

Master's Thesis

**Exploring the Decline Phase in the Product Life Cycle of Services:
Case of Mobile Game Industry in Japan**

by

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Certification Page

I, AVILA Carlo Irawan (Student ID 52115624) hereby declare that the contents of this Master's Thesis are original and true, and have not been submitted at any other university or educational institution for the award of degree or diploma.

All the information derived from other published or unpublished sources has been cited and acknowledged appropriately.

AVILA Carlo Irawan
2017 / 07 / 20

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Summary

Nowadays, service industries that produce intangible goods, such as health, education, modern communication, information, and business services are growing more than ever. In fact, many of the new ‘products’ that have been launched to the market were services rather than durable goods. This evolution goes through a process that is closely tied to the well-known Product Life Cycle theory as the lifespan of a product and service from which they are born, grow, mature, and then decline, just like human beings or animals. Unlike products that have physical deterioration, services are intangible therefore the qualities supplied by the service providers remain constant over time. Nevertheless, services still decline, with many businesses entering and exiting the market. Former studies have vouched that Product Life Cycle theory is valid in many common market situations, but limited studies had been conducted regarding the application of Product Life Cycle theory in services. Similarly, many contributions have been made to research the uptake of the cycle. However, the decline is treated as a given.

Coupling the Product Life Cycle theory with Diffusion of Innovation as the underlying theoretical rationale, this research aims to explore the decline of Product Life Cycle in services using Net Attrition Rate as the central metrics of the measurement. Two main components that this research will focus on are disadoption rate and adoption rate of the service. The main hypothesis of this research is to elaborate the significant cause-and-effect relationship between disadoption rate and adoption rate. When high disadoption rate causes the adoption rate to decline, services will deteriorate over time because of declining number of existing adopters. The mobile game industry was selected as the industry scope, and Pokémon Go was used as the case study to generalize the findings into the service industry.

Even though this research employs a mixed approach method where qualitative research was done through document screening and interviews, a quantitative method using experimentations is used as the most prominent empirical research instrument. The initial design of the experimentation is two-by-three experimentation groupings where “disadoption rate” and “time of release” will be manipulated as the treated independent variable, and “adoption rate” will be measured as the dependent variable using four different measurements. The disadoption rate variable will have two levels: low and high, while the time of release variable will have three levels: 3 months, 8 months, and 18 months; creating six experiment groups with 355 samples in total.

Initially, the main hypothesis was not significantly supported, as respondents acted indifferently on the disadoption rate treatment. However, this research has unexpectedly discovered that time of release was not a static variable but varies relative to the perception of the players, developing the service age variable into perceived maturity. The significant effect of the perceived maturity to the adoption success was present during the analysis with 99% confidence level, meaning that the adoption rate depreciates over time due to time factor alone. This finding suggests that even services are worn off by time, no matter how excellent the qualities are. Thus, the scholarly contribution of this research is to identify that mere newness effect exists in new services. The managerial implication is that service providers have a limited window of opportunity to exploit this mere newness effect by minimizing the disadoption rate from disenchantment and the maximizing the adoption rate through promotion in early stages, as it will be increasingly difficult to gain new adopters as the novelty of the service is depreciated over time.

Introduction

The role of service industry in the world economy is imperative, and dominates the world economy. World Bank reported that service industries contributed as much as two-third of the nation's GDP –Gross Domestic Product– in high-income countries¹, twice more than the industry and agricultural sectors combined. The most recent data from World Bank in 2014 even highlights that service industry's contribution to GDP shot up from 58.3% in 1995 to 68.47% in 2014². The services industry itself has evolved over the past decades, from traditional services such as transportation until gaming services. In all cases, it is the interest of every stakeholder to ensure that their service business is stable and growing financially by maximizing the business profitability with the most appropriate strategy.

Although there are several ways to maximize the business profitability, this research viewpoint would be limited to minimizing the customer attrition rate, which is defined as how many customers in the percentage that stopped buying from a company in the next annum, subtracted by how many customers in the percentage that have started buying from a company in the next annum. This customer attrition rate can be regarded as the complement of customer retention rate, which is defined as how many customers in percentage can a company retain in the next annum (Farris, et al., 2010)³. Srinivassan and Hanssens (2009:304)⁴ highlights that “*retention is more important than margin or acquisition cost because 1% of improvement in retention can improve profitability by 5%, while a similar improvement in margin and acquisition cost improves profits by 1.1% and .1%, respectively*”.

Most businesses would want to focus on retaining existing customers than spending a large

¹ World Bank. (1995). Growth of the service sector. Retrieved from http://www.worldbank.org/depweb/beyond/beyondco/beg_09.pdf

² World Bank. (2014). Services, etc., value added (% of GDP). Retrieved from <http://data.worldbank.org/indicator/NV.SRV.TETC.ZS>

³ Farris, P. W., Bendle, N. T., Pfeifer, P. E., & Reibstein, D. J. (2010). *Marketing metrics: The definitive guide to measuring marketing performance (2nd ed.)*. New Jersey: Pearson Education, Inc.

⁴ Srinivasan, S., & Hanssens, D. M. (2009). Marketing and firm value: Metrics, methods, findings, and future directions. *Journal of Marketing Research*, 46, 293-312. Retrieved from <http://www.jstor.org/stable/pdf/20618893.pdf>

sum of money on advertising to acquire new customers, as the cost of acquiring a new customer is reported to be as much as five times more than retaining the old one (Saleh, 2016)⁵. Therefore, it can be concluded that the more service businesses can minimize the customer attrition rate, the more efficient the service business will be in the long run.

This research itself will focus on determining the relationship between the number of customers who stopped buying and the number of the customers who started buying. This relationship is very interesting to examine because in traditional product business, it is believed that as time progresses, more and more customers stopped buying, while less and less customers started buying, resulting in a natural death of the business. It is believed that products behaved as living being that naturally deteriorates, and the most prominent theory in this field is the wide-known Product Life Cycle theory which is commented by Kotler and Armstrong (2006:273)⁶ as the lifespan of a product and service from which they are born, grow, mature, and then decline, just like human beings or animals. It runs on the assumption that every product is mortal: they will be born, growing, maturing, and then dies.

Former studies have vouched that Product Life Cycle theory is valid in many common market situations, but limited studies had been conducted regarding the life cycle of service industry itself. Does the natural deterioration also occur in the service businesses as well? The distinctive factor that prevents services to be directly applied to the Product Life Cycle theory is the tangibility and the durability of the offer. By offering a physical product, customers might stop using the product involuntarily when the value of the product has been exhausted by usage (for example, consumables) or because it simply breaks down physically. However with service industries, this may not be the cause as services offer intangible products which quality supplied remain constant throughout the time. Services do not deteriorate physically over time unlike products and therefore there should be no reason for

⁵ Saleh, K. (2016). Customer acquisition vs. retention costs – statistics and trends. Retrieved from <http://www.invespero.com/blog/customer-acquisition-retention/>

⁶ Kotler, P., & Armstrong, G. (2006). *Principles of marketing (14th ed.)*. New Jersey: Prentice Hall.

customers to stopped using the service involuntarily as services are not physically exhaustible. This suggests that customers who stopped using the service, stopped voluntarily. The customers decided to disadopt the service with their own volition rather than because of the deterioration of physical quality of the service offered itself.

Similarly, many contributions have been made to research the uptake of Product Life Cycle, such as the well-known “Diffusion of Innovations” theory by Rogers (1995)⁷ which divides the customers into five categories from: Innovators, Early Adopters, Early Majorities, Late Majorities, to Laggards with a similar pattern with the Product Life Cycle. However, the decline in the adoption of an innovation is treated as a given where Rogers (1995), then, coined the term of discontinuance which is described as “*decision to reject an innovation after having previously adopted it*”. In other sense, this can also be defined simply as the opposite of adoption, or disadoption. The literature gap in translating the application of the Product Life Cycle to the services industry and the scarcity of the literature in the decline of adoption motivates the author to explore the decline phase in the Product Life Cycle of services industry.

This research weighs upon the cause-and-effect relationship between two variables: disadoption rate and new adoption rate. Indeed, there are many causes of customers to stop adopting a service as there are many causes of customers to disadopt a service. Regardless of the causes that drive the high disadoption that varies between industries, this research aims solely on examining whether high disadoption rate plays a significant effect on adoption rate or not. The main hypothesis of this research is that over time, higher disadoption rate negatively affects the new adoption rate in the service offers. If this is the case, the main cause of the natural decline in product lifecycle of services can be explained more clearly.

⁷ Rogers, Everett M. (1983). *Diffusion of innovations (3rd ed.)*. New York: Free Press of Glencoe.

With that in mind, this research proposes three main questions:

1. Does high disadoption rate have a significant effect on the new adoption rate, causing the decline in Product Life Cycle of services?
2. Does the service age have a significant effect on the new adoption rate?
3. Are there any interaction effects between disadoption rate and service age?

The second and third questions are asked because it is essential to separate the effect of the disadoption rate and the time effect of the disadoption rate. By isolating the time effect from the total effect, the cause-and-effect relationship of the disadoption rate and the adoption rate can be established more clearly.

Due to the wide area that services industry covered, the author would like to limit the industry scope by focusing on the mobile games industry, a relatively new sector that has been growing rapidly due to the high demand of mobile phone users⁸, where the Compound Annual Growth Rate (CAGR) of global games market are projected to rise by an average 6.6% in 2015-2019. The mobile game industry, especially, has a high projected growth which will have 34% of market share of the global games market in 2019 compared to 24% in past 2015. The other reason why the mobile game industry is selected is because of the high connectivity of the service adopters through the internet, enabling the cause-and-effect relationship to be identified more straightforwardly. By using the mobile game industry as a context, this research aims to generalize the findings to examine the decline in the Product Life Cycle of the service industry. Ultimately, the significance of this research is to achieve a better understanding of the behavior of all two components of the customer attrition rate, thus managerial strategies to minimize customer attrition rate can be discussed and formulated.

⁸ Newzoo. (2016, April 21). Global games market report. Retrieved from <https://newzoo.com/insights/articles/global-games-market-reaches-99-6-billion-2016-mobile-generating-37/>

Literature Review

This section will examine the previous theories and arguments that have been proposed regarding the author's topic. The literature review will be divided into five subparts: 1) Product Life Cycle, 2) Service Life Cycle, 3) Diffusion of Innovation, 4) Gartner's Hype Cycle and 5) the mobile game industry. In each of the subparts, the contribution of these theories to the study would be elaborated.

2.1. Product Life Cycle

The concept of "Product Life Cycle" has been discussed and applied for the past few decades and it claims that products will inevitably go into the decline phase over time. The Product Life Cycle is depicted in Figure 1. There are four stages of Product Life Cycle: 1) Introduction, 2) Growth, 3) Maturity and 4) Decline (Anderson and Zeithaml, 1984:5-24)⁹ and in each stage, companies should try to formulate the most appropriate strategies. The main function of the Product Life Cycle itself is not to forecast the life cycle of the product itself, but rather to help decision makers to plan and formulate the policy (Polli and Cook, 1969: 386)¹⁰. In each stage of the Product Life Cycle, the business strategies formulated may vary to each other. This is supported by Hofer (1975: 798)¹¹ who proposes that: "*the most fundamental variable in determining an appropriate business strategy is the stage of the product lifecycle*". In the maturity phase, or the phase before the customers stopped using the product into the decline phase, Hofer (1975: 799) proposed that the two major determinants of business strategy in this phase will be the nature of buyer needs and the degree of product

⁹ Anderson, C., & Zeithaml, C. (1984). Stage of the product life cycle, business strategy, and business performance. *The Academy of Management Journal*, 27(1), 5-24. DOI: 10.2307/255954

¹⁰ Polli, R., & Cook, V. (1969). Validity of the product life cycle. *The Journal of Business*, 42(4), 385-400. Retrieved from <http://www.jstor.org/stable/2351877>

¹¹ Hofer, C. (1975). Toward a contingency theory of business strategy. *The Academy of Management Journal*, 18(4), 784-810. DOI:10.2307/255379

differentiation. In the decline phase the major determinants vary from buyer loyalty, the degree of product differentiation, the price elasticity of demand, and the company's share of the market, product quality, to marginal plant size. These abovementioned factors may influence the customers stopping decision to buy a product, especially during the maturity and decline phase.

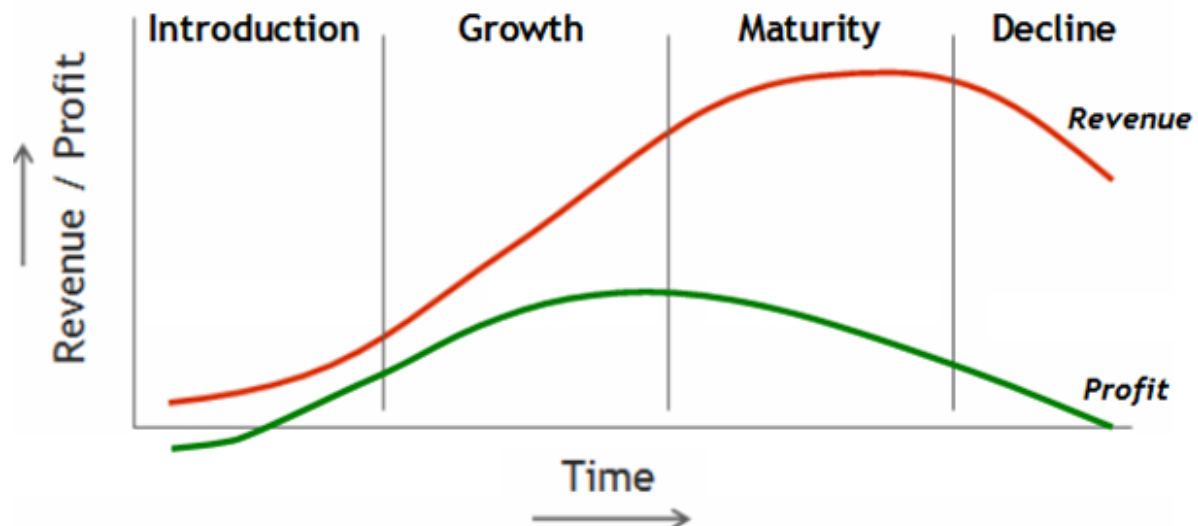


Figure 1: Product Life Cycle
Source: Kotler and Armstrong (2006:273)¹²

Polli and Cook (1969) confirm that Product Life Cycle is a valid model of sales market that works under the condition of: “... in the case of different product forms competing for essentially the same market segment within a general class of products”. It is also essential to 1) define the definition of the product itself as it can be distinguishable into product classes, product forms, and brands, and 2) the demand and supply factors on sales when demand is the more dominant influence. Further literature study reveals that one of the most common misleading assumptions of the Product Life Cycle is that the decline phase is regarded to be irreversible and the best strategy is to milk dry all the remaining profits and then exit the business. Dhalla and Yuspeh (1976)¹³ proposes a counter-argument that it is not

¹² Kotler, P., & Armstrong, G. (2006). *Principles of marketing (14th ed.)*. New Jersey: Prentice Hall.

