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MESTRADO EM ENGENHARIA DE SERVIÇOS E GESTÃO

Gaming as a Service: A case study

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Master Thesis

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To those who stood by me every step of the way.

"We keep moving forward, opening new doors, and doing new things, because we're curious and curiosity keeps leading us down new paths."

Walter Elias "Walt" Disney

Abstract

Today's professionals have huge constraints to be open-minded and do not question a lot of everyday practices and assumptions, which constitutes a barrier to innovative thinking. There is a lack of appropriate methods to assist professionals on how to grow and develop key innovation skills and capabilities. Such a method is required and needs to go beyond the traditional tools and learning experiences, like long conventional training sessions.

Having realized the existence of this gap, this research focuses on linking Design Thinking (DT) and Gamification knowledge and tools with Service Design (SD) methods in order to reach a final product and service system to fulfil those needs. This project follows a qualitative research approach and Service Blueprinting (SB) method and we focused on involving our target users through all the design and concept testing process. DT contributes by establishing a concept creation and improvement loop focused on the end-user, Gamification adds a new approach to the service delivery and SD enables us to image and develop the service itself following specific methods, in this case SB.

This research started with a market analysis, where the industry, target market (along with our target users) and the competitors' products/services were identified. A qualitative study, following Grounded Theory (GT) methodology, was then done alongside our target users (experienced professionals, students that just started working and companies) in order to better understand and identify their environment and needs, as well as hear their suggestions. Based on this study, the next step was to develop a concept based on the study's results, following by the definition of the service architecture, service blueprints and, finally, a functional prototype. With this prototype ready to be shown, a series of presentations to target users, were conducted to validate the concept and collect more insights on the designed service. Implementation is expected as soon as final iterations are completed.

The designed service is an online mobile game, that combines the gamification framework with a creative approach based on famous movie scenes metaphors. It allows the users to develop key skills and capabilities (identified after literature review and field research) and at the same time have fun, collaborate with other professionals, connect with companies out there, and build routines, which are core components of the gamification approach.

This concept was created with continuous contributions from the users, which participated in interviews and focus group sessions, in order to better fulfil their needs. The test users, from students to very experienced professionals, with no exception, were very much happy with the final concept and view it as something that can really be useful in their daily lives. Companies also viewed this as a great opportunity to discover innovative minds and talent in general, which is also one of their main challenges right now.

This dissertation project contributes as a case study that shows what are the benefits in adopting methodologies like DT and Gamification in order to design a service that focuses in the customers' needs, better engages people and, in the end, shows results that could not have been achieved using a more traditional mind-set.

Acknowledgments

Fortunately I have the need to fill this page with words of thanks, and I will do so happily.

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Finally, I want this dissertation to be a sign of gratitude towards my family. To my mother, father and sister, Laurinda Silva, Francisco Fernandes and Daniela Fernandes; my very close aunt and godparents, Conceição Simões, Manuel Lopes and Adília Silva; my girlfriend, Ana Rita Carvalho, for always being beside me with no rest; and to those who started this journey with me but are no longer here, this is also for you, Carla Silva and Domingos Silva.

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DT – Design Thinking

FEUP – Faculdade de Engenharia da Universidade do Porto

FG – Focus Group

GT – Grounded Theory

SB – Service Blueprinting

SD – Service Design

1 Introduction

Humans are incredible and infinitely curious beings. This is what moves us into finding new ways of looking at the world and, possibly, combine two things so different no one has ever thought of relating in order to come up with something innovative and revolutionary.

At first sight it might not be obvious what these so different concepts, services and gaming, have in common but as we dig deeper into their characteristics we can clearly see how a connection can be made. Services and games meet in one particular, and crucial, aspect: they are all about providing an experience to the customer/user, something that is intangible (although it can sometimes have products associated with them) and adds value. For example, you want to provide IT consultancy services, where you meet with the client and try to come up with a solution with them. Why not use a game that helps both you and the customer coming up with a solution in a more engaging experience and a lot more efficiently?

In the following topics we take a look at: the context and theme of this project, the identified market, along with its gaps and opportunities; the problems that emerge from it as well as the opportunities to be explored in order to fill those gaps; the objectives of the research; the procedures of the research and project in general, with information about the company's position; and lastly, the outline overview of the dissertation report.

1.1 Project background

Technology has been advancing at an incredible rate during this last decade, and it is predicted that in the future it will not slow down, as "every twelve to eighteen months, computers double their capabilities, and so do the information technologies that use them" and in thirty years' time it will be a billion times more advanced (The Emerging Future 2012).

This constant technology growth will also have impact on our main project focus: gamified services, especially since the majority of them are now being delivered through electronic resources like websites and mobile applications. These are services build around the concept of Gamification, which briefly means that some game mechanics, dynamics and component are used in a service context in order to better engage people and consequently be improved. We explore these concepts in more detail in the following sections.

With that being said, in this project we focus on the mobile gaming counterpart. This is one of the most attractive markets out there, as the mobile industry continues to scale rapidly. It is estimated that we will go from 2.6 to 6.1 billion smartphones in circulation by 2020 (Ericsson 2016), which is almost one per every person on the planet right now. With that growth, there is a big opportunity for mobile games as, according to App Annie this industry is expected to reach about $74.6 billion (aprox. €66.9 billion) by the same time in 2020 and is already generating approximately 85% of the total mobile app market revenue (App Annie 2016).

Gamification is a growing trend on the market right now, and it is being used to address issues in a way that makes learning and collaboration more enjoyable and engaging than traditional methods. According to IEEE, "85% of the tasks in our daily lives will include game elements by 2020" (IEEE 2014). However, "there are warnings that about 80% of current gamified applications will fail to meet business objectives, primarily because processes have been inappropriately gamified" (Gartner 2012).

Because of this, Gamification has gained a special place in some companies' business models in the past two decades because they want to use some of the approach's techniques to increase customer loyalty as well as productivity among the employees. Translating that into numbers, MarketsandMarkets estimates that this market will grow from $1.65 Billion (aprox. €1.46 Billion) in 2015 to $11.10 Billion (aprox. €9.85 Billion) in 2020 (MarketsandMarkets 2016).

By analysing this market data, we find the business motivation for this project. Having a clear opportunity to take advantage of this growth and of the fact that it is a relatively new market with few competitors, is crucial for establishing a series of organized procedures that, when validated in the end of this dissertation, can later be followed or improved by others for better results.

The Design Thinking, Service Design and Gamification Framework framed this research, during analysis, concept creation, prototyping and improvement until we reached our final gamified-service offering. Following the business motivation, research challenges are detailed next.

1.2 Problem Description

In order to fully develop a new service, whether it is based on Gamification or any other methodology, we first need to identify what are the existing problems. When we have identified the problems and gaps on the literature and market that we will be entering, we can proceed to find ways of turning them into advantage opportunities.

As explored in the previous section, the Gamification approach is relatively recent, especially when applied to services. This constitutes an important gap that we explore, and also demonstrate practically, in this report, as there are few studies done on the use of Gamification for leveraging service design (Hamari and Koivisto 2015). As awareness increases, some companies try to find ways of adopting some of its mechanics into their businesses for improved results. This is the case of Microsoft, Deloitte, Google and Cisco, for example (Coy 2015).

With Innovation being one of the main focus of the company this project is being developed in, we wanted take a look at what can be done in order to promote Innovation around people and at the same time use it to fulfil their needs, whether they are professionals or students. This is where we find another crucial gap/barrier, there is still an enormous amount of resistance to innovation and change, especially when talking about older companies that have been working using the same methods for all their existence.

There is also a particular problem with a lot of gamified systems themselves, as they are not offering all the features needed, and/or are not completely focused on innovation, and are very expensive. Most of them focus too much on the rewarding aspects, like awarding the player with points, levels, achievements or badges without having a real connection with the service point of view (Nicholson 2015), which also constitutes a theoretical gap in the gamification field.

Having realized that, and following the Design Thinking methodology, we explore how we can overcome these gaps using the Gamification and Service Design approach. For that we made a theoretical study as well as a qualitative research in the field with a sample of our target users. In the practical aspect of the research, we found that today's professionals have huge constrains to be open-minded and do not question a lot of everyday practices and assumptions, which constitutes a barrier to innovative thinking. There is a lack of appropriate methods to assist professionals and students in the learning process, and "the use of educational games as learning

tools is a promising approach due to the games' abilities to teach and the fact that they reinforce not only knowledge but also important skills such as problem-solving, collaboration, and communication" (Dicheva et al. 2015). These skills are involved in the development of innovative minds. Because of that, a new learning method is required and needs to go beyond the traditional tools and learning experiences as "the workforce needs, new, or newly emphasised, skills and capabilities to support an innovation economy" and "as the nature of work is constantly changing it is important to develop capacity for innovation to keep up with workplace changes" (Australian Government and IBSA 2009).

1.3 Research Questions

Here we present the main research questions, related to the literature gaps identified in the previous section, and also to the practical work, that we want to address with this research.

The objectives of this research study were the following:

- How can Gamification be applied to services;
- Understand the main challenges faced by professionals regarding their work lifestyle, how they deal with them currently and what they would change if they had the power;
- How can Gamification be used in a service design project to foster innovation.

All the data gathered from this investigation is crossed, further in this document, with the literature research and gaps found within it, with the goal of reaching a set of results that are relevant to the fields of study and also relevant for the practical project.

1.4 Study and Project Development at Digitalflow

Digitalflow is a company that provides Innovation and Gamification solutions that drive sustainable change and exceed expectations. Offer includes facilitation and education (hands on training, 21st century meetings, long-term support innovation Programs) and cutting edge methods and tools (workplace gamification e.g. ideaChef®; innovation and entrepreneurship toolset and public sector procurement innovation).

Digitalflow addresses a wide range of challenges such as the following:

- Development of new applications;
- Identification of new markets;
- Selection of a technology;
- Prioritization of features in upcoming products/service releases;
- Drive product/service roadmap decisions;
- Create new products/services;
- Co-creation of more intimate relationships or engage more with customers;
- Manage idea competitions and hackathons;
- Leverage direct customer feedback for market research;
- Identification of areas for improvement in internal processes;
- Encouragement of internal collaboration;
- Redesign of internal processes;
- Understand teams better;
- Provide support and strengthen teamwork relationships, among others;

The Digitalflow approach follows four fundamental steps: (1) screen opportunities and identify the change agents; (2) design a project with the right mix of methods, tools and people; (3) support the implementation and motivate the adoption; (4) and communication and engage

people on a continuous basis. Through its network of alliances, Digitalflow provides complete solutions that drive sustainable change and achievement of results.

