# Gamification as an Innovative Idea within Human Resources Management

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**Abstract.** The purpose of the article is to present gamification as an innovative instrument used in Human Resources Management (HRM). Gamification fits into the concept of the Industrial Revolution 4.0 (also referred to as the Cyber Revolution). Due to a lack of statistics on the use of gamification in HRM, the article presents the character of the analyzed concept, the areas where gamification is used and underlines directions for further research. The paper is based on subject literature studies in combination with scientific reflection. The paper discusses both global changes and the nature of Polish HRM.

**Keywords:** Modern Technologies, Gamification, Human Resources Management

## 1    Introduction

Managing people (human resources management, HRM) can be considered the key management area. Individuals and groups have the most influence on achieving goals thanks to their competences (knowledge and skills) and motivation. HRM includes actions which are focused on recruiting and retaining valuable employees. In the literature we can find many different definitions and scopes of HRM. It is generally assumed that a set of actions or areas of HRM consist of recruiting and selecting (R&S), onboarding, training, evaluating, rewarding and HR flow (including career management). Approaching HRM from a broader perspective such topics as working conditions (including health and safety) and the formation of organizational culture are considered. The term which consolidates many of the above-mentioned actions is motivating people.

Nowadays, job market is very turbulent, which is a challenge for employers. In order to find and maintain high-quality human potential a company has to adjust to the needs and expectations of potential and existing employees. In the current job market two generations of employees dominate (Generations X and Y). The latter generation (as well as the next one who are now still "cutting their teeth") is called the companies' future. A Gallup study shows that they are the least engaged generation, with only 28.9% engaged, as compared to 32.9% for Generation X [20]. In the literature many

characteristics of Generation Y are presented. It is said that Millennials commit themselves to activities which provide them with personal fulfilment and that they desire to shape their own development. Moreover, they believe they are a part of "global village" thanks to unlimited Internet access. People from Generation Y are fluent in modern technologies. There is also the following generation – known as WWW or C – who actively influence the content of commonly accessed Internet sites. Members of the last two generations have spent much time in front of a computer working, learning, socializing, shopping and having fun. Entertainment as well as education is delivered through playing computer games.

J. Huizing defines a game as a voluntary activity which we consciously treat as less serious than everyday life, but which at the same time completely engrosses the player. This activity is not associated with material gains. A game is played in its own space, place and time, according to established rules and in a set order [33]. Some people believe that games have always existed, "from the first Olympics in ancient Greece through "The Biggest Loser" television show to the latest Xbox offering" [30]. But the first computer games appeared in the 1940s [38]. Modern solutions are more and more technologically advanced and interactive and computer graphics are 100% realistic. The old and new games have one trait in common: the computer game players display their determination, persistence and engagement. It was assumed that the players' drive could be transferred to the real world and utilized in finding solutions to real problems – in the workplace as well. In this way gamification is becoming a new trend in management and marketing [28]. It uses game mechanics to modify people's behavior – including employees.

Gamification fits into the concept of the Industrial Revolution 4.0 (also referred to as the Cyber Revolution). The use of new technologies exerts an impact on people's attitudes and HRM processes (for more see [26]). There are some concepts matching HRM with this Industrial Revolution, e.g., the concept of e-HRM and HRM 4.0. E-HRM is defined as "the way of implementing HR strategies, policies and practices in organizations through a conscious and directed support of and/or with the full use of web-technology-based channels" [31]. In turn, adding the number "4.0" to the term of HRM means the digitalization of all HR processes [35]. We can call gamification the newest innovative instrument of HRM and, in the same way, create a concept of gamified HRM.

The purpose of this paper is to present the idea of gamification in the context of HRM. The problem was discussed in more detail by means of answering the following research questions:

- What is the character of gamification? How does it work?
- In which areas of HRM is gamification used?
- What are the directions for research in the topic of gamification in HRM?

In order to provide answers to the above research questions literature studies were conducted in combination with scientific reflection. Due to a lack of statistics on the use of gamification in HRM, the article will present some examples of gamification which we can find in the academic literature and on websites dedicated to HRM and

technology issues. The paper discusses both global changes and the nature of Polish HRM. The paper also indicates directions for empirical research in the area of gamification. That is why it can be treated as a pilot paper for future research.

