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Surveillance Capitalism and Nudging in *Pokémon Go*: A dispositif Analysis of Behavioral modification and commodification

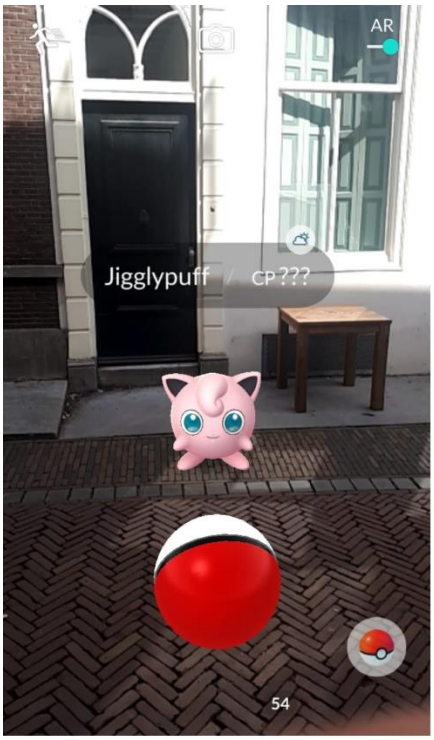

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Table of Contents

Summary 3

Introduction 4

Theoretical Framework 9

Surveillance Capitalism 10

Nudging and Choice Architecture 13

Academic positioning 16

Methods 17

Analysis 22

Chapter I: Item Placement 22

Chapter II: Behavioral Aspects 28

Chapter III: Behavioral Commodification 37

Conclusion 45

Bibliography 48

Academic Journals: 48

Books: 49

Conference papers: 50

Online Videos: 50

Websites: 51

Unreleased Material: 53

Appendix 54

Summary

From productivity and entertainment to shopping, digital technologies have become an immutable aspect of our daily lives. Through the advent of learning algorithms, digital tools gained consistent and powerful predictive affordances which are highly coveted by marketers and data brokers. **Prediction** is made possible with data, and serves the ultimate goal of foreseeing **behavior** (and) or modifying it. When combining behavioral prediction and modification with technology and commodification, **surveillance capitalism** is spawned**.** Therefore, understanding how surveillance capitalism works is becoming significantly more critical as the century progresses.

This paper aims at applying the dispositif analysis, a simple human-computer interaction framework to *Pokémon Go*, a mobile augmented reality video game by *Niantic.* This case study demystifies complex behavioral notions such as **nudging** and technical concepts falling under the artificial intelligence umbrella such as **big data**. To illustrate the chosen concepts, practical observations supported by evidence, presented as screenshots are explained with a nuanced theoretical framework.

Through a concept-driven dispositif analysis, multiple levels of surveillance capitalism in *Pokémon Go* were researched. Starting at the lowest level (text), the origin of information on the game was investigated based on its socio-economic relevance. The lowest level was incremented by studying the behavioral implications of this information (spectator). Finally, the commodification of behavior was analyzed in the ultimate step of the dispositif (screen).

After analyzing *Pokémon Go* from the intertwined perspective of **behavior**, **technology** and **economics**, it is confirmed that the game acts as a surveillance capitalist product. In fact, in each step of the analysis, the game lacks **transparency**, practices **market control** concerning its participatory data collection process and facilitates advertising for bigger businesses. These findings match critiques of **all scholars** in the debate, no matter how nuanced or critical. ***Pokémon Go* is therefore indeed a surveillance capitalist product that benefits from opaque behavioral modification and commodification. *Niantic* controls the market through surveillance capitalism and reaches the status of a leader in location-based augmented reality gaming.**

Introduction

In July 2016, gamers and non-gamers gathered on the street to play *Pokémon Go*. The game's ease of use, simplicity and clever design were revolutionary, and attracted more than 30 million active players worldwide at the time of its release.[1] Players were a mixture of nostalgic (young) adults as well as teenagers and children. Following the big data logic, these players are perceived as valuable commodity.

Big data has been defined by artificial intelligence and organizational scholars Ioanna Constantinou and Jannis Kallinikos as "large data volumes generated and made available on the internet and the current digital media ecosystems."[2] Because of this, big data needs to fulfil several criteria of volume, velocity, variety, and veracity.[3] In other words, it is a real-time data evaluation of a "large number of (unstructured) records."[4]

It should be noted that big data's advent was not a product of itself. This technique of data collection and processing is made possible through the use of learning algorithms. Because of the sheer amount and volume of data available, its manual processing is impossible. More than two and a half quintillion bytes of new data are generated every day.[5] If each byte of data represented a kilometer, this would be the equivalent of 264,250 light-years of information generated every single day. This is the equivalent of five and a half round trips to the center of our galaxy, every day **(fig. 1)**.[6] Such large data volumes could only be collected and processed by learning algorithms falling under the artificial intelligence

[1] "Pokémon Go Revenue and Usage Statistics (2020)," Business of Apps, accessed March 25, 2021, https://www.businessofapps.com/data/pokemon-go-statistics/.
[2] Ioanna Constantiou and Jannis Kallinikos, "New Games, New Rules: Big Data and the Changing Context of Strategy," *Journal of Information Technology* no. 30 (2015): 49.
[3] Dirk Helbing, "Societal, Economic, Ethical and Legal Challenges of the Digital Revolution: From Big Data to Deep Learning, Artificial Intelligence, and Manipulative Technologies," in *Towards Digital Enlightenment: Essays on the Dark and Light Sides of the Digital Revolution*, ed. Dirk Helbing (Berlin: Springer International Publishing, 2019), 49-50.
[4] Ibid.
[5] "How Much is 2.5 Quintillion?" Medium, accessed May 4, 2021, https://medium.com/@nicole.chardenet/how-much-is-2-5-quintillion-361aff053059.
[6] "Galaxies and the Expanding Universe," The European Space Agency, accessed May 17, 2021, https://sci.esa.int/web/education/-/36827-galaxies-and-the-expanding-universe.

umbrella. This data collection process allows stakeholders "to explore what people actually do rather than what they say they do […] in an incredibly granular and intimate way."[7]

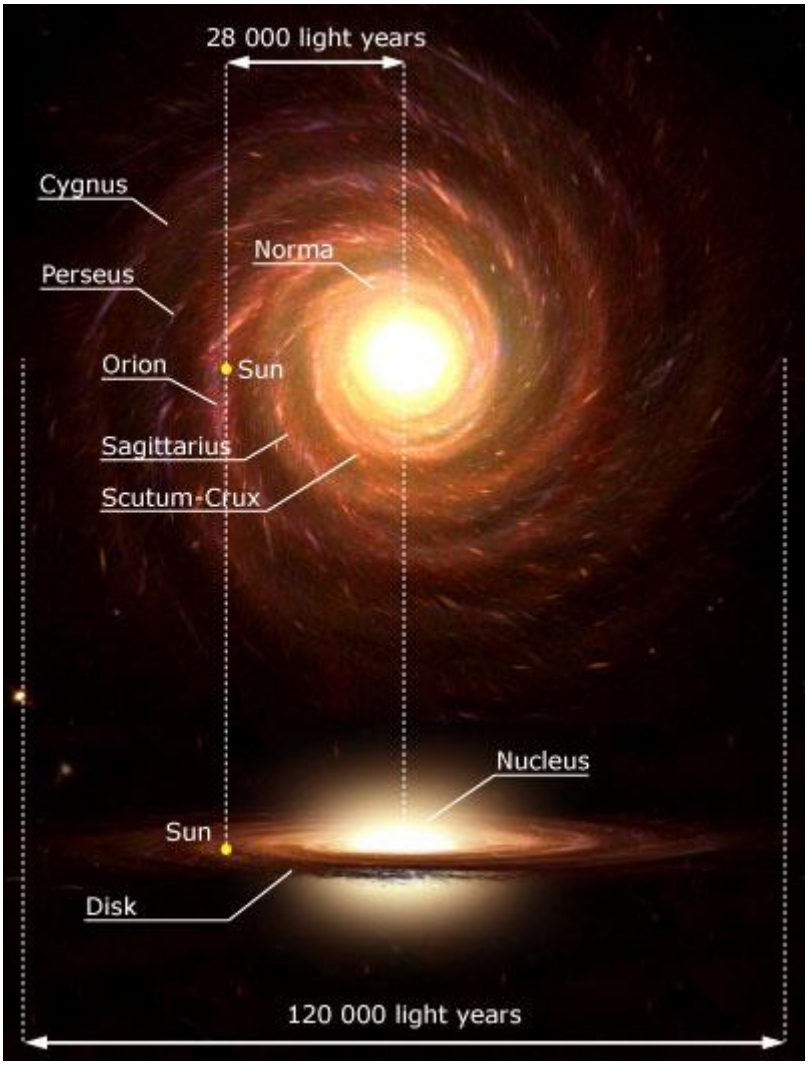

Figure 1: A visual representation of the distance between the sun and the center of the Milky Way. Five and a half round-trips can be made every day with data generated during the information age.[8]

[7] Colin Strong, "This changes everything," in *Humanizing Big Data : Marketing at the Meeting of Data,* ed. Colin Strong (London: Kogan Page, 2015), 2-3.
[8] "Galaxies."

In the *Pokémon Go* case study, following the big data logic, players are perceived as a valuable commodity. *Niantic,* the company behind *Pokémon Go* is owned by *Google*, which is notorious for its highly profitable big data and surveillance products. At the end of the 2020 fiscal year, *Google* generated around 182 Billion dollars in revenue, mainly generated by *Google Services*, their advertising branch **(fig. 2)**.[9] To further put things into perspective, *Pokémon Go* users spent 917 million dollars on the game in 2019. This equates to roughly 0.5 percent of *Google's* total revenue.[10] This revenue is divided between the money spent by the players on in-game items and the money spent on *lure modules*.[11] *Lure modules* have been defined as items "intended to attract *Pokémon* to a specific location."[12]

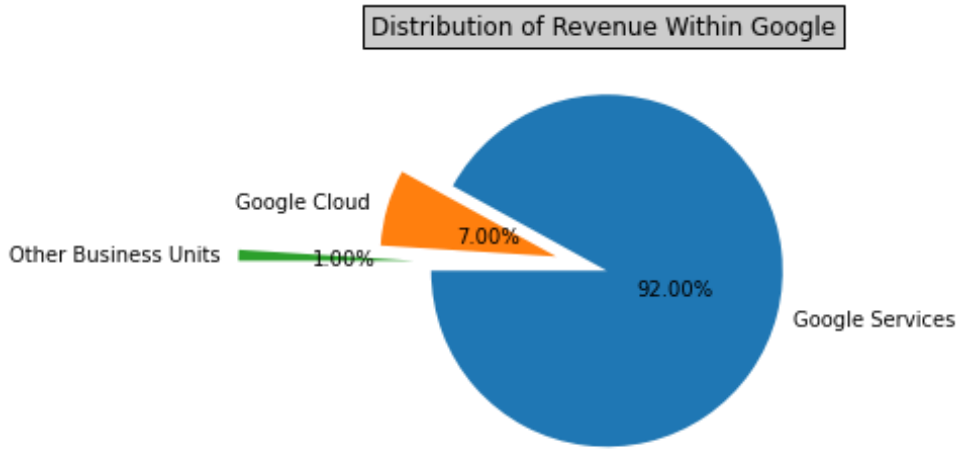

Figure 2: Share per business unit of the 182 billion dollars in revenue in 2020. Non-advertising-related business models generate only 8%. This plot was developed using *Python* with the *Matplotlib* library.[13] (Source code available in the appendix and pdf notebook file).[14]

[9] "How Google (Alphabet) Makes Money," Investopedia, accessed May 04, 2021, https://www.investopedia.com/stock-analysis/2012/what-does-google-actually-make-money-from-goog1121.aspx#:~:text=Alphabet%20leverages%20its%20search%2C%20web,Google%20Cloud%20revenues%20are%20growing.

[10] "Annual revenue generated by Pokémon GO worldwide from 2016 to 2021 *(in million U.S. dollars)* ," Statista, accessed May 04, 2021, https://www.statista.com/statistics/882474/pokemon-go-all-time-player-spending-countries/.

[11] Shoshana Zuboff, "Pokémon Go! Do!" in *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power*, ed. Shoshana Zuboff (London: Profile Books, 2019), 314.

[12] Ibid.

[13] "Matplotlib: Visualization with Python," Matplotlib, accessed June 05, 2021, https://matplotlib.org/.

[14] "How Google."

The issue of profitability through big data, virtual transactions and surveillance is at the core of surveillance capitalism, a concept coined by psychologist Shoshana Zuboff, which she defines as a "new form of information capitalism that aims to predict and modify human behavior as a means to produce revenue and market control."[15] In this thesis, I will demonstrate how *Pokémon Go* is an example of surveillance capitalism. I will ask the following question: **how can *Pokémon Go* be understood as an example of surveillance capitalism?** As surveillance capitalism in *Pokémon Go* is characterized by how it influences player behavior to generate profit and market control, I will address the following sub-questions:

How are game-relevant locations placed in *Pokémon Go* (text)?

How are players nudged by *Pokémon Go'*s textual elements (spectator)?

How does *Niantic* use behavioral modification (*nudging*) to be more profitable (screen)?

The social relevance of my research is that it contributes to a raging debate in the public sphere about behavioral *commodification* through behavioral *modification*. By analyzing the game in the center of Utrecht, I demonstrate how in surveillance products such as *Pokémon Go*, behavior is manipulated and adjusted semi-transparently. Using a method such as a dispositif analysis, an understanding of opaque surveillance products such as *Pokémon Go* can be formed.

Although a considerable amount of research has been done on *Pokémon Go* by academics such as Zuboff, Yuan Zhang, Jie Zhang and Alf Inge Wang, a gap still exists between linking the players' experience to the pillars of surveillance capitalism hidden behind the products. My research aims to provide a more tangible, first-person approach to analyzing such a product (as I use my perspective as a player in the analysis). Due to my research's word limit and scope, I will be using a dispositif analysis instead of the game studies' formal analysis method. Therefore, instead of focusing on the design building blocks of *Pokémon Go*, I will be using the dispositif analysis to instead focus on how the player

[15] Shoshana Zuboff, "Big other: Surveillance Capitalism and the Prospects of an Information Civilization," *Journal of Information Technology*, no.30 (2015): 75.

interacts with the game.[16]

To answer the research question, specific situations in Utrecht will be analyzed as I interact with the game. The analysis will connect the three research sub-questions to the overarching problem statement using the central concepts of *surveillance capitalism* and *nudging*, which will be defined in the next section.

[16] Petri Lamkoki and Staffan Björk, "Formal Analysis of Gameplay," in *Game Research Methods: An Overview*, ed. Petri Lamkoki and Staffan Björk (Pittsburgh: ETC Press, 2015), 27.

Theoretical Framework

Around the *nudging* and *surveillance capitalism* concepts, a complex academic debate takes place. All academics involved in this debate, such as Dirk Helbing and Zuboff, are primarily concerned with big data-enabled technologies and surveillance capitalism. However, the solutions to the surveillance problem are in contrast. Zuboff and her peers are more outspoken on their anti-surveillance stance, while Helbing and his peers call for more transparency and better implementation.

Therefore, I believe the debate is split into two sides. The first side led by Zuboff is highly critical of surveillance capitalism; she believes manipulative, big data-enabled surveillance technologies are inherently wrong and harmful to society. The second side of the debate, with Helbing at its core, is still critical of these technologies without entirely rejecting them. Helbing and his peers believe that these technologies can be used to further propel human progress with a robust ethical and legal framework. I will define each of the concepts separately by reflecting on their **problems** and their virtuous societal **potential** with each relevant author in the debate.

Surveillance Capitalism

As outlined in the introduction, surveillance capitalism is a "new form of information capitalism […] produce revenue and market control."[17] In this definition, multiple keywords can be extracted and separately defined.

