FACTORS INFLUENCING SUSTAINED COMPETITIVE ADVANTAGE AMONG TELECOMMUNICATION FIRMS IN MALAYSIA

DEVANDRAN MUTHU

FEP 2019 34

FACTORS INFLUENCING SUSTAINED COMPETITIVE ADVANTAGE AMONG TELECOMMUNICATION FIRMS IN MALAYSIA

By

DEVANDRAN MUTHU

Thesis submitted to the School of Graduate Studies, Universiti Putra Malaysia in Fulfillment of the Requirements for the Degree of Doctor of Philosophy

March 2019

COPYRIGHT

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfillment of the requirement for the degree of Doctor of Philosophy

FACTORS INFLUENCING SUSTAINED COMPETITIVE ADVANTAGE AMONG TELECOMMUNICATION FIRMS IN MALAYSIA

By

DEVANDRAN MUTHU

March 2019

Chairman : Kenny Teoh Guan Cheng, PhD
Faculty : Economics and Management

With the emergence of the digital economy and shorter product/service life cycles, advanced knowledge in the field of sustained competitive advantage has become critical. This study expands the knowledge by integrating broad based theories for empirical testing. Four theories, namely, the Resource-Based Theory, Dynamic Capabilities Theory, Diffusion of Innovation Theory and Social Exchange Theory were integrated to examine factors relating to sustained competitive advantage in the telecommunication industry in Malaysia. A conceptual framework was formulated with these factors: a) Firm Agility (alertness, accessibility, decisiveness, swiftness, and flexibility), b) New Product Development (design thinking, human-computer interaction, design engineering, software development), c) Innovation (magnitude & speed), with the focal construct being sustained competitive advantage to achieve customer retention. Additional postulates included Disruptive Technology as moderator; and Customer Loyalty as mediator. This was a quantitative study adopting the survey method and data were collected from the Malaysian telecommunication service providers (TSPs) and analyzed using SPSS and Smart PLS 3. The findings revealed that three factors had significant positive relationships with the focal construct; and both the moderator and mediator significantly affected the focal construct, leading towards achieving customer retention. The results imply that customer loyalty is an important component in the creation of competitive advantage for customer retention. The results also indicated that disruptive technology is a strong influence on customer loyalty. Consequently, the vigilance of TSPs towards new technologies is vital to move technological breakthroughs from incubators to mainstream; and to sustain customer loyalty. The results of this study provide better understanding of the factors that are relevant to customer retention.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

FAKTOR-FAKTOR YANG MEMPENGHARUHI KELEBIHAN DAYA SAING OLEH FIRMA TELEKOMUNIKASI DI MALAYSIA

Oleh

DEVANDRAN MUTHU

March 2019

Pengerusi : Kenny Teoh Guan Cheng, PhD
Fakulti : Ekonomi dan Pengurusan

Dengan kemunculan ekonomi digital dan kitaran hayat produk/perkhidmatan yang lebih singkat, peningkatan pengetahuan dalam bidang kelebihan daya saing yang mampan telah menjadi lebih kritikal. Oleh itu, kajian ini bertujuan untuk menambah pengetahuan dalam bidang ini dengan mengintegrasikan teori untuk ujian empirikal. Empat teori iaitu Teori Berasaskan Sumber, Teori Keupayaan Dinamik, Teori Penyebaran Inovasi dan Teori Pertukaran Sosial telah diintegrasikan untuk mengkaji faktor yang berkaitan dengan kelebihan daya saing mampan dalam industri telekomunikasi di Malaysia. Rangka kerja konsep telah diformulasikan dengan factor berikut: a) Agiliti Firma (kepekaan, kecapaian, ketegasan, ketangkasan, fleksibiliti) b) Pengembangan Produk Baru (pemikiran reka bentuk, interaksi manusia-komputer, kejuruteraan reka bentuk, pembangunan perisian), c) Inovasi (magnitud dan kelajuan), dengan kelebihan daya saing berterusan sebagai konstruk tumpuan, untuk mencapai pengekalan pelanggan. Postulasi tambahan termasuk Perubahan Teknologi sebagai penyederhana; dan Kesetiaan Pelanggan sebagai pengantara. Ini merupakan kajian kuantitatif yang menggunakan kaedah tinjauan dan data dikumpul dari penyedia perkhidmatan telekomunikasi Malaysia (TSP) dan dianalisis dengan menggunakan SPSS dan Smart PLS 3. Penemuan kajian menunjukkan bahawa tiga faktor mempunyai hubungan positif yang signifikan dengan konstruk tumpuan dan kedua-dua penyederhana dan pengantara juga mempunyai kesan signifikan ke atas pengekalan pelanggan. Hasil kajian ini menunjukkan bahawa kesetiaan pelanggan amat penting untuk mencapai kelebihan daya saing dan seterusnya, mengekalkan pelanggan. Oleh yang demikian, TSP harus waspada terhadap teknologi baru untuk menggerakkannya dari incubator ke arus utama; dan seterusnya memampankan kesetiaan pelanggan. Hasil daripada kajian ini memberikan pemahaman yang lebih baik mengenai faktor-faktor yang berkaitan dengan pengekalan pelanggan.

ACKNOWLEDGEMENTS

Firstly, I would like to express my sincere gratitude to my supervisor Associate Professor Dr. Kenny Teoh Guan Cheng for the continuous support and patience in regards to this dissertation. I would also like to thank the rest of my supervisory committee Associate Professor Dr. Lee Chin and Dr. Yee Choy Leong for their valuable support and encouragement. My sincere thanks also goes to Professor Dr Murali Sambasivan and Dr Indra Thangavelu, without their precious support this dissertation would not have been possible.

I would also like to express my sincere gratitude to the Malaysian government for the scholarship under the MyBrain15 initiative and support in completing this dissertation. I thank all my friends who have contributed, supported me in one way or another throughout this journey. Special gratitude to Mr P. Selvakumaran for his persistent support and encouragement.

Besides, I would like to thank my mother, my uncle, my brothers and sister for supporting me with love throughout the whole journey.
Most importantly, I would like to thank my wife Sithra for being my pillar of strength and my loving children Purnna, Pritvii and Jayvant for their love, care and subtle motivation.

Finally, the completion of this study could not have been possible without the encouragement and support of so many people whose names may not all be enumerated. Their contributions are sincerely appreciated and gratefully acknowledged.

This thesis was submitted to the Senate of the Universiti Putra Malaysia and has been accepted as fulfillment of the requirement for the degree of Doctor of Philosophy. The members of the Supervisory Committee were as follows:-

Kenny Teoh Guan Cheng, PhD
Senior Lecturer
Faculty of Economics and Management
Universiti Putra Malaysia
(Chairman)

Lee Chin, PhD
Associate Professor
Faculty of Economics and Management
Universiti Putra Malaysia
(Member)

Yee Choy Leong, PhD
Senior Lecturer
Faculty of Economics and Management
Universiti Putra Malaysia
(Member)

_____
ROBIAH BINTI YUNUS, PhD
Professor and Dean
School of Graduate Studies
Universiti Putra Malaysia

Date:

Declaration by graduate student

I hereby confirm that:

- this thesis is my original work;
- quotations, illustrations and citations have been duly referenced;
- this thesis has not been submitted previously or concurrently for any other degree at any institutions;
- intellectual property from the thesis and copyright of thesis are fully-owned by Universiti Putra Malaysia, as according to the Universiti Putra Malaysia (Research) Rules 2012;
- written permission must be obtained from supervisor and the office of Deputy Vice-Chancellor (Research and innovation) before thesis is published (in the form of written, printed or in electronic form) including books, journals, modules, proceedings, popular writings, seminar papers, manuscripts, posters, reports, lecture notes, learning modules or any other materials as stated in the Universiti Putra Malaysia (Research) Rules 2012;
- there is no plagiarism or data falsification/fabrication in the thesis, and scholarly integrity is upheld as according to the Universiti Putra Malaysia (Graduate Studies) Rules 2003 (Revision 2012-2013) and the Universiti Putra Malaysia (Research) Rules 2012. The thesis has undergone plagiarism detection software

Signature: _____ Date: _____

Name and Matric No: Devandran Muthu, GS41125

Declaration by Members of Supervisory Committee

This is to confirm that:

- the research conducted and the writing of this thesis was under our supervision;
- supervision responsibilities as stated in the Universiti Putra Malaysia (Graduate Studies) Rules 2003 (Revision 2012-2013) were adhered to.

Signature: _____
Name of Chairman of Supervisory Committee: Dr. Kenny Teoh Guan Cheng

Signature: _____
Name of Member of Supervisory Committee: Associate Professor Dr. Lee Chin

Signature: _____
Name of Member of Supervisory Committee: Dr. Yee Choy Leong

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

"Every morning in Africa, a gazelle wakes up, it knows it must outrun the fastest lion or it will be killed. Every morning in Africa, a lion wakes up. It knows it must run faster than the slowest gazelle, or it will starve. It doesn't matter whether you're the lion or a gazelle–when the sun comes up, you'd better be running"
(Schulz, Steinhoff, & Jepsen, 2017)

1.1 Sustained Competitive Advantage and Customer Loyalty

As markets become more globally unified and new forms of technology and competition arise, the ability of companies to retain market leadership position has become more challenging. This market leadership position is often dealt within the context of competitive audit is advantage commonly viewed from two angles, performances and nowadays determinant (Sigalas, Pekka Economou, & B. Georgopoulos, 2013). A firm is said to have a competitive advantage if it is able to create greater economic value than its marginal competitor in its product market and such economic value is the difference between the perceived benefit gained by the purchaser and the cost to the firm (Peteraf & Barney, 2003). Initial studies on competitive advantage focused on isolating a firm's opportunities and threats against the strength and weakness of the firm's internal capabilities to maximize value for the firm (Porter, 1985). Although the created advantages spur firms to achieve market leadership, they are more eager to create longer lasting i.e., sustained advantages by emphasizing on economic value creation through competing with the marginal competitor in the industry. (J. B. Barney & Clark, 2007). Sustained advantages are generated by the utilization of resources to create differentiation (Cesar, Guimarães, & Imed, 2017) and in the wake of rapidly developing technologies, the utilization of technology and innovation and the ability of the firms to rapidly respond to changing environment have become key differentiating factors (Stratopoulos, 2017). The economic value attained from the advantages are enjoyed by the customers of the firms which, in turn, exhibit firm loyalty because the value delivered by the advantages is not duplicated by competing firms (J. Barney, 1991).

