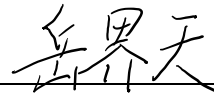Saint-Petersburg State University

Institute "Graduate School of Management"

Bachelor Thesis

"Defensive Marketing Strategy Design: Mitigate and Overturn

Disruptive Technologies"

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2022

Statement of substantive character
of the course paper

I, Yue Jietian, 4th year student of bachelor program in Graduate School of Management (group IM), confirm that the bachelor thesis on the topic of "Defensive Marketing Strategy Design: Mitigate and Overturn Disruptive Technologies", that is subjected to the public defense on the 18th of June 2022, does not contain elements of plagiarism.

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Defensive Marketing Strategy Design: Mitigate and Overturn Disruptive Technologies

Bachelor Thesis

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Abstract This paper intends to recount some of past studies on disruptive technologies and take defensive marketing side of the challenge into perspective. The focus is to provide a theoretical basis for building marketing strategies. Specifically, this study serves management theories in two folds, the first is to determine the impacts of disruptive technologies on market leader from marketing perspective, the second is to formulate marketing strategies around such conditions. Some of the most common and serious problems an incumbent could face are the low understanding of the disruptive technology, how to avoid the attack by shifting segments and how to defend the large customer base by positioning the product socially. Considering the depth needed to understand the consumers to solve this, this paper proposes to understand the customers from psychology perspective, therefore, devise a set of strategies based on psychology and can be used against disruptive technology. A plan is therefore formulated to include these strategies, including detecting, socializing, as well as reorganizing, shifting segment, restructuring for contingency.

Keywords: Defensive Marketing, Disruptive Technologies, Marketing Strategy, Case Study, Psychology in marketing

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Contents

1. Introduction

Over the past decades, we have seen many changes in how we get things done with new technologies, and many companies came to prosperity or decline. The magnitude of this problem expands into many fields of management, while in particular, marketing personnel work in the frontier by engaging customers and managing profitable customer relationships (Philip Kotler 2018), will take first initiatives in a company and respond to the changes. This paper explores the possibilities of building a successful marketing strategy even when our product is about to be obsolete.

Ideally, new product development process as both a part of marketing discipline and engineering discipline, should have more integrated approaches when trying to capture the future trends, while in practice, many companies have isolated marketing departments and R&D departments under specialization framework. Griffin and Hauser (1996)'s work on marketing-research and development(R&D) integration suggested multiple communication barriers between R&D personnel and marketing personnel, including perceptual barrier in personalities, education-based cultural thought-worlds differences, different technical terms based on product benefits or specifications, different task priorities and responsibilities, and physical barriers. Despite this awareness, it is also found that hybrid R&D organizations do not consistently yield innovation that is 'intermediate' between that of fully decentralized and fully centralized organizations (Nicholas S. Argyres 2004), this brings further complication to designing organizational structure with innovative intentions.

This problem persists in other fields of management, at the meantime, marketing personnel are always the "first response team" to detect the consumers' behavioral changes, and the frontline of protecting the company's profitability. Therefore, in this paper, we suggest that marketing department, as a functional, independent team, should take early initiative to respond in the following two areas: the first is to protect the sales of current products as much as possible, this could buy us some valuable time for our R&D department in order to make a proper response to the disruptive technologies; the second is to anticipate our opponents' moves, therefore, plan ahead our matching responses with marketing tools.

In order to do so, this paper start with a cross-case analysis based on the past understandings of defensive marketing strategy and disruptive technology, 5 cases of disruptive technology are selected to provide an analysis on the challenges presented, then we will discuss the actions of dealing with disruptive technology in different stages. Different from the previous approaches to this problem, this paper will be heavily based on psychology studies for following reasons: (1) Better understanding of consumers' motivation in choosing the products (2) Better efficiency in targeting and communicating with customers. (3) Better understanding of campaign goals. (4) Different angles to address marketing challenges.

In the early stage, to detect the changes in consumer behavior therefore to understand the potential disruption as early as possible, this alone might stop the disruption if the management realizes such potential and implement this technology early on; there are still actions can be taken even the disruption is perceivable, including early reinforcement by socializing the product, avoiding the attack by shifting the product segment, still, in the new segment the marketing resources needs to be restructured to operate at better efficiency, or go through radical restructuring if everything has failed.

The structure of this paper as following: throughout the paper, we begin with a brief review of the past research on disruptive technologies and defensive marketing, and then we discuss how psychology might help in such scenario. In section 3, we will discuss the methodology that will be used in the paper, then in the section 4 and 5, we will discuss the analysis and strategies in detail.

2. Literature overview

Disruptive Technologies. One of the most consistent patterns in business is the failure of leading companies to stay at the top when facing technology changes (Joseph L. Bower 1995). Established by Christensen Clayton, disruptive technologies theory has been quickly popularized after its debut.
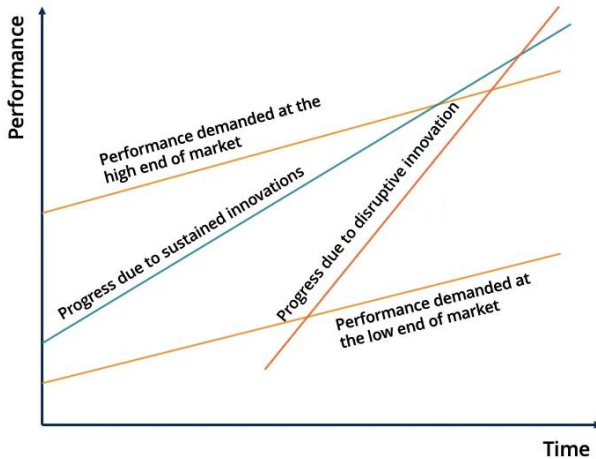
Figure 1 Disruptive technology (Source: Corporate Finance Institute[CFI])

Generally, disruptive technologies underperform established products in mainstream markets, eventually they displace the established products (Clayton 1997) . Disruptive technologies do not initially meet the minimum criterion along the performance parameter most valued by mainstream customers, hence incumbents in the mainstream market consider them inappropriate for meeting their customers' needs. (Figure 1)

The market leading companies have systems to eliminate ideas that customers do not ask for, pose difficulties for these companies to invest resources in disruptive technologies (Henry C. Lucas Jr. 2009). As research and development (R&D) investments are made and the technology matures, the disruptive technology's performance increases to the point where it can also meet the needs of the mainstream market. Incumbent enterprises who have concentrated their R&D efforts on improving existing technologies are having a difficult time catching up to the disruptive technology-based entrants.

The view based on competence believes that disruptive technology poses as a competence-destroying force

(Tushman 1986) , while Danneels (2004) defined the disruptive technology as "changing the performance metrics along which firms compete". MacMillan and McGrath (200) believe that the benefits the customers sought determines the attributes of the product to the customers, this may be valued differently among different groups of customers (segments), and the technology embedded in the products formulate the attributes, the new products based on disruptive technology have different dimensions of the attributes to make it difficult for the mainstream consumers to accept.

Christensen and Overdorf (2000) also built a framework for dealing with the disruptive changes focusing on the resources, processes and values. The people, the equipment, the technology, the funds, the product designs, and the connections are all examples of resources. Processes are the routines and operational patterns of the company, and values are the standards that employees use to determine priorities when making decisions. Together, these two concepts make up the firm. Processes are designed by managers to ensure that employees always carry out their responsibilities in the same manner. These procedures are not intended to be altered. When it comes to dealing with a disruptive technology, the processes that take place in the background are the ones that are the most important. These processes include how an organization conducts market research and translates that research into financial projections, as well as how an organization negotiates plans and budgets. Every day, employees put their principles into action when they make decisions about which orders are more necessary, which clients are given priority, and whether or not an idea for a new product is appealing. Henry and Lucas (2008)'s extension on Christensen's theory suggests that when a company is

confronted by a technology disruption, it faces a fight between its employees who want to use dynamic capabilities to bring about change and its employees whose core capabilities have become core rigidities.

Some scholars criticized that innovation studies lack of common criteria (Chesbrough 2001), this made identifying and classifying innovation studies disorganized.

Defensive Marketing. Usually, defensive marketing strategies are used by market leaders to retain their valuable customers. Marketing efforts that are centered on the acquisition of a competitor's clients are referred as offensive marketing, and the marketing efforts that are centered on the maintenance of a company's existing clients or the promotion of brand loyalty are referred as defensive market strategies. (Martín-Herrán 2012) Even if a significant percentage of the advertising element is aimed at existing clients, the vast majority of such expenses are for the offense. However, a strong defense is absolutely necessary in a climate of limited economic expansion and intense market competition. When expansion of a company is achieved at the expense of other firms in the industry, that is, by capturing market share, the enterprises that do not have strong defenses are the first to incur losses. (C. Fornell 1992)

Incumbent firms often make an effort to discourage prospective competitors from entering their markets far before the new competitors even consider entering those markets. In general, incumbent firms try to prevent or slow the entry of new competition by employing entry deterrence strategies, or they decide to wait until new competition enters the market before taking action (Clark 1996). Similarly, incumbent firms defend their markets by retaliating when new competitors enter (Chen 1992).

