The Shades of Grey:
Datenherrschaft in Data-Driven Gamification

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Abstract

Data-driven gamification refers to the use of data collection and data science methods together with gamification practices in order to improve the selected aspects of a service or a product. As new innovations cause new ethical questions, this study surveys possible ethical problems of data-driven gamification. Precisely, we focus on the ethical question of using data collected from a user to modify behaviour of the user. Instead of a clearly bright or dark side of the force, we focus on the ethically grey area where intentions might be ethically justified while the results are not. To discuss this dilemma, we borrow the concept of 'Datenherrschaft'—mastery over information—and present a philosophical inquiry of five cases: Leisure, Governmental, Healthcare, Educational and Workplace solutions. As a result, this study shows that there are clearly ethical issues, different shades of grey, related to the data-driven gamification and future work is needed in order assess, analyze and answer the presented problems.

1 Introduction

Gamification and *Data*, with its derivates such as *Data science* and *Big data*, are currently among the biggest buzz terms both in academia and industry. Yet, these two concepts represent possible technological and social changes that might have considerable impacts on humanity in several different areas of life.

First, the concept of 'gamification' refers to a practice of applying game design elements into non-game contexts [Det+11]. Such use can be, for instance, adding game-like elements into educational material in order to increase the motivation of the students. Second, the concept of 'Data science' is used to refer methods and tools used to extract insights from raw data to support, for example, managers in data-driven decision-making or mining new knowledge [Dha13].

When these concepts are put together as *data-driven gamification*, the new concept refers, in our use, to practices where gamification methods and tools are embedded with a data collection, and the data is used to further improve the effects of gamification as well as the product or service itself. The data could be, for example, behavioral, physiological, psychological, environmental, emotional or even social data. As always with new inventions and innovations, this presents ethical issues that should be taken into consideration.

As recently discussed by Bui, Veit, and Webster [BVW15], Kim and Werbach [KW16], and Hyrynsalmi, Smed, and Kimppa [HSK17], the ethical questions raised by gamification techniques have been studied scarcely and the discussion is still in an immature state. Unfortunately, the ethical discussion on big data and its problems is also in its first steps

(cf. [FS14]). The Big data and ethical research is seen as area needed to be covered because Big Data is here to stay and by ethical analysis we will help us to see it effects on as and gives possibilities to manage it [HM17]. However, to the best of our knowledge, no prior discussion or critical reflection on the ethical implications of data-driven gamification has been yet presented. This is the direction where we focus in this study.

In this paper, we survey the ethical dimensions of using customer data in gamification solutions. More precisely, we discuss the ethical questions raised by the use of data collected from a user to modify behaviour of the user. The study is based on a philosophical method of inquiry and the aim is not to provide solutions but rather emphasize and open discussion on the possible ethical problems. We borrow the concept of *Datenherrschaft*—mastery over one's information—which has previously been applied to the healthcare information systems, in discussing patients' rights on the data collected from themselves [Kos16]. We use this ethical framework to guide the analysis of the selected five case environments.

The remainder of this study is structured as follows: Section 2 presents the previous studies and cases on (data-driven) gamification ethics. It is followed by a short introduction of Datenherrschaft concept in Section 3. The philosophical inquiry with the cases is presented in Section 4 and the study concludes with few ideas for future work in Section 5.

2 (Data-Driven) Gamification

The term 'gamification' was coined to Nick Pelling[1] in 2002, who used it to describe the use of game design methodologies in non-game contexts. Since then, an abundance of scientific gamification studies as well as industrial analyses have been put forth. For example, Hyrynsalmi, Smed, and Kimppa [HSK17] identified 22 different literature studies on gamification published during 2013–2016 in their tertiary study. The number of primary studies in gamification are nowadays counted in hundreds.

