Games as Mediating Platforms in an Open and Digital World

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Abstract. The complexity of social interactions has been pointed out as challenges in studies on social development, education, cultural diversity, behavior change, and innovation. The COVID-19 pandemics highlighted important issues of our modern society, especially regarding emotional and psychological issues: humans as artificial beings disconnected from the planet, anxious for socialization, mainly through virtual worlds. Stress, anxiety, hopelessness and depression are sources of concern, while pleasure - a fundamental aspect for human life - loses space. We argue that our society needs to recover the pleasure which relies on the learning aspects of life situations as well as to rebuild the way we interact for social or work purposes. In this chapter, we propose as a challenge for the games research community, to face the sophistication that encompasses how to conceptualize, model, design, evaluate, and play games which can turn our actions in the world more playful. We primarily approach games as enablers and agents for work relations, social change and innovation in organizations, with a special look to the Brazilian context.

Keywords: Cyberdemocracy · Serious games · Digital game design

1 Introduction

"Because games make us better and can change the world". With this thought in mind, McGonigal starts her book and invites us to think about how games can change the world we live in [54].

Digital games are a branch of the entertainment industry that annually moves billions of dollars, with Brazil holding the 13th position in this market [57]. The growth of this market in Brazil can be explained by the popularization of smartphones and tablets, and, according to the 2nd Census of the Brazilian

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Digital Games Industry (2014–2018) [73], a growth of 182% of companies in the niche of digital game development in the country was identified. The importance of digital games is even pointed out in Brazilian government's strategies, such as in the Brazilian Strategy for Digital Transformation [14].

As tools for learning and virtualizing the world, the idea of translating complex interaction contexts into game environments is not a new deal. Games that support learning range from educational games used by children, to those that apply to organizational environments, military training games, advergames and newsgames, respectively for advertising or reporting on global issues [3].

However, digital games have been underused as tools for social and behavioral change. This reality begins to change with the emergence of non-governmental initiatives and organizations such as Games for Change[1] which aims to promote social development, education, cultural diversity and innovation through the use of digital games. Some of these games were produced by initiatives such as Half the Sky[2], focusing on awareness, fundraising and behavior change [30] and proposals that frequently appears in journals such as Simulation & Gaming[3]. Controversially, in several situations, games are also associated with harmful transgressions of social behavior [28].

Meanwhile, the world is increasingly connected as networks. We experience technological disruptions due to the convergence of collaboration, mobility, big data and artificial intelligence. We are also experiencing increasingly complex emerging challenges related to our own survival and the sustainability of life in the planet [58], recently highlighted with the occurrence of the COVID-19 pandemic. We have witnessed the phenomenon of social media expanding the communication channels between individuals, and ICTs being massively applied for opening businesses and public administration. The world is increasingly connected and open, bringing benefits and challenges to our society. A long list of aspects can be considered as implications of this opening: new forms of interaction, information sharing, privacy, security, values, reliability, diversity... the list is endless.

In parallel with technological disruption, we watch society getting sick. Stress, burnout, anguish, anxiety, depression, panic syndrome, among other situations of imbalance affect a large part of the world population, to the point of being included by the World Health Organization in the International Classification of Diseases (ICD) [59].

New teaching and learning methodologies, such as Transformative Learning [82], advises for the need to develop attitudes (so-called soft skills) for the development of important characteristics of personality, sociability and human action - ethics, resilience, commitment, collaboration, leadership, etc. The documentary *Tarja Branca* [66] brings a beautiful denunciation of how much humanity has become serious and, by separating the act of working (conquering) from the act of playing (pleasure), we have become sick, artificial and disconnected from the

[1] http://www.gamesforchange.org/.
[2] http://www.halftheskymovement.org/.
[3] https://journals.sagepub.com/home/sag.

planet. The documentary makes clear the urgency of playing, of reconciling the act of playing with the act of living, producing and acting in the world. But how to do it?

Life is a continuous learning process. According to Koster [46], the human being is a learning machine and, in order to learn, he/she needs to be stimulated since our birth. The act of playing is a simple way for a child to start with: they set goals, play and, while playing, they learn useful skills for their life [38]. However, at some point, given the complexity of everyday life and the economic, social and cultural pressures, we put challenges and games aside, get more and more serious and start "playing to survive" in the world.

We propose as a challenge for the game community, in particular for the Brazilian Scientific community, to design games which promote gamification and pleasure in our actions in the world, reconciling "play" and "work", using digital games as platforms for social interaction in distinct contexts of human activity, considering the open and increasingly digital world we live in. We describe this challenge from the point of view of a conceptual vision of cyberdemocracy and open world premises, approaching games as platforms for work and social change, as well as their potential to innovation. We start our endeavour by focusing on work and social relations inside organizations as well as their openness to the outside environment.

