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GAMIFICATION IN PROJECT MANAGEMENT

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Abstract:

Studies have continuously shown that motivation is a key factor in the process of pursuing success. Domains such as education and business highly rely on intrinsic and extrinsic motivation to drive personal and professional performance, foster innovation and achieve the proposed goals. Studies also highlight a decrease in motivation levels across various fields of activity. Considering this, individuals and companies have been searching for solutions to increase motivation and engagement. A less popular one is gamification. My study focuses on the impact of gamification on project management. Keeping a team motivated is an important responsibility for leaders. Moreover, individual and collective well-being can have a significant impact on performance and general satisfaction in a project. In light of this, I explored the effects of implementing points, leaderboards, badges and peer-to-peer collaboration, as gamification elements, on the performance and general satisfaction of a project team at Amazon Iași. By conducting both a qualitative and quantitative analysis, the study aimed to identify the possibility of perceiving gamification as a solution for increasing team motivation and performance. My findings show that most members of the team felt more satisfied after interacting with gamification, but their performance KPIs did not reveal any obvious change. This underscores the need to expand the research within the field of project management and gamification.

Key words: gamification; Project Management; work performance; job satisfaction; motivation.

1. Introduction

Project management represents a cornerstone of any professional (and often even personal) activity, and it's meant to guarantee constructive progression and favorable outcomes. When the right methodologies and strategies are applied, projects are more likely to be successfully implemented. Using the right tools, techniques and resources can have a big impact on the project's journey outcome. However, the essential and indispensable element of any project is the team. In its absence, the concept of "management" is reduced to a mechanical tool for coordinating systems and artificial processes. For project managers, creating and sustaining a productive, adaptable, and driven team becomes a top priority. One innovative approach to enhance team performance and motivation is the application of gamification, particularly through reward systems.

This research focuses on analyzing the impact of gamification in project management, with its main goal being to answer the central research question regarding how gamification

influences team dynamics and individual experiences. The key objectives of this study are: to evaluate the impact of gamification on individual and team performance, specifically productivity and quality, within a corporate project environment; to explore the influence of gamification on team members' satisfaction and engagement by collecting qualitative feedback; to identify the benefits, limitations, and potential areas for improvement in applying gamification strategies to project management practices in an organizational context. The case study involves a project team based in Iași, Romania, within the multinational company Amazon, comparing performance indicators and general satisfaction before and after gamification was integrated. Applying a mixed-method approach, the study combines quantitative metrics, such as work productivity and quality, with qualitative insights derived from the team members' interviews.

2. Literature review

Prior to delving into the particularities of implementing it in project management, it is necessary to outline the holistic view of gamification. The concept of gamification is often confused with the intrinsic notions of game or play. According to the Cambridge Dictionary, gamification is "the practice of turning work tasks into game-like activities in order to make them more interesting or enjoyable" (Cambridge Dictionary, 2024). Therefore, games and playing are not synonyms with gamification, but rather the pieces of the whole puzzle. Cloke (2024) describes gamification as "applying game elements and game principles in non-game contexts in order to motivate and captivate users". Hence, the main goal of a gamified activity directly involves people and their level of motivation and engagement.

Applying gamification implies using one or more of its elements. Badges, points, leaderboards and rewards are well-known for their usage as gamification components (Kien and Nguyen, 2021). In the bigger picture, gamification heavily relies on collaboration and/or competition.

Depending on the type of activity and context, gamification can be implemented for numerous particular reasons. First of all, a gamified strategy can be integrated into one's private or professional life. Personal life gamification is mostly self-driven, whereas professional life gamification could be a result of a company's or institution's goal of achieving specific labor objectives (Swacha, 2023). Gamification can be used as a personal motivating tool for completing day by day chores and simple tasks, but it can also act like a business instrument meant to fine-tune the relevant key performance indicators. The literature around this subject underlines the most important business objectives achievable through gamification (Bitrián *et al.*, 2023) (Elidjen *et al.*, 2022):

- Guarantying completion and time reduction for work tasks;
- Training and learning processes' facilitation;
- Team work and collaboration optimization;
- General work satisfaction and motivation.

Business is not the only major field potentially impacted by gamification. Studies have been conducted in areas like education, marketing, healthcare, corporate training, etc. A 2018 study reveals that the majority of analyzed research in the field of gamification in education yields positive results: out of 91 articles, 65 present gamification in a favorable

manner (Majuri, Koivisto *et al.*, 2018). For primary education in Spain, another study refers to gamification as a factor that generates motivation, engagement, responsibility and enthusiasm amongst students, regarding learning processes (Sáez-López *et al.*, 2023). They also mention proper teacher training as an important prerequisite for the successful implementation of gamification. The usage of points, badges, leaderboards, levels, feedback and challenges is the most common regarding gamification in education (Khaldi *et al.*, 2023).

Another field where gamification has left its marks over the time, is marketing. Placing clients at the core of any business activity, the integration of gamification into marketing processes has changed the overall experience. Companies that use game elements in their marketing activities give people the opportunity to mark personal progress, receive personalized offers and benefits, and assert themselves in the communities they belong to or integrate into precisely by interacting with gamification (Houtari and Hamari, 2016).

