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# A literature review on Human Capital Management in the Video Game Industry

## Zarządzanie kapitałem ludzkim w branży gier video – przegląd literatury

**Abstract:** Companies which create and publish video games (computer, mobile, console, or browser games) are undergoing an evolution from small, unstructured teams to large organisations where structures are essential. Along with this transformation, the importance of human capital management for the organisation's effectiveness is increasing, which is forcing changes in the way the human resources function is performed. The article presents a literature review which goal is to establish the current state of knowledge about human capital management in companies from the video game industry and identify the most important subjects, that should be covered in the future research. 4K model of human capital was adopted as a theoretical framework for the analysis. The research revealed that all parts of the human capital management process in the video game companies are underdeveloped or don't exist at all.

**Keywords:** human capital management, video games, gaming industry

**Streszczenie:** Przedsiębiorstwa tworzące i wydające gry video (komputerowe, mobilne, konsolowe, przeglądarkowe) przechodzą ewolucję od niewielkich zespołów pozbawionych struktur, do dużych organizacji, gdzie struktury są niezbędne. Wraz z tą transformacją rośnie znaczenie zarządzania kapitałem ludzkim dla skuteczności organizacji, co wymusza zmiany w realizacji funkcji personalnej. W artykule przedstawiony jest wynik badań literaturowych, których celem było ustalenie obecnego stanu wiedzy na temat zarządzania kapitałem ludzkim w branży gier video, a także identyfikacja najważniejszych obszarów do dalszych badań. Model kapitału ludzkiego 4K posłużył za ramę teoretyczną do przeprowadzonej analizy. Badanie wykazało, że wszystkie elemen-

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ty procesu zarządzania kapitałem ludzkim w przedsiębiorstwach z branży gier video są słabo rozwinięte, a niektóre w ogóle nieobecne.

**Słowa kluczowe:** zarządzanie kapitałem ludzkim, branża gier video, gry video

**JEL:** M12, M50, M54

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The video game industry will soon celebrate its 50th birthday. It dates back to 1971, when the founders of Atari for the first time used a video game Computer Space in a commercial way. (Sobociński et al., 2016). Since then, video games have become a daily companion to hundreds of millions of people around the world (cf. Entertainment Software Association (ESA, 2020). Data from 2020 show a growth rate of nearly 10% in the industry's value per year, with revenues of nearly \$ 160 billion. By 2023, it is projected to reach \$ 200 billion (Wijman, 2020). It is worth noting that a value of \$ 160 billion – which the industry is expected to generate in 2020 – corresponds to the size of Hungary's GDP in 2019 (*GDP (Current US\$) | Data*, n.d.). By comparison, the value of the global music market was only \$ 20 billion in 2019 (Childs-Young, 2020).

Growing number of video game players results in more data available for video game publishers. Collecting and analysing more data supports the growth of the industry, as it allows video games publishers to adjust their products to individual needs of their customers. On the other hand, knowledge about customers helps publishers to attract advertisers, who can direct their communication to tailored groups of viewers. This data driven approach to the creation and management of products, which are typical for the Industry 4.0 (cf. Sanghavi et al., 2019), has a profound impact on how video game companies deliver their services/products and, as a result, what are their requirements in terms of human capital. This can also be an indicator of how other IT companies will develop in the near future.

The growth of the industry resulted in the structural transformations in video games' development studios. The teams which develop games have become larger and more hierarchical, the production time has increased, and the expenditures on creating and publishing games have grown significantly (Tschang, 2007). The popularisation of mobile platforms in the distribution of games has changed the profile of the average player, resulting in the emergence of new business models, such as freemium or free-to-play (cf. Davidovici-Nora, 2013). This, in turn, became the basis for the Game as a Service (GaaS) model. However, GaaS is no longer the mobile-only distribution model, as it has been spreading to other platforms such as WEB, PC and even console with a substantial growth in 2020 (cf. Krampus-Sepielak et al., 2020).

This paper's goal is to establish the current state of knowledge about human capital management in companies from the video game industry and identify the most important subjects, that should be covered in the future research.