Customer loyalty remains the central thrust for market leadership as firms focus on developing, maintaining and enhancing loyalty; and this is attested by the customers' relative attitude and the repeat patronage of the product/services of the firms (Dick & Basu, 1994) (Kandampully, Zhang, & Bilgihan, 2015). Customer loyalty attributed to either brand and/or product has become more challenging as markets become increasingly globalized and consumption crosses borders (Mostert, Petzer, & Weideman, 2016). Today, consumers actively participate in the product selection on the realization of their significant contribution as co-owner and co-creator of value for the firms (Kandampully et al., 2015). Hence, firms to achieve a competitive advantage requires to implement appropriate marketing generate to muster continuous loyalty of

their customers and these instruments may include pricing mechanisms, being quality centric, relationship building, advertising and communications, distribution channels and promotional activities (Bolton, Lemon, & Verhoef, 2004). In a study of telecommunication service providers, Lee, (2011) found product innovation, product quality and corporate image to be were key factors for creating customer loyalty, which is the precursor to customer retention (Gerpott, Rams, & Schindler, 2001).

In the telecommunication industry in the United States of America (US) in year 2004, the cost of retaining a customer was 25 USD as compared to acquiring new customer which costs 300 USD (Seo, Ranganathan, & Babad, 2008). Based on the cost alone, it is more economically viable to work on retaining existing customers than finding new ones. In addition to cost, there are opportunities to increase the value contribution of the customers by up-selling products and services to these existing customers (Seo et al., 2008). As market saturation becomes a definitive reality in some industries, firms are shifting strategies from growth model to value-adding and pushing customer retention programs to play a prominent role towards market leadership (Jeng & Bailey, 2012).

1.2 Telecommunication Service Providers

Telecommunication Service Providers (TSP) are companies that are engaged in delivering both fixed line and cellular mobile services to customers Kim, Park, & Jeong, (2004) . For all countries, TSPs are deemed to be a critical and strategic sector that is held in tight reigns, especially in term of monitoring, licensing and managing competition because these services form a vital backbone for economic growth and expansion. To provide services such as Voice, Data, Internet, the TSPs invest heavily in building connectivity which include fiber-optic/cables, telephone exchanges, International nodes, data warehouses and base stations. The spending varies from country to country, depending on its land size and population. However as a result of the high initial investment cost, the TSPs have unintentionally created monopolistic oligopolies in nature (Gerpott et al., 2001). For example, Canada which is the second largest country in the world (3.85 million square miles) with low relative population density of (34 million) has 99.3% coverage provided by three major players (Bell, Telus & Rogers); although, in total, there are 57 licensed operators (Canada Communication and Monitoring Report, 2018). In Germany, the TSPs are led by four major players (Mannesmann/Vodafone, Deutsche Telekom/T-Mobil, E-Plus and VIAG) (Gerpott et al., 2001). In the US where the mobile penetration is high, four major players (Verizon, Cingular, T-Mobile and Sprint Nextel) serve a customer base of 196 million, in a population size of 350 million (Seo et al., 2008). There are four major players in Turkey, with Turk Telekom, a previously publicly owned entity leading the industry group ((Kolsal and Emin, 2015)). Since the beginning of GSM services in the early 90s, there have been multiple mergers among the TSPs to create bigger companies to derive benefits from economies of scale; the result of infrastructure continuing raise rapidly. In smaller countries like Taiwan which started with many players, the raising cost quickly saw companies merging from eight players to three main players today (C. Kang & Wu, 2013).

Here in Malaysia, the telecommunication sector remains highly regulated, divided into two broad categories, namely network infrastructure and telecommunication services; and licensed in four categories, namely network facilities provider, network service provider, applications service providers and content application service providers. The TSPs are tasked to provide basic telephony services, payphone, telefax, leased circuit, toll free number, voice information, home country direct, tie line, fax plus, bureau fax, data and information facility, messaging and text transmission, radio communications and new international services, such as IRIDIUM Project 21, INMARSAT, PCN/PCS video conferencing and telecommuting to serve a population size of 31.06 million (Ministry of Energy, 1995). By 2020, the tele-density is projected to increase to 85 phones/100 residents, generating 13.5 million subscribers (Arokiasamy & Abdullah, 2013). The use of broadband service has increased from 20.7 million in 2014 to 38.8 million subscribers in quarter 2, 2018. The Malaysian mobile market has been more spectacular, reaching 36.2 million subscribers in quarter 2, 2018 from a mere 17.6 million subscribers in 2014, with projected continuous growth at annual rate of about 25 per cent. The penetration of internet users (combination of mobile and fixed internet subscriber) has reached 117.9% in quarter 2, 2018 (Chong, Chong, & Wong, 2009). The monopolistic oligopoly environment also holds true for Malaysia with the market being held by five players, Maxis, Celcom, Digi, Ti. me Telekom and TM (Figure 1.1) (MCMC Commission, 2017).

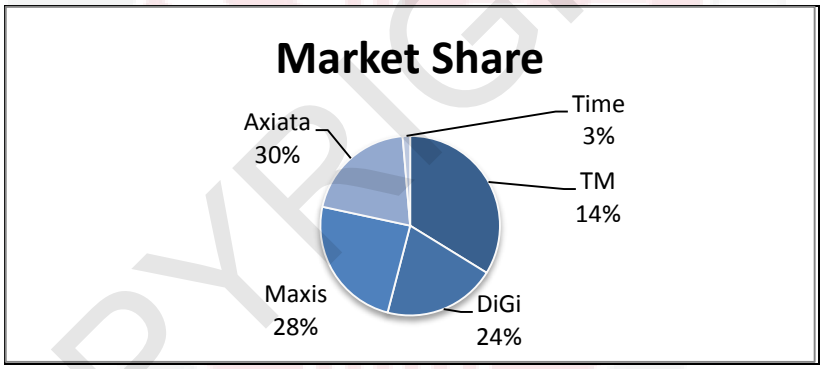

Figure 1.1 : Market Share by 5 Major Telco's in Malaysia
(Source : MCMC Commission, 2017)

The Malaysian Communication & Multimedia industry has secured a market capitalisation of RM183.99 billion representing 9.6% of Bursa Malaysia (Malaysia Stock Exchange) total capitalization of RM1,906.84 billion depicted in Figure 1.2 below.

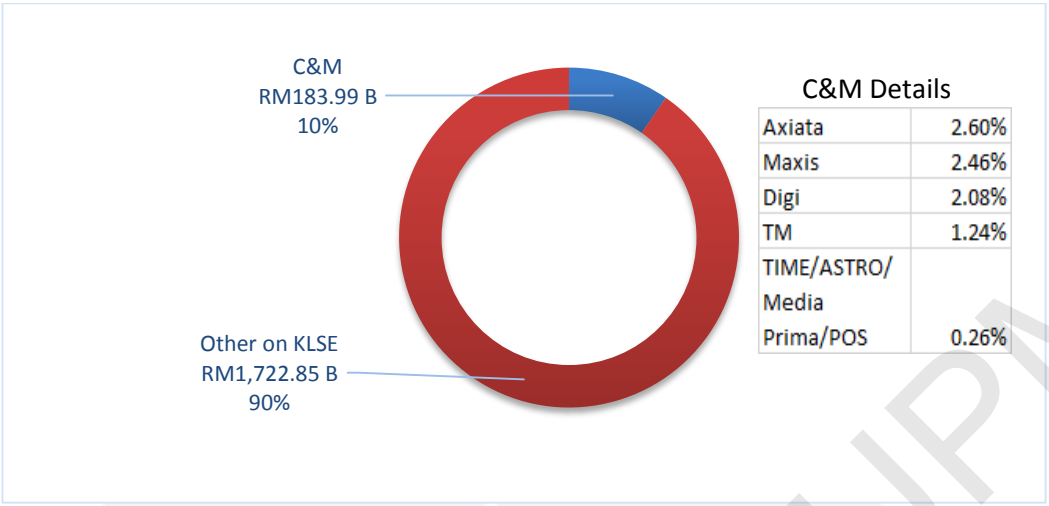

Figure 1.2 : Communication & Multimedia Companies' Contribution to Bursa Malaysia 2017 (RM1,906.84 billion)
(Source: Bloomberg, MCMC 2017)

By the year 2020, tele density in Malaysia is estimated to reach 85 telephones for every 100 inhabitants and this would translate to 13.5 million subscribers. The government of Malaysia offers are four categories of licences, namely, Network Facilities, Network Services, Applications Services and Content Applications Service licences. A total of 437 individual licences had been registered as at end of 2017. The total number of licences issued comprises 209 Network Service Providers (NSP), 176 Network Facility Providers (NFP), and 52 Content Applications Service Providers (CASP). In terms of market capitalization, Axiata has the highest share, with significant contribution from its overseas operations as well as Celcom, followed by Maxis, DiGi and TM. (See Figure 1.3)

Company	Market Capitalisation (RM Billion)			Change (%)	
	2017	2016	2015	2016-2017	2015-2016
Axiata	49.67	42.35	56.51	17.3	-25.1
Maxis	46.94	44.91	51.07	4.5	-12.1
Digi	39.65	37.55	41.99	5.6	-10.6
TM	23.67	22.36	25.48	5.9	-12.2
Time	5.29	4.51	4.37	17.3	3.2
Total	165.22	151.68	179.42	8.9	-15.5

Figure 1.3 : Market Capitalization by 5 Major Telco's
(Source : Bloomberg, MCMC 2017)

Although the market is led by five players, the competition between them is intense because firstly, the domestic market size is not expanding (Arokiasamy & Abdullah, 2013), and, secondly, making forays into international markets requires vast initial capital outlay, with open competition and barriers to entry from first movers. Even

within Malaysia, the government authorities are working towards price deregulation to stimulate competition to deliver better value to the end user. An intense and challenging competitive environment is expected to bring out the best strategies in driving the development of product innovation and enrichment to enhance value for money in product and service offerings (MCMC Commission, 2017).