The chapter is organized as follows: Sect. 2 details the concepts that ground the proposed challenge; Sect. 3 discusses the challenge relevance; Sect. 4 details the challenge and its sub-challenges; Sect. 5 discusses ideas for monitoring advances towards the challenge goals; and, finally, Sect. 6 concludes this chapter.

2 Conceptual Background

2.1 Cyberdemocracy

The Information Systems Brazilian research community has settled down as one of this community's research challenge the case of how to cope with conceptualizing, building and providing information systems which promote broader and massive collaboration, knowledge management and participation [13]. Araujo [8] highlights the importance of regarding the new requirements brought by the open world to information systems specification, design, implementation and evaluation based on the epistemological view of cyberdemocracy, a conceptual view to approach these systems as digital ecosystems; a pragmatic view to describe and understand their dynamics by understanding their processes; and the desired implications or impacts on these systems' behavior and mindset through mutual accountability.

Cybernetics [84] is the interdisciplinary study of regulatory systems structure (physical as well as social systems) and is closely linked to control theory and general systems theory [12]. Complex systems affect their external environment and then adapt to it. In technical terms, they focus on control and communication functions: both external and internal phenomena from/to the system. This ability occurs naturally in living organisms and has been imitated in

machinery and organizations [80]. Cybernetics is the science of control, the science of governance.

The concept of Democracy is usually understood as a government model where the power of making important political decisions comes directly from the citizens, or in its most usual form, through elected representatives [72]. Democracy refers to a set of cultural and historical processes and has a difficult definition, grounded on the notion of a political community where all people have the right to equally participate, debate and decide on political processes and, in the modern sense, in which certain rights are universalized from the principles of freedom of expression and human dignity. The concept, although closely linked to legislation and constitutionalism, is not limited to legal equality, and also depends on democratic access (i.e. the same for all) to spaces and social benefits. Democracy is a socially constructed concept, based on the creation and preservation of rights, where conflict is legitimate and necessary and sovereignty is popular, not belonging only to the ruler [15].

Based on these two concepts, Cyberdemocracy is understood as the assumption that in a digitally-enabled open world, information sharing and reconfiguration performed by individuals provide collaboration, plurality, empowerment and governance. The idea is that the more we produce, deliver and share information, more "intelligent" (in the sense of governance) and conscious the society can be. Cyberdemocracy can be seen as the intelligence that arises through the possibilities of public opinion and empowerment with the use of technology, leading to better levels of social and organizational systems governance. The relationship between communication (social power) and technique (power of action) is the basis for this new political dimension, providing each individual connected by technology a new relationship with space and time, a new dimension of collectively living [49]. Cyberdemocracy is a term that brings together the great aspects of contemporary society - connected, convergent, informed and collaborative - and the great challenges faced by organizations to follow it. Cyberdemocracy points to the challenges of these new ecosystems that involve citizens, institutions public policies, technology, information, practices, policies and processes [5].

2.2 Serious Games

In general, games focus on the player's entertainment. However, they can also be innovative tools for socialization, education, reflection, and training [55]. Games used for these purposes are known as "serious games". According to Abt [1], serious games design considers "serious" contexts (reason of the name), i.e., contexts committed to educating and training people instead of just entertainment.

Michel and Chen [55] reaffirmed the concept of serious games proposed by Abt, arguing that these games have the primary purpose of teaching players something beyond entertainment. It does not mean that these games should forget entertainment, but the real goal is in the message that the game will transmit to players and how that message will influence them in the real world

[67]. Therefore, the word "serious" does not imply a dull game, but it refers to the purpose and reason for creating the game [71].

In Petridis et al.'s studies [62], they concluded the existence of the potential to use serious games to improve the efficacy of formative programs, to increase organizational productivity, and to solve problems. To become more effective as a learning or training tool, serious games must not only fulfill learning or training requirements but, they should follow the domain competencies and give feedback to players in real-time [67].

There are different types of serious games categorized by their purposes and contexts [69]. Among the most known genres, Alves [2] highlighted: advergames; edutainment; game-based learning; newsgames; training and simulation; persuasive games; organizational dynamic; games for health; art games and militainment. Each of these genres represents distinct purposes, but all of them have the feature of communicating and/or teaching something, encouraging thoughts, opinions, attitudes, and persuading players. In this sense, movements like *Games for Change* argue in favor of these games as timely tools to social change in many contexts (educational, political, philosophical etc.) [4,31,39].

Independently of the context, when designers think of a game for reflection or teaching something, they are proposing new ways of learning, facing and overcoming challenges. Thus, as researchers in games and players, we envision the possibilities of games to change work and social relations in organizations, turning them more amusing, humorous and fun [31,39].