The gamification ethics discussion seems often to be inspired by Star Wars: the implications are roughly divided into the ethically justified (the bright) and clearly ethically questionable (the dark) side (cf. [CBL15; AMI16; HSK17]). For example, the rumoured Russian 'Blue Whale'[2] game is a grand exam-

ple of a gamification solution used by the dark side. In the game, a player is given increasingly more dangerous tasks, and, for completing the game, the player has to ultimately commit a suicide.

While there is no complete evidence of 'Blue Whale' even existing and there are even discussion is the 'game' really an example of dark gamification or just a social pressure in the social media group, different kinds of gamified products by the dark side have been reported and confirmed. For example, Versteeg [Ver13] documented a game by anarchists in Berlin, Germany, in which a player gets points from each CCTV camera stolen or destroyed.

On contrast to the dark side, there is a series of studies describing how the natural playfulness of human beings can be utilized in motivating people in arduous and possible boring tasks. For example, Hamari, Koivisto, and Sarsa [HKS14] in their meta-analysis found some implications from existing empirical studies that gamification seems to be able to improve motivation of users, at least in certain contexts.

The bright and dark sides, however, are not really that interesting. The different shades of grey, in contrast, present a more fruitful area of research. With the grey area, we refer to solutions that are either legal but questionable or that have been developed with good intentions whereas their consequences are ethically questionable. That is, we refer solutions that are unexpectedly, unintentionally or accidentally dark.

For an overly simplified example, a gamified solution for a nurse, paramedic, or firefighter could, in theory, improve their job satisfaction; however, every second spent on secondary purposes could, literally, endanger someone's life or property in these kinds of contexts. Similarly, while casinos and gambling are legal in several countries, the use of gamification methods or tools in these domains to make a user spend more money is ethically questionable.

Data-driven gamification, where the methods of data science and analysis are used to improve the effectiveness of gamification, naturally belong to this grey area. That is, when a human is measured, the measured data is analyzed and used in a way that effectively aims to modify behavior of the user, the ethical questions and possible problems are present.

The use of data mined from a customer to modify his or her behaviour is not a new invention. In 2015, an anonymous senior producer of mobile games revealed for a news source TouchArcade how they utilize players' profiles and information to modify their behaviour[3]. The senior producer told an example case

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[1]Conundra Ltd. `http://www.nanodome.com/conundra.co.uk/`. Accessed September 21, 2017.

[2]Will Stewart, Yasmin Jeffery and Mark Hodge (March 3rd, 2071) *"'Blue Whale' suicide game linked to 130 teen deaths is just tip of the iceberg in the world's suicide capital Russia"*. `https://www.thesun.co.uk/news/3002981/blue-whale-game-suicide-russia-rules-challenge-social-media/`. Ac-

cessed September 21, 2017.

[3]Eli Hodapp (September 16th, 2015) *"We Own You"—Confessions of an Anonymous Free to Play Producer*. `http://toucharcade.com/2015/09/16/we-own-you-`

where they lured a whale—a player spending lots of money to the game—to reveal the player's Facebook profile. Based on the collected information and found affections (i.e., American Football), they designed virtual items (i.e., based on certain football teams), that were solely meant for the whale, and added them to the game. The senior producer even stated that *"Every day we collect a ton of data. I don't even know the size of what we collect anymore, we have entire divisions to instrument and analyze the data."*

While this is an unconfirmed report from a single domain, it is still an emphasizing example of how data science can be used in ethically questionable way. While the player is likely satisfied due to the inclusion of items based on his or her favorite team, the case is an example of the ethically grey area: the player did not needed or request the virtual items, nor they did affect to the game play in any way. In addition, gamification is not presented in this example case as the context is a game; however, it is rather easy to generalize these kinds of actions by developers into other areas also.

When data science meets gamification, where users' motivations and intentions are modified with the help of playful nature of human beings there are prevalent ethical questions needing to be discussed. The following section presents Datenherrschaft, the ethical framework. It is used in Section 4 where we present a discussion of five different example case environments of data-driven gamification with ethical questions.