1.3 Research Problem and Gap

With the increasing competition and market saturation, maintaining competitive advantage with the objective of retaining customers became a key focus of firms' strategies. To this extent, the firms need to operate at the frontier of the next economic growth spectrum; it being the digital economy. The telecommunication industry is well positioned to participate aggressively in this growth spectrum because the products and services provided by TSPs are the infrastructure and building blocks for the digital economy. These infrastructure and building blocks underpin the foundation and revolution towards the digital economy and the investment strategies made by the TSPs in the infrastructure development and introduction of digital services will generate greater value propositions for consumers (MCMC Commission, 2017).

At present, the strategies adopted by the TSPs remain generic. For example, in the context of price wars, the firms counter each other with simple prepaid propositions with low prices, offering low level product innovations and hybrid package propositions. Some level of up-selling is leveraged on captive customers and attempts are made to expand retail distribution networks. To address market saturation, the TSPs focus on developing brand recognition and presence appealing to the target market and establishing strategic partnerships with relevant parties (MCMC Commission, 2017). As these generic strategies are adopted by all players**,** the ability to achieve competitive advantages over other market player diminishes. To overcome these shortcomings, the firms need to focus on their core competencies and develop comprehensive overarching strategies that would catapult them towards sustained competitive advantage. For instance, to keep pace with technology advancement and consumer demand for content across multiple media and devices, TSPs have been aggressively embracing over-the-top (OTT) platforms across their value chain to increase viewership and subscriptions. The Internet Protocol (IP) enabled services, namely, OTT and IPTV have accelerated over the last few years as high speed broadband services have become more pervasive. Eventually, as IPs increases in capacity and throughput, these efforts would, to a large extent, support new business models and revenue generating sources, including and reducing churn.

The exponential pace of technological advancement and disruptive trends in ICT is reshaping the structure of the telecommunication services towards vertical convergence. Digital services are being built across vertical economic sectors which ride on enablement and data platforms, supported by robust and secure communications infrastructure. To these digital economy developments, the Malaysian government seeks to promote new strategic key initiatives such as digital services and data enablement platforms. These initiatives are expected to unlock

greater value across the public and private sectors and across all layers of the digital economy. MCMC believes that three key enablement platform initiatives are digital ID, open data and mobile payment (MCMC Commission, 2017); and the extent to which the TSPs readily embark on these initiatives would be critical to Malaysia's readiness towards embracing the digital economy. Chong et al., (2009) discovered that the integration of telecommunication services to the computer had brought about new technology centric products and services driven by the information technology. In fact, the telecommunication industry is transitioning quickly from a conventional voice arranged market to information driven market, as evidenced by internet-empowered availability such as high definition video spilling, video conferencing and Internet-of-Things (IoT); all of which require the successful combination of information and voice systems using higher data transmission (ComputerWorld, 2016).

Unfortunately, the TSPs have been slow to respond with unique product offerings, with the result that firms offer products and services with low levels of product differentiation; hence, making customer loyalty and retention problematic. Moreover, the telecommunication industry is driven by technology and innovations, and the lack of both these key contributors combined with reactive TSP organizations contribute towards diluting competitive advantages among them. In a recent survey conducted by ComputerWorld, (2016); Internet of Things (IoT), Mobile Payment, Self-Service IT, Next Generation WiFi and Artificial Intelligent are the elements of emerging technologies that believe will be catalysts for long-term innovations, Figure 1.4. Worldwide tech-industry believes up to 26 billion devices will be connected to IoT by 2020 and keeping these devices safe from security breaches would be critical although the benefits of IoTs are still nebulous. Readily available self-service cloud services have opened information accessibility to consumers at low costs as mobile phones morph from communication tools to lifestyle devises. The convenience of mobile payments, now commonly bundled with incentives and reward programs, will likely cause consumers to demand for such flexibility from their TSPs. Artificial intelligence and knowledge-based systems no longer remain within the realm of science fiction. One use of this technology will be the advancement of autonomous vehicles and aerial delivery drones, both of which will change travel and city living. This connectivity will only be possible with the wide availability of Wi-Fi connecting such products at homes, wearables, cars and this list is only set to expand further. The introduction of new Wi-Fi technology such as Wi-Fi HaLow will further support the low power, long-range requirements of IoT applications (ComputerWorld, 2016).

More studies are required to determine the extent of readiness of TSPs to embrace these new technologies. The work of Clayton M Christensen & Bower, (2008) is an apt reminder that industry leaders can be sight of the critical technologies that may actually be the driving technology for the future. The prevailing difficulty lies in identifying the relevant technologies that will be capable of delivering competitive advantage.

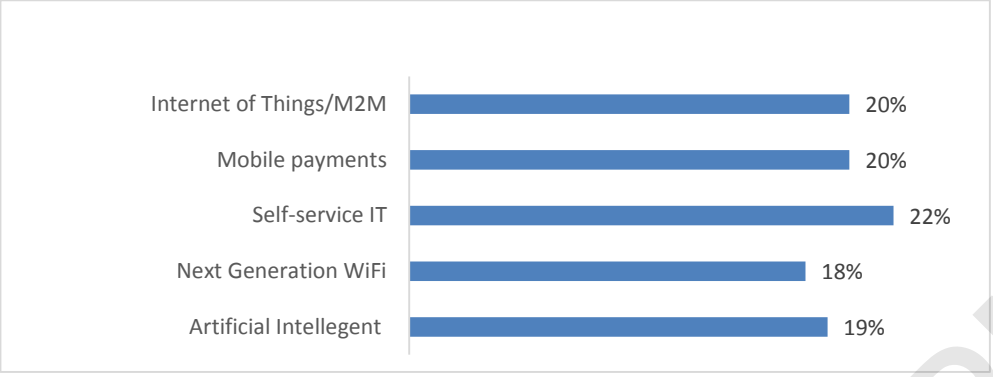

Figure 1.4 : What Technology is Most Likely to Impact Your Organization in the Next 3 to 5 years

These technological trends raise as to the question how prepared are the Malaysian TSPs to take advantage of the new opportunities and are they making the necessary investments now. ComputerWorld (2016) found that companies are investing in five key areas of technology as shown (Figure 1.5).

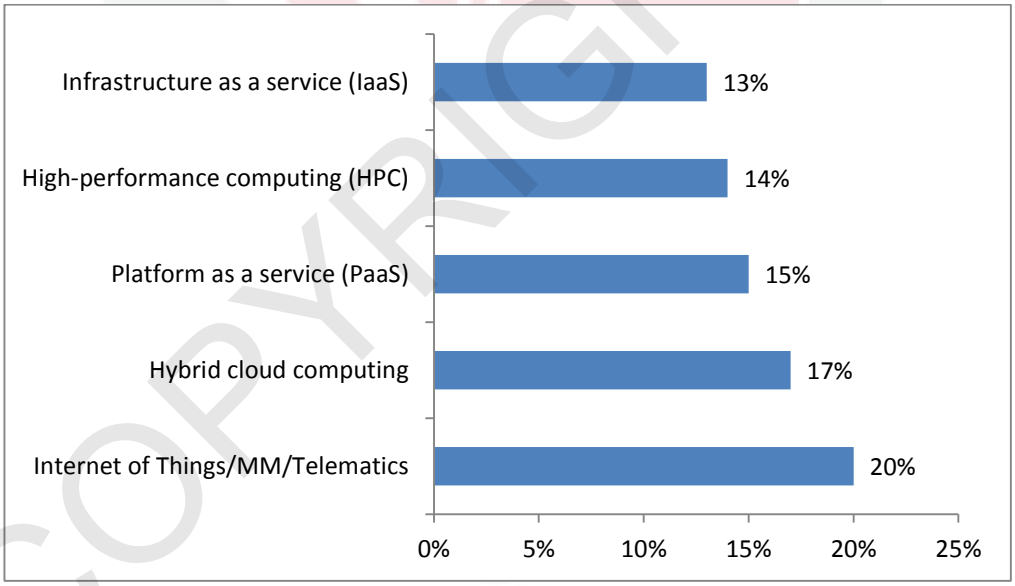

Figure 1.5 : Five Areas of Technology Investment by Companies
(Source : Computer World, 2016)

TSPs are vital to ensure that adequate resources are allocated to the specific areas to ensure preparedness and agility to accommodate market changes. The lack of agility in response to market change leads to firms losing their competitive advantage (Kock & Gemunden, 2016). Furthermore, because of the high capital outlay needed to build the telecommunication infrastructure, TPSs are usually monopolistic oligopolies and the firms' sizes and complex strategies, in themselves, pose serious threats to alignment and agility (Tallon & Pinsonneault, 2011). Although past studies have

established the relevance of firms agility to stay competitive, Kock & Gemuenden (2016) found that in turbulent environments, firms agility becomes less important has compared to innovation strategy, which had become more impactful.

