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# LEAN GAMIFICATION AS A LEVERAGE FOR INNOVATIVE ORGANIZATIONS

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**Purpose:** The paper aims at investigating the issue of low engagement and innovativeness within organizations. It introduces the lean gamification concept and investigates its impact on innovativeness and employees engagement.
**Design/methodology/approach**: In order to achieve the research objectives a literature review is conducted followed by a case study of real life implementation of lean gamification.
**Findings:** Lean gamification can be an effective method of increasing innovativeness within organizations. A successful application of this concept can be achieved by following the POMPA model (Problem, Offtakers, Mechanics, Pilot, Adjustments).
**Research limitations/implications**: In order to confirm presented findings it is recommended to conduct bigger number of case studies of lean gamification application.
**Practical implications:** The research has a big impact on business by introducing a new concept, which can be leveraged to increase employees engagement and innovativeness within organizations.
**Originality/value:** The paper expands the theoretical knowledge in terms of social sciences by combining two popular concepts – lean management and gamification, consequently creating a new concept of lean gamification. The article introduces also a standardized method of the lean gamification application through the POMPA model.
**Keywords:** lean management, gamification, innovation, continuous improvement.
**Category of the paper:** Research paper.

## 1. Introduction

Game elements accompany us today in almost every aspect of life. They are so widespread and embedded in our everyday reality that we often fail to notice them, treating them as a natural part of the environment in which we function. When we go shopping, we collect points for our purchases, we receive badges and rewards for our physical activities, even in an area that might seem inherently serious-personal finance-we are encouraged to achieve our savings goals by game-typical progress bars and rankings.

The concept of using game elements in a context unrelated to games is called gamification, and is one of the fastest-growing management trends of the twenty-first century. Its popularity is hardly surprising. Companies use it to strengthen customer engagement, increasing loyalty and attachment to the brand. Thus far, it's the end users of goods and services that have been primary recipients of gamification solutions.

What, however, about applying game-like elements inside, rather than outside, the organization? Can gamification be equally effective in building corporate innovativeness by enhancing employees' capacity to generate new and creative solutions? Numerous studies indicate that it may be the case.

According to a survey conducted by the TalentLMS portal in 2019, 89% of American employees stated, that gamification makes them feel more productive, while 87% reported that they are more engaged in their tasks when game elements are applied. Additionally, 88% of respondents confirmed that using gamification simply makes them feel happier at work.

In traditional business environments, we have long been accustomed to a clear separation between entertainment and professional duties. Yet everything suggests that, along with generational changes in the labor market, the habits and practices prevailing in the office or on the shop floor will also evolve. Referring to data from the United States-which may be representative for most developed countries – 70% of people under the age of 18 play video games regularly and as many as 74% of teachers use digital game elements in their classroom practice. Today's youth are therefore accustomed to gamification being incorporated into their daily activities and there is a high likelihood that this habit will carry over into their adult working lives.

Given clear market trends and proven effectiveness of gamification, a wider spread of game elements in organizational management is only a matter of time. It is reinforced by the fact that gamification helps addressing one of the biggest challenges, which contemporary enterprises are facing -low employee engagement. Referring now to data from the Polish market, according to a 2022 study by ARC Rynek i Opinia, as many as 40% of individuals aged 18-24 and 44% of those aged 24–34, feel bored with their current tasks at work. Low motivation for proactive behaviors is also evident; for example, only 29.2% of employees reported submitting improvement suggestions in 2021 studies.

Companies dealing with the above-mentioned problems often lack an appropriate "toolbox" to address them effectively. Many members of managerial staff-despite sincere intentions-do not know how to encourage their employees to be proactive, innovative, or engaged in the innovation and improvements of their processes.

An answer to such challenges can be found in a new idea called lean gamification, which combines two leading contemporary management concepts: the gamification and lean management-a philosophy derived from the Toyota Production System that strives to maximize value added for the customer while simultaneously minimizing waste in processes.

Their synthesis-lean gamification-is a concept which is using game techniques and elements to support the application of lean management principles and to build a culture of continuous improvement and innovation within organizations.