The specialized literature demonstrates that gamification has many roles in marketing: customer loyalty consolidation, evaluation and recognition for employees, community creation, customer engagement increase, brand awareness enhancement, etc (Corna, 2017) (Santos, Dias *et al.*, 2024) (Houtari and Hamari, 2016).

However, gamification is not devoid of disadvantages. A 2020 review of 49 other studies found that cognitive training tasks were more motivating and engaging when gamified but were also described as more difficult and demanding than usual (Vermeir *et al.*, 2020). Another 2022 study, which examined the impact of gamification in corporate training, found that the playful elements had a negative impact on learning outcomes (Kulkarni *et al.*, 2022).

The need of gamification in Project Management

When it comes to tasks in the life cycle of a project, there is the possibility of bottlenecks for various reasons: high complexity, misunderstanding of requirements, poor collaboration between team members, lack of motivation, etc. Motivation in projects is essential because it encourages people to be efficient and meet deadlines while delivering quality work (Abyad, 2018). Gamification is a method of increasing the engagement of team members, especially through collaboration, competition and reward.

Studies show that dopamine is involved in the reward process and is essential in experiencing pleasure (Shrivastava, 2023). The satisfaction derived from gamification practices applied to projects is based on human psychology consistent with games and their integration into professional and personal life. Recognition of achievements boosts team motivation, and an environment that encourages freedom of expression allows individuals to perceive failure as an improving opportunity, rather than reasons for criticism. A cycle of challenges and performances, according to the premise of neuroscientists, causes the brain to release dopamine (Patra, 2019), which implies the implicit desire to repeat the action.

According to the State of the Global Workplace 2024 report, only 23% of employees worldwide are engaged in their work, while 62% are not engaged, and 15% are actively disengaged (Gallup, 2024). This disengagement represents not only a loss of potential, but also a substantial economic burden, costing the global economy an estimated \$8.9 trillion, or 9% of global GDP. Monetary rewards are not always enough to capture the attention of human resources, as people are complex beings and require the simultaneous fulfillment of

certain requirements to feel fulfilled. One of the theories of motivation in project management is represented by Maslow's Pyramid. Project managers or team leaders must ensure that team members meet all their individual goals so that their work determines the success of the project (Ball, 2019). At least three levels of Maslow's pyramid can be reached by integrating gamification into professional projects: the need for belonging, the need for esteem and the need for personal development (Fig. 1).

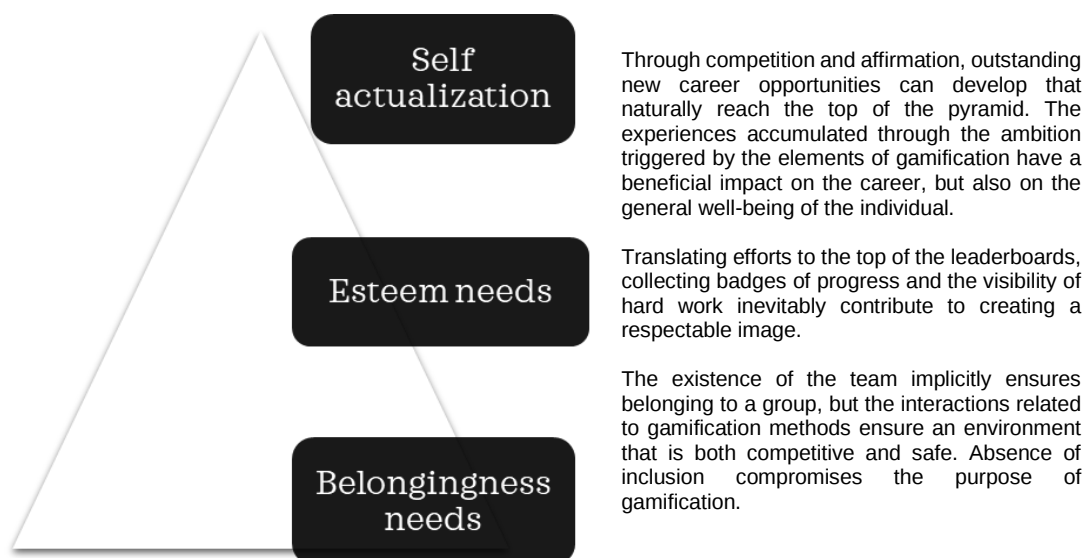


Figure 1. The role of gamification in fulfilling Maslow's needs in project-based work environments

(Source: Dar and Sakthivel 2022)

Another theory of human psychology, which explains the need for gamification in project management, is that of Self-determination. The Self-Determination Theory suggests that an employee's performance and satisfaction are influenced by the motivation they have in relation to the professional activities they perform (Deci, Olafsen *et al.*, 2017). The theory explains three basic psychological needs that have also been passed through the filter of gamification (Magnani 2023):

- **Competence:** People feel the need to feel competent when assigned work tasks, especially within a team. This need is covered by gamification, as elements such as scores, levels, rankings or badges provide immediate feedback to people and positive results will make them feel competent.