With the gamification market growing at a fast rate, Digitalflow saw here an opportunity to develop tools that address the challenges presented earlier using the gamification approach. Looking at the company's portfolio, we find that three games were already developed: (1) *ideaChef*®, (2) *The Path for Growth: an Innovation Journey* and (3) *The Innovation Stickers Card Collection*.

ideaChef® is a gamified method and a tool (a board game that uses cooking metaphors) that was designed to enable teams to convert high potential ideas into working concepts or prototypes. *ideaChef*® supports convergent thinking by helping to narrow a number of potential solutions down to a "best fit" solution, which provides an engaging and more efficient way of selecting and developing ideas to be pursued further.

ideaChef® serves to create solutions ("recipes") that address a particular challenge, need or problem, related to either internal processes or to the external market.

When tackling the corporate innovation segment, *ideaChef*® can be applied to: create a new product/service; address a new service weakness; identify new markets; co-create services/products with customers; create more intimate relationships or engage more with customers; develop new applications; select a technology; prioritize features in upcoming product/service releases; drive product/service roadmap decisions; improve marketing campaigns; gain a better understanding of how value can be created; create strategic plans for organizations or business units; leverage direct customer feedback for market research; identify areas for improvement in internal processes; encourage internal collaboration; redesign an internal process; understand teams better; provide support and strengthen teamwork relationships; among others.

ideaChef® also helps entrepreneurs to develop, enrich and test their business ideas. The direct outcome is a visual report that can be used to pitch the ideas. This method and tool can also be applied to manage idea competitions and hackathons as well as to provide start-ups with mentoring and training in entrepreneurship.

The Path for Growth: an Innovation Journey is an interactive and gamified "Innovation Journey" self-assessment. It can be used for free and it is part of the company's strategy to increase awareness for value added service in the innovation field. This games enables the player to become more aware of the required capabilities, evaluate emergent needs, raise self-awareness, support decision making and boost innovation performance.

The Innovation Stickers Card Collection is also an innovation awareness and educational game that promotes both a structured and appealing discussion method about innovation and networking and collaboration among conference attendees. It is based on the concept of collecting all the stickers in order to complete the collection. For this the players need to trade them with each other and stick them in their right places.

Having this background of developed gamified tools, with this project the company wants to fill a gap in the market: the lack of an effective, engaging and accessible tool to develop a more innovative mind-set among professionals and students, and also explore the fact that technology and more specifically, mobile tech, is growing at a very fast rate.

As the company never developed a such IT intensive game, there was a need to understand better the user requirements and needs and make an intensive research among them, to make sure the concept was successful when applied functionally. The metaphor technique used in *ideaChef*® was also considered for this game, as the results show it is effective for player engagement.

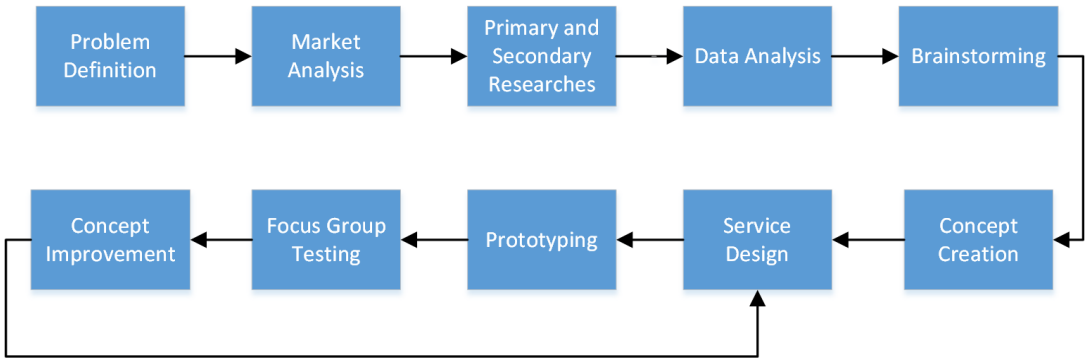

Figure 1 - Project Process Outline

Figure 1 above represents all the phases of the practical project development process that are also aligned with the report outline explained further below.

1.5 Report outline

This dissertation report is organized in six key sections:

- Section 1: Introduction – the context of the research and project are described alongside the specific the problem, objectives, procedures and possible gaps to be explored are defined;
- Section 2: Literature Review and Theoretical Framework– relevant fields of study to this research are discussed and interconnected before addressing the methodologies;
- Section 3: Problem Characterization – the problem is defined in detail, considering the objectives for the research and company objectives, the gaps defined earlier in the literature are addressed, and a presentation in detail of the company is made;
- Section 4: Methodologies – the methodologies and techniques used during the research are presented and justified;
- Section 5: Understanding the Target User's Needs and Requirements – the results gathered from the research and interviews are analysed and presented;
- Section 6: Designing the Service – the service concept is designed and structured based on that data, the prototype is presented as well as the results already gathered of the focus group testing sessions;
- Section 6: Conclusion and Future Research – final considerations about the results reached and description of the next research and project phases.

Our focus during this theoretical research was to explore each of these concepts in detail, from the broader to the most specific, identify the advantages and disadvantages or their use, detect their gaps and justify their significance to this project.

First we look at the Innovation concept, focusing always on the skills and capabilities that are most important for someone that wants to develop an innovative thinking ability. This is where we introduce the 4 Cs framework and further explain it in detail.

Gamification comes next as its combination with the previously presented Service Design approach is the main study for filling the identified gaps. Here it is also explained the difference between “Play” and “Game” and we focus on the Game Elements and Hierarchy framework (Werbach and Hunter 2015) in order to design this service and its functionalities.

The next concept that we tackle is the Design Thinking methodology. The research and project processes are supported by this methodology, always aiming for the customer involvement in the continuous design and improvement.

Then comes the Service Design approach, that we detail and explain why it is a really important to study before trying to create or implement any service. This includes the Service Blueprinting, that we used to practically design the service and its processes.

Lastly, we address the research gaps found in the each of the literature concepts and how it is possible to explore them.

When it comes to the practical procedures that were taken when addressing the challenge and concept creation, it all started with the problem definition and market analysis. In this analysis we explored the size of the market, defined our target users and also made some research on our possible service competitors.

The next phase was to make a qualitative research among a sample of our identified target users. At the same time, it was also important to do an intensive web research.

This leads us to the next procedure that was the analysis of the data collected during the interviews and also during the literature research. By analysing and crossing these data sets we were able to reach specific results that would be important for the next project phase.

After this analysis, we discussed the results and, after some brainstorming, we made the adjustments needed to the initial strategy (like target market and content priority) and were able to reach an initial concept that was adequate and that met the needs of our target users.

Following this concept creation, we started designing the service, through SB, and the defining the functionalities that would be available in the service system.

When these blueprints and functionalities were finally completed and well defined, we started the prototyping phase. Here we designed the mock-ups for the mobile application and, according to the blueprints, made a functional prototype possible to be shown and experimented with in the next part of the project.

The last, and present, processes of the project are the testing and concept improvement phases. Here, and with the first version of the prototype completed and functioning, we are putting it to the test among our target users (some of which had also taken part in the interviewing phase). This is really important for us because we are able to get feedback on the functionalities of the game and continuously improve the concept until we reach a final state.

In the near future, when we have completed this phase, we will proceed with the development of the final product-service system and we make our entry on the market.

2 Literature Review and Theoretical Framework

In this section we address all the relevant fields of study, and respective frameworks, that the research tackles, in order to provide a more organized view over the context and background as well as interconnect the literature with the project and methodologies chosen.

As explained earlier in the previous section, the study fields that we review here are: Innovation: skills and capabilities, Gamification, Design Thinking and finally Service Design. Each of these is detailed in this section and its choice justified.

2.1 Innovation: Skills and capabilities

Innovation can be viewed as a process of "making changes, large and small, radical and incremental, to products, processes, and services that results in the introduction of something new for the organization that adds value to customers and contributes to the knowledge store of the organization" (O'Sullivan 2008).

Focusing on innovation in services, we find that it is a relatively recent research area, receiving little attention until the 1980's. Though, when reaching the 1990's, a number of research projects were developed in this field, the main reason being the exponential growing of information technologies in services and consequent need to differentiate (Miles 2006).

Today, innovation is considered by three out of four CEOs in the world, one of the most important factors in the success of a business (PwC 2013). Yet, the innovative process is not simple, especially because it depends on people being able to generate and apply the knowledge they have in the project, organization or even society (OECD 2011).

The fact that people and organizations have such a huge resistance to change creates a big gap in this research field, mainly because if people do not take risks research cannot go on. This makes innovation investigation a lot harder as there are not that many study cases to be analysed.

This sentence from a study made back in 1986 sums up the human natural aversion to change: "human beings tend to resist change, even when change represents growth and development ... [and will lead to] greater efficiency and productivity. [Since] changes in an organization affect the individuals within that organization, and individuals ... have the power to facilitate or thwart the implementation of an innovation" (Fine 1986).

This gap is evidenced even more when we discover that even when companies know that innovation is required to achieve better results they still cannot apply it successfully: "we say innovation is our top priority, but we don't effectively allocate our time, resources and efforts to walk the innovation talk" (Chen and Hove 2011).

We realise that that is how humans work, and that resistance is inevitable, so, in order to fully understand the problem we are dealing with, we need to find what exactly these barriers to change are.