¹³ Dhalla, N.K., Yuspeh, S. (1976). Forget the product life cycle concept. *Harvard Business Review*. 54(1), 102-112. Retrieved from <https://hbr.org/product/forget-the-product-life-cycle-concept/76104-PDF-ENG>

unusual that products can gain “second life” which implies that it is possible to drive the product from maturity phase to another curve of introduction phase, with the help of a brilliant marketing strategy. These marketing strategies are hinted by Levitt (1965)¹⁴, for example, re-packaging, discounting, re-branding, and expanding abroad. Therefore, Product Life Cycle must be utilized carefully so the business stakeholders do not make the wrong decision to neglect the potential products that may be able to be revitalized.

Understanding how the traditional Product Life Cycle works, especially the decline phase, is the first step before then exploring the application of the Product Life Cycle theory into the service industry.

2.2. Service Life Cycle

It is true that many studies have been done regarding the Product Life Cycle and its validity. But especially in the decline phase of Service Life Cycle, very few contributions have been made regarding the nature of the voluntary disadoption of service where customers decided to stop using a service even though the service is still being offered. The previous contribution was also rather limited on one industry. Avlonitis et al. (2005: 700)¹⁵ after Channon et al. (1986)¹⁶ made a significant contribution on identifying three major differences of the Product Life Cycle and Service Life Cycle in financial services industry, which are: 1) Product Life Cycle in service industry may have shorter introduction stage, because services are relatively easy to be imitated compared to products, 2) it is more difficult to eliminate services, as there are existing service users that have been subscribing to the service, and 3) easier to do multi-service amalgamation, or can be repositioned more easily.

¹⁴ Levitt, T. (1965). Exploit the product life cycle. *Harvard Business Review*, 43, 81-94. Retrieved from <https://hbr.org/1965/11/exploit-the-product-life-cycle>

¹⁵ Avlonitis, G. J., Indounas, K. A., & Gounaris, S. P. (2005). Pricing objectives over the service life cycle: some empirical evidence. *European Journal of Marketing*, 39(5/6), 696-714. DOI 10.1108/03090560510590773

¹⁶ Channon, D.F. (1986). *Bank strategic management and marketing*. Chichester: John Wiley & Sons Ltd.

The decline in Service Life Cycle, specifically, has been analyzed from two points of view: the customers and the service providers. From the customers' point of view, Piccoli (2001:39) introduced the Customer Life Cycle that consists of four phases: 1) Requirement Phase, 2) Acquisition Phase, 3) Ownership Phase, and 4) Retirement Phase¹⁷. The Customer Life Cycle itself is also intended to formulate the business strategy, specifically to “differentiate your offer at any of the stages that your customer experiences in researching, acquiring, owning, and disposing your product or service” (Piccoli, 2001:38). On contrary Papastathopoulou et al. (2012:846)¹⁸, argues that service providers can also choose to stop providing the service at any timeframe within the four stages of Product Life Cycle. This term is called service elimination decision, and the process consists of four stages: 1) services are screen against audit criteria, 2) rejuvenation to restore from the deviant performances, 3) evaluate the elimination impact, and 4) decide the timing and the elimination strategy.

However, these two types of research only cover the customers' involuntary disadoption of the service where 1) the customers have finished using the service so they stopped, or 2) the service provider terminated the service so the customers cannot use it anymore. Again, it is perplexing to discover that the amount of the literature in the application of Product Life Cycle in service industry is very scarce and rather limited to financial services industry. This brings the potential for the pool of literature to be enriched with the application of Product Life Cycle theory into various service industries as the service industry is vast and growing.

¹⁷ Piccoli, G., Spalding, B. R., & Ives, B. (2001). The customer-service life cycle: a framework for improving customer service through information technology. *Cornell Hospitality Quarterly*, 42(3), 38-45. DOI:10.1177/0010880401423004

¹⁸ Papastathopoulou, P., Gounaris, S. P., & Avlonitis, G. J. (2012). The service elimination decision-making during the service life cycle: Some pilot empirical evidence. *European Journal of Marketing*, 46(6), 844-874. DOI:10.1108/03090561211214636

2.3. Diffusion of Innovation

The literature discussion of Product Life Cycle would not be complete without the Diffusion of Innovation theory, as Rink and Swan (1979:220)¹⁹ stresses the importance of the Diffusion of Innovation theory as the theoretical rationale behind the Product Life Cycle. The Diffusion of Innovation theory was introduced as it has inseparable relationship with the Product Life Cycle. This theory stems from introducing the product or services as an innovation, which Robertson (1967: 15)²⁰ categorized in three types of innovation:

1. Continuous innovation, where alteration of a product is involved rather than the establishment of a new product and the least disruptive one,
2. Discontinuous innovation, where a new product is established that requires the establishment of new behavior patterns, and
3. Dynamically continuous innovation, which falls between the previous two that a relatively new product is created but does not generally alter established patterns.

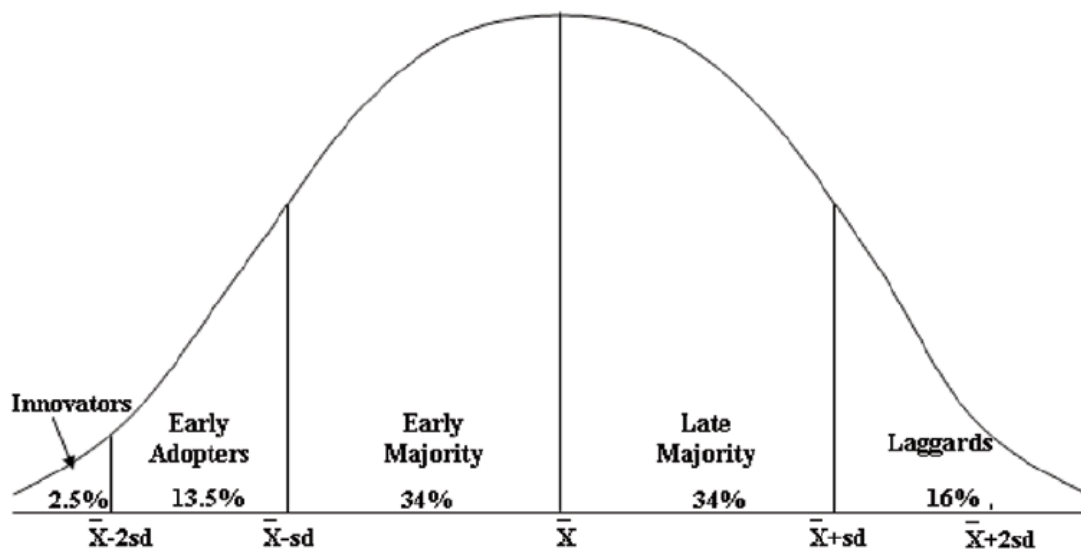


Figure 2: Adopter Categorization on the Basis of Innovativeness

Source: Rogers (1955:262)

¹⁹ Rink, D. R., & Swan, J. E. (1979). Product life cycle research: A literature review. *Journal of Business Research*, 7(3), 219-242. DOI:10.1016/0148-2963(79)90030-4

²⁰ Robertson, T. S. (1967). The process of innovation and the diffusion of innovation. *The Journal of Marketing*, 14-19. DOI:10.2307/1249295

As an innovation carries a certain level of novelty that has some unfamiliarity, the innovation is diffused over time through a process. The sociologist Everett M. Rogers (1995: 262) sequenced this diffusion or adoption process orderly based on the adopter's innovativeness with a diffusion curve that is essentially a normal curve of distribution. This diffusion curve classifies the adopters into five categories, three to the left of the mean and two to the right of the mean. Rogers referenced adopters who came first in the adoption process as innovators, and it stretches out to laggards or those who adopt the last. Mansfield (1961:741-766)²¹ in his research of diffusion of innovations among firms in bituminous coal, iron and steel, brewing, and railroad industries, confirms the validity of the diffusion of innovation model, whereas the proportion of adopting firms increase, the adoption rate would increase as well. This means that competitive pressures from other firms would create a chain-reaction effect where 15% the innovators and early adopters would influence the other remaining adopters (85%), which then the adoption rate will snowballs. The main argument of the diffusion innovation model is to identify the characteristics of the innovators and early adopters and then concentrate the marketing and advertising resources of the innovation to persuade the opinion leaders first, saving the considerable waste of mass-marketing advertising before the penetration is achieved.

Product Life Cycle and Diffusion of Innovation go side-by-side where the product and service will enjoy Growth when the Early Majority and the Late Majority started to come in. However, there is a limitation of Roger's diffusion of innovations model. The model assumes the rate of 100% adoption in the market because the innovation is perceived as a superior alternative to existing forms or brands where it is only a matter of time before everyone adopts. In practicality, however, not everyone will adopt because the superiority if the innovation might not be perceived by the customers' mind. For example, Rogers' model was

²¹ Mansfield, E. (1961). Technical change and the rate of imitation. *Econometrica: Journal of the Econometric Society*, 29(4), 741-766. DOI:10.2307/1911817

validated by the research of Coleman et.al (1957:253-270)²² in the case where the product was deemed superior to existing products. On contrary, the validation of Rogers' diffusion of innovation model for service industry has not been discussed as much. The main similarity between Product Life Cycle and Diffusion of Innovation are the existence of the time factor in the X-axis of the graph. Both assumes that the number of adopters declines over time, and eventually become zero. This is when a product or service goes into a decline.

2.4. Gartner's Hype Cycle

Aside from using S-Curve and adoption curve models, there is another theory that plays an important role in the service industry, especially services using new technologies. Gartner's Hype Cycle adds another dimension in the life cycle of technology from the "emerging technology from user and media overenthusiasm through a period of disillusionment" until an understanding of the role and the relevance in the market is achieved (Linden and Fenn, 2003: 5)²³. Gartner's Hype Cycle connection to the S-curve and adoption curve models can be seen in Figure 3.

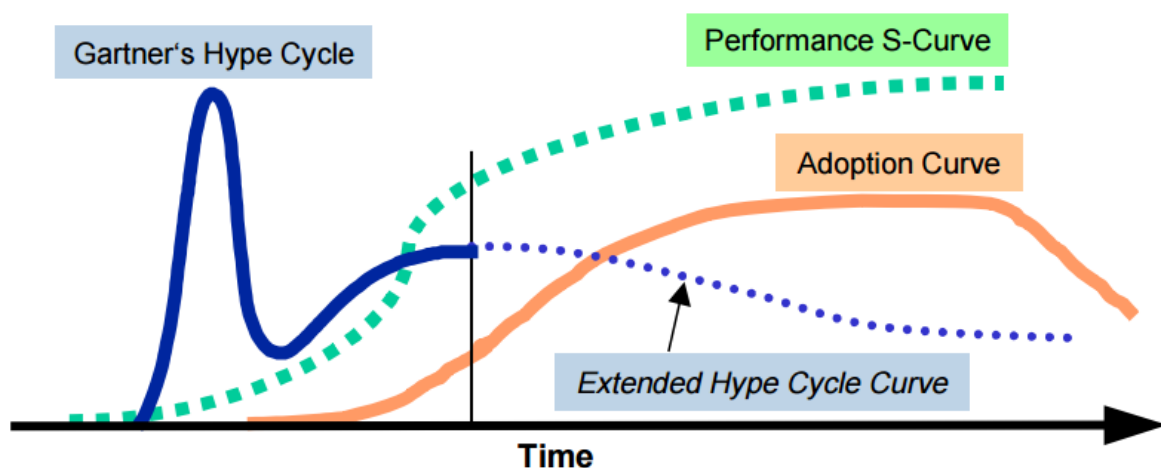


Figure 3: Technology Life Cycle Models
Source: Linden and Fenn (2003: 6)

²² Coleman, J., Katz, E., & Menzel, H. (1957). The diffusion of an innovation among physicians. *Sociometry*, 20(4), 253-270. DOI: 10.2307/2785979

²³ Linden, A., & Fenn, J. (2003, May 30). Understanding Gartner's hype cycles. Retrieved from <http://www.bus.umich.edu/KresgePublic/Journals/Gartner/research/115200/115274/115274.pdf>

Gartner’s Hype Cycle considers the human attitudes towards technology in the adoption process. It typically occurs in the early phase of the life cycle, driven by vacuous hype mainly by the media which speculates the technology’s prospects and raises the expectation of the customers (“On the Rise”). As the problems with the first-generation products become visible and the technology is unable to meet with market’s overinflated expectations, it is rapidly discredited and slides into the “Trough of Disillusionment”. When improvements are made, it climbs to the “Slope of Enlightenment” and then entering the “Plateau of Productivity” where the mainstream adoption begins. Gartner’s Hype Cycle is presented in Figure 4.

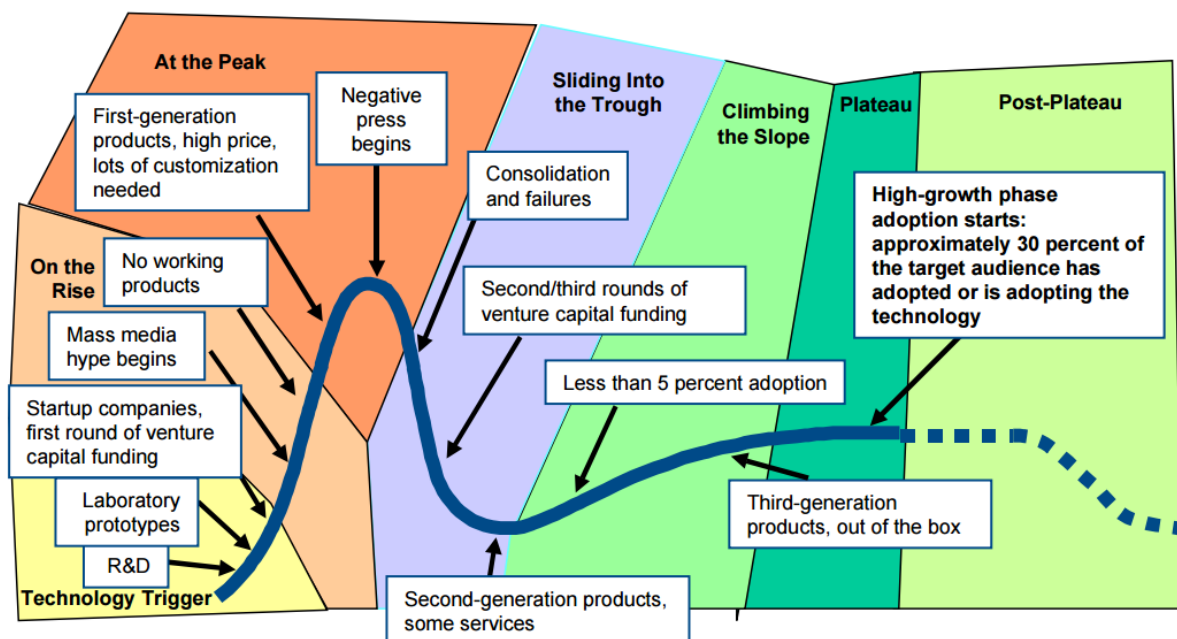


Figure 4: Gartner's Hype Cycle
 Source: Linden and Fenn (2003:7)

The Hype Cycle itself can be seen as a measurement of knowledge and risk. At the earlier stages of the cycle, little to none is known about the costs and the benefits of the technology, while during the latter stages of the cycle more information can be obtained therefore enabling the customers to make better decisions. Gartner’s Hype Cycle argued that new technologies will inevitably go through the Hype Cycle, but with three categories of different adoption speeds:

1. Fast Track, where technologies go through the Hype Cycle within two to four years. Typically the benefits of these new technologies can be seen much easier and adopted without much fanfare.
2. Long Fuse, where technologies may take one or two decades to go through the Hype Cycle. These new technologies are more sophisticated and need more time to develop.
3. Normal, where technologies traverse through the Hype Cycle within five to eight years. These new technologies' properties fall in between the former two categories.