- **Autonomy:** Psychological freedom is the ability to make decisions based on one's own principles, without being constrained by someone else. With the help of gamification, this autonomy is reflected, for example, by personalizing the team members' avatars, free from the influence of external factors.

- **Belonging:** People have a fundamental need for integration in the social environment. In addition to the obvious team membership that influences collaboration between individuals, another way gamification fulfills this need is by creating a story that involves all team members on the project. This causes them to empathize more easily with their avatars, generating a deeper sense of belonging, which causes them to complete tasks faster and with high performance (Deci, Olafsen *et al.*, 2017) (Sailer *et al.*, 2017).

The impact of gamification application in project management

Cornelius Fichtner said that "The letter P found in the abbreviation MP refers as much to the management of people as it refers to the management of projects" (Davis, 2016). Gamification supports this statement and facilitates processes by motivating human resources.

A very common practice in project management is the awarding of badges associated with progress in the activity. They can be designed as standard or designed in a customized manner depending on the field of activity, the team members or the nature of the activities undertaken. Badges reflect various stages of performance and act as recognition of individual or team efforts. Team rankings are also often implemented, based on displaying the scores obtained by participants from completing certain challenges. Although they can become generators of negative competition, the proper use of rankings leads to clear goal setting, improvement of learning techniques and removal of obstacles to the achievement of the goal (Kim and Park, 2021).

(Table 1) synthesizes various project life cycle stages, specific challenges encountered by teams studied by Spreitzer (2013) and the corresponding gamified solutions implemented to address them. Although the examples originate from a particular study, many of the elements, such as progress tracking, rewards, or scenario-based planning, are adaptable and have the potential to be generalized across different project environments.

Table 1. The impact of using gamification elements in project management processes

Project management process	Challenges	Proposed gamified elements	Team impact
Project Charter Development	Inability to establish clear objectives; Lack of overall vision.	Progress bar for tracking the development of project objectives	Increased visibility of progress; Greater transparency; Deep understanding of project objectives.
Project Plan Design	Gaps in knowledge; Minimal level of experience.	Guarantee of monetary and non-monetary rewards, mentoring programs	Motivates individuals with less experience to see value in new information; Provides high-quality mentoring for juniors; Develops professional relationships.
Requirements Gathering from Stakeholders	Collecting unclear or unprincipled requirements; Immature decision making.	Treating tasks as part of a reverse treasure hunt; Introducing challenges and gamified tasks.	Stimulates creativity; Reduces deadline-related pressure.

Project Coordination and Administration	Individualism within the team; Limited resources; Ineffective team communication.	Rewards for team accomplishments; Utilizing methods for task estimation and scenario planning.	Encourages teamwork; Improves communication between team members; Creates a collaborative and supportive environment.
	Lack of essential information about progress and evolution; Team members' reluctance to engage in monitoring.	Developing a visible, editable progress map; Assigning bonuses based on activity levels (e.g., 25%, 50%, 75%, 100%).	Increases team motivation and satisfaction; Provides recognition through progress tracking; Fosters healthy competition

(Source: Spreitzer, 2013)

The game atmosphere includes several factors that directly affect the perception of individuals on their own person, but also on the environment in which they work. In a project, there are elements of influence that can determine the finality of the staged experience. From a personal point of view, people tend towards the need for recognition, exposure and acceptance from others. (Marcão, Pestana *et al.*, 2017) At the collective level, mutual benefits and social influence motivate the human resource to aspire to high quality and meaningful work.

In 2014, taking into account the extent of the gamification phenomenon, a group of researchers developed a workflow for the introduction of gamification in various fields, consisting of ten principles: "self-focus", "inclusion of persuasive elements", "learning orientation", "results-based rewards", "adaptability for Gen Y", "integrating fun elements", "implementing transformative processes", "prioritizing satisfaction", "source of documentation" and "gamification based on knowledge" (Oprescu, Jones *et al.*, 2014). Focusing on these principles in any field aims to improve the systemic and operational processes, but also to bring the human resource to the fore. In project management, most of the principles stated above are practicable and can bring long-term benefits. For example, self-focus, learning orientation, and prioritizing satisfaction provide team members with feelings of appreciation, safety, and belonging to a diligent community. Project teams focus their attention primarily on meeting common goals and objectives. Collaboration, however, works best in the presence of self-satisfied people, motivated by their own aspirations and ambitions.

Risks associated with gamification in project management

The introduction of modern concepts into established systems with long-standing, well-documented structures inherently carries certain risks. Project management does not lack valid procedures and strategies that have been officially used for at least almost a century. The daily temptation to try newly discovered things, arising from the abundance of information and innovations, but also from the natural curiosity of people, presents two possible consequences: success or failure. Gamification falls into the same pattern of the decision tree. It starts from a premise, and gradually, by going through some choices

influenced by internal and external factors, the purpose of implementing the concept in the chosen field is outlined.