First, what is information capitalism? Govindan Parayil defined the term as "the economic logic of post-industrialism that posits a rupture in the articulation of industrial capitalism."[18] This definition shows how this form of capitalism is in stark contrast with all previously known production methods. This rupture is shaped by an absence of labor, replaced by intelligent algorithms **(fig. 3)**.[19]

Second, I will explain how predictive algorithms produce revenue and market control. Profitable knowledge is created by placing users such as *Pokémon Go* players in situations where algorithms can perform calculations to be aggregated as behavioral data. *Niantic* collects user information such as location, in-game actions, voluntarily shared personal data and more.[20] Market control is achieved through this data collection process; having sufficiently diverse and accurate data makes algorithmic predictions more accurate.

Third, why are behavioral modification and commodification relevant to surveillance capitalism? Algorithms need training data to make accurate predictions. In the case of *Pokémon Go, Niantic* can predict and ***nudge*** player behavior much more accurately, thanks to the plethora of user data at their disposal. Predictions can range anywhere from placing a *Pokémon* in the right place to directing player movement, to sending a push notification to the player.[21]

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[17] Zuboff, "Big other," 75.
[18] Govindan Parayil, "Introduction: Information Capitalism," in *Political Economy and Information Capitalism in India*, ed. Govindan Parayil (London: Palgrave Macmillan, 2005), 1.
[19] Ibid.
[20] "Niantic Privacy Policy," Niantic, accessed May 04, 2021, https://nianticlabs.com/privacy/en/.
[21] "Pokémon Go now seems to send push notifications encouraging people to play," Reddit, accessed May 04, 2021, https://www.reddit.com/r/TheSilphRoad/comments/6bkg1u/pok%C3%A9mon_go_now_seems_to_send_push_notifications/.

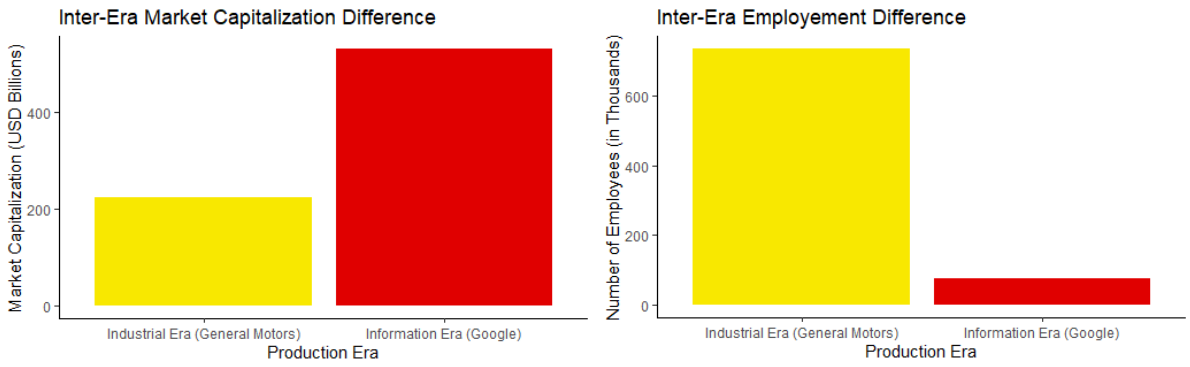

Figure 3: Comparison between *General Motors* and *Google* shows the differences in market capitalization and employment between industrial and information eras. Plot generated using *R* with the *ggplot2* library, source code in the appendix and pdf markdown file (Data Source in the footnotes).[22]

The problem with Surveillance Capitalism

"Parasitic economic logic," "threat to human nature," and "an expropriation of critical human rights," all of these negatively connotated and critical judgments are part of Zuboff's opening definition of surveillance capitalism in her book, *The Age of Surveillance Capitalism*.[23] Not only does Zuboff's book approach the topic from a pejorative standpoint, so does her crowd. Endorsements on the back cover by successful authors such as Naomi Klein and Annan Gridharadas refer to the book as "a shield against predators" and a "digital self-defense book."[24] The stance of Zuboff and her peers on this side of the debate cannot be made more evident: Surveillance capitalism and big data technologies harm society, the companies yielding this power violate our human rights and must be stopped. Zuboff's work disregards any positive outcomes created by big data-enabled companies. Other Academics in her side of the debate share the same vision.

New media scholar, Mark Andrejevic, is amongst the scholars sharing Zuboff's stance. In his analysis, he compares surveillance companies to stalkers.[25] By doing so, he is also using pejorative terms to paint a negative picture of these companies. Although his points on one-sided information gathering are valid, he also disregards any positive outcomes from such

[22] Shoshana Zuboff, "Surveillance Capitalism and the Challenge of Collective Action," *New Labor Forum* 28, no. 1 (January 2019): 22.
[23] Shoshana Zuboff, "The Definition," in *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power*, ed. Shoshana Zuboff (London: Profile Books, 2019), V.
[24] Shoshana Zuboff, *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power*, (London: Profile Books, 2019), back cover.
[25] Mark Andrejevic, "The Discipline of Watching: Detection, Risk, and Lateral Surveillance," *Critical Studies in Media Communication* 23, no. 5 (2006): 399.

practices. Andrejevic talks about a "participatory panopticon" where surveillance capitalist products allow users to spy on others on behalf of the larger entity.[26] With the critical side defined, I will now provide a more optimistic definition of the term outlying its virtuous applications without ignoring the threats surveillance represents to society.

The Potential of Surveillance capitalism

Dirk Helbing, a computational social scientist, explores how big data and surveillance capitalist technologies are merely imperfect tools used by humans to reach an end. This approach to the problem aligns with the stance of the father of inferential statistics, George Box, who claims that "all models are wrong, but some are useful."[27] In other words, predictive models are mainly flawed tools that should always be seen as such.

Helbing calls for critical assessment and thinking when using surveillance technologies such as big data. After providing a thorough introduction to the technical aspects of big data, he quickly admits their dangers: "artificial intelligence, and nudging can produce potentially harmful side effects, but in this case, the impact on our economy and society may be massive."[28] In the remainder of his paper, Helbing provides guidelines for harnessing these powerful technologies for a better society. He provides seventeen recommendations for big data and warns against manipulation and deception.[29] Helbing sees the danger of manipulative technologies because "we might not even notice the manipulation attempts."[30] Such manipulation attempts are a pillar of surveillance capitalism the way Zuboff defined it, making this one point where both sides of the debate would agree.

However, the main difference between the two sides of the debate lies in the hopeful conclusion from Helbing where he asserts that "digital technologies […] may help us to solve some long-standing problems."[31] This hopeful conclusion is in stark contrast with Zuboff's pessimistic approach. As long as technologies are not manipulative, beneficial progress for

[26] Andrejevic, "The Discipline," 405.
[27] "'All models are wrong, but some are useful'. George E. P. Box," Admore, accessed March 03, 2021, https://www.lacan.upc.edu/admoreWeb/2018/05/all-models-are-wrong-but-some-are-useful-george-e-p-box/.
[28] Helbing, "Societal," 54.
[29] Helbing, "Societal," 62.
[30] Helbing, "Societal," 65.
[31] Helbing, "Societal," 68.

humanity can be achieved. With *surveillance capitalism* introduced, the **behavioral** aspects of this notion will be elaborated upon with the *nudging* concept.

Nudging and Choice Architecture

The second concept, *nudging*, **concerns the behavioral aspect of surveillance capitalism**. *Nudging* analyzes how infrastructures influence individuals within them to behave in a certain way. These infrastructures are referred to by behavioral economists Richard Thaler and Cass Sunstein as the "choice architecture."[32] Responsible for building this architecture is a choice architect, which Thaler and Sunstein define as an individual who "has the responsibility for organizing the context in which people make decisions."[33]

For *Pokémon Go*, *Niantic* is the choice architect, responsible for designing the game and its mechanics, contextualizing the setting in which players will be making decisions. As a result of this design, players are pushed or "nudged" into performing specific actions. Thaler and Sunstein define nudging as "any aspect of the choice architecture that alters people's behavior predictably without forbidding any options or significantly changing their economic incentives.[34]" In other words, behavior can only be affected (nudged) in a restricted setting (the architecture) by a choice architect either in a virtuous or harmful way.

[32] Richard Thaler and Cass Sunstein, "Introduction," in *Nudge: Improving Decisions About Health, Wealth and Happiness*, ed. Richard Thaler (London: Yale University Press, 2008), 3.
[33] Thaler and Sunstein, "Introduction," 3.
[34] Thaler and Sunstein, "Introduction," 6.

The problem with Nudging

Communication scholars Nathan Hulsey and Joshua Reeves contribute on this idea of the participatory panopticon. In their paper: *The Discipline of Watching: Detection, Risk, and Lateral Surveillance*. The two academics analyze *Ingress*, the precursor to *Pokémon Go*. In this game, *Niantic* monitors behavioral data at a highly granular level. In fact, *Ingress'* main focus is "gathering capitalizable data about consumption habits" and is also "deeply entrenched in the logics of capital accumulation."[35] Many elements of *surveillance capitalism* are present in this precursor to *Pokémon* Go, most notably the "logics of capital accumulation." Furthermore, the idea of the participatory panopticon is also relevant with *Ingress*, as Hulsey and Reeves discuss how "*Ingress* produces a community where every day surveillant labor is normalized as a valid system of exchange."[36] In the concluding remarks of Hulsey and Reeves' paper, this behavioral accumulation is heavily criticized: "citizens are being called on to submit to surveillance."[37] Hulsey and Reeves see the choice architecture of *Ingress* as an entrapment here, contradicting Thaler and Sunstein's stance on healthy and virtuous nudging.

Another vital critic of behavioral nudging is Sam Harris, who makes a case for the absence of free will and joins the behavioral side of the debate. The American neuroscientist defined free will as "viewing one another as autonomous persons, capable of free choice."[38] Harris argues for the absence of free will, where humans are nothing more than "biochemical puppets."[39] He views humans as weak individuals prone to manipulation because "thoughts and intentions emerge from background causes of which we are unaware and over which we exert no conscious control."[40] According to Sam Harris, choice is an illusion and human beings are mostly unaware of what drives them to make such decisions. If free will is an illusion and humans are reduced to "biochemical puppets" then users interfacing with Surveillance capitalist products are vulnerable to manipulation. Chamath Palihapitiya, one of the earlier senior executives at *Facebook*, another surveillance company; admitted the damaging consequences of using these biochemical triggers to manipulate

[35] Nathan Hulsey and Joshua Reeves, "The Gift That Keeps on Giving: Google, Ingress, and the Gift of Surveillance," *Surveillance & Society* 12, no.3 (2014): 392.
[36] Ibid.
[37] Hulsey and Reeves, "The Gift," 398.
[38] Sam Harris, "Preface," in *Free Will*, ed. Sam Harris (New York: Free Press, 2012), 1.
[39] Sam Harris, "Choices, Efforts, Intentions," in *Free Will*, ed. Sam Harris (New York: Free Press, 2012), 47.
[40] Harris, "Preface," 5.

individuals: “The short-term, dopamine-driven feedback loops that we have created are destroying how society works.”[41] With the anti-nudging part clear, I will now move to the opposing side, calling for a better, critical implementation of nudging without rejecting its virtuous potential.

The Potential of Nudging

While defining the overarching concept, nudging is a helpful tool for orienting individuals towards a specific direction. Thaler and Sunstein view nudging as a valuable contributor to society. Both authors consider nudging as a beneficial resolution to improve flawed human behavior.[42] To illustrate this, Thaler and Sunstein presented a case study using Amsterdam Schiphol’s urinals. In this example, “authorities have etched the image of a black housefly into each urinal,” this small etching improved the accuracy of urinal users and “reduced spillage by 80 percent.”[43] Thanks to nudging, uninformed urinal users were able to make better-informed aiming decisions subconsciously. *Pokémon Go* is full of similar applications virtuously manipulating users with simple mechanics, especially in the navigational aspect of playing I am analyzing. The ways in which the game modifies the players’ behavior will be demonstrated in the analysis described in chapters I to III.

[41] Chamath Palihapitiya, “Founder and CEO Social Capital, on Money as an Instrument of Change,” filmed November 2017 at The Stanford Graduate School of Business, Stanford, CA, video, 22:50, https://www.youtube.com/watch?v=PMotykw0SIk.
[42] Thaler and Sunstein, “Introduction,” 6.
[43] Thaler and Sunstein, “Introduction,” 4.

Academic positioning

The debate on surveillance capitalism and manipulation ranges from moderate to more outspoken critiques. The academics from both sides critique surveillance technologies from both a technological and behavioral standpoint. Although each contribution provides rich and valuable material on which I conduct my research, no author analyzed manipulation within a surveillance product with a hands-on method such as the dispositif analysis. Additionally, Thaler, Sunstein and Harris used neither *Pokémon* Go nor other surveillance products as a case study. Applications of their behavioral literature in the game will help understand both *Pokémon* Go and the overarching concepts.

For my research, I will be combining the practicality of the dispositif with behavioral literature from Harris, Thaler and Sunstein to position myself on Helbing's side of the debate. Through my positioning, I will demonstrate in my practical analysis how nudging combined with big data technologies can bring both virtue and harm to players. This decision allows me to argue **for** surveillance capitalism as a tool benefiting *Pokémon Go* players and **against** it. Therefore my research aims to be more nuanced than Zuboff's one-sided negatively connotated critique on the topic. I do so by approaching the problem from the perspective of Helbing and his peers. Therefore, my research aims to fill the space left between the **affirmative** authors and the **critics**.

Methods

To fill the nuance gap left in the academic debate, I analyze *Pokémon Go,* a surveillance product using a practical, hands-on methodology intertwining both *surveillance capitalism* and *nudging*. In other words, I investigate the way technology negatively or positively influences behavior using the dispositif analysis.

The dispositif analysis is a three-step process encapsulating screen, text, and spectator.[44] First, the **screen** step provides information on the technological configuration of the device displaying the information.[45] Second, the **text** step represents the information displayed on the screen. Third, the **spectator** step reflects how the spectator is positioned in this situation **(fig. 4)**.[46] The combination of the three steps enables a thorough definition of the method-anchored concepts.

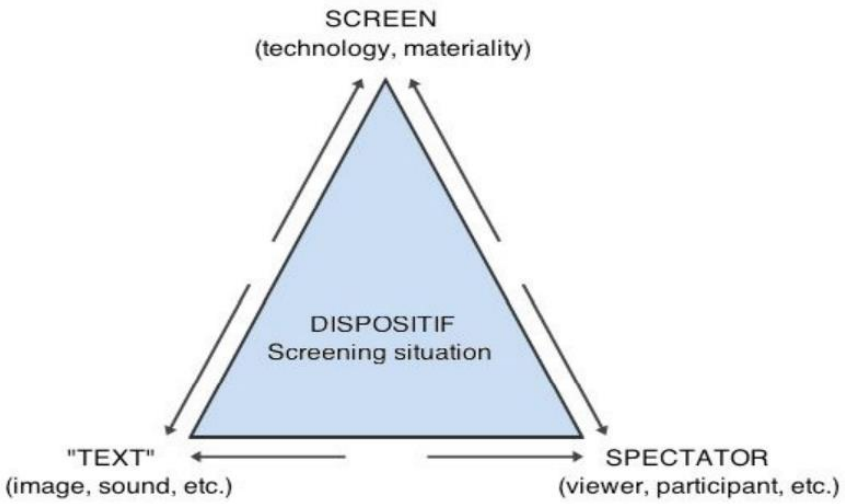

Figure 4: Outline of the dispositif analysis framework.[47]

In *Pokémon Go*, the **screen** represents the technological affordances of the game such as geo-localization and augmented reality features. I use these technological

[44] Nanna Verhoeff and Karin van Es, "Dispositif Analysis: How to Do a Concept-Driven Dispositif Analysis," third edition, (Utrecht: Utrecht University, 2020), 5.
[45] Verhoeff and Es, "Dispositif," 6.
[46] Ibid.
[47] Verhoeff and Es, "Dispositif," 5.

affordances to illustrate the revenue and profitability aspects of surveillance capitalism due to **behavioral modification**. The **text** represents how in-game information such as *Pokéstops*, *Pokégyms* and *Pokémon* are placed and communicated to the player. Finally, the **spectator** here is the player, where I look at how the **spectator**'s behavior is *nudged* and predicted by *Pokémon Go* through its use of textual elements. For more clarity, I refer to the **spectator** as the **player** or the **user** during my analysis.