Defensive marketing strategy can be categorized into pre-entry strategies and post-entry strategies (Yannopoulos

2011). (Figure 2) This classification indicates leading companies should prepare beforehand by utilizing advantageous resources such as threatening with financial power that can support moving to new field, strengthening the weak points; even the opponent has entered the market, we can still take actions by suppressing the challenger's development or engage the opponent in different grounds/angles. Roberts (2005) also considered the defensive marketing strategies should be situational based on strength and weakness, either engage

	Leverage your strengths	Mitigate your rival's strengths
Retain customers	**Positive strategies:** Hold on to customers by emphasizing the perceived advantages of your product, service, or company.	**Parity strategies:** Hold on to customers by matching, neutralizing, or blunting the perceived advantages of the new entrant's product, service, or company.
Slow the rate of customer loss	**Inertial strategies:** Acknowledge that some customers will leave despite your strengths, but offer product or service enhancements that will delay their defection. Emphasize that benefits lost in the switch may be major ones.	**Retarding strategies:** Acknowledge that some customers will leave because of the new entrant's perceived advantages, but offer product or service enhancements that will delay their defection. Emphasize that benefits gained in the switch may be only minor ones.

Figure 2 Defensive marketing strategies (Roberts 2005)

with the customers with advantageous areas (positive strategy) or neutralize the rival's advantages (parity strategies); or considering the eventual losses, either emphasize the benefits customer might lose because of switching (inertial strategies) or emphasize the gain might be insignificant (retarding strategies). (Figure 3)

Reducing the number of customers that leave and transfer brands is also an important component of defensive
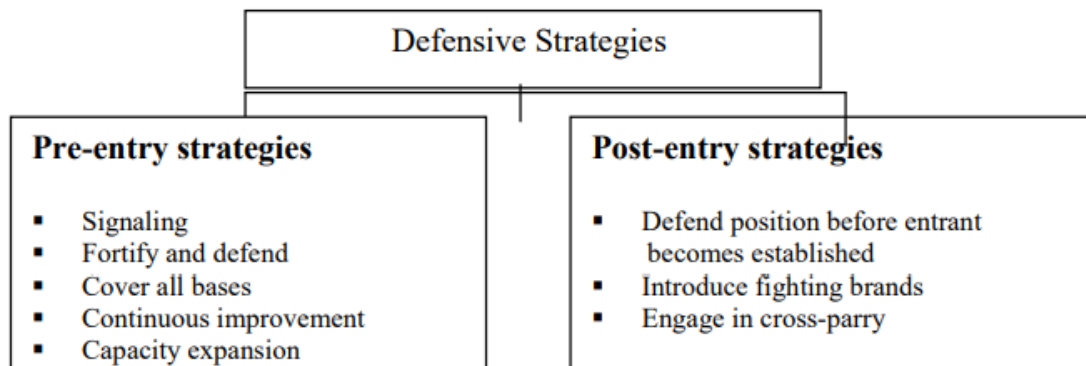

Figure 3 Pre-entry and post-entry strategy

strategy. (C. Fornell 1992) Given specific economic restrictions, the purpose of a defensive strategy is to minimize the loss of customers (maximize the retention of existing customers), and this is accomplished by shielding products and markets from incursions by competitors. Hauser and Shugan (1983) developed the well-known "defender model" which included a framework in using the marketing mix to optimize incumbent response to market entry of competition. They concluded that as a response to market entrants, incumbents lower advertising and distribution expenditures, decrease their price in general, but increase price in market segments with differentiated products to maximize profits. Follow up to this, Hauser and Shugan (2008)'s theorem on defensive marketing strategies concluded the following results: (1) the defender's profit will decrease, (2) if entry cannot be prevented, budgets for distribution and awareness advertising should be decreased, and (3) the defender should carefully compare

the competitor's angle of attack to his position and the distribution of consumer tastes.

Complaint management provides another angle in defending, the value of complaints, both as a means of communication and as a means of providing the company with the opportunity to transform an unhappy consumer into a happy and loyal customer (C. B. Fornell 1987). Some also suggested that it could be useful to cooperate with the competitors to deter further entries. (Heil 1993)

Psychology in marketing. Other scholars have imagined psychology and marketing cross-disciplinary studies as well. Behaviorism could be useful in analyzing consumer decisions that are 'unimportant, uninvolved, insignificant and minor' and 'do not need a grand theory of behavior. (Gaidis 1981) The investigation of lesser-known behavioral psychological approaches and their application to marketing and consumer behavior responds well to both calls for a more pluralistic and interdisciplinary culture in consumer research. (David Marsden 1998)

Allen and Janiszewski (1989) mentioned how classical conditioning could work successfully and correctly in advertising, conditioned stimulus – which is the brand, can be paired with musical jingle or visual cues and predict a trim-figured woman, the unconditioned response. fOperant conditioning has also been talked in marketing, early approaches are mostly focused on advertising, e.g., DiClemente (2003) studied the usage of "conjugately

programmed analysis of advertising" to analyze advertising effectiveness should be highlighted.

Applied behavior analysis has a long heritage of applying behavioral principles to a variety of problems, and the behavior analyses movement brought operant conditioning applications into the consumer area. (DiClemente 2003) Behavior perspective model (BPM) also provides views on the topic, according to the model, both discriminative inputs in the behavior setting and degrees of informational and utilitarian reinforcement explain the pace of behavior emission/responding. (Foxall 1992)

Three areas of psychology are mostly associated with marketing, the mostly used classical conditioning in marketing is part of learning research; while we are trying to make a memorable product that our customers can actively demonstrate positive behaviors, it is crucial to examine how memory works, especially considering in a long term defensive situation; and we also need to carefully monitor how our customers' emotions towards our product or brand, this is particularly true since internet largely accelerated how people respond to changes. (Figure 4) Therefore, this research will address marketing challenges with related theories of these three basic elements in mind.
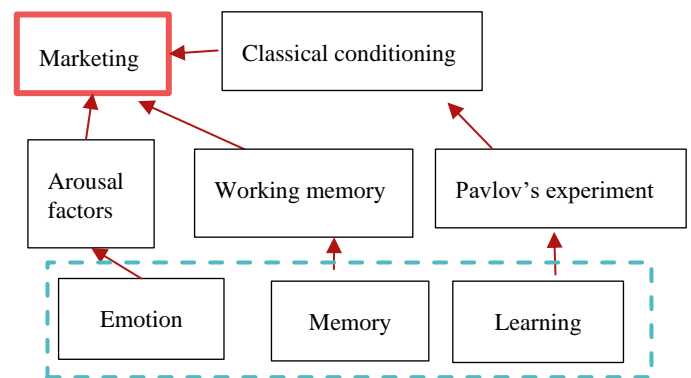
Figure 4 Marketing and psychology

3. Methodology

The cross-case analysis was chosen as the research approach in order to have a better understanding of the disruptive technology in a variety of scenarios. Knowledge gained from individual case studies may be mobilized through the use of this research method. In this stage of the research project, the data for the case studies were derived from academic and public publications of the relevant incidents. The first part of the analysis will

examine the focal points of the analysis through past understandings of disruptive technology and defensive marketing, these aspects could be overlapping. The cases here selected are through following considerations: (1) The first is having notable market indicators. Some of the disruptive technologies are less market oriented than others, e.g., Wikipedia disrupted traditional encyclopedia businesses, but Wikipedia remains non-for-profit, also there is no clear sales record for encyclopedia (e.g., Britannica). (2) The second is strong relevance to modern management theories. Management theories have been fast developing in the past few decades, especially in fields like organizational structure, knowledge management and innovation management, introducing cases spanning out long period in history will bring in many more variables, this can severely deviate the research focus. (3) The third is the necessity of defensive marketing strategies. Defensive marketing strategies are mostly adopted by market leaders, which have significant market shares and the dominance to affect competitive landscape.