These are the most common barriers to change identified in the literature (Schuler 2003):

- Feeling that it is riskier to change than to stand still – walking into the unknown is risky, you never know what might expect you. There could be good things or bad things, and people do not deal well with this kind of feeling, only risking when they feel that there will be more benefits than drawbacks;

- Feeling connected with people that prefer the old way of doing things – when people get attached to others, sometimes they get influenced, more times than not unconsciously, which can lead to this barrier;
- No existence of nearby role models for change – a bit connected with the previous one. People like to look at what others do in order to formulate their opinion about something. In this case if people do not see someone operating with this visionary point of view, it is more difficult for them to accept change;
- Fear of the lack of competences – people sometimes find that their skills do not meet the requirements for adopting and dealing with such a new methodology. Even if in some cases that can be true, change only happens if someone takes a step into the unknown, and that also includes knowledge;
- Feeling of overload and overwhelm – the nature of some jobs can lead to exhaustion and fatigue, which consequently leads to a more close-minded and resistant to change mind-set;
- Healthy feeling of scepticism about new ideas – people want be sure new ideas make sense. This can actually lead to a better final result, as they will demand the initial idea to be tuned and improved;
- Fear of increasing workflow – unfortunately some people are more concerned with their agendas and amount of work than to look at the benefits of implementing a new approach;
- Fear of losing self-notion – it can happen that an extreme change in someone's job can lead to the loss of their self-notion, which can lead to them feeling useless and out of place in the company;
- Fear of losing status or life quality – changing in business can lead to the re-evaluation and repositioning of certain people inside the company. In people's minds some might end up being promoted and others might be demoted;
- Genuine belief that the proposed change is a bad idea – sometimes it happens that the change really is a bad idea, and it is nothing to do with fear. People should be open minded, accept others' opinions, and if they really believe that specific change can be useful, they should try to improve it with those opinions in mind.

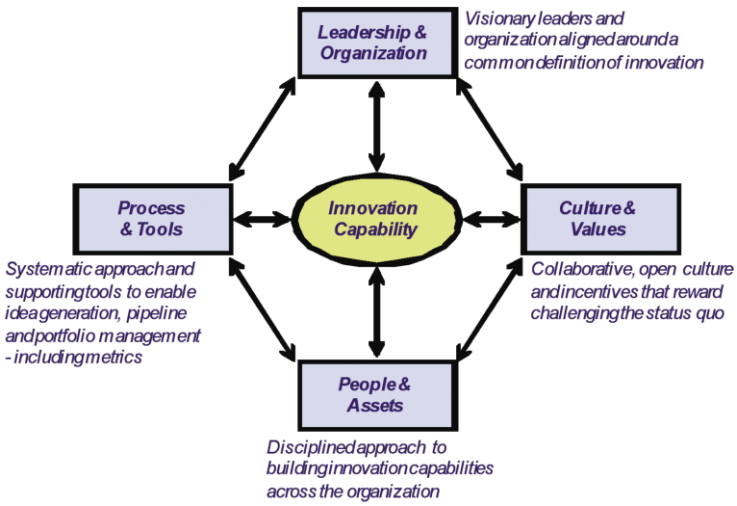

Figure 2 - Innovation System (Chen and Hove 2011)

In order for the innovation to create value instead of drawbacks in an organization, all the components of the system (leadership and organization, process and tools, people and assets,

and culture and values) must work and connect with each other smoothly, as seen on Figure 2. But for that to happen, the barriers above need to be overcome.

Here we reach one of the focus of this report: in order to innovate, people with the right skill set and capabilities must be involved in the application of practical tools and techniques (O'Sullivan 2008). So, what skills are the most important when talking about innovative thinkers? Certainly everyone can be an innovator sometimes, but in order to consistently be able to come up with good "outside of the box" ideas, development of certain key soft skills may be vital. With this project we aim to reach this very well defined set of skills, so we can create a service that will enable users to develop or enhance them.

Twenty-first century professionals need to be equipped with a lot more than technical skills in order to "to thrive in today's complex and interconnected global landscape" (Bernhardt 2015). They have huge constraints and, most of the times, simply do not have room to be open-minded. This constitutes a barrier to innovative thinking. Also, "the educational demands of this century require novel and different teaching practices that not only align with workforce preparation, but that also embrace highly collaborative project–based learning environments" (Bernhardt 2015).

The 21st century learning skills, often called the Four Cs, is a skill set defined by the Partnership for 21st Century Skills (established by the National Education Association) that includes the four most important skills needed for professionals and students to succeed in work, life and overall citizenship (Partnership for 21st Century Learning 2015). This skill set results from a survey conducted by the association where they involved 768 managers and executives.

The results showed that the following four skills are key:

- **C**ritical thinking and problem solving – implies looking at problems in a different way, connecting knowledge to problems and situations;
- **C**ommunication – sharing knowledge, ideas, simple thoughts, solutions or questions;
- **C**ollaboration and team building – involves working together to reach a common goal, by joining talent and knowledge from different people in one place;
- **C**reativity and innovation – trying something different in order to solve a problem and create value in a new way.

Although we can look at them as different concepts, they are transversal and completely interconnected with each other.

In this study also three out of four managers and executives surveyed pointed at these skills as incredibly important to their respective organizations in the next three to five years (American Management Association 2012).

Critical thinking, also known as "left brain" activity, relates to the analysis of a problem or situation in order to better understand and solve it (Marrapodi 2003). It can be broken down into four main characteristics/stages: reasoning, systems thinking, judging and deciding and problem solving (Lai 2011b).

First it is crucial to understand the problem, so, adequate types of reasoning (inductive, deductive and abductive) should be applied. Then, we need to look at the system this problem is inserted. This includes analysing not only the system as one but each part and how they interact with each other. Judging and deciding comes next, and here it is important to argue and reach a conclusion, after analysing, synthesizing and interpreting the information. This conclusion usually has a decision attached to it, so, in order to decide, it is critical to evaluate

the situation and possible outcomes. This will enable the person/team to assess the possible added value. The last instance is problem solving, and here it is important to understand the causes and effects of a problem and find the best solution to stop them (National Education Association 2014).

By improving the critical thinking ability, professionals and students are able to (Paul and Elder 2002):

- Raise important questions and problems, formulating them clearly and precisely;
- Gather and assess relevant information, and effectively interpret it;
- Reach well-reasoned conclusions and solutions, testing them against relevant criteria and standards;
- Think open-mindedly within alternative systems of thought, recognizing and assessing, as need be, their assumptions, implications, and practical consequences;
- Communicate effectively with others in figuring out solutions to complex problems.

The ability to communicate is the most transversal skill, whether it is critical thinking, creativity or collaboration, it is always required that people communicate with each other. Because of that "interpersonal and communication skills often rank among the most critical for work related success" (Dixon and O'Hara 2008)

So, in order to communicate clearly, the professional or student should be able to master the oral and written forms or communication, listen carefully and effectively, be able to use the knowledge gathered from the communication process, know how to use media and technologies to their favour and also have a rich culture background that enables them to connect with people from other countries and cultures.

Good communication skills result in better team work, which is getting more important as the society goes global with technology. This will lead to the best spread of the business, better relationships with customers and colleagues (National Education Association 2014).

Collaborating is another vital skill to successful projects, as working together results in knowledge sharing between subjects. A group of people working for a common goal will always reach a better and more robust result than someone who is working alone, leading to a better decision for the project in the end (Surowiecki 2004).

Working in a team, and collaborating in general, requires people to be able to share goals, negotiate and simply interact with each other, which "can have powerful effects on student learning, particularly for low-achieving students" (Lai 2011a)

Lastly, creativity is another crucial skill for twenty-first century professionals. There is a constant need to innovate and, not only come up with different solutions that go beyond the bound of conventional thinking, but also be able to evaluate ideas and contributions that may be pursuable and know how to execute them (Sternberg 2006).

This creative process is incredibly important for businesses, as the environment is constantly changing and there is a need to adapt and develop solutions that go beyond the traditional thinking so to better understand the problem and generate solutions (Sefertzi 2000).

Lastly, the idea proceeds to implementation, where the process/product/service will be created/enhanced in order to deliver value to the target users.

One of our research goals it to use gamification in a way that can foster innovative skills within users, the problem is that we found that "its application in the field of innovation management

is, however, still at the beginning" (Witt et al. 2011), which is a gap that we explore later with our case study.

2.2 Gamification

"Games are a modern model of people's self-organization to achieve a goal" and by using them "it's possible to change companies' tasks by introducing the social dimension of work from games that bring motivation, engagement, and personal satisfaction" (Vianna et al. 2014).

Simply put, gamification concerns the "use of elements of game design in non-game contexts" (Deterding, Khaled, et al. 2011) in order to make complex or uninteresting tasks more fun and engaging. However, being a relatively new concept (first documented in 2008), it still leads to confusion among those who never heard of it, mistaking it for something that has to do only with having fun and not seeing it as a possibility to generate value within projects, businesses and whole organizations.

This is especially the case with organizations themselves, as only a few number of them realise the value added by the fun factor, and only use this gamification concept "as, at best, an occasionally affordable distraction from work that may boost employee morale but has little overall impact on their core business" (Mainemelis and Ronson 2006).

Benefits of this approach have been reported by other studies, such as:

- Increased motivation – because of the rewarding system, whether it is by points, badges, achievements, real world benefits, like discounts or coupons, gamification has been proved to help increase motivation towards tasks that are perceived as boring in the first place, like studying for example (Muntean 2011);
- Increased user participation – this is a consequence for gamification, because by being more fun and also by taking advantage of the rewarding mechanics when there is an "accomplishment of action toward goal and task", helps maintaining users' voluntary participation (Park and Bae 2014);
- Better user experience – although user experience does not guarantee better engagement (Guin et al. 2012), it is important to be a more entertaining and enjoyable experience than traditional methods to give it a more "game-like" experience (Cheong et al. 2013).

However, "there is currently a lack of empirical research to demonstrate that increased gamification provides these benefits" (Cechanowicz et al. 2013), and because of that, our research among users and later case study can prove valuable in a sense that it is another contribution to the field.

But first, in order to fully understand what gamification is, it is vital to situate the concept relatively to all of the surrounding variables.