Any project involves understanding the needs and requirements of the clients or its beneficiaries, in order to solve the stated problems. Analogously, the modernization of project management processes by introducing gamification methodologies requires a preliminary analysis before implementation. The diversity of teams and the variety of projects indicate the need to assess risks regarding: individual behavior of team members, team dynamics, costs of integration, usefulness of implementation to achieve the goal, and more.

According to Richard Bartle, there are four main categories of players: "The Achiever", "The Explorer", "The Socializer" and "The Killer" (Park, Min *et al.*, 2021). The achiever focuses on completing objectives that generate points, rewards and leaderboards. The explorer is eager to discover new horizons, training his creativity by identifying hidden details. As the name suggests, the socializer focuses on communication and interaction. Ultimately, the killer has the same concerns as the achiever, but the main difference is the burning desire to see their opponents lose. Drawing a parallel with project management, metaphorically, names and descriptions can be suggestive of teams. That is why it is essential to study individual behaviors and goals before deciding whether or not to implement gamification in the project. If the presence of competition is a motivating factor for the achiever or killer, the other two categories of players could be overwhelmed by it. At the same time, teamwork could create difficulties for the killer, just as for the socializer, individual tasks can be cause for concern. The explorer's attention to detail can add value to the team, but can be associated with missing deadlines. Taking into account all these variables, the projects will be gamified or not depending on the conclusions drawn from the psychological-social analysis of the team members.

The personalities of those involved in a project represent only part of the decisive criteria in the implementation of gamification. Regardless of one's behavioral traits and ideals, there are imminent risks that sabotage the honorable purpose of the initiative. Ranking by score-based rankings, one-sided and exclusive rewards, and a focus on achieving results can jeopardize people's need for self-esteem. This leads to anxiety and disengagement, caused by a loss of autonomy (Granger, 2023). Elements of gamification require gradual integration, documented and adapted to team dynamics. This role falls to the project manager who assumes responsibility throughout the activity to ensure a positive-competitive atmosphere that does not harm in the long term. The challenge arises when the project manager has the initiative, but does not show the necessary knowledge, the action plan does not fit the project requirements and the communication between them and the team is deficient. (Table 2) highlights the risks associated with the implementation of gamification in project management, based on the main elements (scores, rankings, badges, profiles).

Table 2. Risks associated with the integration of the primary components of gamification in project management

Gamification element	Implementation context	Risks
Points	Each activity corresponding to a milestone is assigned a certain score. It takes into account the deadline and the complexity of the	• Emphasis on quantity can affect the quality of work • Scoring pressure can distract from the main purpose of the project

	workload. Completing the activity leads to receiving the corresponding score.	• Being an element associated with the game, the overall seriousness can be lost • Not reaching the maximum score can lead to discouragement and loss of motivation
Leaderboards	At the end of each iteration (if applicable) or at the end of the project, the ranking based on the scores obtained previously is displayed. It can be visible along the way or only at the end and is available to all team members.	• Comparison between team members can create harmful competition • Checking the ranking frequently reduces the importance of achieving real goals • Affirming the people at the top of the ranking in front of the leaders can be frustrating for others • Based on competition, teamwork is affected and there is a possibility of creating conflicts between people
Progress Badge	Such badges can be awarded for completing work tasks in the shortest possible time. They can be achieved in concert with team members or exist separately, privately, for each individual.	• The importance of quality may be diminished • The preoccupation with collecting badges can overshadow the purpose of the project • Speed is not always beneficial
Performance Badge	This reward reflects the volume of work and its quality.	• Although quality is a beneficial factor in the project, the time required to complete an activity can increase substantially • The preoccupation with collecting badges can overshadow the purpose of the project • Continuous performance can lead to overload and reverse the desired results

(Source: Corna, 2017)

These are just some of the aspects of gamification that could lead to negative effects. The challenges associated with these can be mitigated by executing the implementation plan correctly and according to the needs of the project. To guarantee the generation of a positive impact, the project manager has the possibility of partnering with specialists in risk assessment, who have a plan to reduce or eliminate risks in the event of their occurrence. However, there are chances of rejection from one or more team members. Resistance to change can be a major impediment to implementing new practices in a well-known HR workflow. Opposition can generate low adaptability to the new system, but also low participation (Gazzerro, 2023). While resistance from the team is generated by the fear of the unknown, the associated insecurity and the need to adapt by learning and applying new procedures, it will be viewed by the manager as any action or restraint that is not correlated with the achievement of the objectives and purpose of the project (Postica, 2017). It is also up to the project manager to manage these behaviors and find solutions in order to convince the team members.

3. Methodology

The Amazon gamified project was conducted with a scientific purpose and it was initiated by the author of this paper. Even if the gamified experience had a direct impact on the business, the main goal was to analyze the effects of gamification applied to project management, in order to contribute to the already existing research done in the field.

