative culture inside SMEs.[4].

Another study examined the degree to which Indian software companies are focused on the market and if newly established businesses do better overall. According to the survey, in order for businesses to succeed and survive, they must concentrate on marketing and have the capacity for original thought.
This study, which focused on Korean service companies, illuminates the strong relationship between the effectiveness of the marketing department and the use of information technology (IT). Significant relationships between several aspects of IT employment and marketing performance are found in the research, however there is a lack of support in particular for the categories of "use of outside database" and "networking between mainframe computer and PCs." Furthermore, the study emphasises how important the type of IT use is in terms of how it affects improving the performance of the marketing function. The claim that information technology investments result in measurable returns is supported by this empirical study. Moreover, it indicates the existence of a time lag in reaping the rewards of IT investments, as demonstrated by the advantages of connection that are still untapped.
In conclusion, this study highlights both the potential benefits of information technology and the temporal dynamics required to achieve these advantages, providing insightful information about how technology may improve the marketing function within service-oriented firms.[5].

The third study looked at the link between market mindset and marketing success in the food service business of West Java Province, Indonesia. It did this by using innovation

as a bridge. The study's results show that smart marketing needs both knowledge of the market and new ideas.
This study's main goal is to investigate how integrated marketing techniques affect hotel companies' performance in light of the COVID-19 pandemic. amid particular, the study intends to look into how public relations, social media, advertising, and sales promotion work for hotels as survival tactics amid the ongoing pandemic.
A descriptive research design was used as a methodology. Primary data were gathered by means of a 5-point Likert scale questionnaire from 226 patrons in 15 different hotels. The Statistical Package for the Social Sciences (SPSS 23) was used for data analysis and multiple linear regression was used to test hypotheses.
The results of the study showed that social media, public relations, sales promotion, and advertising all had a major positive impact on hotel performance. These findings offer empirical support for the idea that hotels can improve their marketing success by implementing integrated marketing strategies, even in the face of the COVID-19 pandemic's hurdles.
The research adds significant empirical knowledge to the body of literature while demonstrating the effectiveness of integrated marketing strategies for hotels dealing with the extraordinary conditions resulting from the epidemic. As a result, useful advice is provided, and ideas for more study in this field are put forth to deepen our comprehension of hospitality marketing tactics in times of crisis. [1].

An additional study looked at how information technology affected marketing in the Korean service sector. It found that marketing activity, efficiency, and competitiveness were all improved in three areas by using IT.
This article presents a thorough analysis of the measures that are important for gauging marketing performance in Turkish companies. It also looks into the effects of market dynamics and sectoral imbalances and examines the relationship between measures' perceived importance and business performance. Based on information gathered from a sample of 145 Turkish companies using a carefully designed questionnaire derived from the body of literature, the study identifies metrics related to customer perceptions as being of utmost importance.
On the other hand, it is discovered that indicators like Customer Lifetime Value (CLV) and Economic Value Added (EVA) are given less weight when evaluating performance. Remarkably, there is no significant correlation found between the importance CEOs place on measurements and the performance of the resulting company.
This research project is the first of its kind to investigate marketing metrics in the Turkish environment and is one of the few studies of its kind carried out in emerging economies. Determining the management implications and outlining directions for future research are essential elements that are expected in the study's last section. [6].

According to a survey of 187 businesses, the export process is influenced by industry-specific factors, domestic and foreign client loyalty, and niche market targeting, as opposed to the psychological or geographical proximity of export markets
from an analysis of small software companies in Finland, Ireland, and Norway's export practices and internationalisation tactics. Our research challenges the premise of linear growth by revealing different internationalisation patterns among these enterprises, which defies conventional theories of internationalisation. Their techniques are shaped by variables like network ties, digital distribution platforms, and demand in niche markets. In order to adequately capture the distinct dynamics of the software business, we contend that classic theories should be reevaluated.
Conventional models of internationalisation, such as the Uppsala Model, propose a step-by-step approach that begins with a reduction in psychological distance and moves from home markets to overseas ones. But according to our research, small software companies have taken several routes to internationalisation since their founding and frequently use digital channels to expand internationally. This raises questions about the relevance of psychic distance and advocates for theories that are specific to a given environment for analysing globalisation.
Our results have theoretical ramifications and support more complex frameworks that are adapted to the specific dynamics of the software industry. In practical terms, they offer advice to tiny software companies, stressing flexibility, agility, and strategic decision-making when negotiating international marketplaces. Through the examination of small software companies' internationalisation procedures, our research adds to a better comprehension of the challenges associated with worldwide growth in the digital economy. [7].

The researcher's focus is on examining how interaction orientation and market sensing capabilities affect the marketing performance of service-oriented businesses in Ghana. In the service industry, the study specifically attempts to investigate the moderating role of interaction orientation capability on the relationship between market sensing and firm performance.
They are finishing the investigation using a systematic approach. That strategy was used to target 200 employees from different service organisations, providing a convenient sample. Hierarchical multiple regression was used in the analysis to determine the associations between the relevant variables.
The findings suggest that differences in the marketing effectiveness of service organisations can be attributed to both interaction orientation and market sensing capability. Furthermore, a key element in attaining improved marketing results was shown to be the interplay between market sensing and interaction orientation capabilities.
It is significant to emphasise that because of possible participant bias, the research's con-

centration on service firms may limit how broadly the findings may be applied. However, the study offers insightful information about the significance of matching interaction orientation and market sense to marketing performance goals. The study also offers ways to improve marketing performance assessment, specifically in terms of evaluating customer profitability and cultivating customer relationships. [8].