3 Datenherrschaft

The term *'Datenherrschaft'* combines the words *'data'* and *'Herrschaft'*, the latter meaning "mastery over something". Herrschaft means complete mastery or control over something, irrespective whether the power is intentional or not, or whether there is any particular skill implied or not. The use of Herrschaft can be clarified with an example of *Tatherrschaft* in conjunction with *Täterschaft*, meaning mastery over a criminal deed as in perpetrator-ship in German criminal law. The potential criminal has a possibility to choose whether they act in a certain (criminal) way or not and it cannot be removed from individual. Thus, Datenherrschaft is not removable and, therefore, it is similar to human rights: one cannot give it away even they wish to do so. [KK12; Kos16] Datenherrschaft means "possession of and mastery over data (or information)". As Mastery over information includes both the possession of data and control over it, this is the term we use. [KK12]

confessions-of-a-free-to-play-producer/. Accessed September 21, 2017.

Koskinen [Kos16] argues that when data about us is collected, we should have mastery over that data, as it is a part of the representation which defines us. This is especially important in situations where this data is used either in situations where we cannot choose to use a different system such as healthcare information systems—some of which are mandated for others than the ultra rich—or when the data is used to modify our behaviour, as in when we use gamified systems. If we cannot have as much control as possible over what—and who—we are, we become distanced from ourselves rather than being master's over our own destiny [Hei27].

The mastery of data has been also in the eye of European Union for many years. Recently, the council set a directive about the protection of natural persons with regard to the personal data and on the free movement of such data [Eur16]. The new directive will become effective in May 2018 and it aims at giving back natural persons' data ownership as well make visible how their data is used by different actors in the fields of business and politics. This will heavily affect on the vendors of data-driven gamification solution and it should be already taken into account in this industry.

As data-driven gamified systems typically, by the definition, handle parts of our data, drawing conclusions on our and others behaviour, and attempt to modify our behaviour based on that data through gamification, it is especially important that we can, should we so choose, have control—or mastery—over the use and storing of our data; namely, Datenherrschaft over the data in question.

4 Case Environment Analyses

Next, we discuss Datenherrschaft of data-driven gamification in five different environments: healthcare, governmental, work life, school and leisure. These environments are selected based on their special characteristics; for example, citizens and employees cannot choose the information systems that they have to use, and schoolkids are underage. In addition, these are the domains where gamification solutions are often discussed as a way to improve the participants' motivations and actions. Naturally, it might be more useful to motivate the users with the content (or make better content if motivation is a problem) rather than just gamify it; especially, but not only regarding childrens' education.

Healthcare

Technology is a direction where healthcare is looking to find ways to improve people's health behaviour—from a healthcare perspective—and gamification is

seen as providing promising possibilities. [AO16] We could imagine a gamified healthcare system provided by public healthcare that drives for a change of lifestyle, meaning getting rid of intoxicants, getting more exercise or having a generally medically reasonable way of living (e.g., see [Par+14; Par+16]). Gamification itself is not being criticized here—it most likely is a good tool for many people—but there are still risks that should be noted.

First, health is an area of life where people can be vulnerable, and they may be forced to accept the decision of their healthcare provider; especially as one often does not have the financial independence to choose services they like. Second, if information collected from gamification can be used for the purposes of healthcare, there is a danger of losing control of that information, and, thus, the Herrschaft is taken from the individual. There has been a drive for gathering medical information for research purposes and those are commonly done in good will. However, we know through examples that genetic information of whole countries have been turned to be a tradeable goods where the Datenherrschaft by individuals is not respected [Kap16]. Third, gamification will be driving towards a bio-medically desirable lifestyle. However, personal experience of health is not bio-medical experience, but existential; what could be called homelike-being-in-the-world, as Svenaeus [Sve01] calls it. Hence, what people experience as good health is different from person to person and it depends on their personal goals and desires in life. Thus, Datenherrschaft should be given to patients [Kos16], as European Union's new General Data Protection Regulation (GDPR) also aims at doing. The Commission specifically raises the health sectors' data ownership as one problematic area to improve with this new regulation. Otherwise, we can lose the autonomy of patient and have less justified healthcare and thus have a conflict with the core values of healthcare [BC13].