This paper also proposes a novel angle to address marketing challenges - a psychology-based strategy design process. Psychology-based strategy could touch the fundamentals of consumer behaviors; hence we can see issues, goals and undermining reasons in a much bigger picture, consequently, produce a strategy that fits long term constraints resulted from the long spanning of disruptive technology. Management and psychology both are parts of the social science, while management is more focused on the practical side, psychology covers both practices and fundamentals evenly. Many psychology studies have already been implemented in management (Figure 5, below), e.g., social psychologist Shalom G. Schwartz's work on "theory of basic human values" has been widely used as a basis for cross-cultural management.
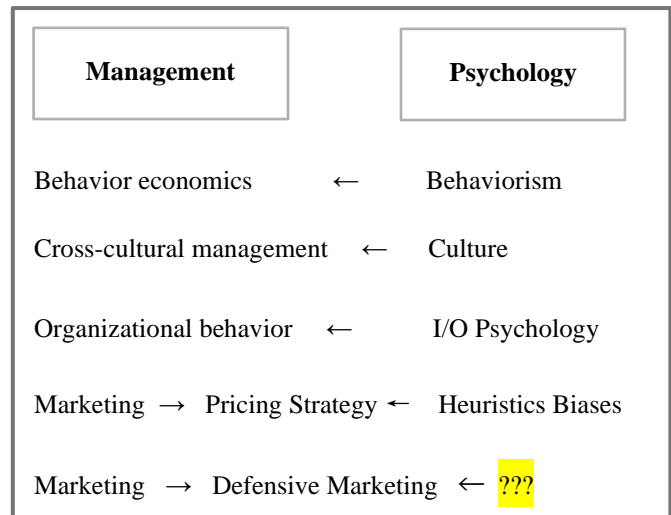
Figure 5 Management's connections with Psychology

Psychology systematically studies behavior and experiences (Kalat 2016), interacting with customers from psychological perspective is an angle also has been imagined by psychology and marketing experts. Current psychological implications on marketing are mostly based on behavioral psychology and cognitive psychology (Wells 2014). Considering the case of defensive marketing, some other fields psychology is also applicable, e.g., since we are dealing with large customer base we already have, how to interact with them through mass media is rudimental in our era, studies from media psychology is certainly pertinent. Moreover, psychology offers a much broader picture and deeper understanding over consumers' behavior and mental process, this could help us by building a much more agile, proactive strategy.

Therefore, this paper will address the defensive marketing problems through the following procedure (Figure 6): 1. Define the marketing problem through a cross-case analysis. 2. Find the solution from psychology side. 3. Devise a new set of marketing strategies.
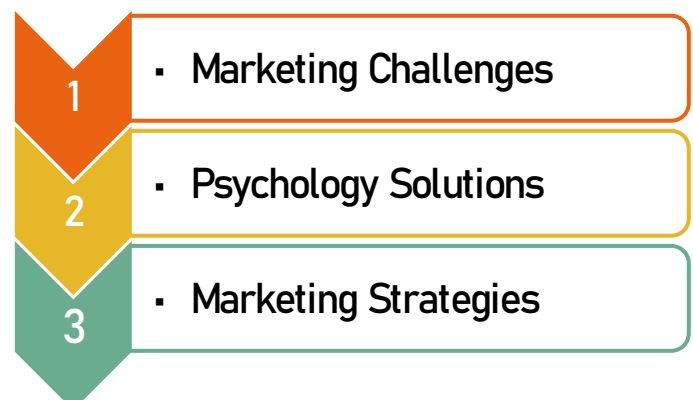
Figure 6 Psychology-Based Strategy Design Process

4. Cross-Case Analysis

Aspects of the analysis

Low understanding of the disruptive technology. Benazzouz (2019) examined the component knowledge and architectural knowledge in disruptive technology, and architectural knowledge is more involved in supply side disruption. Because of the barriers that have been set up, there will be no way to provide a pathway through which new architectural knowledge can be integrated into the mainline business if a new disruptive threat emerges from the supply-side. This will be the case even if the threat originates from the demand-side. O'Reilly and Tushman's (1991) idea "organizational ambidexterity" also influenced the study by examining the organization's **exploitation** and **exploration** abilities. This approach concludes that the exploration side of the story seem to be most difficult for a leading company. Christensen and Bower (1996) also stated that one of the primary reasons for incumbents losing their position is "listen too carefully to their customers", i.e., overly focused on exploitation the current customers as in O'Reilly and Tushman's (1991) idea. Chandy and Tellis (1998) as well found that companies which focus on future customers (i.e., exploration) rather than current customers have a greater development in radical innovations.

Segment shifting. Hauser and Shugan's work (1983, 2008) described the model of defensive marketing should consider the segments of taste. Fournier (1998) stated that the short-term drive of consumer for a transaction is relationship while the main drive of the consumer is the curiosity of trying something new, which also implies the segment changes in taste on the long run. Christensen's (1997) definition on disruptive technology itself also indicates the inherent segment shifting, i.e., the disruptive technology only satisfies the lower segment but as it matures it becomes competitive in higher segments. And then the disruption happens as the leader fail to cope with the high penetration by disruptive technology. Hence, avoiding this challenge by shifting the segment is a viable option both in defensive marketing theory and disruptive technology theory.

Large audience size. Both defensive marketing and disruptive technology theories consider the sheer size of audience we need to handle. Brand loyalty approach in marketing addresses this issue through building customer relationship in three dimensions: emotive tendency, evaluative tendency and behavioral tendency towards the brand. (Sheth 1974) Consumer relationship approach considers the psycho-socio-cultural context (Fournier 1998), relationships have an effect on the contexts in which they are situated, and those contexts also have an

Table 1, Aspects of the analysis

Challenges	Theory types	Literatures
Low understanding of the disruptive technology	Disruptive technology theory	Benazzouz (2019), O'Reilly and Tushman's (1991), Christensen and Bower (1996), Chandy and Tellis (1998)
Segment shifting	Defensive marketing theory/Disruptive technology theory	Hauser and Shugan (1983), Hauser and Shugan (2008), Fournier (1998), Christensen (1997)
Large audience size	Defensive marketing theory/Disruptive technology theory	Sheth (1974), Fournier (1998), C. T. Christensen (2001)
Social context	Disruptive technology theory	Winston (2002), Ebersold (2015)
Lowered awareness advertisement budgeting	Defensive marketing theory	Hauser and Shugan (1983), Hauser and Shugan (2008), Kumar and Sudharshan (1988)
Long campaign duration	Disruptive technology theory	Christensen (1997)

effect on the relationships. Disruptive technology theory addresses this issue through incumbents' profit-oriented perspective on their consumer base, rarely are most businesses able to build a case for investing in disruptive technologies until it is far too late. This is especially true for those businesses that have a practiced discipline of listening to their best customers and identifying new products that promise greater profitability and growth. (C. T. Christensen 2001)

Social context. Supervening social necessity (Winston 2002) dictates how a protype can succeed in becoming an accepted innovation, the social side of the innovation is also a factor to determine marketable a product is. Technologies have the potential to significantly upset social and economic status quos, it is extremely crucial for the leaders of today and tomorrow to take note of them and watch their developments. (Ebersold 2015)

Lowered awareness advertisement budgeting. Hauser and Shugan's (1983, 2008) research showed that the incumbents should lower the awareness advertisement budgeting, this theory has also been tested by Kumar and Sudharshan (1988).

Long campaign duration. By definition, disruptive technologies underperform initially hence are ignored by incumbents and examples given by Christensen (1997) span out into many years. This indicates the starting point of going up against the disruptive technology could be as early as the disruptive technology enters the market as many defensive marketing theorists, not until the disruption starting to appear and displace the incumbents, which is already very late.

Nokia

Nokia, a mobile phone brand from the Navia Peninsula in northern Europe, has been occupying the No. 1 market share since 1996, and once boasted a global market share of more than 40%. Nokia's main product is mobile phones. With the help of the Symbian system, it has gradually developed into the world's largest mobile phone manufacturer. However, in the face of the double attack of the iPhone launched by Apple in 2007 and the smart phone using Google Android, Nokia come from the world's largest mobile phone manufacturer for 14 consecutive years till the second quarter of 2011, the No. 1 position in mobile phone sales was surpassed by both Apple and Samsung. In February 2012, Nokia abandoned the Symbian system that had been in operation for many years and turned to Microsoft's Windows Phone system.

In July, Nokia announced its second-quarter financial report. The financial report showed that in the second quarter of 2013 as of the end of June, Nokia's net operating income was 5.695 billion euros, a year-on-year decrease of 24%. A net loss of 22.7 billion euros was better than analysts' expectations for a net loss of 258.8 million euros. Meanwhile, 7.4 million Lumia smartphones were sold in the second quarter, an increase of 32% from the previous quarter, but Lumia smartphones struggled to support the overall situation, leading to a steady decline in the mobile phone market. Eventually, Nokia was forced to sell mobile phone business in 2013 to Microsoft, which also admitted defeat in 2017.

Nokia was prepared to the disruption from the smartphone with huge investment in R&D, market research, variety of inventions and innovations, but eventually failed at having a precise technology forecasting (Ahmed Alibage 2018). Nokia has owned smartphones for nearly ten years, known as Symbian mobile phones, but since Apple released the first iPhone in 2007 and Google developed the Android mobile operating system, smartphones have been redefined. And Nokia is still immersed in the brilliance of Symbian. Compared with the new Android and IOS, the various shortcomings of Saipan are exposed, complicated operation, poor multitasking, poor compatibility, frequent crashes, fewer applications, and inconvenient downloads Wait. Therefore, after 2007, many mobile terminal manufacturers that support Symbian, such as Motorola and Samsung, gradually gave up the Symbian platform and turned to the Android operating system. When Google took the initiative to seek cooperation with Nokia, Nokia did not choose to invest in the Android operating system in cooperation with Google hence missed the investment opportunity in the post-smartphone era. In the next two or three years, in the rapid expansion of Android and IOS, the market share of Saipan dropped rapidly. The market share of Android increased from 25.5% in 2010 to 68.8%, and the Symbian system decreased from 36.6% in 2010 to 3.3%. As the sales share of Nokia's Symbian system shrinks, Nokia is gradually in trouble. From 2007 to the end of 2012, in just four years, Nokia's main business income decreased year by year, its net profit margin decreased year by year, and its net profit went from a profit of 7.205 billion euros to a loss of 2.303 billion euros. The strategic transformation of Nokia was slow, and the company did not grasp the best time for investment, and the company gradually fell into difficulties.

