Co-design of Neighbourhood Services Using Gamification Cards

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Abstract. Gamification is the design process that applies the principles of digital games along with behavior economics and psychology to enhance existing processes that facilitate user behavior transformation. The application of gamification remains very much a craft, difficult to understand and harder to master without the benefit of experience. Consequently, there is a lack of comprehensible tools that lower the barrier to use and leverage the benefits of gamification by non-experts. This paper presents the gamification cards created within the context of the European MyNeighbourhood project to support co-design activities by the citizens. The paper also shares the lessons learnt from one of the gamification workshops involving stakeholders from neighbourhoods from four European cities (Aalborg, Birmingham, Lisbon and Milan).

Keywords: Co-design, gamification.

1   Introduction

It is undeniable the power of user engagement that digital entertainment games have, which with careful game design manage to place a user in a state of flow, being sufficiently challenging whilst avoiding both boredom (too easy) and frustration (too difficult). It is not unheard of users getting lost in time, as they spend time completing level after level of a game. Consequently, many have tried to harness the power of digital entertainment for other purposes other than enjoyment, thus the emergence of serious games across a wide range of fields including management science, economics, psychology, interpersonal skill development [1]. However, the potential of achieving user engagement by leveraging careful game design was attractive, and the approach was to reduce the scope to focus on a process. As a result the term gamification [2] was coined and its potential success is based on the use of game mechanics such as points, badges and leaderboards, supported by careful game design driven by behavioral economics and psychology. However, this success may not continue as people can get tired of counting their points and following their loyalty programs. Designers are challenged in gamifying processes in creative ways that are also meaningful for people and their work [3] and most of all, engage and keep them engaged. It is not surprising that Gartner group estimated that 70% of the Forbes Global 2000 will be using gamified apps by 2015 [4]. However, the same report also states that 80% of the gamified processes will fail due to bad design. This corroborates that

gamification, similar to the game design of serious games, remaining a craft that only a few experts are capable of producing results consistently.

2   MyNeighbourhood Project

Our society has evolved over the millennia, with people congregating together in urban cities. However, along the way, the social cohesiveness has been lost and addressing this challenge is the aim of the MyNeighbourhood project. The project aims at using 'smart' ICT services and citizen/neighbourhood generated data to help recreate the social mechanisms which, in the past, ensured that urban neighbourhoods coincided with a social system of connected and trusted communities, where the quality of life was very high and people felt safe and happy with a true sense of belonging.

MyNeighbourhood builds upon three key components: Urban Living Labs (ULL), Neighbourhood and Sustainability. ULL are considered in MyNeighbourhood as creative environments where diverse stakeholders (non-governmental organisations (NGOs), municipalities, business partners, and citizens) collaborate to explore new services for tackling their urban issues. Here, creativity has the opportunity to gain a market perspective: in such environments, in fact, it is possible to start from considering daily life problems and the way they are locally experienced; then, citizens' experiences are transformed into resources for innovation. The neighbourhood is the appropriate urban scale at which creativity for community innovation can be effectively activated and cultivated. This conviction is also driven by a firm belief in the urban studies domain, which locates at this urban scale some of the biggest environmental and economic challenges that cities are currently facing. Moreover, it is at this scale the project believes in "community power", or a sense of community igniting citizens' capacity to become drivers of change. The MyNeighbourhood project does not necessarily look for conventional market solutions, i.e. products and services situated and profiled in the market and having a price determined in coherence with the traditional "cost based, profit oriented" economic model. Instead, the project assumes that an alternative economy is possible, in coherence with the idea that citizens are not only service users, but primarily human beings. Therefore, it considers the opportunity to rely on non-conventional, non-marketable "micro" solutions: small, practical ideas developed ad hoc, to solve problems right where the problems are experienced, at the scale they are experienced; frugal services that can be envisioned in urban co-design environments, while working with and for the citizens; and that are used to push the citizens themselves in the direction towards systemic change.

At the heart of the MyNeighbourhood is the use of an ICT platform that embodies all the concepts in the form of social services. The challenge lies in attracting citizens to start using the platform and to interact with their neighbours through the platform as well as in the real world. Ideas from playful interactions can be used to support this and the gamification process by creating opportunities for people to start interacting either with the platform or with one another.