## 2 Methodology

The main research method which was used for the purpose of this article is literature studies. The author used a stand-alone review in order to provide an overview and synthesis. A review of subject literature was carried out by analyzing the Web of Science database. The keyword "gamification" in combination with "HRM" was used. Then the author read all the articles in order to check whether they really focus on a topic similar to the one presented in this article. The focus was put on academic papers (in Polish and English) that have been published in the last seven years (2011-2018). The results of the database search are presented below.

**Table 1.** Publications about gamification indexed in Web of Science in the last eight years.

| Year of publication | | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|
| Number of publications (conference proceedings and articles) indexed in Web of science | Results for the keyword "gamification" in the topic | 5 | 35 | 100 | 239 |
| | Results for the keyword "gamification" in the title | 2 | 17 | 45 | 119 |
| | Results for the keywords "gamification" and "HRM" in the topic | 0 | 0 | 0 | 0 |
| Year of publication | | 2015 | 2016 | 2017 | 2018 |
| Number of publications (conference proceedings and articles) indexed in Web of science | Results for the keyword "gamification" in the topic | 493 | 718 | 662 | 259 |
| | Results for the keyword "gamification" in the title | 200 | 315 | 265 | 99 |
| | Results for the keywords "gamification" and "HRM" in the topic | 0 | 0 | 1 | 0 |

The main conclusion after the database analysis is that gamification in HRM does not represent a highly popular topic in the high impact factor academic journals. That is why the authors decided to use also the Google search engine in order to find more information about the utilization of gamification in HRM. The conducted study shows mainly different case studies. None of the articles pertain to quantitative research in the area of gamification used in HRM.

# 3 Results of Literature Studies on Gamification in HRM

## 3.1 General Characteristics of Gamification

The term *"gamification"* was "coined in 2002 by the British consultant N. Pelling, as a "deliberately ugly word" to describe the application of a game-like accelerated user interface design in order to make electronic transactions both enjoyable and fast [3]. Nowadays, gamification is defined as utilization of game mechanics in order to increase the participants' engagement. Gamification is also described as the "intersection of psychology and technology" [6]. Entertainment, clear rules, game design and challenges are connected with the use of games for achieving real world aims, not only for fun. In business it refers to implementing games in different organizational areas. This is possible thanks to combining business thinking with creativity and programmers' tools [22].

As mentioned above, gamification is utilizing game elements (mechanics) and the rules of game design in order to solve problems, which are not actually games. In publications about gamification the concept of a "serious game" can be found. This concept "is more tightly concerned with the use of games to achieve serious outcomes" [40]. Gamification is not necessarily based on serious games.

The basic elements of game mechanics connected with game dynamics are as follows [41]:

- scores which are a kind of prize for making progress and completing tasks with feedback, which enable the immediate reaction of other players. In order to make a game more attractive these scores can be given an original name, based on the name of the company, its products, game topic, etc.
- levels which mark the status of the player and show the player's position in rankings,
- scoreboards,
- trophies,
- challenges.

The phenomenon of gamification depends on providing players with positive emotions connected with what is known as state of flow. This state is when people are so involved in an activity that nothing else matters. The experience itself is so enjoyable that people will do it even at great costs, for the sheer sake of doing it [4].

In order for gamification to be beneficial, an organization should define the business outcome and success metrics. The second step is to define the target audience. The third step is to define the player goals. The fourth step is to determine the player engagement model. The fifth step is to structure the experience. Finally, the organization should be able to read the data obtained through gamification [3]. Moreover, the following factors are important [18,33]:

- clearly defined goals and conditions for winning,
- fair rules for all players,
- plot twists, adventures and challenges,
- voluntary participation,

- a way to communicate within the game.

Computer game mechanics have started to be used by many global organizations. The development of gamification is visible in different business areas, e. g rewarding clients for loyalty and encouraging them to design new products. Interest in this concept is growing more and more, not only in marketing, but also in human resources management [19].

While analyzing the definition of gamification one gets the impression that it is nothing revolutionary or innovative. That is why one may wonder why game elements were not implemented before in different areas of everyday life. The answer is simple – humanity did not have enough technology at their disposal or the use of technology was too expensive. Once Internet access, smartphones and tablets became widespread, interest in gamification started to increase.