The dispositif analysis method connects my research sub-questions as follows: the **text** step concerns how points of interest (*Pokéstops* and *Pokégyms*) are placed; the **spectator** (**player**) step analyzes how players are *nudged* by the game's **textual elements** and finally; the **screen** looks at how *Niantic* uses behavioral modification and *nudging* to be more profitable. As my research question looks into forming an understanding of **how *Pokémon Go* achieves behavioral modification and commodification**, a method analyzing both the source and potential outcome of *nudging* is useful.

To operationalize the dispositif analysis, I gathered information about its three poles by playing the game on my mobile phone in two types of locations: cultural and commercial. For the cultural areas, I have gathered material at Utrecht's city center near the Dom tower **(fig. 5)**. For the commercial type of location, I have gathered material in the shopping streets near the Oudegracht and Drift **(fig. 6)**. My choice of these two types of places is based on Hulsey and Reeves' literature: "*Google* is developing a profit model that is based on targeted advertisements and strategic portal locations."[48] City centers and commercial streets have the densest shop and monument concentration, making them ideal locations for advertisers.

I documented all my experiences while playing at the selected sites in Utrecht with screenshots translating my "screening" situation. Every individual image is used to illustrate each respective step of the dispositif analysis. Due to how my research concerns surveillance capitalism through behavioral modification, which is analyzed from its navigational aspect, I mainly focus on movement mechanics. Therefore, I will ignore all combat mechanics and focus exclusively on how players are incentivized to move through the map to specific locations. Elements such as the inventory, shops, *Pokégyms* battles and the *Pokédex* are not considered in my analysis as they lie beyond the navigational scope of my research.

[48] Hulsey and Reeves, "The Gift," 392.

Figure 5: Area analyzed near the Dom tower, in Utrecht's city center (source: *Google Maps*, link with exact coordinates in the footnotes).[49]

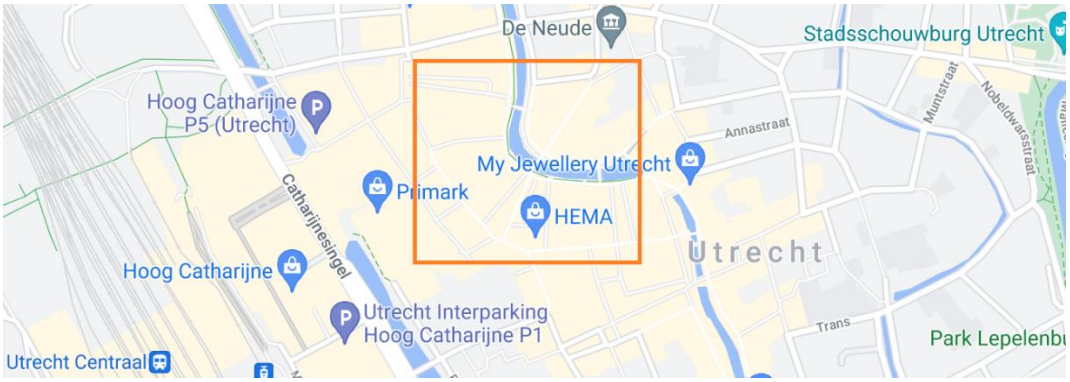

Figure 6: Area analyzed near the Oudegracht, in Utrecht's city center (source: *Google Maps*, link with exact coordinates in the footnotes).[50]

By reducing the scope of my method, I disregard essential game design elements such as in-game shopping, item scarcity, game handling, combat design and other game mechanics. However, although my research is weakened by lacking the details above, the complexity reduction gives way to focus on the connection between the behavioral aspects (*nudging*) and economic-technological aspects (*surveillance capitalism*) of the game. Because of its hands-on nature, the dispositif analysis offers a coherent, practical and accurate operationalization. This operationalization will allow me to answer the research question through the dispositif's concept-driven nature **(fig. 7).**

[49] "52.0923133,5.1187588," Google Maps, accessed May 10, 2021, https://www.google.com/maps/@52.0923133,5.1187588,15.58z.
[50] Ibid.

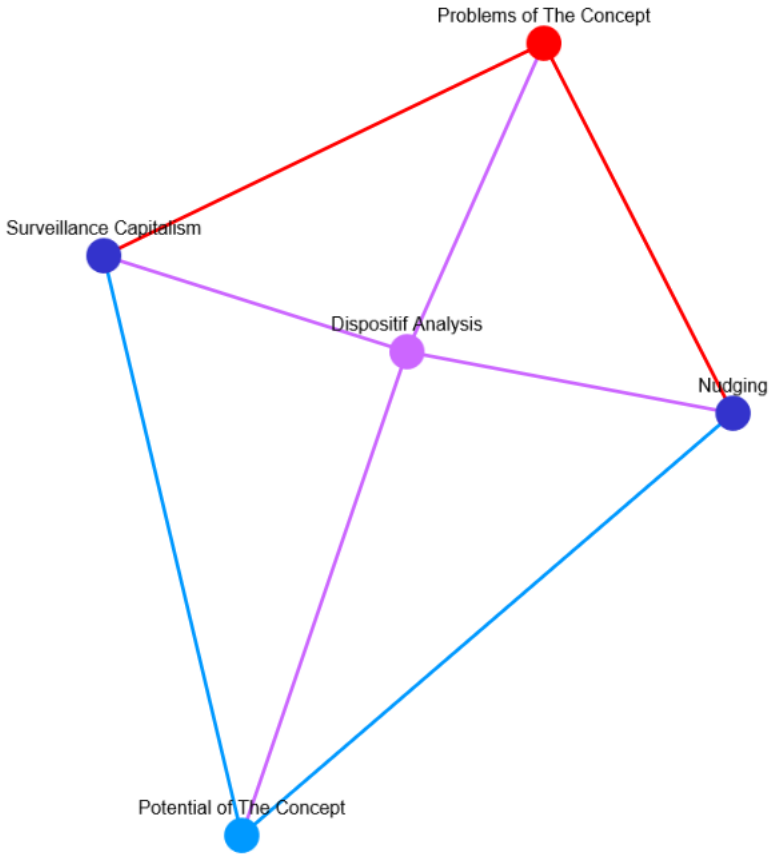

Figure 7: In this kite-shaped visual representation of the operationalization, dark blue represents the concepts, purple represents the dispositif, and the remaining two colors are attached to each concept's problems and potential. As can be seen, all elements of my theoretical framework are connected with the dispositif to provide a nuanced perspective. (Visualization built using the Dash Python library, source code with detailed comments and technical explanations available in the appendix and the separate pdf notebook.)[51]

With the dispositif method, the behavioral, technical and economic aspects of surveillance capitalism in *Pokémon Go* are explained by maintaining the text-player-screen relationship. In other words, the dispositif is immutable, and my analysis of *Pokémon Go* reflects this steadfast relationship.

Therefore, the analysis is divided into three chapters, each treating a step of the dispositif analysis. Starting with text and ending with screen, the analysis looks separately at each step in great detail before concluding by gathering the observations from each

[51] "Network Graphs in Python," Plotly, accessed March 20, 2021, https://plotly.com/python/network-graphs/.

respective element of the dispositif. Furthermore, each step of the dispositif will be analyzed using the appropriate locations outlined in the methodology (the Dom area, the Oudegracht and *Pokéstops* near Drift).

Analysis

Chapter I: Item Placement

In this first chapter, I investigate how textual elements are spatially placed on *Pokémon Go*'s map. This chapter serves as a foundation for the behavioral aspects of the game in the second chapter. In this first chapter, I will focus on how items such as *Pokémon* (highlighted in purple), *Pokégyms* (highlighted in red), rewards from these *Pokégyms* (highlighted in yellow) and *Pokéstops* (highlighted in orange) are placed in the selected areas in Utrecht's city center **(fig. 8).** I will outline *Niantic's* placement methods' positive and negative aspects by combining the literature and dispositif analysis to support my claims through my investigation.

Figure 8: Screenshot of the in-game map at Utrecht's city center with all visible items

First, the *Pokéstops*, these textual elements represent points where players can obtain various resources such as *Poké balls* or *Pokémon* eggs. *Pokéstops* can also be enhanced with *lure modules* to attract *Pokémon* in their vicinity.[52] Therefore, *Pokéstops* serve as a hub to attract *Pokémon* (directly) and players (indirectly), as shown in **figure 8**.

In her book, Zuboff used a New York pizza bar to illustrate how *lure modules* work. She gives an example of an owner who paid for *lure modules* on a nearby *Pokéstop*, after which drink sales "were reported to be 70 percent above average."[53] Local governments also used *lure modules* to increase civic activities. Laura Minich, the deputy city manager for West Covina, California, reported how they "dropped a lure [...] to attract more attendees" at town hall meetings.[54] The previous governmental example shows how *lure modules* can be used to incentivize civic behavior. In the chosen locations in Utrecht where I played the game, each monument has been established as a *Pokéstop.* As explained on the official *Pokemon* website: "look for PokéStops located at interesting places—such as […]monuments."[55] These monuments appear as a blue icon, and once the player taps on the icon, the game zooms in and reveals more information **(fig. 9).**

[52] "Pokéstop," Pokémon Go Wiki, accessed May 10, 2021, https://pokemongo.fandom.com/wiki/Pok%C3%A9Stop.
[53] Zuboff, "Pokémon Go!" 314.
[54] "How Local."
[55] "Pokémon GO," Pokémon, accessed May 10, 2020, https://www.pokemon.com/us/pokemon-video-games/pokemon-go/.

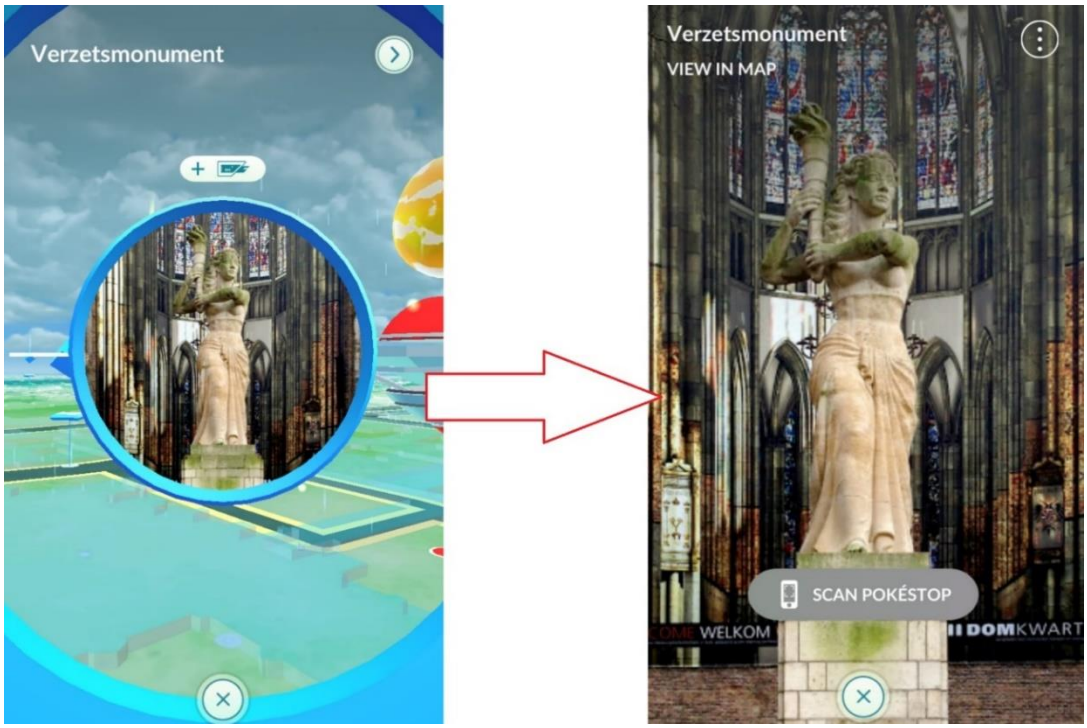

Figure 9: How players can interact with *Pokéstops* by tapping on their screen.

These *Pokéstops* are central to playing the game as *Pokémon* appear around these *Pokéstops* to attract players and increase foot traffic. Furthermore, the locations of these *Pokéstops* are crowdsourced (built by the target crowd of the game instead of *Niantic*). Instead of being manually created by *Niantic*, *Pokéstops* are created by local players. Locals such as content creator *LuckyBunz* show how this process works. *LuckyBunz*, an active member of the *Pokémon Go* community, demonstrated how through *Niantic's* companion app *Scanner redacted*, users can create "portals" which will be used as *Pokéstops* after being approved by *Niantic*.[56] Hulsey and Reeves also reported on the importance of crowdsourcing in the portal creation process: "an essential element […] is the process of self-archival and self-presentation that facilitates this peer-to-peer surveillance."[57] By self-archival, Hulsey and Reeves refer to the crowdsourced portal submission process.[58]

Niantic later reviews these portals according to strict quality guidelines such as visibility.[59] This process of depending on user-submitted portals has been defined as the

[56] LuckyBunz, "How To CORRECTLY Submit Portals In Ingress To Create *NEW* PokeStops & Gyms In Pokémon GO! (Pt.3)," filmed May 2019 at LuckyBunz's studio, Santa Clarita, CA, video, 9:00, https://www.youtube.com/watch?v=iDnEsTZ_Cm8.
[57] Hulsey and Reeves, "The Gift," 396.
[58] LuckyBunz, "Submit Portals," 1:05.
[59] LuckyBunz, "Submit Portals," 9:25.