As suggested by C. Oliver (1997), ascertaining sustainable advantages cannot be focused merely on attributes of firm resources but also on how resources are developed, managed and diffused. For example, although investment in technology and innovation are key drivers to creating sustained competitive advantage, these investments are always shrouded by uncertainties which increase the risk to deriving adequate returns; hence, the managerial risk adverseness to increasing investment in these areas. As depicted in Figure 1.5, future technology and innovations rest on five domains; but each of these domains in themselves have much technological depth, creating multiple areas of investment. These uncertainties do not necessarily allow for speedy decisions (Gopalakrishnan, 2000) on market focused innovations as Schulz et al., (2017) aptly quote:

> **"**Every morning in Africa, a gazelle wakes up, it knows it must outrun the fastest lion or it will be killed. Every morning in Africa, a lion wakes up. It knows it must run faster than the slowest gazelle, or it will starve. It doesn't matter whether you're the lion or a gazelle–when the sun comes up, you'd better be running" (Schulz et al., 2017)

Technology and innovation will be used to outrun the competition but unfortunately there is no success formulae because innovations are managed as a portfolio (Adams, Bessant, & Phelps, 2006) (Kock & Gemunden, 2016). In his book, "*Competitive Advantage: Creating and Sustaining Superior Performance",* M. Porter raised the concern on instituting the right technology strategy for the firm by incorporating two key aspects, namely the technologies to be developed and whether to seek leadership in the relevant areas. It is clear that firms cannot seek to be a leader in all technological fronts; as such, selecting the right technological mix would be critical for onward innovations in these areas. The investment in these innovations must necessarily lead to commercialization with new product development which, in turn, can be used to generate sustained competitive advantage (Homburg, Schwemmle, & Kuehnl, 2015). Bringing-to-market the right products, resulting in ready acceptance by customers, have been found to be sporadic and volatile, where the revolution in technology, particularly in Internet technology in packet switching, internet protocol and world wide web, has fundamentally transformed the telecommunications industry (Gupta, Pawar, & Smart, 2007). Petrick & Echols, (2004) recommended that firms adopt a more heuristic approach to selecting new products rather than be limited to traditional financial-based evaluations by combining technology, road mapping and information technology techniques.

In addition to determining the optimal technological mix, revolutions in technologies also bring forth disruptive technologies, which introduces different performance packages from mainstream technologies and though initially deemed inferior to mainstream. The disruptive technologies are able to better perform on certain key dimension serving niche market segment before such technologies become mainstream (Adner, 2002). Furthermore Govindarajan & Kopalle (2006); found that disruptive innovations are a powerful means for broadening and developing new markets by providing new functionality and weakening existing market linkages.

TSPs operate in a technologically advanced business environment which imploded by the volatility of consumer preferences. Academic research on this environment has been scarce, especially in the field of firm agility, and marketing strategies and responses. As such, formulating appropriate responses in light of resource scarcity will lead to superior performance through firm agility (Lim, Mavondo, & Mssanzi, 2000). In contrast, Garrison (2009), established firm size to be an impediment to an organization's response capability despite its increased capability to sense new technology. TSPs which are primarily monopolistic oligopolies, tend to be large firms and they may not be agile, and the lack of agility impedes their market leadership in advance technological environments. Thus, studying the influence of firm agility on firm competitiveness will add to the current body of knowledge. Moreover, technological advances often cause disruptions in the marketplace, resulting in the displacement of existing product leaders with new ones. This reality compels firms to re-map their resource allocation to include even radical innovation to address existing customer's needs. This is because technologies which initially are used in emerging markets can invade mainstream markets and carry entrant firms to victory over established ones (Clayton M Christensen & Bower, 2008). The rapidly changing business environment, spurred by technology and innovation will see firms developing new market-centric products. A review of past studies conducted in the telecommunication industry reveals that understanding customer preferences and aligning the organizations' strategies towards meeting customer needs and expectations remain critical for achieving market growth.

In consequence of the need to carry out a customer-oriented business, understanding the antecedents to competitive advantage for TSPs would significantly contribute to the body of knowledge on this industry. More specifically, understanding how TSPs organize their strategies on new product development, adoption of new technologies and managing innovation is necessary to derive sustained competitive advantages and generate customer loyalty – this is the promise of this study. Furthermore Du, Yalcinkaya, & Bstieler (2016) have recently established that customer focus is the pathway through which sustainability orientation enhances new product development and they have suggested future research to focus on innovations from the standpoint of extending competitive advantage. Kandampully et al., (2015) believed since Gen Y will become an important market segment, it would be sensible for firms to identify appropriate organizational structure for effective management of technology to effectively engage this market segment.

1.4 Research Questions

The alignment of a firm's agility towards its NPD program and innovation portfolio remains an exciting area for research, especially with the onslaught of new innovation that constantly push forward the technological frontiers (Roberts & Grover, 2012). In light of the problems and the lack of knowledge in the area of organizational agility, NDP and innovation cluster in the telecommunication sector, this study aims to answer the following questions:

a) Does a firm's agility, new product development and innovation create sustained competitive advantage and leading to customer loyalty?
b) Does disruptive technologies influence the sustained competitive advantage of a firm and its customer retention?
c) Does customer loyalty influence the relationship between sustained competitive advantage and customer retention?

1.5 Research Objective

The objective of this study is to:

a) To assess and evaluate the extent to which the agility of the firm, its new product development and innovation strategies create sustained competitive advantage and customer loyalty for the firm in the Malaysian telecommunication environment.
b) To assess the impact of disruptive technologies on the firm's sustained competitive advantage and its customer retention.
c) To access the influence of customer loyalty on the relationship between sustained competitive advantage and customer retention.

1.6 Justification and Significance of The Research

The findings of this research are expected to add to the knowledge and understanding of the subject of competitive advantages; and its impact on customer behavior in the telecommunication industry in Malaysia. The research findings will provide managers with new knowledge and insights into building core competencies and developing strategies to achieve an organization's competitive advantage.

Particularly, among the TSPs where barriers to entry are high and where the customers may be beholden to legacy providers, long standing core competencies are taken for granted as indispensable assets not because they have demonstrated superiority under competitive conditions but rather because their longevity is considered sufficient evidence of their value (C. Oliver, 1997) and such mistaken beliefs are capable of even bringing the market leader to its knees, as in the case of Nokia.

Leonard-Barton (1992) pointed out that core competencies have the potential to become core rigidities, where the development of competencies that had served the firm well in the past may also hinder innovation and new product developments, as the company moves forward. Developing robust and distinctive capabilities in critical areas such as innovation and new products are much needed for the telecommunication sectors. Being too slow to respond to technological changes has witnessed the fall of Kodak from its once leading market position, where Lucas & Goh (2009) have traced Kodak to failure to cultural and bureaucratic rigidities that had hindered adaptation and innovation.

Hence, determining the impact of key factors for competitive advantages, such as firm agility, new product development, technology and innovation will be useful for the telecommunication industry so that the TSPs can develop the right strategies to enhance market share and customer loyalty. This study complements existing literature on how to make distinctive competencies succeed and it offers useful theoretical bases on which future research can explore value creation for firms.

1.7 Assumption and Scope of The Study

This study assumes that all TSPs in Malaysia actively invest in new product development and innovation to stay competitive; and that the role of the government in regulating the telecommunication industry only causes minimal market disruption to the operations of the free market economy. The scope of this study is limited to providers of telecommunication services in Malaysia.

1.8 Operational Definition of Variables/Terms

Construct	Simple Definition
Disruptive Technology	A disruptive technology is one that displaces an established technology and shakes up the industry; or a ground-breaking product that creates a completely new industry (C M Christensen, 1997). It is the evolving advances in technology are threatening to interrupt established products and markets, creating an atmosphere of turmoil and difficult decision-making for firms.
Agility	Capacity of a production network to quickly react to changes in economic conditions and client requests (Hallanoro et al., 2015); Christopher & Towill, 2001; Vinodh, Sundararaj, Devadasan, Rajanayagam, & Murugesh, 2008). In the other words, agility is an ability of the firm to succeed in an environment of continuous and often unanticipated change.
Innovation	An item, process, or practice that is new to the firm (Kimberly & Evanisko, 1981). Refers to something new with a high degree of uniqueness, in any area, and is introduced to consumers.
New Product Development	The complete process of bringing a new product to market and making it available for sale. The product can be tangible or intangible (Kahn, Kay, Slotegraaf, & Uban, 2013). The products act as a new or better way out to customer problems. This further leads to revolution of the existing market as well as improvement of new ones.
Customer Loyalty	Intention of a buyer to purchase, in the future, the same services (retention) and additional services (expansion) from the current provider, in the future, as well as the buyer's activities in recommending this provider to others (referral) (Cahill, Goldsby, Knemeyer, & Wallenburg, 2010). It's a relationship of the outcome of customer satisfaction from the usage of product and services.
Competitive Advantage	Properties of individual product/markets which will give the firm a strong competitive position. (J. Barney, 1991). Is a firm's ability to create superior value for its buyers with lower price as compared to other firms.
Customer Retention	Ability of a company or product to retain its customers over some specified period (R. Ahmad & Buttle, 2002). Customers will remain reliable to a service organization if the value of what they receive is determined to be relatively greater than that expected from competitors.

1.9 Organization of The Thesis

The dissertation is organised in five chapters:

a) Chapter 1: Introduction and Background of the Study. This chapter provides a general introduction to the study. It focuses on the background of the study, significance of the study and statement of the research problem.
b) Chapter 2: Literature Review. This Chapter focuses on the literature surrounding the topic. In particular, this chapter will present the review of theories and models and a critical discussion of key issues.
c) Chapter 3: Research Methodology. This Chapter describes the methodology and design, population and sampling procedure, data collection methods, research constraints and ethical considerations related to this research.
d) Chapter 4: Research Findings**.** This Chapter deals with the analysis and interpretation of the research findings from collected data.
e) Chapter 5: Discussion, Conclusions and Recommendations. This is the concluding Chapter that discusses the results, conclusions and recommendations.