2.2.1 Serious Games Design

In the begining, game design was just a matter of coding games [9]. Designers had no formal and systematic support to game design. They just "codified" them. Through the years and more recently, the game industry has been worried about formalizing specific game design processes as well as optimizing their production [9]. However, those game design processes are put aside by game organizations due to its complexity [9]. What we know about game design processes are experiences and steps reported by game designers and researchers such as Salen and Zimmerman [74], Fullerton [34], Jesse Schell [76], and other authors.

Traditional approaches to support game design for entertainment follow steps such as conception, documentation, prototyping, production, programming, tests, and delivery [34,74]. However, these activities may change depending on the target audience, goal, marketing strategy, financial resources, and other organizational needs. It is still a great challenge to the games research and practice community on how to define effective approaches to support digital games engineering [53,60]. Literature describes different proposals for supporting serious game design. For instance, the DPE (design, play, and experience) framework [85] focuses on the relationship between how players overcome game challenges and the resultant effects that they learn and feel from playing the game. Siriaraya et al. [81] presented the PGD (persuasive game design) model for persuasive purposes, which composes a set of components, tools, and elements for the game design task. Classe et al. [25] developed the Play Your Process (PYP) method to

support the design of business processes-based digital games, through systematic mapping of business process models into elements of game design.

Although we can find many serious game design proposals in literature, there is still ground for researching the theme, basically because of the diversity of application contexts and learning, understanding or changing behavior objectives [81]. The main challenge in any serious game design process is knowing and understanding the game application context and how to represent it as game elements. People involved in serious game design (artists, designers, programmers) must learn about the application domain to be described in the game. Therefore, to design a serious game, the development team must think about the expected learning goals and continuously care about them during the game design [42].

Another important issue is how to evaluate serious games. Designing these games is complex, and it is hard to say that they deliver the right message to players [10]. Many proposals consider serious games assessment and evaluation, such as [33] or MEEGA+ [61].

2.3 Business Process-Based Digital Games

Business process-based digital games are games with a purpose that present a business process in a playful, funny, and engaging manner, and that allow players to understand and learn how the process works, as well as to develop an awareness of the process objectives, practices, values, challenges, and limitations [18,22,63]. The *Play Your Process* method was developed to carry out the design of business process-based digital games and is fully described in [22]. It organizes the whole business process-based digital game development through game engineering concepts, guiding game designers from the game conceptualization to evaluation, starting from a business process model. The key activity in the method is the possibility of semi-automatically translating elements of a process model into game design elements, making the game design directly adherent to the process definition.

A business process-based digital game is, to some extent, an "adventure game" where players can effectively "play" the adventure of performing the organizational process. For example, consider the process model depicted in Fig. 1, which describes part of the process conducted in a Brazilian police department for finding missing persons, comprising case analysis, and its inclusion into the police department information system. To design this process as a game, the method guides the designer to map process elements into game elements: events ("Missing person reported", "Answer Closed", and "RO is sent") as start and winning condition of the game; actors ("Citizen" and "Police Station") as characters or scenarios in the game; activities (e.g., "Person Welcome" and "Case Analysis") as game tasks or phases; resources (e.g., "ROWEB" and "Documents") as tools or achievements in the game; and rules and decisions in the process into decisions in the game.

Following this process mapping activity suggested by the method, it is possible to build a game to allow the player to go through the process execution as defined in the model like an "adventure" game, and eventually, to learn about

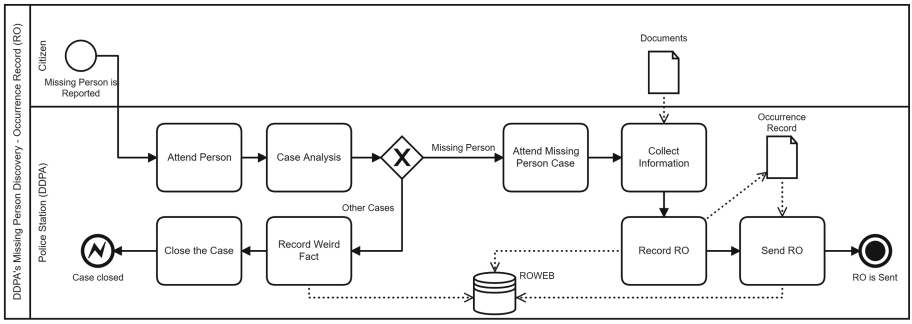

Fig. 1. Example of a business process model (Missing Person Discovery's BPMN Model).

the process designed in the game. The game designed using the method for the process depicted in Fig. 1 is described in [16].

Other activities besides process-game mapping are required to complete the game design: to understand the process context, aims, and expected organizational results (context analysis); to create the game concept where designers use their creativity to create an enjoyable game by defining its mechanics and aesthetics game project step; to work on prototyping and development, evaluation and publishing.

2.4 Values in Digital Games

Values are the moral and ethical principles that guide a person's life [36,70,77]. The idea that values can be incorporated into systems and technical devices (artifacts) has been the target of various approaches to studying technology, society, and humanity. In an ideal world, technology should promote not only instrumental values (efficiency, safety, reliability, and ease of use) but also social, moral and political values to which societies subscribe, hence, those who design systems have a responsibility to take these latter values into account [32].