## Method

A literature review on the project management and human capital management in the video game industry was conducted, covering English and Polish sources. Books and scientific articles were studied, along with statistical publications from US and Polish public-sector entities and independent organizations researching the video game industry. For the purposes of the analysis carried out in the text, it is assumed that the video game industry includes entities developing and publishing, video games. It should be noted, however, that in a broader sense, the industry also indirectly includes other related companies, including providers of various services supporting the creation and publishing of video games. The most important supporting companies include game engine suppliers, electronic game distribution platforms, data collection and analysis tools providers, payment providers, cloud computing providers, advertising networks (Feijoo et al., 2012).

## Results

To emphasize the importance of the subject, an attempt was made to assess how many people are employed in the video game industry worldwide. Although there is no data on global employment in the industry, some estimation can be done based on partial data from the USA, Canada and Poland by comparing employment with the revenue generated by the industry in a given country. By extrapolating these indicators, it can be estimated that globally the video game industry employs from about 1,089,000 to about 1,815,000 people. As the industry has been growing very fast for many years, this number is expected to rise in the future. (cf. *IBISWorld – Industry Market Research, Reports, and Statistics*, n.d.; cf. Dyer-Witheford, Sharman, 2005).

## Human capital management in a project-based organisation

A project is defined as the deliberate, time- and resource-limited, unique, and complex actions of people that lead to the achievement of results of a certain quality (Łabędzki, 2019). Each project requires a team of people with complementary competences, which allows them to achieve goals beyond the capabilities of individuals. Literature review showed that video game companies, like other software companies, are project driven organisations (Tschang, 2007; De Vaan et al., 2013). Such organizations are managing multiple projects concurrently. Projects are the most important part of their activity. Strategy of project driven organisations is based on the long-term

plan of projects. This requires a sophisticated, careful, in-advance planning of human capital requirements for upcoming months or even years (Kerzner, 2016).

Organisation of work in form of projects have direct impact on the human capital management in the video game companies. According to De Vaan et al. (2013) human capital is a key component of the capital of companies in the video game industry. Human capital can be described as a set of four elements: competencies, interpersonal contacts, organisational culture, and organisational climate (Juchnowicz, 2014).

Human capital management is a process, which consists of multiple subprocesses. A comprehensive set of the most important subprocesses was proposed by Juchnowicz (2014). It is built out of seven elements, which are:

- 1) acquisition and relocation,
- 2) job requirements assessment,
- 3) development of competences,
- 4) employee evaluation,
- 5) building employee engagement,
- 6) shaping relations with internal stakeholders,
- 7) counteracting pathological phenomena.

This set was used as a framework for the literature research on the human capital management in the video game industry. As no publications were found, regarding directly to the processes of the employee evaluation, and shaping relations with internal stakeholders, they were not covered by this paper. Also, the topic of counteracting pathological phenomena was not covered by the analysis, as the available literature describes the phenomena, but not management methods, which counteract them.

## Acquisition and relocation

A process of employee acquisition starts with the definition of the demand for employees, then transitions to the recruitment and selection phase and ends with the new employee introduction phase (Juchnowicz, 2014). No research results were found covering this subject directly. However, the analysis of financial statements of companies from the video game industry, reveals the great importance of employee acquisition and retention for the organisation's success.

The process of acquisition is arguably one the most important elements of the human capital management system for the video game companies. In Poland the majority (72%) of the companies intend to expand their teams within the (2020) year. At the same time 30% of polish game development companies consider lack of qualified workers on the market as an important factor affecting their growth (Krampus-

Sepielak et al., 2020). As a result, competition for human capital between video game companies is strong. Such situation can be caused by:

- 1) the existence of the well-organised, committed occupational community of video game developers with an international, supra-organisational range (cf. Weststar, 2015; cf. Young, 2018; cf. Ruffino, Woodcock, 2020),
- 2) the strong industry growth,
- 3) the project-based organization of work, with an employment period amounting to 3.5 years on average (Weststar, 2015).

The tendency of video game developers to organize in a big community seems to be a world-wide phenomenon. It helps people to share their knowledge and experience without any organisational barriers. This also makes video game companies transparent, as the knowledge about working conditions in the particular organization is easily available. As a result, differences in remuneration, working hours, pathological phenomena etc. are well known and employees can take this knowledge into account when joining or leaving the company. Because industry is growing fast, new companies are emerging, as well as successful ones are becoming larger. Also project teams are becoming larger. The number of people working over the course of the entire production cycle of the game may even exceed 100, with an average of 20 (Tschang, 2007). In Poland, 73.5% of development teams have up to 10 people, 17.7% have between 11 and 50 people, 4.9% have between 51 and 100 people, and 3.9% have more than 100 people (Warzecha, 2018). This creates a rising demand for competencies, which supports the employees' motivation to change working place relatively often.