REFERENCES

Abdi, H., Chin, W. W., Vinzi, V. E., Russolillo, G., & Trinchera, L. (Eds). (2013). New Perspectives in Partial Least Squares and Related Methods. In H. Abdi, W. W. Chin, V. E. Vinzi, G. Russolillo, & L. (Eds) Trinchera (Eds.), *Springer Proceedings in Mathematics & Statistics* (Vol. 56).

Adams, R., Bessant, J., & Phelps, R. (2006). Innovation management measurement: A review. *International Journal of Management Reviews*, *8*(1), 21–47.

Adner, R. (2002). When are technologies disruptive? A demand-based view of the emergence of competition. *Strategic Management Journal*, *23*(8), 667–688.

Agle, B. R., Mitchell, R. K., & Sonnenfeld, J. a. (1999). Who matters to CEOs? An investigation of stakeholder attributes and salience, corporate performance, and CEO values. *Academy of Management Journal*, *42*(5), 507–525.

Ahmad, A. (2015). *Business intelligence for sustainable competitive advantage* (Curtin University of Technology).

Ahmad, R., & Buttle, F. (2002). Customer retention management: a reflection of theory and practice. *Marketing Intelligence & Planning*, *20*(3), 149–161.

Ahn, J., Han, S., & Lee, Y. (2006). Customer churn analysis : Churn determinants and mediation effects of partial defection in the Korean mobile telecommunications service industry. *Telecommunications Policy*, *30*, 552–568.

Aksoy, L., Buoye, A., Aksoy, P., Larivière, B., & Keiningham, T. L. (2013). A Cross-national Investigation of the Satisfaction and Loyalty Linkage for Mobile Telecommunications Services across Eight Countries. *Journal of Interactive Marketing*, *27*(1), 74–82.

Anderson, J. C., & Gerbing, D. W. (1988). Structural Equation Modeling in Practice: A Review and Recommended Two-Step Approach. *Psychological Bulletin*, *103*(3), 411–423.

Ardiyok, S., & Oguz, F. (2010). Competition law and regulation in the Turkish telecommunications industry : Friends or foes ? *Telecommunications Policy*, *34*, 233–243.

Armstrong, C. E., & Shimizu, K. (2007). A Review of Approaches to Empirical Research on the Resource-Based View of the Firm. *Journal of Management*, *33*(6), 959–986.

Armstrong, J. S., & Overton, T. S. (1977). Estimating Nonresponse Bias in Mail Surveys. *Journal of Marketing Research*, *14*(3), 396–402.

Arokiasamy, A. R. A., & Abdullah, A. G. (2013). Service Quality and Customer Satisfaction in the Cellular Telecommunication Service Provider in Malaysia. *Journal of Arts, Science & Commerce*, *6*(2), 1–9.

Athabassopoulos, A., & Iliakopoulos, A. (2003). Modeling Customer Satisfaction in Telecommunications: Assessing the Effect of Multiple Transaction Points on the Perceived Overall Performance of the Provider. *Production and Operations Management*, *12*(2), 224–245.

Aydin, S., Ozer, G., & Arasil, O. (2005). Customer loyalty and the effect of switching costs as a moderator variable A case in the Turkish mobile phone market. *Marketing Intelligence & Planninganning*, *23*(1), 89–103.

Aydin, S., Ozer, G., & Özer, G. (2005). The analysis of antecedents of customer loyalty in the Turkish mobile telecommunication market. *European Journal of Marketingarketing*, *399*(7/8), 910–925.

Bagozzi, R. P. (1978). Marketing as Exchange: a theory of transactions in the Marketplace. *Journal of Marketing*, *4*(4), 535–556.

Bagozzi, R. P. (2011). Measurement and Meaning in Information Systems and Organizational Research: Methodological and Philosophical Foundations. *MIS Quarterly*, *35*(2), 261–292.

Bagozzi, R. P., & Phillips, L. W. (1982). Representing and Testing Organizational Theories : A Holistics Construal. *Administrative Science Quarterly*, *27*, 459–489.

Bansal, H. S., & Taylor, S. F. (1999). The Service Provider Switching Model (SPSM): A Model of Consumer Switching Behavior in the Services Industry. *Journal of Service Research*, *2*(2), 200–218. https://doi.org/10.1177/109467059922007

Barney, J. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Management*, *17*(1), 99–120.

Barney, J. B. (2001). Resource-ased theories of competitive advantage : A ten-year retrospective on the resource-based view. *Journal of Management*, *27*, 643–650.

Barney, J. B., & Clark, D. N. (2007). Resource-Based Theory: Creating and Sustaining Competitive Advantage. *Oxford University Press*, 336.

Baron, R. M., & Kenny, D. a. (1986). The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*(6), 1173–1182.

Beaudouin-lafon, M., & Mackay, W. E. (2000). Chapter 52 Prototyping Tools and Techniques. *Prototype Development and Tools*, 1–41.

Blaikie, N. (2007). *Approaches to Social Enquiry* (2nd ed.). Cambridge UK: Polity Press.

Bolton, R. N., Lemon, K. N., & Verhoef, P. C. (2004). The Theoretical Underpinings of Customer Asset Management : A Framework and Propositions for Future Research. *Journal of the Academy of Marketing Science*, *3*, 1–20.

Bryman. (2001). *The debate about quantitative and qualitative research in built environment: A question of method or epistemology? 35*(1), 75–92.

Buckinx, W., & Poel, D. Van Den. (2005). Customer base analysis : partial defection of behaviourally loyal clients in a non-contractual FMCG retail setting. *European Journal of Operational Research*, *164*, 252–268.

Cahill, D. L., Goldsby, T. J., Knemeyer, A. M., & Wallenburg, C. M. (2010). Customer Loyalty in Logistics Outsourcing Relationships: An Examination of the Moderating Effects of Conflict Frequency. *Journal of Business Logistics*, *31*(2), 253–277.

Carlile, P. R., & Christensen, C. M. (2005). The Cycles of Theory Building in Management Research. *HBS Working Paper 05-057*, *February*, 1–25.

Cesar, J., Guimarães, F. De, & Imed, F. M. (2017). Sustainable Competitive Advantage : A Survey of Companies in Southern Brazil. *Brazilian Business Review*, *14*(3), 352–367.

Chang, W., & Taylor, S. A. (2016). The Effectiveness of Customer Participation in New Product Development: A Meta-Analysis. *Journal of Marketing*, *80*(1), 47–64.

Chin, W. W., Marcolin, B. L., & Newstead, P. R. (2003). A Partial Least Squares Latent Variable Modeling Approach for Measuring Interaction Effects: Results from a Monte Carlo Simulation Study and an Electronic-Mail Emotion/ Adoption Study. *Information Systems Research*, *14*(2), 189–217.

Chong, C. W., Chong, S. C., & Wong, K. Y. (2009). Is the Malaysian telecommunication industry ready for knowledge management implementation ? *Journal of Knowledge Management*, *13*(1), 69–87.

Christensen, C M. (1997). The Innovator's Dilemma. *Business*, 1–179.

Christensen, Clayton M, & Bower, J. L. (2008). Customer Power, Strategic Investment and the Failure of Leading Firms. *Strategic Management Journal*, *17*(3), 197–218.

Christensen, Clayton M, Johnson, M. W., & Rigby, D. K. (2002). Foundations for Growth : How to Identify and Buuild Disruptive New Businesses. *MIT Sloan Management Review*, *43*(3), 21–34.

Christensen, Clayton M, Raynor, M., & McDonald, R. (2015). What Is Disruptive Innovation? *Harvard Business Review*, *93*(12), 44–53.

Christopher, M. (2000). The Agile Supply Chain. *Industrial Marketing Management*, *29*(1), 37–44.

Christopher, M., & Towill, D. (2001). An integrated model for the design of agile supply chains. *International Journal of Physical Distribution & Logistics*

Management, *31*(4), 235–246.

Čiutienė, R., & Thattakath, E. W. (2015). Influence of Dynamic Capabilities in Creating Disruptive Innovation. *Economics and Business*, *26*, 15.

Cohen, D., Lindvall, M., & Costa, P. (2008). *Agile Software Development*.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Lawrence Erlbaum Associates, Publisher.

ComputerWorld. (2016). *Disruptive Technologies* (pp. 26–31). pp. 26–31. Creswell, J. W. (2003). Creswell, J.W. (2003). Chapter One, "A Framework for Design." In *Research design Qualitative quantitative and mixed methods approaches* (2nd ed., pp. 3–26).

Cronin, J. J., Brady, M. K., & Hult, G. T. M. (2000). Assessing the effects of quality, value, and customer satisfaction on consumer behavioral intentions in service environments. *Journal of Retailing*, *76*(2), 193–218.

Crosby, L. A., & Masland, J. L. (2009). Customer Experience Innovation. *Marketing Management*, *18*(2), 10–11.

Culnan, M. J. (1983). Environmental Scanning: The Effects of Task Complexity and Source Accessability on Information Gathering Behavior. *Decision Sciences*, *14*(2), 194–206.

Delaney, J., & Huselid, M. (1996). The impact of human resource management practices on perceptions of organizat ... *Academy of Management Journal*, *39*(4), 949.

Dewar, R. D., & Dutton, J. E. (1986). The Adoption of Radical and Incremental Innovations: An Empirical Analysis. *Management Science*, *32*(11), 1422–1433.

Diamantopoulos, A., & Siguaw, J. a. (2006). Formative versus reflective indicators in organizational measure development: A comparison and empirical illustration. *British Journal of Management*, *17*(4), 263–282.

Dick, A. S., & Basu, K. (1994). Customer Loyalty: Toward an Integrated Conceptual Framework. *Journal of the Academy of Marketing Science*, *22*(2), 99–113.

Du, S., Yalcinkaya, G., & Bstieler, L. (2016). Sustainability, Social Media Driven Open Innovation, and New Product Development Performance*. *Journal of Product Innovation Management*, *33*(1), 55–71.