Kheirandish et al. [44] discuss the role of values to design activities, highlighting the importance of having a list of values as a reference to supporting designers in identifying the relevant ones to be included in their target products. They developed the *HuValue* - a card-based design tool to help designers consider human values at different stages of the design process. Horn [37] argued that games are cultural artifacts that reflect designers' values and may reinforce or challenge players' values. These aspects give games the potential for social change and make us reconsider our relationship with the world. Darzentas and Urquhart [24] point out that game designers and players, as citizens, need systematic critical reflection on social, ethical, and political issues and games are a good starting point for framing and provoking critical discussion around values, being both cultural and educational tools.

Considering values in game design, the work of the American writer and game designer Mary Flanagan is noteworthy. Flanagan has dedicated her career to studying alternatives for game development that can add positive values - both for those who design the games but mainly for those who play them [32]. To address human issues in game design and promote the inclusion of values in design practice, she developed, together with Helen Nissembaum, a methodological framework, called Values at Play (VAP), or "Values at the Game", to promote the integration of values in the design process [32]. One of the essential features of VAP is the card game Grow-a-Game (GaG) [11], a brainstorming tool that helps designers incorporate values into their projects.

The use of cards as a way to identify relevant values for a game is also explored by Kheirandish and Rauterberg [45], in the *HuValue* tool; and by Raftopoulos [64], who presents a set of card-based tools to assist in the gamification design process for business, products, and services. Cards are used as a common tool for discussing values because many designers search for finding a balance between their values, those of users and other interested parties, and those of the surrounding culture. Therefore, it is essential to have a set of values to start with, and to decide which value must be designed in the game is only possible through an interpretative, collaborative, and brainstorming activity.

3 Relevance

When analyzing the research tracks of the Brazilian Symposium on Digital Games and Entertainment, (SBGames)[4], since its first edition in 2004, we will find tracks concerning games applied to complex contexts ("In2Games" and "GameArt" tracks). New tracks emerged in the following years: "Culture" in 2007; "Games For Change" in 2010 (closed in 2013); "Education" in 2018; and "Health" in 2019. This dynamics show how games in context have been considered as important to the research and practice in games.

As mentioned before, this challenge proposition is also aligned to the research challenges described by the Information Systems academic community in Brazil, particularly when examining the open world and cyberdemocracy principles - transparency, collaboration, sharing and empowerment [8]. In a world where transparency is a watchword, where diversity is considered a need and innovation and multidisciplinarity are key to solve complex global problems that anguish our society, this world must be open, connected, accessible, and its main actors (individuals) should be able to get organized without a previous predicted plan [78].

Business and organizations will keep themselves competitive if they learn how to manage their collaborators and internal processes in this new scenario, connected and open. In the meantime, the organizational internal environments need to cope with new forms of collaboration and interaction using technology, to guarantee the execution of work and business processes which comprise more

[4] Análise das trilhas nos sites dos anos anteriores - https://www.sbgames.org/.

simple, less bureaucratic tasks, performed with more autonomy and quality, highly connected to the external environment (clients) needs [68].

Our proposal is to reconcile these two visions to address the challenge of how to build innovative platforms for human interaction based on games, transforming everyday activities mediated by digital systems and tools into games, expanding connection, dialogue and pleasure.

4 Challenges

We propose to the scientific research community in games to join efforts to investigate how to expand everyday interactions within organizations and among organizations and society using games (Fig. 2). How to make individuals, society and institutions cooperate, look for essential communication aiming at the construction of an effective sharing process towards a common objective? How to manage permanently connected individuals which are both information providers and consumers, disconnecting them from old organizational interaction spaces (usually based on confrontation), to new spaces of community bond between them and with the organizations? How to strengthen the ties between organizations and people (workers, clients and citizens) as supporting actors in its governance, aiming at continuous improvement?

