



**Gamification as Management Support System:
Can Gamification Contribute to Management Success?**



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Abstract

Gamification is seen as a new instrument to increase the motivation of people in terms of learning experiences. Gamification is described as the transfer of typical gaming elements into non-game environments. This thesis answered the question of whether gamification can be applied as a supporting method for developing new aspects of working processes within business management. In particular, the effects resulting in the use of gamification aspects were examined. The results presented in this thesis showed, gamification had a positive effect on management and can be used as a tool for management supporting system. In the present, studies implicate the impact gamification had on the activities of management and business-related processes. These studies acknowledged the conclusion that the integration of elements in business and management related terms had a positive effect. Theoretically, it is possible to prepare management support systems in an exciting and learning way. Especially when game-based elements are integrated for evolving aspects of affection and personal interests. However, it is important to connect these aspects in a sounded and professional way to increase the outcome of positive side effects in terms of management related education. The duration of professional organized events may be longer or may even be absent. The results of this work confirmed that gamification supports corporate management in all five categories and can be used as a tool for management support systems. The findings of this study and its limitations point to the requirement of further research.

Keywords: gamification, management support system, management success



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1. Introduction

1.1 Research Background

Games have become an integral part of everyday life in modern societies (McGonigal, 2016). Video games not only deal with fantasy worlds, but they can also describe our reality or address important social topics, convince people while playing, or distribute possibilities to reflect on own or social behaviour. Playing Videogames can have positive impacts on players, for example the promotion of logical thinking and the development of problem-solving skills. Also, all these aspects can be improved while users feeling entertained by using digital ways of playing. Gamification is the transfer of game-typical elements and processes into non-game contexts with the intention of changing behaviors and boosting motivation among people while using games to develop certain skill sets. (Deterding, 2016). Gamification has become a popular way to increase engagement and participation in tasks that would otherwise be considered as work in management and business-related terms (Reiners & Wood, 2015). Research has utilized gamification successfully in a wide range of topics, demonstrating that a gamified design can result in improved motivation, subject performance and data quality. A wide range of gamification can also be observed in the sphere of marketing, where the improvement of respondents, subjective enjoyment and keeping a respondent engaged leads to positive results (Deteerding, 2011). Despite the promising results, research on gamification is relatively new and prospective. Gamification is particularly interesting for management support systems, because creativity and playful incentives are seen as welcomed elements as part of an innovative industry. At the same time, results of previous research provide that improved engagement is not the only and certain outcome of gamification. Moreover, studies demonstrate that the success of gamification depends mostly on the used and implemented gaming designs (Reiners & Wood, 2015). In addition, researchers also underline the importance of users' experience, where it is assumed that the perception of gamified solutions is helpful, while the participation in games is indeed entertaining (Browell, Cechanowicz & Gutwin, 2015). Gamification does not require a complete development and redesign of existing tools and techniques. Certain designed elements applied through different contexts can be used to create the necessary user experience. In business, the so-called PBL triad (Points, badges, leaderboards) is nowadays used in the majority of commercial and business gamified applications (Management Association USA, 2015). That means, that there is already a wide range of gaming related systems

in non-gaming contexts. Nevertheless, there is a shortage of studies that investigate how game elements in current gamified applications are perceived by users. Beside that there is a lack of impressions that deals with the terms of user expectations in contrast to the offered gamification contexts (Management Association USA, 2015). As a result, some researchers stress, that exactly this point is important for further investigation as it serves as the motivational factor that attracts and motivates participation. To improve the knowledge of this terms of research while developing and analyzing studies is a key factor to secure the persist and power to act in terms of companies. This can only be achieved with the using and integration of professional tools and methodical approaches. The ability to act while finding decisions throughout persistent working processes further strengthened by stimulating them with playful elements.

1.2 Research Problems

The current research is focused on the possibilities and prospects of gamification solutions for business related terms. Existing research on the playing behaviorism and the way of human learning experiences brings a critical link between the understanding of the human nature to play as well as the human-cognitive and social-emotional growth. Some researchers believe that the core idea of playing games is to align organizational and individual core values by encouraging participants to integrate their own values into their daily work (Gudiksen, Inlove, 2018). The game encourages participants to take responsibility for their experiences. The gamified software is designed around the learning cycle, where players move through the process of experiencing, reflecting, thinking and acting as they decide their actions, implementing a specific change and receive feedback on the outcome of their choice (Gudiksen, Inlove, 2018).