Additionally, another study looked into how marketing knowledge might improve the marketing skills of selling companies from emerging economies that work in developed markets. The study found that market response was one of the most important factors that led to better marketing success in developed markets.
Exporting companies in emerging markets must navigate a dynamic and difficult environment in advanced economies, where market demands are always changing and competition is fierce. To attain better performance outcomes, these companies are forced to develop unique marketing competencies. In addition to examining the impact of competitive intensity on this relationship, this academic study utilises resource-based and dynamic capability theories to empirically investigate the critical role that marketing skills play in fostering market responsiveness, a dynamic capability that is necessary for improving marketing performance.
This study provides significant insights by analysing a sample of 98 companies that are primarily involved in exporting to developed markets like the United States and the United Kingdom but are based in Pakistan, a developing market. In particular, the results show that market responsiveness, acting as a mediator between marketing abilities and responsiveness, positively affects these firms' marketing performance in advanced markets. Moreover, it is found that higher degrees of competitive intensity positively reduce the indirect link.
This study adds to the body of knowledge on dynamic capability and export marketing by illuminating these dynamics, especially as they relate to exporting companies from emerging markets that operate in contexts of advanced markets. Furthermore, the results provide export marketing managers with practical knowledge that has important ramifications for maximising performance outcomes in this competitive and changing environment. [9].

The goal of the study under evaluation is to thoroughly investigate how software companies perform in developing nations, with an emphasis on their export-related operations. The study used a multiple-case-study research design, incorporating a variety of sources of information, including 15 in-depth interviews with founders, shareholders, and CEOs of software enterprises, and focuses on Paraguay as a representative environment. As the methodological foundation, grounded theory aids in the formation of categories and patterns and sheds light on observable variations and regularities.

The study strengthens the theoretical foundation of the research by placing its analysis inside the updated Uppsala internationalisation process model. The article's main focus is on clarifying professional opinions about how business intelligence affects Paraguayan software companies' export results. Although the interviewees acknowledged a low current adoption of business intelligence solutions to assist international strategic decision-making processes, there is a significant trend towards their use due to the expected improvement in export performance and international competitiveness.
The main topics of debate are around what variables are most important when choosing a business intelligence solution. These include things like price model attractiveness, outstanding client service, and cost and benefit transparency. The study's conclusions are applicable to all parties interested in comprehending how business intelligence systems affect export success in emerging nations, going beyond the purview of software companies alone.
Essentially, this paper fills a clear vacuum in the literature and addresses a request for additional study on the application and effects of business intelligence systems on software companies' export performance in developing nations. It makes a significant contribution to the larger conversation on the globalisation efforts of software companies that operate in developing market contexts [10].

Five Bangladeshi businesses' marketing performance was ultimately evaluated in a study that examined the impact of big data. According to the study, big data concepts are unpopular among marketers in Bangladesh, despite the fact that their adoption would improve marketing performance.
To better navigate the competitive landscape, this article explains how big data plays a crucial role in shaping marketing strategies within the Bangladeshi context. It does this by enabling a deeper understanding of consumer preferences and market dynamics. Big data is still relatively new in Bangladesh, but the way major corporations are implementing its ideas shows how important it is for marketing strategies. Because most businesses in Bangladesh have an online presence, big data analytics must be integrated in order to extract insights from unstructured digital data.
The study primarily focuses on five well-known Bangladeshi businesses that have shown a dedication to integrating big data principles into their operations: British American Tobacco Bangladesh, Banglalink, Robi, LankaBangla Finance Limited, and GrameenPhone. The study used a qualitative methodology, particularly Focus Group Interviews, to explore the features and consequences of using big data analytics as a tactical tool for marketers.
The study highlights big data's revolutionary potential in analysing consumer behaviour and giving firms a competitive edge by examining the interaction between big data and analytics. The results add to the body of literature by clarifying the subtleties of big

data adoption in Bangladesh's developing market and highlighting the role that big data plays in improving marketing efficacy and strategic making decisions for the company functioning in this environment. [11].

Regarding the social, economic, environmental, and sustainability aspects, ride-sharing services play a crucial role in mitigating traffic jams and limiting the number of cars on the road. This research aims to investigate the key elements relevant to the ride-sharing sector and the development of software marketing strategies used by ride-sharing companies, especially in reaction to the COVID-19 pandemic's demands for increased customer retention.
The study uses a hybrid methodology that combines qualitative and quantitative techniques. Google Forms is used to facilitate data collecting, interaction with pertinent parties to obtain insights. Python is then used for data analysis, which makes it possible to extract statistical data and assess variables that are crucial from the company's and customers' points of view.
108 replies from customers and 4 from businesses are gathered through survey research. Examining the gathered survey data reveals a changing environment in which, in contrast to earlier emphasis on avoiding traffic congestion, safety emerges as the top priority during the epidemic. Promotional marketing campaigns—like offering discounts during business hours—are found to be crucial for drawing clients.
Furthermore, the participants indicate a greater desire for augmented safety protocols, such as real-time location sharing, emergency contact notifications, and better-quality helmets. Furthermore, the availability of ride-sharing services that accommodate numerous passengers attracts a great deal of interest. Notably, consumers have a positive attitude on additional services provided by ride-sharing firms during the COVID-19 pandemic.
In conclusion, this research clarifies the dynamics that are changing within the ride-sharing sector and highlights the crucial role that software marketing tactics play in adjusting to new problems, especially in light of the COVID-19 epidemic. The results highlight how important it is for ride-sharing businesses to put safety first and develop creative marketing campaigns to increase customer engagement and retention.[12].