The author specifically introduced this theory as the mobile game industry is heavily reliant on technology. Also, as it will be introduced in later parts, the case of the mobile game industry that the author selected has been highly anticipated, which satisfy the condition of the Gartner's Hype Cycle. All in all, the introduction of a new technology application in the mobile game industry will have a very close relation with Gartner's Hype Cycle.

2.5. Mobile Game Industry

This sub part will explain the current literature review on the mobile game industry. In the traditional games industry, typically the service offered to the customers, or players, are exhaustible. This means that when the game main storyline is finished, then the customers will automatically stop using the service as the game value has been exhausted. However, nowadays there are most mobile games are non-subscribing, non-exhaustible service in respect that the game that has no ending story. It continues as long as the game developers update the game periodically.

In the mobile games industry, game developers mostly utilize the freemium business model, where basic services of the game are provided free of charge while more advanced features of the game must be paid for. The mobile game can be downloaded for free in the App Store or Google Play Store, but other features can be purchased in the application, which

is called in-app purchase, and it's one of the two revenue streams of mobile game developers. The other revenue stream comes from advertisement, where other business developers advertise on the mobile game.

The mobile game industry is quite different to the traditional console game industry as the mobile games usually won't have any completion point. Therefore, in mobile game replayability must be redefined as the way to keep the game value high in order to extend the player's interest towards the game. Wolf (2012)²⁴ defined replayability itself as the game value to be played for the second time after the first completion. Frattesi et al. (2011:20-28)²⁵, elaborated that there are five specific aspects that can drive the players to replay a game, which are:

1. The Difficulty, which is an increasing difficulty curve throughout the game to keep the player challenged and engaged.
2. Completion, which is making the game impossible to reach 100% completion in one play through, such as creating specific achievements or non-linear story plots.
3. Social Aspects, that revolves around hype, discussion, and increased playtime to become the best player around the player's circle.
4. Randomization, which is making a certain variable of the games random to keep the game interesting and unpredictable.
5. The Experience, which is bringing something unique to the player by developing an emotional or spiritual connection between the player and the game or giving the player some aspects to individualize their gaming experience.

²⁴Wolf, M. (2012). *Encyclopedia of video games: The culture, technology, and art of gaming* [E-Reader Version]. Retrieved from <https://books.google.com/books?id=deBFx7QAwsQC>

²⁵ Frattesi, T., Griesbach, D., Leith, J., Shaffer, T., & DeWinter, J. (2011). Replayability of video games. IQP, Worcester Polytechnic Institute, Worcester. Retrieved from https://web.wpi.edu/Pubs/E-project/Available/E-project-051711-130604/unrestricted/Replayability_of_Video_Games_2011.pdf

In the games industry, game developer mainly emphasizes on the game replayability values to delay the service discontinuation phase. Thier (2016)²⁶ argued that there are six strategies that mobile game developers use: 1) Player vs. Player, 2) Daily Challenges, 3) Difficult AI Opponents, 4) High-priced Customization Objects, 5) Collectibles, and/or, 6) Releasing more single-player content. In mobile game industry, game developers can update their games regularly by releasing an update pack, therefore making it possible for the developers to reinvigorate the quality of the service, unlike products which quality deteriorate over time. As the mobile game industry is relatively an emerging industry, previous literature in this area is very scarce and academic paper writing about this topic is non-existent. The concrete connection between the mobile gaming industry and the diffusion of service was not previously researched.

From several key literatures that have been elaborated above, it is clear to see the importance of the proposed research. As the economy dominated by the service industry, it is perplexing to see the lack of the literature pool especially in the application of the Product Life Cycle in services industry aside from financial services. This research is very different from the previous researches as it explores the decline phase in the Product Life Cycle of services by coupling with Diffusion of Innovation theory and applying the concept with the emerging mobile game industry. The model of minimizing net attrition rate was also different where traditional customer retention rate was mostly used the measurement model. The trend of service industry dominating the economy will continue as well as the rise of mobile game industry in the future, therefore this research aims to provide more contributions to the pool of the literature on diffusion of services in general, and mobile gaming industry market in specific.

²⁶ Thier, D. (2016, September 22). 'Pokémon go' has been dethroned in the app store because it has no endgame Retrieved from <http://www.forbes.com/sites/davidthier/2016/09/22/Pokémon-go-has-been-dethroned-in-the-app-store-because-it-has-no-endgame/#482dd7362c52>

Conceptualization of Research

Just like a product, service declines over time. The objective and focus of this research are to examine the decline in the product life cycle of the services industry. It aims to provide the information on the service disadoption in the mobile gaming industry specifically on its effect on the new adoption. This section aims to elaborate more on the disadoption, or the process of the customers rejecting an innovation (which in this case is service) after first adopting it (Rogers, 1995: 182)²⁷. Rogers elaborated that there are two causes of service disadoption: replacement or disenchantment, where replacement is defined as a decision to reject the innovation because there is a better product that supersedes it and disenchantment is to reject the innovation because of performance dissatisfaction.

Decline itself can be quantified using the Net Attrition Rate, which can be written in the formula as follows:

$$\text{Net Attrition Rate} = \text{Gross Attrition Rate} - \text{Customer Acquisition Rate}$$

Libai (2009), then formulated Roger's concept as the gross attrition rate, consisting of disadoption rate (due to disenchantment) and churn rate (due to replacement).

$$\text{Gross Attrition Rate} = \text{Disenchantment Rate} + \text{Churn Rate}$$

As net attrition rate is influenced by the number of customer inflow (adopters) and outflow (disadopters), it is important to note that decline in the service industry is not only caused by the existence of disadopters but also the adopters. If the Net Attrition Rate is positive, it means that businesses lose old customers more than they can gain new customers. Therefore, it is important for every business to minimize the Net Attrition Rate.

²⁷ Rogers, Everett M. (1983). *Diffusion of innovations (3rd ed.)*. New York: Free Press of Glencoe.

As argued, services which do not deteriorate over time as the quality of the service supplied remained constant, unlike product. In the mobile game industry, it is also possible to reinvigorate the quality of the service by simply updating the game over time. However, still there are some services that decline and exited the market. Indeed, this may be the result of the disenchantment or churn, but if so the number of new adopters should be able to compensate the reduction from the disadopters. The thought-provoking argument of the theory is that the numbers of new adopters do not surge over time, and it may be that the disadoption rate indeed affects the adoption rate, therefore forcing the service to decline naturally. Is there really a significant effect from disadopters that prevent the potential adopters to start adopting a service? Therefore, the central hypothesis of this thesis is:

H1:

Demand for service declines when the customers are dissatisfied with the service or switched competitor or technology replacement, reducing the number of the new adopters.

This is why then the mobile game industry is ideal for this research, as mobile games are different from the traditional game because the players are connected to each other with mobile internet. In this case, the adopters and the non-adopters can influence each other easier rather than a closed traditional game. From Liebenstein (1950)²⁸'s theory of customers' demand, the mobile game industry can be categorized into the bandwagon effect where "*the demand of the commodity is increased due to the fact that others also consuming the same commodity*". In essence, larger the number of the current adopters, the number of new adopters will also increase. However, this is not everlasting as at some point the service declines due to the low number of customers. The reverse of this bandwagon theory is called social taboos where "*some people will not buy and consume certain things because other*

²⁸ Liebenstein, H. (1950). Bandwagon, snob, and veblen effects in the theory of consumers' demand. *Quarterly Journal of Economics*, 65, 183-207. Retrieved from <http://www.jstor.org/stable/pdf/1882692.pdf>

people are not buying and consuming these things". This means that the larger the number of the current non-adopters, the larger the number of future non-adopters will be as well. However, both Liebenstein's bandwagon effect and social taboos phenomenon do not explain the relationship between the disadopters, especially the voluntary ones, and the new adopters. It might be that the disadopters are influencing the potential adopters not to adopt at all, which why H1 is formulated to tackle this phenomenon empirically.

It is also important to consider the time as another variable that may affect this phenomenon. In the Product Life Cycle theory, products decline over time. Therefore, isolating the time variable from the decline will make the cause-and-effect identification easier. Time or service age is can be defined as the time elapsed since a service is released to the public. Do new services gain higher adoption rate compared to mature or old services? Is time a moderating effect that causes disadoption rate to impacts the adoption rate differently? This leads to the formulation of the second and third hypothesis:

H2:

There is a significant effect of service age on the new adopters in the service industry.

H3:

There is an interaction effect between disadoption rate and service age.

Hypothesis 1 aims to fulfill the research objective by providing a clearer explanation of the cause of the decline in the Product Life Cycle of the service industry, which was built on the previous literature reviews by establishing the existence of a cause-and-effect relationship between adoption rate and voluntary disadoption. Hypothesis 2 detects the effect between adoption rate and service age, and Hypothesis 3 checks the interaction effect between disadoption rate and service age.

Based on the theoretical background, literature reviews, and the hypotheses, the conceptual framework of the research can be summarized as shown in Figure 5.

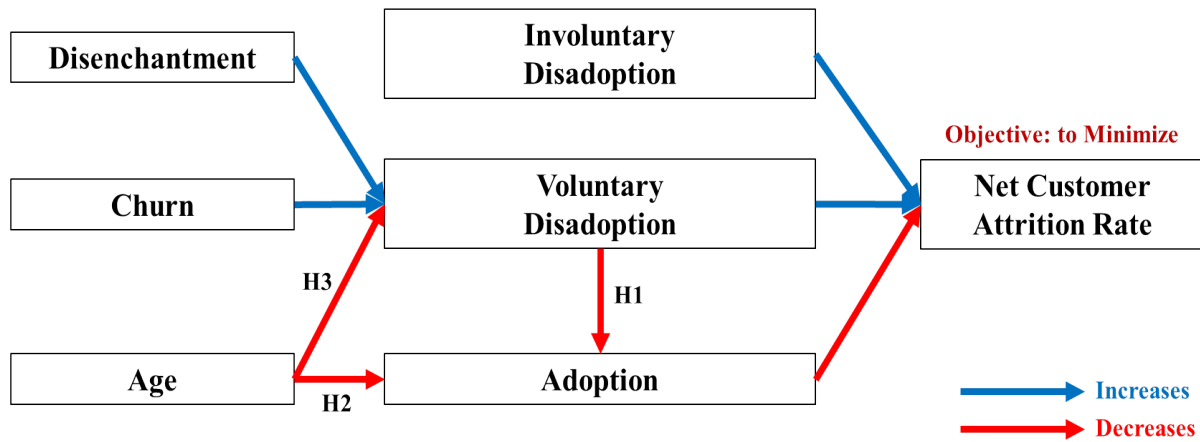


Figure 5: Conceptual Framework

These three hypotheses will be focused on the mobile game industry, which means that adoption will be translated into “playing the mobile game”, voluntary disadoption will be translated into “stopped playing game voluntarily”, and age will be translated into “time of release” of the game. The proposed title of this thesis would be “Exploring the Decline Phase in the Product Life Cycle of Services: Case of Mobile Game Industry in Japan”.

Methods

4.1. Case Study

In order to have a deeper understanding of decline in the service industry, the author has selected a case study method, selecting one specific game in the mobile game industry. The selected mobile game was Pokémon Go, an augmented-reality (AR) geo mobile game that which was released by Niantic Labs in July 2016. Pokémon Go is a geo mobile game where players have to roam the real world to searching virtual creatures known as Pocket Monsters, or abbreviated as Pokémon. The Pokémon will appear on the player's phone screen if the player is close enough to where the Pokémon had spawned location-wise, using the GPS feature of the mobile phone. The players then will try to catch them.

Pokémon Go itself can be categorized as a discontinuous innovation as the location-based gameplay coupled with the augmented reality creates a new behavior pattern. This has created a worldwide phenomenon where players are gathering around in the previously deserted park and exercising to find rare Pokémon all around the vicinity, which also helped local businesses to grow due to increased foot traffic. Pokémon Go also attracts a lot of attention from the media, not only because of its unique gameplay but as well as several controversies as there are many accidents occurred because of the game.

When Pokémon Go was released, the server was experiencing heavy traffic due to the high demand (Thier, 2016)²⁹. Only in few days after the initial release, the number of the players has increased dramatically. It bypasses the Gartner's Hype Cycle straight to Plateau of Productivity and soon Pokémon Go became the biggest mobile game ever in United States (Kain, 2016)³⁰.

²⁹ Thier, D. (2016, July 7). 'Pokémon GO' servers down for many. Retrieved from <https://www.forbes.com/sites/davidthier/2016/07/07/pokemon-go-servers-seem-to-be-struggling/#61e96fca61e9>

³⁰ Kain, E. (2016, July 13). 'Pokémon GO' is the biggest mobile game in US history - and it's about to top snapchat. Retrieved from <http://www.forbes.com/sites/erikkain/2016/07/13/Pokémon-go-is-the-biggest-mobile-game-in-us-history-and-its-about-to-top-snapchat/#28f6c5b1722b>

Pokémon Go was initially only Google’s April Fool Joke at 2014, but due to the positive reception and the presence of the demand, the game was developed and highly anticipated (Dang, 2016)³¹. However, as soon as one month after the release dates, Pokémon Go player has reached its saturation point and begin to deteriorate until today (Blake, 2016)³².

There are three reasons why Pokémon Go was appropriate for this research. First, the number of Pokémon Go worldwide active players from the initial release on July 5th, 2016 onwards clearly resembled the Product Life Cycle pattern (as seen in Figure 1).

