Serious Games and Their Use in HRM:
A Typology of Uses in CAC40 Companies

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Abstract
The purpose of this article is to build a typology of serious games based on their use in human resources management (HRM). To construct this typology, an inventory was made of all the serious games used by CAC40 companies. Of these, 114 serious games have been identified for the 43 listed companies since December 2011. These games have been classified into 3 categories and 11 subcategories based on their designated uses. This is the first study to demonstrate that all CAC40 companies use serious games, with seven such companies adopting at least five games. This research is also the first to offer a detailed typology of serious games based on their use in HRM. The discussion will demonstrate how this typology can help to operationalize the concept of serious games for HR managers to better understand and choose their specific HR uses.

1. Introduction

Joseph Chilton Pearce wrote that “play is the only way by which the highest intelligence of humanity can unfold” [24]. This shows the importance the famous psychologist attached to the role of games in intellectual development. The superior intelligence produced through games is extremely valuable for organizations. However, the concept of “the company as play” is not well regarded by the “contemporary subjects” of Generation Y. Games are thought to be foolish and futile whereas management is noble and addresses important issues [8]. However, serious gaming has established a niche for itself within the most prestigious companies. In fact, as will be demonstrated in this article, all CAC40 companies use serious games. Those 40 firms are selected from the 100 that have the highest market capitalization in France and form the reference index in the national stock exchange. Many of them are even using half-
dozens of serious games in various subsidiaries or departments.

Managers are faced with a rapidly changing technological environment and hiring employees from Generation Y. This generation is radically different from its predecessors [19]. The young people of Generation Y know exactly how to use and optimize social networks and operate in virtual environments [21] [22]. They communicate through new languages, are able to manage multiple tasks at the same time, and are very familiar with information technology. They are both nomadic and mobile on the labor market, and remain constantly connected to their favorite communities and media [23] [28].

In this context, the development of serious games points to an attitude shift among managers toward the use of video games. These are no longer viewed as representative of alienation or addiction—one study shows that 52% of players are depressed and 69% are dependent on playing games [15] but as a mean to stimulate the creativity and competitiveness of young talent, make the training as attractive and immersive as possible, and to enable more effective communication about sensitive and potentially divisive topics.

Serious games are aimed at a population that is familiar with online games, particularly Generation Y, who are more playful, outgoing, are major consumers of training and coaching, and cannot be recruited in the same way as previous generations [21] [30]. Among the three generations that currently coexist in the labor market (Baby Boomers, Generation X and Generation Y), Generation Y represents over 30% of European or American populations. Raised in a world where technology takes center stage, these young people hope to work in an environment with the latest technology [23] [29].

This research aims to establish a typology of serious games based on their use in human resources management (HRM). This article shows how serious games enable new methods of selection, recruitment, integration, motivation, training, collaboration, and evaluation based on virtual reality communication.
Possible uses will be identified and a typology will be developed based on an inventory of all serious games used by CAC40 companies. However, it is first necessary to define the purpose of the research and its context, that is, the HR function. This is rapidly evolving as shown in the rise of so-called tacit jobs as opposed to those that are transformational and transactional. These jobs are characterized by complex interactions requiring a high degree of judgment [25].

The first part of this article will present the origins, definition, and various forms and uses of serious games through the literature. The second part will be devoted to an exploratory methodology based on an inventory of serious games in relation to the management of human resources in CAC40 companies. The third part will present the construction of the typology of serious games based on the HR use for which they are intended. The fourth part will detail the various categories identified in the typology based on specific cases. Then, following some caveats concerning the dangers and limitations of serious games, the conclusion will summarize the findings of this research work.

2. Play at work or professional game?

Research into serious games focuses on their classification [7] [20] [27] design rules, and educational effectiveness [6]. Although everyone agrees that serious games have a primary purpose other than entertainment, they are often confused with e-learning software, virtual environments, and business simulations [4].