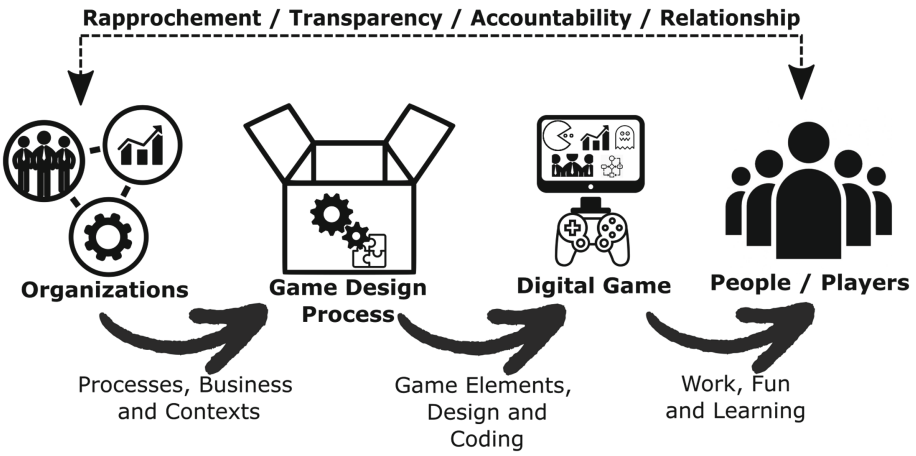

Fig. 2. Organization, games and people

The dynamics of the modern world have resulted in increasing the intricacy in the relationship among politics, economics and the media, making it challenging for people to keep up with daily events and react appropriately to changes in organizations and society. These complex contexts have brought barriers, for example between citizens and their representatives, where communication between them is minimal or distorted. Looking forward to shorten these

distances, one step could be to try to make these complex contexts, political, economic, social, etc., minimally known and understood by individuals within the society [7].

We summarize the challenge as: **how to conceptualize and design games in order to expand mutual understanding between actors (society, clients, citizens, workers, organizations, regulators, etc.), particularly the understanding of complex organizational or social contexts, access to information, interaction and innovation, in a world increasingly connected and open**.

The design of these games must be based on the social, economic, cultural and educational contexts of the target players. Regarding individuals who have no technical skills, games must bring a simple language to allow easy dialogue with the players, make them understand the game, and associate it to the world they live. The potential use of these games need to be explored, analyzed and evaluated by society and institutions, which will bring to light relevant contexts as well as real organizational issues, and possible solutions including innovation and social entrepreneurship. We understand that this is a broad challenge, however, we direct our initial efforts to the Brazilian scenario.

This challenge comprises "sub-challenges", which were observed from insights and gaps in our research programs, as well as within SBGames (the Brazilian games research community), and in international forums. Each of these sub-challenges are discussed below.

4.1 Digital Games to Understand Organizational Processes

Games can be introduced in private or public organizational environments. In these contexts, games are usually associated to the possibility of promoting workers motivation, stimulating them to search for alternatives to improve the efficiency of organizational processes [48,52]. We argue that games can also be used to enable participants outside the organization (clients and citizens) to understand how the organization perform their processes in order to provide products and services, considering the inside context, obstacles, particularities and challenges [19,21].

This challenge can be summarized as: **how to carry out the *design* of digital games describing organizational contexts and processes, faithfully and efficiently, so that players (clients, citizens, workers) can understand the organizational functioning and to contribute to quality improvement?**

If we consider, for example, public organizations, digital games can be used to help citizens understand how the public organization performs in order to provide them a specific public service [26,63]. Simulation environments supported by digital games could be helpful for citizens and public administrators to experiment new possibilities and alternatives to public policies or service provision, allowing mutual understanding, quality improvement and innovation [83]. Games can be a "two-way street" where citizens can understand the organization and the organization workers can understand citizen needs and expectations.

Designing games in public contexts is a unique process when we take into the account that the game elements should simplify distinct and complex aspects such as social interactions, regulation, organizational rules and culture etc. It is also necessary to take into account cultural and social aspects of citizens, their values (ethical, moral, civic, legal, etc.), and bring them into the game design [25].

The Brazilian government and its institutions have performed significant legal and operational efforts to improve public service delivery. As a consequence, most public institutions nowadays provide basic information about their services online[5]. However, great part of these initiatives concerns possibilities with limited interaction with citizens (document download, filling forms, "talk to us" etc.). Owing most likely to process complexity, information available on the website is kept to a minimum, consisting of a brief service description and facilities to schedule an appointment. Brazilian citizens still have limited interface channels with the public bodies and to obtain information about services. Classe et al. [26] suggest the use of business process-based digital games (Sect. 2) in this context, as an alternative for explaining citizens how public services are provided. The idea is not to show just the service delivery aspects that the citizen already knows, but its internal details: rules, activities, actors, resources, bottlenecks, etc.

To illustrate this idea, let's consider one game designed for this purpose in the context of our research group: *The Missing Person Game*. The missing person discovery service is performed by the police department in Rio de Janeiro, Brazil. As reported by the police representatives at the Missing Person Police Department (DPPA), the service and its steps are usually unknown by the citizens, which leads to confusion and disappointment in service provision. The process modeled in Fig. 1 was used to design the game. The game narrative follows common cases the police department faces, like a missing boy who got lost in the subway while going to school. The game puts the player into the role of a police officer at the police department (Fig. 3A), and he/she must correctly perform the process tasks. At the same time, he/she attends to different citizens reporting missing persons. The game allows the player to experience the process used in the police department, considering the resources available to perform the process and facing the process challenges and difficulties. The cases that must be solved are based on real-life situations described by the police department staff, leading the player to contact with several social issues involved in the process (missing children, the elderly, mentally-ill persons, and criminals). The game is over when the player cannot solve the case in a specific timeframe or the character gives up the service. The player must collect information about the missing person. As in the real process, the officer must calm down the citizen while he/she tries to get enough information (e.g., ID, address, eye color, skin, birthmarks, and clothes) to find the person as fast as possible (Fig. 3B). The player must use the resources available for performing the tasks, such as information systems, and face frequent problems while using these resources (for instance, finding the password to access the system). Player success in the game comprises finding the missing person by performing the right task.