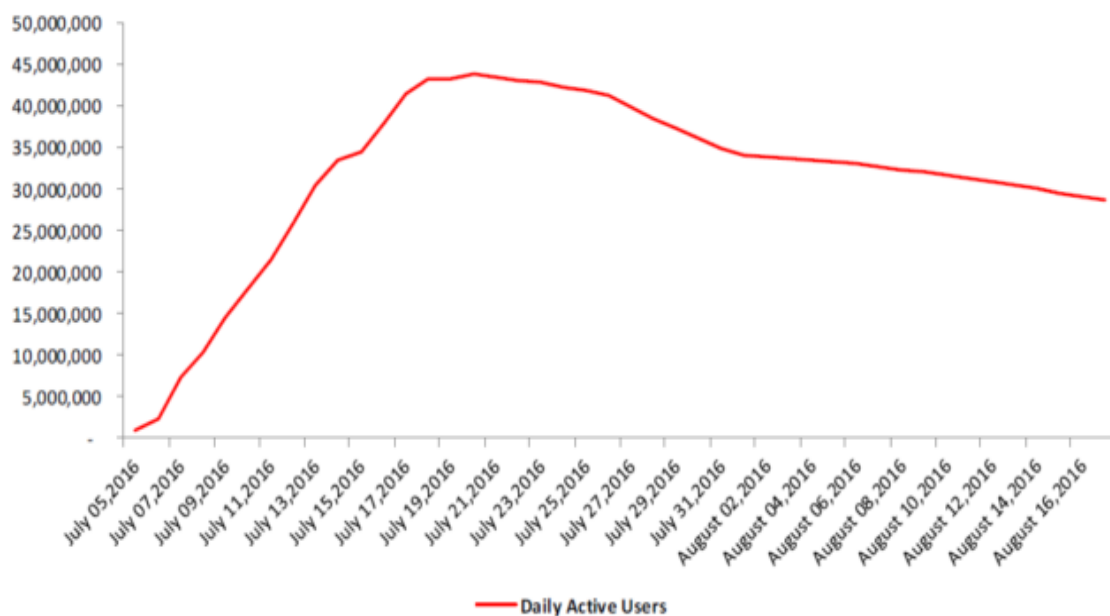


Figure 6: Daily Active Users of Pokémon Go in the United States (July - August 2016)
Source: Gamerant (2016)

Second, Pokémon Go offers the social benefit where players can play together with their friends, which signals the presence of bandwagon effect and social taboo effect in the game mechanics. Finally, Pokémon Go is not a specific “game for gamers only” which means any gender and any age can play this game provided that their smartphones are connected to the internet.

³¹ Dang, L. (2016, July 13). Pokémon go was basically just an April Fool’s joke at google in 2014. Retrieved from <http://nextshark.com/pokemon-go-google-april-fools-2014/>

³² Blake, B. (2016, August). Pokémon GO has lost over 15 million daily users. Retrieved from <https://gamerant.com/Pokémon-go-lost-15-million-users/>

A cross-sectional study done by a mobile game research company proved that Pokémon Go is played by all age range, despite the larger amount of younger players (Figure 7). Rogers (1995:273) explained that earlier adopters are more highly interconnected through personal networks in their social system rather than the late adopters, therefore justifying this behavior. This means the results of this research could be easily generalized into the whole service market as it follows the characteristics of the early adopters.

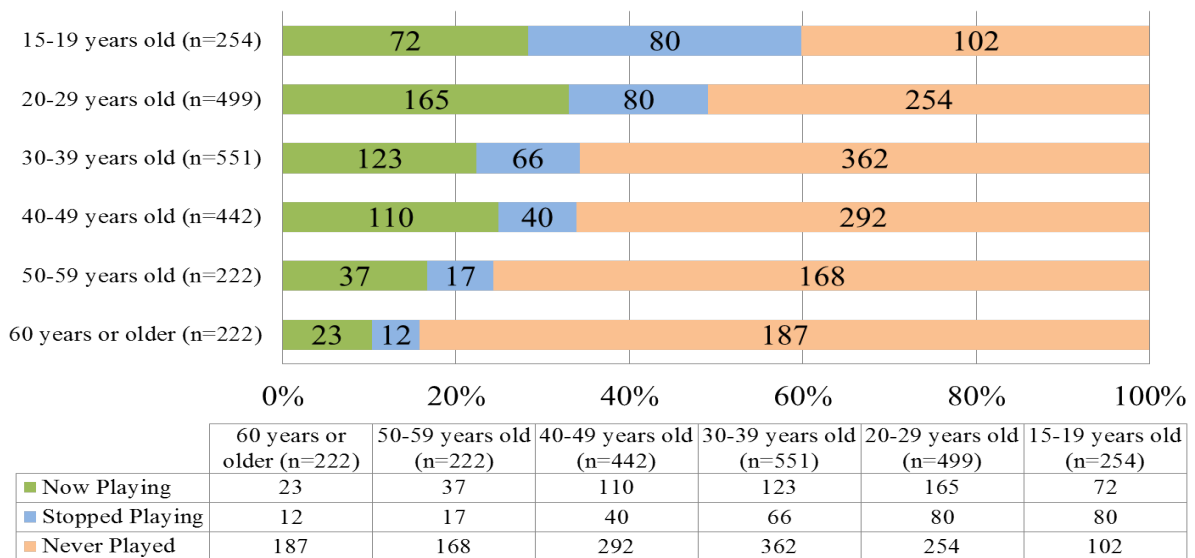


Figure 7: Demographics of Pokémon Go Players in Japan (August 19th – August 26th, 2016)
Source: MMD Laboratory Japan (2016)

4.2. Mixed Approach Method

The selected research method was a mixed approach where the qualitative method was used as the theoretical research using both primary and secondary data to research the high disadoption rate Pokémon Go, while the quantitative method was as the empirical research using primary data to research the low adoption rate of Pokémon Go. This mixed-approach followed a sequential exploratory strategy with “*an initial phase of qualitative data collection and analysis, followed by a phase of quantitative data collection and analysis with the survey*” (Creswell and Clark, 2007:86)³³.

³³ Creswell, J. W., & Clark, V. L. P. (2007). *Designing and conducting mixed methods research*. United States: SAGE Publications, Inc.

The qualitative method was a document screening method where the author collected secondary data from cross-sectional study research by MMD (Mobile Marketing Data) Laboratory Japan, a Japanese mobile application research company, and mobile gaming intelligence services to obtain the necessary metrics such as number of players, number of downloads, weekly ranking, and reviews. Interviews were also conducted to Pokémon Go players in Japan to identify the cause of the disadoption of Pokémon Go.

Two-by-three experimentation model was selected as the quantitative method where ‘disadoption rate’ and ‘time of release’ variables are manipulated in order to evaluate its cause-and-effect relationship with the adoption rate. This three-levels experimentation model was previously done by Sheikh and Beise-Zee (2011:27-39)³⁴ where the level of the corporate social responsibility and the cause affinity as independent variables were manipulated in order to determine the comparative effect on the customer’s attitude. In this research, the independent variable ‘disadoption rate’ had two levels: low and high, while the independent variable ‘time of release’ had three levels: 3 months, 8 months, and 18 months, therefore creating six experiment groups as described in Table 1.

A hypothetical mobile game was used in the questionnaire design to minimize possible bias or other emotional association towards Pokémon Go. The hypothetical game was described to be a well-made game, where the time of release information varies from 3 months (Scenario 1 and 2), 8 months (Scenario 3 and 4), and 18 months (Scenario 5 and 6). Other information that was given differently was that the game has either the low disadoption rate of 10% (Scenario 1, Scenario 3, and Scenario 5), or high disadoption rate of 40% (Scenario 2, Scenario 4, and Scenario 6).

³⁴ Sheikh, S. U. R., & Beise-Zee, R. (2011). Corporate social responsibility or cause-related marketing? The role of cause specificity of CSR. *Journal of Consumer Marketing*, 28(1), 27-39. DOI:10.1108/07363761111101921

Table 1: Two-by-three Experimentation Group Design

Experimentation Groups		Time of Release		
		3 months	8 months	18 months
Disadoption Rate	Low (10%)	Scenario 1	Scenario 3	Scenario 5
	High (40%)	Scenario 2	Scenario 4	Scenario 6

4.3. Validity Check

There were two validity checks for the experimentation: 1) *internal validity*, which checked whether the manipulation of the independent variables actually affects the dependent variable, and 2) *external validity*, which checked whether the cause-effect relationships found in the experiment can be generalized (Malthora, 2002:231)³⁵.

The internal validity of this questionnaire was ensured when both manipulations, which are the time of release and disadoption rate, are understood well. To check whether the ‘time of release’ variable worked, the author asked a control question at the end of the questionnaire: “*Finally, it was mentioned that this game has been released for 3/8/18 months. Do you think that this is a new release?*” Respondents then answer this question in Likert scale, scaling from 1 (Very Old) to 5 (Very New). The ‘disadoption rate’ variable manipulation was assumed to be understood properly since the author directly communicates that: “*This number (disadoption rate) is relatively big/small compared to the average rate*”.

The external validity of this questionnaire was achieved by using randomization technique as the sampling method. The respondents were randomized in the sense that there were no specific criteria and behavior to choose which group each respondent belongs into. By using this randomization method, it helped to ensure the groups to be free from systematical differences in any dimension (such as big money spender on the game, or either casual or maniac gamer) as the characteristic and behavior tend to be similar (Aaker et al.,

³⁵ Malthora, N.K. (2002). *Basic marketing research: Application to contemporary issues*. United States of America: Prentice Hall.

2011:317)³⁶. Also, this randomization method achieved the purpose of generalizing the findings to the general population.

4.4. Measurements

To measure the adoption variable especially in the mobile game industry, there are four measurements that were asked in the survey:

1. Play Intention, which is the central measurement of the experimentation where higher play intention means higher adoption rate in the mobile gaming industry. One item question employing 5-point Likert scale is used by asking how likely the respondents are willing to play the hypothetical game.
2. Expectation, which is measured with one item question employing 5-point Likert scale, asking how high the expectation of the hypothetical game is regardless of their playing intention.
3. Play Time, which is measured with one item question employing 5-point Likert scale, asking how frequent will the respondent play the hypothetical game more than their average playtime. Before the measurement, all respondents from all scenarios were exposed to the information that the game is interesting and addictive.
4. Purchase Intention, which is measured with one item question employing 5-point Likert scale, asking how likely the respondents are willing to spend money for the hypothetical game. Prior to the measurement, all respondents from all scenarios were exposed to the information that the game offers a good pricing point for in-app purchases.

³⁶ Aaker, D. A., Kumar, V., Leone, R. P., & Day, G. S. (2013). *Marketing research*. Singapore: John Wiley & Sons, Inc.

4.5. Sampling

Pokémon Go is a global game offered in multiple countries; however in the qualitative data collection and analysis phase, the author would like to limit his case study method research in concentrated Japan. Based on Newszoo's Global Game Market Report (2016), Japan is ranked as the third-highest game revenue contributors with 93.11% of its population online. Sensor Tower, a mobile gaming marketing intelligence site, highlights the importance of Japanese market for Pokémon Go where the number of players in Japan is only 7% of the world but made up 36% of the company's revenue through in-app purchases (2017)³⁷. Understanding the Japanese market is ideal as it is a very critical market and also provides additional value to the service provider or the mobile game developer, which is Niantic.

On the following phase using quantitative data collection and analysis, the sampling of the experimentation using a self-administered questionnaire was directed into a broader scope. This cross-sectional study used questionnaires that were distributed electronically through Google Survey general audience all across the world to determine the cause-and-effect relationship between high disadoption rate and low adoption rate. To maximize the geographical scope of the questionnaire and to minimize the loss of meaning in language translation, the questionnaires were conducted only in English. Randomization was used as the sampling technique to ensure the external validity of the questionnaires.

The data collection took place during March-April 2017, where the author contacted 100 respondents per scenario to fill questionnaires. Out of 600 contacts, the overall number of observations is 355, ranging from 52 respondents to 72 respondents per scenario, translating into an average of 59.16% response rate. The observations are distributed to each scenario as follows.

³⁷ Sensor Tower. (2017). Pokémon go - app store revenue & download estimates. Retrieved from <https://sensortower.com/ios/us/niantic-inc/app/Pokémon-go/1094591345/>

Table 2: Two-by-three Experimentation Group Design (n=355)

Experimentation Groups		Time of Release		
		3 months	8 months	18 months
Disadoption Rate	Low (10%)	Scenario 1 (n=52)	Scenario 3 (n=57)	Scenario 5 (n=72)
	High (40%)	Scenario 2 (n=60)	Scenario 4 (n=53)	Scenario 6 (n=61)

4.6. Pilot Study

A pilot study was conducted in order to test the effectiveness of the test: 1) whether the questions are easy to understand and 2) whether the manipulations worked. More importantly, the pilot test helped the author to develop to calibrate the value of the independent variables. The initial experimentation model was two-by-two, where the time of release variable consisted only of two levels: 3 months (new) and 6 months (old), while the disadoption rate variable was 15% (low) and 40% (high). Four versions of the questionnaires were developed, and a pilot study was launched to 12 respondents, each 3 respondents per questionnaire version. After filling it out, the author conducted a short conversation and asked the respondents' overall impression of the questionnaire. As an outcome, the independent variable values were calibrated to reflect the perceived value of the respondents. The disadoption rate of 15% was perceived to be slightly high, so the author reduced it into 10%. With 6 months as the time of release, the game was considered as new, thus the author extended it into 8 months and redistributed the modified two versions (8 months' time of release, 15% disadoption rate and 8 months' time of release, 40% disadoption rate) to each 3 more new respondents. Most respondents perceived 8 months' time of release to be somewhat old, with some indifference answers. Thus, to make it more decisive, the author developed the model into two-by-three experimentation model by adding the extreme 18 months' time of release into the experimentation model design. The wording of the questionnaire was proofread by a native English speaker and was also refined in this stage.

Findings

Both qualitative and quantitative research using primary and secondary data is presented in this section, using Pokémon Go as the case study method. In this section, the decline of Pokémon Go will be presented from three perspectives, segregating the chapter into three subparts: 1) customer attrition rate calculation, 2) the high number of disadopters, and finally the pivotal point of the research: 3) the low number of adopters.

5.1. Net Attrition Rate

Measuring the exact number of the disadoption rate and the adoption rate of Pokémon Go is a difficult task because the data is only available to the game developer, or in Pokémon Go's case, Niantic Labs. Another challenge that emerges is that since Pokémon Go is a mobile game that can be downloaded and installed in the mobile phone for free, anyone could have downloaded Pokémon Go out of curiosity, but in fact didn't play the game. In other cases, not all players are active users. Undoubtedly, there exist occasional users who play less frequent than once a week or stopped playing due to various reasons but then continued after a while, making them an existing player that is not measured accurately in the Weekly Active Users. Thus, the number of the disadoption rate and the adoption rate are estimated with available secondary data from various sources such as mobile intelligence agencies, trusted web articles, and the Pokémon Go's developer website. As most of the data available are from cross-sectional studies, the author collects and combines the data, and then interprets the data to get a rough estimation of the disadoption rate and the adoption rate of Pokémon Go.