It is assumed, that the process of gamification, is a new approach to solve problems. The participants acquire flexibility to deal with changes and learn to enter an open and honest dialog with other participants. Gudikson & Inlove (2018) consider the central research problem as the constant and instant formation of silos, namely the formation of specialized knowledge groups within companies. In other words, the problem, which can be solved by gamification, is a lack of dynamic and flexible communication to improve the working processes for a whole team and across individuals. Adamou (2019) considers gamification as a helpful tool for marketing use, as the game-based research methods are about market research, improving participant's engagement, stimulating their behavior,

as well as improving data quality with the target to re-engage suppliers and buyers into the market research process (Adamou, 2019). Besides, the lack of engagement also affects customers' loyalty and employee's performance (Duggan & Shoup, 2013). Wegalsawier (2019) suggests examining the research design of several publications and proposes a mixed-method research design for creating a holistic understanding of the gamification phenomenon (Alsawier, 2019). Herzig et al. (2015) considers the research problem with the definition of clear roles and tasks within the process of gamification. The external boundaries of games and the implementation of this in terms of gamification as involving non-game contexts and manifestations are also to be researched. Dymek & Zackariasson (2017) investigate role-playing games as a gamified process of organizational learning and its effects in the project management, as well as in sustainable consumption and management processes (Dymek & Zackariasson, 2017). Resuming the chapter, the core research problem is the efficiency and the relevance of gamification in business. The secondary problem that is also being identified is the design process as sustaining the expects of general usability to implement a solution of solving business related problems.

1.3 Research Objective

The main objective of the research is to identify the core goal, the necessary design process, and the roles of the participants, as well as the usability of the corresponding applications. However, it should be mentioned that most of the analysed studies focus on quantitative research. The present work represents an attempt to conduct an analysis of qualitative research on the area of business gamification and examines the impact of this new solution to improve business performance.

Since the above criteria cannot be calculated, the measurement focuses on the following factors:

- What effects does gamification of business processes deliver?
- To what extent the users and other participants are satisfied?
- What problems and (or) shortages can be identified within the gamification solution for businesses?

The goal of the current analytical research is therefore to investigate the theoretical background and principles of gamification in organizations and processes that can improve and enhance user satisfaction and experience.

1.4 Research Significance

Researchers consider gamification as a method to use game mechanisms and rewards in other contexts than gaming to increase users' engagement and drive desired users' behaviours (Duggan & Shoup, 2013). In addition, it is important to emphasize that gamification can be used to record the desired behaviours. With the fundamental research to gain data, it shows an opportunity to implement this aspect in further variety. Gamification is already used in spheres as retail and e-commerce, politics, healthcare as well as in human resourcing. Although gamification implies a complex task, the potential to solve business related problems increases. The answer to the current study objectives may help to develop a certain strategy for gamification of business process parts in a more correct way, avoiding gaps and shortcomings.

1.5 Research Scope

The objective of the current work is to identify current studies that focus on providing knowledge and relevant tools to the theme of gamification in context of business forms, namely those studies that feature prospects as well as potential to improve a lacking gamification approach in relation to business processes.

During the development of the current review, many studies have been found regarding different lines of research within the gamification scope. The majority of the found data introduce specific applications for the process of education and knowledge transfer. The research started with the queries "gamification" and "Gamification in business". The first search was conducted with the help of the search platform "scholar.google.com". The result brought a wide number of articles and studies that were thoroughly read and analysed. Other relevant literature sources were found in the reference section of the paper's studies. Based on the analysis of the relevant sources and literature and by observing keywords of the sources, the final query was formed: "gamification in business decision making", "gamification in management". More than 200 references relevant to the topic of the current thesis were found. A lot of useful information is also offered on the platform "Towards Data Science". It is important to stress, that almost every paper is published in 2010 or the following days, until the year 2022. This fact confirms the idea that the approach is relatively new and needs extended research or analysis.

