

Factors Influencing Sustained Competitive Advantage with the Impact of Disruptive Technology as a Moderator among Telecommunication Firms in Malaysia

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Abstract:- 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. 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 the moderator significantly affected the focal construct, leading towards achieving customer retention. The results also indicated that disruptive technology is a strong influence on customer retention. Consequently, the vigilance of TSPs towards new technologies is vital to move technological breakthroughs from incubators to mainstream; and to sustain customer for long term. The results of this study provide better understanding of the factors that are relevant to customer retention.

I. INTRODUCTION

As economies become more worldwide unified and new forms of technology and competition arise, companies' capacity to maintain market leadership becomes more difficult, particularly in the context of competitive advantage. Competitive advantages are commonly assessed from two angles, performances and determinants (Sigalas et al.2013). A company has a competitive advantage when it can generate more economic value in its product market than its marginal rival. Economic value is the distinction between the purchaser's perceived advantage and the

company's costs (Peteraf & Barney 2003). While the benefits produced spur companies to market management roles, companies are keen to maintain their leadership position by emphasizing economic value creation by competing with the industry's marginal competitor by suppressing competitors' capacity to take the lead (Barney & Clark 2007). The use of resources to generate differentiation generates sustained benefits (Cesar et al. 2017) and the use of technology, innovation and the proactive strategy to react to evolving environments have become important differentiating variables in the aftermath of quickly growing systems. (Stratopoulos 2017).

The economic value obtained from the benefits is obtained from the clients of the companies that show strong allegiance because other competing firms do not duplicate the value provided by the benefits (Barney 1991).

Customers are the most valuable asset that must be nurtured and developed in the course of doing business (Bolton et al., 2004). 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).

It is extremely important for telecommunications service providers (TSPs) to create sustained competitive advantage, as companies are engaged in delivering both fixed line and mobile cellular services to customers. For all countries, TSP is considered a critical and strategic sector held in tight control, monitoring, licensing and competition management by these governments, as these services are 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/cable, telephone exchanges, international nodes, data warehouses and base stations. The expenditure differs from nation to nation, depending on the country's land size and

population. The TSPs have unintentionally developed monopolistic oligopoly in perspective of the elevated original investment costs (Gerpott et al. 2001).

As an oligopoly where there are only small differences in the type of goods and services provided by all TSPs, firms need to move to the boundaries of the next digital economy economic growth spectrum. TSPs as the infrastructure provider and digital economy building blocks are in the top position. Companies now need to focus on their core competencies and develop comprehensive overarching strategies that would catapult firms to the digital economy's sustained competitive advantages.

The current exponential pace of technological development and disruptive trends reshapes the telecommunications services structure towards vertical integration. Digital services are constructed across vertical, enabling and information platform industries, backed by robust and safe communications infrastructure. The incorporation of telecommunications services into the computer resulted in fresh technology-centric products and services powered by IT (Chong et al., 2009). Unfortunately, TSPs are slow to react with distinctive product offerings resulting in companies providing low-level product differentiation goods and services making customer loyalty and retention more difficult.

TSPs' strategies are vital in ensuring adequate scarce resources are allocated to specific areas to ensure market readiness and agility (Kock & Gemunden 2016), a process that is troubled by the high capital outlay required for the construction of telecommunications infrastructure. C. Oliver, (1997) suggested determination of sustainable benefits cannot be focused solely on firm resource attributes but also on how resources are developed, managed and disseminated. Technology and innovations can be used to overcome the contest, but the right combination does not contain success formulas (Adams et al. 2006) (Kock & Gemunden 2016).

The quickly evolving company climate driven by technology and innovation enables companies to develop market-driven new products that are helpful for maintaining competitive benefits. A review of previous telecommunications research reveals knowledge of client preferences and alignment of organizations policies with client requirements and expectations remains critical to attaining firm objectives to retain customer and maintain the organization performances. Hence understanding how TSPs organize their strategies to derive sustained competitive advantages and generate customer retention with the adoption of the disruptive technology would be useful addition to the present body of knowledge. Hence this article attempted to answer the question "does disruptive technologies influence the sustained competitive advantage of a firm and its customer retention?"

II. LITERATURE REVIEW

A. Agility

Agility relates to the unifying notion of velocity of response and insight into the dynamics of the environment and the capacity to react to changes in a timely and suitable way in the face of uncertain and quickly evolving competitive forces on the market. This organisational positioning is described by the theory of dynamic capacity, which states that companies are continually searching for ways to integrate, construct and reconfigure external and internal capacity to remain ahead of the contest. Lim et al., (2000) defined agility as "the ability to thrive in an environment of continuous and often unanticipated change". (Gligor et al. 2013) summarized the classification of firm's agility on five dimensions: alertness, accessibility, decisiveness, swiftness and flexibility. Alertness measures the company's capacity to identify changes, possibilities and threats rapidly; Accessibility measures the company's capacity to access appropriate information; decisiveness measures the decision-making capacity; swiftness measures the capacity to rapidly enforce choices; and flexibility measures the capacity to change the tactics and activities to the extent necessary. Companies that are not agile may lose market share and competitive benefit. Overby, Bharadwaj, & Sambamurthy, (2006) assessed the agility of the company by its capacity to sense and respond quickly to environmental modifications. Sensing would also include both detecting and anticipating the competitive market environment that sees the company with velocity and surprise seizing the chance. Hrebiniak & Joyce, (1985) explained that organizational agility is essential for marketing and strategic management and stressed the need for companies to react actively to an accelerated, turbulent setting. They proposed that organisations operating under an oligopolistic financial setting might find adaptation impossible due to entry obstacles and resource limitations extremely dependent on the environmental allocation of assets and political vagaries. Management decisions are restricted because internal determinism is extremely strong, but organisation can depend on technological findings and innovations to influence competitive advantage and mitigate peremptory environmental requirements.