In order to better understand its implications for B2B marketing rational decision-making and its consequent impact on firm performance, this study investigates the effects of big data-powered artificial intelligence on the creation of knowledge about customers, users, and external markets. This investigation's theoretical framework, which is based on Knowledge Management Theory (KMT), offers a solid analytical basis. Primary data was gathered in the context of business-to-business enterprises involved in the mining sector in South Africa.

The results of this study provide some important new information. First, a strong correlation is seen between the process of creating customer knowledge and artificial intelligence-driven by big data. Likewise, a noteworthy correlation is noted between artificial intelligence driven by big data and the trajectory of user knowledge Creation.
Furthermore, a noteworthy correlation is identified between the development of artificial intelligence-driven by big data and the process of creating external market knowledge. Additionally, it has been noted that the generation of user, customer, and external market knowledge all significantly influences B2B marketing decision-making processes.
The study's conclusion emphasises the value of artificial intelligence driven by big data in promoting knowledge production across a range of domains, consequently influencing and improving B2B marketing's rational decision-making processes. Furthermore, it emphasises how crucial a role these decision-making processes have in determining the overall performance of the company in the B2B setting. [13].

Last but not least, a study looked into how big data affected the marketing results of five Bangladeshi companies. The study found that marketers in Bangladesh don't use big data ideas very often, even though doing so could help their campaigns do better
The growth of multinational corporations has emerged as a key feature of globalisation, especially in developing countries. Notably, small and medium-sized businesses (SMEs) make up a sizable share of these newly formed international corporations. The Indian software SMEs are especially noteworthy because they have demonstrated a preference for foreign investment and have taken the lead in this global scene.
The effects of internationalisation on the performance of SMEs that have made foreign investments are empirically examined in this research. It also explores how firm performance is affected by marketing, firm size, and managerial style. Based on panel data collected from 29 software SMEs in India between 2002 and 2008, the study finds a favourable relationship between business internationalisation efforts and firm performance
Based on theories like the Resource-based View (RBV) and Knowledge-based View (KBV), the research shows that marketing has little ability to forecast a company's performance. Furthermore, the results of this study indicate that the firm's age and size are not considered reliable indicators of its performance.[14].

The tourism industry is a well-known one that provides for people's leisure and recreational requirements and is a major source of income for many nations across the world, including Indonesia. Interestingly, Batu is presently setting itself up to take a piece of the global tourism industry. Several investors, including as the Jatim Park Group, have shown interest in using Batu City's wide range of attractions to manage tourism sites as part of this project.

The development of an entrepreneurial marketing mindset, intended to provide a competitive advantage despite the abundance of tourism options, is essential to the efficient management and attraction of tourists to Batu City. Through the lens of competitive advantage, this study aims to investigate the direct and indirect effects of entrepreneurial marketing on marketing performance. Ninety-three people who work in tourism management for the Jatim Park Group make up the research sample. They were selected using a combination of interviews and questionnaire surveys.

The study's conclusions demonstrate a strong correlation between entrepreneurial marketing and marketing performance, which is explained by the competitive advantage's mediating function. This emphasises the interdependence of the variables being studied as well as the critical role that entrepreneurial marketing tactics play in improving marketing outcomes in the context of Batu City's tourism management. [15].

Chapter 3

Hypothesis Development

3.1 Competitive Mediation

In recent times, the integration of innovation into business strategies has grown in significance, owing to its pivotal role in fostering competitive advantage and sustained expansion. By introducing new products or services, developing new technologies, or employing new business models, organisations are perpetually searching for effective methods of innovation and maintaining a competitive advantage[16]. Such items are more likely to succeed, gain market share and be lucrative. Achieving an early-mover or first-mover advantage is a fundamental incentive for businesses to engage in innovative practices. Organisations can attain market leadership and acquisition of market share by being the pioneers in the introduction of novel products or services. This is particularly accurate regarding radical innovations, which entail the launch of novel products, environments, or technologies. By providing substantial price and performance enhancements in comparison to established products, radical innovations have the potential to confer a competitive advantage[6]. Nonetheless, the implementation of a revolutionary advancement is not without its own array of obstacles. Unfamiliarity on the part of customers with the novel product or technology may impede its adoption. Specifically, inadequate product information may impede customers' comprehension of the product's attributes and advantages, thereby introducing elevated degrees of uncertainty and risk. Notwithstanding these challenges, the relative advantage of a product over its competitors positively impacts the adoption of novel products. This advantage may be derived from the product's superiority, unique benefits for the consumer, high quality, or a reasonable price. Products that attain success, marketability, and financial profitability are those that surpass the expectations of consumers through the fulfilment or resolution of their requirements. Existing research has established a correlation between the success of innovation and the firm's or organization's performance, with the former benefiting the latter. Early adoption of the product can contribute to the establishment of the organization's objectives,

thereby enhancing this performance. Furthermore, the benefit of the novel product positively influences the sense of brand value and brand loyalty among consumers in the business-to-business sector, potentially enhancing the performance of the organisation.

Therefore, we have predicted the following hypothesis:
H1: Product radicality and firm performance are positively mediated by the advantage of the new product.
H1(a): Product radicality and advantage of the new product are strongly correlated.
H1(b): Firm success is strongly correlated with new product advantage.

The term "product radicalization" denotes the extent to which an innovative technology is integrated into a novel product. Because the revolutionary element of the innovation is either new-to-market or new-to-the-world, it is possible that consumers are not yet acquainted with the product. Particularly in the B2B sector, this unfamiliarity may generate greater levels of risk and uncertainty, impeding the adoption of new products[6]. Thus, the research has demonstrated that unfamiliarity with the client is associated with increased risk and uncertainty, which impedes the adoption of new products, especially in the B2B context.