Deterding defined four dimensions across two axis: one for gaming/playing and another for whole/parts (Figure 3) and explained the he difference between Gaming and Playing, which is rather important when trying to define gamification (Deterding, Dixon, et al. 2011):

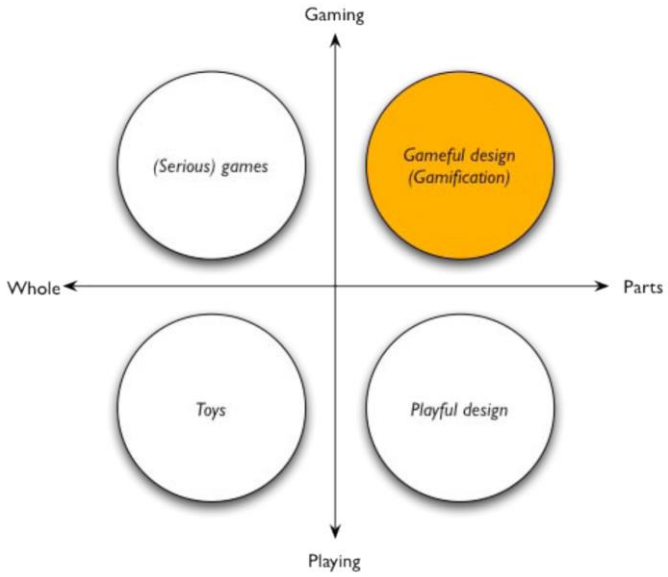

Figure 3 - "Gamification" between game and play, whole and parts (Deterding, Dixon, et al. 2011)

The Playing dimension represents a broader category than Gaming. It does not require any kind of rules and does not have a specific goal to be reached during or at the end of the process, but to enjoy and have fun. In this dimension we can differentiate from the Whole or Parts quadrants. When referring to the whole part, we assume that it is a complete and full-fledged game or product, like toys. When we talk about parts we talk about elements of games, not their entirety.

The Gaming dimension, the one that is most important for us, implies that these games, although they also have some characteristic of the playing dimension, have rules, are relatively structured and have a final goal. The whole quadrant divides, again, the full-fledged serious games, like simulators, from the gamification itself, which has more to do with elements of games than their wholeness, although they can be integrated in them.

Gamified processes, products or services include the following basic characteristics (Axonify 2014):

- Hints that enable the users to easily define what is needed to do next;
- Instant peer assessment – feedback from pairs;
- Performance ranking – comparison with others;
- Progression tracking – self assessment.

All these characteristics articulate really well with the already defined concepts and frameworks for innovation, DT and SD, and because of that Kevin Werbach and Dan Hunter came up with a Gamification Design Framework called “D6”. This framework was used during this project and, briefly, it is based in six steps (Werbach and Hunter 2012):

- **D**efine business objectives – come up with possible objectives and trade-offs, eliminate means-2-ends (means can be mistaken for goals) and justify the remaining objectives;
- **D**elineate target behaviours – specify what is wanted from the players, what are the win states and the rewards for them;
- **D**escribe your players – state who are the target users and what are their motivations;

- **D**evise activity loops – create engagement loops (motivate users to come back to the game) and progression loops (make the user feel that he is progressing);
- **D**on't forget the fun – make sure to create an enjoyable experience along the entire game process.

Later, the same authors developed the Game Elements and Hierarchy, that complements and expands on the previous framework.

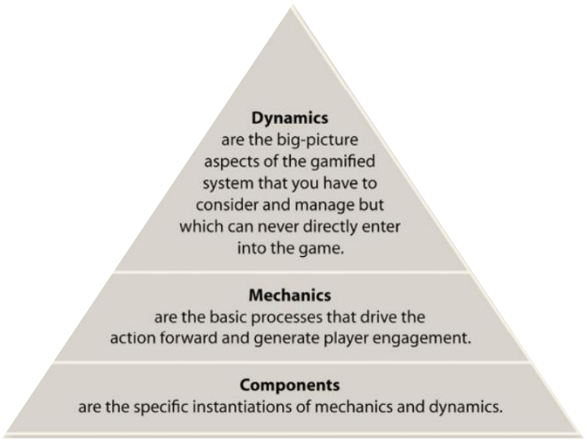

Figure 4 - Game Elements and Hierarchy (Werbach and Hunter 2015)

As seen on Figure 4, game elements are divided into three main blocks (Werbach and Hunter 2015):

- Dynamics – they are not functionalities of the game, but are the main drive on providing motivation through other features (constraints, emotions, narrative, progression and relationships);
- Mechanics – direct functionalities that engage the player (challenges, change, competition, cooperation, feedback, resources, rewards, transactions, turn and win states);
- Components – what mechanics and dynamics work with (achievements, avatars, badges, boss fights, collections, combat, content unlocking, gifting, leaderboards, levels, points, quests, social graph, teams and virtual goods).

Our gamified service project was design based on this methodology, articulating these frameworks with the rest of the concepts in the literature, such as DT, which we tackle next.

2.3 Design Thinking

Now that we have explored the most important aspects of innovation and the skills needed to innovate, we now need to develop a service-product system based on that data.

The Design Thinking (DT) fits into the innovation concept, mainly because both tend to look at things differently, with change in mind but never neglecting the results. As they go hand to hand really well, we can say that DT is some kind of motor for innovation, where all contributors, independently of their background, can take part in the creative process following Design Thinking models. Because of that, this is also a great methodology to follow when working in interdisciplinary teams (Tschimmel et al. 2015), and that is why we chose to follow it in this research and project.

DT is a methodology that takes designers' view of the world as inspiration for business innovation. Designers are described as very sensible and customer oriented, which means they perceive better and more accurately people's problems and needs. Designers look at the experience, try to understand the problems, tackle them from various perspectives, and then generate solutions for those problems, alongside the right people, usually an interdisciplinary team (Vianna et al. 2011).

These solutions are already conceptualized having in mind what technologies are more suitable to the circumstance and, of course, what the "business strategy can convert into customer value and market opportunity" (Brown 2008). All of these characteristics result in a better understanding and integration of the customer in the final product/service and guarantees that the solution reached fulfils the users' needs.

There are numerous DT models out there, being some of them represented in the Figures 5, 6, 7 and 8 below.

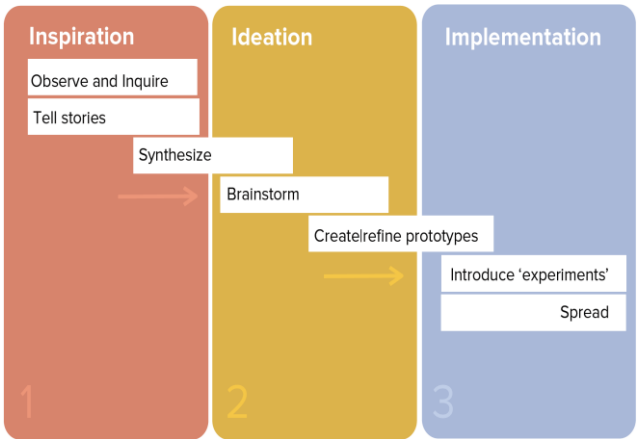

Figure 5 - Design Thinking model of 3 I's (IDEO 2001)

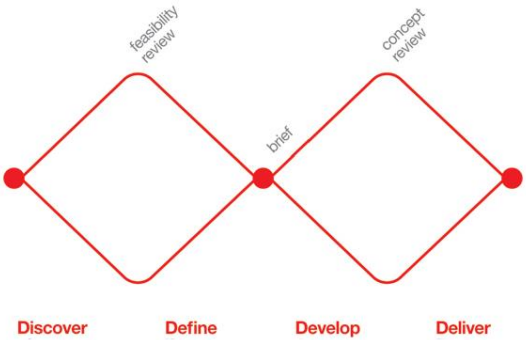

Figure 7 - Double Diamond design process model (British Design Council 2005)

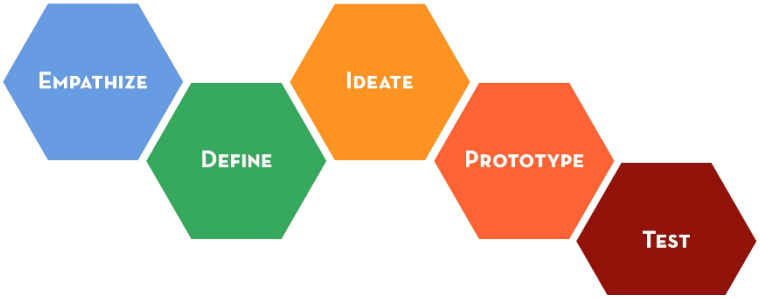

Figure 6 - Design Thinking model (Stanford University 2012)

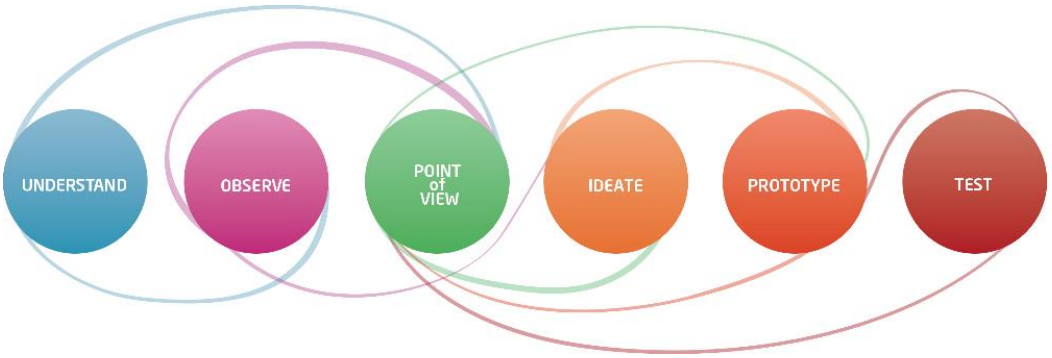

Figure 8 - Design Thinking model (Hasso-Plattner-Institute 2012)

IDEO developed their initial model in 2001 (Figure 5), and it consists of three different phases: (1) inspiration, (2) ideation and (3) implementation. It was designed having in mind the need to work in non-traditional environments.

Later in 2005 the British Design Council designed their own model based on 4 stages (Figure 6): (1) discover, (2) define, (3) develop and (4) deliver, and the convergent and divergent points of this process.

Then, in 2012, the Hasso-Plattner-Institute at the University of Postdam in Germany and the Stanford University, being the first one directly connected with IDEO, developed their own models, having as a basis the initial IDEO model. They are both similar (as it can be verified by the figures above), the only difference being that the Hasso-Plattner-Institute (Figure 8) decided to divide the defining phase of the Stanford University's model (Figure 7) into two different stages.

