

PROJECT | Essays and Researches

PRO-INNOVATION

PROCESS PRODUCTION PRODUCT



Giuseppe De Giovanni

Francesca Scalisi

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Edited by
Giuseppe De Giovanni
Francesca Scalisi



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THE IMITATION GAME

THE GAME AS EXPERIENCE OF A SUSTAINABLE PROJECT

Alessandro Rogora^a, Paolo Carli^b, Alessandro Trevisan^c

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ABSTRACT

For a long time now, the game has been proposed as a way of interaction between designers, planners, citizens and public administrations to facilitate shared choices in the processes of transformation of the built environment. The Imitation Game research, funded through a competitive call for tenders within the Politecnico di Milano – Dipartimento di Architettura e Studi Urbani, for the assignment of the Fondo di Ateneo per la Ricerca di Base (formerly FARB), deepens and applies this approach to the specific topic actions on the territory oriented towards deep sustainability objectives, where the framework of environmental resources available is clear by applying the logic of role-playing and simulation games and verifying their effectiveness for sharing sustainability design choices that require significant changes to lifestyle of the players. The research, still in its initial phases, allowed a first definition of the areas of interest and a survey on the state of the art of the Serious Games.

KEYWORDS

gamification, edutainment, sustainability, environment, role play

Why would it be useful to design a game on sustainability? What is the value in choosing a game? And what does all this have to do with sustainability and architecture? In the last 20 years, but in some countries since well before, the Cosplay's phenomenon¹ has developed quickly, firstly in the bunch of role-playing games (table and live), then in that of Manga² and then in the ones of video games, both classic and online (Ito and Crutcher, 2014; Fig. 1). It is a very curious phenomenon that gives life to a very particular identity-producing group, in which normal people impersonate fictional characters: middle-aged men dressed as epic Marvel heroes, with the same haircut and beard, the same posture and attitudes, but also young ladies who mimic Japanese animation icons. Sometimes it is easy to find entire families – strictly in costume – including children, who seem to have fun as much as adults.

Similarly, we discover the existence of other occasions in which dozens of strangers meet in the countryside to animate a role-playing game with clothes, weapons and medieval equipment. Role-playing games in which the preparation of the costumes can take up for a few months and certainly with high costs, for unsuspected people with different jobs and education. Role-playing games and/or simulation games may arouse a little the interest of people and the general public, but they are undoubtedly fascinating

for everyone from the point of view of the transformation from a virtual and dreamlike experience to something incredibly and absolutely real: an experience from which players come out dirty and tired but smiling, talking to each other in first person about the heroes they impersonate and the simulated battles like real battles between medieval knights in which they really fought, for which they prepared for a long time and from which they gained experience for subsequent representations.

If all this were not enough to answer the first question enunciated as incipit, then we can quote the Tomorrow Today Report (UNESCO, 2010, p. 4), which clearly states that, in order to achieve sustainability goals, the only actions conventional cannot be enough: «Reaching sustainability will require more than legal frameworks, financial resources and green technologies, it also needs us to change the way we think – change that can best be obtained through education», for this reason it is very important to introduce new methods and possibilities for the technical-scientific dissemination of the issues of sustainability and environmental protection. But why through the game? In this case the answer is already found in ancient Rome thanks to the motto ‘*ludendo docere*’, a trick that in real life every good teacher knows very well.

The Serious Games, although nowadays considered mainly in a digital sense, were born in the first half of the twentieth century as strategic board games of war simulation. These are games that not only have a playful purpose, but that instead revolve around educational elements aimed at creating an effective and enjoyable training experience. In the last 20 years they have developed a lot, mainly in the field of video games, but in the wake of these also in the field of table games and role play games (Viola, 2015). On the other hand, the world of ‘serious and formative games’ is really complex, as shown in Figure 2, where the main game families belonging to the principle of ‘*ludendo docere*’ are shown in a Venn diagram. In our case The Imitation Game belongs to the family of Serious Gaming, where – as we will see better later – our game produces a real modification of reality through concrete actions in a real context, however simplified.

Digital game-based learning, e-Learning, Educational games, Edutainment, Games for change, Persuasive games, Social impact games: they are all synonyms of what we could call games «designed with a purpose that goes beyond mere fun» (Ouariachi Peralta, Olvera-Lobo and Gutiérrez-Pérez, 2019, p. 2). Because of this taxonomic difficulty, an online collaborative portal was inaugurated in 2011, designed within a project of the University of Toulouse (Damien, Alvarez and Jessel, 2011) for the multi-criterial classification and knowledge about serious games: from online ones to the table ones up to the role-play ones/LARP (Live Action Role Play) through the most disparate themes and genres. The genre, the support and the public change a lot between the different serious games, and it is difficult to detect a clear differentiation from normal entertainment games, since the formative aspect is often determined by the use itself that is made of it. For example, even the interactive virtual simulation can be considered serious game. The common denominator is in fact to develop skills and competences by the player that can be later applied in real contexts (Fig. 3).