Nayyar & Bantel, (1994) introduced the concept of competitive agility, defined as a source of competitive advantage incorporating both competitive speed and variety, giving the example of how Honda defeated a stronger adversary Yamaha in the 'motorcycle war' of the 90s. But they also stressed the importance timing the response for they believed greater agility may not always be necessary and sometimes may be detrimental to achieving optimal utilization of strategic resources. Overall, being agile improves the competitive position of the firm. Competitive agility could also be considered as a unifying concept encompassing competitive speed, acuity and variety. Agility will enable the firms to identify and capitalize on emerging market opportunities. Agility differs from adaptability for agility involves the ability to respond to multiple contingencies simultaneously; it implies ability to respond quickly and occasionally to precipitate change;

and it implies clarity (acuity) in observing and interpreting environmental dynamics (Nayyar & Bantel 1994). Competitive agility is consistent with the resource-based view which incorporated the ability of an organization to respond to changes in the environment in a timely and appropriate manner in order to face the substantial, uncertain, and rapidly changing competitive forces in the marketplace (Narasimhan & Das 1999). Competitive agility would allow for systematic development of distinctive resource that can provide a sustainable competitive advantage (Nayyar & Bantel 1994)

Agility, or nimbleness, is well recognized as an important source of superior organizational performance. The ability to act quickly in response to environmental and competitive pressures puts a firm in a relatively better competitive position especially in high-velocity environments. Past studies have dealt with firm agility in a number of ways: Zhang, Vonderembse, & Lim, (2002) evaluated the flexibility of the value chain in terms of product, manufacturing, logistic and spanning flexibility to environmental uncertainty; Helo, (2004) suggested improving the data management to stay flexible and agile in response to market changes; Raschke, (2010) studied the agility of the firm by evaluating the agility of the business process responsiveness, re-configurability, employee adaptability, and process centrality. Agility in the TSP firms is essential because of rapid technological changes, low switching cost and highly versatile, value oriented customers. Although previous studies have adopted different construct to measure firm agility such as responsiveness and flexibility (Hanna, Bernardes, & Hanna, 2009), in light of the fact that the supply chain for TSP are both extensive and complex (Gupta et al. 2007), a supply chain based assessment of agility would be more appropriate. Therefore, this study seeks to adopt the multidisciplinary dimensions used by Gligor et al., (2013) of alertness, accessibility, decisiveness, swiftness and flexibility as these dimension would provide a comprehensive assessment of firm agility to achieve sustained competitiveness. The first three of these dimensions are cognitive type and the last two are physical type.

The theory of dynamic capabilities underpins the need for firms to reconfigure their routines and resources that are learned or created to address rapidly changing environments. These capabilities enable the firms to integrate, build, and reconfigure internal and external competencies to meet the changes and maintain product or service leadership against its competitors. The dynamism of the firm will allow for sustained competitive advantage derived from market oriented utilization of scarce resources and demand-led corporate strategies. Hence, the agility of the enterprise allows the firm to remain proactive supported by its dynamic capabilities (Overby et al. 2006). An agile enterprise organizes its resources in response to the environment, which in turn, creates market leaders in that market segment.

The agility of the firm which is explained by its sensing and responding capabilities uses its internal resources such as its IT capabilities to improve the information flow within its firm and across the supply chain and generate product leadership (Overby et al. 2006). In its 2015 telecommunication report, IBM identified successful telecom providers as those that have among other things, clear and distinctive roles, in a fragmented and horizontally integrated industry; and flexible and reconfigurable processes and infrastructure; and the ability to provide ubiquitous and cost-effective ultra-fast broadband access (IBM Institute for Business Value 2015). In today's competitive environment, markets are changing rapidly and the success of the firm is not permanent and firms can do well only with market orientation and firm agility (Lim et al, 2000). Roberts & Grover, (2012) on studying the relationship between firm customer agility and competitiveness discovered agility alignment affects the efficacy of the firm's competitive actions. Based on the importance of firm agility to achieve sustained competitive advantages, hypothesis H1 as postulated:-

H1: The agility of the firm is positively related to sustained competitive advantage

B. New Product Development

New product development (NPD) has become a necessary firm strategy in response to increased competition, rapid technological advancement, higher cost and shorter production cycle (Gupta et al. 2007). Generally, firms develop new products based on resources, capabilities and the potential return on investment from the new product (Petrick & Echols 2004), as firms exploit their resources in manners that would render competitive advantage by developing superior products that are difficult to imitate as prescribed by the resource based view (Kleinschmidt & Brentani 2007) for it is no longer adequate to have high quality, low cost and differentiated products with the dawn of advance technologies. In the high-technology market, the shorter product life cycles, increasingly hard-to-manufacture product designs, fragmented markets, and growing technological parity are changing the nature of competition (Gupta et al. 2007). NPD in the telecommunication service providers differs from many other industries because the new products generally cannot operate without integration to the existing systems, thus, the direct involvement of multiple parties. Each of these parties are also operating as multi-vendor, multi-customer and multi-technology company, increasing the complexity of NPD. TSPs also need to work with channel partners before reaching the end-customers, thus, there are immense complexity to the end-user requirement for the new products which usually covers the entire spectrum of interactions ranging from the channel partner, with whom the customer interfaces, through the original equipment manufacturer and back to the suppliers, indicating an extensive complex supply chain. The NPD process in the TSPs is a repository of NPDs which allows for mix and match configuration from the repository to the supply chain partners all along the value chain. The NPDs consist of a portfolio of technology offerings and services

to meet the wide range of customer requirements, driven to meet the customer satisfaction of the right functionality and technological for the product offerings (Gupta et al. 2007). Unfortunately, the personnel in companies that face turbulent business environment where NDP plays a central role have less favourable attitude to building collaborative work inter/intra organizational work environment (Saghafi et al. 1990) although such collaborative efforts are vital for NDP for volatile business environment (Lee 2011). The NDP process itself needs to be agile and Wieder, Blanco, Le Dain, & Trebucq, (2007) have recommended that the agility can be improved by mastering product architecture, uncertainty and build human capacity of knowledge and skills. As the telecommunication industry face-off the ever increasing competition, six key findings concluded from a previous study (Gupta et al. 2007) on the telecommunication company relevant for this study are summarized as follows:-

According to the resource based view (J. B. Barney & Clark, 2007), a firm achieves sustained competitive advantage when it is creating more economic value than the marginal firm in its industry and these other firms are unable to duplicate the benefits. Sustained competitive advantage focuses on competition both from those who are already operating in its industry and future potential competitors. Although the term “sustained” indicates a time frame, the length of the time frame may be relatively short before the element that permitted the advantage is replicated by others in the industry; hence, the need for continuous new product development (NPD).