Starting from the essence of the research question ("Will the application of gamification in a corporate project have a negative, neutral or positive impact?"), it is

necessary to present expectations regarding the significance of the impact. First of all, measuring the impact will be done in two main ways:

1. Comparison of quantitative data

2. Direct interviewing of team members

Both methods have the common goal of tracking impact and play the role of tools for the combination of the two general research frameworks used: the experiment and the cross-sectional study. My research is an experiment, as it compares quantitative data between an experimental group (members of the project team in which gamification was introduced) and a control group (members of another project team in the past that did not intersect with gamification elements in a professional context), according to an independent variable: gamification in the project. Also, this research has characteristics of a cross-sectional study, with a qualitative approach, because it uses the interview as a research method. These two research methods are the most relevant in achieving the final goal, as they satisfy the need to discover the impact of gamification in projects and provide a broad perspective on the results obtained. The case study provides contextual depth and allows for the exploration of real-life dynamics and team experiences, in line with Yin's (2018) emphasis on the explanatory power of case studies in organizational research. The experimental component facilitates a comparison between an experimental group and a control group, using gamification as the independent variable. According to Bryman (2016), such quasi-experimental designs are particularly effective for measuring the causal impact of interventions in real-world contexts. The choice to combine these strategies is grounded in the literature on gamification research, which recommends methodological triangulation to better capture both behavioral outcomes and subjective experiences (Sailer et al., 2017; Deci et al., 2017).

For the first research method (quantitative data comparison), individual and team productivity and quality metrics will be used to track performance within the gamified project, and will be compared to the same metrics, but from a previous, non-gamified project. This practice combines primary research, which yields new and updated data, with secondary research, which represents the already existing data, needed to observe potential fluctuations in productivity and quality metrics. Data comparison (quantitative research method) was one of the methods chosen for this work because it can directly reflect, through exact numbers, individual and team performance differences in the analyzed projects.

The second way of quantifying the impact will be done by interviewing the team members after the activities have been completed and all milestones in the project have been ticked off. The interview is a common qualitative research method, which offers the possibility of receiving answers directly from the source. For my study, the interview was structured and conducted face-to-face with each team member. All people who were part of the project agreed to be interviewed. The interview was conducted in Romanian, no video/audio was recorded and the answers were recorded in real time. The motivation for choosing this research method is closely related to the data needed to obtain the final results. Since one of the elements analyzed in this study is the overall satisfaction of the project team members, the interview was the optimal choice for collecting relevant information. Using feedback from the people involved is the most direct way to see the impact of gamification on their overall satisfaction.

The next step is to detail the significance of the impact within this study. Answers to the research question may reflect one of the following situations: negative, neutral, or positive impact. Negative impact means the preponderance of interview responses indicating that overall satisfaction has decreased following the implementation of gamification in the project. Neutral impact refers to interview responses tending towards an indifferent attitude when it comes to the impact of gamification on the project. Positive impact will be indicated by interview responses that directly highlight the satisfaction of project team members in the context of interacting with gamification, regardless of productivity and quality outcomes.

The decision to consider the interview responses sufficient for the impact to be positive, neutral or negative, regardless of the quantitative data, is explained by the fact that the direct response of people is much more relevant than the comparison of numbers. For example, if the productivity of the experimental group decreased relative to that of the control group, but the interview responses tend to show increased overall satisfaction, it means that the impact was positive and the performance results may be different due to other uncontrollable causes in my research.

The quantitative data analysis will be carried out per project team, in order to be able to compare the experimental group with the control group. Although the quantitative data on the performance of the analyzed team members do not contribute to the determination of the final impact, their examination provides a new perspective on the performance of a small project team in the context of gamification.

The people who belong to the experimental and control groups were chosen randomly. The projects in the experimental group and the control group have the same number of people: six. As it is not relevant to the study, the demographic characteristics of the members of the two projects will not be mentioned. The control group does not actively participate in the research, as they are team members from a project that ended one month before the initiation of the gamified project. However, the gamified and non-gamified project have similar activities, milestones, and deliverables, and the productivity and quality measurement methods are the same.

The independent variable (cause), which is the object of our study, is gamification. The dependent variable (effect) in the research is the impact on the performance of project team members (by observing productivity and quality metrics). The experimental group will interact with gamification in the activities they will undertake within the project, and the control group's reports on the quantitative data will serve as an element of comparison.

The gamified project that is analyzed during our study has a set of important characteristics:

- It is an internal Amazon project, with the aim of improving a process within the analyzed team;
- The direct beneficiaries of the project are the members of the team that includes those who work within it;
- Financing is own (by the company);
- The methodology used is Agile, and the project is organized through the Kanban system (without iterations);
- The project management software is internal;

- The duration of the project is three months, from 01.02.2024 to 01.05.2024 (dd/mm/yyyy);

- Other tools used for data collection and analysis are Microsoft Excel and Microsoft Word;

- Communication between team members was done verbally or in writing, at the physical headquarters of the Amazon Development Center in Iași or through internal communication channels.

The purpose of the project is achieved through the use of tickets. For reasons of confidentiality, this aspect cannot be detailed, but it can be mentioned that each member will work with these tickets and have various activities to perform. The gamified and non-gamified project have the same purpose and characteristics, apart from the duration and period of the project. Throughout this chapter, reference will be made to the general mode of ticketing and ticketing components, in order to later distinguish the application of gamification elements. The activities in the project correspond to those carried out within the components of the vouchers, and the milestones are represented by the achievement of certain results related to the tickets. Deliverables are both component parts of the tickets and the tickets themselves.