Nokia failed to perform on a few accounts: 1. Disconnection between the top and middle management, as middle management feared to disappoint. 2. Overly focused on short-term market demands instead of delivering a strategic response like an operating system to rival Apple's iOS. 3. Internal politics (Quy Huy 2015). These accounts of the events all indicate that Nokia were pressed to produce short-term results, the higher management failed to grasp what exactly it takes to catch up Apple. On marketing side, above suggests that it is expected that short term sales performance would be crucial, at the meantime the marketing department should deliver a clear idea on specific demands as part of marketing research.

Wrong strategic decision in research and investment, all bets on WP phone. At the beginning of 2011, Nokia began to realize the backwardness of the smart phone field and the dilemma the company faced. Therefore, Nokia began to choose a new operating system, which is eligible for Android and WP systems. Comparing the two operating systems, at the end of 2010, Android's market share reached 25.5%, and its number of applications reached 150,000, while WP's market share was only 2.8%, and its number of applications was only 11,500. As of 2013, the WP system has a huge gap with Android in terms of market share, application quantity and quality, and developer support. The number of Android applications has reached 800,000 and the developer support rate has reached 83.6%, while the number of WP applications is only 130,000 and the developer support rate is only 14%. Nokia chose WP operating system based on the principle of differentiation, which is a puzzling choice. The current competition for mobile phones is not just about functional hardware. The competitiveness of operating systems and the maturity of its ecosystem are directly related to the overall competitiveness of mobile phones. However, Nokia chose the immature WP system in all aspects. No matter in the era of feature phones or the era of smartphones popular in Symbian, the most important reason for Nokia's 14-year market share dominance in the world is its superb mobile phone technology design and manufacturing. At that time, all mobile phone manufacturers produced feature phones and Symbian phones, consumers will choose the Nokia that is resistant to falling and of excellent quality. However, Nokia did not take advantage of this, so consumers had to make a choice on the operating system and hardware, and even some Nokia fans bought a Nokia mobile phone and changed into the Android operating system. Their effort

to react to the changing market was deviated by such understanding, therefore failed at initial stages as from crisis management's account of the event, Nokia failed to deal with problems in preliminary crisis stage and acute stage, hence was left to play catch-up, which also left Nokia launch product offenses without addressing forementioned issues, Nokia was forced to be stuck in chronic crisis stage (John P. McCray 2011).

Kodak

Despite the fact that Kodak produced the world's first handheld digital camera in 1975, the device was shelved for fear that it would jeopardize the company's primary source of income, the photographic film industry. In the 1990s, Kodak set out on a ten-year quest to transition from film to digital technologies. The DC-20 and DC-25 were first introduced in 1996. Overall, though, there has been little progress in implementing the new digital approach. Competitive technologies did not exert any pressure on Kodak's main business, and because the company's executives could not foresee a world without classic film, there was little motivation to stray from the path that had been laid out for them. Consumers eventually began to migrate to the digital offerings of businesses such as Sony and Microsoft. Film sales decreased in 2001, which Kodak attributed to the financial shocks induced by 911 terrorist attacks on the United States. Kodak executives anticipated that by aggressive marketing, they would be able to halt the transition to digital photography. The company, despite its rapid expansion, underestimated how quickly digital cameras would become commodities with minimal profit margins as more and more competitors entered the market starting around mid-2000s.

Because failures in the manufacturing process were costly and profit margins were high, Kodak avoided risky moves and instead built procedures and rules to maintain the status quo; in another perspective, the paradox between resource-based view and market-based view resulted Kodak's reliance to the resource-based view in previous stages, when Kodak shifted their strategy to another side, Kodak's market-based view is primarily reliant on winning a competitive war, which is historically incongruent to their ability to be flexible and competitive (Mendes 2007). Kodak made a significant investment in digital photography, but middle managers and the firm's culture made it hard for the corporation to reap the benefits of that investment (Henry C. Lucas Jr. 2009). It is also suggested that to institutionalize new technology, a company's strategy should have the following practices:

1. Naturalization and legitimization of new technologies. 2. Legitimize the users. 3. Institutionalize the new technology. 4. Understand the existing technology differently. Hence, they concluded that for Kodak's case, it is not necessarily the nature of the new technology that is decisive, instead, the social context of the technology affects the progress (Kamal A. Munir 2005).

Digital camera

Latecomer firms would have had a much harder time catching up to the existing leaders if they had invested in Mirrorless cameras earlier. This occurred during the 1980s and 1990s, when a competency-enhancing transition from SLR to DSLR cameras occurred. The new technology was introduced endogenously by latecomers in the third phase, and its future was exceedingly questionable. The Mirrorless camera was not seen as a major threat by Canon and Nikon. "Mirrorless cameras have been produced by manufacturers who find it impossible to compete in the DSLR industry," Rainer Fuehres, head of Canon Consumer Imaging Europe, remarked in 2011. Despite the fact that consumers wanted lighter cameras, Canon and Nikon chose to improve their products within the DSLR design parameters. These erstwhile industry giants expanded on their existing DSLR-related resources, expertise, and product lines, which had previously given them success (similar to the way that Leica responded to the advent of the SLR camera).

As a result, it's not surprising that the order of entry into the Mirrorless camera market was practically the polar opposite of the DSLR camera market's market share rank. Although the incumbents' continued innovation makes sense given the strong profitability of their DSLR camera business, the force of competence-destroying discontinuity outstripped their status quo initiatives. Sticking to a present technology/strategy that had become misaligned with the evolving market environment has painful consequences ("success trap").

Despite the fact that Canon and Nikon entered the Mirrorless camera market late and grudgingly in 2013, their primary product line was still the DSLR camera, which was already losing ground to the Mirrorless camera. The incumbent leaders' inflexible response helped speed up the leadership transitions outlined in this article. In each of the successful cases of catching up, the leaders of the industry underestimated the new, disruptive technologies that were introduced by the latecomers, which eventually became the new norm. The ever-shifting

preferences of customers, as seen in these examples, imply that there is a significant gap between the evolving requirements of customers and the incumbents' steadily growing technological prowess. Challengers will put incumbents with a strong competitive edge in jeopardy if they focus on the ever-widening gap between the environments in which industries operate (demand, technology, and policy/institutional influence) and the solutions that incumbents provide to those surroundings. (Kang 2017)

Hospitality industry and Airbnb

Airbnb is short for Air Bed and Breakfast; it is a service website that connects tourists and homeowners with vacancies for rent. It can provide users with a variety of accommodation information. Airbnb was established in August 2008, which has online payment functions and supports accommodation at anytime and anywhere. Seven years later, Airbnb has become world-renowned. Its overnight bookings have surpassed hotel giant Hilton in one fell swoop. As of the spring of 2014, Airbnb had more than 10 million users worldwide, 550,000 rooms, and a valuation of $10 billion.

Airbnb fits the disruptive technology definition because it is currently underperforming compared to traditional hotel industry. Hotel industry has been developing for centuries with a mature business model, provides services including lodging, food, drink, event planning, travel, etc., that are supported by complicated, trained systems, this offers higher quality than what Airbnb can offer, but Airbnb delivers cheaper price and unique travel experiences, it is still potentially disruptive to certain segments of hospitality industry.

The existing literature illustrates the appeal of Airbnb shows high penetration in where the platform is widely used. (Goree 2016) After Airbnb's debut, low-quality hotels are forced to compete on price with Airbnb. Luxury hotels on the other hand see a growth in both their cost and the quality of their services. In light of Airbnb's introduction into the accommodation sector, high-quality hotels are repositioning themselves at the upper end of the market, according to data. (Hung-Hao Chang 2022) . A study also found that from over 22000 stays in the state of Texas throughout 2008 to 2013 and 4000 hotels quarterly hotel revenue tax data dating back to 2003, Airbnb penetration is negatively correlated with hotel revenue, lower-end hotels have been accounted for most of this financial impact. (Georgios Zervas 2017)

Similarly, a study in UK also found that age, gender, and occupation have all become key determinants in travelers' decision to stay at Airbnb. Price, convenience, and local experiences are the most important factors to consider. Customers are drawn to Airbnb for a variety of reasons, including kitchen amenities and the local environment. The hotel's loyalty programs and amenities, such as the gym, pool, and conference spaces, have an indirect influence on customers' purchasing decisions. (Lu 2019)

Blockbuster

Blockbuster started as early as 1982, it was an immediate hit in video renting business. Blockbuster's brick-and-mortar dominance in the video rental market was challenged by internet and subscription services. In 1997, Netflix was launched as a DVD-by-mail membership service. Blockbuster's brick-and-mortar dominance in the video rental market was challenged by internet and subscription services. In 1997, Netflix was launched as a DVD-by-mail membership service. As a result, Netflix charges a set monthly fee. In 2004, Netflix had already begun to eat into Blockbuster's subscriber base when the latter began offering a by-mail subscription option of its own. After years of relying on physical rental businesses, Blockbuster was struggling to compete with streaming and mail-order companies, the company went bankrupt due to a lack of flexibility in 2010. Blockbuster made a number of bad decisions, including passing up the opportunity to pay $50 million to buy Netflix.