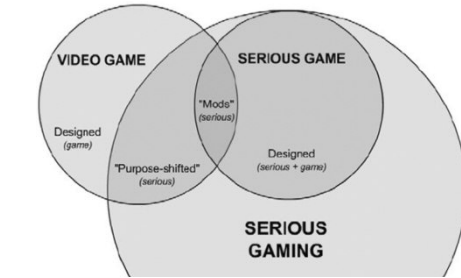
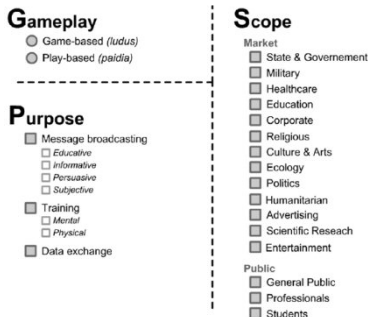


Fig. 1 - A young man performs the Marvel's super her Wolverine at San Diego Comic 2015.

Figs. 2, 3 - Relationship between video games, Serious Games and Serious Gaming; Printed representation of the Game/Purpose/Scope model (credit: Djaouti, Alvarez and Jessel, 2011).

Fig. 4 - Area of the Municipality in Rescaldina (urban area only) and satellite view showing the situation even outside the dense city area with the presence of wooded areas.



Furthermore, the Serious Game market is booming, as the North American growth forecast for this sector shows, from 3.2 billion dollars in 2017 to 8.1 billion in 2022; or the enormous number of arguments behind the numerous serious games produced in recent years and the relative scientific research works that try to frame them. For example, climate change games and research work by Reckien and Eisenack (2013), and by Wu and Lee (2015); and more generally the aforementioned work by Ouariachi Peralta, Olvera-Lobo and Gutiérrez-Pérez (2019). But there are also energy games (WindMill Game, Energy 2020, Energy City), on water (Water Alert, Catchment Detox, Citizen Science), on waste recycling (Garbage Dreams, Dumptown/Recycle City, Environborder), on resource consumption (Great Green Web, Actua con tu consume), on agriculture (3rd World Farmer, Pipe Dreams), on natural disasters and resilience (Stop Disasters), and on climate change (Clim'Way, Climate Defense, Climatica, We Energy).

A game to experience sustainability – The Imitation Game wants to try something sim-

ilar, it looks for extras that feel like protagonists and first person ‘heroes’ in the game. The final goal is to transform tired employees and bored students into proactive people ready to compete with a possible future that is in our hands and in which we can become epic heroes of everyday life. In this game a bit of study, a minimum of strategy, constant application, a certain tenacity, constancy, inventiveness and a touch of madness are required. It is not possible to figure out an aseptic game comfortably played in the bed between soft pillows or on the sofa with a sweet background music; the game must be participated and the active presence of the players is necessary for the game to be effective.

Like most role plays, *The Imitation Game* floats between real experience and virtual simulations that give substance to the experience played and transfigure it beyond the spatial and temporal boundaries defined by the game and the playing field themselves (Patti, 2018). The goal of our game is to identify sustainable behaviors on a local scale by meeting current needs without foreclosing the same opportunities to future generations. The solutions experimented in the game, in addition to being sustainable by an environmental point of view, must be economically feasible and socially acceptable, that is to satisfy both every single player and the group of players as a whole. In the specific case, the goal of the game is not the ‘victory’ of a single player, but to allow experimentation and sharing of different scenarios through the adoption of alternative/sustainable technologies and behaviours.

The indirect goal of the game is instead to transform the behaviour of citizens, modify architectures, fit into the transformation dynamics of the city, work on mobility choices, change the logic and purposes of the consumer (and therefore of the industries), transform deeply the behaviours and values of society; which in some ways is not very different from saving a princess, defeating a dragon or destroying a handful of orcs that threaten our family and our village! It is essentially a matter of facilitating a process of deep metamorphosis of the player’s identity. This is one of the most important and characteristic aspects of both the game itself and our particular game (Abt, 1987). The issue on which we must therefore work is the duration of the metamorphosis of our identity and its impact on our routines and on the real world. The identity decentralization, or the ability to figure out ourselves in a role that is not our (hero, warrior, magician, sorcerer but also, in our particular case, public administrator, designer, Mayor, etc.), is a very powerful tool for educational learning precisely because it has to do with the concept of empathy. It follows that playful learning does not have the goal of notions or sectoral and disciplinary knowledge, but rather the goal of representation and modeling of the real world that allows the experimentation of new skills and competences achieved in the first cognitive phase of the rules of the game.