"participatory panopticon" by Andrejevic, where "distributed surveillance […] relies on the internalized discipline not just of the watched, but also of the watchers."[60] Andrejevic interprets this form of distributed surveillance from an Orwellian perspective by referring to users as "proliferating little brothers."[61] Not only are *Pokéstops* partly imported from *Ingress*-submitted portals, but players can also take part in the "participatory panopticon" by contributing to the description data of the portals **(fig. 10).**

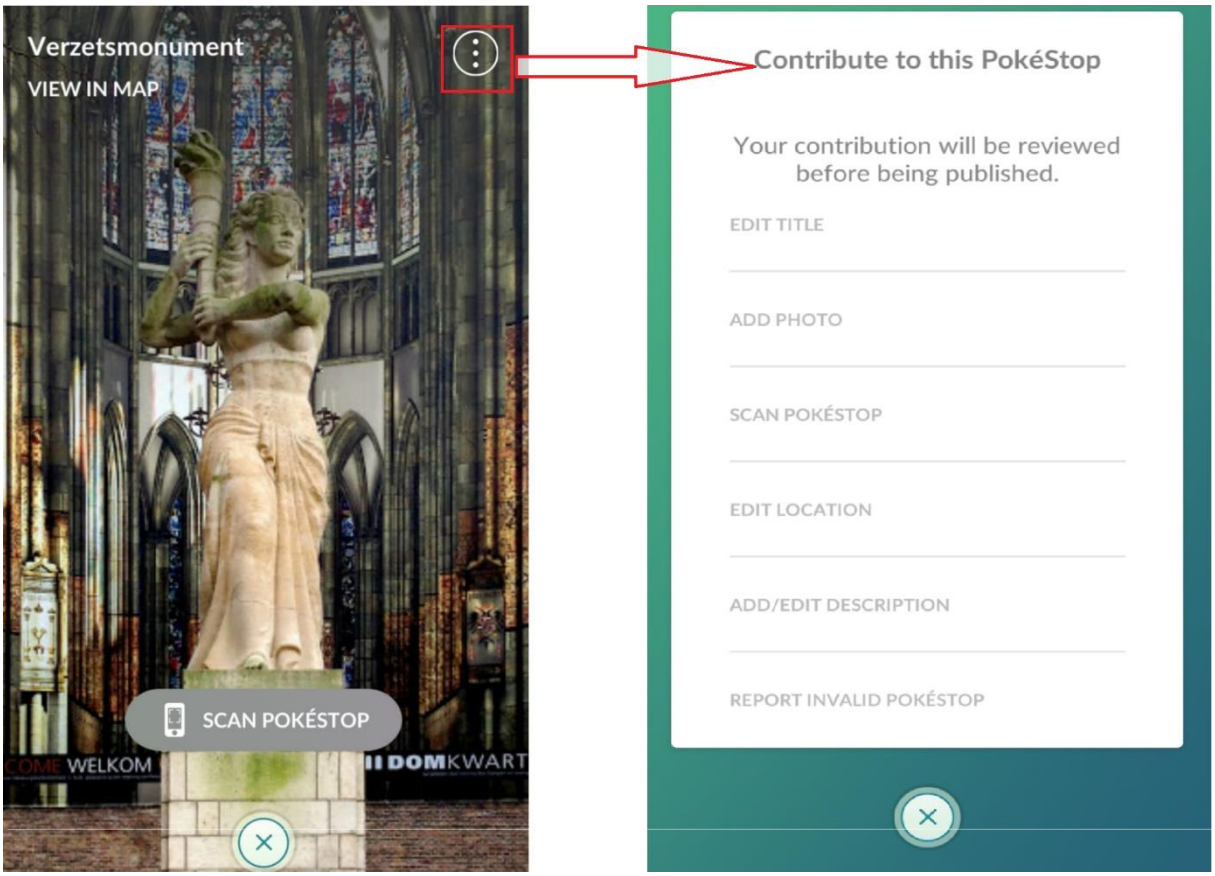

Figure 10: How users can add information to already existing *Pokéstops* inside *Pokémon Go*.

Once *Niantic* reviews the data, the *Pokéstops* will display the user-made submission for all other players, as seen in this *Pokéstop* representing the plate honoring King Willem **(fig. 11)**. The way data has been collected from volunteers to the game is of a surveillance capitalist manner. This is precisely how market control can be achieved: the players submit data through *Ingress* in the form of portals which will be transported to *Pokémon Go,* which allows *Google* to map the entirety of monuments in Utrecht, **for free**. *Google*, as a result, knows more and gets ahead of the market with consistently updated data.

[60] Andrejevic, "The Discipline," 405.
[61] Ibid.

However, despite the benefits *Google* receives, one should also look at how Utrecht's citizens benefit from this. Allowing players to submit such data about their local community is part of Helbing's recommendations on responsible usage of big data: "For governments, public trust is the basis of legitimacy and power."[62] By open-sourcing the portal creation process, local governmental institutions and citizens are able to add portals and in-game locations.[63] For instance, the definition of the "Verzets monument," one of Utrecht's most iconic monuments in front of the Dom church, rests in the hands of Utrecht-based *Pokémon Go* players. However, this could also be sabotaged by ill-behaved users who can create misinformation using these tools. Fortunately, *Niantic*'s quality checking system as outlined by *LuckyBunz,* provides a safeguard against ill-intended behavior. Helbing also includes these security measures in his recommendations: "quality control is needed to ensure that quality standards are met."[64]

Niantic's geospatial hegemony through "participatory surveillance" reveals how surveillance capitalism is present here. The scale and size of their mapping operation ascertain surveillance capitalism's presence. *Pokéstops and Pokégyms* are accurate personifications of *Google's* geospatial hegemony. From *Ingress* to *Pokémon Go*, crowdsourced data was used to maintain *Google*'s position as a leader in augmented reality games. However, this participatory option also allows citizens to promote their local communities and local governments to advertise their cities' landmarks, thus fulfilling many of Helbing's requirements. With the placement of textual elements such as *Pokéstops and Pokégyms* explained, I will now analyze how players are *nudged* to go and interact with these locations.

[62] Helbing, "Societal," 63.
[63] "How Local Governments Are Using Pokémon Go," Medium, accessed May, 10, 2021, https://medium.com/@ELGL50/how-local-governments-are-using-pok%C3%A9mon-go-aa3556beeae2.
[64] Helbing, "Societal," 62.

Figure 11: A *Pokéstop* with user-submitted background information.

Chapter II: Behavioral Aspects

After analyzing the textual aspects of the *Pokémon Go* dispositif in the previous chapter, I present here how the game *nudges* players to interact with the above-outlined items and locations such as *Pokégyms* and *Pokéstops.* I will thus analyze how the player's behavior is *nudged* and predicted by the game. In more detail, I look at how *Pokégyms, Pokéstops and Pokémon* nudge players into walking towards a particular direction and interacting with certain items.

Pokémon Go's navigation map is plain and devoid of details. The entirety of the map comprises green spaces with little to no detail. This directs the eye towards the gameplay items such as *Pokémon, Pokéstops and Pokégyms.* Because of this, *Pokégyms* are visible from hundreds of meters away. For example, Utrecht's iconic Dom tower can be spotted from remote distances **(fig. 12).**

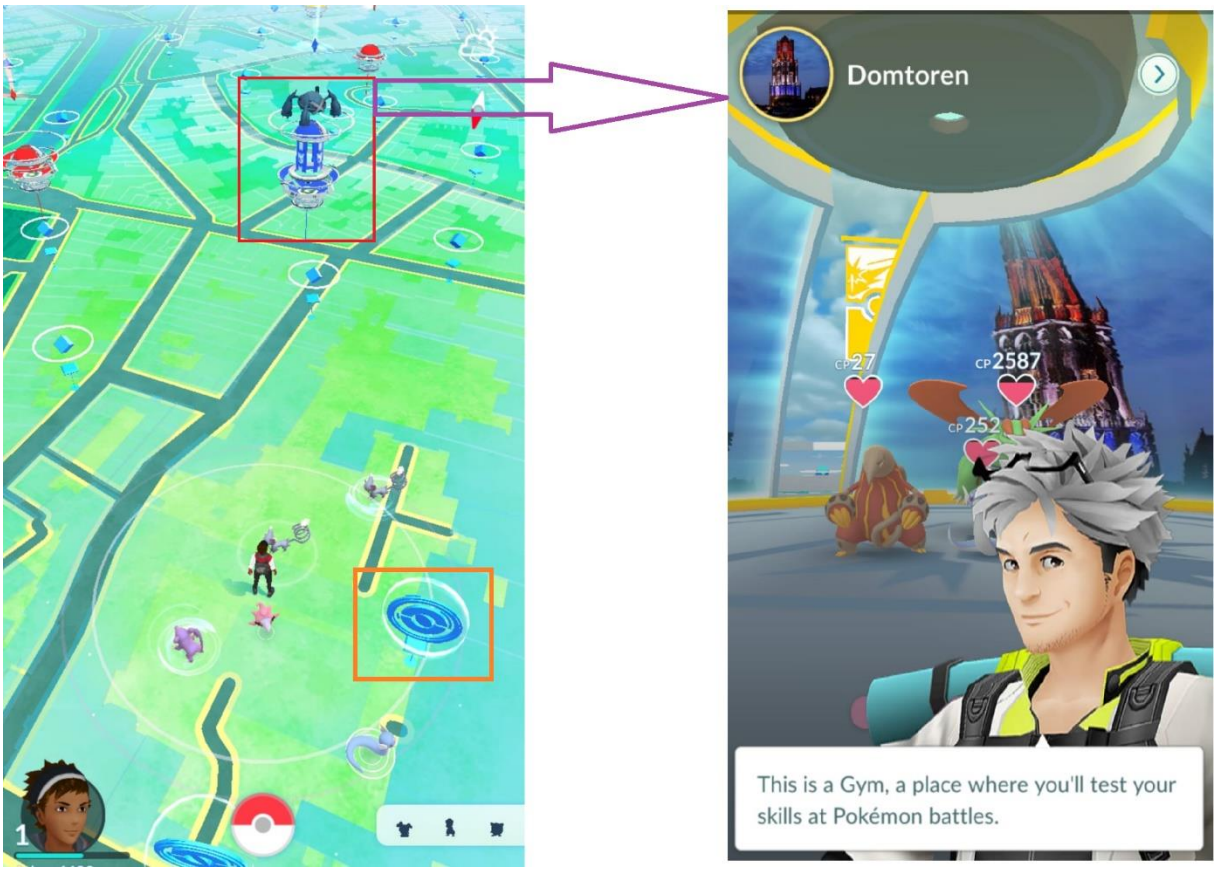

Figure 12: How a simple, plain map allows for easy-to-spot in-game items such as the *Pokégyms* (highlighted in red) and *Pokéstops* (highlighted in orange).

This ease-of-spotting is key to nudging. To come back to the Amsterdam Schiphol experiments, the minor glyphs serve the same purpose as the *Pokégyms* and *Pokéstops* by standing out from the monochromatic environment.[65] This clever and concise way of indicating affordances in a *choice architecture* is what Thaler and Sunstein refer to as "the path of least resistance."[66] The two authors defined the path of least resistance as a consequence of how many people' instincts direct them towards "whatever option requires the least effort."[67] Thaler and Sunstein used examples such as auto-renewal in magazine subscriptions nudging users to stay subscribed for longer. In *Pokémon Go*, applications of *nudging* through the "path of least resistance" are embodied by the user-friendly map, nudging players into walking towards easily identifiable remote *Pokéstops* and *Pokégyms.* Additionally, players can be nudged further by attaching *lure modules* to *Pokéstops***,** attracting more *Pokémon* that in turn attract players wanting to capture them due to the game's choice architecture **(fig. 13)**. These modules were effective in Zuboff's pizza bar example and in Laura Minish's townhall experiment, which showed "satisfactory results."[68]

Figure 13: An example of how any user can purchase *lure modules* for 100 coins (0.99 Euros).[69]

[65] Thaler and Sunstein, "Introduction," 4.
[66] Richard Thaler and Cass Sunstein, "Choice Architecture," in *Nudge: Improving Decisions About Health, Wealth and Happiness*, ed. Richard Thaler (London: Yale University Press, 2008), 83.
[67] Ibid.
[68] "How Local."
[69] "Pokémon GO Coins," Gamecards Direct, accessed May 19, 2021, https://gamecardsdirect.com/nl-en/pokemon-go-coins-android/.

The effectiveness of *lure modules* depends greatly, if not entirely, on a cleverly designed *choice architecture*. However, the way *nudging* is applied in *Pokémon Go* can be considered as "evil nudges." Thaler and Sunstein raise this issue as all "choice architects […] have incentives to nudge people in directions that benefit the architects rather than the users."[70] This risk is more significant as *Pokémon Go* is for-profit and relies on players for profitability. Zuboff demonstrated how the use of profitable *sponsored locations* was long-planned by *Niantic,* where companies "pay *Niantic* to be locations within the virtual game board."[71] When businesses pay for visibility, foot traffic increases because players are nudged into interacting with commodified in-game locations. This form of geographic commodification relies heavily on understanding the behavioral triggers responsible for nudging players.

During my gameplay at the Oudegracht in the center of Utrecht, the placement of multiple *Pokémon* could potentially reveal the conflicts of interest involved with *choice architecture* design. In fact, of the *Pokémon* I encountered, numerous were placed directly in front or inside shops **(fig. 14)**. Although there is no way of verifying if the shops in question used *sponsored locations*, *Niantic* does indeed offer surveillance advertising services by enabling businesses to "Drive foot traffic to their business through gameplay."[72]

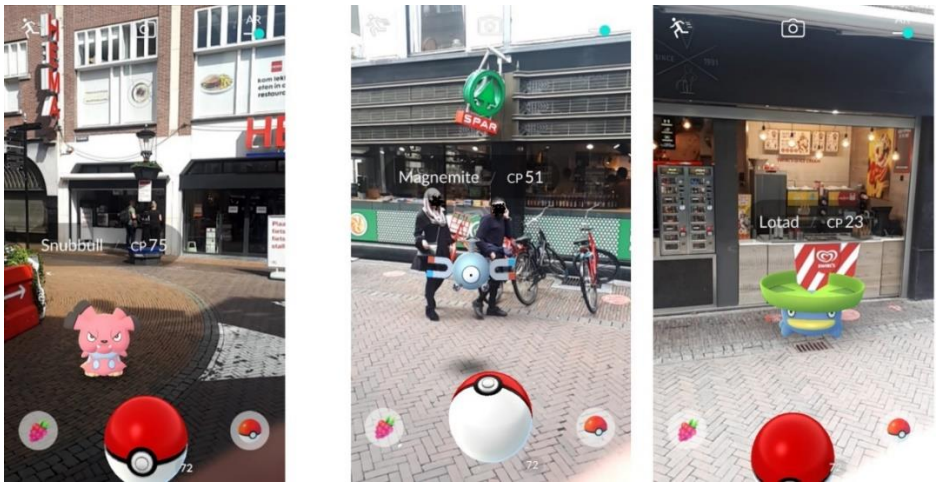

Figure 14: Augmented reality perspective while capturing *Pokémon,* the augmented reality view was used instead of the map view to show the shops in question (from left to right: *Hema, Spar* and *Manneken Pis*).

[70] Richard Thaler and Cass Sunstein, "Extensions and Objections," in *Nudge: Improving Decisions About Health, Wealth and Happiness*, ed. Richard Thaler (London: Yale University Press, 2008), 239.
[71] Zuboff, "Pokémon Go!" 315.
[72] "Sponsored Locations for Business," Niantic, accessed May 20, 2021. https://nianticlabs.com/en/sponsoredlocations/.

This behavioral modus operandi is nothing new for surveillance capitalist companies or video games, triggering specific reward dependence circuits in players. In a study conducted in 2007 on several video game-addicted adolescents, Doug Hyun Han et al. discovered "similar behavioral patterns with respect to reward dependence as users of drugs of abuse."[73] The study concluded "that reward dependence is an important trait in excessive internet game play."[74] Although the study addresses specific aggravated game addiction cases not applicable to the average user, natural reward mechanisms can still be rewired if players are exposed to specific *choice architectures* for extended periods. In *Pokémon Go,* activity is rewarded with in-game items and experience points if the player performs specific tasks **(fig. 15)**. Experience points in **figure 15** and notifications such as the one received in **figure 16** are widely used in surveillance products. In his interview, Palihapitiya describes how "we get rewarded in these short-term signals: hearts, likes, thumbs up and we conflate that with value."[75] These dopamine-secreting notifications designed by Palihapitiya and his peers are also present in *Pokémon Go*. However, instead of taking the form of likes, notifications take the shape of experience points and game items. This structure combines surveillance capitalist nudging methods with game design nudging tools **(fig. 16)**.

[73] Doug Hyun Han, Young Sik Lee, Kevin C. Yang, Eun Young Kim, In Kyoon Lyoo and Perry F. Renshaw, "Dopamine Genes and Reward Dependence in Adolescents with Excessive Internet Video Game Play," *Journal of Addiction Medicine* 1, no.3 (September 2007): 137.
[74] Ibid.
[75] Palihapitiya, "Founder and CEO," 24:50.

Figure 15: An example of the "day streak" nudge.