To evaluate and pilot MyNeighbourhood models, methodologies and tools, the project will be piloted in four neighbourhoods distributed across Europe (Aalborg in Denmark, Birmingham in the United Kingdom, Lisbon in Portugal and Milan in Italy).

3   The MyNeighbourhood Gamification Methodology

The gamification of a process implies a more narrow scope than building a serious game, but the ability of achieving user engagement and behaviour transformation through the artful application of game design remains very much a craft. Although various elements that support gamification are known, such as points, leaderboards, awards, badges, amongst many others, it is not sufficient to combine elements together to achieve an effective gamified solution. In fact, on the contrary, poor designed solutions may achieve the opposite results, disenchanting the audience and causing aversion to desired process. As an example, one can consider the case of leaderboards, which consist of the ranking of users according to some measure, traditionally points attributed or earned by users. In the case of a leaderboard with a large number of users, it may discourage a new user to be confronted with the required threshold to enter the leaderboard. An improved approach is to always place the user in the middle of a leaderboard, indicating two or three other users both above and below the user. This will give the encouragement that the user is already on the leaderboard and is given hints to what they need to do for progressing further in the leaderboard. However, when the user is located in the top of the leaderboard, then the traditional approach to ranking a leaderboard is adopted.

Within the context of MyNeighbourhood, from the onset of the project it was recognized the challenge of applying gamification successfully to either the My-Neighbourhood software platform or its localized services. The abundant tottering of gamification as the silver bullet for improving any solution did little to ameliorate the challenge and consequently, the overselling from the hype did little to improve the limited understanding amongst the MyNeighbourhood consortium. This made it difficult to enhance any of the existing co-design methodologies to incorporate gamification. In addition, emerging approaches for gamification do not provide sufficient support for non-experts to carry out gamification of existing processes, as in the case of Francisco et al.'s method that is based on four steps without much detail beyond the selection of an objective and initial scoping [5]. There exists gamification methodologies based on the use of cards, such as playgen's and SCVNGR's, but these solutions require significant gamification experience from the facilitators, which makes it inappropriate for the use in the MyNeighbourhood pilots where the expertise of gamification is close to non-existent. In addition, the cards of these decks are tailored for more general application domains and do not address the particularities of user engagement of communities. Consequently the MyG(ame) methodology was created, which consists of a workshop that is divided into three main parts:

- **Setting the context.** The MyG methodology makes the assumption that the workshop participants know little or nothing about gamification. Consequently, it is necessary to provide some context with regards to what gamification is along with some examples of gamified solutions. This provides the foundation for describing the MyG process.
- **MyG Process.** The MyG process is an iterative process that supports gamestorming of ideas and concepts towards a gamified solution. Depending on the time constraints of the workshop, the MyG process can be executed one or more times.

When considering groups over 4 participants, it is recommended that these groups are facilitated, preferably by someone with experience in playing games.

- **Crowning of best gamified solution.** The workshop participants are organized into teams of users that compete with each other for the best gamified solution, thus giving them incentive to excel at their gamestorming. The participants themselves vote and rank for the best gamified solution

3.1 MyNeighbourhood Gamification Card Deck

At the heart of the MyG methodology is the MyG process based on the use of a deck with 52 cards. An example of a card is illustrated in Fig. 1.
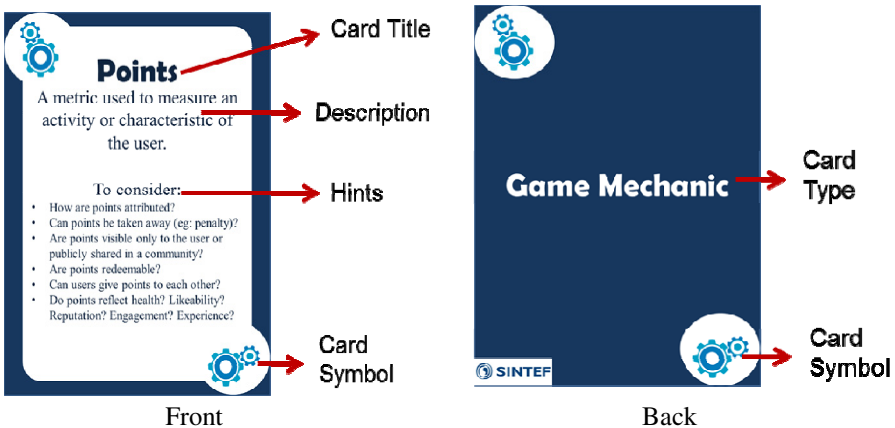