Work life

In the current work-life environment (financial crises, automation of work, competition in the employment field), many employees do not have a possibility to change their employer. Thus, we are ever more tied into our current employment, and if the environment is gamified, a gamified system at the work place could force us in an ever-increasing competition against one another. This would turn us into a mere exploitable "standing reserve" for company purposes (see [Hei77]), which would take considerable parts of our power over our own lives away by creating new "rules" and endanger authentic (self-owned) being in the context of working life (see [Hau82]).

However, there are many employers who are willingly taking new technologies into working environments with the purpose of helping employees to be empowered at work. Such solutions can be linked to, for example, job satisfaction, feedback or improvement suggestions. In these kinds of data-driven gamified solutions, special care should be taken to secure that unique characteristics that help to identify individuals remain hidden.

Government

Governmental information systems (i.e., eGoverment systems) are the tools that are used by government and citizens and, consequently, are part of how our society is working and communicating [Hei+13]. When thinking about gamification of government systems, it must be understood that systems may be such that citizens are obligated to use them. As idea in gamification is to change people's behaviour with information collected trough gamification, there is a risk of losing individuality and the demand to to be an "average" citizen. This should be avoided as it makes the citizens lose their individual goals in life and become just statistics in a government plan; after all, we do have our own desires, hopes and fears, which should be valuable in themselves.

In addition, citizens most likely do not have a possibility to know—and even less to control—who is using their information and for what purposes. Another example of problems of gamification is that it could be used to "activate" unemployed citizens. It is often claimed that unemployed people should perform some activities to be able have their unemployment allowance. However, gamification does not make new jobs but, instead, will easily become just one more duty for those weakest in our society; this is not helping them but rather underlines the lack of power of the unemployed. Hence, as our governmental systems are a crucial part of how our modern society works, it is important to ensure that privacy and liberties of the citizens are secured by the government or we are risking the foundations and justification of democratic society (see [Loc90]).

Furthermore, when a governmental actor innovates data-driven gamified solutions it should take special care of those who are in danger of marginalization. In Finland, there are several ongoing projects aiming to help marginalized young people with gamified solutions. However, it is questionable whether it is ethically justified to embed gamified solutions into the activation programs when a young person is in danger of being marginalized.

School

For younger people, the risk is that they do not necessarily even have the capacity to claim or the will to demand different solutions. When thinking of gamification, pupils lacks the power to choose what is used for teaching. This underlines the need for safeguarding their privacy and other related rights, as they do not have judicial or practical ways to control how gamification and information collected form them by it affects them.

In Finland, in primary and secondary school an information system called *Wilma* has been implemented, which shows that new ways of using technology may have negative consequences. The main idea of Wilma is to ease the communication within schools and between teachers, students and their parents. However, it has resulted in not so desired consequences; unconstructive comments from students, enforcing the stereotypical view of "good" and "bad", and can strengthen a character for students that is hard to get rid of as those records are visible and permanent. [HRK16]

If we add the gamification in education, there is a danger that the division between 'good' and 'bad' students is emphasized and, as a consequence, the outcome can be that the inequality between children grows as *"The winner takes it all. The loser standing small"*[4]. As the pupils do not yet possess full rights or responsibilities as adults do, it is our responsibility to secure their right and govern their rights so long as they are expected to be equal members of the society. Datenherrschaft's strength is that the Herrshaft is appointed to an individual, even if they may not have a way of defending it [KK12]. It is similar to human rights in that it cannot be taken away from individuals and the duty of the society is to secure those rights. In the case of young people, this means that when they are in adulthood, they can decide that they do not want their personal and/or identifiable information to be used; they have the right to prevent the use of it and even to destroy information considering them, if they so decide[5].