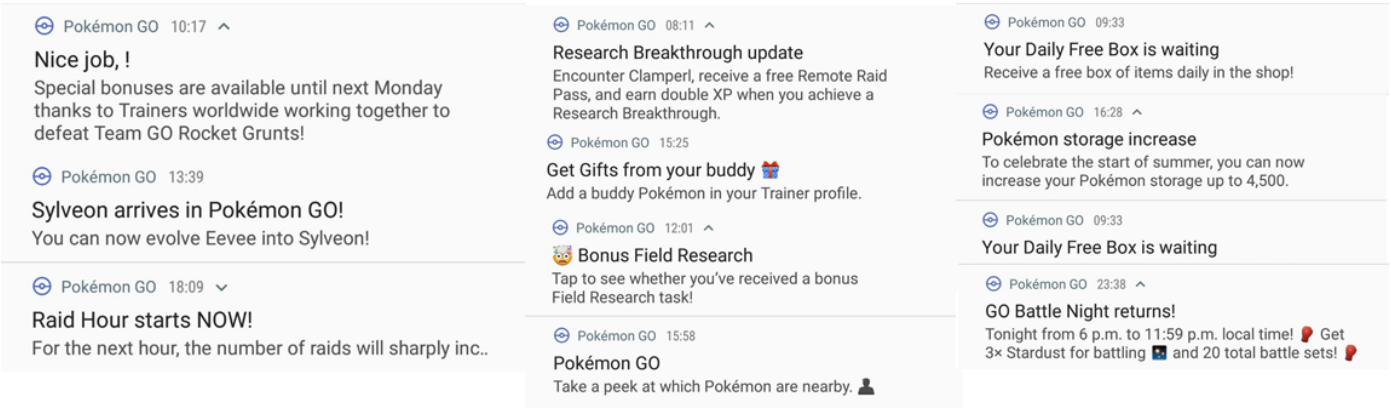

Figure 16: Collection of *Pokémon Go* notifications received over a week of playing, inviting me to play and stay active (a total of eleven notifications were received).

Reward circuit manipulation is at the center of Sam Harris' thesis on free will, through which he claims that: "Will power is a biological phenomenon," to which he adds that one "cannot choose what they choose," nor do they "not choose to choose what they choose."[76] From Harris' perspective, players are nothing more than puppets with a disguised sense of agency. In other words, the players could be the puppets of the choice architects, unaware of how they are nudged. From this perspective, surveillance capitalism commodifies behavior through predatory manipulation, which "modifies human behavior," as outlined in

[76] Sam Harris, "Choices," 39.

the initial definition of the concept. Evil nudges, reward circuitry modification and lack of free will go hand in hand in this perspective of the behavioral aspects of the *Pokémon Go* dispositif.

The manipulative aspects of *Pokémon Go* are clear: from player-rewarding in-game mechanics encouraging more frequent gameplay, to nudging players towards certain locations, *Niantic* proves to be a highly efficient and competent behavioral modifier. Zuboff, Harris, and Thaler argue why such behavior is detrimental. However, *nudging* can also have its benefits for the players. Thaler and Sunstein argued for positive nudging use cases such as "regular" and "custom installations" in software.[77] Thaler and Sunstein argue how the default checking of the "regular" box is a positive nudge to increase the intuitiveness of the installation process for novice users.[78] Therefore, it could be argued how the plain map design in the game contributes to a better player experience by allowing novice players to identify interactive items and maximize their entertainment utility. Additionally, by effortlessly spotting remote locations such as *Poké*gyms, players might be nudged into walking more and being more healthy.

In an extensive literature review conducted by Alf Inge Wang, *Pokémon Go*'s effects on players were proven to be largely beneficial for both mental and physical health **(fig. 17)**.[79] For mental health, *Pokémon Go* has proven to show a "significant positive effect on social anxiety [...] and significant indirect effect on reducing depression."[80] Additionally, the game showed a "positive impact on general wellbeing."[81] Physically, the game has "managed to motivate people who do little or no physical activity to become physically active," *Pokémon Go* has also significantly increased the "number of steps walked or jogged, distance travelled, and time spent on physical activity."[82] This increase in activity and social contact can be attributed to the nudging mechanics pushing the players to be more physically active by walking towards remote in-game locations outlined by the choice architecture **(fig. 18)**. Additionally, players are also nudged to be more active through

[77] Thaler and Sunstein, "Choice Architecture," 85.
[78] Ibid.
[79] Alf Inge Wang, "Systematic literature review on health effects of playing Pokémon Go," *Entertainment Computing* 38, no.1 (May 2021): 6.
[80] Ibid.
[81] Ibid.
[82] Wang, "Systematic," 8.

reward systems collecting activity data, nudging players to be more physically active, as I encountered with in-game rewards in **figure 19**.

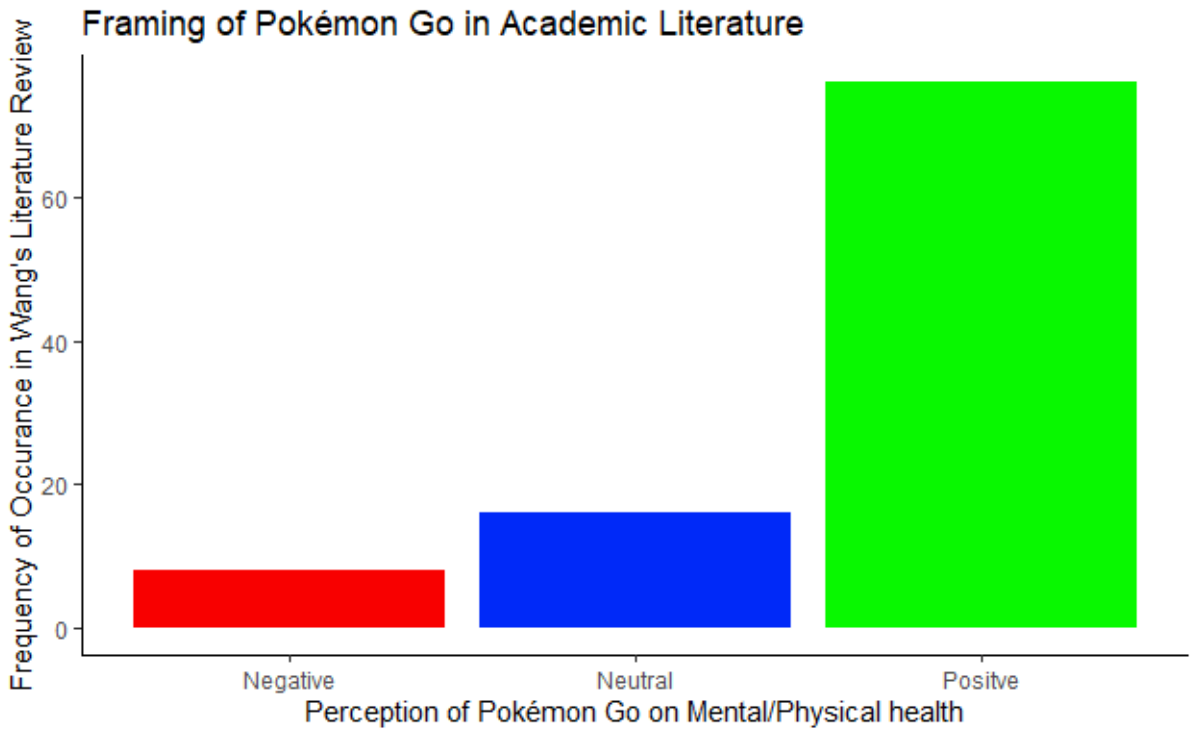

Figure 17: Visualization of Alf Inge Wang's literature review showing the number of papers arranged in each of the three categories. Plot generated using *R* with the *ggplot2* library, source code in the appendix and pdf markdown file (Data Source in the footnotes).[83]

[83] Wang, "Systematic," 6.

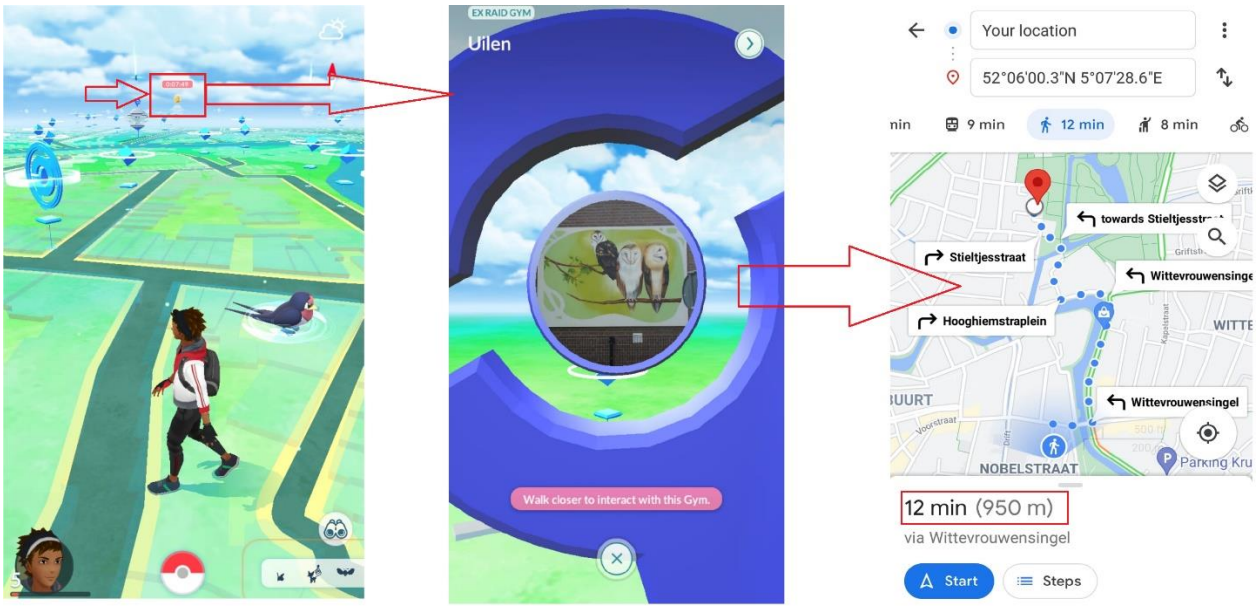

Figure 18: How players are nudged into engaging with remote locations. In this case, I was nudged to walk 950 meters towards a remote *Pokégym* with a countdown signalling the imminent end of an event.

Figure 19: How players are nudged to achieve increased physical activity through a reward system.

This increase of social and psycho-physical welfare in *Pokémon Go* is achieved with *nudging* and the exact mechanisms used to trick the brain into producing dopamine, as shown by Palihapitiya's methods and Doug Hyun et al.'s research on video game and dopamine production.

Therefore, *Pokémon Go*'s approach to nudging serves as a double-edged sword. It helps players make better decisions, such as being more physically active, just as it drives users into areas where they might fall prey to advertised locations in true surveillance capitalist fashion. Just as I was nudged into walking 950 meters to a *Pokégym,* as seen in **figure 18**, I was also potentially drawn to shops and storefronts at the Oudegracht, as seen in **figure 14**. The way nudging is commodified will be elaborated upon in the next chapter.

Chapter III: Behavioral Commodification

The first two chapters demonstrated how text and behavior are intertwined because of nudging and surveillance. This interdependence between the two sides of the dispositif is at the core of *Pokémon Go'*s game design. This design has always been the plan, as Zuboff states about John Hanke (CEO at *Niantic)*: "His aim was the development of 'parallel reality' games that would track and herd people."[84] For the game to be playable and enjoyable, user-tracking must be allowed.

The interaction functionalities go beyond simply affording the playability of the game, 2020 for instance, has been the most profitable year for *Niantic* since the game's release **(fig. 20)**.[85] Potential revenue streams come from *lure Modules, Pokécoins* and *business partnerships* **(fig. 21)**. As was shown in the second chapter, the positioning of the items matters from a behavioral standpoint. In this chapter, while taking into account the findings of *nudging* in the second chapter, I will show how *Niantic* generates profit through the *Pokémon Go business partnership* program, which concerns the screen aspect of the dispositif.

Figure 22 shows how well *Niantic* knows its players and how they use *nudging* to drive foot traffic to businesses willing to pay for the service. *Niantic*'s business partnership program offers two plans: a premium and a standard subscription **(fig. 23)**. In exchange for a fee, any location can become a *Pokéstop or Pokégym.*

Just as I could easily spot the Mural of the city of Utrecht on the map in **figure 18**, businesses with a *premium subscription* can also identically advertise their location. By scheduling an hour-long *special event* once a month, businesses can become *Pokéstops or Pokégyms* in exchange for 60 dollars, as shown in **figure 23**. Although *Niantic* is transparent about its advertising techniques and behavioral modification to charge an advertising fee to third parties, it is still unclear which locations are sponsored and which are not. For instance, Utrecht *Pokéstops* in **figures 24** and **25** represent known locations, but *Niantic* does not clarify whether these *Pokéstops* are here for their cultural or commercial relevance**.**

[84] Zuboff, "Pokémon Go!" 310.
[85] "Annual revenue generated by Pokémon GO."

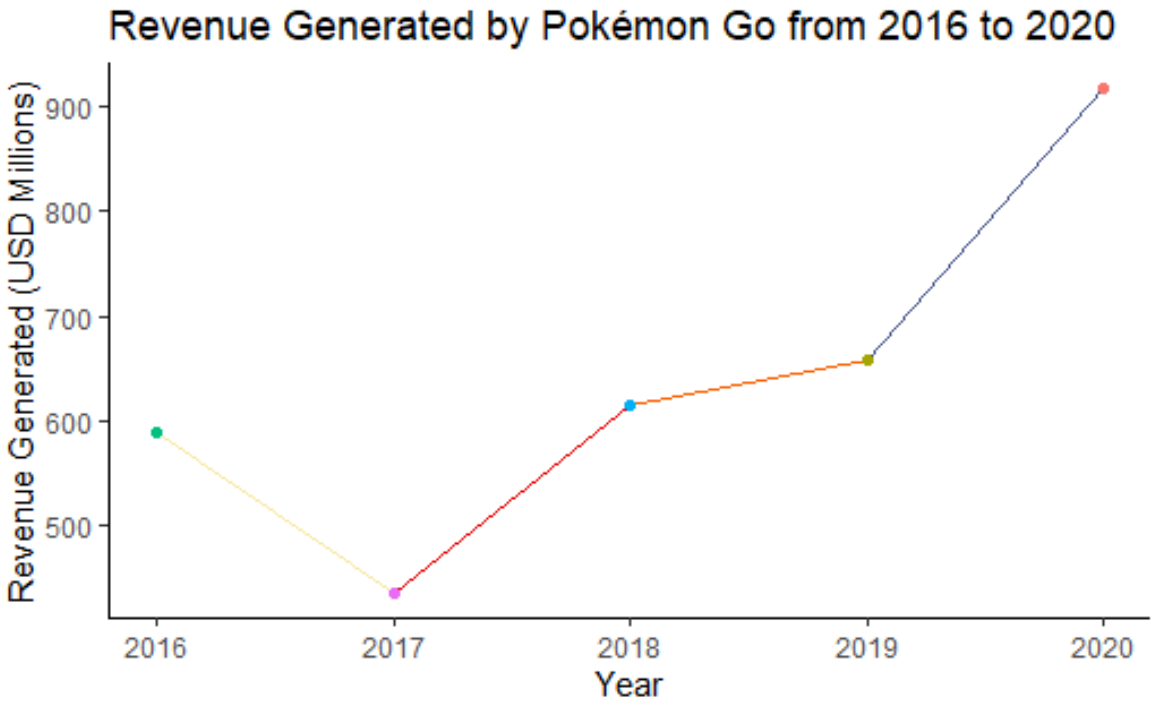

Figure 20: Visualization of *Pokémon Go*'s accrued revenue for the last five years. Plot generated using *R* with the *ggplot2* library, source code in the appendix and pdf notebook file (Data Source in the footnotes).[86]

[86] "Annual revenue generated by Pokémon GO."