According to a report by Gartner, by the end of 2020 70% of medium and large enterprises will have implemented at least one application based on gamification [10].The global gamification market is grown rapidly. In 2013 the value of this market was 50M dollars, and the predicted value according to M2 Research will be as much as 5.5B dollars in 2018. This equates to elevenfold increase within five years [5]. In turn, the experts from Markets & Markets predict that by 2020 this market will reach the value of 11B dollars [16]. Figure 1 presents a Google trend graph to see how the interest in gamification has grown since 2008. The interest in gamification issues is also noticeable in academic papers (see Tab. 1).
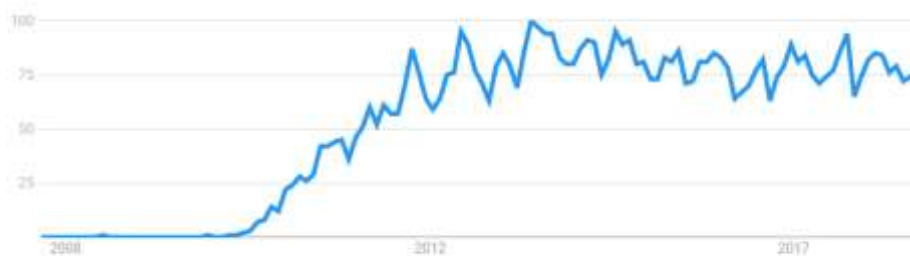


**Fig. 1.** Interest in gamification over time according to Google.

In Poland, the high cost of Internet access and mobile devices is a reason why gamification is not as popular as in Western countries [13]. One more factor which was mentioned in the introduction is societal changes. A thesis can be formulated that as a result of the socialist system that was in place during the '80s, societal changes occur more slowly in Poland than in the West.

Taking into account the above considerations one can ask whether gamification has a place only in the virtual world. This is of course not true. Gamification, on the one hand, uses the mechanics of computer games. On the other hand, detailed tasks formulated in a game can be completed in reality. That is why gamification can be implemented in any team of employees –  even in those who don't work in front of a

computer. The employer can also provide their employees with a mobile version of the game. According to a report by TNS Polska "smarphonization" in Poland (defined as the percentage of Poles using smartphones) was 58% in May 2015 [34].

It is worth mentioning that the use of gamification reduces costs in the long term. The cost reduction is connected with the possibility of adjusting a game to current needs and using it at different stages of the employee life cycle. It is not necessary to use only *on-line* platforms, because *off-line* games can be played as well. This enables the introduction of gamification into smaller enterprises. In order to use games in a company, a huge budget is not required. The most important factor is the willingness to be innovative [39].

## 3.2    The Areas of Using Gamification in HRM

As results from Table 1, gamification in HRM does not represent a highly popular topic in academic research. The conducted study shows mainly different case studies of gamification implementation. Gamification is mainly used in such areas of HRM as recruitment and selection, onboarding, training, broadly defined motivating people and the formation of organizational culture.

The recruitment and selection of candidates is the first area of HRM in which the trends related to the fourth Industrial Revolution have been noticeable for a long time. The subject literature presents several types of recruitment referring to ongoing technological changes, i.e., the traditional one (prior to the 1990s), e-recruitment (1990-2005), social recruitment (2005-2015) and gamified recruitment (since 2015) [24]. Modern recruitment tools facilitate the creation of a modern employer image.

Within the area of recruitment, gamification can portray different aspects of the recruiting organization to potential applicants by immersing them in the organization or persuading them to apply for accept a job offer. Game-like assessments can be utilized within selection systems to identify the best applicants for the job. This solution was used by the Marriott hotel chain. The game developed specifically for its needs – "My Marriott Hotel" – presents working conditions in hotels and the players have an opportunity to test themselves by playing various roles and performing different professional tasks. It is important, however, that at any time during the game, the participant has an opportunity to become a part of the actual recruitment process by using the "Do it for Real" option and entering the hotel chain website, which presents current job offers and questionnaires to be completed [14].

Examples of interesting uses of gamification in the recruitment process can also be found in Poland [37]. The company Talent Bridge has developed a recruitment game which can be customized and adapted to an individual organization's culture by tailoring the possible scenarios to an employer's needs. One of the goals of this game is to recruit candidates for work. Their task consists of a virtual walk through a designed office in the course of which they are supposed to provide answers to questions about their education and experience, and to fill in recruitment forms [32].

The above examples indicate that the implementation of game-specific mechanisms can contribute towards increased efficiency of recruitment processes, measured

primarily by the number and quality of applications and their acquisition cost, along with a shorter recruitment process [8].