In the case of the game *The Imitation Game* the rules are a crucial aspect because they are those that derive directly from the work of basic scientific research. The ‘playing field’ is in fact represented by a real context – appropriately simplified – of which the geo-referenced data relating to locally available resources (energy, money, productive land, etc.) are made available in the form of flowchart. The preparation of the playing

field – that we can define the ‘story telling’ – is organized by the Magister Ludi³. The story telling concerns the method of data preparation and their presentation to the players by those who manage and control the course of the game. These elements are essential for the quality of the match and are certainly elements that influence the course of the game and the overall result. For example, for the Municipality of Rescaldina (MI), some data can be retrieved from an open data-set (see: <http://ugeo.urbistat.com/AdminStat/it/it/demografia/dati-sintesi/rescaldina/15181/4>): Population in play, 14,185 units; Playground area, 8.03 km²; Family components (average), 2.33 people (Fig. 4).

A maximum number of players is not defined, but a greater number of participants corresponds to greater detail in the description of the society. Each player represents a specific type of subject (middle-aged mononuclear family, young couple without children, large family, etc.) to which are associated profiles of energy and goods consumption that can/must be modified as the game unfolds. For each representative typology a certain availability of resources is provided: time, money and an initial reference behaviour. While it is possible to imagine an orientation of the resources available in specific directions to approach sustainability (and these choices will be simulated in terms of expected effects), the change in behaviour – to become operational in the game – requires instead the application of these behaviours in the real world. The choice to reduce the impacts on the planet shifting from a carnivorous diet to a more sustainable vegetarian diet, for example, will require that the actors maintain this behaviour for the duration of the game, in the same way the proposal of soft mobility solutions (by foot or by bicycle) will require the adoption of this behaviour for the entire duration of the game.

It is possible to involve external parties who decide to change their behaviour in the direction proposed by the player. These non-player subjects are defined as extras or passive players and are particularly important because there is the possibility of verifying the availability of real subjects (in terms of age, physical effort, use of time, etc.) with an approach that goes far beyond virtual simulation. The ability to involve third parties is called evangelization and has the aim of spreading the effects of the game and raising citizens’ awareness of the environmental effect of their behaviour. The presence of more extras that share the choices of each individual player increases the effectiveness of the choices made: the greater the number of passive subjects involved, the greater the percentage of citizens represented by the single player participating in the project will be in the game. Naturally the first simulations will be necessary to verify the ability to imitate and to represent of the model and these test matches will be carried out by the students under the direction of the research group to fine-tune the rules of the game and the description of the playing field, while the first real games will be played in a Municipality that wants to make this experience. This does not mean however that the test matches have the sole role of verifying the model; it is in fact expected that the experience lived directly by the players – and indirectly also by the passive players – can produce positive and lasting effects on their behaviour.

The rules of the game concern the ways in which it is possible to modify the availability

of some resources (time, food, material, energy, water, air, land) to approach local sustainability. Every single action and behaviour therefore, has an effect on all these resources or on their representation (money) according to specific procedures that concern each choice. The description of the playing field is modelled through geo-referenced data coming from public databases or from locally conducted evaluations; the quality of the result will obviously depend on a greater accuracy in the description of the playing field and a better quality of description of the interrelationships. But we must consider that it is a simulation in which it is not appropriate to overcome a certain level of complexity that limits – in fact – the playability. The work on the interfaces – at least in a first phase – is therefore prevalent with respect to the quality of the algorithms which will be much simplified.

The consumption profiles of each player are described by 6 sections and are therefore parameterized in terms of the effect on the group it represents. The six sections of the game are: 1) Feeding (food/type of diet; solutions and techniques for the production/transformation of food); 2) Moving (mobility and type of carrier; solutions and techniques to encourage/change mobility); 3) Living (type of home and facilities; technologies to reduce energy consumption); 4) Dressing (clothing and fashion; solutions and techniques for the production/reuse of clothing); 5) Communicate (communication and socialization equipment; solutions and techniques for improving socialization); 6) Wellness, Health, Culture, Hobbies, Sports (equipment for Health, culture, hobbies and sports; solutions and techniques for Health, culture, hobbies and sports).