The purpose of this article is to characterize the concept of lean gamification and to present possibilities for its use in the context of building innovativeness in organizations. To achieve this objective, the paper is structured in three parts. The first presents the origins of gamification and its theoretical foundations, drawing on the evolution of psychology and motivation science. The second characterizes the concept of lean gamification together with a description of the POMPA model, which indicates a sequenced pathway for implementing gamified solutions. Finally, the third part presents a case study of using lean gamification in a project to implement an employee suggestion system, thereby increasing an organization's ability to identify and implement innovations rapidly and to respond to changes in a dynamic business environment.

## 2. Gamification

Games have accompanied humanity since the dawn of history. From an anthropological perspective, they have been not only forms of entertainment but also important components of culture and community, exerting a profound influence on human development and social structures. They have also provided a space for learning the principles of cooperation, competition, and social hierarchy. Beginning with unstructured play within small, isolated hunter-gatherer groups, the practices gradually acquired more defined rules and standards with the Neolithic revolution, slowly resembling the games familiar to us today.

Despite the extensive history and significance of games in human affairs, their use for many years was largely confined to social and recreational aspects. The forms of play naturally differed across social classes and age groups; however, regardless of the form, games most commonly occurred in the context of leisure and fun. This state of affairs was changed only by the Industrial Revolution and the accompanying development of theories in psychology and motivation. Recognition of potential of games within the behavioral sciences was not immediate, as the earliest leading concepts in this field prioritized external motivators over the internal factors, which are typical to games. This applies primarily to two theories: Maslow's Hierarchy of Needs and, as part of Taylorism, the so-called "carrot-and-stick" method.

Despite initial domination of theories emphasizing external motivators, interest in other engagement factors, not necessarily related to rewards or punishment, grew within the scientific community over time.

The first breakthrough in this area was the research conducted by the American professor at the University of Wisconsin, Harry F. Harlow. In 1949, he launched an experiment on a group of eight monkeys concerning knowledge acquisition and learning. He used a simple

puzzle-like toy placed in the animals' cage. To the researchers' surprise, the animals immediately began to engage with the object with visible enthusiasm and joy, achieving very good solution times-all without any rewards. Such behavior contradicted the prevailing theories of primate motivation (including humans), which emphasized only two determinants: biological drives and external motivators (rewards and punishments). Based on his findings, Harlow identified a third factor, which he called intrinsic motivation, grounded in the joy of performing the task itself. Interestingly, when the researchers repeated the study, this time rewarding the monkeys for correctly solving the puzzle, the animals became more distracted and made more errors (Kopertyńska, 2009).

Similar conclusions were reached in 1969 by Edward Deci, who, seeking inspiration for his doctoral work, replicated Harlow's experiment-this time with humans. His findings indicated that external incentives, such as monetary or material rewards, motivate only in a short and limited scope and, when used over longer periods, may even lead to a decline in engagement. Continued research in this area led Deci, together with his former student Richard Ryan, to develop in 1985 the self-determination theory (SDT), which became one of the foundations of modern concepts of motivation. Their theory posits that people are most motivated and engaged when their actions satisfy three basic psychological needs: competence, autonomy, and relatedness. SDT suggests that intrinsic motivation is stronger and more enduring than extrinsic motivation; people perform most effectively when they feel in control of their actions, are competent in carrying them out, and have a sense of social belonging (Kopertyńska, 2009).

The final conclusion of the shift in motivation science from external to internal factors is Daniel Pink's concept of the Motivation 3.0. Presented in his 2009 book Drive: The Surprising Truth About What Motivates Us, this concept argues that traditional motivational methods (Motivation 2.0), such as rewards and punishments, are ineffective for tasks requiring creative thinking and problem-solving. Similar to Deci and Ryan, Pink identifies three fundamental elements that motivate people in the modern world: autonomy, mastery, and purpose. The theory suggests that providing people with greater control over their work, opportunities to develop skills, and participation in activities serving a higher purpose can lead to much better motivation and performance.

The above-described evolution of theories in psychology and motivation indicates a gradual decline in the significance of external motivational stimuli based on the traditional "carrot-and-stick" principle. In their place, internal drivers have become key-those based on setting well-designed goals, ensuring conditions conducive to collaboration, and enabling individual decision-making and independence. This evolution led researchers and management practitioners to recognize the potential of using game elements as a method of engaging both employees and the recipients of the products and services they create.