Leisure systems

These are a different matter altogether. Even though gamified systems during our leisure time may impact who and what we are—unless there is a monopoly (or oligopoly) of data-driven systems only—we can always

opt out, as long as we understand the changes to us the system can make. Still, we need to be able to at least have our data removed from a system we have used or tried; this is the minimum of control requirement under Datenherrschaft.

For instance, we could use sports applications such as heart rate monitors (e.g., see Polar, Suunto or Garmin), which these days offer a plethora of additional applications from GPS to following our sleep and beyond. These applications both use our data and the data of others and gamify the exercise experience (as of writing this article, I just reached 100 percent of my daily exercise need). The "100 percent" is likely defined, at least partly by utilizing aggregated user data. The user can, if they want, stop using the system. However, they still do not have mastery over the data already collected, and it can be used by the application developer later on as the application developer pleases.

5 Discussion and conclusion

This study aims to open a discussion on ethical issues of utilizing data-driven gamification instead of providing complete solutions. To do so, we used the concept of Datenherrschaft and identified five environments that are often used as targets for gamified solutions, and we outlined some of the possible ethical challenges that remain in these. Overall, we question the ethics of data-driven gamification itself.

The main argument here is the observation that data-driven gamification—as we define it—collects data from the user and uses this information in order to modify the behaviour of the user. This creates ethically challenging situations where the developers of gamified solutions might easily slip from the bright into the dark side—even accidentally. That is, the designers of data-driven gamified solutions might have good intentions, while the solutions can still end up causing rather more harm than good.

In addition, possible ethical problems are more fundamental in some of the presented five environments: healthcare, work, governmental, school and leisure. For example, in governmental or work life solutions, the user usually has very few options to choose from, which means that they are forced to adapt to dictated systems. Regardless of leisure, all of those environments are good examples of the grey area. The intentions in these domains can always be good, but the solutions can end on the dark side. Usually, these solutions reside somewhere within the grey area—and when the European Union's new General Data Protection Regulation comes into action, most applications and actions might also suddenly be illegal. Furthermore, actors in these environments may not even re-

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[4]ABBA 1980, "The Winner Takes It All" from the album *Super Trouper*.

[5]It is obvious that information can be used as a part of larger information collections that are used, for example, to develop the systems, or is part of statistics and thus it cannot later be removed.

alize that their gamified solutions are affected by the new regulation.

As the field of data-driven gamification is emerging, we can expect that much more ethical problems are lurking in the shadows. The rumours and possible existence of the suicidal 'Blue Whale' game has already shown that forecasting the results of new technologies and innovations is hard. When a technological or social change appears, it is (too) often so that the weakest and the most vulnerable in our society are influenced the most—and typically not in a good way. Therefore, special care should be paid to ethics of new data-driven gamified solutions.

Naturally, this study has its limitations. First, we presented a philosophical inquiry on the selected environments, which were chosen based on their special characteristics. There might be other environments that are more important or fruitful for analysis; however, the presented environments are often the targets of new gamified solutions. Second, it is possible that our case analyses are not universal as there are cultural and legislative aspects that affect on adoption and use of data-driven gamification tools. Third, the conceptual analysis still lacks empirical data, which sets limits to the discussion.

Nevertheless, this study opens new avenues for further work in gamification ethics. The EU regulations are still being shaped for the environment and, thus, its effects and implications will remain a research target in forthcoming years. Also, empirical analyses of data-driven gamified solutions are needed to fully understand all the influences of these solutions. And, we have focused narrowly on the question of mastery over the data—this domain has lots of other aspects offering fruitful areas for analysis and discussion.

Finally, the aim of this article is not to scare away data-driven gamification users, developers or researchers. Instead, while we emphasize the ethical challenges surrounding this specific domain, we also request further work in analyzing, assessing and evaluating data-driven gamified systems as well as development of guidelines and codes-of-conduct to provide working tools for ethical development of new solutions.

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