Spangler (2016)³⁸ showed the data from research firm Survey Monkey Intelligence that Pokémon Go’s worldwide active user has peaked in July 25th, 2016 (Figure 8) and steadily declines since. Today, in mid-April 2017, Siegal (2017)³⁹ reported that roughly four from five players have stopped playing Pokémon Go beside the developer’s effort to restore the game.

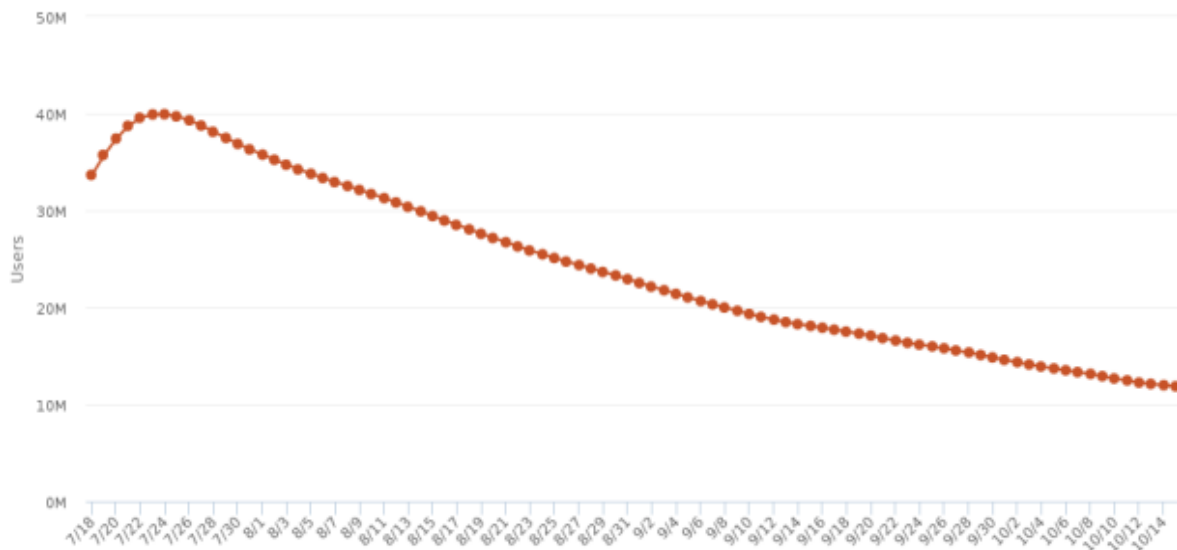


Figure 8: Weekly Active Users (WAU) of Popular Mobile Games (Worldwide)
Source: Survey Monkey Intelligence (2016)

The number of weekly active users of Pokémon Go decreased from 40 million peaks in July 2016 to 12 million in the end of October 2016. Today, the number of weekly active users of Pokémon Go is reported to be only 5 million (Ghani, 2017)⁴⁰. Therefore, since the release of the game, 35 million weekly active users are assumed to have disadopted the game, resulting in disadoption rate around 87.5%.

³⁸ Spangler, T. (2016, October 24). Pokémon Go: the inevitable cooling of mobile’s hottest property. Retrieved from <http://variety.com/2016/digital/games/pokemon-go-usage-decline-1201896904/>
³⁹ Siegal, J. (2017, April 3). Four out of five ‘Pokémon go’ users have quit. Retrieved from <http://bgr.com/2017/04/03/pokemon-go-popularity-2016-users/>
⁴⁰ Ghani, U. (2017, April 4). Pokémon GO now has 5 million daily players, fell from a monstrous 30 million. Retrieved from <http://wccftech.com/pokemon-5-million-daily-players-fell-monstrous-30-million/>

Compared to that, the number of adoption rate since the release of the game is relatively very low. Niantic Labs (2017)⁴¹ in their recent press release noted that currently, they have more than 65 million players worldwide. Compared to the peak number of the online users, which is 40 million in July 2016, this suggests that 60% of the adoption of Pokémon Go has happened only in the first month since the release. After that, in a nine-months-period from August 2016 to April 2017, the adoption rate of Pokémon Go is a mere 25 million, or the remaining 40%. Despite the seemingly high net attrition rate, Pokémon Go is reported to have a fairly high retention rate in the mobile gaming industry compared to the average game (Tucker, 2016)⁴².

According to the construct above, it is suggested that the decline in Pokémon Go happened because of: 1) higher disadoption rate and 2) lower adoption rate over time that happened simultaneously. This indicates that in the following period after the peak on July 22nd, 2016, the Customer Attrition Rate of Pokémon Go is positive, as the number of disadoption rate is greater than the adoption rate. If the number of the disadopters and the adopters were to be compared, meaning that the Net Attrition Rate between the period of August 2016 to April 2017 to be:

$$\text{Net Attrition Rate} = \text{Gross Attrition Rate} - \text{Customer Acquisition Rate}$$

$$\text{Net Attrition Rate} = 87.5\% - 40\%$$

$$\text{Net Attrition Rate} = 47.5\%$$

This positive net attrition rate is the theoretical reason why Pokémon Go went into decline. On the following two subparts, more findings regarding the high disadoption rate and the low adoption rate will be presented.

⁴¹ The Niantic Team. (2017). Thank you... Retrieved from <https://www.nianticlabs.com/blog/thankyou040717/>

⁴² Tucker, J. (2016, October 11). Study shows pokémon go has a higher retention rate than clash of clans. Retrieved from <http://www.develop-online.net/news/study-shows-pok-mon-go-has-a-higher-retention-rate-than-clash-of-clans/0225165>

5.2. High Number of Disadopters

This subpart will present the findings that explain the underlying reason of the high number of disadopters in the case of Pokémon Go. Pokémon Go does not have a direct competitor yet, so the high number of disadoption theoretically will have to be the result of disenchantment as the churn rate would be zero. Pokémon Go's performance satisfaction can be measured by the user reviews that are left on the App Store. This data can be viewed publically through mobile intelligence websites, so the author compared Pokémon Go reviews in the United States and Japan. From the information obtained in Sensor Tower (2017)⁴³, generally, Pokémon Go is not well-accepted in Japan where almost half of the players (or 46.37%) reviewed Pokémon Go as one out of five stars (31,016 out of total 66,890 reviewers). As a comparison, 'only' a quarter of the players (or 26.59%) in the United States reviewed Pokémon Go as one out of five stars (63,485 out of total 238,735 reviewers). The Japanese players reviewed Pokémon Go more negatively than United States players, where the mean of review in App Store are 2.23 and 2.74 respectively (Figure 9).

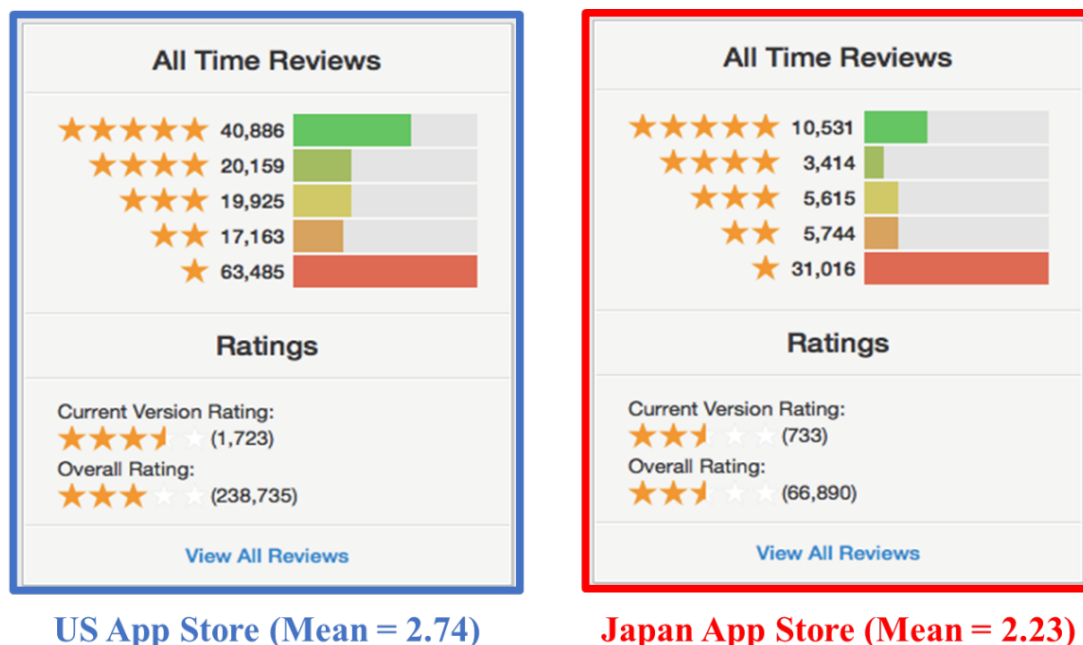


Figure 9: Pokémon Go Reviews in the US and Japan App Store
Source: Sensor Tower Intelligence (2016)

⁴³ Sensor Tower. (2017). Pokémon go - app store revenue & download estimates. Retrieved from <https://sensortower.com/ios/us/niantic-inc/app/Pokémon-go/1094591345/>

The underlying reason for this difference in reception is that Japanese mobile game players are more critical than players in another part of the world, as mentioned by Asahi Shimbun (2016)⁴⁴. This is consistent with a survey conducted by MMD (Mobile Marketing Data) Laboratory Japan presented by Jin (2016)⁴⁵ where 2,190 Japanese players rated Pokémon Go as 5.64 on a 10-points scale with a standard deviation of 2.44. The negative reviews of Japanese players peaked on October 25th, 2017 when Pokémon Go released their first-ever Halloween event worldwide where the amount of the negative reviews is almost 20 times of the positive ones (Figure 10). Even though it's not decisive, this Halloween event was received rather positively in the United States where the number of negative reviews is almost equal with the positive ones. The global event has failed to increase the positive reviews in both countries, which means that indeed the high disadoption rate is caused by dissatisfaction or disenchantment.

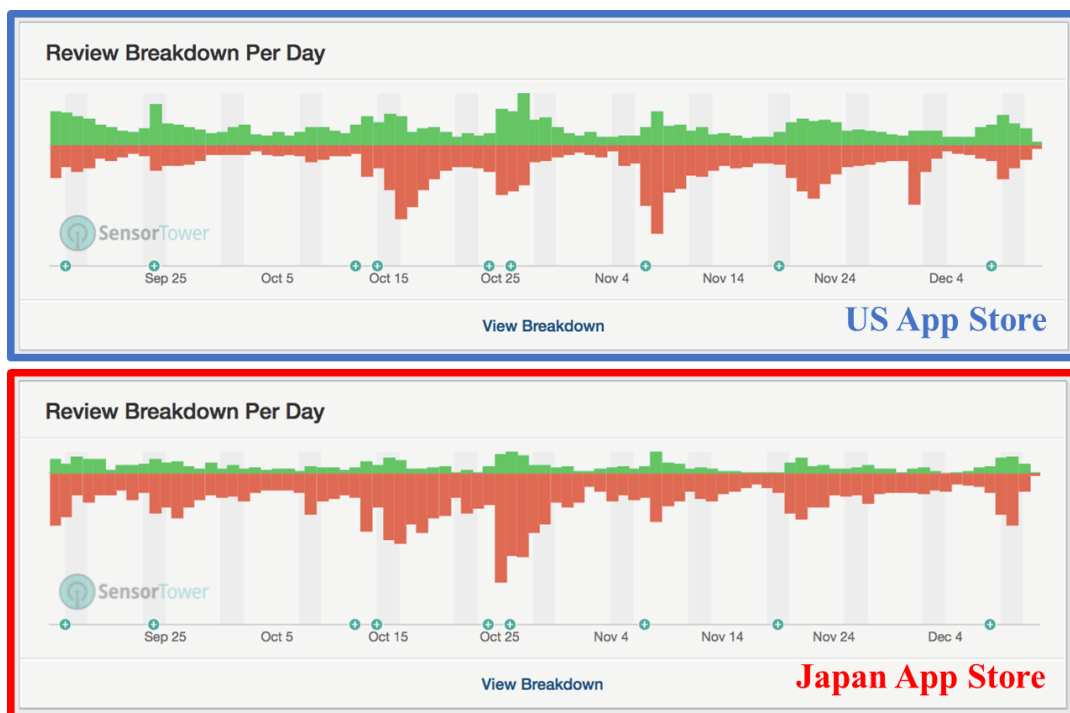


Figure 10: Pokémon Go Review Breakdown Per Day in the US and Japan App Store
Source: Sensor Tower Intelligence (2016)

⁴⁴ Asahi Shimbun. (2016, July 21). More disappointment for Japanese waiting for 'Pokémon go'. Retrieved from www.asahi.com/ajw/articles/AJ201607210007.html

⁴⁵ Jin, U. (2016, September 7). ポケモン goをやめた理由の1位「バッテリーがなくなるから」. MMD調査. Retrieved from <http://japanese.engadget.com/2016/09/07/go-1-mmd/>

The reasons for the high disadoption rate of Japanese players was reported by Jin (2016)⁴⁶ in a cross-sectional study by MMD (Mobile Marketing Data) Laboratory Japan that was conducted one month after the game was released, precisely for the period of August 19th to August 26th. This survey had 825 Japanese players as samples where the 295 of the respondents that have stopped playing were asked the reasons why. The most prominent factor of the disadopting Pokémon Go turns out to be the large consumption of battery when playing (which is agreed by 42% of the respondents). Pokémon Go as a location-based game activates the screen, mobile internet, GPS, and sometimes the camera as well to support its AR technology, which drains the battery relatively very fast. Other top reasons were ‘nothing to do at home’ (agreed by 38.3%) and ‘doing the same thing all over again’ (agreed by 37.6%). The complete reason can be seen in Table 3.