Many businesses make the error of having a narrow view of the concept of digital transformation, resulting in only technical and technological coverage. Many businesses make the error of having an overly narrow view of the concept of digital transformation, resulting in only technical and technological coverage. (Vučeković 2021) While evaluating the prospects of a new technology, we should also cover how does this affect business model and business processes in different segments.

Senior management at companies like Blockbuster failed to recognize the potential of operating online, and while they made some attempts to gain a foothold in the internet market, their decision to rely only on the walk-in movie theater model ultimately contributed to their death. (Satell 2014)

Summary

In summary of the above cases (Table 2), it is found that middle and higher management disconnection is common in complete failure cases, this is likely due to the established ways of innovation is dominated by the higher management, i.e., there's a low understanding of disruptive technology especially in the early stage, which made higher management found it hard to understand what's happening in the middle management, oftentimes, middle management was feared to disappoint, this further hinders the capabilities to innovate.

Another interesting point from the result is the segmentation, incumbents already tried to move to other competing space as disruptive technologies demonstrated strong market penetration in some segments. Furthermore, marketing managers should determine the competing space of the disruptive technology and how that will affect main business model of the company, this is particularly true if the company is based on few products/services, the disruptive technology's penetration could be fatal as happened to Blockbuster and Kodak.

As of the audience size, it is found that we have a large audience size as marketing objective, but at the same time due to the shrinking demand for the obsolete service/product, the overall objective should be preserving all customers undiscriminated. Some analysis also found that the social context sometimes is a bigger

TABLE 2, Summary of the challenges

	Low understanding of the disruptive technology	Segment shifting	Large audience size	Social context	Lowered awareness advertisement budgeting	Long campaign duration
Nokia	☒	☒	☒	☒	☒	☒
Kodak	☒	☒	☒	☐	☒	☒
Digital camera	☒	☒	☒	☒	☒	☒
Hospitality industry	☐	☒	☒	☒	☐	☒
Blockbuster	☒	☒	☒	☒	☒	☒

factor than technological factor. This also indicates that from marketing research point of view, an accurate grasp of the product's social position could be vital. All cases above also indicated that a long campaign is required, this might be due to how fast in general the disruptive technology mature to a state of high market performance, but as of marketing practice, should start preparation stage even before competitor entered the market, closely monitor how consumers' behavior changed because of the competitor's practices and make matching responses, therefore, the campaign should at least have 5-10 years in mind.

5. Solution

Problem definition

Based on the above summary, we can formulate the psychology challenges as the following:

Low understanding of the disruptive technology. Since it's hard for the higher management to grasp what's going on, one of the main marketing objectives should be detecting the consumer behavior changes for extensive analysis. In marketing sense from new product development point of view, the marketing managers should further emphasize how disruptive products can affect consumer behavior especially considering the impacts on business model, this could (1) give a more accurate forecast on how exactly the disruptive technology will compete, hence deliver the critical points for R&D department to work on and help us catch up in those areas, (2) help us redirect the resources to compete in more advantageous areas in selling the current products.

Segment shifting. As considered, high market penetration demonstrated by companies that use disruptive technologies will displace the current products, but luckily, only in some segments. This suggests that the incumbents should try moving the current products to new segments, or even better, moving to new field that is mostly irrelevant to current one but with high market potential.

Large audience size. In active defensive stage, we will have to deal with large audiences acquired in before, though they are segmented in offensive stage based on previous marketing strategies, this segmentation result could be different when we treat it defensively, while at the same time, we need to try to preserve all customers at hand.

Social context. Though technologies change how things work, it still takes time to be accepted by the population, one of the main factors for this change would be social. Lots of time we don't for the best quality/price ratio only, but how the society as a whole perceives the product, e.g., it's better to arrange a business meeting in a rated hotel than going to a sketchy Airbnb place, though the latter could offer a far better experience, we still want to show that we take this business meeting seriously by offering a socially accepted way for this meeting.

Lowered awareness advertisement budgeting. It is optimal to lower our budget on awareness advertising, we can consider how can we have awareness advertising more efficiently or shift the focus of the advertising.

Long campaign duration. Considering a long campaign is required, it is best to see everything strategically, therefore it is useful to analysis the underlying reasons behind how these behaviors changed throughout the long period.

Marketing challenges and solutions

Disruptive Technology Challenge	Marketing Challenge	Psychology Solution(s)
Low understanding of disruptive technology	Detect consumer behavior	Self-determination theory

Self-determination theory. Self-determination theory mainly focuses on the degree of self-determination of human behavior. The premise of its theoretical construction is that human beings are essentially active organisms, with innate tendencies and potentials for self-development and self-realization. Self-determination is an autonomous choice made by an individual on the basis of fully understanding his own psychological needs and external environmental information (E. L. Deci 2002). Self-determination theory believes that the human self plays an important role in the formation of its motivation and proposes that behavior is formed on the basis of people's inner psychological needs. In the process of analyzing the factors of the individual's internal psychology and the external environment, the researchers of the self-determination theory extracted three basic psychological needs, namely, the need for autonomy, the need for competence and the need for relatedness. Self-

determination theory holds that if the above three basic psychological needs are satisfied, human beings will achieve healthy growth and self-actualization (E. L. Deci 2013).

There is still a lack of research on internal and external motivation in the existing consumer behavior literature. In fact, intrinsic motivation is very important in marketing. Whether consumers like and recognize the company's products is undoubtedly the most important factor in determining whether they buy; Influence is also a major factor in the consumer decision-making process. Self-determination theory explains consumer behaviors in following senses: (1) the self-realization factor of consumer behavior. Consumer not just motivated by the external rewards but also how they grow as a person, i.e., self-realization, this means when we analyze the consumer behaviors, it is better to take into the factor how people feel about the challenges and how people feel their growth when they are trying new products. (2) The social influences of the product should also be monitored. Considering the low usability of disruptive technology at early stages, the utility level of these product could be too low to detect, hence the customer satisfaction for them is higher than expected judging from the usual standards.

Disruptive Technology Challenge	Marketing Challenge	Psychology Solution(s)
Segment shifting	Analyze consumers' reasoning on products	Case-based reasoning

Case-based reasoning. Reasoning abilities is part of the cognitive psychology and cased-based reasoning is a psychological theory on human cognition. Case-based reasoning entails using previous experiences to comprehend and solve new problems. A reasoner in case-based reasoning recalls a previous situation similar to the current one and applies that knowledge to solve the new problem. Case-based reasoning can refer to adapting old solutions to meet new demands, explaining new situations with old cases, criticizing new solutions with old cases, or reasoning from precedents to interpret a new situation or create an equitable solution to a new problem.

The whole life cycle of a product can be divided into three stages: D(Demand), P(Production), A(After-sale) are

used to represent the set of problem categories in the **product demand analysis stage**, **product production stage** and **product after-sales** service stage, which are specifically expressed as:

$$D = \{D_1, D_2, D_3 \dots D_n\}$$
$$P = \{P_1, P_2, P_3 \dots P_n\}$$
$$A = \{A_1, A_2, A_3 \dots A_n\}$$

When describing a problem, it is common to use relevant keywords to indicate the type of problem, therefore:

$$D_i = \{D_{i1}, D_{i2}, D_{i3} \dots D_{im}\}$$
$$P_i = \{P_{i1}, P_{i2}, P_{i3} \dots P_{in}\}$$
$$A_i = \{A_{i1}, A_{i2}, A_{i3} \dots A_{ik}\}$$

Therefore, build the case library:

$$Case \begin{cases} \{D_{i1}, D_{i2}, D_{i3} \dots D_{im}\} \\ \{P_{i1}, P_{i2}, P_{i3} \dots P_{in}\} \\ \{A_{i1}, A_{i2}, A_{i3} \dots A_{ik}\} \end{cases}$$

Through survey we can find the keywords in the opinions of the customers, denoted as O(Opinion). The word frequency of keywords for different types of products is expressed as following:

$$O_D = \{O_{D_{i1}}, O_{D_{i2}}, O_{D_{i3}} \dots O_{D_{im}}\}$$
$$O_P = \{O_{P_{i1}}, O_{P_{i2}}, O_{P_{i3}} \dots O_{P_{in}}\}$$
$$O_A = \{O_{A_{i1}}, O_{A_{i2}}, O_{A_{i3}} \dots O_{A_{ik}}\}$$

Then the weight (W) calculation formula of the keyword based on the vector space model (taking the weight calculation of the keyword $O_{D_{i1}}$ as an example) is:

$$W(O_{D_{i1}}) = O_{D_{i1}} / \sum_{j=1}^{m} O_{D_{ij}}$$

The exhaustive strategy is an effective method to calculate the similarity. The description of the segmentation in reports is divided into words, and the words after word segmentation are compared with the keywords. If the word X_i in the sentence and the keyword D_{im} are the same, then $w(X_i, O_{D_{im}}) = W(O_{D_{i1}})$,otherwise $w(X_i, O_{D_{im}}) = 0$. If the opinion is compared with the words in the segment and more words in the opinion appear in the segmentation, it means that the opinion has a greater correlation with the segmentation. Therefore, the similarity between the descriptions of the segmentation and the weight opinion can be expressed as the following:

$$Sim\left[W(O_{D_{i_1}}), Seg\right] = \sum_{i=1}^{n} w(X_i, O_{D_{im}})$$

Through the above process, we can find about the customers' opinion on products and their relationship with the segmentation, based on this, we can see the gap between our product and other segmentations, and make decisions on whether shifting to a segment worth the effort, also provides information on what aspects of the product needs to be adjusted.