2.1. Still emerging and ill-defined objects

Unlike serious games, e-learning is a tool very commonly used in training by enterprises [9] but that is not based on the fundamental principle of play. E-learning is an interactive learning scheme that is generally based on several different media with written and visual materials, such as commented slideshows, audio or video recordings, tests, cases, and learning acquisition tests. It allows a degree of autonomy to learners to work at their own pace and regulate their own skills [12]. Although serious games incorporate all these elements, e-learning does not have a playful dimension and is not as immersive as serious games [20].

Virtual reality games such as Second Life are not serious games because there really are no rules, objectives, modes, levels of competition or construction of useful knowledge in the real world [11]. Without learning goals and a pedagogical dimension, they lack the essential characteristics of serious games.

Finally, business simulations have been used in their modern form since the 1950s. Faria and Nulsen [14] provide a historical overview of the emergence and development of these simulations. Although the term game is used to refer to these simulations, the emphasis is clearly on the realism of the simulation. The playful aspect emerges only episodically and only in terms of the animation methods used. The business simulations do not create a distancing effect or an escape from the work environment, but seek to re-create it as faithfully as possible [18].

The confusion is even highlighted in the main magazine dedicated to the subject: Simulation and Gaming. Its editor, David Crookal, says that debate on the term serious game has only recently emerged [10] and focuses as much on the word serious as on game, sometimes in contrast to the notion of simulation, sometimes as a complement. It is noted that the term serious game applies to a wide range of different situations, hence, the element of confusion in the field.

2.2. Origin and definition of serious games

As early as 1968, Clark C. Abt explained in a book entitled Serious Game [1] how to use play as a means of training to develop industrial project management skills, disseminate marketing messages, foster a shared corporate culture, and become familiar with business processes. It described precisely—forty years ahead its time—a phenomenon that would invade organizations and become an essential HRM tool in large companies [17]. Benjamin Sawyer used this fashionable term in 2002 [26] to describe video games whose playful dimension serves a purpose other than to entertain the player, such as marketing communications, training, or awareness-raising for certain causes. According to Michael Zyda [31], serious games are “a cerebral challenge, played with a computer in accordance with specific rules, that uses entertainment as added value for education and training in institutional or private sectors in the areas of education, health, public safety, as well as for communication strategy ends”.

More recently, serious games have been identified as applications that can “combine ... commercial aspects ... with the fun elements of video gaming” [4]. There are now a large number of terms for serious games, demonstrating the diversity of actors and approaches. “Educational games, simulation, virtual reality, alternative purpose games, edutainment, digital game-based learning, immersive learning simulations, social impact games, persuasive games, games for change, games for good, synthetic learning environments, games with an agenda …” [4] reflect as
many points of view as objects that are similar and different in their structures and uses [27]. However, the purpose in all cases is to “transpose the mechanics of video game to the entire life of an organization,” to guide individual and collective behavior and improve the performance of that organization. In the case of a company, integration, training, motivation, and cohesion are key levers that serious games can use effectively [12].

For Alvarez and Djaouti [4] a serious game is a “computer application, whose original intention is to combine both serious aspects such as, but not limited to, education, learning, communication, or information, with the fun elements of video gaming, in a consistent manner”. According to Noah Falstein, president of the Serious Game Summit, serious games are those that are designed to “make training exciting and immersive” (International Perspectives and Innovations Conference of the Serious Games 2010). For the purposes of this article, serious games will be defined as interactive video games whose main objective is to teach best practices and knowledge, regardless of the sponsor. Although entertaining, their main purpose is multimedia training and not entertainment, whether the player is conscious of this or not. However, this definition requires nuancing in order to better understand the diversity of serious games and the associated challenges.