Narver, Slater & MacLachlan (2004) showed that merely being responsive to customers will not deliver success from new product launched; instead, firms need to be proactive. Customers do not always know the next best thing for new products especially when technology and innovations are dispersed throughout the world. The lack of centrality to technology and innovation makes relying on customer preference to drive new product development less likely (Narver et al. 2004). The development of new products must be carried out in tandem with after-sales services to ensure maintenance of product performance (Szwejcowski et al. 2015). To develop new products that are competitively advantages Emden, Calantone, & Droge, (2006) showed selecting and collaborating with the right partners on aspect of technological, strategic and relational are critical. Petrick & Echols, (2004) recognized the decision making process for new products development as these activities utilizes scarce resources and capabilities with uncertain return on investment, nevertheless the authors recommended a heuristic approach to assessing the investments by concentrating on technological trajectories as such trajectories will provide the impetus to new growth area. In high-tech business environment such as the telecommunication industry, firms must invest in new products to keep pace with the changing environment by developing new capabilities to achieve superior performance (J. Trainor et al. 2013). In light of the fact that resources are heterogeneously distributed across firms, the investment in new products can add value to the firm by

making its product/service offerings rare and difficult to imitate, and thereby creating sustained competitive advantage during the product life-cycle, hypothesis H2 postulates:-

H2: New Product Development is positively related to sustained competitive advantages

C. Innovation

Innovation is the process involving the systematic, organized and continuous activities that ultimately commercializes ideas (Crosby & Masland 2009). To maintain sustained competitive advantage, firms bring innovative products that are difficult to imitate to the market by building and re-configuring their strategies towards innovations. This is particularly the case of high tech businesses where the pressure to innovate dominate the competitive culture. The ability to innovate remains critical whilst the approach adopted by firms towards innovation in evolving (Sisodiya et al. 2013) such as open innovation strategy which eases the diffusion of innovation across the supply chain. The openness allow the firms to stay connected to their environment, benefit from the potential pools of resources that reside in their networks and allow the firms to internally leverage on potential resources and opportunities. The smooth diffusion sees firms' access knowledge, technology, and information through relationships with other firms.

Increased demand for more agility and flexibility in innovation projects that incorporates both market and user demands supports successful outcomes (Schulz et al. 2017). Dynamic capabilities of the firms underscore their ability to integrate, build, and reconfigure internal and external competencies in response to rapidly changing environments and innovations of the firms. To achieve sustained competitive advantage, innovations need to be managed for value creation and contribute towards growth as companies respond to shifting technology and market conditions. Sisodiya et al., (2013) found positive relationship between firm performances and innovation as the latter enhances the firm's ability to engage effectively across firm boundaries. Tung (2012) found firms that allocate resources to product innovation gained leverage in terms of competitiveness and performance. Innovations are deem to be a source for competitive advantage as technological advancements are used to create difficult to imitate products especially in the telecommunication industry (Chang & Taylor, 2016). Where there is intense competitive environment coupled with technological and market dynamism, innovations in the firm will enable it to achieve market advantages (Kessler & Chakrabarti 1996). Both innovation speed and magnitude were found to contribute positively to firm performance (Gopalakrishnan 2000). Lengnick-Hall, (1992) identified four factors that underpin the relationship between innovation and competitive advantage being; a) capitalization of strategic configuration b) emphasize on high value factors c) capitalize on industry specific timing and d) nurture the firm's specific capabilities to exploit the innovation outcomes. Evaluating the innovation activities of the TSPs based on these factor would likely reveal that

these firms are striving to remain competitive in a technologically challenging environment where non-active participation in innovations will most likely deplete market share, leading to hypothesis H3 which posits:-

H3: Innovation is positively related to sustained competitive advantage

D. Sustained competitive advantage

While competitive benefits are commonly recognized, the word continuous competitive benefits remains a rather elusive accomplishment for many companies (Schoonhoven et al. 2002). J. Barney, (1991) believed the term sustained competitive advantages that “continues to exist after efforts to duplicate that advantage have ceased” this is due to the capacity of the company to generate superior value for its customers, which exceeds the price of establishing the company. The two primary issues to be answered when deciding on the competitive policy are: first, the business attractiveness for long-term profitability and determining factors, and second, the comparative competitiveness of the sector (Porter 1985). Competitive management is constantly questioned in a fast-moving technology-driven setting that can dissipate rapidly with the advent of new technologies. To overcome the leadership challenges, Stratopoulos, (2016) recommended three activities ; (1) apply an evolving technology resource-based view assessment to determine whether the length of the competitive advantage is worth exploring ; (2) create a priori testable benchmark length ; and (3) contrast adopters with non-adopters / latest adopters to determine the duration benefit. Based on economics development Schoonhoven et al., (2002) concluded superior financial performance is the consequence of cycles of innovation and business activity which generate and then erode any benefits. Over a period of 10 years, only a tiny proportion of companies have been able to keep coherent performance management, with a couple of over 50 years of superior performance. Schoonhoven et al., (2002) research showed the rarity of attaining continuous superior financial output, which means that such a position can only be accomplished through skilfully implemented and adjusted policies over lengthy periods of time. The writers thought that imitating or adopting market-displayed understanding would not serve as a route to sustained superior output. These strategies need to include aspects of innovation and new product development as well as being continually vulnerable to market modifications by keeping an agile organisation will produce suitable strategies to create sustainable, superior efficiency and create useful, rare and hard to imitate resources (Armstrong & Shimizu 2007). An agile organisation can deliver reliably and rapidly a range of innovative, low-cost, high-quality goods, generating the characteristics of imperfect imitability and replace ability that make it harder for rivals (Zhang et al. 2002). Customer defection has stronger impact on company profit than other factors associated with competitive advantage, such as scale, market share and unit cost (Zeithami, Berry and Parasuraman, 1996). In light of the fact that customer retention is related closely to sustained competitive advantage, Hypothesis H4 is posited: -