Front   Back

Fig. 1. Sample of gamification card

The deck of cards includes six different types of cards:

- **User Archetype.** These are the yellow cards in the deck and they identify the user archetype based on what their personality and how it affects their behaviour and decision making. These cards are best used to scope the solution space.
- **User Experience.** These are the black cards in the deck and they characterize the level of experience of the user. Similar to the User Archetype, these cards help scope the solution space.
- **Goal.** These are green cards in the deck and they indicate the type of goal(s) to be achieved and that will shape the gamification process.
- **Motivation.** These are the red cards in the deck and they represent the intrinsic motivation of a user that will influence and shape their decisions.
- **Social Mechanic.** These are the orange cards in the deck and they capture the social drivers that influence the behaviour of an individual user.
- **Game Mechanic.** These are the dark blue cards in the deck and they capture a component of gamification.

- **Game Pattern.** These are the light blue cards in the deck and they represent complex game mechanics that may depend on 2 or more game mechanics.

Each of the card types are distinctive from each other based on the colour and symbol used. This makes it easier to identify the cards without the need of visualizing them.

3.2   MyG Process

The MyG process consists of an iterative process that supports gamestorming of ideas and concepts towards a gamified solution as co-designed by the citizens. Depending on any time constraints, the MyG process can be executed one or more times within a workshop setting. Participants work in groups of 4-6, people with one facilitator. The job of the facilitator is to support the group as necessary and to ensure that the group remains focused and keep their task well scoped. The facilitator will also take the responsibility to either document or ensure that the gamified idea is documented by the group.

The first step in the MyG process is to set up the MyG cards. This is done by selecting a card for the goal, the player type and the player experience. The latter two cards are for scoping purposes and should be gradually introduced by the facilitator when deemed appropriate.

Then the cards for the mechanics, the social mechanics, drivers and game patterns are selected: 3 cards for mechanics, 2 cards for the social mechanics, 4 cards for the drivers and 2 cards for the drivers for the game patterns. All the cards may be selected at the same time or the cards for the goal, the player type and the player experience can be selected first and the others later once the goals and the player nature has been determined.

Once the MyG cards have been selected, the context for gamification must be identified. Once a context has been decided and agreed upon by the group, the scope of the gamification should be determined. This involves identifying a specific goal within the context which can be realised through gamification. This step is encouraged to ensure that the group can remain focussed on their context and a specific goal.

4   Gamified Neighbourhood Services

The MyNeighbourhood gamification methodology described above has been tried out in the project by all the pilots. Gamification workshops consisting of group work among the pilots were conducted, where each pilot considered how they could design gamified services. Group work was conducted for the phases in the methodology referred to as scope definition, scope refinement and gamification mechanics and they lasted about one and a half hours, during which time the groups used around 10-15 minutes to prepare the presentation of their gamified ideas to the project participants. Each group was provided a stack of gamification cards, a large sheet of paper and coloured pens. Blackboards were available in the area for the groups to use as they desired.

In the rest of this section we will describe the gamified services that were designed by stakeholders belonging to three of the MyNeighbourhood pilots. The descriptions are based on the input provided by the groups and the presentation material created by them during the group work sessions.