2.3. Highly varied forms, uses, and budgets

In five years, all CAC40 companies have engaged in the codesign of one or more serious game as shown in Table 1. Major French companies devote large budgets to developing these tools, such as the game developed for Randstad, the Randstad Business Game, which cost more than 200,000 euros. Investing such fortunes in these games may seem surprising or unreasonable, especially for companies that have been pioneers in the field and that did not expect serious games to prove their worth [17] [18], but the return on investment is substantial and rapid and the benefits for the company are numerous [17].

Even though standard products have begun to appear, serious games are often custom projects developed specifically for each client according to its particular needs and corporate culture. The budget is less than 50,000 euros for basic projects and 100,000 to over one million euros for sophisticated applications. Some serious games are even more expensive in certain sectors, such as Pulse, the game by the Breakaway Company, which reproduces an entire hospital in 3D. Deemed the most expensive serious game of all time, its development cost more than seven million euros. Given these exorbitant costs, SMEs are in retreat and use only standard products under license.

The application areas of serious games are numerous and extensive. They are used in the medical, banking, media, logistics military, aerospace, and pharmaceutical sectors for the functions of sales, marketing, production, purchasing, and finance [17]. Serious games are already being used to train financial advisors at BNP Paribas, AXA, and Barclays, and the sales forces at Renault and L’Oréal, SNCF controllers, tour guides, commercial truck drivers, service station managers, and hair salons. It appears that the application domains of serious games are as limitless as the imagination of the developers [17]. However, although these tools can be used in countless industries, it is necessary to specify exactly the HR uses for which they can add value. Managers can therefore integrate these serious games into HR processes in order to improve and optimize them.

3. Methodology

The objective of this article is to construct a typology of serious games according to their uses in the field of HRM, an as-yet little studied area [5]. To build this typology, it was necessary to address two preliminary methodological issues: the establishment of the reference list of companies and delineation of serious games.

3.1. Typology or classification of serious games

The first multi-criterion classification to include serious games was proposed by Sawyer and Smith in 2008 [27] at the Serious Game Initiative. In this arrangement, serious games are classified in the same way as all video games. This classification is based on a primary criterion of utility or original purpose: games for health, communication, training, education, science and research, production and work, and a second criterion for market segmentation or scope of the title: government, defense, health, marketing and communication, education, corporate, and industry. As described by [4], the purpose category is heterogeneous and sometimes overlaps with the second axis—the market. This typology by sector is not specific to serious games and remains very vague, with categories that combine very different types of games. It does not propose a detailed enough breakdown to be usable by managers and is not specific to a managerial role.

This classification was adapted and extended by Alvarez, Djaouti, and Jessel (2010) in the G/P/S (gameplay/purpose/scope) model. The added dimension, gameplay, or playability, enables us to
determine whether we are facing a game with goals or a toy without explicit objective by studying how the serious game is used. Ten categories or rules of play are identified. The intent or purpose is defined as the explicit purpose of the serious game. To reduce the problem of heterogeneity of the mentioned categories, the classification retains only three categories: (1) the dissemination of a message that can be of varying natures, for example, commercial or educational use; (2) training leading to improved cognitive performance and motor skills through play; and (3) the exchange of information in games that promote communication between players. The dimension that has been added is purely technical and does not deepen the objectives associated with the serious games studied.

According to the authors, the corporate market includes games intended to be used within companies. This research focused specifically on this class, extended to potential employees, because the managerial approach is paramount for this target group. However, the goal is to establish a typology characterized by “the use of multiple classification criteria to categorize individuals and the fact that the combination of the criteria must enable the identification of non-hierarchical categories” (Alvarez, Djaouti & Jessel, 2010). The typology proposed in this article focuses on the specific application domain for serious games: the management of human resources. If HRM is considered a type of use for serious games in some workplaces, the issue here is to construct a typology with subtypes of uses associated with the specific practices within HR.