Table 3: Reasons Why Japanese Players Stopped Playing Pokémon Go

Reasons for Stopping	Number of Respondents	Percentage (%)
It drains my battery.	124	42.0%
Nothing to do at home.	113	38.3%
Doing the same thing all over again.	111	37.6%
The same Pokémon keep coming.	93	31.5%
It's dangerous to play while walking.	69	23.4%
No rare Pokémon appeared.	63	21.4%
It's a waste of time.	60	20.3%
Gym battles are not fun.	51	17.3%
No Pokémon appeared at all.	49	16.6%
It's too difficult to level up.	49	16.6%
No Poké Stop near me.	40	13.6%
Gym defenders' Pokémon is too strong.	38	12.9%
I ran out of Poké Balls.	16	5.4%
No gym nearby.	16	5.4%
People near me stopped playing.	7	2.4%
Other reasons.	37	12.5%

Source: MMD Research Laboratory (2016)

⁴⁶ Jin, U. (2016, September 7). ポケモン goをやめた理由の1位「バッテリーがなくなるから」. MMD調査. Retrieved from <http://japanese.engadget.com/2016/09/07/go-1-mmd/>

To confirm these secondary data, the author conducted a qualitative research through an interview to Pokémon Go players in Japan with one simple question: “Please tell me clearly why you stopped playing Pokémon Go?”. This interview was conducted in November 2016, four months after the game was released in Japan. In total, there were five respondents that were asked on their opinions on why they stopped playing Pokémon Go.

Table 4: Qualitative Interview with Pokémon Go Players

Respondent	“Please tell me clearly why you stopped playing Pokémon Go?”
A	<i>“Well it’s mostly it is because of time, battery, and I caught was the same Pokémon all the time!”</i>
B	<i>“It’s boring and nothing is updated until today. The game is still stagnant and on the same phase.”</i>
C	<i>“I cannot play the game properly because the game developers were not supportive enough. The tracker system feature of the game was broken and I have no way of finding the Pokémon that appeared on my radar. I relied on third-party software to track the Pokémon but that too were shut down by the developers. Why bother playing if I cannot even play properly?”</i>
D	<i>“The game gets boring after a while because you are doing the same thing over and over again every day.”</i>
E	<i>“I stopped because the GPS sometimes didn’t work, especially when you play inside of buildings, which annoys me. More than that, I think the game developers are too late to deliver updates and very slow in taking care of the hackers that roamed in the game. It disincentives me to challenge the gym because the Pokémon levels are ridiculous because of the hackers.”</i>

From this interview, the author was able to confirm that indeed the high disadoption rate was caused by disenchantment or dissatisfaction towards the service provided. Other reasons that were mentioned by the respondents aside from the survey result of MMD Laboratories were because of the game developers’ policy and their lack of speed in handling cheaters, as mentioned by Respondent C and Respondent E.

5.3. Low Number of Adopters

Understanding the reason why a service has a low number of adopters or, in Pokémon Go's case, understanding why the market did not start playing is the focus of this subpart. The low number of adopters of Pokémon Go will be explained with both secondary and primary data, and the cause-and-effect relationship of high disadoption rate to low adoption rate will be presented as argued in the conceptualization of the research. In Japan, examining the reason why the non-adopters did not start playing the game is important as they have the largest portion of the market, which is 62.3% of the Japanese population (Jin, 2016)⁴⁷.

Kalish (1985)⁴⁸ explains that a product adoption model follows two steps: awareness and adoption. However, in this case, awareness was not the factor that caused the low number of adoption as Jin (2016)⁴⁹ further revealed that on July 26th, 2016, or four days after the release date of Pokémon Go in Japan, the game's awareness rate in Japan was already 92.6%. However, even after one month, the penetration rate –or the rate of players adopting Pokémon Go– was ‘only’ 37.7%. Of course, this penetration rate is relatively excellent compared to other mobile games. However, the thought-provoking argument is that the adoption rate is getting relatively smaller while the disadoption rate is getting relatively larger compared to the first week of the release, which may imply that there is a connection between the two. An empirical research based on quantitative data was conducted by manipulating ‘disadoption rate’ and ‘time of release’ variable as elaborated in the previous section. Several performance measurement models are designed to measure the effect of disadoption rate and time of release to the adoption rate, as each of the models is the improvement of the previous, as problems were noticed during the analysis of the data.

⁴⁷ Jin, U. (2016, September 7). ポケモン goをやめた理由の1位「バッテリーがなくなるから」. MMD 調査. Retrieved from <http://japanese.engadget.com/2016/09/07/go-1-mmd/>

⁴⁸ Kalish, S. (1985). A new product adoption model with price, advertising, and uncertainty. *Management Science*, 31(12), 1569-1585. Retrieved from <http://www.jstor.org/stable/pdf/2631795.pdf>

⁴⁹ Jin, U. (2016, July 27). 『ポケモン go』ユーザーはどんな人？ 利用実態調査を MMD 研究所が公開. Retrieved from <http://japanese.engadget.com/2016/07/27/4-go-mmd/>

5.3.1. Performance Measurement Model 1 – Direct Measurement

The first and foremost model was a direct measurement of the play intention using the allocated experimentation groups as intended. Table 5 presents the mean of four dependent variables in all six scenarios. Unfortunately, although there is an observable difference in the play intention between groups with low disadoption rate and high adoption rate, this difference between these groups is very meager therefore significance was not able to be proved using the T-Test Independent Analysis (average mean 3.795 vs. 3.670, $t = 1.199$, $p = 0.231$).

Table 5: Dependent Variables Means by Disadoption Rate and Time of Release (n=355)

Dependent Variables	Independent Variables: Time of Release							
	3 months		8 months		18 months		Average	
	Low DA	High DA	Low DA	High DA	Low DA	High DA	Low DA	High DA
Play Intention	3.731	3.600	3.737	3.623	3.917	3.787	3.795	3.670
Expectation	4.058	3.833	4.053	3.962	4.056	3.738	4.055	3.844
Play Time	3.788	4.033	4.053	3.849	3.861	3.770	3.901	3.884
Purchase Intention	2.250	2.717	2.404	2.415	2.389	2.328	2.348	2.487
Average	3.457	3.546	3.561	3.462	3.556	3.406		

Note: DA = Disadoption Rate

The dependent variable which has the most significant difference is expectation where the hypothetical game with low disadoption rate have higher expectation compared to high disadoption rate (average mean 4.055 vs. 3.844, $t = 2.621$, $p = 0.009$). Neither of the next two dependent variables exhibited a significant difference between the two groups of low disadoption rate and high disadoption rate ($p = 0.872$ for Play Time and $p = 0.329$ for Purchase Intention), therefore disadoption rate does not have any effect on average play time and the purchase intention.

Further analysis using the Two-way ANOVA (Analysis of Variance) using the full factorial model was run which results are summarized in Table 6. In this direct measurement performance model Hypothesis 1: “Demand for service declines when the customers are dissatisfied with the service or switched competitor or technology replacement, reducing the number of the new adopters.” and Hypothesis 2: “There is a significant effect of service age on the new adopters in the service industry.” are not supported, as no significant difference were shown. The posthoc test was also run with Tukey’s HSD (Honest Significant Difference) for the independent variable Time of Release. As the interaction effect was not present in both ANOVA and posthoc tests, Hypothesis 3 “There is an interaction effect between disadoption rate and service age.” was also rejected. Tukey’s HSD test result is summarized in Table 7 as in the following page.

Table 6: Result of ANOVA for Main Effects and Interaction Effects (n=355)

Dependent Variable	One-Way ANOVA				Two-Way ANOVA	
	Disadoption Rate		Time of Release		Interaction Effect	
	F	P Value	F	P Value	F	P Value
Play Intention	1.225	0.269	1.195	0.304	0.002	0.998
Expectation	6.436	0.012*	0.608	0.545	0.642	0.527
Play Time	0.029	0.864	0.726	0.484	1.873	0.155
Purchase Intention	1.002	0.318	0.279	0.756	1.401	0.248

*Significant at 95% confidence level (p<0.05).

Table 7: Tukey's HSD Posthoc Test Result

Dependent Variable	Time of Release 1	Time of Release 2	Mean Difference (1-2)	P Value
Play Intention	3 months	8 months	-0.0211	0.988
		18 months	-0.1964	0.317
	8 months	3 months	0.0211	0.988
		18 months	-0.1753	0.403
	18 months	3 months	0.1964	0.317
		8 months	0.1753	0.403
Expectation	3 months	8 months	-0.0716	0.772
		18 months	0.0277	0.958
	8 months	3 months	0.0716	0.772
		18 months	0.0993	0.584
	18 months	3 months	-0.0277	0.958
		8 months	-0.0993	0.584
Play Time	3 months	8 months	-0.0349	0.955
		18 months	0.1001	0.662
	8 months	3 months	0.0349	0.955
		18 months	0.1350	0.477
	18 months	3 months	-0.1001	0.662
		8 months	-0.1350	0.477
Purchase Intention	3 months	8 months	0.0909	0.861
		18 months	0.1391	0.683
	8 months	3 months	-0.0909	0.861
		18 months	0.0482	0.956
	18 months	3 months	-0.1391	0.683
		8 months	-0.0482	0.956

During the first performance measurement model, the author noticed that the time of release variable manipulation has not worked properly. In accordance with the research design, a control question was asked whether the respondents understood the manipulation. Table 8 presents the number and the percentage of the respondents who answered from the scale of 1 (Very Old) to 5 (Very New) for each time of release manipulation scenario from 3 months, 8 months, and 18 months.

Table 8: Control Question of Manipulated Variable 'Time of Release'

Control Question: Finally, it was mentioned that this game has been released for X months. Do you think that this is a new release?							
Measurement Scale		3 months		8 months		18 months	
		n	%	n	%	n	%
Very Old	1	3	2.63%	5	4.52%	7	5.11%
.	2	21	18.91%	21	19.55%	29	21.64%
.	3	45	40.06%	51	46.19%	67	50.41%
.	4	32	28.46%	28	25.16%	27	20.38%
Very New	5	11	9.94%	5	4.58%	3	2.46%
Average Response		3.242		3.057		2.934	

Even though there is an observable difference in mean (from 3.242, 3.057, to 2.9341 for 3 months, 8 months, and 18 months' time of release respectively), a large portion of the respondents answered with the middle scale of 3. This indicates that the respondent may have difficulty in dealing with the given information, and the specific months did not give the respondents a strong hint to distinguish whether the game was old or new. In fact, less than a half in both 3 months and 18 months' treatment groups understood correctly that the game was intended to be new or old, respectively.

The data above suggests that time of release is assessed very subjectively by the respondents, thus rendering the time of release manipulation to not work properly. The strategy of assigning a specific time of release period in hoping to be understood as 'Old' or 'New' does not work, because time is not a static variable that can be perceived objectively, but it turns out to be a perceptual dynamic variable which values are relative depending on the personality and characteristics of the respondents. This leads to the development of the second performance measurement model that is based on the respondent's perception of service maturity, ignoring the initial groupings of 3 months, 8 months, and 18 months.

5.3.2. Performance Measurement Model #2 – Perceived Maturity

From the previous performance measurement model, the data suggests that the “time of release manipulation” did not work, as each respondent have a different perception to a certain time period. To alleviate this, new groupings were created based on the respondent’s perception of the age of the game, thus changing the name of the independent variable from ‘Time of Release’ to “Perceived Maturity”. Respondents from all six experimental groups who answered “1” (Very Old) or “2” (Old) on the control question were grouped into the “Old” group, while respondents who answered “4” (New) or “5” (Very New) were grouped into the “New” group. Meanwhile, the majority of 163 respondents who answered “3” (Neutral) were excluded as the respondents neither perceived the hypothetical game as either old or new, thereby reducing the total data size to 192 respondents. The new groupings based on perceived maturity are summarized in Table 9.

Table 9: New Experimentation Groups Design

Independent Variable	Perceived Maturity	
	New (Answered “4” or “5”)	Old (Answered “1” or “2”)
Disadoption Rate	Low (10%) Group 1 (n=55)	Group 3 (n=41)
	High (40%) Group 2 (n=51)	Group 4 (n=45)

The other problem that leads the author to develop further performance measurement model is that there is a possibility where the scenario was not realistic enough for some of the respondents, therefore making the respondents difficult to say how likely they will play the game because they are unsure about the hypothetical game. This may possibly interfere with the value validity of the dependent variable itself.

Concentrating on the “Play Intention” as the central measurement of the adoption, 33 out of 192 respondents who answered “3” (Neutral) on the intention to play were excluded, leaving only 159 respondents. Respondents who were assumed to have made up their mind to either play (who answered 4 “Likely to Play” and 5 “Very Likely to Play”) or not to play (who answered 1 “Very Unlikely to Play” and 2 “Unlikely to Play”), then were categorized into a dummy variable “Adoption Decision” with two values: “0” for Not Play and “1” for Play, as can be seen in Table 10.

Table 10: Percentage of Respondents in Dummy Variable “Adoption Intention”

Dependent Variable		Perceived Maturity			
		New		Old	
		Low DA	High DA	Low DA	High DA
Dummy Variable “Adoption Intention”	Not Play (1, 2)	10.9%	20.9%	20.0%	32.4%
	Play (4, 5)	89.1%	79.1%	80.0%	67.6%
	Total	100%	100%	100%	100%

Note: DA = Disadoption Rate.

Hence, from this performance measurement model and forward, Hypothesis 2 and Hypothesis 3 will be reformulated not using service age anymore as the independent variable but perceived maturity instead. These re-formulated hypotheses are:

H2:

“There is a significant effect of perceived maturity on the new adopters in the service industry.”

H3:

“There is an interaction effect between disadoption rate and perceived maturity”,

To show the relationship between both categorical dependent and independent variables, descriptive statistics of cross tabulations using Pearson’s chi-square test was used. The Phi coefficients were also measured to know the impact if the variables turned out to be significant. The result of the cross tabulations is summarized in Table 11.

Table 11: Cross Tabulations with Pearson Chi-Square Test Result (n = 159)

Independent Variable	P Value	Phi	df	Interpretation
Disadoption Rate	0.081	-0.139	1	No Effect
Perceived Maturity	0.108	-0.128	1	No Effect

Using this second performance measurement model, both disadoption rate and perceived maturity were weakly significant at most (p=0.081 for Disadoption Rate and p=0.108 for Perceived Maturity). Both Phi coefficients indicate that there are at most, little effects in both disadoption rate and perceived maturity on the adoption decision of mobile game players. The limitation of this performance measurement model, however, that it was based on the intention to play only. Marketers know that intention cannot be directly translated to the success of the adoption as it will lead to overestimation of demand, thus making it important for the intention to be calibrated prior to demand calculation. Therefore, in order to measure the success, not only the intention, another dummy variable using all measurements asked in the questionnaire would be necessary to be developed.

5.3.3. Performance Measurement Model #3 – Adoption Success

The third performance measurement model was developed to measure the adoption of the respondents not only based on the central measurement of “Play Intention”, but also considering the other three adoption measurements which are “Expectation”, “Play Time”, and “Purchase Intention”. The histogram presented in Figure 11 suggests that majority of the respondents answered “4” for the most questions. In the case of Purchase Intention, the

majority answered with low value because it is believed that in the mobile game industry only relatively small number of players are paying, as Keating (2016)⁵⁰ reported that only 1.9% of mobile game players have actually made an in-app purchase, which supports this positively skewed distribution of Purchase Intention. As the hypothetical game is designed to be an attractive and satisfying game without any competition or other challenges, except two treatments of “disadoption rate” and “time of release”, it is observed that majority of the respondents have decided to go with the soft answer of “4” in most questions.

