**GAMIFICATION FOR CULTURAL HERITAGE**

**Part 1: Introduction to game and psychology**

The playful activities have always characterized the human life, from childhood to adulthood, obviously changing in different forms. The game has also evolved from a temporal point of view,till the end of '900 that is characterized by the coming of videogames and virtual reality. A videogame follows 4 essential rules that more or less are common points to any type (also found in "classic" games):

- **GOAL**: a specific goal that players will achieve by working (alone or in teams). It provides players with some sort of purpose.

- **RULES**: The rules that impose restrictions on how players can achieve the goal, limiting obvious roads, and allowing them to explore unknown possibilities. Free strategic thinking.

- **FEEDBACK SYSTEM**: The feedback system indicates how much the players are close to achieve the goal (levels, points, progress bar) and provides motivation to continue playing. The variety of feedback in videogames is what differentiates them from ordinary games.

- **VOLUNTARY PARTICIPATION**: The voluntary participation requires that every players know and accept rules goals and feedback. And being able to join or leave the game when you want make the game a pleasurable activity.

But what drives people to play? With the passing years why do videogame products have gained exponential sales despite the economic decrease in all the other sectors? We can differentiate two different types of rewards in the life of an individual:

- the "extrinsic rewards", like money, praise and a good social status, are used to find happiness outside oneself. They come from the surrounding environment and also depend a lot from others. The human being creates a sort of tolerance to them so called "hedonic adaptation” and then, with the passage of time, people always require more of it in order to achieve a sufficient level of satisfaction. That’s why many psychologists advise against it, in fact, the prosecution would only lead to a dead end and a continuous dissatisfaction.

- the "intrinsic rewards" are represented instead of positive emotions, attention to personal strengths and social connections. Through an active growth of these qualities, that leads to a consequent improvement of the person, it is activated a circle of self-motivation and self-reward "autotelic" from which a more genuine wellbeing comes.

It is precisely these rewards that are most commonly used in video games; in many of them it is obvious a "blissful productivity" or a sense of being deeply immersed in work that produces immediate results. Passing a level, solving a difficult puzzle, a game won (after several failures) brings a sense of productivity and improvement of their personal skills. Furthermore, the sense of "self-improvement" is also virtual; very often a character or avatar is placed within the game and ,game after game or after special achievements, it becomes stronger with new abilities, weapons, etc. Through specific missions (called "quest"), you get the level points or perhaps game gold. You can improve your own avatar earning points and so he will increase the level; leveling up are accessible new quests always more difficult.

Another very important point that explain why people are more and more attracted by videogames is that reality does not hold (at least for different aspects) the comparison with virtual reality. The real world does not offer the same carefully designed pleasures, the thrilling challenges and powerful social bonds that are encountered in virtual environments. Reality does not motivate with the same effectiveness. The reality is not designed to maximize individual potential and is not designed from the ground to make you happy. In the book "The reality in Game" by Jane McGonigal of 2011, several points of comparison are listed between the real and virtual worlds and the arguments on the fact that nowadays you prefer the second to the first. The reality is called "depressing", "disconnected", "trivial" and "not easily gratifying"; in fact the games test us with volunteers obstacles and help us take advantage of our personal strengths, eliminate our fear of failure and improve our chances of success, build stronger social bonds and lead to social networks more active, calling *“*epic*”* our actions help us feel rewarded when we make our best efforts.

**Part 2: Game types, ARG and Crowdsourcing**

Over the years videogames have reached a huge diversification to cater to a wider market and the needs of a very diverse group of users. Although many games are hybrids, we can make a classification into seven main categories which encompass more or less all types available:

- **High-stakes work**: fast and action oriented game pointing to the possibility of success but also to spectacular failures. (Racing games, shooters)

- **Busywork**: monotonous and predictable game (which would be boring in real life but we feel productive to do it in a game, such as "*Farmville*")

- **Mental work**: game on cognitive ability, strategy games, puzzles, and training for the mind.

- **Physical work**: related to sports simulation in virtual reality through the motions of own bodies ( "*Wii Sports*")

- **Discovery work**: relay on the pleasure of investigating places and unknown objects, in the game there are entire "open world" that can be completely explored and with which the player can interact ( "*Bioshock*")

- **Teamwork:** collaboration between large groups of players to achieve goals that are impossible to face individually ( "*World of Warcraft*")

- **Creative work**: we make decisions and we feel proud of what we did, perhaps without a clear goal. The main purpose is creativity itself.

In the development work that will be explained later, it has been taken into account two very important aspects that characterize the type and the model: the concept of ARG (Alternate Reality Game) and crowdsourcing.