Disruptive Technology Challenge	Marketing Challenge	Psychology Solution(s)
Large audience size	Effective messages	Serial position effects Noncommercial advertisement Retrieval cues

Fennis and Stroebe (2015) suggests that the psychological approach to marketing different from others because stimuli and response approach, which also necessitates not only a focus on the individual, but also being as explicit as possible about the types of consumer responses, the types of advertising stimuli that affect these responses, and the types of postulated, causal relationships between advertising stimuli and consumer responses.
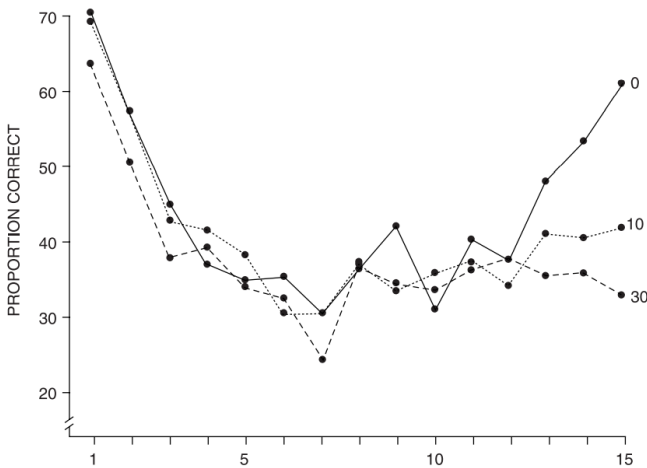

Figure 7 Serial positioning effects after 0 second, 10 seconds and 30 seconds

Serial position effects (Glanzer 1966) (Figure 7) are among the most consistent findings in memory research. When participants are asked to memorize a list of words or nonsense syllables, they remember the items presented first and last better than the items presented in the middle, this is referred as primacy effect and recency effect; though the recency effect disappears if there is a delay between the presentation of the words and recall. A study found that even though the first advertisement and the last advertisement performs better because of serial position effects (Peters 1997), but the last advertisement's recency effects only emerges when it's controlled for; it is also found that a commercial's duration has a significant effect on the aided and unaided brand-name recall, which means that longer advertisements perform better. This result can be implemented in placing our advertisement.

It is also found that **noncommercial advertisement** is more effective in raising body image awareness in a study. (Qian Huang 2021) Usually when we gain a large audience size the product is already at maturity stage of the product, it's harder to gain new customers and many of our current customers have already bought the product, commercialized advertisement will see less effects. Hence, it would be reasonable to change the focus of the advertisement to raising awareness that is related to the product, for example, as a hotel, it would be beneficial to promote the tiredness people feel during the trip, and how this tiredness will affect your tour or your business meeting next day, this is traditionally the strong points of a hotel by helping the customer overcome tiredness.

Retrieval cues refers to using a cue to help customers extract the content from the memory. It is found that retrieval cues can also be used in combating advertising clutter, i.e., the degree to which multiple messages compete for the attention of the consumer. In a study, using a picture from the advertisement as a retrieval cue can be confusing if the picture is not distinctive, but if the picture is distinctive, it might help the customers recall the brand name and the content of the advertisement. (A. a. Kumar 2004) Thus, when promoting the product, it is important to have some distinctive content in the advertisement, considering the matured product typically have many competitors; then we can use the image of the distinctive content as a retrieval cue.

Disruptive Technology Challenge	Marketing Challenge	Psychology Solution(s)

Social context	Exploit the product social potential	Higher-ordering conditioning Operant conditioning Socialization

Socialization is the process by which an individual's standards, abilities, motivations, attitudes, and actions evolve to correspond to those deemed desirable and appropriate for his or her current and future role in any given society. Families, peers, neighborhoods, the media, schools, and religious organizations are all agents in the socialization process. It is expected that these different agents work together rather than independently. When a product is widely used by the population, it is also part of the social life, hence, it could be useful to address the problem from socialization standpoint, for instance, a hotel is socially positioned as a more acceptable option for business trip, this can be socialized into a social norm, hence, business trip will be strongly connected to hotels.

Operant conditioning is a type of learning in which a behavior becomes more likely to recur if followed by a reinforcer or less likely to recur if followed by a punisher. (DeWall 2017) This can be used to help us in making a consumer behavior more likely to recur, for instance, as previous example on hotel, we can try to reinforce the connection between a suit and hotel service that helps steaming the suit, hence the customer will associate business travel with a suit with a hotel's service. This can also be reinforced through **higher-ordering conditioning**, i.e., through a series conditioning connected ordinally together for the final behavior, for instance, associate the sweating and the suit together, then associate the suit and the hotel's steaming together. In the end, we will have a result of connecting sweating and hotel steaming services together. The current study proved that even the most basic instructions provided by a demonstration could result in high-rate responses under conditions that would otherwise result in lower reaction rates. (Matthews 1977)

Disruptive Technology Challenge	**Marketing Challenge**	**Psychology Solution**
Lowered awareness advertisement budgeting	Reorganize the campaign	DAGMAR model

DAGMAR model (Dutka 1995) is model that is used in decision making when considering the individual responses to advertising. DAGMAR stands for <u>D</u>efining <u>A</u>dvertising <u>G</u>oals for <u>M</u>easured <u>A</u>dvertising <u>R</u>esults.

Advertising, according to the concept, can produce nine distinct and hierarchically ordered impacts:

Category need

Brand awareness

Brand knowledge/comprehension

Brand attitude

Brand purchase intention

Purchase facilitation

Purchase

Satisfaction

Brand loyalty

The measurement of different advertising campaigns is the primary objective of DAGMAR. The DAGMAR advertising model is broken down into three sections: "establish the advertising goals," "four steps: awareness, comprehension, conviction, and action," and the third and last section is "to measure the advertising results." This is also used to improve the effectiveness of advertising campaigns targeted toward smaller businesses. Considering the case of defender, some of areas we are already advantageous, e.g., brand awareness, brand loyalty, brand knowledge, purchase. But some of the

aspects need to be re-evaluated: Category need in the offensive stage has been established, but as the product matures, such need is shifting from quality differentiation to other aspects; Brand attitude also changes as other competitors join the race; this also followed by changing brand purchase intention, purchase facilitation, and so on.

Disruptive Technology Challenge	Marketing Challenge	Psychology Solution(s)
Long campaign duration	Strategic Advertising	Planned focuses Behavioral Perspective Model

Most of products follows the product life cycle, hence , it could be useful to use it as a framework for marketing planning (Figure 8). Products typically go through a product life cycle, which is an inverted U-shaped curve that represents the diffusion or spreading of a product across the marketplace from its initial introduction to its decline and eventual demise. The product life cycle is divided into four stages: introduction, growth, maturity, and decline. The S-shape represents the volume of sales and profits at each stage. When a new product enters the market, advertisers must inform consumers about it in order to raise brand awareness (the conscious knowledge

that the brand exists and that it represents a specific product) and induce product trial. During the growth stage, the emphasis is on increasing market share relative to the competition, which is frequently accomplished by improving the product or developing and communicating brand extensions to the consumer. Consolidating market share becomes more important in the maturity stage, with the emphasis shifting to creating consumer brand loyalty and maintaining top-of-mind awareness. Finally, informational appeals may be used in the decline stage to convey new and additional uses for the product.

The **BPM** (Behavioral Perspective Model of Purchase and Consumption) depicts the pace at which consumer behaviors occur as a function of the environment's relative openness and the informational and hedonic reinforcement available in or promised by the setting. It serves management in two ways: for starters, it provides a way to think about situational implications on consumer behavior. Second, the BPM proposes a different approach to marketing strategy. (Foxall 1992) As mentioned in literature review, the inputs in the behavior setting and degrees of informational and utilitarian reinforcement explain the pace of behavior emission/responding.