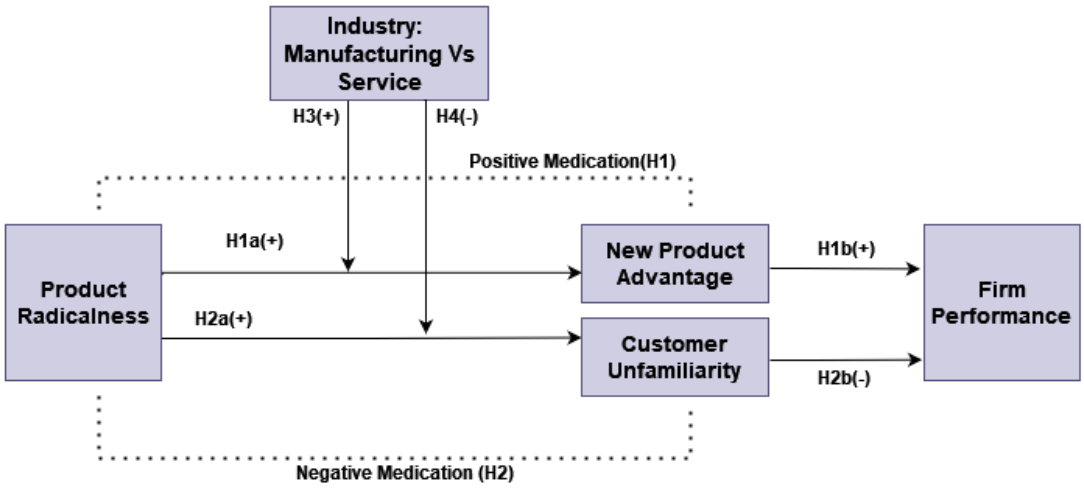


Figure 3.1: Theoretical Model

Consequently, business consumers exhibit a greater aversion to risk, thereby diminishing the likelihood of their acquiring revolutionary new products. The aforementioned has an adverse impact on the seller's enterprise. Furthermore, customer unfamiliarity necessitates that organisations introducing revolutionary products allocate resources towards customer education and training with the aim of altering customer perceptions[17]. In conclusion, the success of radical innovations may be significantly impacted by the timing of product introduction. Before the market is prepared or the technology has been

completely developed, introducing a revolutionary new product too early can result in high costs and low adoption rates. On the contrary, the introduction of a revolutionary product belatedly, subsequent to the establishment of competitors in the market, may lead to overlooked prospects and diminished market presence. Given these factors into account, we put forth the subsequent hypothesis:

H2: Unfamiliar Customers and the Impact on the Relationship among Product Radicalness and Firm Performance.
H2(a): Positive correlation between the radicalness of a product and the level of unfamiliarity experienced by customers.
H2(b): The performance of the firm is negatively affected by customer unfamiliarity.

3.2 Moderated Mediation: Manufacturing Industry vs. Service:

There are substantial disparities between the manufacturing and service sectors regarding innovation strategies, which have an impact on their respective market performance and levels of success. The innovation process is rendered more intricate due to the intangible, heterogeneous, inseparable, and perishable nature of service industry offerings. As an alternative, the manufacturing sector consists of patentable tangible goods, and innovation is frequently predicated on groundbreaking developments that demand substantial investments in research and development. This is because ongoing developments generate a greater quantity of user interactions, which facilitates a more efficient and expeditious product market fit. Additionally, the adoption of agile methodologies, including spiral developments, is more probable in the services sector as opposed to the manufacturing sector. This accelerates the process of transforming the new offering into a competitive edge and ultimately contributes to the success of the organisation.
H3: The impact of product radicalness and novel product advantage on firm performance is contingent upon the industry in which the company operates, with service enterprises generally experiencing a more pronounced positive influence. To alleviate the adverse effects of consumer unfamiliarity, service-dominant organisations allocate a significantly greater proportion of their research and development budget towards incremental advancements as opposed to radical ones[16].
In service industries, where inseparability connotes the concurrent provision and utilisation of services and necessitates a greater degree of collaboration in a business-to-business context, the impact of product radicalness on customer unfamiliarity is comparatively diminished.

Having a significant degree of client interaction during the commercialization phase enables adaptability by customising the service to meet the specific needs of each client, which ultimately leads to increased levels of customer satisfaction and loyalty. In conclusion, consistent human involvement throughout the implementation stage facilitates innovation acceptance by promoting comprehension of novel concepts, raising awareness of their advantages, and reducing the need for extensive training. Innovation improves customer relationships in a business-to-business context, but in the case of services, it is more pronounced by virtue of their inseparability, which compensates for clients' unfamiliarity.

H4: Service firms are less significantly impacted by product radicalness and customer unfamiliarity than manufacturing enterprises. Furthermore, the relationship between product radicalness and firm performance is mediated by the industry category. This disparity arises from the fact that the service sector places a higher value on ongoing innovation and gradual modifications, which customers readily embrace, in contrast to the manufacturing sector which is more prone to investing in revolutionary advancements that customers might not be acquainted with, thereby engendering resistance to adoption. Thus, the manufacturing and service sectors adopt distinct innovation strategies: the former places a premium on incremental advancements and ongoing innovation, whereas the latter allocates resources towards potentially patentable technological revolutions. With a shorter time-to-market, service innovations are simpler to develop and implement than product innovations; service-dominant organisations have a shorter B2B development cycle time than product-dominant enterprises. Additionally, inseparability intensifies service innovation, which helps to compensate for clients' unfamiliarity.