3.2. The field of study: Serious games companies in the CAC40

To construct the typology, the field of study was limited to listed companies in the CAC40, not only for practical reasons of access to information but also because they are pioneering companies in the field of serious games. Indeed, at their origin these tools require a very high level of maturity and formalization of internal processes and significant investments in development and testing. Today optimized and adaptable standard serious games, known as “off-the-shelf” games, resulting from partnerships with key accounts are accessible to SMEs at lower cost. Our work was based on the reference list of CAC40 companies in December 2011. As the research progressed, companies that were subsequently quoted in the CAC40 were added to the list, until November 2013. The sample is composed of the 40 companies in the CAC40 at the beginning of the study, plus three companies that later were put on the list, for a total of 43 companies.

The range of serious games is very broad. As academic study into the subject has been conducted mainly by researchers in information science and communications, such as Amato [5] or Alvarez [3] [4], it was decided to focus the study on the managerial aspects of serious games aimed at only employees and potential employees. Advergames were therefore excluded, except those that contribute indirectly to strengthening employer brand, because they cater either to the community of fans of the brand or to a broad public outside the company. Finally, 114 serious games for the management of human resources were identified for the 43 companies selected.

3.3. Identification and referencing of serious games

Once the list of reference companies was established, data collection was conducted in four stages. The first step was to comprehensively explore the institutional websites of the companies listed. Particular attention was paid to the pages dedicated to recruitment and training practices that will prove to be key in our study as well as external corporate communications. More serious games designed for these large companies have been widely publicized in the media, which increases the volume of available secondary data and the ability to use that data for comparison. The second step was to explore the websites of publishers of serious games. Their communication relies heavily on their expertise and their key customers, which include the CAC40 companies. On their sites, these service companies list many of their achievements with functional and technical specifications. The uses of the serious games they publish are displayed prominently because of their power to attract potential new customers. Moreover, the global market for serious games is dominated by French companies, which facilitated data collection. This helped confirm and clarify some of the information obtained on the websites of corporate sponsors and also identify a large number of new games.

The third step of this exploration was to analyze the contents of several specialized community sites, which helped to complete our research. These include the site http://serious.gameclassification.com, which lists more than 2,800 games and proposes a taxonomy based on a collaborative initiative by Alvarez and Djaouti in 2008 [3].

Finally, the fourth step was a review of all articles published about serious games from 2011 to 2013. This
approach gave access to information on the projects most recently completed or still in progress. The four data sources—company sites, publisher sites, community sites, and press reports—enable the gathering of different views on the same subject in order to compare, make judgments, and clarify the results.

The cross-checking of several methods of data collection was necessary to improve the reliability of information obtained from the Internet as part of this methodology [13]. Cross-checks were therefore made between several sources, including the comparison of institutional and specialized sites. Information on the use of serious games whose source does not guarantee a sufficient level of reliability was excluded. This triangulation resulted in particular in a much greater level of detail on the various uses of serious games than the stated intentions of publishers and their clients, sometimes contradictory, ambiguous, or incomplete [16]. It is quite common that serious games are designed with a specific use as an initial target, which then changes over time once the tool is deployed or when other uses are added. Triangulated information concerning the use of serious games has resulted in a sample of 114 serious games with much higher reliability. During the data collection process, the work consisted of classifying the information obtained for all CAC40 companies and identifying the themes and objectives for using these games. The coding of the data was performed by a single researcher to ensure uniform treatment. The overall classification was gradually refined because it progressed as a result of cross-checks of data from the field and the literature.

4. Results analysis of and discussion

A list of serious games used by CAC40 companies was drawn up in order to better understand and measure their current use. These games were then classified according to their respective uses. Each use was explored based on the examples studied in more detail to illustrate the HRM practices to which serious games contribute and to better characterize each type of the serious games highlighted.