Stage	Introduction	Growth	Maturity	Decline
Marketing communications objectives	Category need Brand awareness Brand knowledge Brand attitude	Brand attitude Brand preference	Top-of-mind awareness Brand attitude Brand loyalty Customer satisfaction	Purchase New target groups
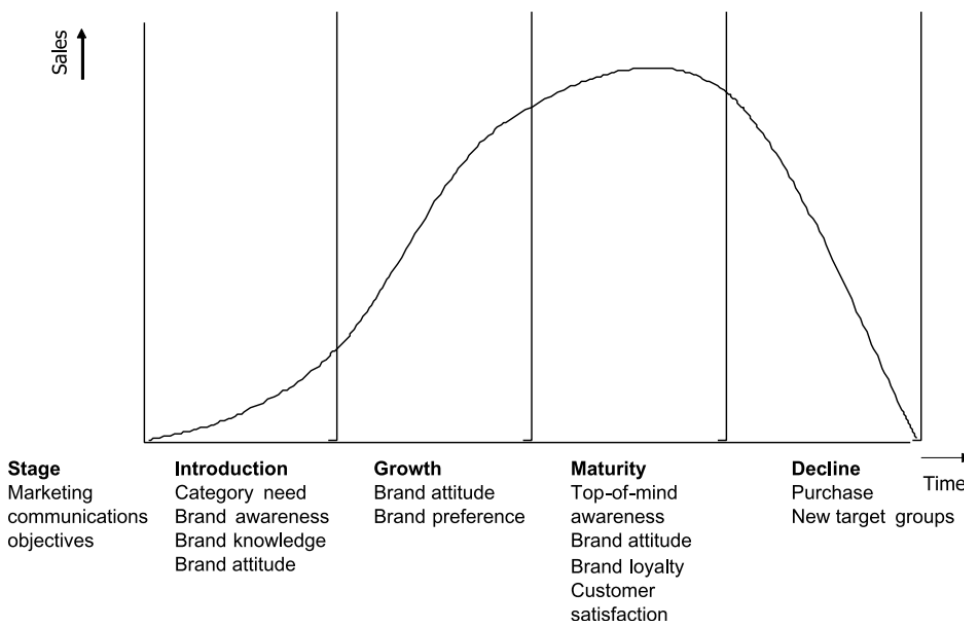
Figure 8 Product life circle and marketing (Fennis 2015)

Table 3, Summary of psychology solutions						
Challenges from disruptive technology	*Low understanding of the disruptive technology*	*Segment shifting*	*Large audience size*	*Social context*	*Lowered awareness advertisement budgeting*	*Long campaign duration*
Marketing challenge	Detect consumer behavior	Analyze consumers' reasoning on products	Effective messages	Exploit the product social potential	Restructure the campaign	Strategic Advertising
Psychology solution(s)	Self-determination theory	Case-based reasoning	Serial position effect

Noncommercial advertisement | Higher-order conditioning

Operant conditioning

Socialization | DAGMAR model | Planned focuses

Behavioral Perspective Model |

Summary

In summary of the solutions, the corresponding marketing strategy are listed on the table above. In response to the low understanding of the disruptive technology, the best action to take is by detecting the consumer behavior changes as early as possible, self-determination theory explains the possible areas we need to focus on, hence the detection. While it is also found that disruptive technologies show strong market penetration once it becomes more mature, at this stage, it would be reasonable to shift our product into another segment, this can be helped by using case-based reasoning, we can a clearer idea on why the customers chose products in different segments, hence, plan ahead for such shifting and make proper adjustments to the targeting segment based on this understanding. Once the product reached maturity stage, it is often characterized as large audience size as a market leader, at the same time, the maturity of product makes the product quality differentiation difficult,

the social factor now is the more dominant factor. Thus, we can reorganize our campaign from actively seeking new customers (offensive) to address to the large audience we gained in the offensive stage, this could be done through organizing effective, inclusive campaign that addresses all the current customers, at the meantime, the whole campaign focus should be shifting to understanding the social potential of the product by socialize its usage.

Considering the lowered awareness budgeting, DAGMAR model can help us restructure the campaign focuses, when aspects like brand knowledge/ comprehension is already high as a market leader. Furthermore, since this is a long campaign, it is also important to plan it with distinctive focuses in different stages, also, the socialization process takes long time to complete, this should also be aligned with other focuses; Behavioral Perspective Model (BMP) can also help in decision making.

Proposed Strategy

Overall, due to the long duration of the campaign, the focuses can be planned as product life cycle theory suggested (Fennis 2015), that is, focusing on different psychological targets in different stages. Sales record of incumbents generally follows product life cycle model and disruptive technologies enable companies to have exponential growth, hence, the strategy can be divided into three stages:

- Offensive/Early defensive stage
- Mobilized defensive stage
- Retract/Retrench stage

Offensive/Early defensive stage. In the early stage, the strategy is more offensively minded to capitalize the growth potential, while at this stage, the signs of potential disruption could already be detected, hence the early defense should start not long after the launch of the product, to address the previous mentioned issue around low understanding of the disruptive technology.

The goal is **detection.** Self-determination theory (E. L. Deci 1985) describes the three elements of motivation and growth as competence, connection, autonomy. It suggests that humans are motivated by the need of growth, hence gaining mastery over challenges and new experience will develop sense of self. This theory emphasizes the autonomy of the ego rather than external factors. This explains why in the early stage of disruptive technologies, people would still try them though it is much less rewarding externally, it presents inwardly as a challenge and a mastery to gain. Hence, to detect the consumers' behavior, we can use a survey that lists the current products in the market and ask the participants to rank them by easy-to-use, this can let us have an eye on those

products that use different technology and ranked low in terms of easy-to-use; then we can have a more focused study on how these products' customers feel about the challenges and overcoming these challenges. Theory of planned behavior (Ajzen 1991) suggests that three components of behavior intention are attitude, subjective norms and perceived behavior control, which forms the intention, then the intention forms the behavior. Perceived behavioral control, i.e., how the consumer perceives the ease or difficulties in a behavior, could be different from the objective ease or difficulties, this means by surveying on this we can forecast the customers' behaviors; attitude and subjective norms can also be monitored to see how these factors forms the behavior.

With good detection, it is possible to adopt these technologies as soon as we found out about its potential, or least alert the higher management about its danger and how we can deal with it strategically instead of demanding short-term outcome.

In the offensive stage we will also see a slowdown in growth, this usually signals saturation in the market, or the disruption starts. At this stage, competition became strong, the products are matured and tend to be homogeneous with marginal product differences, the differentiation now will be focusing on promoting fine product distinctions through packaging and advertisement (Levitt 1965). Therefore, the quality of the product is no longer the dominant factor. Also, as previous suggested, the social context is important, it is optimal to shift the focus to exploit the product's social potential around this time.

The usage of a product is a type of behavior, if this behavior is accepted by the population, it will become a

Table 4, Psychology solutions and Marketing Strategy						
Psychology solutions	Self-determination theory	Serial position effect Noncommercial advertisement	Higher-order conditioning Operant conditioning Socialization	Case-based reasoning	DAGMAR model	Planned focuses Behavioral Perspective Model
Marketing Strategy	Detection	Reorganize/ Socialization	Reorganize/ Socialization	Segment shifting	Restructuring	Planned advertising focuses

norm, and **socialization** theory describes the process of internalizing such norms. This is an advantage of a matured product over disruptive technologies as the disruptive technologies are still in the early stages socially. We can start with determining the social position of the product, i.e., how people tend to see the product in their social life. For instance, cameras are seen as a preservation of memories, who's in the picture is extremely important.

The social factor can also be created and enhanced, one way to achieve this is through associative learning. Associative learning is defined as "learning about the relationship between two separate stimuli, where the stimuli might range from concrete objects and events to abstract concepts" (Marc Philippe Lafontaine 2020). We can try to associate our product to something important in the social life and enhance it into a strong "if-then" response, then the position of our product will be anchored to this specific social activity in customers' minds. Furthermore, **higher-order conditioning** - defined as "a procedure in which the conditioned stimulus in one conditioning experience is paired with a new neutral stimulus, creating a second (often weaker) conditioned stimulus." (DeWall 2017), can also be used to form an advantageous string of thoughts for us. Coming back to the previous example on cameras, one of the most important things about camera and photography is taking a picture of a person or more and share the picture, for starters, this involves the lighting quality of the picture which phone cameras can't compete (some other properties of a good camera as well, here we will use lighting as example). Therefore, lighting is associated with how good the picture is, if the picture is good, then the person in the picture looks good. Based on this, we can create the following association:

> I want to share a photo of me → I should look good in the photo → A good photo needs good lighting → Only a real camera offers good lighting → I only want a real camera to take a photo of me

As of the previously mentioned higher order conditioning theory, the result will be:

> I want to share a photo of me → I only want a real camera to take a photo of me

If this association is successful, we can shape a new social norm: if you want to take a picture of a person, then you can only use a real camera, phone camera only makes people look worse, it's disrespectful to take a picture of a person with a phone camera. And if this norm takes place early enough, it will discourage the phone makers to invest in improving the phone camera, it will also discourage the photo editing software development on smartphones considering they are a compensation to the bad quality taken by phones. This can be done through a well-organized advertising campaign, as previously mentioned **serial position effects, noncommercial advertisement, retrieval cues.** A string of stimulus like this could take years to complete depends on our angle and effort, it is better to understand the product's social position accurately so that we don't have to change it in the middle of the process.