[5] https://acesso.gov.br/.

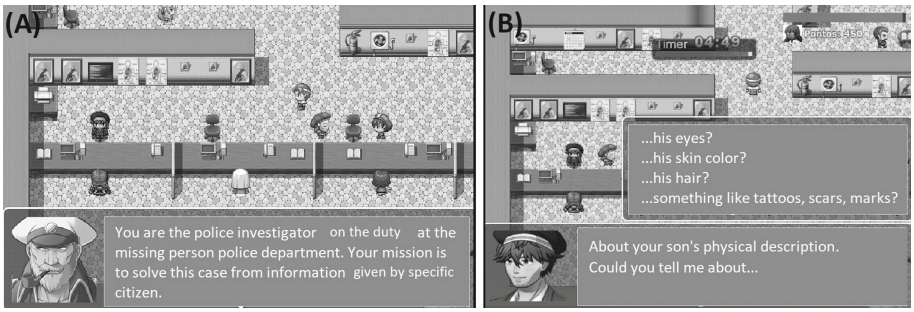

Fig. 3. A) Game introduction telling the player that he/she is the police officer and the aims in the game. B) Police officer investigation: requesting a physical description of the missing person.

Focusing private organizations, games can be used to add value to products and services, disclosing to customers relevant aspects of the production process. Additionally, they can be used as platforms to change work interactions within organizations, balancing work and pleasure. One possibility to find this balance is discussed in [52] and [79], proposing the use of business process-based digital games as tools for business process training. To cope with the design of games for this purpose, the authors propose the *PYP4Training*, a variation of the game design method *PlayYourProcess* regarding training objectives [51].

To illustrate this idea, we describe the *Mediador Game* [79], designed in the context of The Judicial Centers for Conflict Resolution[6], agencies responsible for carrying out and managing judicial conciliation and mediation sessions. Although it is a public context, the conflict mediation process was a first attempt to design business process-based digital games form process training. The conflict mediation process comprises the selection of agents to hold mediation sessions, where parties can discuss and solve the existing conflict. The *Mediador Game* comprises the activities of scheduling a mediation session and the selection of mediators. This selection of mediators is important given that the success of mediation depends on their experience and knowledge.

The study highlighted the importance of addressing the training of the actors who assume the role of secretaries, since the turnover for providing this service is high. Particularly, it was observed the importance of training these actors in analyzing citizen's requests and selecting the mediator according to specific criteria. The process used for the development of the game is depicted in Fig. 4.

[6] http://www.tjrj.jus.br/web/guest/institucional/mediacao/cejusc.

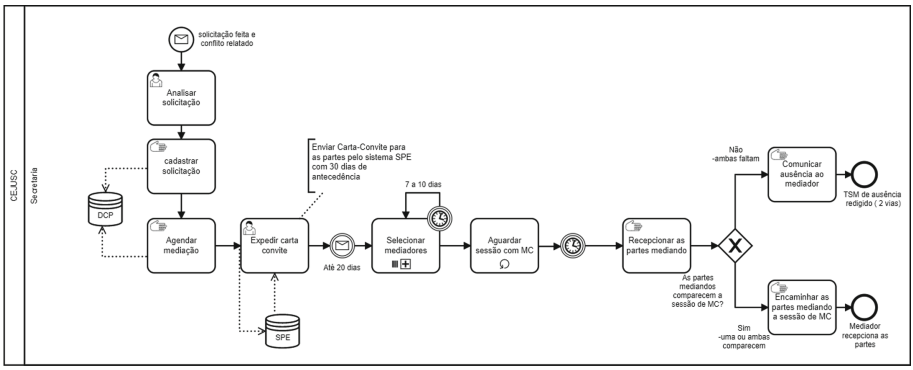

Fig. 4. Mediator selection process

The game puts the player in the role of the secretary who receives different conflict resolution requests and need to perform all the activities to select the appropriate mediators and to schedule a conflict resolution session with all the involved parties (Fig. 5).