The earliest attempts to use simplified gamified solutions occurred in the 1970s and 1980s in the form of numerous loyalty programs, marketing campaigns, as well as training simulations and games. One of the pioneers in employing game elements is considered to be American

Airlines, which in 1981, as the first airline, launched its own loyalty program, AAdvantage, allowing passengers to collect points for miles flown (Christians, 2018). The effectiveness of such programs-leading to the attainment of increasingly prestigious tiers and privileges with accumulated distance.

Despite the gradually growing popularity of game elements in business contexts, the term "gamification" gained prominence only at the beginning of the twenty-first century. One of the originators is considered to be game designer Nick Pelling, who coined and popularized the English word gamification while developing game-based interfaces for ATMs and beverage machines (Kapp, 2012).

As a formal concept, gamification began to be widely discussed and examined in academic circles toward the end of the first decade of the twenty-first century. In 2008, Deterding, Dixon, Khaled, and Nacke published an article containing a definition of gamification, and a year later Byron Reeves and J. Leighton Read released the book Total Engagement: Using Games and Virtual Worlds to Change the Way People Work and Businesses Compete, in which they elaborated the concept. However, it was Daniel H. Pink's aforementioned 2009 book Drive: The Surprising Truth About What Motivates Us that garnered greater attention from the scientific and business communities by linking gamification with Motivation 3.0.

Over the years, gamification has gained popularity as a business, educational, and social tool. Today, more and more companies employ game elements both with respect to their customers-embedding them in offered products and services-and to influence the motivation and engagement of their employees (Czerska, 2017).

The most common areas of application currently include (Werbach, Hunter, 2012):

- Marketing – brands and companies use gamification in advertising campaigns and loyalty programs. Elements such as contests, challenges, and points increase customer engagement and build stronger relationships with the brand.
- Innovation and product development – programs and applications incorporating games that encourage collaboration, innovativeness, team-based problem solving, and idea generation.
- Social behaviors – in some cities, gamification is used to promote pro-environmental behaviors, such as waste separation or the use of public transport, through point systems and rewards.
- Social networks – platforms use gamification to increase user activity, e.g., by introducing voting functions, activity badges, or ranking systems.
- Education and training – game-characteristic elements such as scoring, challenges, or difficulty levels are increasingly used in schools and training institutions. As a result, students and employees are more motivated to achieve educational goals, and materials become more accessible and engaging.

What, then, is gamification in essence? Being a relatively new idea in both business and academia, there is currently no single binding definition. Nevertheless, across existing descriptions, a set of common elements can be observed that point to three fundamental characteristics of gamification (Deterding et al., 2011):

- the use game-like elements and mechanisms,
- operation in a context not related to games,
- the pursuit of increased user motivation and engagement.

For an initiative to qualify as gamification in its full sense, all three of the above elements must be present. This is particularly important because, with rising popularity, the use of the term has become visibly "elastic". Many companies or individuals familiar with gamification only superficially, label as such any program, training, or product with even a semblance of rankings, points, or levels. This is not a proper approach, since, as noted above, merely introducing game elements represents only one of the three essential characteristics of the concept.

A similar distinction is employed by Brian Burke in his book Gamify: How Gamification Motivates People to Do Extraordinary Things. He indicates a division in the use of game elements depending on the objective we wish to achieve (Figure 1). In doing so, the author emphasizes that the primary aim of gamification is not fun, but building of sustained emotional engagement among participants.