The papers were evaluated based on properly defined criteria. First, the paper citation was observed, and sources cited in at least five further papers are used for the current thesis. In the second step, the research with the final query was done. The articles and other academic sources that did not match with the final key words and the above quality criteria as per citation were eliminated. Third, only journals and platforms with a good scientific reputation were observed. It turned out that papers for IT conferences and seminars seems to be suitable. These are, for example, the papers in Computer Science, Semantics, and Big Data.

2. Literature Review

2.1 Definition of Gamification

Various authors have dealt with the analysis and implementation of gamification in various areas. There is not a uniformly definition of the term "gamification" (Werbach and Hunter, 2019). So, in order to address the need of improving this term related understanding, scientists need to approach to a common sense. While trying to conclude an adequate definition, existing approaches need to be processed. "Gamification is the use of game-design elements in non-game contexts". (Deterding, 2016). Werbach and Hunter (2019), who dealt with gamification in a business context, offer a similar definition: "Gamification: the use of game elements and game-design techniques in non-game contexts". (Werbach and Hunter, 2019). Alternating with this, Zichermann and Cunningham (2011) define gamification in the context of online applications and apps as "the process of game-thinking and game mechanics to engage users and solve problems" (Zichermann and Cunningham, 2011). In contrast to the previously mentioned definitions, the inclusion of users and the solution of problems are exclusive components to conclude a sounded definition.

The definition by Kapp (2018) refines the variant by Zichermann and Cunningham: "Gamification is using game-based mechanics, aesthetics and game thinking to engage people, motivate action, promote learning and solve problems" (Kapp, 2018). Here, psychological variables such as the promotion of engagement, motivation, learning and problem solving are mentioned in order to show a deeper understanding of gamification. It relates to topics in terms of human psychology and behaviourism.

Nora S. Stampfl has taken a further step towards the concept of gamification. She claimed that gamification is a kind of tool. The focus here is on generating motivation and changing the user's behaviour. Stampfl (2018) defines gamification as deliberately making use of game mechanisms in order to awaken people's motivation and to turn them into certain behaviouralistics (Stampfl, 2018). Another way to approach the complex structures is by focusing on semantics. Gamification includes the English word "game". In the English language this term is to be distinguished from "play". According to Salen und Zimmermann (2004), play refers to free action that is associated with certain characteristics (Salen und Zimmermann, 2004). The main difference between game and gamification is that the intention is built into the context of interacting by using certain rules, that defines the game. Gamification only relies on individual game elements without forming a complete game (Walz 2016). According to Deterding (2016), a further distinction can also be made in this context. The authors distinguish between the terms of "serious games", "gameful design (gamification)", "toys" and "playful design".

As can be seen in Figure 1, a distinction is made on the X-axis between Whole and Parts and on the Y-axis between Game and Play. Gamification should show the position on the diagram to better classify borderline cases. Gamification is assigned to the category Game and differs from „Serious Games" by only implementing individual parts. Serious games are complete games that, have a non-gaming reference and are set into a new context, but want to achieve learning and exercise effects in addition to the gameplay aspect (Deterding, 2016).

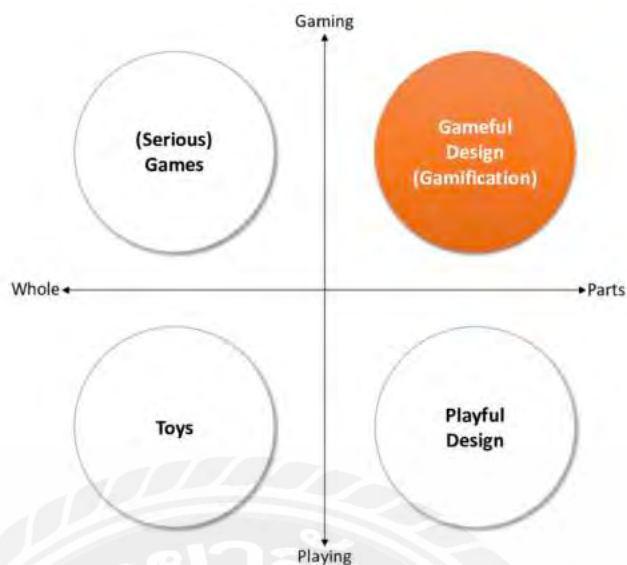


Figure 1. “Gamification between play and game, whole and parts” (Deterding, 2016)