Mobilized defensive stage. The previous effort might be effective enough to overturn the disruptive technology, but if the disruption persists, we will have to change to next stage. At this stage, the sales starts to decline, this concludes the offensive stage and shift to highly defensive by mobilize most of the resources for defending, hence the mobilized defensive stage.

Considering our product is already not competitive on rational basis, it is possible to shift to other competing methods. Rationalization is defined as a defense mechanism that use logical reasons to justify unacceptable behaviors that is motivated by unconscious instinctual impulses. (APA dictionary of psychology). Therefore, the first thing is to rationalize the consumers' choice on our product, that way the consumers will focus on their own personal reasoning about the product instead of seeing it objectively, and we want the consumers to defend their choices on their own.

Above this, emotions and memories can also be focused on, this is also an aspect that companies with disruptive technologies can't compete – a large audience base to elicit responses. Commercials which elicit emotion or more involving showed significantly different patterns of attitudinal response to repeated commercials (Hitchon 1995); in a study also showed that the results for emotion appear to be consistent with the neuroscience literature, which suggests that affect improves long-term memory of the advertisement. (Ambler 1999)

Perceptual needs are often a potential psychological need of people, and this need is precisely a comprehensive image that people hope to meet but is difficult to express, how to clarify these needs and accurately capture the potential and hidden psychological needs of customers is

a topic needs to be considered. The effective way to solve the problem is the accurate acquisition and transformation of customers' perceptual needs. At present, the research on the acquisition and transformation of perceptual needs is mainly carried out from two perspectives. One is represented by perceptual engineering, which takes the product itself as the research object, in this way, language expresses its perceptual demands, decomposes the perceptual image of the product into several perceptual words, obtains the perceptual demand image by selecting perceptual words, and establishes the relationship between these perceptual words and product design elements through a series of statistical investigation methods, thus, realize the transformation of perceptual demand. The other is to study whether the three elements of product emotion (evaluation, interest, stimulation) can stimulate emotion and what kind of emotion can be stimulated from the psychology to emotion's functions, mainly based on the study of user emotion and the overall structure of the product's interrelationship. Because product emotions are subjective and mixed, only a few one-to-one relationships between product design and emotional responses can be identified. (Desmet 2008) Even if there isn't a lot of hard information in experiential ads, this doesn't mean they can't change people's memories and attitudes in a way that helps the advertiser. (Hitchon 1995)

To avoid the attack from the disruptive technology, it is important to realize how exactly this technology can change the business. By definition, the disruptive technology moves to different segments as it matures, it is hard to foresee which segment will it be even by themselves, but it is still foreseeable that this technology won't stay in the same segment. **Case-based reasoning** provides such analysis, through analyzing large amounts of reviews we can see how different customers value different attributes of a product, hence determine the segment of disruptive technology, our segment and other segments. These attributes could be related, if we are planning on **shifting segments,** it would be useful to examine these differences in attributes and plan ahead our moves.

While marketing our product in above ways, it is important to keep in mind that it will most likely only slowdown the decline as disruptive technology demonstrated high market penetration, to actually keep the sales up, we need to shift to other segments. When customers face multiple choices, they will have to construct a series of reasons to use a product. These
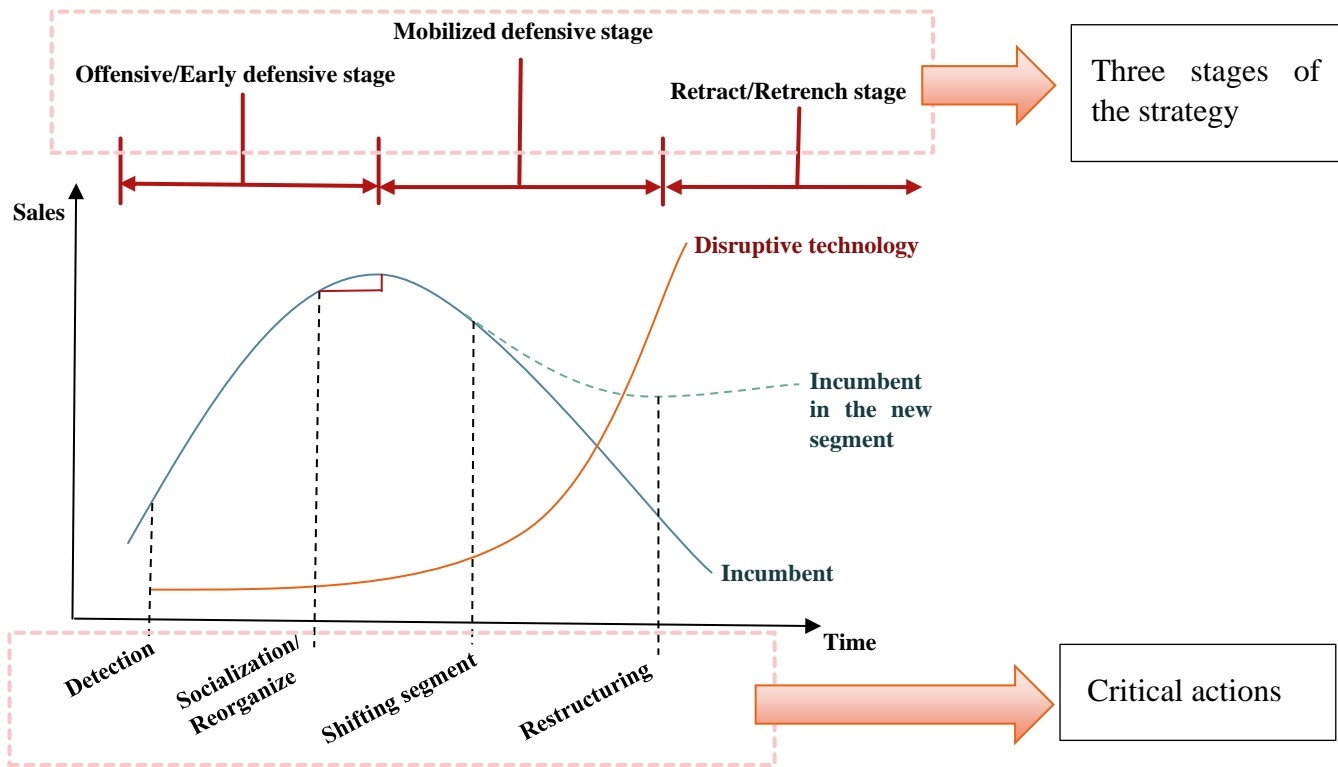

Figure 9 Strategy map

reasons are interconnected, and they are also connected to external conditions, e.g., a customer chose a high-performance computer because he needs to process data, but some cloud-based service actually perform better in data processing, this means cloud-based service is a potential alternative, cloud-based service providers can consider target this segment.

Retract/Retrench stage. We either successfully shifted our segments or failed at this stage, either way, the final step is to **restructuring**.

If we successfully get into the new segment, the previous experience and competence need to be reconsidered, this can give us opportunities to preserve these aspects. We can now try to restructure the campaign into a more efficient handling, in this way we can shift the marketing resources to our own adopted disruptive technology if it has market readiness. DAGMAR model can help us restructuring our focuses differently by prioritizing what is lacking,

Or if we failed at adopting disruptive technology, it is also applicable to go for efficiency, the disruptive technology will drive us out of market eventually, running on best efficiency will be good for damage control. And if the defending was not successful, the sales continue fast decline, it is best now to liquidate the assets as these assets will be devalued fast, the best damage control now is to cash in and move on to other business.

6. Conclusion

This paper explored the possibility of designing a marketing strategy against disruptive technology. The analysis shows that connecting defensive marketing strategies and psychology theories are among the paper's most important findings. As of the nature of defensive scenarios, the long period of the campaign should and need to be planned beforehand, this might as well be guided by theories like psychology to increase effectiveness. The psychology-based strategy building process can also be further developed, this paper showed the unique approaches in psychology, especially the "stimulus-response" approach, can be useful in unclear situations like a hardly foreseeable disruption.

Limitations. This research only takes account of more accepted cases, as Danneels (2004) suggested, the theories on disruptive technology still have questions to be answered, namely, the inherent disruptiveness of the technology, resource-based views as of incumbents, as well as how the disruptive technology change the base of competition by introducing new dimensions of attributes previously unexplored. These questions should be answered in the future to provide a more accurate analysis, therefore, to have a more pluralistic assessment from marketing side.

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