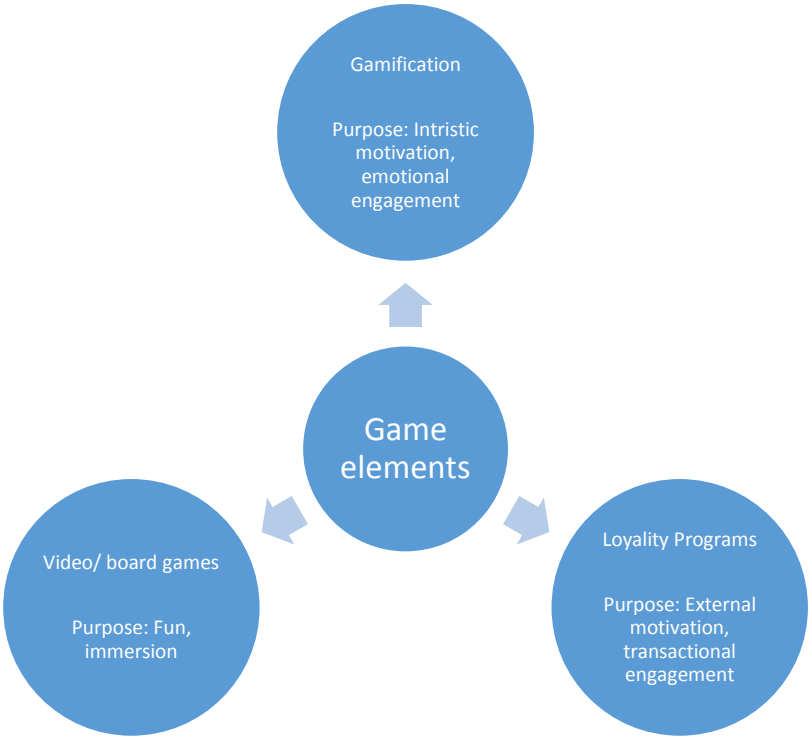


**Figure 1.** Application of game elements.

Source: (Burke, 2014).

To sum up, gamification can be defined as application of game elements in a non-game context to create a sustainable motivation and engagement among target audience. It accomplishes this by stimulating individuals' intrinsic motivators, creating conditions that confer purpose, support collaboration, and strengthen participants' decision-making and autonomy. The detailed elements and mechanics of gamification used in the context of process improvement and innovation are described in the second part of the article, which concerns the concept of lean gamification.

## 3. Lean Gamification

Getting to know the origins, theoretical foundations and benefits of gamification, it is worth asking how this concept can be used to increase innovativeness and operational performance of companies.

Lean management can be of assistance here. This management philosophy, derived from the Toyota Production System, places respect for people at the forefront while simultaneously aiming to achieve operational excellence in terms of cost, quality, and lead time for products or services. With the success of Toyota and many other enterprises applying its principles, lean management has become a leading paradigm for managing organizations of all kinds - from industry, through services, to the public sector.

Popularity, however, does not always translate into the effective and correct application of its principles. Many companies that consider themselves "lean" in practice implement lean management in a tool-centric manner, limiting themselves to isolated improvements while neglecting the "soft" aspects related to employee development, empowerment, and engagement. As a result, improvement initiatives are often executed in a top-down, coercive fashion, yielding only short-term business benefits. This is precisely why the foundation of an effective application of lean management is building a durable culture of innovativeness, based on the engagement and motivation of the workforce.

Achieving this objective is not straightforward. One reason is that the traditional lean "toolbox" does not contain ready-made solutions that rapidly increase employee motivation. Engagement is presented rather as a goal and a prerequisite, whereas attaining it is left to the organization itself.

This is where gamification comes in to play. To understand its role in fostering innovativeness in the spirit of lean management, an analogy is helpful. "Lean organizations" often use different dedicated tools and methods to solve specific problems: for poorly designed workplace they deploy 5S; for long changeover times - SMED; and for high machine failure rates - TPM. Similarly, when seeking to solve the problem of low motivation and proactivity among employees, the organization should reach for an appropriate tool - gamification.

Embedding game mechanisms and elements into existing organizational programs and processes creates conditions to enhance autonomy, strengthen purpose, and simply make work more enjoyable. Hence, gamification should be part of the "toolbox" of every organization working in the lean spirit (Feijóo, Hernantes, 2017).

In this part of the article, I present how the two concepts referenced above - lean management and gamification - can complement and reinforce each other. Their combination, referred to as lean gamification, can be defined as the use of game techniques and elements to strengthen a culture of continuous improvement and innovative behavior.

In line with the trends in motivation science and the needs of today's labor market, the concept of lean gamification enriches the traditional set of managerial methods and techniques by addressing soft organizational problems, including low innovativeness or weak employee motivation. By weaving game mechanisms and elements into existing programs and processes, it creates conditions that elevate autonomy, sharpen purpose, and increase enjoyment at work.