H4: Sustained Competitive Advantage is positively related to Customer Retention

E. Disruptive Technology

Disruptive technologies are external forces that are capable of influencing a firm’s competitive position and customer loyalty. These technologies are highly prevalent today, in this digital connected world, where economies are driven by telecommunications. C M Christensen, (1997) first examined the concept of disruptive innovation in his seminal book titled, “The Innovator's Dilemma”. According to Christensen, disruptive technologies are technologies that provide different sources of value compared to mainstream technologies; and, they are initially inferior to mainstream technologies along the dimensions of performance, which is most important to mainstream customers. In its early development stage, each product that is based on a certain disruptive technology can only serve niche segments that value its non-standard performance attributes. Subsequently, further development could improve the performance of the disruptive technology to a level that is sufficient to satisfy mainstream customers. This is often possible because the performance of the mainstream technology may have already out lived its usefulness, resulting in ‘performance overshoot’ with over-served customers.

Market disruption then occurs when, despite its inferior performance on focal attributes valued by existing customers, the new product displaces the mainstream product in the mainstream market. For C M Christensen, (1997) there are two preconditions for such a market disruption to occur: there is performance overshoot on the main stream attributes of the existing product; and there are asymmetric incentives between an existing healthy business model and the potentially disruptive business model. Christensen documented these processes in numerous contexts including hard disk drives, earth-moving equipment and motor controls (C. M. Christensen, 1997). Since then, there have been a number of studies on this concept of disruptive technology which had been used interchangeably with “disruptive innovations” (Wan, Williamson & Yin, 2015). A narrower definition for disruptive technology is yet to emerge (Kostoff, Boylan & Simons, 2004); the current definition includes both firm-based and industry wide product technology factors. Disruptive technologies tend to create major new growth in the industries they penetrate by making it possible to create new customer values by delivering smaller, lighter, cheaper, more convenient, more reliable, improved performance and simpler products and/services.

Since the definition for disruptive technology is yet to crystalize, separating this from the on-going technological growth that takes place within a firm would be useful; Clayton M Christensen, Johnson & Rigby (2002) called it sustaining technologies, where goods and services are produced to meet the demand of the existing customers in the existing markets. Clayton M Christensen et al., (2002) distinguished between disruptive and sustaining technologies, recognizing that the pace of technological

progress always outstrips the demands of customers in any given time but will likely address the customer need at a future point in time. Firms will likely earn improved profit margins when products are stretched to up-market target customers who are not satisfied with the existing products offerings.

Sustaining innovators may not always be the first to market but they almost always end up on top by having more resources. In contrast to sustaining innovations, disruptive innovations appeal to customers who are on the look-out for new product offerings, which often times are offered by alternative sellers than their current suppliers. Customers tend to stray because the present established firms lack the motivation to win because large firm usually target large markets; and small segments of customers desiring alternative product or services lack priority. But yet every major attractive market that exists today was at its inception small and poorly defined just as the major growth markets of tomorrow are small and poorly defined today. Hence, firms seeking new growth area should therefore seek disruptive opportunities because industry leaders will not be motivated to pursue them. Unfortunately, although disruptive technologies can bring about growth to revenue and market share, often times the existing planning processes are notoriously poor in identifying the mix of sometimes highly disparate technologies required that are to address the multiple performance objectives of a particular niche in the market.

For a number of reasons, especially the inability to look beyond short-term profitability, and the risk/return trade off of longer term projects, many a times, it has been suggested that current strategic planning and management processes promote sustaining technologies at the expense of disruptive technologies (Wan et al, (2015). This should not be the case; instead, market leaders should always devote marketing resources to disruptive technologies. History has shown the cost of ignoring disruptive technologies: Polaroid films and Olivetti typewriters. More over as postulated by the resource based view, investing in disrupting technology may provide opportunities to create new products and services which the competition will be unable to imitate and which will create new value streams

for the organization. Disruptive technologies may not be the mainstream technologies that are relied on by the TSP to create competitive advantages; nevertheless, ignoring these technologies may be fatal. Thus, the causal relation between Sustained Competitive Advantage and Customer Retention changes as a function of the moderating effect of Disruptive Technology. Accordingly, Hypothesis H5 is posited: -

H5: Disruptive Technology moderates the relationship between Sustained Competitive Advantage and Customer Retention.

F. Customer Retention

The continuous competitive advantage of exploiting the scarce resource to create hard-to-imitate products, particularly innovative products linked to technology, generates powerful adherence from certain market segments. Mostert, Petzer, & Weideman (2016) found that it was hard for smartphone marketers to retain market share in a market characterized by fierce competition and the ongoing introduction of fresh products. Consumers generally have sound technological understanding and are engaged in technology-related behaviours such as text, tweeting and web surfing. To maintain these customers, ensuring that continuous competitive advantage is attained is critical for TSPs, which in turn produces brand loyalty to significant long-term relationships and retention. Peng, Quan, & Zhang (2013) found the use an early warning scheme to define prospective clients with elevated flight danger and early client relationship construction intervention. In an effort to generate a continuous competitive advantage in the mobile phone industry through loyalty programs, Keropyan & Gil-lafuente, (2012) noticed the response from clients found varied based on their revenue brackets and rewards type. The high net worth customers responded favourably to the high-value reward programs. There was also a telephone system to provide a competitive advantage for retention of customers (Jeng & Bailey 2012) and companies can derive benefit by assembling component in the most optimal way. Customer defection has a greater effect on corporate profit than other competitive advantage variables such as scale, market share, unit cost (Zeithami et al. 1996).