4.1   Engaging Volunteers

One of the pilots is based on supporting services for mentally handicapped citizens by engaging volunteers. The context for this group was to get a volunteer (user type A) to pay a visit to a mentally handicapped person living in a care home (user type B). The specific goal was to "build" relations between user types A and B. The final gamified idea was presented as a poster as shown in Fig. 2, which also included the gamification cards that were used. The gamified process was organising social visits for the handicapped citizen and organising and arranging volunteers to support the services. The organisation of the services was done my mediators; mediators were considered necessary in this context due to the nature of the citizens. The service was focussed on engaging volunteers to arrange outings for the handicapped citizens such as taking them out shopping or to an event in the city. This requires arranging a bus that the volunteers could use when they went on a trip with the handicapped citizens.
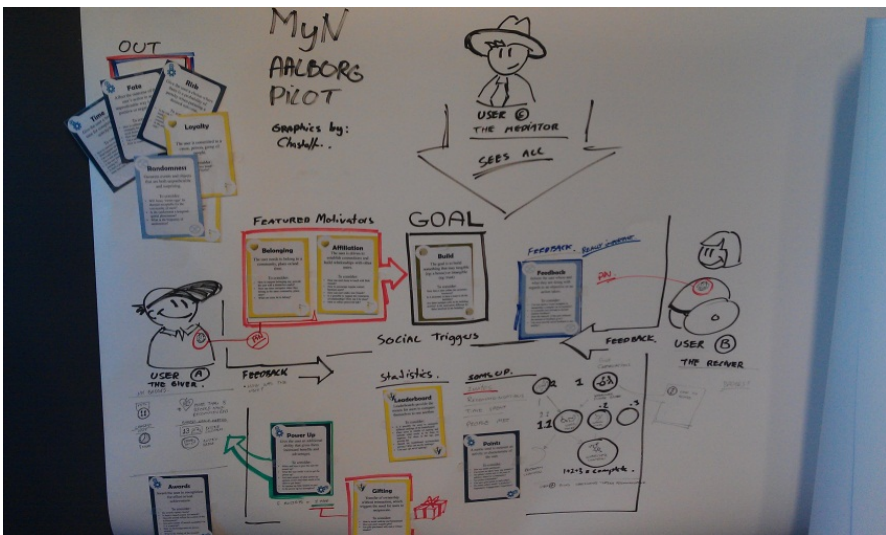

Fig. 2. Gamification of volunteer services

The goal for the service was identified using the card goal or driver "Build". The motivations for the service were identified using the Motivator cards "Affiliation" and "Belonging", recognizing that the handicapped citizens were motivated to establish connections and their need to belong to a community or a place. Considering that the focus was on designing neighbourhood services, the choice of these motivators high-lighted the social context of the service. The game mechanics that were used include "Points", "Awards" and "Power up". The volunteers received badges based on points indicating a tier, e.g. a super care taker. The different types of badges that could be earned were identified, e.g. a wheelchair badge or a bus trip badge, depending on the activity that the volunteer took part in. The recognition through the badges was an indicator to the mediators how well a volunteer was progressing and this influenced the assignments that were given to the volunteers. Social game mechanics were used to encourage and motivate the volunteers to continue contributing to the service. The card "Leaderboards" was used to

provide the means for volunteers to compare among themselves and "Gifting" was used to reward volunteers for their activities. The feedback provided by both the volunteers and the handicapped citizens were considered very important.

4.2   Overcoming Digital Divide

Another example of a service that was designed was on the challenge of overcoming the digital divide of elderly people by matching them with young ICT students. The service was aimed at reciprocity between generations through a synergetic approach: some basic needs of the elderly could become opportunities for young people to do work experience; e.g. a young student bringing fresh products from the supermarket or the market to an elderly citizen and in return gaining a small salary or course credits from the educational institution. The actors involved in this service could include elderly people, young ICT students, an educational institution and the local shopping mall.
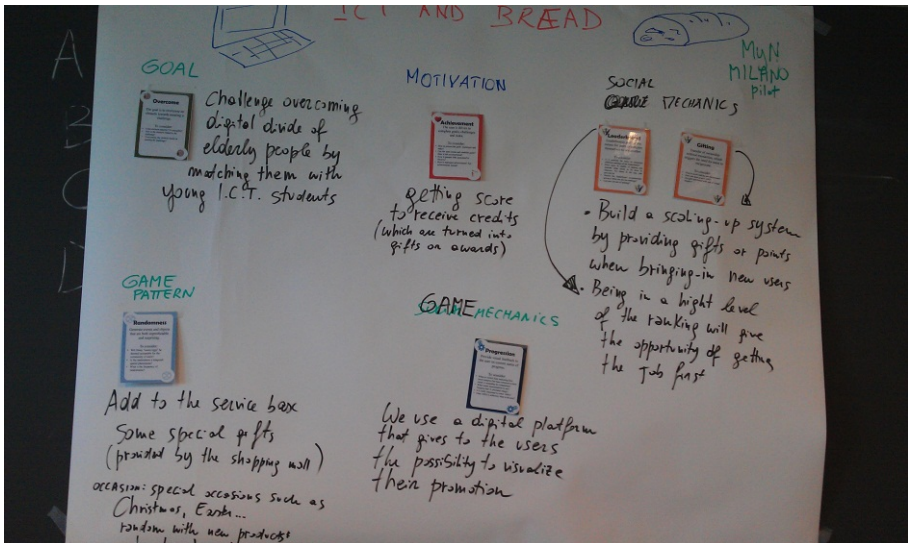