Although the term lean gamification is not yet widely used in business and academic nomenclature, certain solutions that fall under this concept have been successfully employed by enterprises in Poland and around the world for many years. This pertains primarily to educational games and simulations that introduce participants to the theoretical aspects of lean management. Today, virtually every major company offering lean training has at least one product that explains its key principles or tools through gameplay. We refer to this area of lean gamification as the simulation environment.

An important niche in the application of lean gamification, however, is the real environment, which concerns the use of game elements for actual problems and processes carried out in the enterprise (Figure 2). In this case, the aim is not to facilitate knowledge acquisition for the user but to drive concrete behavioral change and obtain tangible results. It is precisely this second area which constitutes the scope of this article.

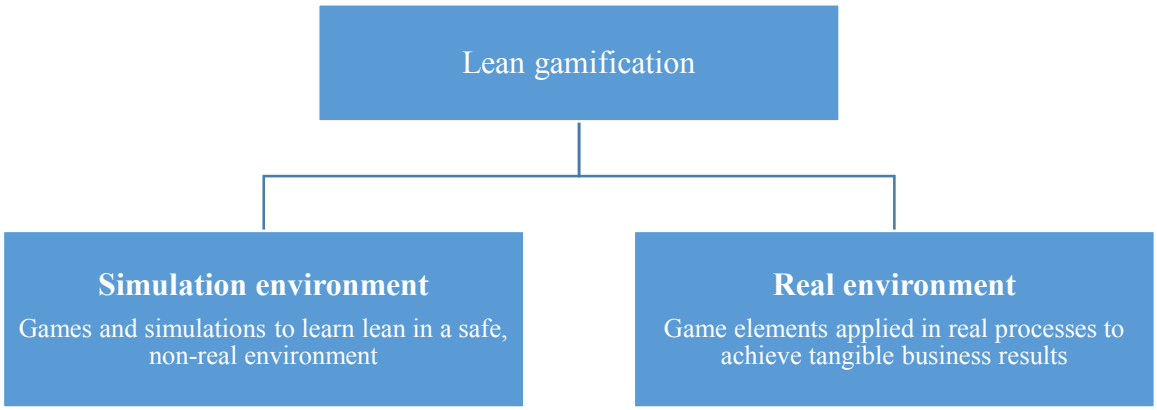


**Figure 2.** Areas of lean gamification application.

Source: Author's own work.

The pathway leading to the effective application of lean gamification in real organizational environment is presented by the POMPA model. It provides a support to go through each of the lean gamification implementation steps: from problem definition, through game design and pilot deployment, to gathering feedback for further improvement.

The POMPA model (Figure 3) consists of five steps that should be executed sequentially:

- Problem – unambiguous definition of the problem and the business objective.
- Offtakers – identification of the target users of the lean gamification solution and their key needs, based on Bartle's taxonomy of player types (Bartle, 1996).
- Mechanics – design of the lean gamification concept, comprising elements of emotion, narrative, and rules.
- Pilot – pilot implementation of the lean gamification prototype.
- Adjustments – drawing conclusions from the pilot and improving the lean gamification solution.