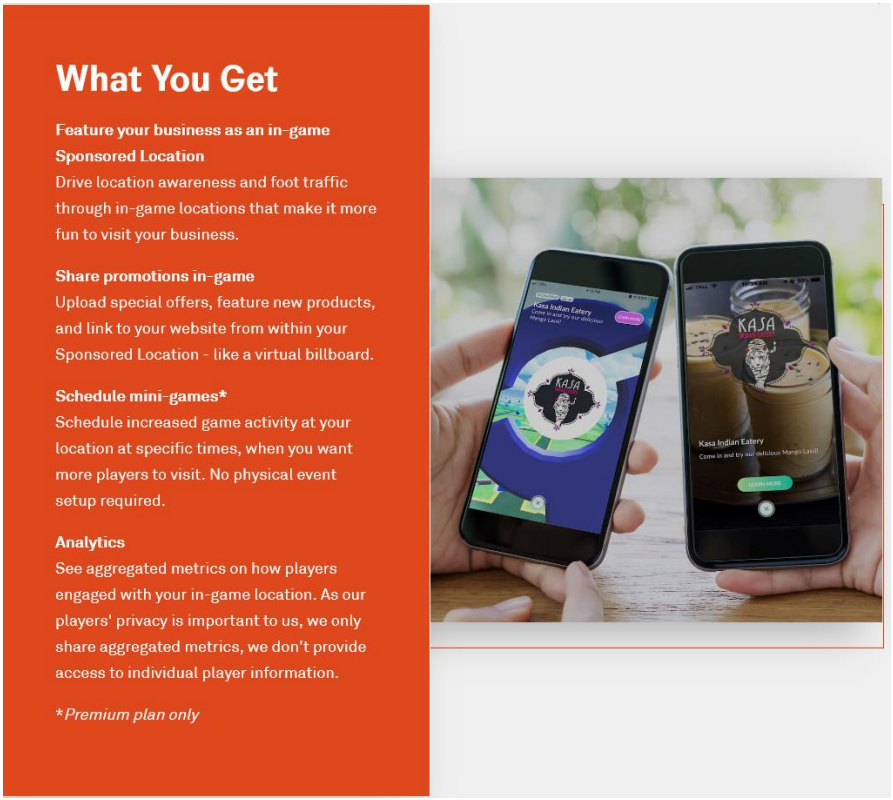

Figure 21: How *Niantic* link behavioral modification and advertising (source: *Niantic.com).*[87]

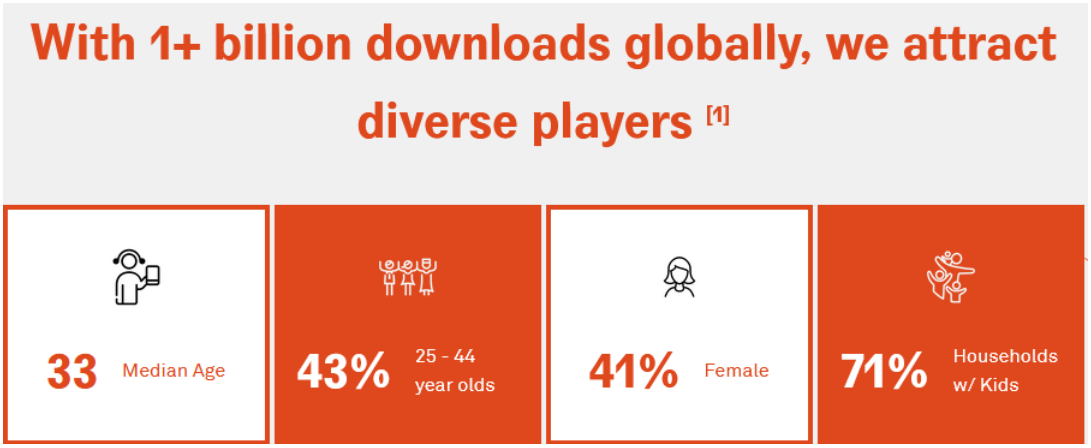

Figure 22: How Niantic advertises the knowledge they have of their players through surveillance (Source: *Niantic.com).*[88]

[87] "Sponsored Locations for Business."
[88] Ibid.

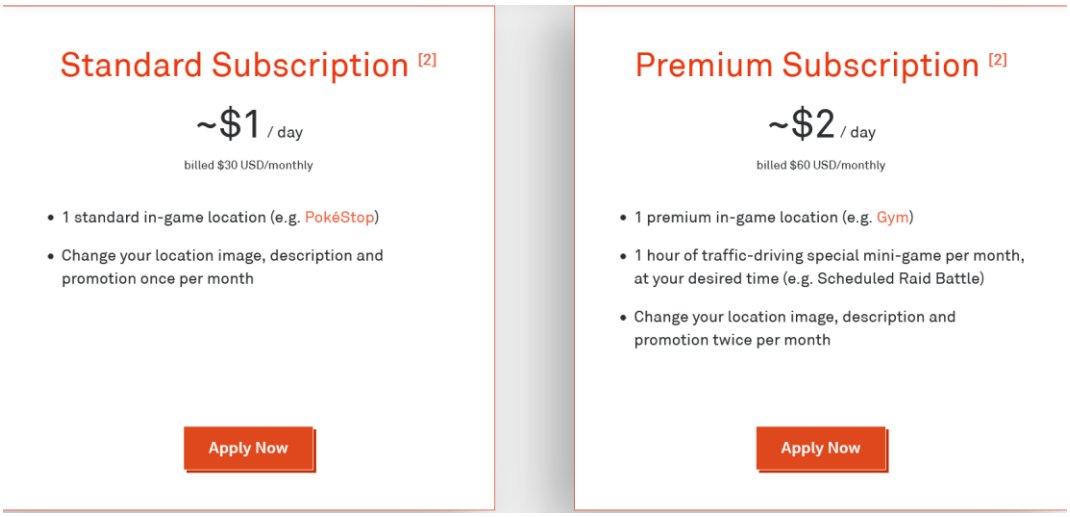

Figure 23: Pricing and contents for each of the possible subscriptions.[89]

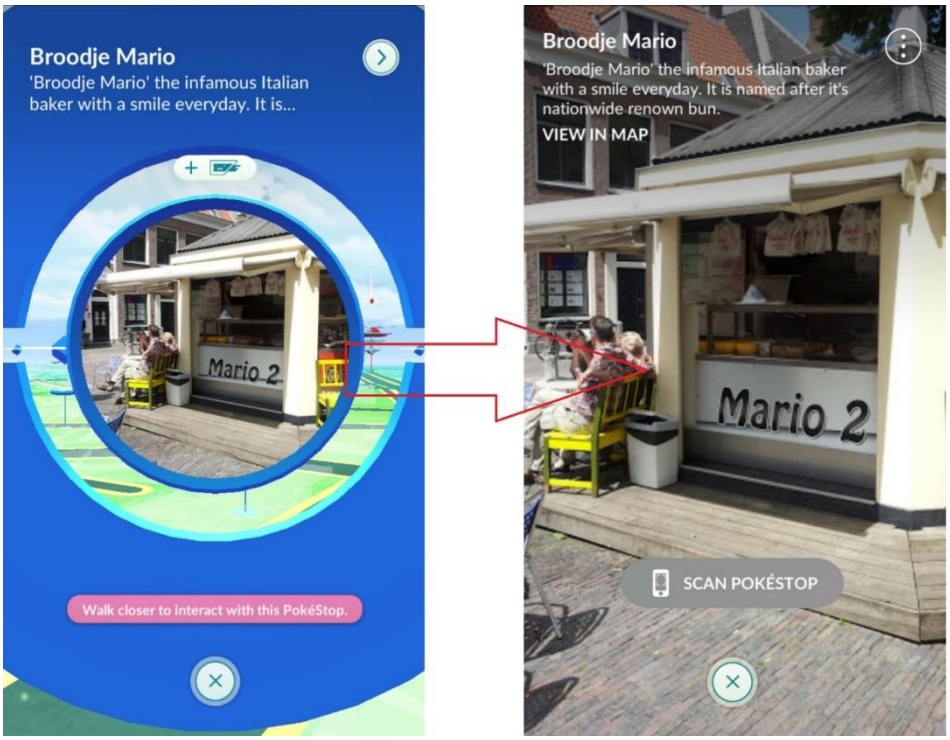

Figure 24: How *Broodje Mario* uses its second location as a *Pokéstop* using the *location description* feature, which is purchasable through both the *standard* and *premium* subscriptions.

[89] Ibid.

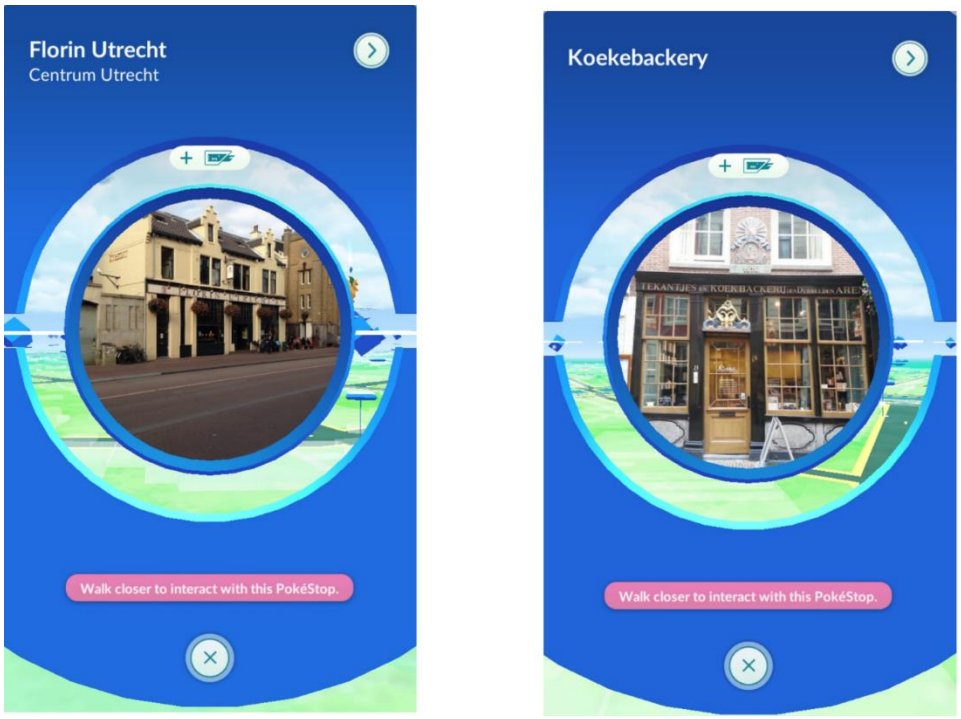

Figure 25: *Florin* and *KoekeBackery*, two historically relevant locations in Utrecht serving as a bar and a bakery, are *Pokéstops*.

The *premium subscription* advertising method has been widely used by large companies, as shown by *Placed.com*, a consultancy firm specialized in geo-spatial advertising and analytics.[90] After an extensive analysis of U.S *Pokéstops* and player data, the consultancy firm found only large companies in the most popular restaurants **(fig. 26)**.[91]

By looking at the results from *Placed.com*'s research, it becomes clear how *Niantic* uses its game to appeal to businesses in need of advertising. Although this could be an opportunity to shed light on smaller businesses, as shown by Zuboff's small pizza bar example, the current state of affairs seems to be more advantageous for companies with more significant cash flows such as *Red Robin* or *Hot Topic*.[92] *Starbucks*, another large corporation, communicated how "12,000 of its US stores are becoming official *pokéstops* or *pokégyms*."[93] Hulsey and Reeves refer to this as "a banal infiltration of the game by corporate interests," where they "could easily call for thousands of players to descend on whatever businesses cough up the highest bid."[94] The two authors also shared their

[90] "WHITE PAPER: POKEMON GO'S IMPACT ON RETAIL, RESTAURANTS, AND APPS," Placed, accessed May 24, 2021, https://www.placed.com/resources/white-papers/pokemon-go-impact-store-visits-apps-installed.
[91] "WHITE PAPER: POKEMON GO'S IMPACT."
[92] Zuboff, "Pokémon Go!" 314.
[93] Zuboff, "Pokémon Go!" 315.
[94] Hulsey and Reeves, "The Gift," 395.

nudging-reated concerns on the behavioral accuracy of such advertisements as "they are now able to track—step-by-step—how advertisements affect subjects' movements into and between physical spaces."[95]

Zuboff elaborates on this *nudging*-afforded technique, writing that "high bidders enjoy an ever-closer approximation of guaranteed outcomes."[96] Zuboff, Hulsey and Reeves thus all agree on how such powerful advertising tools are a threat to consumers. This also resonates with my findings on *KoekeBackery* and *Café Florin,* where players have to guess if the location is paid for or not, making *Pokéstops* opaque. This increased opacity also violates Helbing's recommendations for "a sufficient level of transparency and/or independent quality control."[97] Additionally, Helbing's guidelines on manipulative technologies are also violated because of how "manipulation attempts should be easily recognizable."[98] A solution to this problem can be a more explicit and transparent mention of sponsors as is commonly done on websites such as *YouTube* for media bias **(fig. 27)**. A small tag for sponsored *Pokéstops or Pokésgyms* could be a solution to the transparency requirement needed to alleviate the risk of "evil nudges" or going against Helbing's recommendations for responsible use of big data.

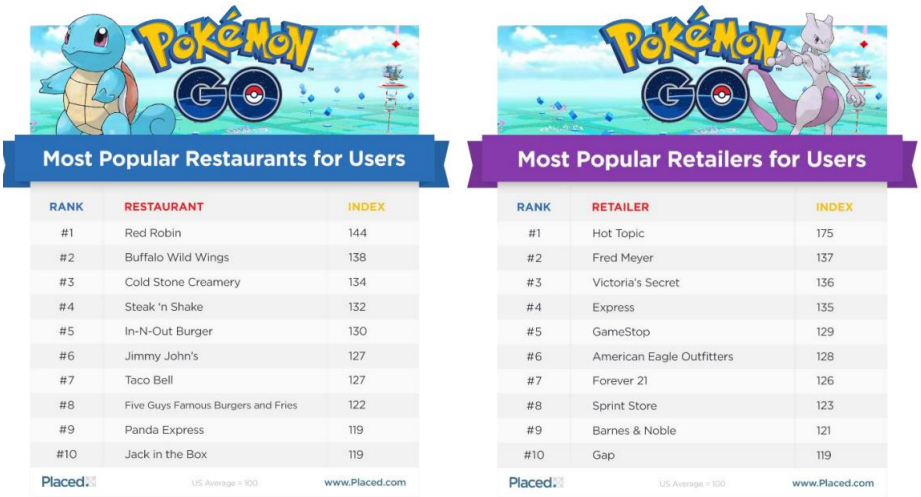

Figure 26: Most popular retailers per *Pokémon Go* foot traffic (source: Placed.com).[99]

[95] Ibid.
[96] Zuboff, "Pokémon Go!" 316.
[97] Helbing, "Societal," 62.
[98] Helbing, "Societal," 67.
[99] Ibid.

Figure 27: How *YouTube* reveals the potential bias behind each news source.[100]

Although *Pokémon* Go's commodification of behavior goes against Helbing, Thaler and Sunstein's recommendations on transparency and *nudging*, smaller businesses can still benefit from it. For instance, the small pizza bar example from Zuboff, or an empirical paper from Yuan and Jie Zhang measuring how "Nearby *pokéstops* improve restaurants' online reputation."[101] In their conference paper, the two researchers discovered how *Pokémon Go* "could significantly boost local business online reputation metrics including rating, review volume, valence, check-in records and Elite review numbers."[102] The authors did mention the short-run nature of most of their ratings, which could be explained by the "*Pokémon* fever" in 2016. However, they still concluded with a positive note on how the game "indeed provided positive externalities to local businesses" and how in general, absolute restaurant ratings are "still shown as significantly improved in the long run."[103] From Zuboff's small pizza bar in New York to Zhang and Zhang's robust regression modelled on "59,999 reviews on 1215 restaurants from January 6, 2016, to December 6 2016," the evidence does indeed support how *Pokémon Go*, as a *surveillance capitalist* product, produces positive effects on

[100] "#FixTheCountry: Angry Ghanian youth protest online to address unemployment," YouTube, accessed May 24, 2021 https://www.youtube.com/watch?v=Gh-tw90DKiU.
[101] Jie Zhang and Yuan Zhang, 2018, "Could Nearby Pokéstops Improve Restaurants' Online Reputation?" In *Proceedings of the 51st Hawaii International Conference on System Sciences*, Waikoloa Village, Hawaii, USA, January 2018, 4984, New York: Curran Associates.
[102] Zhang and Zhang, "Could Nearby Pokéstops," 4990.
[103] Ibid.

small businesses.