An **ARG** is a game that connects the virtual and the real world; usually using web tools with a graphical interface to electronic devices like smartphones, tablet and computers as well that introduce the player in a mysterious story full of clues, places to visit and to discover that are actually located in the real world. It is an interesting alternative for those people who are looking for a game but, at the same time, do not want to (or cannot) be too much in a virtual world, and find amusement in interacting in real life despite having a digital guideline. An interesting aspect is that ARGs are highly social. Users have to interact with each other just to accomplish certain goals, for this reason, it is frequent the interaction even (and especially) between strangers that have in common only the interest to the game or to the subject in it. Even the same ARG have different traits between each other and there are many kinds: "*Chore Wars*" is a life-management ARG, a program or service that helps manage real life as in a game; through daily quests displayed on own mobile device that give rewards and power-ups for your own virtual avatar, you are more motivated to do housework or commitments in real life. "*Quest to Learn*" is an example of organizational ARG that through a story and a main theme, is used in schools to entice boys to study through "tasks" in the game which are then performed for educational purposes. Instead "*SuperBetter*" is a concept that uses ARG and social networking tools to share new game ideas, missions, rules that are proposed on their own lives or the ones of the other players. Another very interesting example is the ARG "*Ghosts of a Chance*" proposed by the Smithsonian American Art Museum. It is a model in which members must contribute providing real content to the collection of the museum and should collaborate online between one visit and another. To test this model, the Smithsonian has developed an alternative reality game for one of its locations*,* the *Luce Foundation Center for American Art,* that last six weeks*.* Through a story (shown on mobile devices), through press, clues and puzzles, visitors must solve the final riddle. This could be done by working together and visiting the works of the museum mentioned by the application to find hidden items*.* In practice, through the playful aspect, they motivated the visitors to be a part of the museum, to cooperate and to get to know each other and they gave incentives to come back to visit the cultural site again.

**Crowdsourcing** is rather a term that corresponds to the collective development of a project carried on by people who does not belong to the entity that created the project. It is carried on using the tools that the web makes available as, for example, dedicated pages, portals or applications. The most common example is "*Wikipedia*" (and all portals connected to it), the virtual encyclopedia where anyone can create pages and enter information on a particular topic and where users are often stimulated by a pure search of personal intellectual satisfaction and not by a economic reward. In this way is possible to do things(collectively, faster, better and more economically) that otherwise a single organization would not be able to do on his own*.* Other examples are "*Folding Home*" developed on gaming platforms "*Playstation 3*" in which users "give" the computing power of their consoles to process large amounts of data that a single computer would not be able to compute, "*The Extraordinaries*" a web and mobile phones application designed to help you making good actions during your free time, like doing tasks required by other peopleand "*Lost Joules*" an online game conservation, which invites you to make bets in virtual currency on how much social good can realize other players. It is a "exchange online" game that allows players to make bets (virtual currency) on energy consumption in the real world.

It will then be shown, in the continuation of this work, of how crowdsourcing can be used within an application to gather information, guides and reviews on a specific cultural heritage and how it manages to stimulate the interest of a certain theme or topic.

**Part 3: Game Design**

Create a videogame is not simple especially when there isn’t a base; despite the recreational end, there are hundreds of aspects to manage and numerous choices to deal with. In the book "The Art of Game Design" by Schell of 2014 the main steps of the creation of a videogame are shown, editing also all those aspects that may seem "marginal" as the physical place where you play, the technology to support different choices project and the organizational work that a good game designer should follow. The *"Player*" (and everything that revolves around it) is the main element under which a designer should start. To develop a product to sell on the market must be clear what the market requires and what a player expects from the game who buys and uses. In addition to differences in sex and age context, the book also deal with four major categories of player according to their preferences: the "achievers" are those users that point to complete the proposed objectives, maybe even the secondary ones, the "explorers" are those interested in exploring the world of games, environments, layers paying attention also to the aesthetic aspect, the "socializers" are those who seek others to play, perhaps not in the same game but the possibility to interact with others is required (as in the games offered on the social network "Facebook" where users help each other by giving game items used to advance in their private games), and finally the "killers" who are more inclined to action games with shootings, challenges and competitions.

A very important question that a game designer has to ask is: what experience do i want to convey? What emotion do i want to raise? So once you have decided the kind of target to which offer your work, you must have an idea to develop, an interactive story to tell, or just an experience that revolves around a theme. The theme could be defined as the essence of experience that you’d like to let the player experiment. It is important to unify the theme and make it clear. The player should know well enough what to face and especially what is expected of a given type of game knowing the ultimate goal and the initial obstacles to face the path to achieve it. But you do not need to know everything clearly at 100%, the addition of some surprises in the middle of the story allows you to increase the curiosity and the desire to continue playing.

However, a videogame is made up of four essential elements, and the more they are balanced with each other, the more the game will have a good balance and can provide a positive experience. However, in some cases, a videogame could have shortcomings in one of the 4 characteristics due to its inherent composition, in which it is not necessary to have all four. Let's see them below:

- **History**: History is the sequence of events that animates the game and can be linear and predetermined (perhaps punctuated by a succession of levels) or emerge from the player's actions as it happens in adventure games where you are faced with choices that will influence later future events. In this case the story is generated slowly by following a general path dictated by indirect controls. There are also stories called "string of pearls" where the pearl corresponds to level of the game in which the player will perform actions, obstacles and conflicts while the thread between a pearl and the other corresponds to an interlude in which are narrated parts of the story and the player has only a passive role of observer. History is perhaps one of the four elements less necessary in a game; some games do not provide it (or at least they have one just mentioned) maybe because they rely more on solving puzzles or quizzes, simulations of sports competitions or creative games that do not require an history background in order to be appreciated.