Gamification can also dramatically increase onboarding efficiency as candidates are motivated to complete various steps in order to earn rewards. Gamified training can challenge new hires to learn more during training, benefitting both the employee and the organization in the long term. The onboarding process is strictly connected with employee education. According to a study conducted by the University of Colorado on the impact of simulations and games in adult learners, the participants in gamified eLearning experiences scored [23]:

- 14% higher in skill-based-knowledge assessments,
- 11% higher in terms of factual knowledge and
- 9% higher retention rate.

This shows that gamification not only helps learners acquire knowledge and skills more effectively, but it also allows them to retain information and commit it to long-term memory for future use.

R. N. Landers and A. K. Landers [17] identified the only psychological theory focusing upon gamified learning. This theory proposes that game elements affect training outcomes through one or two mechanisms. Firstly, gamification may be used to create a mediating behaviour or attitude which, in turn, is thought to affect learning. In an empirical test of this theory, a leaderboard was used to increase the amount of time learners spent engaging in a project, and that amount of time, in turn, increased the learning outcomes. Secondly, gamification may be used to strengthen the relationship between instructional design and learning outcomes. For example, game fiction can be used to increase learner engagement, which should make the existing course material more effective in increasing training outcomes. Critically, in both of these approaches, gamification itself is not intended to teach the learner anything; instead, it is used to support the existing instructional material [1].

The case of Walmart can serve as an example of applying gamification to train personnel on the subject of labor health and safety. The gamification-focused labor health and safety training provided two benefits in this case: competing turned out to be "addictive" and the co-workers involuntarily started talking not only about the ranking but also about the importance of compliance with labor health and safety standards. That, in turn, changed the behavior of the employees. The number of accidents declined by 54% in eight company distribution centers [25].

Any discussion on the application of gamification in the education process should be prefaced by the statement that gamification allows not only self-learning, but also knowledge sharing [29]. The aspects of cooperation, mutual education of the participants and searching for a solution by asking another employee can be included in the game. As a result, desirable characteristics of organizational culture can be developed. In this case, we can recall DuePropos which is an application for companies that fosters teamwork and competition. It helps organizations to recognize the commitments and efforts of employees in achieving the objectives together [24].

Gamification can support the process of product improvement suggestions or the participation in company-wide volunteer programs, also fostering an organizational

culture. Physical activity of employees can also be promoted in the game. Points can be awarded for participation in in-company or external sports competitions.

Gamification can be applied to everyday work performance, motivating employees to higher qualities and quantities of work output. As M. Ward rightly observes, "if people are well-motivated to work, both managing them and succeeding will be much simpler" [36]. Without attaining an adequate level of employee motivation, which is related to satisfying their needs properly, it is impossible to carry out a strategy, to implement changes in the company successfully or even to run the day-to-day business efficiently. The most effective and most frequently used method for persuading a team to carry out company goals has been to motivate it, e.g., by means of applying a reward system aimed at meeting specific needs [33]. Referring such assumptions to the above-mentioned representatives of the modern generation employees, the thesis can be put forward that the most popular forms of motivation (i.e., payroll and non-payroll ones) may not work in the long run. Herger [11] thinks that "when we talk gamification, we also talk about motivators. You may have already used bonuses, prizes, and other rewards to motivate your employees. Those rewards are what psychologists call extrinsic motivators. They come from outside an individual. They work well but have certain limits and may sometimes interfere with the intrinsic motivations. Those are motivators that come from inside an individual, such as the desire to become better in what we are doing, the desire to make friends and meet people, or to belong to a group".

As M. Armstrong, R. Landers and A. Collmus [1] rightly point out the gamification of sales appears to be the most common form of gamification in a business setting. This is presumably because the most basic game mechanics (e.g., points, badge, and leaderboards) can be easily applied to a sales context without much thought or planning. At the same time, much like a sales function, HR teams can also use gamification internally to reward top recruiters and to incentivize employees to refer top candidates. The opportunity for an employee to earn Referrer of the Year status can encourage employees to take a more active role in talent acquisition and can even help relieve some of the pressure from the HR department itself [27]. Gamification mechanisms for conducting recruitment processes based on recommending acquaintances were implemented by Hays Poland. The objective of the activities carried out by the company was to recruit as many people as possible, aged 20–30, who were fluent in at least two foreign languages. As a result of gamification, the potential of the current staff was taken advantage of – i.e. its network of contacts – allowing the recommendation of further candidates for work. The players become NASA agents searching for candidates to populate Earth. The application is maintained in the atmosphere of tension provoked by the threat of planetary destruction. In order to reinforce the players' involvement, the project introduced immediate feedback for the recruiters regarding the effectiveness of their actions, along with additional rewards for each subsequent stage successfully completed by the people they had recommended ([9] cited in [37]).