In this last chapter, both opposing sides of the debate agree on how the lack of transparency in the commodification of behavior benefits large companies such as *Starbucks* or the corporations presented in **figure 26.** Despite assisting smaller businesses such as restaurants in competing, the opaque way in which *Pokémon Go* commodifies *nudging* and benefits more prominent companies shows how the game is a surveillance capitalist product. *Pokémon Go* violates Helbing's transparency requirements for ethical uses of big data and meets Zuboff's market control and behavioral commodification criteria.

Conclusion

The goal of this thesis was to research **how *Pokémon Go* can be understood as an example of surveillance capitalism.** To answer the research question, I applied the dispositif analysis method and used Zuboff's notion of surveillance capitalism as a central concept. In more detail, I looked at how textual information is shown in the game and how it manipulates the players by navigationally *nudging* them into walking and interacting with specific locations. I demonstrated how through *nudging, surveillance capitalism* becomes profitable. The concepts of *surveillance capitalism* and *nudging* allowed me to analyze the intertwining of intelligent technologies, markets, and behavioral commodification and modification.

My analysis was backed by literature extracted from a complex academic debate with two sides: one side unilaterally rejecting all surveillance and big data technologies. The other attempts to establish an institutional and ethical framework through which they should be implemented. During each step of my analysis, my findings were mapped in the nuanced debate to reflect how they could be interpreted through literature. In short, **my findings do indeed show how *Pokémon Go* is a surveillance capitalist product** using the three pillars of the dispositif, which I elaborate upon below.

First, **text** was explained by showing how users can submit portals using *Scanner redacted* and contribute to already existing *Pokémon Go Pokéstops*. This was shown using *Pokéstops* around Utrecht such as the memorial monument **(fig. 10)** and King Willem's plaque **(fig. 11)**. My findings were interpreted from both sides of the debate; Zuboff's side allowed me to argue for how *Google*'s position as a leader is maintained through unpaid user submissions. In contrast, the more affirmative side of the debate on surveillance capitalism provided me with arguments showing how local governments such as Utrecht's municipality can advertise their cities' landmarks and involve citizens in monument mapping.

Second, **spectator**, or as I referred to it throughout this thesis: **the player** or **the user**. Here is where the concept of *nudging* entered my analysis by linking big data technologies to behavior. Similarly to the first chapter, Zuboff, Palihapitiya, Doug Hyun Han et al. and Harris all show how biochemical triggers work. In *Pokémon Go*, I have shown how *Niantic* mimics these triggers to nudge the players into playing more, either through in-game metrics **(fig. 15)** or notifications **(fig. 16).** Additionally, I have shown how the game uses plain map design

to attract players to specific locations through behavioral modification. While Zuboff, Helbing and Harris would interpret this approach as unethical and manipulative, it could also be interpreted as fair when following Sunstein and Thaler's perspective on *nudging*. Additional evidence brought forward by Wang's literature review showed how this manipulation also had benefits for the players. Evidence of improved mental and physical health conditions hints at the benefits of nudging Thaler and Sunstein explain.

Third, the **screen** closes the gap between behavior and revenue through technology. I analyzed in this thesis how through in-game textual items such as *Pokéstops* or *Pokégyms* (outlined in chapter I), *Niantic* was generating profit through behavioral modification(outlined in chapter II). Here, *Pokémon Go* is seen as a surveillance product from Zuboff's perspective. All academics in the debate would interpret this way of generating profit through behavioral nudging as opaque. Although *Niantic* publicizes the option to purchase *Pokéstops* or *Pokégyms*, differentiating between sponsored and non-sponsored in-game locations is, at the moment, not possible. Additionally, while the game allows smaller businesses to compete with bigger businesses, potentially nurturing healthier, more competitive markets, the figures still show bigger corporations to be in control **(fig. 26).** This control is achieved through *Pokémon Go*'s lack of transparency, as demonstrated in my gameplay (**fig. 27)** and the literature, where *Niantic* predicts player behavior to produce revenue through advertising. Although *Pokémon Go* can bring virtue to the players on each of the steps of the dispositif, **the end-goal of the game will always be an opaque method of commodification. This violates Hebing's recommendations concerning both Big Data and manipulative technologies. Therefore, through my literature-backed gameplay, *Pokémon Go* confirms Zuboff's critical definition of surveillance capitalism**.

Recommendations on further research

Finally, this thesis aimed at applying a dispositif analysis to analyze surveillance capitalism at work in location-based gaming. This reduced scope serves both an academic and social relevance. The academic relevance is achieved by applying the dispositif to a practical use-case, while other research either uses empirical methods to quantify certain effects (such as Wang and Zhang's papers); or uses theory-rooted critical methods such as Zuboff's book. The social relevance joins the academic relevance using the same argument of practicality and simplicity. Just as I could perform my research using this simple model,

other digital citizens also can. This could contribute to differentiating between virtuous big data applications and unfair, opaque, unethical applications.

However, this approach was restricted due to the limited word count, which prevented me from delving deeper into the economics of surveillance and the dichotomous relationship between free will and nudging. Additionally, the spectator/player step of my thesis suffers from personal bias, which could only be resolved using a thoroughly designed empirical framework which, once again, could only be feasible in a more extended and more expanded paper. As an additional recommendation for future research, an application of the dispositif in an empirical framework could potentially provide a remedy to the bias of a personal first-person perspective.

Despite these critical reflections, the goal of this thesis was to merely provide a robust understanding of how surveillance capitalism works in consumer products. The present state of my research provides a good outline enabling the digital citizen to identify the symptoms of a surveillance capitalist product as *Pokémon Go*. The importance of having such an understanding grows exponentially as surveillance-enabled big data services are becoming more prevalent.

The path to and back from Sagittarius A* at the center of the Milky Way is paved daily with global personal data **(fig. 1)**. The path can either remain as opaque and invisible as its destination. Or it can become a transparent, brightly paved path leading towards an equitable and ethical digital future for *all* citizens, and *all* small businesses, not just for Silicon Valley giants.

Words: 7588 (excluding titles, sub-titles, footnotes and figure descriptions)

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Appendix

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Appendix A

Figure 2 Source Code

In this first appendix you can find the source data, code and explanations for figure 2.

As R's support of pie charts is not satisfactory, this plot is among the few I wrote in python using the Matplotlib library. The following libraries are imported:

In [2]:
```
import pandas as pd ## For data wrangling
from pandas import DataFrame ## Additional Data Structure import
import matplotlib.pyplot as plt ## for data visualization
```

Data Generation:

We create two lists each fitted with three respective data points (frequencies in this case) referring to each one of Google's business units:

In [3]:
```
revenue = [92, ## share of revenue for Google services
           7,# share of revenue for Google cloud
           1]# share of revenue for the remaining business units


## list with the categories to be used as labels:

business_units = ['Google Services', 'Google Cloud', 'Other Business Units']
```

Now a data frame (table) is created with the above lists to generate the plot

In [4]:
```
df = pd.DataFrame(list(zip(revenue,business_units)), columns = ['revenue', 'bu'])


print(df) ## data frame is displayed
```

```
   revenue                    bu
0       92       Google Services
1        7          Google Cloud
2        1  Other Business Units
```

The above data was gathered from the below source:

Investopedia. “How Google (Alphabet) Makes Money.” Accessed May 04, 2021. https://www.investopedia.com/stock-analysis/2012/what-does-google-actually make-money-from goog1121.aspx#:~:text=Alphabet leverages its search, web,Googl Cloud revenues are growing.

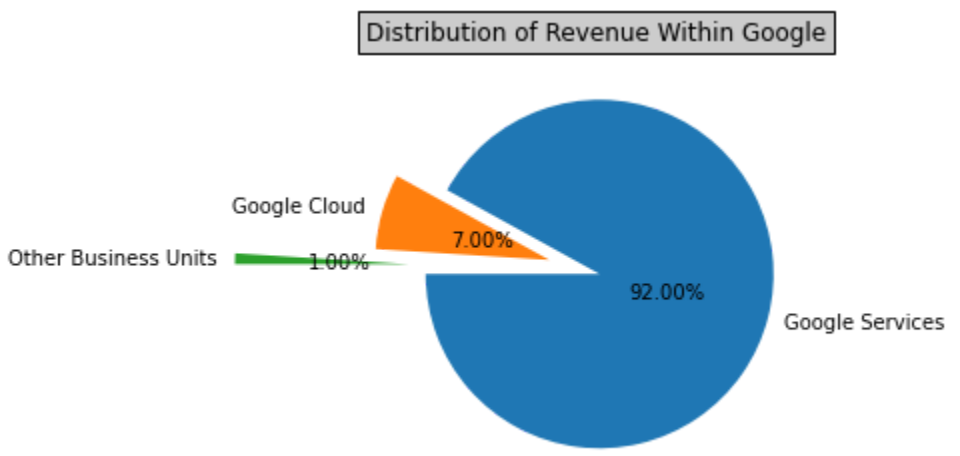
Data Visualization:

In [5]:
```
## A list is generated to separate the smaller subsets of the pie plot for easier rea

explode = [0.1, 0.2, 1]


plt.pie(df['revenue'], ## the revenue data is retrived from the data frame
        labels = df['bu'], ## the labels are retrieved from the data frame
        autopct ='%.2f%%', ## Percentage argument is passed
        pctdistance = 0.4, ## Distance of the points from the center of the pie is en
        explode = explode, ## Explode list is passed in the the explode argument
        startangle = 180) ## the start angle is set at 90 degrees for easier readabil

plt.title('Distribution of Revenue Within Google', ## Plot title
          bbox={'facecolor':'0.8', 'pad':4}, ## Box around the title is added
          loc = 'left')## Placement of the title is adjusted
plt.show() ## plot is generated
```



Appendix B

Figure 7 Source Code

In this section of the appendix, the source code for figure 7 is displayed. This network graph was written in Python using the Plotly and Dash libraries. As this network plot is initially interactive, it requires the use of a local server, making the ususal plot dislay impossible in this case. Therefore, it can only be ran and visualized if you open the .ipynb file on your computer and install the necessary pacakges beforehand(python 3.2 and above, as well as the plotly and dash libraries)

This section of the appendix therefore only serves the purpose of sharing my code for reproducibility and not for visualizing the plot in a similar fashion to the other notebooks I have provided in the appendix. Therefore, this plot can only be seen in the thesis file as I screenshoted the plot on my own device. Please feel free to run my code and play around with the interactive plot if you have the tools to do so!

Library imports:

In [1]:
```
## Main libraries:

import dash
import plotly.express as px

## Requiring the following graphical modules:

import dash_core_components as dcc ## main building blocks
import dash_html_components as html ## html parsing components
import dash_cytoscape as cyto ## network graph module

## I/O modules

from dash.dependencies import Input, Output
```

Main Program:

The scope of the Dash object is defined below:

In [2]:
```
app = dash.Dash(__name__)
```

The graph is nested in a JSON object created in the dictionary below. The dictionary is then passed through the 'html.P' method to allow browser display:

In [3]:
```
app.layout = html.Div([ ## an app.layout object contains the below JSON dictionary:
    html.P("Theoretical Framework"),## Main title
    cyto.Cytoscape(
        id='cytoscape',## Visualization type
        elements=[
            {'data': {'id': 'DA', 'label': 'Dispositif Analysis'},## Dispositif Analys
             'style' :{'background-color': '#cc66ff'}}, ## coloring the node
            {'data': {'id': 'SC', 'label': 'Surveillance Capitalism'},##Surveillance (
             'style' :{'background-color': '#3333cc'}},## coloring the node
            {'data': {'id': 'NU', 'label': 'Nudging'},## Nudging node
            'style' :{'background-color': '#3333cc'}},## coloring the node
            {'data': {'id': 'Z', 'label': 'Problems of The Concept'},## Zuboff debate
            'style' :{'background-color': '#ff0000'}},## coloring the node
            {'data': {'id': 'H', 'label': 'Potential of The Concept'},## Helbing deba
            'style' :{'background-color': '#0099ff'}},## coloring the node
            {'data': {'source': 'Z', 'target': 'DA'},## Dipositif analysis is linked
             'style' :{'line-color': '#cc66ff'}},## coloring the line linking the two
            {'data': {'source': 'H', 'target': 'DA'},## Dipositif analysis is linked
             'style' :{'line-color': '#cc66ff'}},## coloring the line linking the two
            {'data': {'source': 'NU', 'target': 'DA'},## Dipositif analysis is linked
             'style' :{'line-color': '#cc66ff'}},## coloring the line linking the two
            {'data': {'source': 'SC', 'target': 'DA'},## Dipositif analysis is linked
             'style' :{'line-color': '#cc66ff'}},## coloring the line linking the two
            {'data': {'source': 'H', 'target': 'SC'},## Screen is linked to Helbing
             'style' :{'line-color': '#0099ff'}},## coloring the line linking the two
            {'data': {'source': 'H', 'target': 'NU'},## Nudging is linked to Helbing
             'style' :{'line-color': '#0099ff'}},## coloring the line linking the two
            {'data': {'source': 'Z', 'target': 'SC'},## Screen is linked to Zuboff
             'style' :{'line-color': '#ff0000'}},## coloring the line linking the two
            {'data': {'source': 'Z', 'target': 'NU'},## Nudging is linked to Zuboff
             'style' :{'line-color': '#ff0000'}}## coloring the line linking the two
        ],
        layout={'name': 'circle'},## Shape of each node is defined
        style={'width': '1000px', 'height': '1000px'}## Aspect ratio is defined
    , )
, ])
```

With the structure and data defined, the local server is run using the below Dash command:

In [5]:
```
app.run_server(debug=True)
```

```
Dash is running on http://127.0.0.1:8050/

 * Serving Flask app "__main__" (lazy loading)
 * Environment: production
   WARNING: This is a development server. Do not use it in a production deployment.
   Use a production WSGI server instead.
 * Debug mode: on
```

```
An exception has occurred, use %tb to see the full traceback.

SystemExit: 1
```

The interactive visualization is now locally hosted and can be accessed by copy-pasting the above link into any recently updated internet navigator

Appendix C

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17-6-2021

Visualizations for Figures 3, 17 and 20

In this last appendix, you can find all R plots generated in my thesis, all data plotted here is referenced both in this file and in my main thesis document.

This appendix is split in two parts: Data generation and data visualization. Both of them are clearly defined step by step so you can follow the code with ease.

PS: small fun fact: I used a library to replicate the palette from the Pokemon cartoons and games in most R plots.