Fig. 3. Gamification of services to overcome the Digital Divide

The goal for the service was identified as overcoming the digital divide for the elderly citizens and the goal card "Overcome" was used. The aim is to engage young ICT students to help elderly people overcome their digital divide by providing the elderly some help with technology. In exchange, the students would receive some credits which can be turned into gifts that are offered from the local shopping mall. The poster that was used to present the gamified idea is shown in Fig. 3. It was assumed that the students will be motivated to achieve credits which can be credits on their course or redeemed for gifts from the shopping mall. Thus, the motivator card "Achievement" was used. The social mechanics cards "Leaderboard" and "Gifting" were used to scale up the service by offering gifts to students who bring new students onboard and the high achievers (from the leaderboards) could have the first choice in selecting jobs. The "Randomness" card was used to give special gifts on

special occasions such as Christmas or Easter as an incentive to sustain the engagement of the students. The game mechanic "Progression" card was used to provide the users the possibility to visualize their progress.

4.3   Engaging Women to Cycle

Another pilot is based on a project called Women on Wheels aiming to encourage women to cycle. The specific goal was to build confidence among groups of women and develop a sense of belonging whilst mastering a skill: cycling. The project provides a course which lasts for 6 weeks and they would like to encourage the women to continue cycling after the end of the 6 week course. Thus, ideas of gamification were explored to identify how the women could be encouraged to continue, enroll new women and become active cyclists as well as trainers for new beginners.
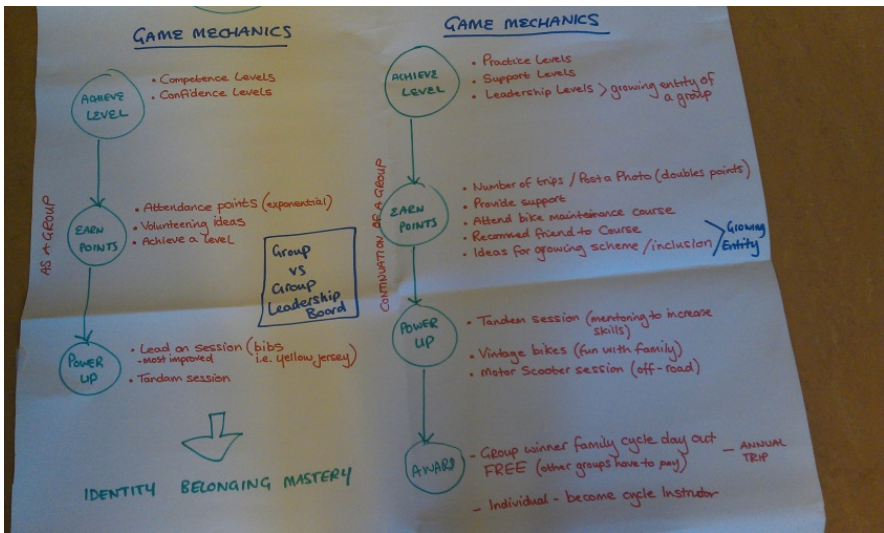

Fig. 4. Gamification of services for social re-engagement and while mastering cycling

Unlike the first two examples, this one focused on describing the type of user or player using cards of the types Player type and Experience. The poster in Figure 4 shows the ideas for the gamification of the services. The cards were not included in the poster. However, the terminology used to describe the gamified service indicates the cards that were used. The card for the goal was "Social Re-engagement". The cards that were used to indicate the player type were "Socializer" and "Explorer" and the user experience was "Novice" as most of the people enrolled in the project were novice cyclists. However, it was clear that achieving the goal of the service would lead to users of the type "Master", who belong to the community and identify them-selves with the community; thus using the –Motivator cards "Belonging" and "Identity". The game mechanic "Power up" was used to recognise cyclists that have achieved a certain level, which may be based on a number of different things such as their attendance, improvements in skills and contribution of ideas.