Gamification implementation

In February 2024, I organized an online interview with the regional manager of Southeast Europe from the Staffino company, in order to better understand how they apply gamification in the context of marketing, especially in feedback processes. To improve the interactions between employees and customers, Staffino has introduced a feedback platform, where customers who come into contact with the various operators, sellers or service providers of the companies, can directly share their experience. This can be done through comments and rating stars (from 0 to 5) given to predetermined criteria. These two components are then analyzed automatically by averaging the number of stars received and by examining the sentiment of the texts sent by customers. Based on these, employees receive standard or customized badges, depending on the complexity and nature of the activities performed. Depending on the badges received, employees can receive monetary rewards or have discussions with managers regarding their performance.

After the interview and the review of the literature, I decided to apply the most used and known gamification elements in all fields. They are easy to understand and do not require complex implementation actions. The project manager was informed and agreed to the elements. (Table 3) shows the gamification elements that were applied in the project.

Table 3. The gamification elements introduced in the Amazon team project

Gamification element		Description
Badges	For quantity	Offered weekly based on the number of tickets solved.
	For quality	Awarded weekly based on quality scores from weekly reports.
	For productivity	Offered weekly based on productivity percentages.
	For creativity	Awarded weekly to members who provide the most creative ideas for solving ticket problems.

	For collaboration	Members of two-person teams working together on tickets can award each other personalized collaboration badges (thanks, appreciation, etc.).
Points		Points will be awarded for solving each ticket, and as a tie-breaking method, points will also be awarded for each component of the ticket, depending on the quality parameters.
Leaderboards		Based on the scores previously awarded, visible rankings will be made for each team member. Rankings will be updated daily, and rewards will be given according to the monthly ranking, for the 3rd, 2nd and 1st places.
Teamwork		In some cases, the tickets will be worked by two people simultaneously (two by two). This activity will not count towards scores or rankings. It is introduced only to analyze the interaction between team members.
Customized stickers		Personalized stickers will also be provided when badges are awarded.

(Source: Own elaboration)

Qualitative research method (interview)

Regarding the qualitative research method of this study, the people in the experimental group, who came into contact with gamification in the project they worked on, were interviewed at the end of the project. The interview is structured, consisting of 12 questions (Table 5 and Table 6).

The interview includes questions that refer directly to people's perception of the impact of gamification in the project (1, 2, 4, 5, 6, 9, 10, 11), specific questions related to gamification elements (7 and 8) and questions designed to provide a future perspective on gamification in projects (3 and 12). The last two categories will be called "secondary questions". The question "Do you consider that gamification had a negative, neutral or positive impact on your activities during the project?" is strictly related to the research question of our study.

The analysis of the answers will be done according to the most important questions that contribute to finding out the main answer of the research question. They will be referred to as "main questions", they being directly connected with the team members' perspective on the impact of gamification in the project (1, 2, 4, 5, 6, 9, 10, 11). Depending on the answer given by each person, it will fall into the positive, negative or neutral category.

In this way, the analysis can be organized as a decision tree:

- If the number of answers with a negative tone is higher than the neutral or positive ones, the impact on the person was negative;
- If the number of answers with a positive tone is higher than the neutral or negative ones, the impact on the person was positive;
- If the number of responses with a neutral tone is greater than the positive or negative ones, the impact on the person was neutral.

The interview took place at the Amazon Development Center in Iași, verbally, face to face. Interviewing a person lasted around 15 minutes. All individuals are over 18 years of age and have given their consent to be interviewed.

4. Results/findings

For a better understanding of the data in (Table 4), I provided an explanation on how productivity and quality are measured for this project. The examples are hypothetical, due to the confidentiality of Amazon.

Productivity is related to the number of tickets closed in relation to the time spent on them and is calculated as a percentage. To calculate productivity, it is necessary to present the expectation or benchmark productivity: one ticket solved every two hours. Thus, assuming a work schedule of eight productive hours per day, a team member can close a maximum of four tickets. For example, if in one day, a team member has solved three tickets in eight productive hours, the calculation would be as follows:

Expected number of tickets:

$(\text{Number of hours worked}) / (\text{Number of hours spent per ticket}) = (8 \text{ hours}) / (2 \text{ hours/ticket}) = 4 \text{ tickets}$

Actual productivity:

$(\text{Number of tickets resolved}) / (\text{Expected number of tickets}) \times 100\% = (3 / 4) \times 100\% = 75\%$

Quality in the project refers to the tickets and the components of the tickets. Each of them has a predefined quality standard, with different parameters to be respected by team members. For this project, there are ten quality parameters related to the fairness and hygiene of the tickets and their components. For each parameter a certain score is given or not, whether it has been respected or not.