Chapter 4

Research Methodology

The research design of this paper employs a quantitative approach with a cross-sectional design. It involves purposive sampling to select 27 software companies in Bangladesh, with 96 individuals participating in the study. Data collection methods include personal and phone interviews, along with surveys via Google Forms. Measurement instruments such as scales and questionnaires assess constructs like product radicalness and firm performance. Data analysis encompasses descriptive and inferential statistical techniques to test hypotheses and examine relationships between variables. Overall, the research design aims to systematically investigate factors influencing new product development in the software industry in Bangladesh.

4.1 Purpose of the Study

The purpose of this study is to delve into the intricate dynamics influencing the development of new products by profoundly innovative businesses, particularly within the software industry in Bangladesh. It endeavors to uncover the pivotal factors shaping the strategies adopted by these businesses in introducing novel products to the market. Through a comprehensive examination of product radicalness, market performance, and organizational characteristics, the study aims to shed light on the underlying mechanisms driving innovation and success in this context. Additionally, the research seeks to provide valuable insights into the marketing tactics employed by software firms in Bangladesh, as well as to gauge consumer reactions and awareness regarding new products. By contributing to the existing literature on marketing performance, innovation, and firm success, especially within the realm of emerging economies like Bangladesh, this study aspires to offer practical implications for businesses aiming to navigate the complexities of product development and marketing in the rapidly evolving software industry.

4.2 Data Collection

The information gathered for this study comprised personal interviews, phone interviews, and Google Forms surveys. The surveys inquired about the approaches employed by the companies to inform consumers about their new products and elicited corresponding responses. The findings of this research may provide minor software companies in Bangladesh with insights into how they can increase their competitiveness through product innovation and marketing strategies. The data was gathered via telephone interviews and in-person consultations. Our primary emphasis was on utilizing Google Forms as a data collection instrument for the generated questionnaires. This study examines the manner in which companies communicate new products to consumers and the corresponding reactions they elicit.

Table 4.1: Participants Samples

	Number of Companies	Proportion
Number of Employees (size)		
0 - 10	7	25.93%
11 - 20	8	29.63%
21 - 30	3	11.11%
31 - 40	5	18.52%
Above 40	4	14.81%
Age (In Years)		
0 - 5	15	55.55%
6 - 10	6	22.22%
Above 10	6	22.22%
Industry		
Manufacturing	20	74.07%
Services	7	25.93%
Total	27	100%

Table 3.1 further on the details of sample characteristics and dispersion. The sample and the population of workers in the participating software businesses did not significantly vary from one another.

4.3 Measurement and Analysis

The items of the scale, along with their standard factor loadings and reliability indices, are detailed in Table 3.2. The median values for the initial measurements of each variable, as estimated for a sub-sample of 27 companies: product radicalness (26), customer unfamiliarity (20), new product advantage (27), and firm performance (25). Consequently, singular scores were computed for each construct and company through the process of averaging the scale elements provided by multiple respondents. Like previous research, this study examined innovation practices that have occurred within the past five years. The evaluation of every independent factor and mediator was conducted utilizing a Likert

scale ranging from 1 to 7.

Product Radicalness: The degree of radicalness of respondents' new or considerably upgraded products/services were in the past five years.
Customer Unfamiliarity: The grade for Avlonitis and Salavou's newness to customers was changed.
New Product Advantage: We modified the new product uniqueness scale developed by Avlonitis and Salavou[16]. This measure's items correctly capture the concept of a new product advantage.
Firm Performance: Utilising the six-item subjective measure that Zahra devised, business performance was assessed. On a scale of one to seven, the respondent's level of satisfaction with the firm's achievement of a specific goal was assessed for each inquiry. The weighting of the questions was determined by the perceived significance of the objectives. Because both importance and satisfaction were evaluated using a seven-point scale, the aggregate index ranges from 1 to 49[16]. By conducting discussions with the companies involved, we were able to ascertain the industry type and the age of the firm, which facilitated the generation of this information. By conducting discussions with the companies involved, we were able to ascertain the industry type and the age of the firm, which facilitated the generation of this information.

Measurement Analysis:
As the evaluation instruments were formulated subsequent to an extensive literature review pertaining to the research constructs, their content validity can now be affirmed. The variables being examined are represented in Table 3.2 with Cronbach's alpha, composite reliability (CR), and average extracted variance (AVE).

4.4 Research Method

Information was gathered from modest software companies in Bangladesh that develop software applications and digital marketing services for the purpose of this investigation. These sectors have been acknowledged as a rapidly growing economic domain in Bangladesh, which incorporates cutting-edge components into its operational framework. This study consulted twenty-seven software companies based in Bangladesh, including those that were recently established in the industry. Information was collected from a heterogeneous cohort of staff members, comprising project managers, developers, marketing executives, and sales directors, all of whom were involved in the launch of innovative products or the redesign of existing ones pertaining to software, web, and other technical applications.

Chapter 5

Result Analysis

The result analysis of this paper interprets the findings from statistical tests conducted on the collected data. It confirms or refutes hypotheses about the relationships between variables like product radicalness, customer unfamiliarity, new product advantage, and firm performance. Additionally, it discusses any moderating effects found and highlights the implications of the results for theory and practice. Limitations of the study are also acknowledged.

5.1 Demographic Result

Instead of using more traditional methods, process analysis was chosen as the best way to test hypotheses when the independent and dependent variables have conflicting impacts. [16].

Product Radicalness (PR), Customer Unfamiliarity (CU), New Product Advantage (NPA), and Firm Performance (FP) were the variables under investigation. SFL is Factor loading.

SFL = Factor Loading, AVE = Average Variance Extracted, CR = Composite Reliability, α = Cronbach's Alpha

Here, we decided that 1 = Totally disagree, 7 = Totally agree for every part of the questionnaires. Note: All factor loadings exhibit significant statistical significance label: 0.01.