4.1. Identification of serious games used in business CAC40

The identification of serious games in the CAC40 companies shows that they all use such games, contrary to the findings of several recent sources suggesting an adoption rate of 50%. Several CAC40 companies are themselves serious games publishers, such as Vivendi or Publicis. Some have acquired or developed several serious games such as Renault, Crédit Agricole, France Telecom Orange, and L’Oréal, who each have half a dozen successful projects. The HR managers of these firms must be particularly pleased with the performance of their first games because they are continuing to invest hundreds of thousands of euros in such tools. Many companies have already been using serious games since the mid-2000s in their communication, recruitment, training, and integration strategies and in the transmission of their corporate culture. They have developed a real expertise in this area and have enough experience to be able to analyze the performance of these games and their impact on the management of their human resources [17].

The main difficulties were (1) to identify and exclude advergames for a product, therefore unrelated to HR, whereas retaining those oriented toward “employer brand” and (2) to exclude e-learning tools, which are nothing more than traditional courses available online. Finding the purpose for which each serious game was intended was also a challenge for the research process because many of them have either multiple uses with respect to the target audiences or sources consulted, a use that was not specifically defined, or had one official and one unofficial use. Based on the data collected and interviews conducted, the classification was based on the following criteria: (1) designated use, that is, the purpose for which the serious game was designed as stated by its sponsors; (2) specific use in order to distinguish subcategories and show the diversity of designated uses; and (3) alternative use, that is, the purpose for which the serious game is sometimes used in addition to or instead of its designated use. Indeed, serious games can sometimes be used quite differently from their designated use, either deliberately or as a result of gradual drift.

The categories of uses were constructed after much cross-checking between the literature and the field. The categories were gradually refined by a process of convergence, giving rise to very distinct differences between the varying types of serious games identified. The literature served as a starting point to distinguish three categories of uses. HRM is responsible for three main and complementary activities to which serious games may possibly be related. First, HRM should support “the company in order to provide the human resources it needs” [12]. This involves employee selection, recruitment, and integration. Then, after providing these resources to the company, “it develops the company’s skills through training, performance measurement, increases motivation through incentive systems and manages its progress” [12]. Finally, it is also in charge of “creating a common framework of
professional standards” and a “system of prevalent values within the company.” The aim is to define a collective culture and spread this culture, internally and externally [12].

The list of serious games used by CAC40 companies identifies three main categories of uses related to the management of human resources: recruitment games, training games, and internal or external communication games (Figure 1). Each of these three categories of uses is then divided into various designated uses for serious games, that is, the uses to which the designers intend their games to be put. For recruitment, there are (1) orientation games, such as L’Oreal’s Reveal, which enable fresh graduates to identify the roles for which they have talents and skills; (2) selection games such as BNP Paribas’s Ace Manager, involving open competition among hundreds of thousands of candidates in an international context around increasingly difficult events; (3) integration games such as Alcatel-Lucent’s Mission Tolukha, which are intended to promote the integration of new entrants, the adoption of professional tools, and business and the construction of a professional identity in relation to the position occupied.

With respect to serious games for training, four types of designated use were identified: training related to the acquisition of (4) knowledge—products, services, techniques, and work environment, such as DanFirst, which presents Danone’s products and the company’s various business units; (5) know-how—roles, expertise, and experience, such as the BNP Paribas game Starbank with its training in banking skills; (6) behavior—social responsibility, collaboration, and security practices, as in Code of Conduct, the game in which Carrefour employees can take ownership of the professional code of conduct of the group; or (7) professional development within the company, changes in the hierarchy, and career management, as in Welcome to Accor, in which employees can develop a vision of potential changes in the business’s future.

Serious communication games can be initially categorized as (8) primarily internal communication tools used to disseminate and strengthen the corporate culture through community values, fostering professional development, and creating a sense of group belonging and mainly external communication tools with three different uses, which correspond to three messages. The first highlights (9) quality and innovation in the enterprise, the second focuses on (10) social responsibility, and the third on (11) the employer brand.