III. THE THEORETICAL FRAMEWORK

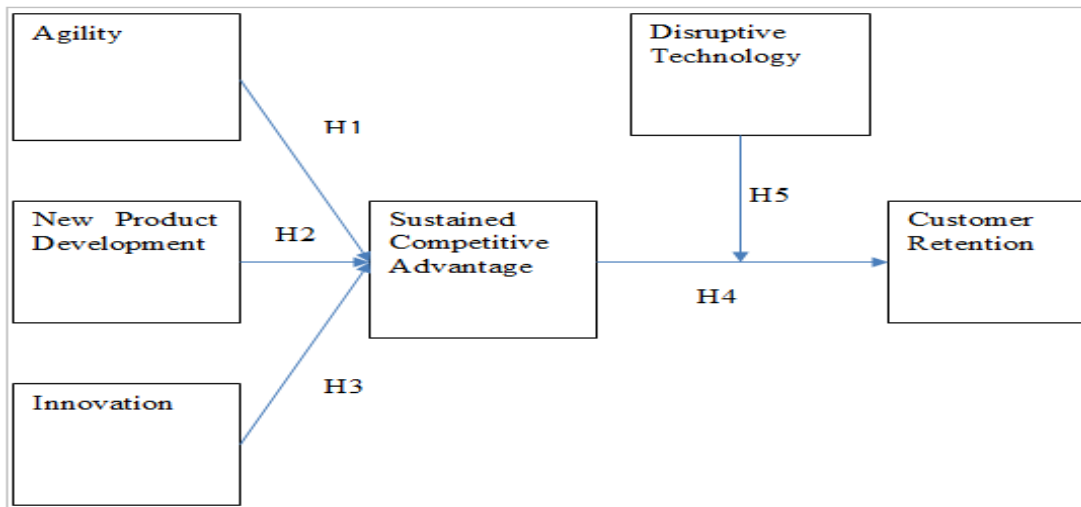


Fig 1

IV. MEASUREMENT

As this study embraced the quantitative methodology, measurements were taken from earlier tested scales for each of the constructs. The appendix lists a summary of the tool and the source of the scales.

V. DATA COLLECTION

Prior to large-scale study, a pilot was performed. A total of 137 usable questionnaires gathered among executives and management team from local TSPs. A total of 85 issues had to be answered by the participants, which

lasted 27 minutes on average. The information was coded and used SPSS and Smart PLS 3.0 to examine information.

A. Non-response Bias

A separate sample t-test was performed to compare early participants and late respondents to determine the non-response bias. As soon as the questionnaires were finished at an inner meeting between Telekom Malaysia company units at a single stage in time, a total of 57 answers were handled. Over a span of several months, the remainder of the answers were gathered. There is no important distinction between early and late respondents except for the Sustained Competitive Advantage structure.

Construct	Early Responses		Late Response		t-value	P value
	Mean	Std	Mean	Std		
Agility	0.5442	0.995	0.039	1.01	0.537	0.892
New Prod Dev	0.085	1.063	0.0617	0.965	0.084	0.529
Innovation	0.04	1.182	0.028	0.859	0.395	0.115
S Comp Adv	0.013	1.145	0.009	0.896	0.130	0.02
Cust Retention	0.031	1.017	0.022	0.99	0.303	0.654

Table 1

B. Common Method Bias

To rule out common factor bias, the Harman Single Factor analysis was performed. This is done by entering into a main component factor analysis all the main constructs. No single factor emerges from the factor analysis nor was there a general factor among the measures that accounted for most of the covariance. Only 34.74% of the variance is explained by a single factor. It can therefore be concluded that there is no common bias in the method.

C. First Order Construct –Reliability

Acceptance of the recommendation Wright et al., (2012), the first order measuring model was evaluated independently from the structural model of the second order. For the first order model, reliability, discriminating

and converging validity were determined. The entire structure of the first order was modelled as reflective. The exterior loading for each item determined the reliability of the indicator. A reading of 0.7 or higher is preferred although for exploratory research a reading of 0.5 or higher is also acceptable (Hair et al. 2014). If products with external loading reduced than 0.7 are removed, this deletion should lead to greater composite reliability. Composite reliability represents inner coherent reliability, with greater value indicating greater reliability levels. And this reading is proposed to be higher than 0.7 (Hair et al. 2014). Reliability of the composite is internal consistent reliability, with higher value indicating higher rates of reliability. And this reading is suggested to exceed 0.7 (Hair et al. 2014).

Items	Outer Loading	Cronbach Alpha	rho	Composite Reliability	Average Variance Extracted
AGAL1	0.752	0.714	0.745	0.839	0.636
AGAL2	0.874				
AGAL3	0.759				
AGAC1	0.914	0.739	0.763	0.883	0.791
AGAC2	0.864				
AGDC1	0.861	0.87	0.876	0.92	0.793
AGDC2	0.906				
AGDC3	0.904				
AGSW1	0.795	0.805	0.848	0.884	0.718
AGSW2	0.905				
AGSW3	0.838				
AGFX1	0.815	0.832	0.833	0.889	0.667
AGFX2	0.849				
AGFX3	0.757				
AGFX4	0.842				
NDED1	0.912	0.856	0.919	0.931	0.871
NDED2	0.954				
NDHSC1	0.898	0.896	0.907	0.935	0.827
NDHSC2	0.925				
NDHSC3	0.905				
NDDT1	0.798	0.775	0.816	0.866	0.683
NDDT2	0.822				
NDDT3	0.858				
NDS1	0.782	0.877	0.889	0.916	0.734
NDS2	0.797				
NDS3	0.925				
NDS4	0.913				
INSP1	0.84	0.834	0.844	0.888	0.666
INSP2	0.80				
INSP3	0.831				
INSP4	0.791				
INMT1	0.785	0.734	0.737	0.848	0.651
INMT2	0.834				
INMT3	0.800				
SCA1	0.813	0.916	0.92	0.932	0.631
SCA2	0.863				
SCA3	0.803				
SCA4	0.725				
SCA5	0.715				
SCA6	0.833				
SCA7	0.783				
SCA8	0.808				
DT1	0.710	0.842	0.858	0.881	0.516
DT2	0.639				
DT3	0.599				
DT4	0.221				
DT5	0.810				
DT6	0.812				
DT7	0.768				
DT8	0.657				
CRR1	0.082	0.818	0.845	0.87	0.534
CRR2	0.209				
CRR3	-0.149				
CRCS1	0.742				
CRCS2	0.825				
CRCS3	0.582				

CRT1	0.071				
CRT2	0.791				
CRT3	0.749				
CRSB1	-0.178				
CRSB2	0.577				
CRSB3	0.570				
CRSB4	0.318				

Table 2

To improve the reliability of the composite, the items with outer loading were removed less than 0.5.