Because process analysis works well in situations where the independent and dependent variables are subject to conflicting effects, it was chosen for this inquiry over more traditional alternatives for hypothesis testing. This study investigated the following variables: PR, CU, NPA, and FP & SFL (Factor Loading).

Table 5.1: Scale item, factor loading, and convergent validity

Construct	Scale Item	SFL	Alpha	CR	AVE
Product Radicalness	Regarding the new or significantly improved products/services launched by the company in the previous five years, it can be say that:		0.827	0.16	0.43
	PR_1: They were based on a revolutionary change in technology	0.786			
	PR_2: They were a breakthrough innovation	0.735			
	PR_3: They led to products that were difficult to replace with substitutes using older technology	0.808			
	PR_4: They represented a major technological advance in the subsystems	0.686			
	PR_5: They represented a minor improvement over the previous technology	0.540			
New Product Advantage	NPA_1: They offer more possibilities to customers	0.770	0.841	0.56	0.86
	NPA_2: They cover more customer needs	0.775			
	NPA_3: They have more uses	0.791			
	NPA_4: They offer unique, innovative features to customers	0.793			
	NPA_5: They are of higher quality	0.580			
Customer Unfamiliarity	CU_1: They required a major learning effort by customers	0.792	0.792	0.011	0.015
	CU_2: It took a long time before customers could understand their full Advantages	0.820			
	CU_3: The product/service concept was difficult for customers to Understand	0.637			
	CU_4: They were not known and tried in the market	0.663			
Firm Performance	FP_1: Return on investment	0.805	0.819	0.014	0.063
	FP_2: Return on equity	0.814			
	FP_3: Sales growth	0.822			
	FP_4: Net profit margin	0.796			
	FP_5: Market share	0.816			
	FP_6: Return on assets	0.801			
Industry	0 = Manufacturing 1 = Service	N/A			
Firm Size	Number of employees	N/A			
Firm Age	Number of years since the firm was founded	N/A			

The assessment of the measurement instruments' reliability was conducted utilising Cronbach's Alpha (alpha) and Composite Reliability (CR). Convergent validity was evaluated using the Average Variance Extracted (AVE)[16]. On a scale of one to seven, respondents indicated their degree of agreement with each statement. Significant factor loadings were observed for all variables at the 0.01 level.

PR = Product Radicalness,CU = Customer Unfamiliarity, NPA = New Product Advan-

Table 5.2: Exploratory Factor Analysis

	Factor 1	Factor 2	Factor 3	Factor 4
PR_1		0.786		
PR_2		0.735		
PR_3		0.808		
PR_4		0.686		
PR_5		0.540		
NPA_1	0.776			
NPA_2	0.775			
NPA_3	0.791			
NPA_4	0.793			
NPA_5	0.580			
CU_1				0.792
CU_2				0.820
CU_3				0.637
CU_4				0.663
FP_1			0.805	
FP_2			0.814	
FP_3			0.822	
FP_4			0.796	
FP_5			0.816	
FP_6			0.801	

tage, FP = Firm Performance.

The findings of this study suggest that a product's radicalness affects performance in two ways: favorably, via the mediation of unique product benefits, and adversely, through customer unfamiliarity. Process analysis was selected as the best approach for investigating these two opposed routes.

Table 5.3: Standard Deviation

	Standard Deviation
Product Radicalness	4.380
Customer Unfamiliarity	3.920
New Product Advantage	4.099
Firm Performance	4.710
Industry	2.074
Firm Size	5.196
Firm Age	9.192

As hypothesised in H1 and H2, we examined the effect of two competitive intervening factors on the relationship between radical product innovation and firm success in this study. The results of our study offer evidence in favour of both Hypotheses 1a and 1b, suggesting that the relationship between firm performance and product radicalness is influenced by the benefit of new product and client unfamiliarity. Additionally, we have noted a negative correlation between client unfamiliarity and product innovation, which subsequently affects business performance negatively[5].

Table 5.4: Correlation Matrix

	1	2	3	4	5	6	7
Product Radicalness	1						
Customer Unfamiliarity	0.510	1					
New Product Advantage	0.385	0.212	1				
Firm Performance	0.287	0.342	0.318	1			
Industry	-0.09	-0.171	0.564	0.636	1		
Firm Size	0.995	0.979	-0.189	0.961	0.327	1	
Firm Age	1	1	-1	1	-1	1	1

Additionally, it can be stated that the client's ignorance and the commerce of assiduity concerning the radical sound of the product were both substantial. Like the preliminary direct effect, a basic pitch analysis was performed on H4. The precision of the product reduced the client's ignorance during production, but the effect was negligible when it was served.

We can affirm that both H2a and H2b are supported, as per our analysis. In addition, the results of the bootstrapping analysis reveal that the circular effect is statistically significant at 0.03, which provides additional support for H2[5]. Subsequently, we employed the process analysis methodology, more precisely the average-centric function in PROCESS, to examine the mediating effect while considering the industry-specific circumstances. Hypotheses H3 and H4 posit that the influence of product radicalness on firm performance is moderated by the category of industry via the two intervening variables.

A significant correlation was identified between the category of industry and the combined effect of customer unfamiliarity and product radicalness. A straightforward slope analysis was performed for H4, following a methodology similar to that of the indirect impact. Based on the results, it was observed that product radicalness positively impacted consumer unfamiliarity, albeit with a relatively weaker effect in the service sector.

Chapter 6

Proposed Solution

Proposed solutions to enhance new product development and firm performance in the software industry of Bangladesh may include refining marketing strategies to emphasize unique product benefits, investing in research and development for innovation, focusing on customer education and engagement to address unfamiliarity with new products, fostering industry collaboration for knowledge sharing, and adapting innovation strategies to align with industry dynamics. These solutions aim to address challenges identified in the research and capitalize on opportunities to drive growth and competitiveness in the software sector.