Part 1: Data Generation

Before starting the below libraries are called:

```
## Data Visualization:

library(ggplot2)## for generating plots
library(palettetown) ## for Pokémon colors
library(cowplot) ## for plot grids

## Data manipulation:

library(dplyr) ## for pipes, tibbles and other data manipulation methods
```

```
##
## Attaching package: 'dplyr'

## The following objects are masked from 'package:stats':
##
##     filter, lag

## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

Figure 3: Bar chart industrial vs information era

Three vectors displaying the market cap, employee count and era are created

```
## Vector for market capitalization (in billions):

era_mkt_cap <- c(225.15,## industrial era market cap
532##information era market cap
)

## Vector for employee count in thousands:

era_emp_count <- c(735,## employee count industrial era
75 ## employee count information era
)

## Vector for category labels:

era_categ <- c('Industrial Era (General Motors)', 'Information Era (Google)')
```

The below data frame is created:

```
era_comparison <- data.frame(market_cap = era_mkt_cap,
## The market cap vector is passed to the market cap column
employee_count = era_emp_count,
## The employee count vector is passed to the employee count column
era = era_categ)## finally, the categorical vector is passed into a column

era_comparison ## data frame is displayed
```

```
##   market_cap employee_count                            era
## 1     225.15            735 Industrial Era (General Motors)
## 2     532.00             75        Information Era (Google)
```

Source:

Zuboff, Shoshana. "Surveillance Capitalism and the Challenge of Collective Action." New Labor Forum 28, no. 1 (January 2019): 11-26.

Figure 17: Alf Inge Wang's literature review:

Two vectors are created, one with frequencies and one with labels for each sentiment evaluation:

```
## Vector for frequencies

pokemon_freq <- c((19/25)*100,(4/25)*100,(2/25)*100)

## Vector for labels for each sentiment:

pokemon_sentiment <- c('Positve','Neutral','Negative')
```

The below data frame is created using the above vector:

```
## frequency vector is passed to the percentage column:
sentiment_frame <- data.frame(percentage = pokemon_freq,
```

```
## The sentiments about the game are passed in the sentiment column
sentiment = pokemon_sentiment)
sentiment_frame ## data frame is displayed
```

```
##   percentage sentiment
## 1         76   Positve
## 2         16   Neutral
## 3          8  Negative
```

Source:

Wang, Alf Inge. "Systematic literature review on health effects of playing Pokémon Go." Entertainment Computing 38, no.1 (May 2021): 1-10.

Figure 20: Pokémon Go Revenue

Two vectors are created here, one with revenue and one with the year:

```
## Vector for revenue in millions of dollars

pg_revenue <- c(589,436,615,658,917)

## Vector for the year

pg_year <- c(2016,2017,2018,2019,2020)
```

The below data frame is created using the above vector:

```
## Revenue vector is passed to the revenue column

pg_revenue_frame <- data.frame(revenue = pg_revenue,
year = pg_year) ## The pg_year vector is passed to the year column

pg_revenue_frame ## data frame is displayed
```

```
##   revenue year
## 1     589 2016
## 2     436 2017
## 3     615 2018
## 4     658 2019
## 5     917 2020
```

Source:

Statista. "Annual revenue generated by Pokémon GO worldwide from 2016 to 2021 (in million U.S. dollars)." Accessed May 04, 2021, https://www.statista.com/statistics/882474/pokemon-go-all-time-player- spending-countries/.

Part 2: Data Visulization

Figure 3: Bar chart revenue industrial vs information era

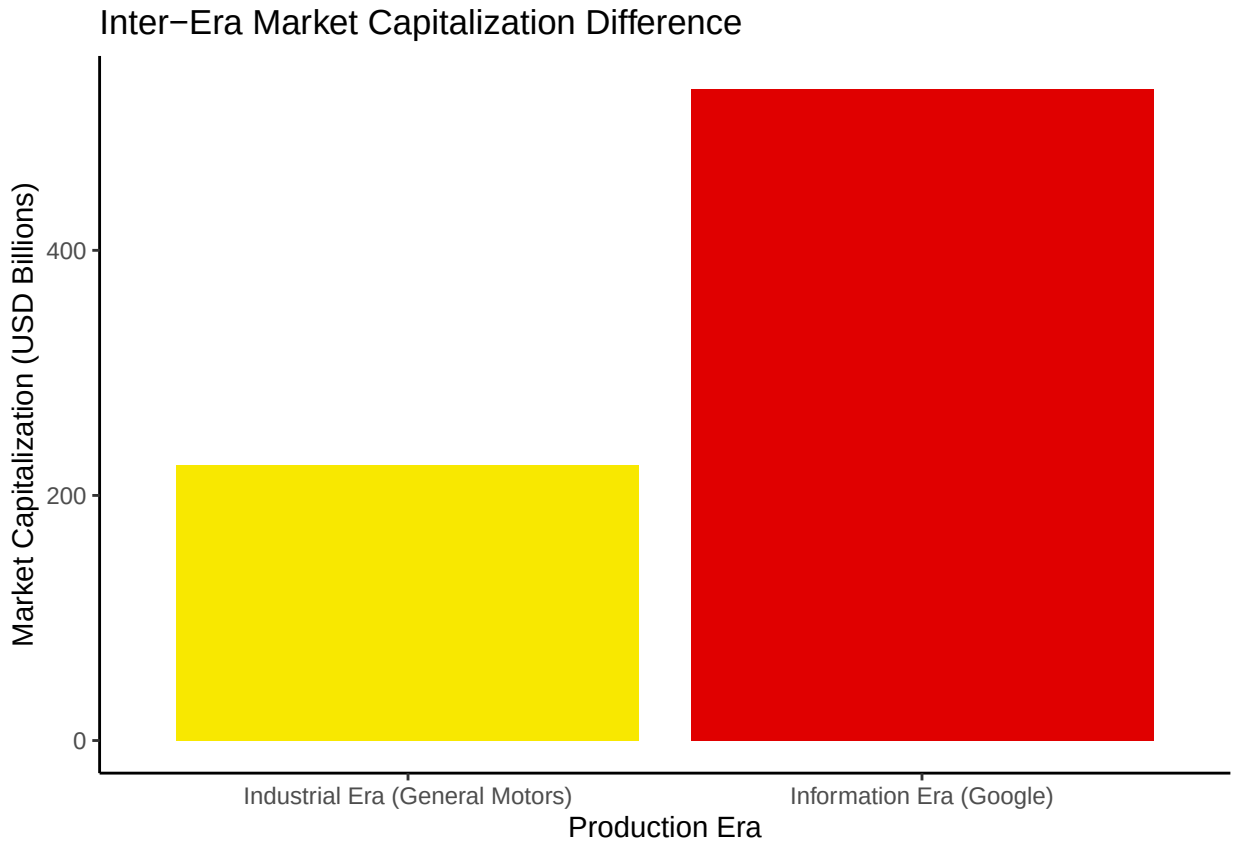
A bar plot is used for this figure:

```
fig_3 <- ggplot(data = era_comparison, ## call to the data frame from part 1
   aes(x = era, ##x encodes to the era
     y = market_cap, ## the market cap is encoded to the y axis
  fill = era )) + ##the fill is each era

geom_bar(stat ='identity') +## identity argument is passed to avoid defaulting
## to the count() method
scale_fill_poke(pokemon = 'pikachu', spread = 7) + ## Pikachu color code
   theme_classic()+ theme(legend.position = 'none')
```

With the object created, labels for the plot are now added

```
fig_3 + labs(x = "Production Era",
y = "Market Capitalization (USD Billions)",
title = "Inter-Era Market Capitalization Difference" )
```



The second bar plot for employees is now generated

```
fig_3_1 <- ggplot(data = era_comparison, ## call to the data frame from part 1
   aes(x = era, ##x encodes to the era
     y = employee_count, ## the employee count is encoded to the y axis
  fill = era )) + ##the fill is each era

geom_bar(stat ='identity') +## identity argument is passed to avoid defaulting
## to the count() method
scale_fill_poke(pokemon = 'pikachu', spread = 7) +
theme_classic()+theme(legend.position = 'none')
```

With the object created, labels for the plot are now added

```
fig_3_1 + labs(x = "Production Era",
y = "Number of Employees (in Thousands)",
title = "Inter-Era Employement Difference")
```

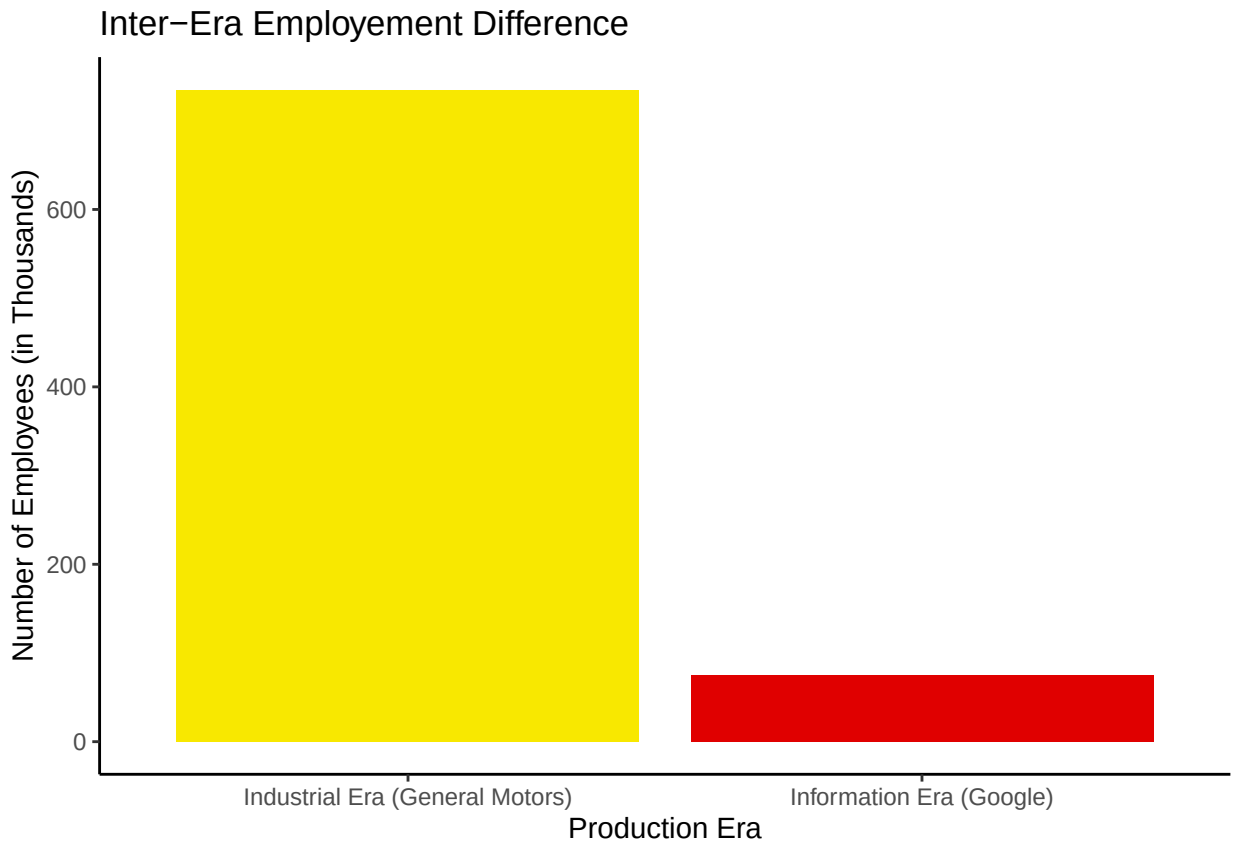


Figure 17: Alf Inge Wang's literature review:

A bar plot is used for this figure:

```
fig_17 <- ggplot(data = sentiment_frame, ## Call to the data frame from part 1
   aes(x = sentiment, ##x is how Pokémon go was perceived by academic literature
     y = percentage, ## the frequency count is encoded to the y axis
  fill = sentiment )) + ##the fill is each era
```

```
geom_bar(stat ='identity') +## identity argument is passed to avoid defaulting
## to the count() method

## Colors below are vanilla R hues as the Poké palette gave me issues here
theme_classic()+ theme(legend.position = 'none') +
scale_fill_manual(values = c('#f80000', ## Blue HEX Code is manually passed
                             '#0029f8', ## Blue HEX Code is manually passed
                             '#08f800'))## Green HEX Code is manually passed
```

With the object created, labels for the plot are encoded

```
fig_17 + labs(x = "Perception of Pokémon Go on Mental/Physical health",
y = "Frequency of Occurance in Wang's Literature Review",
title = "Framing of Pokémon Go in Academic Literature")
```

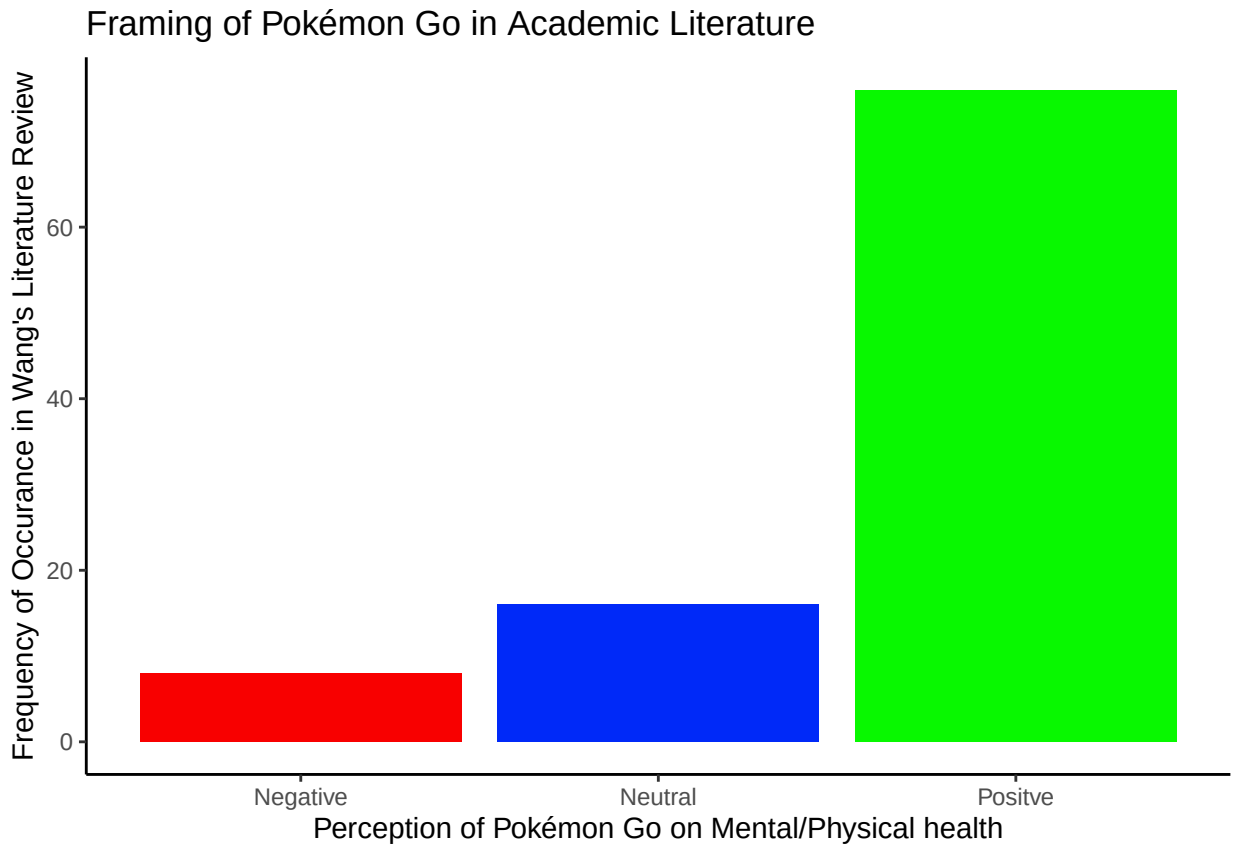


Figure 20: Revenue generated by Pokémon go for Niantic:

A line chart is used for this plot:

```
fig_20 <- ggplot(data = pg_revenue_frame, ## data frame call
   aes(x = year, ##year is passed to the x axis
     y = revenue ## the revenue is encoded to the y axis
     )) +
```

```
## Colors are called:

geom_line(col= pokepal('quilava', 5)) +
geom_point(aes(col = pokepal('porygon', 5)))+
theme_classic()+ theme(legend.position = 'none')
```

With the object created, labels for the plot are now added

```
fig_20 + labs(x = "Year",
y = "Revenue Generated (USD Millions)",
title = "Revenue Generated by Pokémon Go from 2016 to 2020")
```