D. Second Order – Reliability

2 nd Order Construct		Outer Loading	Cronbach Alpha	CR	AVE
Agile	Alert	0.819	0.871	0.907	0.662
	Access	0.676			
	Decisive	0.843			
	Swift	0.864			
	Flexible	0.851			
New Product Development	Engineering Design	0.822	0.838	0.925	0.861
	Human Computer Interaction	0.776			
	Design Thinking	0.846			
	Software Development	0.857			
Innovation	Speed	0.929	0.845	0.896	0.682
	Magnitude	0.926			

Table 3

Second order constructs were also developed as reflective constructs for Agility, New Product Development and Innovation, the three autonomous first order constructs. Instead of the repeated indicator strategy, the global scale was used to anchor the second order structure. The second order's reliability has been evaluated and the latent variable score has been used for further route assessment.

E. Hypothesis Testing

Bootstrapping was used to assess the significance of path coefficient. The numbers of subsample used were 500 tested as two-tailed with significance level of 0.05. All but for one rejected the null hypotheses and the confidence interval between the upper limit and lower limits were also found to saddle zero for one of the hypothesis.

Path	Path Coefficient	T value	P Value	Sig	95% CI
H1 Agility to Sust Comp Adv	0.188	2.17	0.03	Reject Null	[0.04,0.385]
H2 New Prod Dev to Sust Comp Adv	0.264	3.375	0.001	Reject Null	[0.113,0.421]
H3 Innovation to Sust Com Adv	0.456	4.904	0.00	Reject Null	[0.266,0.601]
H4 Sust Comp Adv to Cust Retention	0.160	1.833	0.067	Accept Null	[-0.005,0.322]

Table 4

F. Moderating Effect

The product indicator approach was used to test the moderation effect of Disruptive Technologies on the relationship between Sustained Competitive Advantage and

Customer Retention. The relationship between Sustained Competitive Advantage and Customer Retention was found to be moderated by the presence of Disruptive Technology.

	Beta	T-value	P-Value	95% LL	95% UL	Decision
Sust Comp Adv and Cust Retention	0.160	1.877	0.06	-0.008	0.330	Not Sig.
Disruptive Technology and Cust Retention	0.193	2.566	0.011	0.043	0.347	Sig.
Disruptive Technology (Interaction)	0.107	3.19	0.002	0.041	0.173	Sig.

Table 5:- Moderating Effect: of Disruptive Technology

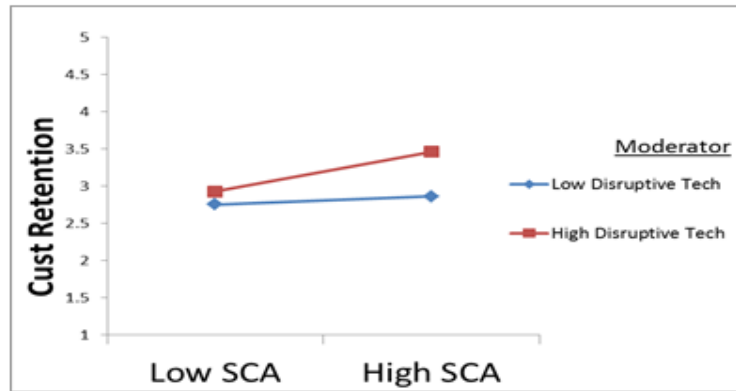


Fig 2:- Moderating Effect of Disruptive Technology

The moderation effect was computed, (Table 6). According to Cohen (1998) and Chin, Marcolin, & Newstead (2003), f^2 less than 0.15 is assessed to be a small effect; but he went on to say that even a small

interaction effect can be meaningful under extreme conditions, if the resulting beta changes are meaningful as is the case of this study ($f^2 = 0.039$).

	f^2	T-Value	P-Value	95% LL	95% UL
Moderator Disruptive Technology	0.0390	2.923	0.0040	0.042	0.192

Table 6:- Moderator Effect: Assessment f^2

G. Effect Size

The change of coefficient value when a specified exogenous construct is omitted from the model can be used

to evaluate whether the omitted construct has a substantive impact on the endogenous construct and this is measured by effect size, f^2 .

	f^2	T Statistics (O/STDEV)	P Values	2.50%	97.50%	Sig
Agility -> SCA	0.043	0.836	0.404	0.002	0.198	No
CustLoyalty -> CustRetention	0.176	2.500	0.013	0.071	0.344	Yes
Innovation -> SCA	0.313	1.775	0.077**	0.087	0.764	Yes
NPD -> SCA	0.085	1.485	0.138	0.015	0.229	No
Disruptive Technology -> CustRetention	0.045	1.083	0.279	0.002	0.161	No
Moderating Effect 1 -> CustRetention	0.039	1.510	0.132	0.003	0.099	No
SCA -> CustRetention	0.022	0.765	0.445	0.000	0.099	Yes

Table 7

H. Model Predictability

The internal model was calculated to determine the coefficient R2. R2 is the predictive precision metric of the model representing the combined impact of exogenous latent factors on the endogenous latent variable. R2

quantifies the percentage variation that can be accounted for by the exogenous variable in the endogenous variable. The Stone-Geisser's Q2 was also examined in relation to assessing R2 as a criterion for predictive precision, which given the predictive significance of the model.

	R^2	Effect	Q^2
SustCompAdv	0.643	Moderate	0.579
CustLoyalty	0.638	Moderate	0.607
CustRetention	0.568	Moderate	0.532

Table 8

I. Model Fit

The standardized square residual root mean (SRMR) is the standardized square root of the difference between the sample covariance matrix residual and the hypothesized

covariance model (Hooper, Coughlan & Mullen, 2008). SRMR range values from 0 to 1, reduced value, better fit with limit below 0.08 considered acceptable fit model (Hu & Bentler, 1999).