This last one is the model that we focused on for this research this research, and it consists of six main stages (Hasso Plattner Institute of Design 2012):

- Understand – this is where is all starts. The emphasis is on understanding the people relevant to the project/challenge. This includes gathering background information about understanding their way of doing things, how they feel about certain situations and the environment they are in, and what is important to them;
- Observe – this phase is where observation techniques are applied, for example qualitative research such as interviewing. These two first stages help the person develop a sense of empathy;
- Point of View – after understanding and observing, the user will construct his point of view, which is his perspective of that situation or problem. Here the person will define the challenge to be addressed, and often imagine what can be done to change or improve the current situation;
- Ideate – this stage of the design process consists of idea generation. Users come up of a series of concepts that are possible solutions. These ideas will be the source material for the next phase;
- Prototype – in this mode, prototypes (can be anything from a wall of post-it notes to a storyboard) that can extract useful information and feedback from the possible target users are created;
- Test – the last stage consists of putting the prototypes made earlier to the test. This is an opportunity to call in target users, collect feedback from them and understand better their needs and how they interact with it in order to later be able to improve it.

The DT method is not straight forward, there is the need to sometimes take a step back and redo things according to feedback received or other changes. Note that each stage of the process has some line connected to another one, which means those involved are being performed in iterative loops.

Another important characteristic of DT is that, as it was already mentioned in this document, it is based on inductive, deductive and abductive reasoning. Deduction "allows us to safely predict results", induction allows us to "observe results" and abduction allows us to understand "the value that we want to achieve". (Dorst 2010)

This model was very important for the development of the research and project as it enabled us to follow a specific set of stages in order to develop our own gamified-service. Because of this we want to show that the application of the DT methodology when gamifying a service can be beneficial not only for the organisation of the research but also for obtaining better results in the end.

2.4 Service Design

With the evolution of the service design concept it became clear that the traditional perspective of manufacturing and delivery of goods would not apply very good in this situation, as the customer was viewed as "ideally separated in order to enable maximum manufacturing efficiency" (Vargo and Lusch 2004). There are advantages in involving the consumer, and all organisation departments, as co-producers since "the key to creating value is to coproduce offerings that mobilize customers" (Normann and Ramirez 1993). Service Design then comes up as a way to help connect the customers and end-users to the development of the service itself, which results in a better match of their needs and requirements.

Service Design (SD) is multidisciplinary field that appears as a normal evolution of services themselves (Moritz 2005). Services have always existed in the world, but it is the way they are engineered that can improve the overall experience and add value to both the user and the service provider.

SD is not only about creating new services, but also about improving those that already exist, as "there is a desperate need for new service innovation, but also a need to improve existing services in order to meet user expectations and the demand for higher productivity" (Leinonkoski 2012). This improvement might be even more important as services that are not well designed can lead to the failure of a company in the market (Huang 2008). However, SD includes not only the "design of the overall experience of a service" but also "the design of the processes and strategy to provide that service" (Moritz 2005).

By having this kind of relationship with customers and letting them have a say in the designing of the service, the experience can be continuously improved over the time, and service innovation can be fostered "because it generates and brings service ideas to life by understanding customer experiences, envisioning new service offerings, and prototyping them" (Ostrom et al. 2015).

In order to design a service, and specifically the one in this project, it is necessary to map all its processes and possible interactions. For this, a notation called Service Blueprinting (SB) is used.

SB is a modelling approach created by Shostack in 1984, and it is defined as "a picture or map that accurately portrays the service system so that the different people involved in its development can understand and deal with it objectively regardless of their roles or their individual point of view" (Zeithaml and Bitner 2000).

This means that it is not as complex as other process modelling techniques, like UML (Unified Modelling Language) or BPMN (Business Process Modelling Notation), because in order for it to useful, everyone in the organization as well as customers, need to be able to understand it and know what is their position in the process and in the service system overall (Bitner et al. 2007). This process design notation makes "collaboration among key contributors and stakeholders across a broad customer experience" easier, whether it is being used for creating a new service or to improve an existing one (Bitner et al. 2012) – service innovation.

Service blueprints are designed along two axis: the horizontal axis portrays the chronology of actions and the vertical one discriminates different areas of action separated by specific lines (Boughnim and Yannou 2005), and they are made of five main components (Bitner et al. 2007):

- Customer Actions – this represents the point of view and activities of the customer across the process. Because services are centred and co-created by them, it is crucial to start by designing their actions and then proceed to build the rest of the process around them;
- Onstage/Visible Contact Actions – where actions made by employees/system that interact directly with the customer. It is separated from the Customer Actions by the line of interaction;
- Backstage/Invisible Contact Actions – actions made by employees/system that interact with customers through invisible means. It is separated from the previous actions by the line of visibility, where everything bellow it is not seen by the customer;
- Support Processes – this component displays activities that are required to have happened before in order for the service to be delivered. It is separated from the previous component by the line of internal interaction;
- Physical Evidence – represents the tangibles that customers come into contact with during the whole process and that can impact their quality perception.

These components are depicted in Figure 9 below.

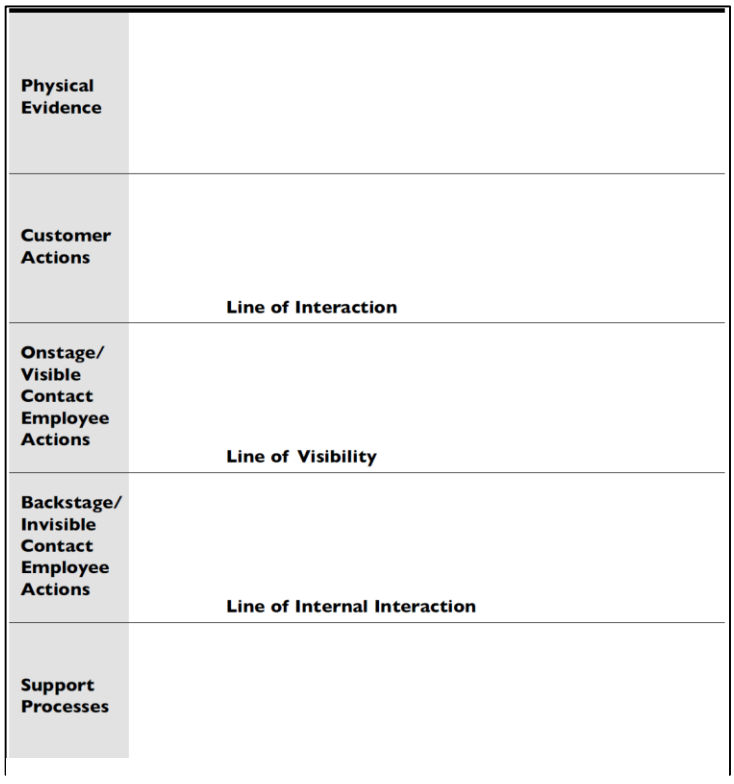

Figure 9 - Service Blueprint components (Bitner et al. 2008)

Specifically, in this practical project, the user will never be in direct contact with employees from the company. The actions depicted through all of the blueprints will be between the user and the service technology platform, in this case a mobile game.

2.5 Summary and Research Gaps

As I previously stated during this literature review phase, there are numerous challenges that innovation faces, especially when combining it with services and gamification.

People have natural aversion to change, mostly because it is something that leads to the unknown and in an organizational environment, risks may arise at any moment if innovation is done wrong. This resistance has its repercussions in innovation as it is a process that mainly focuses on exactly that, change. Therefore, many barriers to innovation arise, and skills to overcome them are needed. That is one of the gaps that we address in the next section.

The other gaps that we tackle concerns the just recent application of gamification in services and consequently the lack of case studies that show the procedures and real benefits of this application. Therefore, we present a case study that shows how Gamification can be applied to services and how it can be used in a service design project with the objective of fostering innovation.

To overcome those gaps, this dissertation uses the Design Thinking, Service Design and Gamification approaches and frameworks that I explained earlier.

3 Problem Characterization

In this section the research and project problems are presented, connecting their objectives with what was done in order to solve them. Here we address the research gaps in detail, explaining how they can be overcome by applying existing methodologies and series of frameworks in a new context, and also address the project's specific practical challenges.

The initial problem arose from the understanding that we live in a world where changes occur faster than ever, not only in businesses but also in society in general. The constant evolution of society and economy demands people (students and professionals) to be up to date and keep up with these fast changes, transform their attitude towards the world, broaden their horizons and develop and enhance certain skills and capabilities that enable them to be more innovative and think in a more open way.

However, there are numerous barriers, that we defined earlier in the literature, to this kind of innovative approach. One of them concerns the environment these professionals and students are inserted. Frequently the nature of the jobs turns more difficult to be innovative: high-stress jobs and often long working hours, resistance to change and usually fear of assuming risks are some of the examples where this is true.

By addressing this problem, we aim to understand these gaps in detail:

- How can Gamification be applied to services;
- Understand the main challenges faced by professionals regarding their work lifestyle so that we can promote innovation;
- How can Gamification be used in a service design project to foster innovation.

3.1 Research Gaps and Theoretical Contribution

The fact that people and organizations have such a huge resistance to change creates a big gap in this research field, mainly because if people do not take risks research cannot go on. This makes innovation investigation a lot harder as there are not that many study cases to be analysed.

As it was already explained, we aim to: (1) understand how Gamification can be applied to services, (2) understand the problems faced by people in their professional lives in order to promote innovation, and (3) understand how a gamified service can be designed for that same end. In order to fill to these gaps, we conducted a primary and secondary research studies to find out the real challenges and key skills that can respond to them. Then, with that information we could start designing the gamified service with the help of the DT methodology and the SB method to support a solution.

This project then serves as a case study on how these different methodologies and methods can work together to gamify a service the right way, and also provide a solution to the target users' problems. Details on the research process and solution are provided during the next main section.

3.2 Organisational Challenges and Practical Work

As it was already described previously, the company found a gap in the market that we aimed to fill: the lack of an effective, engaging and accessible tool to develop a more innovative mind-set among professionals and students, and also explore the fact that technology and, more specifically, mobile tech, is growing at a very fast rate.