Based on the findings, several proposed solutions can be recommended to enhance the performance of software firms, particularly in developing countries like Bangladesh:

1. Investment in Customer Education and Training: Given the negative impact of customer unfamiliarity on the adoption of radical innovations, software firms should allocate resources towards educating and training customers about new products. This could involve developing comprehensive communication strategies, providing demonstrations, and offering training sessions to enhance customer understanding and confidence in innovative offerings.
2. Tailored Marketing Strategies: Recognizing the importance of market orientation and the diverse needs of customers, software firms should develop tailored marketing strategies that resonate with target audiences. This could include segmenting the market based on customer preferences, utilizing digital marketing channels effectively, and leveraging customer feedback to refine marketing campaigns.
3. Continuous Innovation and Adaptation: In response to the dynamic nature of the software industry, firms should prioritize continuous innovation and adaptation to stay competitive. This could involve investing in research and development efforts to develop new products and services, embracing agile methodologies to expedite product development cycles, and fostering a culture of innovation within the organization.

4. Industry Collaboration and Partnerships: Given the importance of customer relationships and market insights, software firms could explore opportunities for collaboration and partnerships within the industry. This could involve forming strategic alliances with complementary firms, engaging in co-creation initiatives with customers, and participating in industry associations to share knowledge and best practices.
5. Industry-Specific Training and Development: Recognizing the differences in innovation strategies between manufacturing and service sectors, software firms should invest in industry-specific training and development programs for their employees. This could include providing training on agile methodologies, customer relationship management, and market research techniques tailored to the software industry context.
6. Government Support and Policy Advocacy: To create an enabling environment for innovation and growth, software firms could advocate for government support and policy reforms. This could involve lobbying for incentives for research and development, tax breaks for innovative firms, and policies that foster a conducive business environment for software startups and SMEs.

Overall, the proposed solutions aim to address the challenges identified in the paper and capitalize on the opportunities presented by radical innovation in the software industry. By implementing these recommendations, software firms in developing countries can enhance their competitiveness, drive innovation, and ultimately improve their performance in the market.

Chapter 7

Conclusion

7.1 Sustainability

Sustainability considerations play a pivotal role in assessing the impact of radical innovation within software enterprises in Bangladesh. Environmental sustainability involves evaluating the ecological footprint of innovative practices, including energy usage and waste management. Social sustainability entails examining the equitable distribution of benefits from innovation among diverse stakeholders and addressing issues like digital inclusion and data privacy. Economic sustainability delves into the financial viability of innovation investments and the creation of long-term value for the company and society. Technological sustainability involves ensuring the scalability and longevity of innovative solutions and leveraging emerging technologies responsibly. Organizational sustainability focuses on fostering a culture of innovation within the company, nurturing employee skills, and promoting resilience in the face of change. By integrating these dimensions of sustainability, the research can provide a holistic understanding of the implications of radical innovation, guiding software enterprises towards a more sustainable future.

7.2 Feasibility

7.2.1 Technical Feasibility

Assessing the technical feasibility of conducting research on sustainability in software enterprises in Bangladesh involves several key considerations. Firstly, ensuring access to necessary research tools such as academic databases and statistical software is crucial for effective data collection and analysis. Additionally, evaluating the feasibility of data collection methods, including surveys, interviews, and document analysis, is essential to determine practicality and resource constraints. Proficiency in statistical and qualitative analysis techniques is also paramount to interpret collected data accurately. Moreover, addressing potential language barriers and arranging for translation services are necessary

to facilitate communication with participants in Bangladesh. Furthermore, assessing the willingness and availability of software companies to participate in the study, considering factors like industry engagement and time constraints, is essential for obtaining relevant data. Ensuring adherence to ethical guidelines and regulations, particularly regarding data privacy and confidentiality, is imperative throughout the research process. Lastly, identifying access to technical support for troubleshooting any challenges, such as software issues or data management problems, is crucial for the smooth execution of the research project. These considerations collectively contribute to evaluating the technical feasibility of conducting research on sustainability in software enterprises in Bangladesh.

7.2.2 Economical Feasibility

Examining the economic feasibility of researching sustainability in Bangladesh's software enterprises involves a detailed scrutiny of financial aspects. Firstly, it necessitates estimating the expenses associated with accessing essential research tools like academic databases and statistical software licenses. Secondly, allocating funds for data collection methods, including surveys, interviews, and document analysis, is crucial for financial planning. Additionally, accounting for costs related to participant recruitment, incentives, and any required travel or accommodations is essential for budgeting purposes. Moreover, assessing the affordability of translation services, if needed to overcome language barriers, is a critical consideration. Furthermore, evaluating the costs linked to data analysis, such as hiring skilled analysts or providing training for research staff, is vital for prudent resource allocation. Additionally, factoring in indirect expenses like administrative overheads and personnel salaries is necessary for comprehensive budgeting. Lastly, exploring potential funding sources such as research grants, sponsorships, or partnerships with industry stakeholders can help alleviate financial constraints and improve the economic feasibility of the research endeavor. These steps collectively contribute to assessing the economic viability of researching sustainability in Bangladesh's software enterprises.