As teams responsible for developing video games are getting bigger, acquisition and relocation process becomes more and more important. Especially a strong diversification between team members in terms of competences make the process difficult to carry on successfully. What is more, not only competences but a right matching of team members on the interpersonal level is crucial, as according to Scholz (2012) performance of the team in the video game industry strongly depends on the quality of cooperation between its members.

Not only teams are getting bigger, but also their structure evolves. The growth of augmented reality's as well as virtual reality's market (expected worldwide revenues growth from 2021 to 2023 of 46,7%) (Krampus-Sepielak et al., 2020) will result in the evolution of required competences in the game development teams. This evolution will be relevant for all stages of the video game development process, from the game design, through programming and graphics, to quality assurance.

## Job requirements assessment

Although no publications were found directly referring to the subject of the job requirements assessment, a valuable knowledge indirectly related to the subject, concerning remuneration, is available.

As data shows, the average total compensation per employee for game developer employees ranges from 90292 USD in 2010 to 97001 USD in 2013 (Siwek, 2017). This is almost 7,5% increase over three years. Data from the worldwide (but 53% of respondents work in the USA) survey carried out by the International Game Developers Association in 2019 show that 65% of the video game industry earn more than 50000 USD per year, with the most common salaries being between 50000 USD and 75000 USD (17% of respondents) or between 75000 USD and 100000 USD per year (17% of respondents) (International Game Developers Association, 2019). In 2014 only 50% respondents declared income equal or higher than 50000 USD per year. However, 19% of respondents were in the range between 50000 USD and 75000 USD, but only 14% in the range between 75000 USD and 100000 USD (International Game Developers Association, 2014). In the report from 2015, these values were respectively 67%, 20% and unknown value for the range between 75000 USD and 100000 USD (International Game Developers Association, 2015). In the report from 2017, these values were respectively 54%, 15% and 15% (International Game Developers Association, 2017). A summary of those reports is presented in the Table 1.

**Table 1** Salaries (in percent of respondents) in the video game industry between 2014 and 2019

	Salaries below 50k USD	Salaries between 50k USD and 75k USD	Salaries between 75k USD and 100k USD	Salaries over 100k USD
2014	50%	19%	14%	17%
2015	33%	20%	47% (merged cells)	
2017	46%	15%	15%	24%
2019	35%	17%	17%	31%

Source: International Game Developers Association, 2014–2019.

Although unstable, a growth in salaries is visible. Over five years the percentage of employees with salaries below 50000 USD dropped from 50% to 35%. At the same time the percentage of employees earning more than 100000 USD rose from only 17% to 31%.

Analysis of working hours weekly declared by the respondents of mentioned reports gives an interesting insight to the subject of the job requirements assessment. According to the 2014 data, 81% of respondents crunched at least once in the past two years

and almost 45% experienced more than two crunch periods. Crunch is the obligatory, often unpaid overtime lasting for many months or even years (Dyer-Witthford, Sharman, 2005). Even not in the crunch periods, approximately 40% of respondents worked more than 44 hours weekly (International Game Developers Association, 2014). In 2015 of survey's, 50% respondents indicated working 40–44 hours per week. 18% of respondents worked between 45 and 49 hours per week and 12% between 50 and 59 (International Game Developers Association, 2015). In 2017 this was respectively 49%, 19% and 9% (International Game Developers Association, 2017). In 2019 this was respectively 54%, 14% and 5% (International Game Developers Association, 2019). A summary of hours of work is presented in the Table 2.

**Table 2** Hours of work per week in the video game industry between 2015 and 2019

	40–44 hours p/w	45–49 hours p/w	50–59 hours p/w
2015	50%	18%	12%
2017	49%	19%	9%
2019	54%	14%	5%

Note: Due to lack of the data, values in rows don't sum up to 100%.