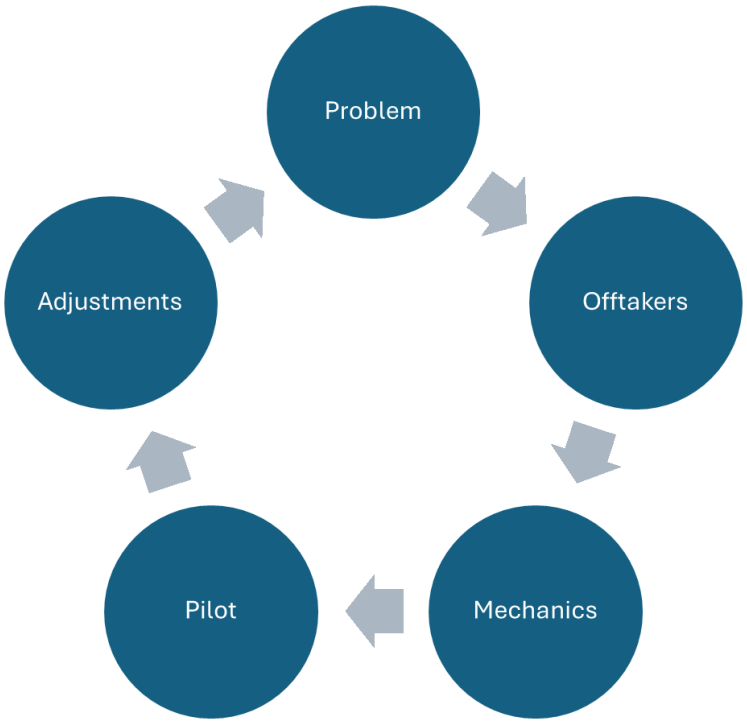


**Figure 3.** The POMPA Model.

Source: Author's own work.

The next part of the article presents a case study of using the POMPA model in a real business project aimed at increasing organizational innovativeness and engagement.

## 4. Case study

A branch of a global aerospace company was struggling with low motivation and innovativeness of employees. The enterprise had no formal engagement system and the management team aimed at building a new, creative solution, which could encourage the employees to improve their work. The company primarily targeted small, bottom-up innovations which could be quickly implemented by employees, but also expected tangible financial benefits from these efforts. An important target was also to build ownership among the workforce and to empower them as the decision-makers.

The first step, following the POMPA model, was to define problem and specific goals connected to desired effectiveness of the designed solution. The success metrics were defined as followed:

- Employee engagement level – measured as the percentage of employees submitting at least one improvement idea in a given calendar year; the target was ≥ 50%.
- Product and non-product savings – measured as annual savings resulting from reduced material consumption or avoided purchasing costs; the target was ≥ USD 50,000.

The intended audience (Offtakers) for the lean gamification solution comprised all non-managerial employees of the branch - approximately 100 people, mostly aged 25-40, though some were significantly older. To better detect the needs of future users, a randomly selected group of employees was surveyed to identify dominant player types based on the Bartle's Taxonomy. The analysis indicated a predominance of Socializers (38%) and Achievers (30%), with a meaningful representation of Explorers (20%). This information was used in the subsequent stage of designing the game mechanics to ensure application of emotionally engaging solutions aligned with employees preferences.

To achieve the intended goals and address the organizational challenges described above, the company decided to design an employee suggestion system. It took a shape of a board game. The premise was simple: employees submit and implement successive innovations, consequently earning points and moving along the board, winning various prizes.

The game was called sCORE - alluding both to "scoring" points and to the company's operational system named CORE (Customer Oriented Results and Excellence). To give the project an industry context, the board was designed with aeronautical motifs with scoring fields represented by the company's various overseas units.

Within the game, employees could submit improvements in four categories:

- Excellence – elimination of process waste, productivity gains, cost reduction, and shortening of operation times.
- Quality – reduction of the cost of poor quality, lowering defect rates, improving inspection effectiveness or error-proofing solutions.

- Safety – improving workplace ergonomics and identification of potential hazards.
- Culture – a peer-to-peer recognition token that one employee could grant another for behavior consistent with company values.

To promote cross-functional collaboration, participants could work on specific ideas in teams of up to three people. A crucial aspect was maintaining high autonomy, where it was up to players to decide with whom they would collaborate and which innovations they would implement. In addition, the typical pre-implementation idea evaluation step, present in many suggestion systems, was removed. In the designed game, teams obtained approval directly from area owners, securing the budget and time necessary for its application. Consequently, the program significantly reduced unnecessary administrative work.

Designing the game mechanics, the team defined submission criteria, which followed the same logic of simplicity. With a use of a basic one-pager, the implemented idea was documented and then forwarded to each category coordinator (usually the manager of the relevant function), who analyzed it and assigned a score from one to three. Based on this assessment, the employee(s) moved along the board by the corresponding number of fields. The farther they progressed, the more attractive rewards they received. Importantly, the rewards were not exclusively material; they also included opportunities such as participation in a training course, spending a day in a chosen department, receiving a parking space or organizing a team integration.

To add a competitive element, the end of the game was defined at the moment when the first person reached the 30th (final) field. In addition to the overall winners, category leaders-those who accumulated the most points in Excellence, Safety, Quality, or Culture-were recognized after the game. To involve managers, who according to the rules could not submit improvements themselves, there was also a special reward for team lead with highest number of total points.