7.2.3 Operational Feasibility

Evaluating the operational feasibility of conducting research on sustainability in software enterprises in Bangladesh involves assessing the practical aspects of implementing the research project. Firstly, it requires determining the availability of necessary resources such as research personnel with relevant expertise in sustainability and software industry practices. Secondly, ensuring access to suitable research facilities and infrastructure, including office space, computing resources, and internet connectivity, is crucial for smooth project execution. Additionally, evaluating the feasibility of data collection methods in the local context, considering factors such as cultural norms, accessibility of participants, and lo-

gistical challenges, is essential. Moreover, establishing effective communication channels with stakeholders, including software companies, research participants, and collaborators, is necessary for facilitating data collection and project coordination. Furthermore, identifying potential risks and developing contingency plans to mitigate them, such as addressing data security concerns and ensuring ethical compliance, is vital for project success. Additionally, considering the scalability of research activities and the potential for future expansion or replication of the study is important for long-term sustainability. Lastly, fostering collaboration and partnerships with local organizations, academic institutions, and industry stakeholders can enhance the operational feasibility of the research project by leveraging existing networks and resources. These considerations collectively contribute to evaluating the operational feasibility of conducting research on sustainability in software enterprises in Bangladesh.

7.3 Social and Environmental Impact

The social and environmental impact of the research outlined in the paper is multifaceted. On the social front, the study contributes to the advancement of knowledge in the field of software innovation and firm performance, which can have far-reaching implications for economic development, job creation, and technological progress in developing countries like Bangladesh. By understanding how radical innovation influences firm performance, policymakers, industry practitioners, and other stakeholders can make informed decisions to foster innovation ecosystems, support entrepreneurship, and drive inclusive growth. The research findings may have implications for social equity and inclusion by shedding light on how different segments of society, including marginalized communities, may benefit or be disadvantaged by technological innovation in the software industry. This knowledge can inform efforts to promote equitable access to technology, bridge digital divides, and ensure that the benefits of innovation are shared equitably across society. On the environmental front, the study's insights into innovation practices and their impact on firm performance could inform efforts to promote sustainability and reduce environmental footprint within the software industry. For example, by understanding which innovation strategies lead to improved firm performance, companies may be incentivised to invest in environmentally friendly technologies, practices, and business models. Additionally, the study may uncover opportunities for reducing energy consumption, waste generation, and carbon emissions associated with software development and deployment. Overall, the social and environmental impact of the research extends beyond academic discourse to inform policy-making, industry practices, and societal well-being, contributing to a more sustainable, inclusive, and technologically advanced future.

7.4 Ethics

Each aspect of research, including the research described in this publication, must consider ethics. This research requires careful evaluation of several ethical issues. First and foremost, all participants must give their informed permission, attesting to their understanding of the study's objectives, their role, and any potential dangers. Along with maintaining participant anonymity and confidentiality, handling of data rules should ensure that only authorised staff have access to it. Researchers also need to make sure that their procedures follow ethical norms and guidelines, abstaining from any kind of coercion, fraud, or injury to participants. In addition, to prevent bias and conflicts of interest, the research should aim for objectivity and integrity in the data collection, analysis, and reporting processes. Last but not least, researchers must ensure that results are communicated to stakeholders and people in general in a responsible, transparent, and accurate manner. This goes beyond the study process itself. Researchers can preserve integrity, trust, and respect for all those involved in the research process by conforming to these ethical guidelines.

7.5 Project Summary

The inquiry of the impact of radical innovation on the performance of software enterprises in underdeveloped nations—with a particular focus on Bangladesh—is summarised in the project summary. The study examines how the introduction of novel products or services affects business performance through a mixed-methods approach that includes surveys, interviews, and data analysis. It takes into account aspects including market dynamics, customer unfamiliarity, and industry-specific obstacles. The results show a complex relationship in which radical innovation can have a detrimental effect on a firm's performance because of client unfamiliarity or a favourable impact due to product advantage. The study highlights how crucial it is for software companies hoping to improve their long-term profitability and competitiveness in quickly changing industries to comprehend these dynamics. The project also proposes directions for future research, such as cross-cultural analyses, longitudinal studies, and examinations of the social impact and integration of emerging technologies, with the goal of enhancing knowledge and supporting strategic decision-making in the software sector.

7.6 Future Work

Further study related to this paper may encompass the following: cross-cultural analyses in developing nations to extrapolate findings; longitudinal studies monitoring software firm performance over time; qualitative research to probe deeper into underlying

mechanisms; industry-specific analyses to comprehend sector dynamics; assessments of the impact of external factors; investigations into efficient customer engagement tactics; examinations of the implications of emerging technology integration; comparisons with established markets; and inquiries into sustainability and social impact. By deepening our understanding of the relationship between radical innovation and firm performance in the software industry, our activities will have a positive impact on both industry practice and academia.

Through an examination of the effects of radical innovation in products on the performance of software enterprises based in Bangladesh, this research contributes to the existing literature on marketing performance. The research demonstrates that radical product innovation has two contradictory effects on firm performance: a positive impact mediated by the innovative product's benefit, and an adverse effect mediated by consumer unfamiliarity. Additionally, the research reveals that product radicality has a more negative effect on consumer unfamiliarity in the industrial sector than in the service sector.

It is essential to note, however, that the findings of this study may not be applicable to other nations, as the research was limited to Bangladeshi software companies. Consequently, it is imperative that forthcoming investigations delve into distinct categories and impediments to innovation, alongside sales and marketing tactics employed by software firms based in Bangladesh. Moreover, conducting research on these variables in different nations may yield a more holistic comprehension of the ramifications of radical innovation in products on the performance of businesses.

In general, the findings of this study carry significant implications for enhancing the marketing efficacy of software companies based in Bangladesh. Through gaining an understanding of the impact that radical innovation in products has on the performance of businesses, organisations can formulate tactics to minimise the adverse consequences of consumer unfamiliarity while capitalising on the favourable outcomes of the new product's advantage.

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