Just like productivity, quality will be measured using calculation formulas, based on the scores obtained for quality parameters. Below is an example of how quality is calculated:

- Each quality parameter is assigned a score (which can be either 0 or the maximum assigned score);
- Based on the correctness of the work, the corresponding scores will be awarded for each parameter;
- It is assumed that a team member can receive either 0 or 10 points for each ticket parameter. Thus, the total score is 100;
- The percentage quality will be calculated as: $(\text{Score obtained} / \text{Maximum score}) \times 100$

Following the collection of data over the pre-determined ten weeks, the productivity and quality of project team members in the experimental group were compared with those in the control group. Thus, the results are shown in (Table 4).

Table 4. Calculation of the percentage difference between the performance of the experimental and control groups

Per team	Control group		Experimental group		Difference	
	Productivity (%)	Quality (%)	Productivity (%)	Quality (%)	Productivity (%)	Quality (%)
Week 1	108	100	120	100	11.11%	0.00%
Week 2	178	90	145	100	-18.54%	11.11%
Week 3	98	100	79	100	-19.39%	0.00%

Week 4	81	90	140	90	72.84%	0.00%
Week 5	184	70	79	100	-57.07%	42.86%
Week 6	110	100	104	70	-5.45%	-30.00%
Week 7	98	100	78	100	-20.41%	0.00%
Week 8	132	100	109	90	-17.42%	-10.00%
Week 9	94	100	102	100	8.51%	0.00%
Week 10	85	90	104	90	22.35%	0.00%
TOTAL	116	97	99	92	-14.65	-5.15

(Source: Own elaboration)

For the first ten weeks of the two projects, the difference in productivity is -14.65%, that is, it is lower in the case of the gamified project team than the non-gamified project team. Also, the experimental group recorded a 5.15% decrease in quality percentage compared to the control group.

The differences are small and no trend can be seen over the ten weeks. There are no upward-only or downward-only slopes between the two groups, which may indicate that gamification did not have a noticeable impact on the performance of gamified project team members. External influencing factors for which the productivity and quality of the members of the experimental group have a low percentage compared to those of the control group could be: complexity of tickets and ticket components, collaboration between team members, time pressure, or other personal reasons. Moreover, the two analyzed projects had different periods and durations.

For reasons of confidentiality and to preserve anonymity, the six interviewed persons will have the following pseudonyms: person 1, person 2, person 3, person 4, person 5 and person 6. In the first phase, the secondary answers to the interview will be analyzed (3, 7, 8 and 12), to later establish, through the main ones, the final impact.

Table 5. Answers to secondary interview questions

Table of answers to secondary interview questions			
No.	Question	Person	Simplified answer
3	Do you think it would be advisable to introduce gamification in all future projects?	Person 1	Yes
		Person 2	No
		Person 3	Yes
		Person 4	Yes
		Person 5	Yes
		Person 6	Yes
7	What was the gamification element that you enjoyed the most?	Person 1	Badges
		Person 2	Badges from coworkers
		Person 3	Leaderboards

		Person 4	Leaderboards
		Person 5	Stickers
		Person 6	Creativity badges
8	What was the gamification element you didn't like?	Person 1	Leaderboards
		Person 2	Points
		Person 3	Teamwork
		Person 4	-
		Person 5	Leaderboards
		Person 6	-
12	If you wanted to change something about how gamification was integrated, what would you change?	Person 1	Leaderboards not visible to everyone or gamification applied without team members knowing what will be monitored
		Person 2	-
		Person 3	I would like monetary rewards
		Person 4	-
		Person 5	-
		Person 6	Each member to receive rewards, regardless of results

(Source: Own elaboration)

Five out of six people thought that the introduction of gamification in future projects would be indicated. They expressed their opinion about the gamification elements they interacted with and offered possible ways to improve their implementation. Overall, team members were excited about scores, leaderboards, and badges, but there were also people who saw these elements as negative. Following the answers to the secondary questions, it can be seen that half of the people were satisfied with the way of implementing gamification in the project they were part of.

To find the answer to my research question "**Does gamification have a negative, neutral or positive impact on the Amazon project team?**", it is necessary to analyze the answers of the people involved to the main questions. They are listed below, in (Table 6), along with the answer's classification into one of the categories: negative, neutral, positive. Impact will be calculated based on the proportion of categories that the responses fit into, at the team level.

Table 6. Answers to the main interview questions

No.	Question	Person	Simplified answer	State
1	What impact do you think gamification has had on your project activities?	Person 1	I was not interested	Neutral
		Person 2	It didn't particularly impact me	Neutral
		Person 3	Positive and competitive impact	Positive
		Person 4	It gave me a boost to work	Positive
		Person 5	I socialized better, had new perspectives	Positive
		Person 6	Gave me motivation, felt I had a sense of purpose	Positive
2	Did the gamification elements you interacted with motivate you?	Person 1	No, but they didn't demotivate me either	Neutral
		Person 2	No	Negative
		Person 3	Yes	Positive
		Person 4	Yes	Positive
		Person 5	Yes	Positive
		Person 6	Yes	Positive
4	Did you feel that your overall satisfaction improved during the project?	Person 1	Yes	Positive
		Person 2	No, on the contrary	Negative
		Person 3	Yeah, when I got rewards	Positive
		Person 4	Yes	Positive
		Person 5	Yes	Positive
		Person 6	Yes	Positive
5	Do you find the experience in the gamified project more interesting than other non-gamified projects you have been part of?	Person 1	Yes	Positive
		Person 2	Yes, but not for me	Neutral
		Person 3	Yes	Positive
		Person 4	Yes	Positive
		Person 5	Yes	Positive
		Person 6	Yes	Positive
6	Do you feel that the motivation in the gamified project was higher than in the non-gamified	Person 1	Yes	Positive
		Person 2	No	Negative
		Person 3	Yes	Positive