From the literature we found that gamification can lead to better engaging and effective applications that can possibly be used along with service design to create a gamified service that, by using some dynamics, mechanics and components usually found in games, can help professionals overcome the carriers to innovation, already described earlier as well. A mobile gamified service application has some characteristics that make it a better solution than traditional training. There is less pressure when addressing a challenge, there are more possibilities for communication and networking, the possibility of playing alone and whenever the user wants, and many more.

However, as the company never developed a such IT intensive game, there were some challenges, such as:

- The need to understand better the user requirements and needs and make an intensive research among them, to make sure the concept was successful when applied functionally;
- Find how the metaphor technique can be applied in in this kind of platform;
- Understand what is possibly to be done and what are the current software limitations;
- Come up with a business model that appeals but still is successful and profitable in this platform;
- Develop all the service processes that fulfil our target users' needs;
- Understand how prototyping a mobile application can be done.

In the next section we take a look at the methodology and consequent methods used during the research in order to gather and analyse information for later application.

4 Methodology

In order to gather information about the new gamified service to be developed, a qualitative analysis was performed. We conducted eighteen interviews among target users, being all of them recorded for later examination. This included the transcription of the most pertinent data collected and then the coding process. The next step was to analyse using *Microsoft Excel* in order to understand what were the target's top needs and reach a conclusion about how the new game service should be designed (interface, features, functionalities, etc.) to fulfil them. With the service designed, a series of prototype concept tests were performed using the focus group technique, where we collected feedback from the users to improve the final concept.

Although younger professionals are more open to these new kinds of approaches, our targets are professionals of any age, income and location. With this we want to reach to those who are used to more traditional approaches and not as receptive to these new methods. This service will enable them to think differently and question older habits in order to develop skills that will help them evolve as a professional and as a person, as well as relax and have fun at the same time.

The initial idea, however, has been changed over the time. Like the Service Design and the Design Thinking methodologies, we seek continuous improvement of our initial service ideal by involving the future target users in the process. Because of this, as we collected data, we had to adapt and improve our service concept according to our target needs and expectations.

After researching on our target's needs, we reached a set of skills and capabilities that they value more and would like to learn or enhance. Some of those skills made us rethink the concept and establish other priorities when designing the service. For instance, we found that collaborating, exchanging experience and creating routines were highly valuable by professionals and companies. We also came up with a different set of target priorities for the service, but we explore all of this information in detail further in the report.

4.1 Qualitative Research and Grounded Theory

In research design there are three ways to ways to characterize research methods: quantitative, qualitative or mixed approach, where there is a combination of both (Creswell 2003).

In this project the qualitative method was chosen as its characteristics are more appropriate to the goals defined. Table 1 below makes a simple comparison between both quantitative and qualitative approaches in order to justify this choice (Keele 2012):

Table 1 - Quantitative vs. Qualitative Research Methodologies (Keele 2012)

Quantitative Research	*Qualitative Research*
Considered a hard science	*Considered a soft science*
Objective	*Subjective*
Deductive reasoning used to synthesize data	*Inductive reasoning used to synthesize data*
Focus – concise and narrow	*Focus – complex and broad*
Tests theory	*Develops theory*
Basis of knowing – cause and effect relationships	*Basis of knowing – meaning, discovery*
Basic element of analysis – numbers and statistical analyses	*Basic element of analysis – words, narrative*
Singles reality that can be measured and generalized	*Multiple realities that are continually changing with individual interpretation*

Being a soft science, the goal of qualitative research is to give outputs in the form of "open-ended, emerging data with the primary intent of developing themes from the data" (Creswell 2003), while qualitative research aims to gather information in the form of statistical data (Creswell 2003).

The following definition of qualitative research by Denzin and Lincoln (2005) sums it up perfectly: "qualitative research is a situated activity that locates the observer in the world. It consists of a set of interpretive, material practices that make the world visible. These practices transform the world. They turn the world into a series of representations, including field notes, interviews, conversations, photographs, recordings, and memos to the self. At this level, qualitative research involves an interpretive, naturalistic approach to the world. This means that qualitative researchers study things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them" (Denzin and Lincoln 2005).

As we aim for a more exploratory research, where we seek information that then help us develop the concept and further design the service, qualitative was the method chosen.

In order to perform this qualitative research, I followed a methodology first described by Graser and Strauss in 1967, called Grounded Theory (GT). It was developed from the need to produce theory based on more exploratory social research by bonding this "gap between theory and empirical research" (Glaser and Strauss 1967). GT focuses in "developing theories from research grounded in data rather than deducing testable hypotheses from existing theories" (Charmaz 2006), this means that it enables researchers to move from the data collected to the construction of new theories, instead of relying only on already existing ones.

To "ensure that data is collected, coded, compared, and organised into increasingly abstract categories" (Kenny and Fourie 2014), Glaser and Strauss defined a series of basic practices and procedures for GT that Charmaz later summarized in the book *Constructing Grounded Theory: A practical guide through qualitative analysis* (Charmaz 2006):

- Simultaneous involvement in data collection and analysis – as data is collected it is simultaneously analysed which leads to early generation of relevant hypotheses that can be later theorized. The researcher will continue collecting evidence until "no additional data are being found whereby the sociologist can develop properties of the category" (Glaser and Strauss 1967), which is called theoretical saturation;
- Constructing analytic codes and categories from data – this is when our collected and analysed data starts to take form. It is the "fundamental analytic process used by the researcher" (Corbin and Strauss 1990). Coding means that data is categorized into relevant segments that will enable us to compare and understand better how they relate (Charmaz 2006);
- Using the constant comparative method – Involves making comparisons between data and categories collected and created with their sources during each stage of the analysis. This "assists the researcher in guarding against bias, for he or she is then challenging concepts with fresh data" and at the same time help "achieve greater precision (the grouping of like and only like phenomena) and consistency (always grouping like with like)" (Corbin and Strauss 1990);
- Advancing theory development during each step of data collection and analysis – from the constant collection, analysis and comparison, the researcher must always look for information that will contribute to the development of concepts and discovering theory (Glaser and Strauss 1967);
- Memo-writing – "consists of writing about tentative ideas and emergent categories and includes the crucial intermediate stage of writing between coding data and writing the first draft of a paper" (Charmaz and Bryant 2010). This will enable the creation of categories, specify their properties, define relationships between categories, and identify gaps "to explore the potential of selected focused codes as tentative categories" (Charmaz and Bryant 2010);
- Sampling aimed toward theory construction – the goal of the sampling process in a qualitative research is to reach the theoretical saturation of categories. For that the researcher might change the sample during the process if he or she thinks it will be beneficial for the research and the construction of a new theory;
- Conducting the literature review after developing an independent analysis – it is best "to ignore the literature of theory and fact on the area under study, in order to assure that the emergence of categories will not be contaminated by concepts more suited to different areas" (Glaser and Strauss 1967).

These practices were followed in this research, along with the techniques that I will be detailing in the next section.

4.2 Methods used in the project

As stated previously, GT is a methodology well suited for a more exploratory or discovery-oriented research, and that is why it was chosen for this project.

4.2.1 Sampling

Having the research objectives and gaps in mind: (1) understand our target users' needs (what challenges they face in their professional life, how they overcome them and what they would change), (2) how can we design a service based on gamification, and (3) that helps them foster more innovative thinking capabilities, we defined our sample constitution: students that have just started working and experienced professionals from a variety of backgrounds. By having

this diverse sample of the population we aim to gather information that may help developing a service that is versatile and meet the different target user's needs.

A number of people that fit into our target (mostly people the company had already worked with) were contacted and asked about their availability to take part on the project, twenty-two of which accepted the invitation. In spite of this, problems always arise, and because of geographical and other constraints, some of these could not participate in the interviewing process. This left us with a final sample of 18 participants, which is still satisfactory for the research.

The sample usually evolves with the research of the project, and that was the case with this one, as we started by looking only after experienced professionals but as the research advanced we found the need to interview students as well. This also supports the idea that collection and analysis of data should be performed simultaneously for additional benefits, as the GT principle says (Glaser and Strauss 1967).

4.2.2 Interviewing and Focus Group

For this research, as it was previously stated, eighteen interviews were performed. This process of data gathering started on the 11th of March and finished on the 14th of April, 2016. The interviews were mainly performed in person, at the workplace of participants, or remotely over the phone or other online communication platform (Skype or Hangouts), and were arranged according to their availability.

Before the interview, the participants were sent an email introducing (briefly to avoid influencing their future answers and suggestions) and contextualising the project and the research. If the interview was not made face to face, then an Informed Consent would be also attached to this email (a signed version would be returned in another email), otherwise two copies of this document were brought to the interview in order to be signed by the interviewer before starting. Every interview was audio recorded for later analysis under the permission of the participant.

In spite of the email sent, the interview process always started by introducing the research and project context and objectives. In order to make the interviewer comfortable with the situation I also told them that: (1) since it is an exploratory research there are no right answers and I only wanted to hear their opinion; (2) if they did not understand the question they were free to ask me to clarify it; (3) if they said something they did not want to be used in the interview I would not do so.

The interview itself is semi-structured, meaning that it "is open ended, but follows a general script and covers a list of topics" and is the best for "situation where you will not get more than one chance to interview someone" (Bernard 2006). So, the interview course and duration would change depending on the person being interviewed, as some of them would address more than one question in a single statement or would deviate towards other matters, but in the end all the questions were addressed. The interview script is available in Appendix A.

The interview was divided into two categories:

- Context – with a set of five questions where I aimed to understand the participant's needs and habits, specifically (1) the challenges they face in their professional life, (2) what they currently do to overcome them, (3) what would they change if they could, (4) which soft skills they think are the most important to face professional challenges (4) and (5) what methods they use to develop those skills;

- Exploration – with another set of four questions where I tried to understand how a gamified service could help them improve those skills, specifically (1) how they think different methods and practices can help them, (2) how they are familiarized with the gamification approach (if they were not familiarized I would proceed to explain it briefly), (3) how they think a gamified approach can be a good method for developing soft skills and (4) how they imagine a mobile online game with this purpose.

In the end I would also ask if they had any suggestions or recommendations for the project.