Edwards, J. R. (2011). The Fallacy of Formative Measurement. *Organizational Research Methods*, *14*(2), 370–388.

Elverum, C. W., & Welo, T. (2015). On the use of directional and incremental prototyping in the development of high novelty products: Two case studies in the automotive industry. *Journal of Engineering and Technology Management - JET-M*, *38*, 71–88.

Elverum, C. W., Welo, T., & Tronvoll, S. (2016). Prototyping in New Product Development: Strategy Considerations. *Procedia CIRP*, *50*, 117–122.

Emden, Z., Calantone, R. J., & Droge, C. (2006). Collaborating for New Product Development: Selecting the Partner with Maximum Potential to Create Value. *Journal of Product Innovation Management*, *23*(3), 330–341.

Eshghi, A., Haughton, D., & Topi, H. (2007). Determinants of customer loyalty in the wireless telecommunications industry. *Telecommunications Policy*, *31*(November 2003), 93–106.

Faul, F., ErdFelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A Flexible Statistical Power Analysis Program for the Social, Behavioral, and Biomedical Sciences. *Behavioral Research Methods*, *39*(2), 175–191.

G. Tabachnick, B., & S. Fidell, L. (2007). Using Multivariate Statistics. In *Pearson Education, Inc.* (Vol. 28).

Gandomi, A., & Zolfaghari, S. (2013). Profitability of loyalty reward programs: An analytical investigation. *Omega (United Kingdom)*, *41*(4), 797–807.

Garrison, G. (2009). An assessment of organizational size and sense and response capability on the early adoption of disruptive technology. *Computers in Human Behavior*, *25*(2), 444–449.

Gatignon, H., Tushman, M. L., Smith, W., & Anderson, P. (2002). A Structural Approach to Assessing Innovation: Construct Development of Innovation Locus, Type, and Characteristics. *Management Science*, *48*(9), 1103–1122.

Gerpott, T. J., Rams, W., & Schindler, A. (2001). Customer retention , loyalty , and satisfaction in the German mobile cellular telecommunications market. *Telecommunication Policy*, *25*, 249–269.

Gligor, D. M., Holcomb, M. C., & Stank, T. (2013). A Multidisciplinary Approach to Supply Chain Agility: Conceptualiationa and Scale Development. *Journal of Business Logistics*, *34*(2), 94–108.

Gloet, M., & Samson, D. (2016). Knowledge and Innovation Management: Developing Dynamic Capabilities to Capture Value From Innovation. *49th Hawaii Internatioanal Conference on System Sciences*, 1–19.

Gopal, A., Krishnan, M. S., Mukhopadhyay, T., & Goldenson, D. R. (2002). Measurement programs in software development : determinants of success Measurement Programs in Software Development : Determinants of Success. *IEEE Transaction on Software Engineering*, *28*(September), 863–875.

Gopalakrishnan, S. (2000). Unraveling the links between dimensions of innovation and organizational performance. *The Journal of High Technology Management Research*, *11*(1), 137–153.

Govindarajan, V., & Kopalle, P. K. (2006). Disruptiveness of innovations: Measurement and an assessment of reliability and validity. *Strategic Management Journal*, *27*(2), 189–199.

Groeneveld, E., & Lacher, P. (1992). An open information system for the swine production and marketing industry : its scope , topology and telecommunications strategy. *Computers and Electronics in Agriculture*, *7*, 163–185.

Gupta, A., Pawar, K. S., & Smart, P. (2007). New product development in the pharmaceutical and telecommunication industries: A comparative study. *International Journal of Production Economics*, *106*(1), 41–60.

Hair, Joe F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a Silver Bullet. *The Journal of Marketing Theory and Practice*, *19*(2), 139–152.

Hair, Joseph F., Hult, J. G. T. M., Ringle, C. M., & Sarstedt, M. (2014). *Partial Least Squares Structural Equation Modeling (Pls-Sem)*. Sage Publication Inc.

Hall, J., & Sammons, P. (2014). Mediation, Moderation & Interaction, Definition, Discrimination & (Some) Means of Testing. In T. (Ed. . Teo (Ed.), *Handkook of Quantitative Methods for Educational Research* (pp. 267–286).

Hallanoro, Mikko, Galliers, R. D., Salmela, H., Tapanainen, T., Baiyere, A., … Galliers, R. D. (2015). IS Agility Research : An Assessment and Future Directions. *23 European COnference on Information Systems Munster, Germany 2015*.

Hanna, M. D., Bernardes, E. S., & Hanna, M. D. (2009). A Theoretical Review of Flexibility , Agility and Responsiveness in the Operations Management Literature A theoretical review of flexibility , agility and responsiveness in the operations management literature Toward a conceptual definition of customer re. *International Journal of Operations & Production Management*, *29*(1), 30–53.

Hauser, J., Tellis, G. J., & Griffin, A. (2006). Research on Innovation: A Review and Agenda for *Marketing Science*. *Marketing Science*, *25*(6), 687–717.

Hawkins, T. G., Gravier, M. J., & Powley, E. H. (2011). Public Versus Private Sector Procurement Ethics and Strategy: What Each Sector can Learn from the Other. *Journal of Business Ethics*, *103*, 567–586.

Hayes, A. F. (2013). *An Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-based Approach* . The Guilford Press.

Hazelrigg, G. A. (1998). A Framework for Decision-Based Engineering Design. *Journal of Mechanical Design*, *120*(December 1998), 653–658.

Helfat, C., Finkelstein, S., Mitchell, W., Peteraf, M., Singh, H., Teece, D., & Winter, S. (2007). *Dynamic Capabilities*. Blackwell Publishing.

Helo, P. (2004). Managing agility and productivity in the electronics industry. *Industrial Management & Data Systems*, *104*(7), 567–577.

Hennig-Thurau, T., Malthouse, E. C., Friege, C., Gensler, S., Lobschat, L., Rangaswamy, A., & Skiera, B. (2010). The Impact of New Media on Customer Relationships. *Journal of Service Research*, *13*((3)), 311–330.

Henseler, J., Hubona, G., & Ray, P. A. (2016). Using PLS Path Modeling in New Technology Research : Updated Guidelines. *Industrial Management & Data Systems*, *116*(1), 2–20.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, *43*(1), 115–135.

Hidalgo, D., & Sekhon, J. (2011). Causality. In B. Badie, D. Berg-Schlosser, & L. Morlino (Eds.), *International Encyclopedia of Political Science* (pp. 204–211).

Homburg, C., Schwemmle, M., & Kuehnl, C. (2015). New Product Design : Concept , Measurement and Consequences. *Journal of Marketing*, *79*(May), 41–56.

Hooper, D., Coughlan, J., & Mullen, M. R. (2008). " Structural Equation Modelling: Guidelines for Determining Model Fit Structural Equation Modelling: Guidelines for Determining Model Fit. *The Electronic Journal of Business Research Methods*, *6*(1), 53–60.

Howe, K. R. (1992). Getting over the Quantitative-Qualitative Debate. *American Journal of Education*, *100*(2).

Howell, R. D., Breivik, E., & Wilcox, J. B. (2007a). Is formative measurement really measurement? Reply to Bollen (2007) and Bagozzi (2007). *Psychological Methods*, *12*(2), 238–245.

Howell, R. D., Breivik, E., & Wilcox, J. B. (2007b). Reconsidering formative measurement. *Psychological Methods*, *12*(2), 205–218.

Hrebiniak, L. G., & Joyce, W. F. (1985). Organizational Adaptation: Strategic Choice and Environmental Determinism. *Administrative Science Quarterly*, *30*(3), 336–349.

Hughes, M. A., Price, R. L., & Marrs, D. W. (1986). Linking Theory Construction and Theory Testing: Models with Multiple Indicators of Latent Variables. *The Academy of Management Review*, *11*(1), 128.

Hwang, H., Jung, T., & Suh, E. (2004). An LTV model and customer segmentation based on customer value : a case study on the wireless telecommunication industry. *Expert Systems With Applications*, *26*, 181–188.

IBM Institute for Business Value. (2015). *Telco 2015 Five Telling Years, Four Future Scenarios*.

Izogo, E. (2013). An Empirical Assessment of Customer Switching Behavior in the Nigerian Telecom Industry. *African Journal of Business and Economic Research*, *8*(1), 61–82.

J. Trainor, K., T. Krush, M., Agnihotri, R., Trainor, K. J., Krush, M. T., Agnihotri, R., … Agnihotri, R. (2013). Effects of relational proclivity and marketing intelligence on new product development. *Marketing Intelligence & Planning*, *31*(7), 788–806.

Jahanzeb, S., Fatima, T., & Khan, B. (2010). An empirical analysis of customer loyalty in Pakistan ' s. *Database Marketing & Customer Strategy Management*, *18*(December), 5–15.

Jeng, D. J., & Bailey, T. (2012). Assessing customer retention strategies in mobile telecommunications Hybrid MCDM approach. *Management Decision*, *50*(9), 1570–1585.

Julio, A., & Eugenia, V. (2014). Customer segmentation model based on value generation for marketing strategies formulation. *Estudios Gerenciales*, (100), 0–5.

Kahn, K. B., Kay, S. E., Slotegraaf, R., & Uban, S. (2013). *The PDMA Handbook of New Product Development* (K. B. Kahn, S. E. Kay, & R. Slotegraaf, Eds.).

Kallol. (2009). Relationship marketing research (1994- 2006). *Marketing Intelligence & Planning Marketing Intelligence & Planning Iss Management Decision Journal of Business & Industrial Marketing*, *27*(2), 326–363.

Kandampully, J., Zhang, T. (Christina), & Bilgihan, A. (2015). Customer loyalty: a review and future directions with a special focus on the hospitality industry. *International Journal of Contemporary Hospitality Management*, *27*(3), 379–414.