Figure 1 - Typology of HR uses of serious games

4.2. Building a strong employer brand to attract talent

Serious games are a particularly effective way to market a business through viral marketing and thus promote the employer brand by making it more attractive and closer to the expectations of potential candidates. Although CAC40 companies generally do not suffer from a lack of notoriety, they are in competition with each other and with large foreign groups to recruit the candidates with the greatest potential, and some are much less attractive than others in terms employment. To improve the attractiveness and build a prestigious business reputation as a place
where it is pleasant to work, these companies use serious games, which seem to be in tune with the behavior of young graduates and exert a potent mobilizing power.

At L’Oréal, the stakes are very different: it must facilitate the orientation and selection of countless applicants. The serious game Reveal is intended for this purpose: in addition to being the heart of the group’s employer brand strategy, it facilitates the identification and recruitment of young talent. Three full-time HR employees and 200 managers were mobilized for a year and a half to design Reveal. With more than 21,000 registrations even before its launch in January 2010, among others through a dedicated Facebook page, Reveal has become a leading serious game, winner of multiple professional awards whose attractiveness to candidates from schools worldwide is undeniable with more than 70,000 players during the year, of whom 4,500 finished the game. In 2011, L’Oréal shortlisted some of its 3,300 trainees as a result of the Reveal serious game, which resulted in 185 new hires. The already very solid employer brand—consistently ranked among the best in France and in the world—was thereby strengthened and modernized, especially among Generation Y.

Serious games have thus radically changed HRM practices and improved their performance in terms of recruitment [4]. They are also new brands that create a strong interest and attract young and focused audiences with strong potential for the companies they promote. This is the objective of games such L’Oréal’s Reveal. The most talented candidates set out to take on the challenges offered to them and show that they are the best. The integration of some of these games, such as BNP Paribas’s Ace Manager, into the training programs of the most prestigious universities demonstrates academic recognition of their educational potential.

4.3. Training in products, business and good business practices

Serious games transform a daunting training program into a fun activity that generates enthusiasm and motivates participants. They have to learn in order to progress in the game, and what they have learned enables them to grow professionally. The serious game Oleen 1 (for “all in one”) is used to train Orange customer advisors. Three thousand employees have been trained to level 1 in 2012 and level 2 was rolled out in 2013. This serious game is fully aligned with the Orange corporate strategy, which places customer relationships at the heart of its sales policy toward individuals and businesses. Learners develop skills that are easily transferable to their professional practices. A training manager at Orange explains that serious games are not there to replace the face-to-face training but to complement it by adding extra elements and a new vision. These tools thus contribute to a more interactive and multimodal learning. The benefit of the game is that it can be accessed anywhere and anytime, and that once mastered, you can return as many times as necessary, depending on its availability.

In the Renault Challenge game, customer advisors have fun developing their sales skills. They compete with themselves and with others in a true virtual concession. They self-evaluate and measure their ability to put into practice the lessons learned during conventional training. They can then devote more time to the most difficult areas. Renault Academy is a division specializing in the training of technicians and sales at Renault-Nissan. In July 2008, after unsuccessfully testing an e-learning program rejected by 70% of learners, the company decided to call on the Daesign firm to create a tool for interactive training of the sales force that relies on virtual situations. The Renault Challenge simulation that was developed sets challenges related to the specifics of selling cars in order to improve performance. Unlike the e-learning platform, the serious game was very well received by dealership managers who took the initiative of organizing tournaments with one month’s salary as a bonus for the best player.

Each seller has his or her avatar interact with virtual clients, analyzing their needs and offering the best product. Another test is to look at the salesperson’s pitch and identify the mistakes made. “The sales staff love the element of challenge. They have a real appetite for the fun aspect. By encouraging the sales staff to play again and again to improve their score, you will also develop sound reflexes in terms of customer approach,” said Damian Nolan, associate director of Daesign. Sellers exceed their limits because they dare to take risks and test bold solutions, which they would not do in the real world. Used by more than 18,000 customer advisors in 37 countries and in 4 languages, the serious game Renault Challenge has had a much more lasting impact on the performance of sales consultants, especially those of Generation Y. According to a survey of users by Daesign, this new pedagogical approach is highly appreciated and has met with a satisfaction rate of over 90%. Because this type of training has proven itself in the group, Renault has launched its fifth serious game project in partnership with Daesign.