Fig. 5 - Playing cards: TOP Quartet (Dal Negro 1996 by Ravensberg). The playing cards report specific values of some performances for each vehicle involved in the game; an old fashion way of organizing and making data available in a board game.

Fig. 6 - Example of consumption's distribution at the beginning and at the end of the game (Current and Goals) in two different visualizations: the first is an aggregated categories form; while the second is by single consumption categories. Note that the Infrastructure category is considered a flat rate of 25% in our game.

For each of the 6 sections two databases are available: the first is used to estimate the consumption levels for each specific section, while the second contains the indications relating to the solutions and techniques that allow you to modify the initial values for each of the sections (Fig. 5). In addition to the couple of data-sets for each section, there are 4 other data-sets related to material resources (good practices and technical solutions for: reducing consumption and producing renewable energy, reducing consumption and purifying water, waste reduction and food production) and a further 4 related to intangible resources (good practices for: the use of time, staying healthy, increasing the degree of social relations and increasing the degree of consensus). During the game each player can accumulate bonuses to increase their intangible resources (time, health, consent and awareness), carrying out training for themselves and information activities for third parties. Training activities include: reading texts, attending seminars or online training in relation to issues of local sustainability good practices, while information activities include the organization of social activities, the promotion and dissemination of knowledge via internet, the involvement of young people, etc.

Duration of the game, goals of the game and expected results – The aim of the game is to get as close as possible to the goal of local sustainability by maximizing the level of available intangible assets. Each match can last from one week to a few months; the longer the duration of the match and higher the number of players, the more likely the results and the more highlighted the conflicts and the methods of solving them. In particular, it will be possible to ‘play’ some solutions that will be very effective from the point of view of sustainability but not practicable in terms of social consensus unless there is a deep transformation of the context: for example, the construction of bike slopes to promote soft mobility. In this case the active involvement of the local public administration would allow to experiment temporary solutions to modify the road network, the other slopes, the presence of support systems, etc.

The result of the game is both formative/experiential and numeric/quantitative. On one hand we have the citizens who actively participate in the experimentation and experience the applied sustainability, on the other hand we have the involvement of the Public Administration that can quantitatively verify the results of the simulation and drives the urban transformations towards solutions with greater sustainability and higher consensus (Fig. 6). The Imitation Game research is still ongoing and funded by the Dipartimento Dastu of the Politecnico di Milano. In these months the research group is working on the definition of the rules of the game and on the research and organization of data. The first test matches are scheduled to start next autumn 2020.

NOTES

1) The word Cosplay is born from the contraction of the English terms ‘costume’ and ‘play’, and means the identification by a Cosplayer in his/her favourite fantasy character of cartoons, manga, comics,

video games or movies, imitating gestures, behaviours and, above all, aesthetic aspects through sophisticated costumes, strictly self-produced and identical to the original ones with also the same accessories (weapons, rings, sceptres, etc.).

2) Manga are, outside of Japan, typical Japanese comics, with characteristic differences compared to other types of comics (comic strips, graphic novels, etc.)

3) The term Magister Ludi is from the book of Hesse (2010). In this case the Magister Ludi is not necessarily a physical person, but the team that prepare the playing field for the game by organizing the data, making them available, defining the reports, preparing the set of general and specific rules for the game, etc.

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The beginning of the third millennium has marked a period of unprecedented change for cities, architecture and product/visual design. Over the last two decades, economic, social and environmental causes have stimulated and conditioned research and production, directing them towards substantial paradigm changes, proposing new challenges to create more smart, more resilient, more responsive and adaptive, more efficient and more sustainable urban systems, buildings and objects – from nearly Zero Energy Buildings (nZEB) to Positive Energy Architecture (PEA) – designed and built faster, with lower costs and with a positive effect on the environment, society, health and productivity: more innovative, in a nutshell. It is a common knowledge that innovation is, now more than ever, the tool needed to recover from the global economic crisis, to aim for economic prosperity and quality of life improvement, to increase productivity, to foster competitiveness, to support the challenge of globalization and environmental sustainability, both at an 'incremental' level (improvement of an already existing production process) and 'radical' (to create a new unmatched method or production system).

In this regard, the book 'Pro-Innovation: Process Production Product' collects essays and critical thoughts, researches and experimentations on the subject of Innovation in the building and design industry, which can provide some starting points for debate for the international scientific Community or show successful examples of innovation, sustainability and social inclusion. The papers are grouped into two sections (Architecture and Design) according to the scientific field they are referred to, and provide a summary – obviously not exhaustive – of the Innovation that is characterizing the beginning of this century, presenting many proposals and new points of view of the process, of its management and of the building production that indicate new paths to thread and new professionals.

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