After designing of the lean gamification mechanics, the pilot was carried out. It was scoped with a smaller group of people covering a limited area of the company. The purpose of such scoping was to obtain rapid feedback on whether the lean gamification solution would be attractive to employees and whether it would effectively engage them in improvements and innovation generation. The organization also expected first measurable financial benefits from the implemented ideas. These goals were defined with the following pilot hypotheses:

- At least 50% of employees will engage in improvement activities by participating in at least one implementation.
- Improvements will contribute to ≥ USD 5,000 in product cost savings.
- Improvements will contribute to ≥ USD 5,000 in non-product cost savings.

The company anticipated that the first, pilot edition would last about three months. In reality, the game generated such strong interest that it concluded in just under two months. The numerical summary of the first edition was as follows:

- 126 implemented improvements,
- 69% of employees engaged in at least one implementation,
- USD 14,000 in annualized product cost savings,
- USD 3,000 in annualized non-product cost savings.

Beyond the measurable effects reflected in the defined success metrics, the game also brought significant changes in employee behavior and mindset: people began to attach great importance to identifying waste and carrying out improvement actions. During the game, sCORE became a frequent topic of conversation in the canteen and corridors. Employees planned tactics, discussed new ideas and actively sought collaborators to help bring them to fruition. Many of the submitted improvements resulted from collaboration between production departments and support functions, which significantly improved internal communication. This also helped to gradually break down the invisible barrier that often separates "white-collar" and "blue-collar" staff.

After the pilot edition, management and a selected group of employees organized a retrospective session to summarize and further update the game mechanics. Despite the game's overall success, several areas for improvement were identified. Firstly, employees pointed to a lack of transparency in the scoring of submitted improvements, which led to accusations of biased game coordinators. Secondly, some rewards proved difficult to deliver and sometimes required long waiting times, which significantly reduced their attractiveness. Thirdly, management noted that the vast majority of improvements concerned small, local changes, which did not translate into substantial savings. While not inherently negative, it was emphasized that the next edition should place greater emphasis on recognizing ideas that yield bigger financial benefits.

Based on the feedback, the coordination team proposed appropriate changes to the mechanics. These included creating an assessment committee to increase transparency and objectivity in scoring of improvements; introducing additional benefits and rewards for improvements that deliver measurable savings; and finally, adding mechanisms to introduce greater randomness and elements of surprise to further enhance the emotional engagement among players.

## 5. Conclusions

In order to react to ever-changing market conditions, growing complexity and increased customer requirements, motivated and capable staff is a key ingredient to sustain organizational innovativeness and consequently profitability. However, with ongoing technological, social and demographic trends, the well-established managerial solutions are increasingly often proving to be outdated and ineffective, forcing to experiment with new and creative ways of engaging

its employees. The lean gamification concept, which was described in this article, can be considered as one of the solutions to keep up with recent trends and answer the above-mentioned challenges.

By leveraging the strengths of both lean management and gamification, lean gamification constitutes an important tool for supporting the development of innovativeness in enterprises. Firstly, it supports creation of environment conducive to experimentation through simulations and enables testing of solutions under conditions of limited risk. This consequently leads to acceleration of organizational learning - a key capability necessary for generating innovation. Secondly, gamification mechanisms strengthen employees' intrinsic motivation, engagement in processes improvement and the search for new breakthrough ideas. In this way, lean gamification supports process transparency, facilitates knowledge sharing and promotes cross-team collaboration, shaping an organizational culture toward creativity and continuous improvement.

The lean gamification implementation should follow the standardized POMPA model, which starts with proper problem and users definition, continues with design of the game mechanics and concludes with a low-cost pilot to achieve quick feedback. This sequenced approach ensures a comprehensive diagnoses and custom-made deployment of a solution, addressing specific organizational challenges.

As a relatively new concept, it is recommended to continue more in-depth research on the lean gamification. The case study, which was described in this article, was limited to a production environment with a core purpose of increasing employees motivation and innovativeness. It is advisable to extend the scope of future researches to other business environments (e.g. service, administration) and different aspects of organizational processes. Additionally, there is a clear business and academic need to investigate which game mechanics are most suitable for lean organizations as the answers to this topic remain still uncovered.

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