Kang, C., & Wu, C. (2013). Statistical precision of productivity change : A bootstrap application to Taiwan ' s telecommunications industry. *Telecommunications Policy*, *37*(11), 1015–1032.

Karjaluoto, H., Jayawardhena, C., Lepp, M., Pihlstr, M., Leppäniemi, M., & Pihlström, M. (2012). How value and trust influence loyalty in wireless telecommunications industry. *Telecommunications Policy*, *36*(8), 636–649.

Keropyan, A., & Gil-lafuente, A. M. (2012). Customer loyalty programs to sustain consumer fidelity in mobile telecommunication market. *Expert Systems With Applications*, *39*(12), 11269–11275.

Kessler, E. H., & Chakrabarti, A. K. (1996). Innovation Speed: A Conceptual Model of Context, Antecendents, and Outcomes. *Academy of Management Review*, *21*(4), 1143–1191.

Kim, G., Shin, B., & Grover, V. (2010). Investigating Two Contradictory Views of Formative Measurement in Information Systems Research. *MIS Quarterly*, *34*(2), 1–5.

Kim, M., Park, M., & Jeong, D. (2004a). *The effects of customer satisfaction and switching barrier on customer loyalty in Korean mobile telecommunication services*. *28*, 145–159.

Kim, M., Park, M., & Jeong, D. (2004b). The effects of customer satisfaction and switching barrier on customer loyalty in Korean mobile telecommunication services. *Telecommunication Policy*, *28*, 145–159.

Kimberly, J. R., & Evanisko, M. J. (1981). Organizational Innovation: The Influence of Individual and Contextual Adoption Factors on Hospital of Technological and Andministrative. *The Academy of Management Journal*, *24*(4), 689–713.

Klassen, R. D., & Whybark, D. C. (1999). Environmental Management in Operations: The Selection of Environmental Technologies. *Decision Sciences*, *30*(3), 601–631.

Kleinschmidt, E. J., & Brentani, U. De. (2007). Performance of Global New Product Development Programs : *Journal Odf Product Innovation Management*, *24*, 419–441.

Kock, A., & Gemunden, H. G. (2016). Antecedents to Decision-Making Quality and Agility in Innovation Portfolio Management. *Journal of Product Innovation Management*.

Kostoff, R., Boylan, R., & Simons, G. (2004). Disruptive technology roadmaps. *Technological Forecasting & Social Change*, *71*, 141–159.

Labus, M. (2010). The CRM behaviour theory – Managing corporate customer relationships in service industries. *Journal of Database Marketing & Customer Strategy Management*, *17*(September), 155–173.

Lee, J.-W. (2011). Critical factors promoting customer loyalty to smartphone and mobile communications service providers. *Academy of Marketing Studies Journal*, *15*(1 SI), 59–70.

Lee, Y., Nam, J.-H., Park, D., & Lee, K. A. (2006). What factors influence customer-oriented prosocial behavior of customer-contact employees ? *Journal of Services Marketing*, *4*, 251–264.

Lengnick-Hall, C. (1992). Innovation and Competitive Advantage : What We Know and What We Need to Learn. *Journal of Management*, *18*(2), 399–429.

Leonard-Barton, D. (1992). Core Capabilities and Core Rigidities - a Paradox in Managing New Product Development. *Strategic Management Journal*, *13*, 111–125.

Li, X., Goldsby, T. J., & Holsapple, C. W. (2009). Supply chain agility: scale development. *The International Journal of Logistics Management*, *20*(3), 408–424.

Liao, C., & Chechen, S. (2006). Exploring the Role of Knowledge Management for Enhancing Firm ' s Innovation and Performance. *Proceedings of the 39th Hawaii International Conference on System Sciences*, *00*(C), 1–10.

Liew, S. C. (2013). What's Shaping the Market Growth? *IDC Analyze the Future*, 20.

Lim, S. K., Mavondo, F. T., & Mssanzi. (2000). The structure of strategic capabilities, implications for organisational agility and superior performance: a conceptual framework. *Department of Marketing, Monash University*, p. 6.

Lowry, P. B., & Gaskin, J. (2014). Partial least squares (PLS) structural equation modeling (SEM) for building and testing behavioral causal theory: When to choose it and how to use it. *IEEE Transactions on Professional Communication*, *57*(2), 123–146.

Lu, C., Holland, M. J., Gong, S., Peng, B., Bailey, R. L., Mabey, D. W., … Zhong, G. (2012). Genome-wide identification of Chlamydia trachomatis antigens associated with trachomatous trichiasis. *Investigative Ophthalmology and Visual Science*, *53*(6), 2551–2559.

Lu, Y., & Ramamurthy, K. R. (2011). Understanding the Link Between Information Technology Capability and Organizational Agility: An Empirical Examination. *MIS Quarterly*, *35*(4), 931–954.

Lucas, H. C., & Goh, J. M. (2009). Disruptive technology: How Kodak missed the digital photography revolution. *Journal of Strategic Information Systems*, *18*(1), 46–55.

Ma, G. Y., Vonderembse, M., & Modi, S. (2013). *Developing a Focal Firm's Sustainable Supply Chain Framework : Drivers, Orientation, Practices and Performance Outcomes.* University of Toledo.

Mackenzie, S. B., Podsakoff, P. M., & Podsakoff, N. P. (2011). Construct measurement and validation procedures in MIS and behavioral research: Integrating new and existing techniques. *MIS Quarterly*, *35*(2), 293–334.

Mantere, S., & Ketokivi, M. (2013). Reasoning in Organization Science. *Academy of Management Review*, *38*(1), 70–89.

Marsh, J., & Mayo, K. (2008). Cultivating Loyalty. *Multichannel Merchant*, (May), 54–56.

MCMC Commission. (2017). Industry Performance Report 2017. In *Industry Performance Report*.

Miles, J. A. (2012). *Management and Organization Theory*. San Francisco: Jossey-Bass.

Min, S., Roath, A. S., Daugherty, P. J., Genchev, S. E., Chen, H., Arndt, A. D., & Richey, R. G. (2005). Supply chain collaboration: what's happening? *The International Journal of Logistics Management*, *16*(2), 237–256.

Ministry of Energy, T. and M. (1995). *The National Telecommunication Policy (1994-2020) - Malaysia*.

Mohamad, S., Norulkamar, U., Ahmad, U., & Shu, L. (2012). Factors Contributing to Customer Loyalty Towards Telecommunication Service Provider. *Procedia - Social and Behavioral Sciences*, *40*(6), 282–286.

Möller, K., & Halinen, A. (2000). Relationship Marketing Theory: Its Roots and Direction. *Journal of Marketing Management*, *16*(1996), 29–54.

Morgan, R. M., & Hunt, S. (1994). The Commitment-Trust Theory of Relationship Marketing. *Journal of Marketing*, *58*, 20–38.

Mostert, P. G., Petzer, D. J., & Weideman, A. (2016). The interrelationships between customer satisfaction, brand loyalty and relationship intentions of Generation Y consumers towards smart phone brands. *J.Bus.Manage*, *47*(3), 25–35.

Na, K.-S., Simpson, J. T., Li, X., Singh, T., & Kim, K.-Y. (2007). Software development risk and project performance measurement: Evidence in Korea. *Journal of Systems and Software*, *80*(4), 596–605.

Nakagawa, S., & Cuthill, I. C. (2007). *Effect size , confidence interval and statistical significance : a practical guide for biologists*. *82*, 591–605.

Narasimhan, R., & Das, A. (1999). Manufacturing Agility and Supply Chain Management Practices. *Production and Inventory Management Journal*, *40*(1), 4–10.

Narver, J., Slater, S., & Maclachlan, D. (2004). Responsive and Proactive Market Orientation and New Product Success. *Journal of Product Innovation Management*, *21*, 334–347.

Nayyar, P., & Bantel, K. (1994). Competititive Agility : A Source of Competitive Advantage Based on Speed and Variety. *Advances in Strategic Management*, *10A*, 193–222.

Nickerson, R. S. (2000). Null hypothesis significance testing: a review of an old and continuing controversy. *Psychological Methods*, *5*(2), 241–301.

Obal, M. (2017). What drives post-adoption usage? Investigating the negative and positive antecedents of disruptive technology continuous adoption intentions. *Industrial Marketing Management*, *63*, 42–52.

Oliver, C. (1997). Sustained Competitive Advantage : Combining Institutional and Resource-Based Views. *Strategic Management Journal*, *18*(9), 697–713.

Oliver, R. L. (1999). Whence consumer loyalty? *The Journal of Marketing*, *63*, 33–44.

Oral, M. (2009). Green Supply Chain Management Research : Ontological and Epistemological Issues. *Interuniversity Research Centre on Enterprise Networks, Logistics and Transportation Sabanci University Instanbul Turkey*, 1–12.

Overby, E., Bharadwaj, A., & Sambamurthy, V. (2006). Enterprise agility and the enabling role of information technology. *European Journal of Information Systems*, *15*(May 2005), 120–131.

Owen, C. (2006). Design Thinking: Notes on Its Nature and Use. *Design Research Quarterly*, *1*(2), 16–27.

Palmer, R., & Lindgreen, A. (2005). Relationship marketing : schools of thought and future research directions. *Marketing Intelligence & Planning*, *23*(3), 313–330.

Payne, A., & Frow, P. (2013). A Strategic Framework Customer Relationship Management. *Journal of Marketing*, *69*(4), 167–176.

Peng, J., Quan, J., & Zhang, S. (2013). Electronic Commerce Research and Applications Mobile phone customer retention strategies and Chinese e-commerce q. *Electronic Commerce Research and Applications*, *12*(5), 321–327.

Peteraf, M. A., & Barney, J. B. (2003). Unraveling the resource-based tangle. *Managerial and Decision Economics*, *24*(4), 309–323.

Petrick, I. J., & Echols, A. E. (2004). Technology roadmapping in review : A tool for making sustainable new product development decisions. *Technological Forecasting & Social Change*, *71*, 81–100.