2.2 Engagement

In this context, engagement has two definitions. The first is through social engagement by creating opportunities for participants to engage with others in meaningful ways (Reiners & Wood, 2015). A second definition of engagement in this context is the creation of an engaging game experience. One theory behind creating an engaging experience is the concept of flow. Its core idea is that the difficulty of the challenges in the gamification system increases contemporaneous as the player’s skills increase, and a player who is in a state of flow is fully engaged within the system (Reiners & Wood, 2015). Both concepts can be merged as players become more experienced with a system in which they are better prepared to interact with other participants.

There are two types of player engagement to consider when creating a gamification system: Engagement between players in a social manner and engagement between players through game mechanism (Reiners & Wood, 2015). Social engagement can be enhanced and facilitated through discussion boards, chat spaces and other means of communication. Engagement through game mechanism can come through comparative scoring systems such as leaderboards, players created tasks and challenges for each other to solve, and interacting together to solve a shared task (Reiners & Wood, 2015). Based on the above concepts, certain types of gamification apps can be developed for business: Cooperative gamification, which is created to bring people together and encourage

interactions at first. Second, a gamification system that can combine competition and cooperation. One method of doing that is through allegiance. This approach demonstrates two advantages: It engages people and can set up a competitive spirit to achieve better results (Reiners & Wood, 2015).

2.3 Users' Experience and Expectations

The gamification system consists of three levels. To be usable, the system needs to match with certain rules. The goal of gamification is the core element of the gamification approach. It is to define the basis of the actual needs of the addressed user, and it has to be consistent with the user's activity (Marcus & Wang, 2018). In contrast to defining a game, the purpose of the gamification is to meet the exact needs of users, which is fundamental to gamification. In the gamification system or application, the internal motivation of the user can be maintained and stimulated without alienation (Marcus & Wang, 2018).

The second element is the implementation of a rule system. The rules not only construct the system, but also guide the behaviourism users, which serve as the intrinsic motivation for the normal operation of the system. The users' behaviours set the driving force behind the gamification system or application (Marcus & Wang, 2018). Gamification is designed to create a user experience beyond expectations, which guides users to recognize the nature of the real needs, accumulate the user's intrinsic motivation, and form new sustainable and beneficial behavior (Marcus & Wang, 2018).

The using of tools, fulfills the third needed element. According to Marcus & Wang (2018), tools can seem to be the surface of the gamification system, which is closely related to the user's perception and more concentrated on the user interface (Marcus & Wang, 2018). In other words, gamification tools include data and information, which are the external appearance of the user's behaviourism, the result of the user's behaviours, and the feedback. In the same way, as with other applications or technological solutions, the user's experience is the main method and approach to sustain the standard creating usability by finding solutions. The user's experience is subjective, its impact is focused on practical application, and includes emotions, beliefs, preferences, cognitive impression, physical and physiological responses as well as mannerisms (Marcus & Wang, 2018).

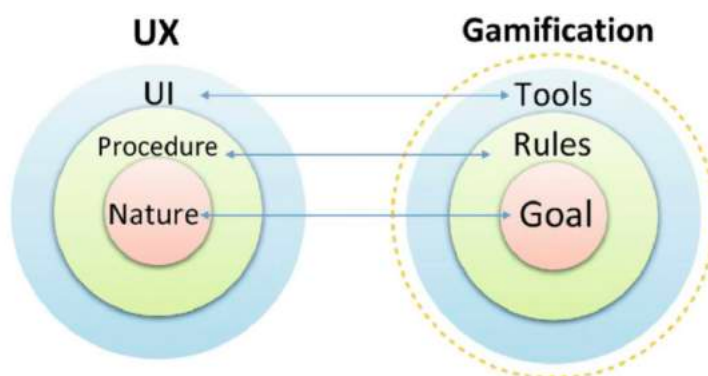


Figure 2: Relationship between gamification system and user's experience.