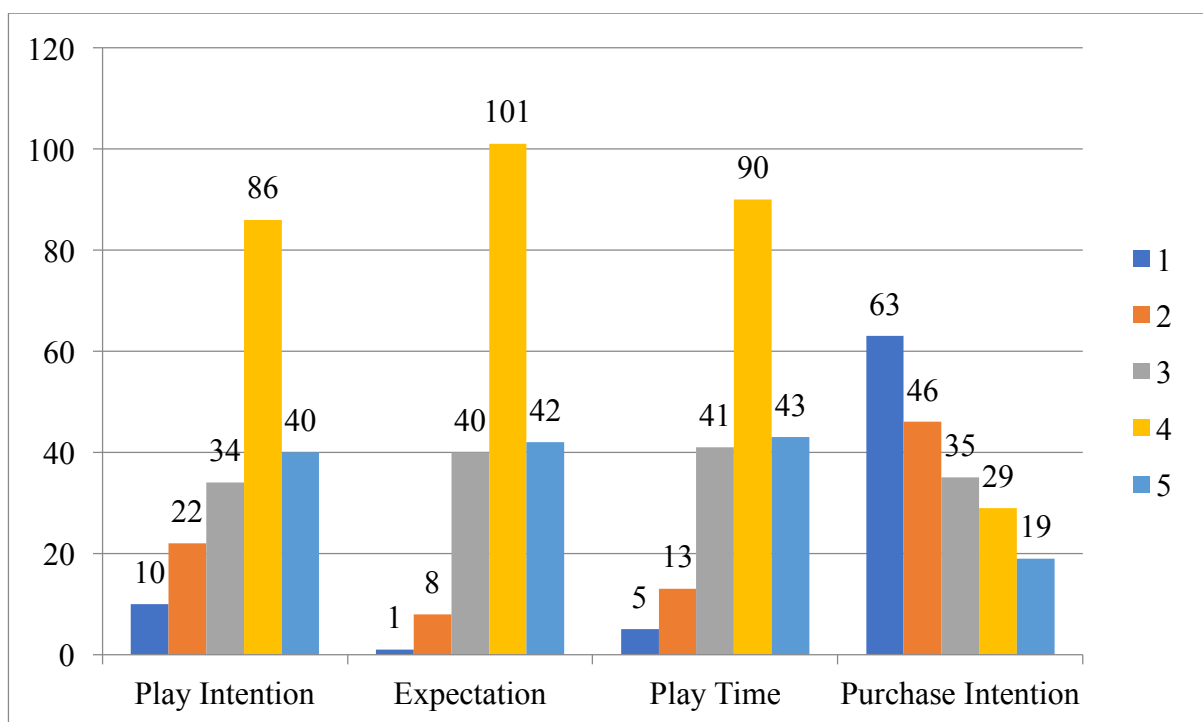


Figure 11: Histogram of Respondents' Answers (n=192)

In this performance measurement model, only hard answers are recognized as a success in the adoption decision. This method corresponds to Kotler and Keller (2012:603)⁵¹ where prospective customers should answer the intention with the most definite answer, which is 5 in this case. This is done by creating another dummy variable “Adoption Success” whereas respondents who answered “5” on either one of “Play Intention”, “Expectation”,

⁵⁰ Keating, L. (2016, March 25). Report finds that only 1.9 percent of mobile gamers make in-app purchases. Retrieved from <http://www.techtimes.com/articles/144329/20160325/report-finds-1-9-percent-mobile-gamers-make-app-purchases.htm#sthash.9it7fj2e.dpuf>

⁵¹ Kotler, P., & Keller, K. L. (2012). *Marketing management (14th ed.)*. Essex: Pearson Education Limited.

“Play Time”, or “Purchase Intention” will be grouped as “Successful”, while respondents who do not have any hard answers of “5” will be grouped as “Not Successful”.

There are two reasons why this hard answer based constraint is selected. First, it is based on the assumption that not all customers may have high intention to play from the first time, but then providing hard answers on expectation, play time, or purchase intention may also signal the success of the adoption. Second, hard answers are chosen because it provides the clearest intention to adopt the mobile game, waiving the possibility of undecided answers as the central tendency falls to “4” in most measurements. This dummy variable is believed to provide a fairer measurement of the success of adoption, as all 192 samples which both manipulations worked can be used in this case. The number of the respondents grouped in the dummy variable “Adoption Success” is summarized in Table 12, while the cross tabulations with Pearson’s chi-square result is compiled in Table 13.

Table 12: Percentage of Respondents in Dummy Variable “Adoption Success”

Dependent Variable		Perceived Maturity			
		New		Old	
		Low DA	High DA	Low DA	High DA
“Adoption Success”	Not Successful (No “5” Answers)	36.4%	52.9%	58.5%	62.2%
	Successful (Have “5” Answers)	63.6%	47.1%	41.5%	37.8%
	Total	100%	100%	100%	100%

Note: DA = Disadoption Rate.

Table 13: Cross Tabulations with Pearson Chi-Square Test Result (n = 192)

Independent Variable	P Value	Phi	df	Interpretation
Disadoption Rate	0.112	-0.115	1	No Effect
Perceived Maturity	0.026*	-0.160	1	No Effect

*Significant at 95% confidence level (p<0.05).

Again, here the central Hypothesis 1: “*Demand for service declines when the customers are dissatisfied with the service or switched competitor or technology replacement, reducing the number of the new adopters*” is rejected (p>0.05). However, the result of the analysis confirms that Hypothesis 2: “*There is a significant effect of perceived maturity on the new adopters in the service industry.*” can be accepted (p<0.05) at 95% confidence level. The Phi coefficient results indicate that perceived maturity plays a significantly small effect on the adoption success, independent from the disadoption rate.

The existence of interaction effect in Hypothesis 3: “*There is an interaction effect between disadoption rate and perceived maturity*”, unfortunately, was not tested statistically as the categorical type dummy variable was not appropriate to be tested using the Univariate ANOVA method. Binominal Logistics Regression would have been a more appropriate model to test the interaction effect between categorical variables, but it was not tested because the resource of this research was insufficient. Thus, an alternative performance measurement model using continuous dependent variable was created.

5.3.4. Performance Measurement Model #4 – Continuous Dependent Variable

In this fourth and last performance measurement model, the dependent variable “Adoption Success” was computed by summing up the values of all four measurements in this research: “Play Intention”, “Expectation”, “Play Time”, and “Purchase Intention”. The continuous dependent variable and the categorical independent variables were analyzed for main effects and interaction effects using the full factorial ANOVA model. The result is summarized in Table 14.

Table 14: Result of ANOVA for Main Effects and Interaction Effects (n=192)

Dependent Variable	One-Way ANOVA				Two-Way ANOVA	
	Disadoption Rate		Perceived Maturity		Interaction Effect	
	F	P Value	F	P Value	F	P Value
Adoption Success	0.105	0.746	66.161	0.005**	0.431	0.512

**Significant at 99% confidence level (p<0.01).

Using this performance measurement model, the result seems to be consistent with the previous performance measurement model where the central Hypothesis 1: “*Demand for service declines when the customers are dissatisfied with the service or switched competitor or technology replacement, reducing the number of the new adopters*” and Hypothesis 3: “*There is an interaction effect between disadoption rate and perceived maturity*”, remains rejected.

Hypothesis 2: “*There is a significant effect of perceived maturity on the new adopters in the service industry*”, was again, accepted, this time with smaller P-Value, signaling higher confidence level at 99% (p<0.01).

Discussion

The findings have turned the objective of the research into an unexpected direction where perceived maturity was proved to play a significantly larger role in the decline of service, especially in the mobile game industry. The disadoption rate, however, is weakly significant at most in a performance measurement model hence contributing to a little or non-existent effect to the adoption rate in the mobile game industry. In the empirical research using the experiments, the hypothetical game was conditioned to be an excellent and innovative mobile game, removing the disenchantment effect from the decision to disadopt voluntarily. Churn was also out of the question as both competition level and other technological replacement elements were not mentioned in the scenario. Despite that, the treatment of disadoption rate was treated with indifference by the respondents.

Although initial objective of this research was to explore the decline phase in the product lifecycle of services by focusing on the effect of the disadoption rate on the adoption rate of the service, it turns out that service undergoes a quasi-deterioration phase due to the time factor, or in this research's case, perceived maturity only. The third and last performance measurement model confirms the slow death of service over time, independent of the high or low disadoption rate. This suggests that the decline of services behaves similarly to products, even though the quality supplied remained constant or can even be improved in the case of services. The novelty of the service will be depreciated over the time, and this also influences the depreciation of the adoption rate as well. It implies that time wears off old services, no matter how good the quality of services provided.

Ho and Krider (2017:35)⁵² coined the term “mere newness”, or “*the change over time for a single product, independent of functional superiority or aesthetic appeal over the existing products*”. The mere newness is a continuous function, which is an ongoing decay process. This is a very interesting phenomenon as a new but objectively inferior product might be favored over an older but superior one. This appears to be an illogical decision making, but Ho and Krider (2017:42) identifies two possible emotional rationales that explain this phenomenon. First, the value of mere newness arises from hedonic, low-risk nature of products that is supported by promotions. Second, mere newness provides social value that arises from the inclination to share the new information and experiences to other people. Ho and Krider (2017:43) also stresses the importance of mere newness especially in entertainment products category where 1) life cycle of the products are short, 2) prices are low, and 3) product introductions are frequent. The effect of “mere newness” might have only been recently surfaced as nowadays people are more connected than ever. Previously, Blake (1970:485)⁵³ concludes that the period of time a respondent believed a product had been on the market actually did not significantly affect the willingness to buy. This research contributes to this literature stream as the “mere newness” effect was discovered not only in product but also in services as well, especially mobile game services.

More interestingly, this discovery of the mere newness may complement the qualities of Innovators type of adopters. Several prerequisites of being Innovators was mentioned by Rogers (1995:264) which are 1) control of substantial financial resources to help mitigate the risk of unprofitable innovation, 2) understanding of the application of complex technical knowledge, and 3) ability to cope with the high degree of uncertainty. It was also mentioned that the obsession of the innovators is the venturesomeness, which results from the desire for

⁵² Ho, J. Y., Krider, R. E., & Chang, J. (2017). Mere newness: Decline of movie preference over time. *Canadian Journal of Administrative Sciences*, 34(1), 33-46. DOI:10.1002/CJAS.1394

⁵³ Blake, B., Perloff, R., & Heslin, R. (1970). Dogmatism and acceptance of new products. *Journal of Marketing Research*, 7(4), 483-486. DOI: 10.2307/3149641

the rash, the daring, and the risky. But, one piece of the puzzle seems to be missing from this explanation that the incentives for Innovators were not clearly specified. Why do innovators want to take such big risks? Are the abundance of resources and the courageous nature enough to drive the innovators to take these risks?

Findings of this research suggest that innovators may gain incentive by the mere newness value that a product or service provides, rewarding the innovators of being venturesome and risky to try new innovations. A typical characteristic of innovators are described to be the leading pack of adopters hence are independent of other adopters' behavior. But if other adopters have adopted the product or the service and the mere newness value of the product disappears while the innovators are late in adopting for various reasons, this may lead to no adoption at all. This implies that innovators have small duration to decide: whether to adopt first and gain the mere newness value or to never adopt at all.

Several practical outcomes can also be derived from the case study of Pokémon Go. Due to ample media exposures and low entry cost of the customers, the mere newness effect seems to have impacted the game tremendously, perhaps more than the game developers could have anticipated. The findings suggest that Pokémon Go lost a considerable amount of players over time mainly due to dissatisfaction as the findings suggested. As the novelty of the game gets depreciated over time, Pokémon Go lost their mere newness effect and so does the number of the new adopters. Here, it can be seen that the intangible depreciation of the mere newness effect behaves very subjectively as the players disadopt based on their personal reason, independent from any objective factors such as other players also stopped (in MMD Research Laboratory's survey on Table 3, other people near the players stopped playing was chosen as the weakest reason why players disadopted Pokémon Go, with only 2.4% of the respondents agreed) thus strengthening the argument that time factor is a dynamic factor and perceived differently relative to each player. Pokémon Go, the biggest mobile game in United

States history (Kain, 2016)⁵⁴, dies out simply because it gets old. Even for the biggest mobile game in the history, perhaps, Pokémon Go is not immune to this phenomenon where excellent services can drop down to decline phase without any good and logical reason.

All the discussion has led that the decline Product Life Cycle are implied to have two layers: 1) tangible decline which is characterized by the physical deterioration of a product, and 2) intangible decline which is the emotional value of the product that cannot be seen such as the depreciation of newness because the product is no longer pristine once belongs to possession and being used (Dinnin, 2009:264)⁵⁵. The tangible decline is very objective as the physical deterioration is visible and can be estimated. However, the intangible decline is very subjective, as suggested in this research empirical construct where the time of release is perceived differently by the respondents. Also, in a research of tangible and intangible depreciation of premium cars, Bialogorsky and Muller (2017:1)⁵⁶ reveal that the true cost of owning premium car is not only the tangible depreciation of the physical dimension of the expensive car itself but also the intangible depreciation which consists of age depreciation and the emotional value depreciation from owning a premium car. Moreover, intangibility declines in a faster pace than tangibility decline, as the newness value will disappear first before the product is physically deteriorated.

⁵⁴ Kain, E. (2016, July 13). 'Pokémon GO' is the biggest mobile game in US history - and it's about to top snapchat. Retrieved from <http://www.forbes.com/sites/erikkain/2016/07/13/Pokémon-go-is-the-biggest-mobile-game-in-us-history-and-its-about-to-top-snapchat/#28f6c5b1722b>

⁵⁵ Dinnin, A. (2009). The appeal of our new stuff: how newness creates value. *Association for Consumer Research*. 36. 261-265. Retrieved from http://www.acrwebsite.org/volumes/v36/NAACR_v36_58.pdf

⁵⁶ Bialogorsky, E., Heiman, A., & Muller, E. (2017). Branding and the ravages of time: the effect of time on the brand premiums of automobiles. Retrieved from <http://www.hitechmarkets.net/files/BialogorskyHeimanMuller2017.pdf>

Indeed, the focus of the study has shifted to the depreciation of the intangible component of services, as literature in the decline of Product Life Cycle is dominated by the tangibility depreciation. Thus, the result of this study not only provides scholarly contribution to the intangibility depreciation of the services only, but as well as products as nowadays durable goods are proposing higher proportion of intangible benefits (Bialagorsky and Muller, 2017:17) such as newness and the desire to have a pristine product (Dinnin, 2009:262).