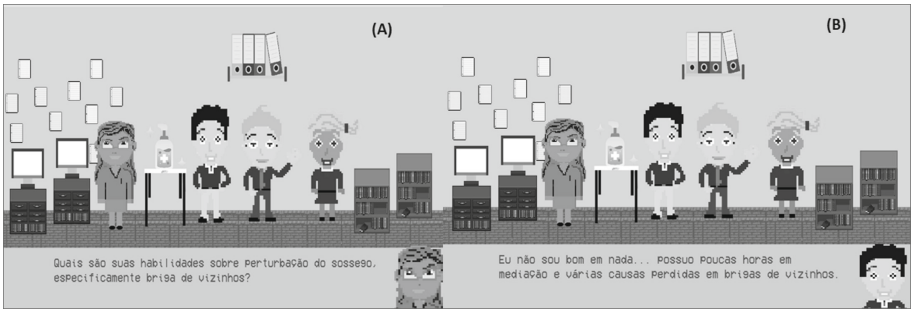

Fig. 5. Mediator selection

The design of business process-based digital games for understanding organizations comprises a set of challenges: **Methodology:** Improvements on methodologies for building games to explain and understand organizational complexity are mostly welcome. Play Your Process is just one proposal, grounded on the assumption that organizations benefit form business process management approaches [27]. Another approach is the proposal of how to systematize business process-based interactive narratives, showing business process models as games in interactive fiction style [29]. **Evaluation:** Digital games evaluation is an important matter in the game research community. The evaluation of the kind of games we propose in this challenge is still an open research issue. The question is how to objectively evaluate if the organizational context is correctly represented

in the game, if the players were able to learn and if their learning impacts the organization performance and changes social and work relations. **Supporting tools:** Designing the games proposed herein requires and brings many opportunities for the development of design supporting tools: game modeling, automatic translation of organizational models to game elements [17], narrative design tools [29], new game design documents and even specific game engines [43]. **Continuous change:** Organizations change continuously and fast, pressured by market competitiveness or innovation. Game design is a time consuming task what may hamper continuous delivery of new versions of the game whenever the organizational process change. It is important to think about approaches to keep the game design frequently updated upon organizational change. **Game design viability:** organizations can model a business process in several levels of complexity. Depending on the process model complexity, designing a game based on PYP can be an arduous task. Thus, it is essential to discuss the viability of this approach. To what extent it is valid, and to what it is not.

4.2 Digital Games, Open Data and Accountability

Information transparency is a determinant factor in building democratic environments. Its definition relates to information availability truthfully and straightforwardly and allows society to audit for governmental acts. Usually, information transparency relies on the relation between the information publicity of governmental actions and the society's role in supervising the public actors [75].

In Brazil, some laws aim to increase public transparency. The Information Access Law[7] allowed society to access public accounts, see the personal spending of public actors, follow the government's public works, and enable citizens to supervise governmental actions. Although this law aims to publicize governmental data, not even the information is simple. The governmental institutions deliver raw data (tables, texts, and others), and outside people (usually ordinary citizens) can not understand them [35].

In terms of game design, transparency information can be helpful to build games as informational tools that help society to people supervise the public spending. By playing these games, citizens could know that public money is applied, investigate irregularities, and complain to regulatory institutions. All of those actions performed inside a virtual world [65].

Therefore, we can summarize this **challenge: how can we use open and public data to design digital games that support information transparency and accountability?**

To illustrate the idea, let's imagine the scenario that a public institution publishes all data about maintenance in the city's streets (resurfacing, illumination, sewer treatment, and others). In this context, just data availability is insufficient for the society to supervise if the work is or was concluded because usually, they do not know the origin, the validity, or the meaning of the data.

[7] http://www.planalto.gov.br/ccivil_03/_ato2011-2014/2011/lei/l12527.htm.

In this sense, we can bring this context to digital games. Using open data on game elements, we can give transparency to the public information and provide social accountability in a gameful environment.

Recent research is looking into how to design games for transparency and fight against corruption. In its findings, the study found levels to develop games to support information transparency: **Reflection games:** the main objective of these games is to provide simple forms to present open data and enable people to understand, think, and reach their conclusions about the information. **Games for behavior changing:** these kinds of games focus on persuasive concepts to present public data and call the attention of citizens to harmful situations, trying to change the people's minds about how to do the right thing. **Whistleblower Games:** these games encompass the highest level of support for information transparency. At this level, we can provide methods that allow players to analyze public and real situations and complaints with regulatory bodies. This process helps social accountability, making society the supervisor of governmental actions.

Each level has different challenge complexity. The main challenge is to make the open and public data more comprehensive for people in the first one. In the second one, the challenge relies on changing people's behavior through the game information. And in the last one, the main challenge is to make people denounce situations such as corruption or lousy use of public resources to regulatory agencies. This last one still involves the challenge of raising awareness of the regulatory agencies to consider the game denounces as serious complaints and investigate them.

4.3 Values in Games for an Open World

If we desire the design of games for mediating social and work interactions within or outside organizations, values are a fundamental issue. Technology, as a human-made artifact and used by humans, has the potential of becoming imbued with human beliefs, values and attitudes. Technology can be interpreted and adopted by humans differently from how it has been designed as much as it has the potential to change human behavior [50].