I did not focus in the social-demographic characteristics of the sample, as they are not necessarily needed in order to achieve better results. However, we tried to interview as many people from different backgrounds as possible, as well as ensure that we had a balance between students that have just started working and experienced professionals. Figure 10 below shows an overview of this sample:

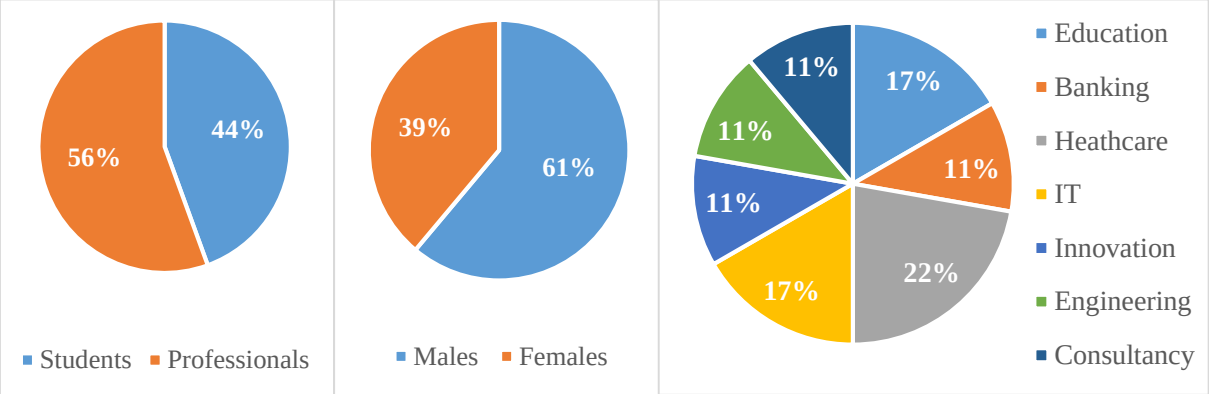

Figure 10 - Sample overview

As we can see, the sample was constituted of:

- An equilibrium in terms of status, being 56% professionals and the other 44% students;
- Most of the participants, 61%, were males;
- A broad and balanced range of backgrounds, although healthcare is the most present (22%).

The average interview length was 34 minutes, which is what was aimed for, as it is not too little information neither it is not too much that it will make it difficult to analyse later.

After the exploratory interviews and later service design and prototyping, a series of focus group sessions were also made with some of the people interviewed in the first phase.

Focus group interviews involve a "a small group of people engaging in collective discussion of a topic previously selected by the researcher" (Edwards and Holland 2013), in this case, the sessions focused on:

- Presenting the concept – what is the purpose, and how the service will be delivered;
- Presenting the target users – who is this service aiming for and what are the targets' needs;
- Presenting the service itself – the mobile application prototype was shown to the users and at the same time its functionalities and features were explained;
- Testing the application – the users were then free to engage with the prototype and see for themselves how it works and what it offers;

- Short survey about the overall concept, functionalities, business model and other suggestions to improve the service until its ready for development. These survey's questions are available in Appendix B.

This was an important phase for the project as we were able to test and validate the concept that we developed based on the qualitative research results with the end-users themselves. Their reactions, discussions and later survey answers helped us improve the service for later development.

4.2.3 Data Analysis

As I collected and analysed the information, an important aspect was its coding. In GT described by Kathy Charmaz in the book *Constructing Grounded Theory: A practical guide through qualitative analysis*, coding is to "attach labels to segments of data that depict what each segment is about" and it "distils data, sorts them, and gives us a handle for making comparisons with other segments of data" (Charmaz 2006).

For data analysis we used *Microsoft Excel*, *Microsoft Word* and *Windows Media Player*. In *Microsoft Word* the most relevant parts of each question were transcribed while listening to the recordings with *Windows Media Player*. Important quotes by the interviewers were also highlighted in order to be used later when presenting and justifying the results. In *Microsoft Excel* data about the participants and interviews in general was stored (status, background, gender and interview length) as well as the coding of two categories (one for skills and another for personal traits), each with multiple data segments (specific skills collected during the interviewing process) that fit them.

As the data analysis was done simultaneously with the collection, the concepts were evolving with each interview in order to better fit a specific identified need. For example, some concepts, broader in the first place, were divided in two different ones in order to address a need more specifically. This was the case of the skills identified by the users. We found that many of them were not really classifiable as soft skills that can be trained, such as humility, so we divided that concept into two different ones: (1) personal skills and (2) soft skills, that are detailed further in the next section.

With the data collected and coded into the *Excel* sheets, queries were then made in order to understand which skills and personal traits were considered the most important from the list created.

The focus group interviews also produced very relevant data:

- Annotations were taken during the focus group sessions, regarding the reactions and suggestion made across the presentation. These were later transcribed into a *Microsoft Word* document for analysis;
- Survey answers were collected and stored in the Google Forms online platform. These data were later analysed and crossed with the annotations explained previously for service and prototype improvement.

5 Understanding the Target's Needs and Requirements

In this section the main focus is the data gathered and analysed from the interviews. The most relevant information gathered in each question is presented in detail in order to understand the targets' needs and requirements, that are used later in the design process of the service. In the end we cross the information gathered from the interviews regarding the skills and capabilities for innovation and the information collected from the literature, for validation purposes.

5.1 Challenges

The first question of the interview was intended to get insights about the challenges these young and experienced professionals face in their day-to-day professional lives. As I already explained in detail before, some of these challenges are sometimes barriers to innovative thinking, and innovation in general, which is what we are trying to foster with this service.

This kind of information is important for us to understand what are problems professionals have to deal with every day, which enables us to define a scope and objectives that the service should address.

When asked about this matter, participants were able to enumerate various challenges, and because of that, the data saturation state took more time to reach. Table 2 below shows the challenges identified, as well as the number of professionals that referred to them and the overall ratio.

Table 2 – Challenges identified by professionals

Challenge	# Sources	%
Constant problem facing	9	50%
Working in interdisciplinary teams	8	44%
Time management	7	39%
Prioritize tasks	7	39%
Little recognition	7	39%
Pressure to achieve goals	7	39%
Stressful jobs	6	33%
Need for fast decision making	6	33%
Customer diversity	5	28%
Fast changing market	5	28%
Too much bureaucracy	5	28%
Fear of making mistakes	5	28%
Administration restrictions	4	22%
Personal problems	4	22%
Not having freedom	4	22%
Too much work	3	17%
Dependence on others	3	17%
No motivation to innovate	3	17%
Team management	3	17%
Laziness	2	11%
Remote work	2	11%
Lack of control over the information flow	2	11%
Having to work individually	2	11%
Racism	1	6%

"Being with the same people, doing the same thing a long period of time creates a routine that's not healthy. We need to change and innovate."

Female, Innovation sector, On the challenges faced as a professional

As we can see from the data in the table, there are a lot of challenges shared between professionals. It is important to note the ones that most participants talked about:

- Constant problem facing – half of the participants indicated that this is a real challenge, as everyday a new problem emerges and quick action is needed to solve it;
- Working in multidisciplinary teams – this was second most mentioned challenge, as companies are getting more diverse and teamwork is essential for success;
- Time management, prioritization of tasks, little recognition and work pressure – these were pointed out by a number of the participants. Pressure to achieve goals on time demands that a prioritization of tasks has to happen, but also rewards should be given to successful professionals in order to motivate them.

5.2 Current Practices

Following the previous question, the next one aimed to understand how participants currently try to overcome the challenges they mentioned before. We found that this information would be very useful when thinking about the behaviours that need to be promoted by our new service, and maybe find what they are doing wrong or insufficiently. Table 3 shows the results achieved.

Table 3 - Current Practices

Current practices	# Sources	%
Talk to other professionals	12	67%
Task prioritization	10	56%
Get to know everyone in the company	8	44%
Being proactive	8	44%
Adequate team building	7	39%
Training	7	39%
Delegate work to others	6	33%
Brainstorming sessions	6	33%
Try to adapt to every kind of tasks	6	33%
Listen to music and have fun	6	33%
Learn from experiences	5	28%
Learn from mistakes	5	28%
Physical activity	5	28%
Look for break points and improve them	5	28%
Rely on IT systems for time and task managing	4	22%
Make to-do lists	4	22%
Work extra hours	4	22%
Being optimistic	4	22%
Try to stay calm at all times	3	17%
Practice before acting	3	17%
Look for new ways of working	2	11%

What we found was that most of the participants mention that they resort to other professionals for help, a lot of them also mention that getting to know everyone in the company helps when facing problems and say that team building is essential. These data let us understand that participants really value cooperation, which is a main aspect explored with our service.

"Circumstances change and I feel the need to be proactive and change the procedures."

Female, Innovation sector, On how to face challenges

Other important discoveries were, not surprisingly, that task prioritization, proactivity and formal training also play an important role in the challenge facing department, and, although

not as much, people feel the need to get away from these problems. This is evidenced by the fact that 33% of participants usually to listen to music and have fun, and 28% resort to physical activity to feel better and more confident when overcoming those problems.

5.3 Change

We now know what challenges participants face and how they try to overcome them. The next step is to understand what would they change if they had unlimited power and resources. When people were confronted with this question they looked like they were not prepared for it, and most of them just told me that there is no such thing as unlimited resources. Here I had to explain that the purpose of the question is to explore the ideal situation in order to find out what would be perfect, so there is no need to think about restrictions.

"Unlimited resources? There is no such thing in the real world."

Male, Education sector, On what to change with unlimited resources

This information is useful to make participants think about what really is impossible and what may seem impossible but is not after all, and can be changed with some effort. Table 4 shows the results.

Table 4 - Change

Change	# Sources	%
More rewards for workers	9	50%
Employ more people	8	44%
Being able to use more innovative methods	7	39%
More ways of training with new methods	7	39%
More experience sharing sessions	6	33%
More flexible working hours	6	33%
Better service marketing	6	33%
Improve the information flow of the company	5	28%
More and better equipment	5	28%
Having a more specific response to the problem	4	22%
More workshops for employees	4	22%
More teambuilding activities	4	22%

Half of the participants admitted that if they had more financial power they would have more rewards for workers and some of them also said that it would be beneficial to have more people employed. Interestingly, it seems that people tend to assume that innovation is too risky, as a number of them say that with unlimited resources they would be willing to try out new innovative methods for working and training.