	Saturated Model	T Value	P value	2.5%	97.5%
SRMR	0.068	13.118	0.00	0.037	0.058
d_ULS	0.549	9.327	0.00	0.168	0.398
d_G1	0.484	6.917	0.00	0.233	0.503
d_G2	0.380	9.613	0.00	0.175	0.327
Chi-Square	284.410				
NFI	0.812				

Table 9

VI. CONCLUSIONS

The H1 research hypothesis, which postulated a positive relationship between agility and sustained competitive advantage, was supported and, as explained by the theory of dynamic capabilities, companies will attempt to integrate, build and reconfigure internal and external skills to address rapidly changing environments (Helfat et al. 2007). Agility is needed to obtain continuous competitive advantage from the use of scarce assets on the market and demand-led corporate policies. Similar findings have been made by Overby et al., (2006), where the writers discovered the company's agility to stay proactive, supported by the dynamic capabilities of the company. Markets are evolving quickly due to the competitive setting and the company's success is not permanent. Companies can therefore do better with market orientation and strong agility (Lim et al., 2000). Robert & Grover, (2002) too found the relationship between customer agility and competitiveness affected the efficiency of the firm's competitiveness. For telecommunications businesses, the rapidly evolving environment requires that their present inner resources be aligned with modifications in the market, which in turn provides firms the added benefit of being more competitive as each of them strives to become the first mover in the sector. Ultimately, market perception and level of trust among current clients improves leading to longer-lasting retention of product subscriptions and lower churn rate.

The research hypothesis H2 which postulated a positive relationship between new product development and sustained competitive advantage was supported. The resource based theory (J.B Barney & Clark, 2007) Suggested that a business achieves a competitive advantage when it creates more economic value than a marginal business in its sector and these other companies are unable to duplicate the advantages over a shorter period of time and ongoing investment in new product development will guarantee that the company's output continues to generate growth (Szwejcowski et al. 2015). In the high-tech company setting such as telecommunications companies, fresh capacities to attain superior performance while maintaining pace with the evolving environment are discovered to invest strongly in new products (J. Trainor et al. 2013).

The research hypothesis H3 which postulated a positive relationship between innovation and sustained competitive advantage was supported by the data. The significance of innovation is discussed by the theory of

dynamic capabilities, which highlighted the need for companies to integrate, construct and reconfigure inner and external skills to react to quickly altering environments and competitive landscapes. Sisodiya et al., (2013) Based on the capacity to participate efficiently across borders, a favorable connection between firm performance and open innovation was discovered and as shown by Tung, (2012) Where companies assigned substantial resources to product innovation in order to leverage competitiveness and long-term results. Chang & Taylor, (2016) Discovered inventions were a source of competitive advantage in that technological advances made it hard to imitate products, particularly in the telecommunications sector.

The major industry players are stepping up with innovation in the Malaysian telecommunications landscape both organically (inner R&D) and inorganically (mergers and acquisitions). The changes in client lifestyle have also compelled the TSP to invest in technology that offers fresh intelligent services (Internet of Things – IoT) such as intelligent home goods, which are combined with telephony and internet services to maintain their clients. For TSPs, the competition is no longer restricted to other TSPs, but involves disruptive technology suppliers that have expanded the market to innovate and deliver fresh products against current backbones for more solution integrators. In short, innovations allow the company to gain market benefits.

Disruptive technology moderated the relationship between sustained competitive advantage and customer retention. A moderator is said to be able to affect the size of the relationship or the direction of the relationship. In this study the relationship between sustained competitive advantage and customer retention is not positively related. Hence with the presence of disruptive technology as a moderator was able to affect the size between sustained competitive advantage and customer retention, the relationship was found to be significant. This shows that the presence of disruptive technology affects the dependent variable, i.e., customer retention. The extensive works of C. M. Christensen, (1997) (Clayton M Christensen et al., 2002) (Clayton M Christensen, Raynor, & McDonald, 2015) over the years have clearly put the spotlight on the importance of disruptive technology in the formulation of strategies on innovations. These technologies are no longer considered accidental technologies because of their capabilities to change market preferences in significant ways especially creating a new lifestyle among the existing and new customers of telecommunication service.

A. Implications for Practice and Policy

The findings from this study have suggested that managers need to consider the three drivers at their respective dimension levels to achieve sustained competitive advantage and the presence of disruptive technology to achieve customer retention. Knowing and understanding these dimensions helps executives to better organize and supervise continuing resource management, particularly when unforeseen changes occur in the sector. By using inner and external resources efficiently and keeping up with market modifications and demand, a company can better comprehend its client base in order to meet its requirements and needs. Today's clients are more educated and astute about their needs and are fast to exercise their privileges to guarantee that the products and service satisfy them. Building customer retention is a long term process which requires investment of time and resources. Currently, the approaches taken by the TSPs stay generic, such as price wars with companies countering easy prepaid proposals with low rates, providing small product innovations and insufficient change in the use of scarce resources to compete efficiently on the market (MCMC Commission, 2017), A general absence of innovative and

creative thoughts for responding to changes in the economy. In order to compete on the current and future market, companies must embrace a more proactive strategy that must include on the three drivers the policies of companies.

B. Limitations and Direction for Future Research

Further research is needed in order to expand the variety of industries in which such oil and gas and airline industries operate in the monopoly oligopoly, which would enable comparative study of the various products and services. Although this research has tried to provide an in-depth perspective of the aspects of continuous competitive advantage, there are other influencing factors such as public interference that may affect the firms ' strategies. In addition, owing to the diversity of today's company setting, future research should also consider other aspects such as organizational culture and long-term customer retention affecting acritical intelligence. Finally, continuous competitive advantage is evident to this industry's future and further research would benefit this critical sector significantly.