Finally, this research has one paramount managerial implication. Services, especially the mobile games industry, in this case, have a limited window of opportunity to minimize the net customer attrition. As it has been proved that the adoption rate will deteriorate over time due to mere newness effect, it is in the best interest of the service provider to invest in the promotion when the novelty effect is still continuing, maximizing the number of the new adopters using the mere newness effect. It is also equally important that service providers should retain the existing adopters as long as possible, as it becomes increasingly difficult to compensate the lost customers with declining adoption rate. This can be done by releasing a more robust version of the mobile game with the help of extensive product development research, so that dissatisfaction could be prevented and profit could be maximized in the early stages. Releasing the first fragile prototype and adjusting it as it goes with the help of customers' feedback is not recommended as the mere newness effect starts to wear off as soon as the service is released to the market. Back to Pokémon Go, currently the service developer has done a great job to increase the quality of the game by releasing new features and implementing several fun events, but the early golden momentum created by the mere newness effect in July 2016 would not be repeated ever again.

Limitations and Future Research

During this research, there are several limitations that would be potentially feasible targets for future research. First and foremost, the selected population of the case study, Japan, may not fully represent the nature of the global population as there are several quirks in accordance with the geographical restrictions, for example, higher standards towards the value of service in Japan. Japan is the home of the Pokémon franchise, the selected case study, which may contribute towards this high expectation level of service. Future similar studies regarding the life cycle of mobile game industry in other countries, such as China as the world's biggest mobile game market, will provide an interesting contrast to that can contribute to enrich the literature pool especially in the emerging mobile game industry.

Secondly, as service industry consists of multiple types of services from health, education, or mobile communication, the findings from this mobile game industry may not be fully generalizable to the service industry. The mobile game industry is a service connected with the internet, making the information transfer between players very easy. This means that the players can influence each other easier than other type of services, where this intensity of information transfer may not be on the same level with the mobile game industry. Thus, future researches can consider applying similar research strategy and methods to identify the cause-and-effect relationship between disadoption rate and adoption rate on other untapped sectors of service industry, enriching the literature on the decline in the Product Life Cycle of services.

Thirdly, this research purely considers the effect of disadoption rate and service age to the new adoption rate. However, the adoption decision itself might be influenced by other underlying factors such as risks or resources of the adopters. Although this research has contributed to the discovery of the mere newness effect in the services industry especially in

the mobile game industry, this leads to another important question which is the benefit of mere newness effect and how service developers can exploit the mere newness effect to maximize profitability. Applying the research design in other entertainment services industry would be worthwhile as well to further strengthen the existence of mere newness effect not only in mobile game industry but also in other service industries.

Last but not least, it is undeniable that the author's empirical research constructs needs to be revised and improved. During the experimental research phase, there was a lot to be learned mostly on the measurement problem and research design. Instead of specifying a time period that was intended to be perceived as old or new, a straightforward measurement method by simply using "this is an old release" and "this is a new release" might be a better manipulation method as it gives the audience a clear-cut definition of the time of release independent variable, as a specific time period would be perceived differently for every person. Hypothetical game was used in order to minimize bias or other emotional association to Pokémon Go, however, the drawbacks appear to be quite considerable, mainly: 1) difference in expectation of service age of respondents, rendering the 'time of release' variable manipulation to not work reliably, and 2) lack of realistic comprehension towards the hypothetical game which leads to indifference responses. Future researches using highly subjective independent variables such as a specific time period for time of release and hypothetical scenarios should be developed more thoroughly with several pilot tests before launching it to the intended respondents.

Also, even though in this experimental research the sampling is randomized to balance the characteristics in each experimental group, the types of the adopters were not identified. Thus, there might be innovators who are exposed to Scenario 5 or Scenario 6, where the hypothetical game has been released for 18 months already but the innovators are conditioned to miss the game from the start. Thus, as the newness value depreciates, there is

no more incentive for the Innovators to start playing the game, no matter how good the quality of the game is. Therefore, the Innovators would more likely to answer 1, or not very likely to play, solely based on their personality not because of the manipulation. In this scenario, the Laggards would be more likely to answer 5, or very likely to adopt, again because of the Laggards' risk-averse personality. Hence, this may create bias in the answer of the adoption intention as personality may have influenced the respondent's answers. If additional questions were asked to distinguish the adopters' categories, this will contribute to the development of better measurement method. Unfortunately, due to time limitation of the research, the author was unable to reconstruct the empirical research design. Future researchers are highly encouraged to design a more robust empirical research construct, as findings could be analyzed quickly and reliably.

Conclusion

Service industry follows the same pattern as Product Life Cycle where services are first introduced, grew, matured, and then declined. Although services do not physically deteriorate over time, it declines when the service disadoption rate is greater than the new customer acquisition rate, making the net attrition positive. Services are still vulnerable to be disadopted because of dissatisfaction and/or churn which are caused by competitor or technological replacements. In the decline of Product Life Cycle, both the tangible and intangible elements decline, with intangible elements declines more rapidly than the physical deterioration of the product itself. Thus, in Product Life Cycle of services where the intangible element is more prevalent, services can go to decline even though the service quality supplied is excellent is free from physical deteriorations.

Although the initial aim of the research is to explore the decline in services with the main hypothesis that disadoption rate negatively affects the adoption rate leading to natural decline, this nevertheless, was not supported significantly. However, this research has, unexpectedly, proves the existence of the mere newness in new services, making the number of adopters goes down over time due to the depreciation of the services' novelty. This new knowledge that implies to the decline in Product Life Cycle of services is the scholarly contribution of this research. This research uses the metric Net Attrition Rate to measure the decline in Product Life Cycle of services. In respect to this, there are two managerial implications that emerged. Firstly, service providers have limited window of opportunity after the service release to maximize the adoption rate with promotion, as this is when mere newness effect peaks. Finally, service providers must minimize the disadoption rate which can be caused by disenchantment and/or churn, especially during the early stages because the recovery of the lost customers will be more difficult due to the declining adoption rate in the

later stages, caused by the depreciation of the services' novelty. In the case of Pokémon Go where players disadopt mostly due to disenchantment, it is essential to construct a more robust service system before releasing it to the market as well as keeping the players engaged with game replayability strategies, especially in the early stages, making the service more sustainable and not falls into decline too early.

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Appendices

1. Scenario 1 of Experimentation Group (Time of Release: 3 months, Disadoption Rate: Low)

Please read this scenario carefully before answering the questions.

*Suppose that there is an interesting social based mobile-phone game that everybody is talking about. It has been released for about **3 months**. Since the game concept is very unique, the media sometimes talks about the game. You didn't start playing on the release day because of various reasons, but now you are considering starting playing because this game interests you personally.*

*Upon seeing the game reviews, you find that this game has many positive reviews. Numerous players love the game because the gameplay is unique, unlike what they've experienced before. Since its release, it is said that from all the players, **10%** have stopped playing the game. This number is relatively **small** compared to the average rate. Currently, you have a mobile phone with specification good enough to play the game.*

1. How likely are you willing to start playing the game?

Very Unlikely 1 2 3 4 5 Very Likely

2. Regardless of your intention to play, how interesting you expect this game will be?

Very Uninteresting 1 2 3 4 5 Very Interesting

Regardless, you started playing the game. It turns to be very interesting and addictive.

3. If you have the time, how frequent compared to your average playtime will you play this game?

Less Frequent 1 2 3 4 5 More Frequent

Also, you are now considering spending money on the game because the game offers a good pricing point for in-app purchases.

4. If you have the money, how likely are you willing to spend money for the game?

Very Unlikely 1 2 3 4 5 Very Likely

5. Finally, it was mentioned that this game has been released for **18** months. Do you think that this is a new release?

Very Old 1 2 3 4 5 Very New

2. Scenario 2 of Experimentation Group (Time of Release: 3 months, Disadoption Rate: High)

Please read this scenario carefully before answering the questions.

*Suppose that there is an interesting social based mobile-phone game that everybody is talking about. It has been released for about **3 months**. Since the game concept is very unique, the media sometimes talks about the game. You didn't start playing on the release day because of various reasons, but now you are considering starting playing because this game interests you personally.*

*Upon seeing the game reviews, you find that this game has many positive reviews. Numerous players love the game because the gameplay is unique, unlike what they've experienced before. Since its release, it is said that from all the players, **40%** have stopped playing the game. This number is relatively **big** compared to the average rate. Currently, you have a mobile phone with specification good enough to play the game.*

1. How likely are you willing to start playing the game?

Very Unlikely 1 2 3 4 5 Very Likely

2. Regardless of your intention to play, how interesting you expect this game will be?

Very Uninteresting 1 2 3 4 5 Very Interesting

Regardless, you started playing the game. It turns to be very interesting and addictive.

3. If you have the time, how frequent compared to your average playtime will you play this game?

Less Frequent 1 2 3 4 5 More Frequent

Also, you are now considering spending money on the game because the game offers a good pricing point for in-app purchases.

4. If you have the money, how likely are you willing to spend money for the game?

Very Unlikely 1 2 3 4 5 Very Likely

5. Finally, it was mentioned that this game has been released for **18** months. Do you think that this is a new release?

Very Old 1 2 3 4 5 Very New

3. Scenario 3 of Experimentation Group (Time of Release: 8 months, Disadoption Rate: Low)

Please read this scenario carefully before answering the questions.

*Suppose that there is an interesting social based mobile-phone game that everybody is talking about. It has been released for about **8 months**. Since the game concept is very unique, the media sometimes talks about the game. You didn't start playing on the release day because of various reasons, but now you are considering starting playing because this game interests you personally.*

*Upon seeing the game reviews, you find that this game has many positive reviews. Numerous players love the game because the gameplay is unique, unlike what they've experienced before. Since its release, it is said that from all the players, **10%** have stopped playing the game. This number is relatively **small** compared to the average rate. Currently, you have a mobile phone with specification good enough to play the game.*

1. How likely are you willing to start playing the game?

Very Unlikely 1 2 3 4 5 Very Likely

2. Regardless of your intention to play, how interesting you expect this game will be?

Very Uninteresting 1 2 3 4 5 Very Interesting

Regardless, you started playing the game. It turns to be very interesting and addictive.

3. If you have the time, how frequent compared to your average playtime will you play this game?

Less Frequent 1 2 3 4 5 More Frequent

Also, you are now considering spending money on the game because the game offers a good pricing point for in-app purchases.

4. If you have the money, how likely are you willing to spend money for the game?

Very Unlikely 1 2 3 4 5 Very Likely

5. Finally, it was mentioned that this game has been released for **18** months. Do you think that this is a new release?

Very Old 1 2 3 4 5 Very New

4. Scenario 4 of Experimentation Group (Time of Release: 8 months, Disadoption Rate: High)

Please read this scenario carefully before answering the questions.

*Suppose that there is an interesting social based mobile-phone game that everybody is talking about. It has been released for about **8 months**. Since the game concept is very unique, the media sometimes talks about the game. You didn't start playing on the release day because of various reasons, but now you are considering starting playing because this game interests you personally.*

*Upon seeing the game reviews, you find that this game has many positive reviews. Numerous players love the game because the gameplay is unique, unlike what they've experienced before. Since its release, it is said that from all the players, **40%** have stopped playing the game. This number is relatively **big** compared to the average rate. Currently, you have a mobile phone with specification good enough to play the game.*

1. How likely are you willing to start playing the game?

Very Unlikely 1 2 3 4 5 Very Likely

2. Regardless of your intention to play, how interesting you expect this game will be?

Very Uninteresting 1 2 3 4 5 Very Interesting

Regardless, you started playing the game. It turns to be very interesting and addictive.

3. If you have the time, how frequent compared to your average playtime will you play this game?

Less Frequent 1 2 3 4 5 More Frequent

Also, you are now considering spending money on the game because the game offers a good pricing point for in-app purchases.

4. If you have the money, how likely are you willing to spend money for the game?

Very Unlikely 1 2 3 4 5 Very Likely

5. Finally, it was mentioned that this game has been released for **18** months. Do you think that this is a new release?

Very Old 1 2 3 4 5 Very New

5. Scenario 5 of Experimentation Group (Time of Release: 18 months, Disadoption Rate: Low)

Please read this scenario carefully before answering the questions.

*Suppose that there is an interesting social based mobile-phone game that everybody is talking about. It has been released for about **18 months**. Since the game concept is very unique, the media sometimes talks about the game. You didn't start playing on the release day because of various reasons, but now you are considering starting playing because this game interests you personally.*

*Upon seeing the game reviews, you find that this game has many positive reviews. Numerous players love the game because the gameplay is unique, unlike what they've experienced before. Since its release, it is said that from all the players, **10%** have stopped playing the game. This number is relatively **small** compared to the average rate. Currently, you have a mobile phone with specification good enough to play the game.*

1. How likely are you willing to start playing the game?

Very Unlikely 1 2 3 4 5 Very Likely

2. Regardless of your intention to play, how interesting you expect this game will be?

Very Uninteresting 1 2 3 4 5 Very Interesting

Regardless, you started playing the game. It turns to be very interesting and addictive.

3. If you have the time, how frequent compared to your average playtime will you play this game?

Less Frequent 1 2 3 4 5 More Frequent

Also, you are now considering spending money on the game because the game offers a good pricing point for in-app purchases.

4. If you have the money, how likely are you willing to spend money for the game?

Very Unlikely 1 2 3 4 5 Very Likely

5. Finally, it was mentioned that this game has been released for **18** months. Do you think that this is a new release?

Very Old 1 2 3 4 5 Very New

6. Scenario 6 of Experimentation Group (Time of Release: 18 months, Disadoption Rate: High)

Please read this scenario carefully before answering the questions.

*Suppose that there is an interesting social based mobile-phone game that everybody is talking about. It has been released for about **18 months**. Since the game concept is very unique, the media sometimes talks about the game. You didn't start playing on the release day because of various reasons, but now you are considering starting playing because this game interests you personally.*

*Upon seeing the game reviews, you find that this game has many positive reviews. Numerous players love the game because the gameplay is unique, unlike what they've experienced before. Since its release, it is said that from all the players, **40%** have stopped playing the game. This number is relatively **big** compared to the average rate. Currently, you have a mobile phone with specification good enough to play the game.*

1. How likely are you willing to start playing the game?

Very Unlikely 1 2 3 4 5 Very Likely

2. Regardless of your intention to play, how interesting you expect this game will be?

Very Uninteresting 1 2 3 4 5 Very Interesting

Regardless, you started playing the game. It turns to be very interesting and addictive.

3. If you have the time, how frequent compared to your average playtime will you play this game?

Less Frequent 1 2 3 4 5 More Frequent

Also, you are now considering spending money on the game because the game offers a good pricing point for in-app purchases.

4. If you have the money, how likely are you willing to spend money for the game?

Very Unlikely 1 2 3 4 5 Very Likely

5. Finally, it was mentioned that this game has been released for **18** months. Do you think that this is a new release?

Very Old 1 2 3 4 5 Very New