4.4. Improving life skills for greater collaboration, responsibility and safety
Collaborative work takes place at several levels in serious games. Collaboration is fundamental in team projects implemented by the players and in the monitoring necessary to increase the credibility of the game and improve the brand image of the company. Hundreds of employees were mobilized for the design of Reveal. These employees contributed to making the virtual world be as faithful as possible to the reality of the group in all its complexity, organization, culture, values, and history. In serious games such as BNP Paribas’s Ace Manager or Société Générale’s Citizen Act, collaboration is encouraged and required for play. This is one of the design objectives and represents a corporate value that banks wish to convey.

In Ace Manager, the game’s design helps the achievement of this objective: players must handle 18 cases of finance in four weeks. These cases follow on from one another and run in parallel. During the second week, players must work on four cases that combine individual wealth management with equity investment issues while tackling an innovative equipment project concerning photovoltaic generators. Over seven days, it is impossible to handle the amount of information needed and demonstrate the required technical playing alone, especially because the lessons are not suspended. The collaborative dimension is essential for players who must organize themselves in relationship to each other. In previous seasons some teams met daily and others exploited collaborative tools.

Cooperation in the monitoring itself is also crucial to the success of the game, even if it concerns a totally different dimension from that of the players. In a classroom, the teacher is able to respond immediately to questions and correct any inconsistency detected in an exercise, but the remote monitoring of 13,000 players is much more complex. The device used is designed to respond quickly and accurately to the questions raised by the teams, either during the resolution of or after the solution has been revealed. The commitment of the monitoring team is to respond within 24 hours to requests from players, whether in relation to missing elements that prevent the resolution of the case, wording errors, disputes about the results, or complaints about the scoring.

Serious games thus involve a collaborative dimension between players and between designers. Another unforeseen form of collaboration spontaneously develops between the teams and may lead to the formation of alliances. They use discussion threads on Facebook for example in order to help each other. They discuss all the solutions and provide explanations after the solutions have been revealed. A collaboration that was highly sought after and very difficult to achieve in a classroom of twenty students all sitting a few meters away from each other emerged naturally in the context of banking serious games on a global scale with essentially international teams.

4.5. Communicating institutional values internally and externally

Serious games promote teamwork, remote work, collaboration, and support, thanks to the many digital tools available: shared, blogs, virtual meeting rooms, and documents. They develop a sense of cohesion and exchange [2]. Serious games are thus integrated with the learning objectives for roles and products of behavioral and cultural aspects. They immerse their users in a universe associated with practices, processes, tools, values, and ideas. They measure and correct the participants’ reactions to certain situations and report them when they are wrong in a fun way that encourages them to improve, develop best practices, and go beyond their limits.

New information technologies create the illusion of equality between the players involved in a community: they have no age, color, beauty, sex, qualifications, or accents. The selection criteria are much more objective and factors such as appearance and attractiveness are eliminated. Player candidates are free from prejudice behind their computer screen and use their mastery of the tools as a foil. A next step could be to incite interactive communities of learners to exchange and enrich the content in a collaborative approach, as in MOOCs (massive open online courses) run by online universities. Social learning is then grafted onto serious games and collaborative behavioral aspects become the most important criteria, given that the knowledge can be easily learned.