One may conclude that the highest level of motivation takes the form of commitment identified with passion, dedication and the willingness of an individual to invest in and contribute towards his/her employer's success. K. Michalska [21] presents gamification as an example of a method for improving the employee potential management processes by strengthening their involvement, which has a direct impact on achieving the long-

term goals. The author argues that gamification can offer an excellent alternative to the classic approach towards basic business processes. Particular attention is paid to increasing employee performance. She describes the positive impact of gamification on company structure – improving business operations, accomplishing the effects and simultaneously and swiftly taking advantage of the opportunities presented to an enterprise. She refers to the case of the company American AC Alion, emphasizing that the application of gamification in Poland is still in the early stages of development. In the fourth quarter of 2014, the aforementioned company introduced the 12-week gamification program called "Reach the Beach" (achieving the program assumptions was rewarded by trip to the Dominican Republic) aimed at involving employees in order to meet a very ambitious goal – a 25% increase in year-on-year sales ([15] cited in [21]).

The 2018 TalentLMS Gamification at Work Survey conducted in the U.S. reported the following results [42]:

- 80% of employees enjoy using gamification software at work. They feel that gamification makes them more productive (87%), more engaged (84%) and happier (82%) at work.
- Employees were mostly motivated by intrinsic motivational factors.
- Older employees are more motivated by game elements than younger ones.

At this point it is worth focusing our attention to the last conclusion from the research. Research conducted by T. Broady, A. Chan and P. Caputi [2] has similarly shown that negative stereotypes about older people being adverse to technology and incapable of using it are outdated.

## 4    Discussion and Directions for Further Research

Referring to the research questions put forward, it should be noted that gamification, constructed in accordance with the respective rules, results in benefits for an organization, as it is based on the player's intrinsic motivation, raises productivity, and provides commitment and satisfaction.

There are many successful gamification examples referring to such HRM areas as recruitment and selection, onboarding, training, motivation (broadly defined) and the formation of an organizational culture. However, there are no quantitative data regarding the popularity of gamification in HRM among various types of enterprises.

In relation to the aforementioned HRM areas, the following problems – representing an interesting research challenge – can be listed:

- the impact of gamification on employer's attractiveness perceived by the candidates for the job (including, e.g., the position hierarchy and gender),
- the comparison of the reliability of results in the course of gamified selection against the results which the candidates would have achieved in traditional tests of their skills, knowledge and personality,

- the impact of gamification on employee learning speed and the progress in learning (taking into account generational differences, position hierarchy and gender),
- the degree of participants' involvement in the game depending on the prize offered to the winners,
- the relationship between the results achieved both in the game and at work and the player type (explorer, achiever, socialiser or killer [7]).

## 5    Conclusions

The article shows that modern HRM is characterized by the use of gamification. This involves using game mechanisms in relation to real problems occurring in the workplace, for example.

It was found that gamification in HRM does not represent a highly popular topic in the high impact factor academic journals. None of the articles pertains to quantitative research in the area of gamification used in HRM. It was also found that gamification represents a relatively new problem in Polish economic practice. Inspiration can be drawn from the examples of implementing games in foreign companies.

It is worth emphasizing that gamification – just like any other solution in the area of HRM – has to be implemented with due caution. The game scenario has to be well thought-out, the technology must be adequately refined and the employees themselves cannot feel overloaded with excessive incentives. Special care should be taken while developing a system using the elements of gamification. The system has to be thoroughly tested and checked – any error, combined with all the characteristics of modern technology, may result in an unfavourable reputation spreading rapidly among the recipients.

According to research company Gartner, gamification is currently at the peak of its popularity, on the so-called life cycle curve of new technologies, along with such technologies as Big Data and 3D Printing. Due to the fact that some organizations introduce gamification using "shortcuts" – without the proper support of already proven frameworks (methodologies) – gamification, after reaching its peak, will be subject to a revision just like in the case of other technologies, consisting in the verification of its suitability and the failure of numerous incorrectly prepared projects and solutions. In 5-10 years, i.e. after verification, gamification is expected to reach its next peak, this time a more stable development [12].