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *The Journal of Applied Psychology*, *88*(5), 879–903.

Porter, M. E. (1985). Competitive Advantage. *Competitive Advantage: Creating and Sustaining Superior Performance*, Vol. 15, pp. 1–30.

Preacher, K. J., Rucker, D. D., & Hayes, A. F. (2007). Addressing Moderated Mediation Hypotheses: Theory, Methods, and Prescriptions. *Multivariate Behavioral Research*, *42*(1), 185–227.

Ranaweera, C., & Prabhu, J. (2003). The influence of satisfaction, trust and switching barriers on customer retention in a continuous purchasing setting. *International Journal of Service Industry Management*, *14*(4), 374–395.

Raschke, R. L. (2010). Process-based view of agility: The value contribution of IT and the effects on process outcomes. *International Journal of Accounting Information Systems*, *11*(4), 297–313.

Roberts, N., & Grover, V. (2012). Leveraging Information Technology Infrastructure to Facilitate a Firm's Customer Agility and Competitive Activity: An Empirical Investigation. *Journal of Management Information Systems*, *28*, 231–269.

Rogers, E M, Medina, U. E., Rivera, M. A., & Wiley, C. J. (2005). Complex adaptive systems and the diffusion of innovations. *The Innovation Journal: The Public Sector Innovation Journal*, *10*(3), 579–584.

Rogers, Everett M. (1995). Diffusion of innovations. *Macmillian Publishing Co.*, 1–236. https://doi.org/citeulike-article-id:126680

Ross, J. W., & Mocker, M. (2017). The Problem with Product Proliferation. *Harvard Business Review*, (May-June), 104–110.

Saghafi, M., Gupta, A., & Sheth, J. (1990). R&D Marketing Interface in the Telecommunication Industry. *Industrial Marketing Management*, *19*, 87–93.

Saunders, M., Lewis, P., & Thornhill, A. (2012). *Research Method for Business Students* (6th ed.). Essex, England: Pearson Education Limited.

Schoonhoven, C. B., Wiggins, R. R., & Ruefli, T. W. (2002). Sustained Competitive Advantage : Temporal Dynamics and the Incidence and Persistence of Superior Economic Performance. *Organization Science*, *13*(1), 81–105.

Schulz, J., Steinhoff, F., & Jepsen, K. (2017). Strike While the Iron Is Hot: User Centricity Adapted to the Agile Innovation Development Process. In *Strategy and Communication for Innovations*.

Seo, D., Ranganathan, C., & Babad, Y. (2008). Two-level model of customer retention in the US mobile telecommunications service market. *Telecommunication Policy*, *32*, 182–196.

Shapiro, C., Varian, H. R., Management, C., Berkeley, R., & Vol, W. (1999). The art of standard wars. *California Management Review*, *41*(2), 8–25.

Sharifi, H., & Zhang, Z. (1999). Methodology for achieving agility in manufacturing organisations: an introduction. *International Journal of Production Economics*, *62*(1), 7–22.

Sheth, J. N., & Parvatlyar, A. (1995). Relationship Marketing in Consumer Markets: Antecedents and Consequences. *Journal of the Academy of Marketing Science*, *23*(4), 255–271.

Sigalas, C., Pekka Economou, V., & B. Georgopoulos, N. (2013). Developing a measure of competitive advantage. *Journal of Strategy and Management*, *6*(4), 320–342.

Sisodiya, S. R., Johnson, J. L., & Grégoire, Y. (2013). Inbound open innovation for enhanced performance: Enablers and opportunities. *Industrial Marketing Management*, *42*(5), 836–849.

Smith, A., Schaarschmidt, M., & Kilian, T. (2014). Impediments to customer integration into the innovation process : A case study in the telecommunications industry. *European Management Journal*, *32*(2), 350–361.

Sobh, R., & Perry, C. (2006). Research design and data analysis in realism research. *European Journal of Marketing*, *40*(11/12), 1194–1209.

Steel, D. (2011). Causality, causal models, and social mechanisms. In I. C. Jarvie & J. Zamora-Bonilla (Eds.), *The SAGE Handbook of the Philosophy of Social Sciences* (p. Chapter 13 288-304). Sage Publication Inc.

Stern, M. J., Bilgen, I., & Dillman, D. a. (2014). The State of Survey Methodology: Challenges, Dilemmas, and New Frontiers in the Era of the Tailored Design. *Field Methods*, *26*(3), 284–301.

Stock, R. M., & Zacharias, N. A. (2013). Two sides of the same coin: How do different dimensions of product program innovativeness affect customer Loyalty? *Journal of Product Innovation Management*, *30*(3), 516–532.

Stratopoulos, T. C. (2017). Duration of Competitive Advantage due to Emerging Technology Adoption. *Journal of Emerging Technologies in Accounting*, *14*(1), 27–35.

Sun, S. L., Chen, H., & Pleggenkuhle-miles, E. G. (2010). Moving upward in global value chains : the innovations of mobile phone developers in China. *Chinese Management Studies*, *4*(4), 305–321.

Szwejczewski, M., Goffin, K., & Anagnostopoulos, Z. (2015). Product service systems, after-sales service and new product development. *International Journal of Production Research*, *53*(17), 5334–5353.

Tachizawa, E. M., & Gimenez, C. (2010). Supply flexibility strategies in Spanish firms: Results from a survey. *International Journal of Production Economics*, *124*(1), 214–224.

Talak, M., & Albert, M. (2013). Customer Retention Strategies by mobile phone Service providers in Zimbabwe : Case of Masvingo City. *IOSR Journal of Business and Management*, *9*(4), 71–82.

Tallon, P. P., & Pinsonneault, A. (2011). Competing Perspectives on the Link Between Strategic Information Technology Alignment and Organizational Agility: Insight from a Mediation Model. *MIS Quarterly*, *35*(2), 463–486.

Tavakol, M., & Zeinaloo, A. (2004). Medical research paradigms: positivistic inquiry paradigm versus naturalistic inquiry paradigm. *Journal of Medical Education*, *5*(2), 75–80.

Teo, T. (Ed. . (2014). *Handbook of Quantitative Methods for Educational Research* (T. (Ed. . Teo, Ed.). Rotterdam Sense Publishers.

Thomas, D. R. (2006). *A General Inductive Approach for Analyzing Qualitative Evaluation Data*. *27*(2), 237–246.

Tse, D., Lee, K.-H., Vertinsky, I., & Wehrung, D. (1988). Does Culture Matter? A Cross Cultural Study of Executives' Choice, Decisiveness, and Risk Ajustment in International Marketing. *Journal of Marketing*, *52*(Oct.), 81–95.

Tseng, Y. H., & Lin, C. T. (2011). Enhancing enterprise agility by deploying agile drivers, capabilities and providers. *Information Sciences*, *181*(17), 3693–3708.

Tunbosun, L. A. (2012). Exploring Marketing Strategy as a Catalyst for Performance in Nigerian Telecommunication Industry. *International Journal of Management & Business Studies*, *2*(4), 65–75.

Tung, J. (2012). A Study of Product Innovation on Firm Performance. *The International Journal of Organizational Innovation*, *4*(3), 84–98.

Umashankar, N., Srinivasan, R., & Hindman, D. (2011). Developing customer service innovations for service employees: The effects of NSD characteristics on internal innovation magnitude. *Journal of Service Research*, *14*(2), 164–179.

Vinodh, S., Sundararaj, G., Devadasan, S. R., Rajanayagam, D., & Murugesh, R. (2008). Infusing agility, innovation and quality in products: an integrated effort through the agile ITQFD technique. *International Journal of Services and Operations Management*, *4*(2), 243.

Wan, F., Williamson, P. J., & Yin, E. (2015). Antecedents and implications of disruptive innovation: Evidence from China. In *Technovation* (Vol. 39–40).

Whitten, D., & Wakefield, R. L. (2006). Measuring switching costs in IT outsourcing services. *Journal of Strategic Information Systems*, *15*(3), 219–248.

Wieder, C., Blanco, E., Dain, M. Le, Trebucq, B., Le Dain, M.-A., & Trebucq, B. (2007). How to evaluate the NPD process Agility in an intensive innovation context? *International Conference of Engineerinf Design*, (August), 28–31.

William, F. A. (1987). Meaning in Method : The Rhetoric of Quantitative and Qualitative Research. *Education Researcher*, *16*(7), 16–21.

Wittink, D. R. (2004). New Ideas on Loyalty. *Marketing Management*, (June), 46–49.

Wright, R. T., Campbell, D. E., Thatcher, J. B., & Roberts, N. (2012). Operationalizing Multidimensional Constructs in Structural Equation Modeling : Recommendations for IS Research Operationalizing Multidimensional Constructs in Structural Equation Modeling : Recommendations for IS Research I . INTRODUCTION Gefen et al ., 2. *Comunications of the Association for Information System*, *30*(June 2012 (article 23)), 367–412.

Zaheer, A., & Zaheer, S. (1997). Catching in the wave: Alertness, market influence in global electronic networks. *Management Science*, *43*(11), 1493–1509.

Zeithami, V., Berry, L., & Parasuraman, A. (1996). The Behavioral Consequences of Service Quality. *Journal of Marketing*, *60*, 31–46.

Zhang, Q., Vonderembse, M. A., & Lim, J. S. (2002). Value chain flexibility: A dichotomy of competence and capability. *International Journal of Production Research*, *40*(3), 561–583.

Zhang, Z. D., & Sharifi, H. (2007). Towards theory building in agile manufacturing strategy - A taxonomical approach. *IEEE Transactions on Engineering Management*, *54*(2), 351–370.

Zhao, X., Lynch, J. G., & Chen, Q. (2010). Reconsidering Baron and Kenny: Myths and Truths about Mediation Analysis. *Journal of Consumer Research*, *37*(2), 197–206.