To maximize the potential of serious games, it is necessary to implement a new form of intelligence characterized by specific skills, such as control of information technology and communication, the gift of locating oneself in virtual environments, the ability to identify and associate talent, the ability to digitally cooperate within very different sociocultural patterns, and the art of managing multiple tasks at the same time without losing productivity [2]. The future managers of Generation Y—and soon Generation Z—have developed these skills by playing video games or using web applications [21]. The new intelligence measured and developed by serious games should be stimulated, channeled, and exploited to create a new sustainable value in the form of human capital. This will be built with agility, adaptability, market timing, multicultural knowledge, interconnection, and real-time interaction with the socioeconomic environment.
4.6. A practical guide to help companies choose a serious game

The typology of serious games based on their use in HRM provides a very useful classification in mapping these tools. Beyond the scientific interest in characterizing and classifying serious games, it can serve as a guide and a manual for HR managers, who may feel lost in the face of the abundance and diversity of available options [17]. This typology can guide the choice of managers and help them implement these powerful tools for managing human resources optimally. They can thus better meet certain expectations of the younger generation at work: to make work more interesting, develop skills, create social links, increase employability, and better manage careers [21].

Indeed, thanks to this typology of HR practices of serious games, companies can capture the diversity of available systems and make a much informed choice as to those best suited to their needs. This typology is invaluable for HR managers who wish to better understand the multiple potential of serious games. They will thus be able to explore the world of serious games in order to contextualize their projects accurately and implement very precise solutions aligned with the HR strategy of the company. To better cover the entire territory of the HR function, serious games that are complementary to each other can easily be deployed and be made available via an intranet portal [17].

Regarding recruitment, the various phases of the process can be a script in a serious game. The many issues associated with these phases of recruitment vary greatly depending on the size of the company and its sector. These specific and defined recruitment strategies will guide the choice of the most suitable serious game. In training, serious games can have a significant impact. It has been found that serious games have an effect not only on knowledge and skills but also on behavior, relationships, motivation, and ambition [2].

The typology also shows that it is possible to design a serious game that can meet several requirements simultaneously. Thus, a serious game on the product training and culture of a company can be used as a means of developing the employer brand and attracting top talent. The same game can help improve business behavior and promote the integration of new employees. Potentially multiple uses of certain games can encourage managers to invest in the tools that can help them solve several problems at the same time [17].

5. Conclusion

All CAC40 companies use serious games. They seem to be satisfied because many of them are investing heavily and in many projects, despite the current economic crisis. The typology presented here is designed to better represent the various uses of these serious games and distinguish them based on the expectations of HR managers. Serious games have significantly transformed methods of recruiting, training, and integrating new employees. To compensate for the reporting bias of certain sources from which some of the data were collected, the designated uses have been associated with the alternative uses to which the games have been attributed by companies or by independent observers. The typology is a useful tool to enable companies to better understand the diversity of available solutions and select the serious games that truly meet the objectives they have set.

Serious games have a key role in promoting corporate values and culture. These fun information systems enable new practices that improve HRD performance, such as the benchmarking and capitalization of collective knowledge, identifying exceptional talent for selection or promotion, raising awareness of issues that do not usually concern employees, and the simulation of extreme situations that are difficult or impossible to re-create, such as incidents on a plane or at a nuclear plant [2] [4].

When integrated into the training process, serious games are powerful tools for fostering collaborative behaviors that seem very difficult to stimulate otherwise. These games have serious behavioral objectives because they promote knowledge sharing, collaboration, involvement, and rigor. Serious games form part of the range of human resource tools to identify and develop key skills for global managers: adaptability, creativity, agility, and interpersonal skills. In-depth case studies involving interviews and observations will enable the contribution of serious games to be better defined in the field of human resources management.

However, serious games seem reserved for large companies because of their high cost and the considerable investment in human resources necessary for their development. As the designer of In Search of Lost Data—a game that immerses learners in a detective story in order to inculcate good practices for the protection of sensitive data—the Qoveo company aims to make its games available for everyone. This company is trying to create a catalog of off-the-shelf products, for which license costs amounts to no more than 60 euros per user. In addition, the game engines can now be recycled, which considerably lowers the
costs of design. Adorned with a new script and a new virtual environment, they can be used by other companies and, in particular, by SMEs, which constitute a much larger market to conquer.

10. References