5   Feedback from Workshop Participants

The MyNeighbourhood gamification workshop had 23 participants in total. Feed-back from the participants was gathered using a questionnaire; 21 of the participants responded. All the participants in the workshop had played games during their lives; 23.81% had played games only recently, 28.57% played games as a child and 47.62 had played games all their lives. The participants play different genres of games; board games and card games were the most popular. The participants were also asked to rate their proficiency as gamers using a likert scale of 1-7, where 1 is "not at all" and 7 is "very much so". There was a big variation in the responses where none responded with the score 7 and the mean value was 2.

While the main aim of the workshops was for the pilots to design their neighbourhood services, some of which are described in the earlier section, the questionnaire aimed to establish the value of the workshop. Thus, one of the interesting feedback is summarized in Figure 5 (vertical scale shows the no. of responses and the horizontal scale shows the likert scale), where the participants reported that their knowledge about Gamification increased as a result of the MyNeighbourhood gamification workshop. Some comments provided by the participants as responses to the open questions about the usefulness of the methodology are: "It is a good tool to promote thinking about the process", "A great way of creating focus on the "motivators" in the system" and "*The workshop is a good way of defining the context conditions for the service. E.g. we got more info on pre- and post conditions for the service and the actors to be involved*"

When asked how useful the participants found the MyNeighbourhood gamification cards, the mean value was 6, with a standard deviation of 0.9. None of the participants responded with a value of 1 or 2 on the likert scale. When asked if the participants would use the cards again, the mean value of the responses was 6 from the likert scale of 1-7.
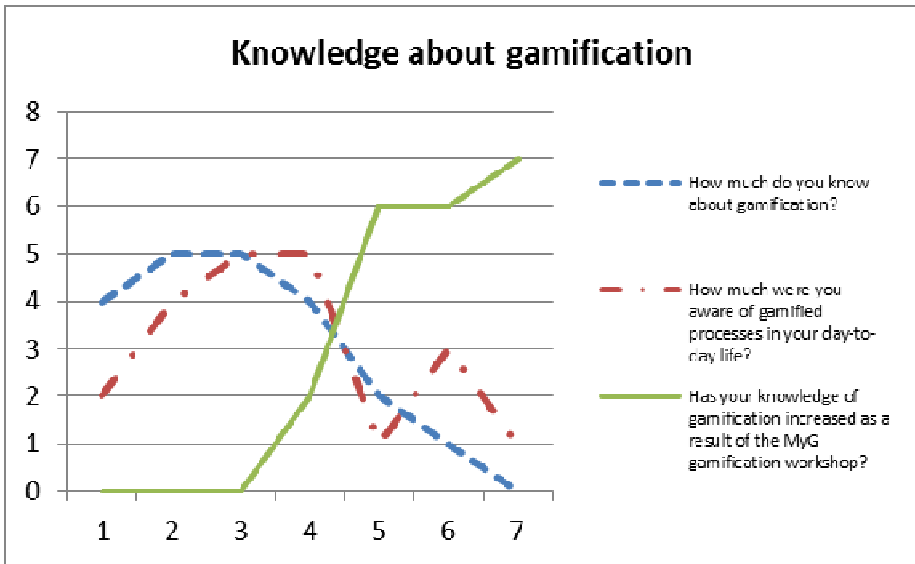

Fig. 5. MyN Gamification Methodology contributes to knowledge about Gamification

Some comments provided by the participants as responses to the open questions in the questionnaire are: "*Very productive! Shaping … thoughts, common concept and aiding the process overall*", and "*Good way of taking an idea and thinking about how it could work in detail - focus on demand from users*".

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