Source: (Marcus & Wang, 2018)

The aim of the gamification solution is to enhance the user experience. The core of the gamification is the creation of the emotional process alongside with the functional tasks. Innovations in technology enable us to integrate many new features and modern data and it is even more effective when understanding the user (Marcus & Wang, 2018).

2.4 Gamification in Decision Making

With growing amounts of data by using digital tools to research, it is essential that managers have the classic analytical thinking skills as well as the ability to apply new techniques and methods of data analysis to improve their abilities.

A study by Burke and Hiltbrand (2015) showed which positive effects gamification can have on business intelligence. There are several game mechanics that help users find, combine, and analyse information to make optimal decisions (Burke and Hiltbrand, 2015). Miller et al (2016) have also tried to integrate gamification applications into business intelligence and measure how they affect their users. In their opinion, the influence of gamification is particularly interesting for the use of a business intelligence software, because important criterions are engagement and participation (Miller et al, 2016).

The gamified business intelligence tool not only makes it possible to make faster but also better decisions (Miller et al, 2016). Schönbohm and Jülich (2016) have examined the effects of gamification on small and medium-sized enterprises in the field of risk management. A gamified risk management workshop was developed and conducted in three different German SMEs. The results showed that gamification can be a valuable tool for business management. The game elements can help to transform complicated processes into simple and understandable processes and increase the quality of business decisions (Schönbohm and Jülich, 2016).

2.5 Gamification in Leadership

Promoting and encourage people is one of the most important tasks a leader must fulfill. The manager has the responsibility to lead his staff in such a way that employees can develop positively.

Since gamification has a motivational effect, it can have a positive effect on people's behaviours and lead to performance enhancement (Sailer, 2015). But it is difficult to design gamification applications permanently attractive for employees (Stieglitz, 2015). At the beginning of the use of gamified programs, employees may still find them attractive and varied, but after some time the point scales and badges may appear superfluous. A wear of the used mechanics can be the result of getting used to it. Stieglitz says that employees react differently to gamification elements. Some will find competition-oriented concepts challenging and motivating, others will not (Stieglitz, 2015).

Mollick and Rothbard (2015) have found in their work the positive impact of gamification on employees and their performance depending on the degree to which they agree to play on their own initiative. Gamification in business states that employers develop games for their employees to motivate them and increase fun at work (Mollick and Rothbard, 2015). Gamification can therefore be an approach for managers to encourage employees to become more active in the company. Gamification is also criticized in its work as mandatory fun (Mollick and Rothbard, 2015). The authors write that if there is not enough voluntary participation of the users, then approval is crucial for the success of Gamification. This agreement should contain the following conditions: the existence and understanding of the rules of the game as well as a sense of justice and fairness (Mollick and Rothbard, 2015).

2.6 Gamification in Promoting Learning

Decker et al (2015) have discussed the question to what extent gamification elements can support the didactic and functional requirements of mobile micro-learning. Mobile micro-learning refers to learning scenarios in which learners have access to context-related, digital learning content independent of time and place (Decker et al, 2015). This enables managers who are on their way to an appointment or on a business trip to complete short learning units on specific topics. Managers often lack motivation to take advantage of such courses, so the use of gamification can be helpful (Decker et al, 2015). By designing an exemplary mobile micro-learning application with gamification elements, Decker et al. (2015) have shown that this can have a motivational effect on learners but does not necessarily lead to an increased motivation (Decker et al, 2015). Gamification elements are often used in mobile applications to illustrate the location and progress of one's own knowledge (Stieglitz, 2015).

2.7 Gamification in Change Management

The main task of change management is to further increase the performance. In a case study by Voit (2015), the change process within a company were examined. Managers are often less motivated when a company questions its organizational structure. Voit (2015) uses an example from the automotive industry to illustrate the effects of the gamification application on managers and their motivational deficits. This illustrates to what extent gamification can help as a change management method. The concept of the Layered-Process-Audit was used to implement gamification (Voit, 2015). A layered process audit is a method used by managers at different hierarchical levels to regularly check compliance with using a checklist (Voit, 2015). The result of the Voit case study (2015) showed a positive impact of the gamification application. Using gamification in change management enables motivating the majority of managers to accept and fulfill their tasks and responsibilities (Voit, 2015).