The challenge here is **how to design values in digital games mediating social and work relations**. As discussed previously in this chapter, designing values comprise i) the existence of a set of relevant values to start with, ii) a multi perspective debate on what values are important to a specific design, and iii) a method to implement these values in the game. We motivate the Brazilian research community to work on these three aspects, regarding different domain, business and social contexts.

Take, for instance, the case of public organizations in Brazil. Jansen et al [20] developed a set of artifacts to cope with how to design values in business process-based serious games for Brazilian public services. They developed a card deck named VAPBr[8] (Fig. 6), containing specific values for public services based

[8] VAPBr: https://ciberdem.mack.com.br/wp-content/uploads/2020/03/VAPBr-Cartas-e-Regras-Ciberdem-1.pdf.

on Brazilian legal documents and national guidelines for public service delivery, searching for explicit or implicit values in Brazilian democratic culture and practice. The Brazilian Federal Constitution[9] (BFC), the country's main democracy letter and the Federal Government's Digital Governance Strategy[10] (DGS) were the main references for building VAPBr card deck. The same authors suggested the use of narratives as a way to introduce values in these games [40]. They propose the PYP-VBr[11], a method for discussing and selecting relevant games for public processes-based digital games using VAPBr and for implementing theses values using narratives, particularly those narrative styles attached to the Brazilian culture.

Fig. 6. VAPBr cards examples (in Portuguese)

What different sets of values should be proposed by the research community as tools for designing games in specific work and/or social contexts? What different alternatives for designing these values could be applied to build games as mediating platforms in these contexts?

4.4 The Paradox of Games

In spite of the fact that we do believe that games can change work and social relations and bring fun, pleasure, collaboration and learning to our lives, we would be very naive to assume that games have only a positive side. As discussed by different authors [47,50], technology brings no neutrality in its inception and will be interpreted by humans and probably differently used from what had been imagined for its purpose. Digital games are not different on this matter. There

[9] Brazilian Federal Constitution: http://www.planalto.gov.br.
[10] Federal Government's Digital Governance Strategy: https://www.gov.br/.
[11] PYP-VBr: https://ciberdem.mack.com.br/index.php/metodos/.

is a lot of debate on how games may be agents of violence and prejudice as well as blamed for damage to health, emotions and social life.

It is also worth to discuss how humans can change technology use according to their needs, desires and expectations. Take, for example, the population of China being submitted to a social credit system based on gamification concepts [41] and the human potential to "play" and trick with technology [56].

We strongly suggest our research community to adopt system thinking, socio-technical approaches and multidisciplinarity as key to the future of game design research, amplifying the scope of our research to go beyond the technical side of game design [6,23].

In this sense, we do not know yet to what extent games will be able to improve people and organizations' relationships. Approaches, metrics and methodologies for this purpose are still unknown. Therefore, we understand that assessing the impact of games in this context is part of the challenge for which we invite the research community to join with us.

5 Progress Assessment

The assessment of the challenges progress is possible through covering research initiatives, programs, projects and their outcomes in the research community. First of all, it is crucial to motivate and follow the sound adoption of theories and research methods to cope with the sociotechnical nature of the research in games as mediating platforms for work and social life. Another important aspect is to observe the results on development and evaluation of games in different organizational contexts. We could also monitor research indicators related to the use of games in complex contexts (ex. number of scientific publications in conferences and journals); results on technological diffusion (ex. intellectual property and technological artifacts); projects and initiatives related to games for complex contexts (ex. funding, number of projects, non-profit initiatives, academic courses, events etc.). Additionally, it is important to motivate innovation, consulting and technology transfer projects between universities and industry on the theme. Moreover, we understand that monitoring proposals from the game industry, governmental organizations, and society is necessary. New business opportunities involving complex contexts can arise from the "social entrepreneur" approaches, even games created by citizens or external clients.

6 Conclusion

This chapter presents challenges addressed to the scientific game community to reflect upon, understand, model, design, play and study the adoption of games to promote the gamification of our actions in a open, interactive, and digital world. Our motivation comes form the growth of game research in different fields, such as education, health, culture, industry, society, etc. We also experienced the arising and growth of a "game culture" from mobile devices, wearables, and e-sports.

When we treat the challenges proposed in this chapter, we will be attempting to use the potential of digital games as social interaction platforms, probably improving communication, organizational transparency, accountability, interchange of experience among people and innovations in distinct contexts. The design of these games can translate the bureaucratic contexts, which are sometimes incomprehensible, into a more playful language. It may have the potential to improve satisfaction while people better understand and interact the context they are in.

We invite the Brazilian research community to join us in this effort and to walk closer to MacGonigal's ideas: we could change the world through games once they bring us to the most powerful state of knowledge building, our act of play.

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