Although data shows that during regular periods hours of work for majority of employees are in the expected or slightly higher than expected range, crunch is still a problem, as 41% of employees experienced it in 2019 (International Game Developers Association, 2019). Taking into account, that only 8% of employees are paid for the overtime (International Game Developers Association, 2019), a conclusion can be drawn, that the job requirements assessment process in the video game industry is premature and clearly needs a deep consideration. This arguably also concerns a project management process, as top reasons for crunch are poor or unrealistic scheduling, feature creep, unclear expectations, insufficient staffing, and inexperienced management (International Game Developers Association, 2014).

## Development of competences

Human capital development in the project-based organisation is affected by the temporality of project teams. As Listwan (2013) points out, projects are often too short to allow time for training, which raises the problem of lack of time for staff development during the project. This results in the need to use resources with parameters adjusted to the project or to develop employees regardless of individual projects, considering

the perspective of the entire portfolio or program and a longer time horizon. If this is not possible, teams may be suffering from insufficient human resources.

Competencies development processes can be implemented based on one of the four human capital development strategies of an organization: intervention strategy, creation strategy, adjustment strategy, and acquisition strategy. The intervention strategy consists of interventions tailored to the needs, aimed at providing employees with specific competencies necessary at a given moment. The strategy of creation is aimed at creating by the organization its own resources of knowledge, competences, abilities, and skills, which are an important factor of the company's competitive advantage. It consists in accepting young, talented people to the organization and conducting a conscious, carefully planned development policy towards them. The adaptation strategy is based on employee training, with the difference that pre-prepared people who already have some experiences are admitted to the company. The acquisition strategy is an extension of the intervention strategy. It assumes only the acquisition of high-quality human resources from the outside, assuming that their education is too expensive and time-consuming (Bieniok, 2016).

Literature review showed that intervention and acquisition strategies are used by Ubisoft and Electronic Arts, two of the largest gaming companies in the world (Cadin et al., 2006). They focus on the development of their most talented employees and acquire only qualified employees. The example of Ubisoft and Electronic Arts, however, can't be considered as representative, as without companies using creation and adjustment there will be no candidates available to enter the industry. Therefore, research is required to examine how all four strategies are implemented by the companies in the video game industry.

## Building employee engagement

According to Juchnowicz (2010), employee engagement should be considered in three dimensions:

- 1) engagement in the job,
- 2) engagement in the organisation,
- 3) engagement in the occupation and environment.

As previously mentioned, video game developers can be considered as a well-organized, international community. This seems to be induced by the subject of their work itself – arguably the vast majority of industry's employees are video games' enthusiasts. As a result, engagement in the occupation and environment are somehow guaranteed by the subject of the job itself. However, engagement in the organisation and the job are not as easily achievable. According to Young (2018) it is particularly important in the



video game industry to cultivate an organisational culture based on a lack of formality, with flexible working hours and co-working. This should affect the engagement in the organisation. To improve the engagement in the job, an organisation should implement, execute and optimize a motivation process.

As no comprehensive research on the motivation in the video game companies, which would cover both software engineers and other employees, was found in the literature, only research regarding software engineers were analyzed. In the recent past, extensive reviews of the literature on motivation in the IT industry were made Sharp et al. (2009) and Beecham et al. (2008). Reviews covered the subject of motivation in software development companies. As a result, a list of the most common motivators of software engineers was made. It is presented in the Table 3.

**Table 3** What motivates software engineers?

Motivators of software engineers	Number of studies reporting
1. Identify with the task	20
2. Employee participation/ involvement/working with others	16
3. Good management	16
4. Career path	15
5. Variety of work	14
6. Sense of belonging/supportive relationships	14
7. Rewards and incentives	14
8. Recognition	12
9. Development needs addressed	11
10. Technically challenging work	11
11. Job security/stable environment	10
12. Feedback	10
13. Autonomy	9
14. Work-life balance	7
15. Making a contribution/task significance (impact on lives or work of other people)	6
16. Empowerment/responsibility	6
17. Appropriate working conditions/environment/equipment/tools/ physical space/quiet	6
18. Trust respect	4
19. Equity	3
20. Working in a company that is successful	2
21. Sufficient resources	2

Note: From Sharp et al. (2009).