2.8 Gamification in Knowledge Management

Schacht et al. (2015) presented in their article a gamified knowledge management system for projects, which was implemented together with Movilitas Consulting. This project should help managers to collect and effectively store their knowledge and gather experience for future projects. When designing the program, great emphasis was placed on a high practical relevance so that the project could also be implemented quickly and efficiently (Schacht et al, 2015). Users should be able to easily access all the necessary information with just a few clicks. The authors did come to the following conclusions: by including gamification elements such as points, levels and rankings, users were more motivated to work with the tool in a long term. Gamification has the potential to put the user in a state of cognitive deepening. It has been proven that users of "Project World" are more motivated to document their knowledge in a playful way, to share this knowledge with colleagues and to use it further. When using the application, they also have more fun solving tasks that are usually seen as annoying, boring, or superfluous (Schacht et al, 2015).

3. Findings

Based on the analysis above, we can state, that in contemporary times, the importance of factors such as fun and entertainment is increasing. They seem to help to enhance user's decisions as well as the use of the application. By implementing elements of gamification into a business application, negative effects like boredom and reluctance will be minimized. The below diagrams demonstrate the method of the research, and its milestones as follows

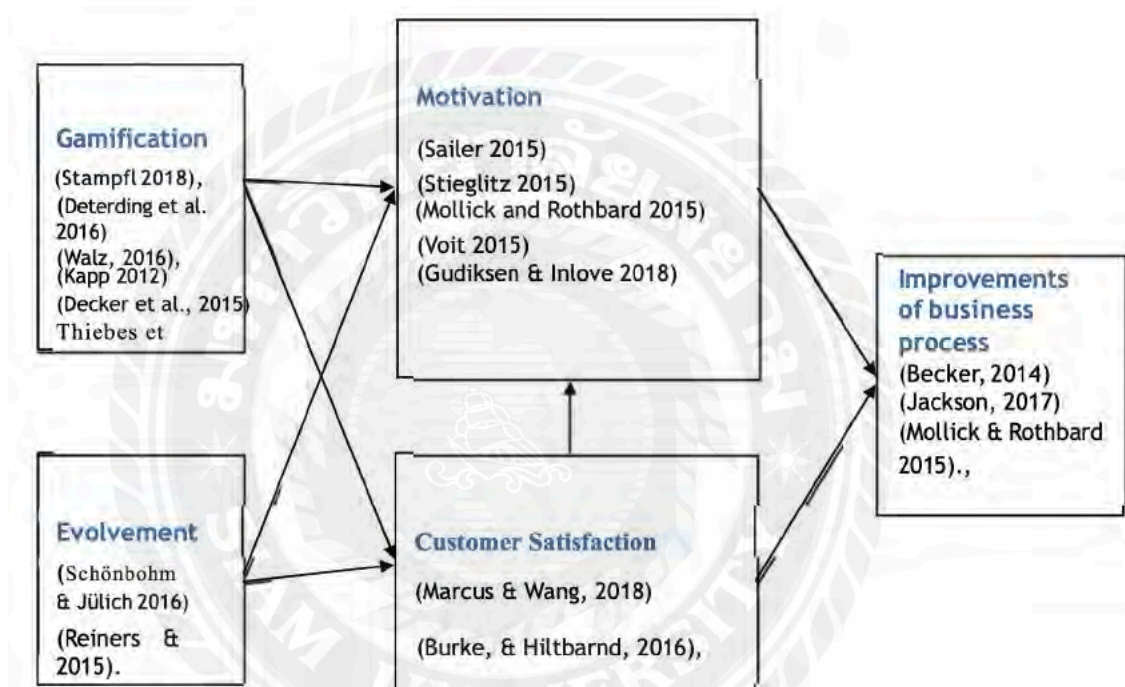


Figure 3: Research scheme, Source: Own performance.

According to Jackson (2017), common design elements of gamification are points, timers, badges and leaderboards. Gamification of the above elements can achieve positive effects as follows as improving the success of motivate and engage participants more without making them bored. It provides practical related opportunities to improve skill sets, and enables participants to assess the business process or learning process through new accommodations during learning processes.