APPENDIX 1 SURVEY INSTRUMENT

	Relative to other telecommunication providers competitors, please indicate on a 1 to 7 scale (1 = strongly disagree; 7 = strongly agree) how well your provider performs or is positioned to perform the following activities.	
Agility – Alertness		
Q1	Our organization can promptly identify opportunities in its environment	(Gligor et al. 2013)
Q2	My organization can rapidly sense threats in its environment.	(Li et al. 2009)
Q3	My organization can quickly detect changes in its environment.	(Li et al. 2009)
Agility – Accessibility		
Q4	We always receive the information we demand from our suppliers.	(Gligor et al. 2013)
Q5	We always obtain the information we request from our customers.	(Li et al. 2009)
Agility – Decisiveness		
Q6	We can make definite decisions to address opportunities in our environment	(Gligor et al. 2013)
Q7	My organization can make firm decisions to respond to threats in its environment.	(Gligor et al. 2013)
Q8	My organization can make resolute decisions to deal with changes in its environment	(Gligor et al. 2013)
Agility – Swiftness		
Q9	My organization can swiftly deal with threats in our environment	(Gligor et al. 2013)
Q10	My organization can quickly respond to changes in the business environment.	(Gligor et al. 2013)
Q11	My organization can rapidly exploit opportunities in our environment	(Gligor et al. 2013)
Agility - Flexibility		
Q12	When needed, our organization can adjust our operations to the extent necessary to execute our decisions	(Gligor et al. 2013)
Q13	When needed, our organization can adjust the operations to be customer focus and extent necessary to execute our decision	(Gligor et al. 2013)
Q14	My organization can increase its short-term capacity as needed.	(Tachizawa & Gimenez 2010)
Q15	We organization adjust the specification of orders as requested by our customers.	(Tachizawa & Gimenez 2010)
Q16	Overall my organization is agile	Author
New Product Development – Engineering Design		
Q17	My organization’s prototype works	(Elverum et al. 2016)
Q18	My organization’s prototype meet the customer needs	(Elverum et al. 2016)
New Product Development – Human Computer Interaction		
Q19	In my organization human computer supports the creativity in new product development	(Beaudouin-lafon & Mackay 2000)

Q20	In your organization, human computer interaction requirement help the developer generate ideas for new product development	(Beaudouin-lafon & Mackay 2000)
Q21	In my organization human computer interaction facilitates the exploration of a design space/new ideas	(Beaudouin-lafon & Mackay 2000)
New Product Development – Design Thinking		
Q22	My organization can facilitate creation of ideas	(Elverum et al. 2016)
Q23	My organization is able to turn ideas to prototypes	(Elverum et al. 2016)
Q24	My organization can turn ideas to prototypes quickly	(Elverum et al. 2016)
New Product Development – Software Development		
Q25	The software ability of my organization can cater for prototypes without any changes	(Lu & Ramamurthy 2011)
Q26	The software ability of my organization is reliable	Author
Q27	The software ability of my organization will manage the project cost effectively	Author
Q28	The project ability of my organization will manage the project time effectively	Author
Q29	Overall, my organization is effective in developing new products and services	Author
Innovation – Speed		
Q30	In my organization, we have innovation quickness to adopt a product or process, relative to its competitors within the industry	(Gopalakrishnan 2000)
Q31	In my organization, we believe by increasing the pace of innovation reduces development costs	(Gopalakrishnan 2000)
Q32	In my organization, we believe by increasing the pace of innovation improves the quality of the product being developed	(Gopalakrishnan 2000)
Q33	In my organization, we believe by increasing innovation speed may be associated with increased market share	(Gopalakrishnan 2000)
Innovation – Magnitude		
Q34	My organization introduced number of effective innovation as compared to others in the same the industry.	(Gopalakrishnan 2000)
Q35	My organization usually agree that greater the number of innovations adopted, the more benefits to the organization.	(Gopalakrishnan 2000)
Q36	My organization believe that more innovation will lead them to increased earnings or substantially lower costs	(Gopalakrishnan 2000)
Q37	Overall, my organization is innovative	Author
Sustained Competitive Advantage		
Q38	Over the past 3 years, our organization has been able to exploit all market opportunities that have been presented to our industry.	(Sigalas et al. 2013)
Q39	Over the past 3 years, our organization fully exploited the market opportunities that have been presented to our industry.	(Sigalas et al. 2013)
Q40	Over the past 3 years, our organization has been able to neutralize all competitive threats from rival firms in our industry.	(Sigalas et al. 2013)
Q41	Over the past 3 years, our organization has fully neutralize all competitive threats from rival firms in our industry.	(Sigalas et al. 2013)
	Compared to other rival firms in your industry, how would you evaluate your firm's performance over the past 3 years in terms of:	(Delaney & Huselid 1996)
Q42	Marketing	
Q43	Growth in sales	
Q44	Profitability	
Q45	Market Share	
Disruptive Technology		
Q46	My organization spends a lot of time talking to new technology vendors before deciding on the right system.	(Obal 2017)
Q47	My organization exerts a lot effort in searching for the right technology vendor	(Obal 2017)
Q48	My organization intends to continue using new technologies.	(Obal 2017)
Q49	My organization would like to discontinue the use of new technology	(Obal 2017)
Q50	My organization's new technology suppliers treat us fairly	(Obal 2017)
Q51	My organization new technology suppliers treat are fair in their negotiations with my organization	(Obal 2017)
Q52	My organization's adoption of new technology is influenced by key competitors using similar technologies.	(Obal 2017)
Q53	My organization adopt new technologies because it will portray us as a high tech	(Obal 2017)

	organization	
Customer Retention		
Q54	My organization's customers are likely to terminate their relationship within the next 6 months	(Cronin et al. 2000)
Q55	My organization's customers are likely to terminate their relationship within the next 1 year	(Cronin et al. 2000)
Q56	My organization's customers are likely to terminate their relationship within the next 2 year	(Cronin et al. 2000)
Q57	Overall, our customers are happy with my organization	Author
Q58	My organization meets my customer expectation	(Cronin et al. 2000)
Q59	My customers think they did the right thing when they choose my organization	(Morgan & Hunt 1994)
Q60	In customer relationship, my organization cannot be trusted at times	(Morgan & Hunt 1994)
Q61	In customer relationship, my organization can be counted to do what is right	(Morgan & Hunt 1994)
Q62	In customer relationship, my organization has high integrity	(Morgan & Hunt 1994)
Q63	My organization customer experience has technical difficulties associated with changing service provider	(Bansal & Taylor 1999)
Q64	My organization customers find that changing service provider is costly	(Bansal & Taylor 1999)
Q65	My organization customer find that changing service provider requires a lot of effort	(Bansal & Taylor 1999)
Q66	My organization customers would change service provider if they could do so without hassle	(Bansal & Taylor 1999)

Table 10

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