Among the most common motivators, a career-path is an interesting one, as it refers to the mentioned problem of the high turnover. This is partially caused by the project-based organization of work, which results in a periodical team dissolving. However, with a proper career path planning in a company's project portfolio, this problem can be solved or at least diminished (cf. Łabędzki, 2019). It is a common practice to keep key, talented employees in the company, while they wait for new projects (Tschang, 2007). A career path planning, along with the identification with the task and sense of belonging can be supported with the employee ownership mechanisms like Employee Stock Option Plans. As the recent research on the subject conducted on game development companies in Poland showed, a well-structured Employee Stock Option Plan can be a good motivation tool for the video game companies (Łabędzki et al., 2021). This is supported by Cadin et al. (2006), whose research showed that motivation programmes based on the revenue share or programmes based on shares in the company are crucial.

Employee motivation seems to be one of the focal points of the video game companies' human capital management process. It has a potential to not only help retaining employees and support them in rising their productivity (Sharp et al., 2009), but also to improve employer branding, which can be a crucial factor in the acquisition process, regarding to the existence of the well-organized, international occupational community.

## Conclusions and recommendations for further research

The conducted analysis shows that human capital management is a key process of strategic importance for companies in the video game industry. However, there are almost no scientific research reports covering this subject. As Scholz (2012) points out, despite the rapid growth and significant size of the video game industry, the area of human capital management is poorly recognised. The scarcity of the peer-reviewed sources is the most important conclusion from the literature review. Conclusions from the conducted analysis of available literature sources is presented in the Table 4.

It is rather surprising, that no research reports were found on managing development teams in the GaaS publishing model, as it is becoming a leading model for free-to-play games, especially on mobile platforms. A key principle of the GaaS model is to keep the game on the market for a long period (many years) after the end of the game production cycle. This is done through *live operations*, consisting in frequent modification and development of game content to extend player retention and maximise their value measured by revenues (Live Time Value) (Cai et al., 2014). This has significant implications for the dynamics of the project team, which, according to the definition of the project, should be dissolved once the operational goal of publishing the game is achieved. However, the GaaS model does not provide a date for the completion of

work on the game. As a result, the project team, becomes a non-project team and its management should be adjusted. Topic of this hybrid nature of development teams, which create and maintain games in the GaaS model seems to be very interesting and important in view of the human capital management in the video game industry. All considered subprocesses could be a subject of adjustments to the GaaS model. Among them Building employee engagement should be considered as a good starting point for the further research, as it covers main issues of the prolonged team life cycle.

**Table 4** Conclusions form the literature review

Human capital management process	Conclusions
Acquisition and relocation	Acquisition and retention of employees is crucial for video game companies. They identify the outflow of key employees and difficulties in acquiring new ones as a significant business risk. International, supra-organisational occupational community provides transparency. Working conditions are easily comparable between companies. A rising demand for competencies, caused by the rapid growth of the video game industry, supports the employees' motivation to change working place relatively often. Employment period is 3.5 years on average.
Job requirements assessment	Job requirements assessment process in the video game industry is premature. Working hours exceed 40 hours per week significantly, which is not reflected in the remuneration. Project teams suffer from unrealistic scheduling, unclear expectations, insufficient staffing, and inexperienced management.
Development of competences	Literature review showed that intervention and acquisition strategies are used by Ubisoft and Electronic Arts.
Employee evaluation	No research reports found.
Building employee engagement	Engagement in the occupation and environment are partially guaranteed by the subject of the job itself. It is particularly important in the video game industry to cultivate an organisational culture based on a lack of formality, with flexible working hours and co-working. Motivation programmes based on the revenue share or programmes based on shares in the company are crucial.
Shaping relations with internal stakeholders	No research reports found.

There is a need for empirical research that will develop knowledge in the field of human capital management in the video game industry. All subprocesses of the human capital management process need research and description both for GaaS and non-GaaS publishing models. The most important subjects of research can be:

- 1) process of acquisition and retention of employees,
- 2) building employee engagement,
- 3) human capital development strategies,

- 4) job requirements assessment,
- 5) employee evaluation,
- 6) shaping relations with internal stakeholders,
- 7) counteracting pathological phenomena.

As majority, if not all, video game companies are project-based organisation, it is justified to carry out research in the field of project team management. A comprehensive description of human capital management in the video game industry can become the starting point for designing dedicated management tools that meet specific needs of this rapidly growing ecosystem.

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