By giving meaningful feedback to learners, possibilities to improve performances will be created (Jackson, 2017). The research also demonstrates a consistent understanding of gamification by all researchers, where they define it as the use of game design and its elements in non-game

contexts to create a sense of playfulness and to make the tasks less boring and more enjoyable (Schacht et al, 2014). If to consider more deeply, key characteristics of gamification are a set of rules, declarative content, and a social layer, as it is built on the behaviours of users. As a result, this mechanism enables us to display a user's progression in task fulfillment and achievements, provide feedback on user's activities such as leaderboards, implementing countdowns or appointments to change the user's behaviours in case it needs to be improved and redirected (Schacht et al, 2014). The third important finding concerns the spheres of implementation of gamification solutions in a non-gaming related context. Analysing the literature, we can find the result that almost 50% of all articles and sources discuss the use of gamification in such settings as education, private life and business. An important finding was that most gamification solutions are implemented in such non-gaming contexts as the sphere of education and business. Many sources focused on the mode of implementation as on core elements of gamification solutions. There are few publications on the effects of gamification, which can be explained by the fact that the approach is relatively new and is not widely used by now. Game elements and rewards serve as a starting point to understand gamification effectiveness. Cognitive load is the most effective measurement for facilitating intrinsic motivation, and reinforcement goals of gamification (Reiners & Wood, 2015). The most researched effects are the user's behaviours and the user's motivation. Thus, gamification is an opportunity to change processes and companies from within. Gamification is also used as a clever way to promote a business or products. The research makes clear, that gamification is an emerging and growing trend. The undeniable fact is, living in a digital age, with people growing up as digital natives whose perception of learning and business processes differ far from those which were presented before. Thus, the approach will be further developed, implemented, and researched.

4. Recommendations and Statement of Problems for Further Research

Yet there is little empirical research on how gamification works and whether it succeeds in promoting the user's motivation (Reiners & Wood, 2015). Additionally, success in a non-gaming context does not guarantee that the same mechanism and strategy will be successful in other areas of application. Nevertheless, research is needed to analyse and to describe the essential game mechanics in different contexts, such as enterprise, education and to compare effects well.

Gamification in management and business can be applied to create simple affinity diagrams, for play testing paper prototypes or for sharing ideas and discussions (Kapp, 2012). A deep analysis should be performed towards the relationship between the game behaviourism and the effect of game design elements (Reiners & Wood, 2015).

Existing motivational models put focus on how games as a whole create the experience of fun and are not linked to the more granular level of single game pattern (Reiners & Wood, 2015). A closer examination may provide more insight regarding to the desired type of behaviours and tools to regulate the outcome. Understanding game rewards and motivation offers interesting implications in various fields such as in business, game design, design environment and educational settings.

While the goal is to create and to maintain the intrinsic motivation, gamification is the application of extrinsic motivators: With creating flexibility in usage, core content may be reached in an easier way. It can also serve as a tool to demonstrate mastery. Laying out a course map that identifies key concepts, processes, topics, and skills and then creates links between those that rely on each other allows for participants to choose a variety of paths through the content and material for analysis. It also helps both the leader and the team see how topics are interrelated (Becker, 2014). By using point systems or a reward structure, not only motivation, but also priorities in business structures may be reached. With rising scores, potentials of positive reinforcement can be created (Becker, 2014). Creating clear rules can be achieved by connecting all required activities to the objectives and gamifying them. Clear rules enable users to get scores and enable them to participate on an equal basis. Feedback should always arrive on time demonstrating achievements or gaps which need to be improved. Badges are connected with achievements. There should be clear criteria, how badges can be earned and what advantages they may bring (Becker, 2014). Leaderboards are common motivational tools in Marketing and Sales. They can enhance competition. However,

Becker (2014) states, while this approach motivates extroverts, it may demotivate introverts. As optional gamification avatars may be assessed. This approach can point out the main features of the person's character or serve as an image in the group. If needed, narrative or storytelling can also be gamified for better understanding to create clear associations (Becker, 2014) Careful selection and integration of these motivators will trigger internal motivation and help to maintain them (Reiners & Wood, 2015).



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