- **Technology**: it is the set of materials or means used by the players to interact with the game; some games are exclusive to smartphones and tablets (to take advantage of the touch function), others are for consoles and computers (because maybe require more graphical specifications), others run on different platforms. Some require the use of special wireless controller that react to vector forces and three-dimensional orientation through an internal accelerometer (as in "*Wii*"), others allow the player to play directly with your body through a stereoscopic viewer that It reveals the movements (like the "*Kinect*" of the "*Xbox One*"), others are related to virtual reality through particular vision VR that immerse the player's views fully within the setting playful. Another important technology is the use of the network: more and more products require an internet connection and allow the interaction of the players even in different parts of the globe simultaneously.

- **Aesthetics**: although it may seem marginal, it is the one that gives a certain kind of atmosphere to the game. The colors, sounds, and those small details produce a dive even deeper of the player within their own product. A more detailed discussion on the avatar could be done: it represents the player itself, a someone with whom the player can identify with or at least with which it can share certain traits. Many of the latest generation games allow full editing of the physical features and the appearance of your character in the game (by the change of hair cutting, adjustable height, weight, gender and clothing), other games have a set of preset characters that cover a large-scale models (female character, senior, sports, classic, etc.) in order to satisfy a greater number of players. Aesthetics also covers gaming menus, buttons and interface. Also in this case the choice must not be superficial. You need to ask yourself what the user needs to know during the game and especially how to arrange this icons on the screen in a way that allow to have them immediately, but that does not bother the view (such as maps, inventory, bar levels or earned money). They should also be the more intuitive as possible to make the experience the more familiar.

- **Mechanics**: are the procedures and rules of the game, and somehow describe the objectives, as players can reach them and what happens when they try. Probably this is the category that most of all represent the level of fun of the game and for this reason is also the most delicate because very complex and different; in mechanics is really important the sense of fairness in all its aspects: the failures must be leveled with the successes (or the game will be too difficult and so frustrating, or too simple and therefore boring); the skill with a random factor maybe based on probabilities; manual skills (for example the physical speed to press certain buttons) with the intellectual faculties (challenged by puzzles or puzzles); competition with cooperation; there will also be a certain extent in the effective length of playful product, and in the obtained rewards playing (a high risk should lead to a higher reward but these must not however be too generous because in the long run would lose in value); we must also provide the right amount of freedom (to allow venting of the player's creativity) and controlled experience (so that you still have clear end goals). But what they are in a practical mechanics? However it is not easy to say, especially because every game adopts numerous and of different types, we can list the main attributes that make clear their main characteristics: space and time are very important concepts in a game; the first can be either discrete (a chessboard, the points of a map) that continuous (a world fully explorable 3D) and the same could be applied to the time factor: in which the discrete corresponds to a turn-based game or where you still need to wait a certain action before placing another, while continuous where there is an actual correspondence between real-time and virtual reality-time. More and more games for mobile devices offer "energy" or "gambling money" at the end of a certain period of time in the real world and without them it is impossible to proceed further in the game. If the user does not want to wait a few minutes or even a few hours to receive them, he can buy them with real money and use them immediately. This is a clever marketing choice that takes advantage of the desire of the player to continue the game, so he will pay in exchange for a suspension of waiting. Other attributes of the mechanics are the rules: they define space and time (mentioned above), usable items, game objectives, and punishments in case of error. They also define the actions: both the events that occur in the game automatically, and the decisions made by the player and their consequences. Finally there is the concept of the puzzle, which is what all those obstacles between the start of the match and the final goal. The goal must be easy to understand and, at first, the road leading to it should be easy just to give a sense of progress that improves the self-confidence and therefore the desire to continue the path taken. As explained before the puzzle need to have the right balance of difficulty (perhaps growing) and should contain both unexpected events, that makes the challenge more interesting, and fortuitous events that create a feeling of uncertainty and surprise which encourage to learn more.

In the work that we want to present you, we try, following the 4 major categories listed above, to develop a game that can offer at the same time fun and interesting aspects that can create challenges that the player will always be more motivated to address and solving, with a focus on aesthetics that will allow everybody (even those who are not computer games expert) to feel a familiar and easy to understand environment, suitable for a large target of users, from children and young people up to the older ones . An application for mobile devices that through more or less recent technologies, such as internet and virtual reality, allows cultural and educational experience and it will be an enjoyable pastime.

**Bibliography**

McGonigal, Kelly - *Reality Is Broken* (2011)

Schell, Jesse - *The Art of Game Design* (2014)

Smithsonian American Art Museum *- ARG: Ghosts of a Chance* (2008)