## References

1. Armstrong, M., Landers, R., Collmus, A.: Gamifying Recruitment, Selection, Training, and Performance Management: Game-Thinking in Human Resource Management. Emerging Research and Trends in Gamification, 140-165 (2016). DOI: 10.4018/978-1-4666-8651-9.ch007.

2. Broady, T., Chan, A., Caputi, P.: Comparison of older and younger adults' attitudes towards and abilities with computers: Implications for training and learning. British Journal of Educational Technology, 41(3), 473-485 (2010).
3. Burke, B.: Gamify. How gamification motivates people to do extraordinary things. 1st edn. Bibliomotion, Brookline, MA (2014).
4. Cherry, M. A.: The gamification of work. Hofstra Law Review, 40(4), 851-858 (2012).
5. Cybulski, A.: Rynek grywalizacji w Polsce i na świecie, https://pl.linkedin.com/pulse/rynek-grywalizacji-w-polsce-i-na-%C5%9Bwiecie-arkadiusz-cybulski, last accessed 2018/09/22.
6. Duggan, K., Shoup, K.: Business Gamification For Dummies. 1st edn. John Willey & Sons, New Jersey (2013).
7. Europejski Instytut Grywalizacji Biznesu: 4 tyy graczy, http://www.eigb.pl/poradnik/4-typy-graczy, last accessed 2018/09/22.
8. Fitz-enz, J.: The ROI of Human Capital. Measuring the Economic Value of Employee Performance. 1st edn. Amacom, New York (2000).
9. Gamfi, http://b2b.gamfi.pl/pl/textpage/rekrutacja,54.html, last accessed 2014/09/10.
10. Kwilosz, M.: Grywalizacja – nadchodzi nowe. Nowe Technologie, 1(17), 8-10 (2013).
11. Herger, M.: Gamification in human resources. 1 st edn. CreateSpace Independent Publishing Platform (2014).
12. Instytut Innowacyjnosci: Projektowanie Postawy Zaangażowania, https://www.instytutinnowacyjnosci.pl/oferta/projektowanie-postawy-zaangazowania-ppz/, last accessed 2018/09/22.
13. Jankowski, M.: Grywalizacja – wykorzystanie elementów gier do modyfikowania zachowań ludzi. Nauki Społeczne 2(8), 139-155 (2013).
14. Joy M. M.: My Marriott Hotel - Gamification in recruitment, https://www.slideshare.net/manumelwin/my-marriott-hotel-gamification-in-re cruitment-manu-melwin-joy, last accessed 2018/09/19.
15. Kerpen, D.: The Gamification of a Successful Sales Culture. How one CEO turned a sales competition into the trip of a lifetime, https://www.inc.com/dave-kerpen/the-gamification-of-a-successful-sales-culture.html, last accessed 2017/05/01.
16. Kostro, P.: Gamifikacja wkracza do polskich firm, https://www.pb.pl/gamifikacja-wkracza-do-polskich-firm-861010, last accessed 2018/09/25.
17. Landers, R. N., Landers, A. K.: An empirical test of the Theory of Gamified Learning: The effect of leaderboards on time-on-task and academic performance. Simulation & Gaming, 45(6), 769-785 (2014).
18. McGonigal, J.: Reality is Broken. 1st eddn. The Penguin Press, New York (2011).
19. Meister, J.: Gamification: Three Ways To Use Gaming For Recruiting, Training, and Health & Wellness, www.forbes.com/sites/jeannemeister/2012/05/21/gamification-three-ways-to-use-gaming-for-recruiting-training-and-health-amp-wellness/, last accessed 2014/09/14.
20. Meister, J.: Future Of Work: Using Gamification For Human Resources, https://www.forbes.com/sites/jeannemeister/2015/03/30/future-of-work-using-gamification-for-human-resources/#6fdd67c824b7, last accessed 2018/09/22.
21. Michalska, K.: Grywalizacja jako element zarządzana strategicznego potencjałem ludzkim, Zarządzanie. Teoria i Praktyka 19(1), 55-62 (2017).
22. Palmer, D., Lunceford, S., Patton, A.J.: The Engagement Economy: How Gamification Is Reshaping Businesses. Deloitte Review 11, 52-69 (2012).
23. Pappas, Ch.: The Top Gamification Statistics And Facts For 2015 You Need To Know, https://elearningindustry.com/top-gamification-statistics-and-facts-for-2015, last accessed 2018/09/22.