	projects you were part of?	Person 4	Yes	Positive
		Person 5	Yes	Positive
		Person 6	Yes	Positive
9	What negative aspects did you experience during the gamified project?	Person 1	Unfair, unethical behavior	Negative
		Person 2	Extra stress	Negative
		Person 3	I was in the play-off and didn't get a prize because of a very small difference	Negative
		Person 4	I had a hard time adjusting	Negative
		Person 5	I couldn't get on the podium	Negative
		Person 6	I felt in non-stop competition	Negative
10	How would you describe the gamified project experience in one word?	Person 1	New	Neutral
		Person 2	Stressful	Negative
		Person 3	Enthusiasm	Positive
		Person 4	Fun	Positive
		Person 5	Connection	Neutral
		Person 6	Fun	Positive
11	Do you consider that gamification had an overall negative, neutral or positive impact on your activities during the project?	Person 1	Neutral	Neutral
		Person 2	Negative	Negative
		Person 3	Positive	Positive
		Person 4	Positive	Positive
		Person 5	Positive	Positive
		Person 6	Positive	Positive

(Source: Own elaboration)

The six interviewees had in total, on the decisive questions:

- 7 neutral answers;
- 30 positive answers;
- 11 negative responses.

5. Discussions

Considering the responses to the key interview questions, **the impact of gamification on the overall satisfaction of the project team is positive.**

Amazon is a multinational company with many processes and a very high number of employees. The results of our study or future studies may be influenced by the size of the firm or its organizational culture. Also, cultural dimensions, such as power distance, individualism vs. collectivism, or uncertainty avoidance (Duczkowski, Slowik *et al.*, 2024), may be factors that play a significant role in the analysis of quantitative data.

For example, if there is a high degree of distance from power, the level of performance may undergo unfavorable changes as a result of the team members' strained relationship with the authority figure.

The outcomes of teamwork-based activities are influenced by whether individuals involved in the project align more closely with individualistic or collectivistic cultural orientations. Our study incorporates gamification elements covering both aspects of collaboration and individual competition. The lack of clear visibility on the degree of individualism or collectivism of the project team may lead to the use of inappropriate gamification elements, which may alter the validity of the recorded results.

Regarding the avoidance of uncertainty, a high degree of this cultural dimension may create a reluctance to implement gamification, as it is not a concept often addressed in project management.

After analyzing the relationship between quantitative data (productivity and quality of team members' tickets) and qualitative data (their answers to the main interview questions), it can be said that the performance and overall satisfaction of team members were not influenced in the same way by gamification. For most individuals, productivity and quality had no obvious increases or decreases to indicate that gamification had had an impact on them.

Research limitations

Although my study achieved its ultimate aims and objectives, it was not without its limitations. These will be listed in the present sub-chapter to point out possible reasons that led to vague results in terms of the performance of the gamified project team members.

Firstly, the project team that interacted with the gamification elements consisted of six people. It is possible that the small number of people is an impediment for this type of study. Also, the control group consisted of people who were members of a project team run before the gamified one, which included people from the experimental group. These were mainly due to the lack of human resources available to participate in the study.

Secondly, the gamified project lasted three months, while the non-gamified project lasted only two months. The projects' lifetime was limited, since projects are usually carried out on a much longer period of time. This implies that the amount of data to draw a conclusion regarding the performance of the project team might not be sufficient.

Furthermore, due to lack of financial resources for the study, the gamification elements introduced in the project were rudimentary and the reward plan was carried out by one person.

Being a large company and different people, it cannot be said that the results of the study are entirely based on gamification as a single influencing factor. Elements such as people's general satisfaction in the company, their personalities and other personal reasons are also important to consider.

6. Conclusions

My research contributes, through the results obtained, to the expansion of knowledge about gamification applied to project management. According to the conclusions outlined at the end of the study, gamification elements had a positive impact on the overall satisfaction of project members in Amazon. From a performance perspective, it cannot be conclusively determined whether gamification had a positive or negative effect on the productivity and/or quality of the participants' work. The differences between the experimental and control groups are minimal, and no consistent trend is observed over the ten-week period. There are no sustained upward or downward trajectories in either group, suggesting that gamification did not produce a noticeable impact on the performance of the gamified team members. This ambiguity may be attributed to several outside variables, such as the varying complexity of tickets and their components, time pressure, or individual circumstances.

In the event of a future approach to this topic, it is recommended to thoroughly review the literature, but also to analyze beforehand all the factors that may influence the dependent variables under study, except gamification. This eliminates the possibility of reducing the validity of the research by creating an environment conducive to obtaining relevant, unbiased results.

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