24. Perinot, C.: Gamification in the field of human resource management. Gamified solutions for recruitment. 1st edn. Universita Ca'Foscari Venezia, Venezia (2015).

25. Piwowar-Sulej, K.: Grywalizacja jako sposób na zwiększenie zaangażowania pracowników w obszarze BHP. In: Ulewicz R., Żywiołek J. (eds.), Bezpieczeństwo systemu: człowiek – obiekt techniczny – otoczenie, Oficyna Wydawnicza Stowarzyszenia Menedżerów Jakości i Produkcji, pp. 21–31, Częstochowa (2016).

26. Piwowar-Sulej, K.: Human Resources Management in the Industrial Revolution 4.0: General and Polish Perspective. In: Jedlicka P., Marešová P., Soukal I. (eds.), Hradec Economic Days. Double-blind peer-reviewed proceedings part II of the international scientific conference Hradec Economic Days 2018, pp. 179-187, University of Hradec Kralove, Hradec Kralove (2018).

27. Sims, S.: How Gamification Can Improve HR Management, https://www.thebalancecareers.com/gamification-hr-management-improvement-1917995, last accessed 2018/09/22, last accessed 2018/09/24.

28. Staszel, A.: Wykorzystanie grywalizacji do zwiększenia zaangażowania pracowników. In: Piwoni-krzeszowska E., Małkus T. (eds.), Współczesne problemy zarządzania organizacjami, Mfiles, pp. 51–50, Kraków (2014).

29. Stockinger, T. et al.: Towards Leveraging Behavioral Economics in Mobile Application Design. In: Reiners T., Wood L.C. (eds.), Gamification in Education and Business, pp. 105–131, Springer, New York (2014).

30. Roberts, B.: Gamification: win, lose or draw? HR Magazine, 59(5), 29-35 (2014).

31. Ruel, H., Bondarouk, T.: Van der Vald, M.: The Contribution of e-HRM to HRM Effectiveness. Employee Relations, 29(3), 280-291 (2006), DOI: 10.1108/01425450710741757.

32. Talent Bridge: Grywalizacja w procesie rekrutacji, www.talentbridge.pl/raporty/97-raport-grywalizacja, last accessed 2014/09/10.

33. Tkaczyk, P.: Grywalizacja. Jak zastosować mechanizmy gier w działaniach marketingowych. 1st edn. Onepress (2012).

34. TNS Global: Raport Polska jest mobi 2015", http://www.tnsglobal.pl/coslychac/files/2015/05/POLSKA_JEST_MOBI_2015.pdf, last accessed 2016/06/07.

35. Ursprung, S.: HRM 4.0: not yet with us! Summarizing the Personal Swiss, http://blog.jacando.com/en/hrm-4-0-noch-nicht-mit-uns-ein-besuch-an-der-personal-swiss/, last accessed 2017/07/25.

36. Ward, M., 50 najważniejszych problemów zarządzania. 1 st edn. Wydawnictwo Profesjonalnej Szkoły Biznesu, Kraków (1997).

37. Wawer, M.: Grywalizacja - nowy trend w rekrutacji kandydatów. Studia i Prace WNEiZ, 39 (3), 219-230 (2015).

38. Wolf, M. J. P.: Before the Crash: Early Video Game History. 1st edn. Wayne State University Press, Detroit (2012).

39. Wolf, O.: Grywalizacja, czyli frajda z pracy, http://nf.pl/manager/grywalizacja-czyli-frajda-z-pracy, last accessed 2015/07/15.

40. Wood, L.C., Reiners, T.: Encyclopedia of information science and technology. 1st edn. Information Resource Management Association, Hershey (2005).

41. Zichermann, G., Cunningham, Ch.: Gamification by Design. Implementing Game Mechanics in Web and Mobile Apps. 1st edn. O'Reilly Media, Inc., Sebastopol (2011).

42. Zoe E.: The 2018 Gamification At Work Survey, https://www.talentlms.com/blog/gamification-survey-results/, last accessed 2018/09/22.