5.4 Key skills

This was the main focus of the interviewing sessions. With the challenges and good practices identified before, we wanted to understand, among the participants, what are the key skills a professional should enhance or develop in order to better face those day-to-day problems. The top mentioned skills are then crossed with the skills gathered from the literature research, presented before, in order to reach a list of skills our new gamified service focuses on.

These soft skills are the ones where our service focus on. Unlike technical skills, that can be accounted for "what you know" (Hunt 2007) and usually refer to technical aspect of performing a job (Rainsbury et al. 2002), soft skills are more about "how you use it" (Hunt 2007) and refer to "interpersonal, human, people, or behavioural skills, and place emphasis on personal behaviour and managing relationships between people" (Rainsbury et al. 2002).

Soft skills "are essential for entrepreneurial success and for maximizing human capital in any enterprise" and "provide a way to get the highest return on the investment in terms of human capital" (Kaipa et al. 2005).

When asked about the skills that they though were the most important ones in order to overcome challenges, most of the participants seemed aware of the importance of this kind of skills. This is very good for the research because we were able to gather a lot of information about the issue, so much that we felt the need to divide the skills into two different categories:

- Personal skills – these are specific characteristics of the person herself and, for the most part, cannot be trained;
- Soft skills – these are skills explained above.

Table 5 represents the results gathered and coded into the two categories, regarding this topic during the interviews.

Table 5 - Personal Skills and Soft Skills

Personal Skills	# Sources	%	Soft Skills / Competences	# Sources	%
Empathy	7	39%	Communication and Relationship-making	14	78%
Proactivity / Initiative	5	28%	Collaboration / Teamwork	10	56%
Curiosity	4	22%	Creativity	7	39%
Intelligence	3	17%	Leadership	6	33%
Emotional Intelligence	3	17%	Interdisciplinarity	5	28%
Motivation	2	11%	Time management	5	28%
Humility	2	11%	Decision making	5	28%
Self-esteem	1	6%	Critical thinking	4	22%
Confidence	1	6%	Ability to understand the needs	4	22%
Competitiveness	1	6%	Organization	4	22%
Respect	1	6%	Attention / Focus	3	17%
Patience	1	6%	Risk taking	3	17%
			Autonomy	2	11%
			Pragmatism	2	11%
			Reflexes	1	6%
			Sagaciousness	1	6%
			Assertiveness	1	6%
			Sense of opportunity	1	6%
			Conciseness	1	6%

As we can see by the results, a vast majority of the participants pointed at Communication and Relationship-making and Collaboration/Teamwork, with 78% and 56% respectively, as the most important skills for a professional that wants to be successful. This is not a surprise since when asked about their current practices they also mentioned topics related to collaborating with others and establishing relationships, as presented before.

When looking at the rest of the table, the skills that stand out the most are Creativity, Leadership, Interdisciplinarity, Decision Making and Critical Thinking. Most of these skills are mentioned in the literature review, as they were already identified by other authors as key skills for innovation and problem solving.

It is also interesting to look at the personal skills participants mentioned, although that is not the main focus of the project. Participants seem to value Empathy, Proactivity and Curiosity the most. Again, empathy is mentioned which leads us to the communication and relationship-making skills.

5.5 Methods for soft skills development

This next assessment had the goal to understand what methods are people using currently to develop the skills mentioned by them in the previous section. With that information we wanted to learn the behaviours of our targets and be able to pin what they are doing that may be useful to integrate in the service when designing it.

Every participant, with no exceptions, mentioned some of their practices, which are shown in Table 6 below.

Table 6 - Soft skills development methods

Method	# Sources	%
Ask for advices and exchange ideas	8	44%
Brainstorming	8	44%
Learn from mistakes	8	44%
Hang out with friends	7	39%
Training	6	33%
Play games	6	33%
Relax	6	33%
Try new things	6	33%
Physical activity	5	28%
Study	5	28%
Sports (team spirit, decision making, coordination)	5	28%
Volunteer work	4	22%
Teambuilding	4	22%
Expand comfort zone (try to adapt to other realities)	4	22%
Case study solving - simulation	3	17%
Hanging out after work – dinners, barbecues, etc.	3	17%
Set mind up after waking up – Be positive	2	11%
Public speaking	2	11%
Take a break and maybe some days off	2	11%

"Businesses move too fast and we need to adapt. Because of that we should rely on others for collaboration."

Female, Banking sector, On the methods used for skill development

From the data in the table we find that participants use a variety of methods in order to improve their soft skills. The main methods mentioned are, again, related to collaboration: asking for advices and exchange ideas with others as well as brainstorming sessions. Participants also

mentioned that by learning from their past mistakes they can improve their soft skills. Interestingly, more informal activities also appear here, such as hanging out with friends and playing games, that can help them training their communication, decision making and risk taking skills.

5.6 Benefits of innovation and gamification

In this section we be analyse answers to two different but relatable questions: (1) how is innovation beneficial and (1) how can a gamification approach be beneficial for skills enhancement and development.

These questions are important, first because we need to be sure that the participants are well aligned with these concepts, then because the benefits identified by the participants are crucial to justifying the creation of the service and also for the design itself, in order to take advantage of the most crucial benefits.

Before asking about the benefits of gamification, participants were asked if they were familiarized with the term. If not, then I would briefly explain the main aspects of the concept. Out of the eighteen participants, thirteen were familiarized with gamification and only five were not.

"[games] can be a good way for people with a lot of scattered ideas to reach a final result that makes sense and can be applied."

Male, Healthcare sector, On how games can be a way good to face challenges

"Why are there millions of people playing games like Age of Empires? (...) If all these people motivate themselves to be focused on these games, it means that games play, today, a very important role in learning and collaborating. They collaborate in order to win."

Male, Education sector, On how games can be a good way to face challenges

"I feel like games help me make quicker decisions and improve skills like communication and collaboration, which are important when working on a team."

Male, Healthcare sector, On the benefits of gaming

"They [games] can help me by making me more motivated to do a certain task that usually would be very boring."

Male, Information Technology sector, On how gamification can be beneficial during work

Every participant agreed that innovation, when well applied, can be a powerful weapon for companies and for professionals as well. The benefits that were identified are displayed in Table 7 below.

Table 7 - Benefits of Innovation and Benefits of Gamification

Benefits of Innovation	# Sources	%	Benefits of Gamification	# Sources	%
More enjoyable experience	13	72%	More interesting	13	72%
More interest	12	67%	Improvement of team spirit	12	67%
More variety of solutions	11	61%	Ability to reward creative ideas	11	61%
More motivation	10	56%	More interactive	10	56%
Creativity	9	50%	Funnier learning experience	9	50%
Better collaboration and cooperation	8	44%	More motivational	8	44%
Better results	7	39%	Healthy competition	8	44%
More value added	7	39%	Ability to train multiple skills at the same time	7	39%
Adaptability to specific needs	7	39%	Easier to learn and retain knowledge	7	39%
Ability to reinvent	7	39%	Controlled environment – without risks	6	33%
Extra effort	6	33%	Cheaper	6	33%
Higher quality of work	6	33%	More freedom	5	28%
Less expenses	6	33%	Simplifies complex problems	5	28%
More efficiency	5	28%	Ability to be critic about your performance	5	28%
More productivity	5	28%	Ability to develop individual skills	4	22%
Better market overview	5	28%	Customization	2	11%
Freedom	5	28%			
Spontaneity	5	28%			
Better and faster decision making	4	22%			
Optimization of time and resources	4	22%			
Less need to change and update services	4	22%			
Better customer experiences	3	17%			
Less complaints	2	11%			

Participants were very keen on identifying benefits in the innovation practice. It is important to note that most of them mentioned that innovation can turn something less enjoyable into something fun, resulting in more interest, more variety of solutions for challenges, increased motivation, creativity, collaboration and of course added value. When we look at the rest of the data, we find that in general people find that innovation, by involving more engaging and creative methods, can lead to better results, efficiency and to an overall better service (from the professional and customer points of view).

Concerning the gamification approach, participants were also proactive in identifying the benefits of such approach for skill development.

> *"[games] can also offer the option of playing alone, so I can change or train some behaviours or skills that I feel I should, for the organization's best."*
>
> Female, Engineering sector, On how games can be a good way to face challenges

As we can see from the data in the table above, when people think of gamification, they think about a more interesting, interactive and more fun approach to sometimes boring tasks, that involves not only team spirit and cooperation but also healthy competition. It is also interesting to note that participants mentioned that this approach can result in an easier and more engaging learning experience, whether in a team or alone, where multiple skills can be developed at the same time and with the possibility of assessing their own skill gaps.

6 Designing the Service

The practical service design process was divided into three distinct phases: (1) concept definition, (2) service blueprinting and (3) prototyping.

First the initial concept is presented, which includes the target market definition, the main objective of the service and the functionalities that it offers. Then, the service blueprints for the most important functionalities are shown. Lastly, the prototype that was created is presented, in order to represent those service blueprints.

6.1 Initial Concept definition

The concept for this new gamified service has suffered some changes since the beginning of the testing phase. The initial concept, built after the interview data analysis, is described in this section.

The initial concept of this project was to provide a mobile gamified approach that supports the development of critical innovation skills and capabilities in an inspiring and collaborative environment. This would be done through multiple games that enhance innovative thinking could be delivered through engaging storytelling platform.

Another interesting factor is that the gamified service takes advantage of the metaphor technique also used with the other company's game: *ideaChef*®. This technique makes the user relate and understand the problems better, in a more relaxed way and also helps with the fact that, using a metaphor, something can be interpreted differently by different people, which leads to a richer solution in the end. In this case we use a movie based metaphor.

This game platform would stimulate experience sharing and collaboration with peer assessment and evaluation mechanisms and a rich feedback loop. This way it is possible to get easy access to best practices and knowledge that typically are not explicit by traditional working environment and training experiences. The name of the application was also subject to change during the first phase, changing from *ideaWe* to *ideaMovie*, until it was dropped again later in the project.

There were two initial main targets:

- B2C - Professionals from industries/sectors where the nature of the job turns more difficult to be innovative: high-stress jobs and often long working hours, resistance to change and fear of assuming risks;
- B2B - Innovative companies that decide to make this game available for their employees.

Initial main objectives for individuals were:

- Grow and develop innovation skills and capabilities;
- Have a quick and efficient way to self-assess and benchmark with other professionals;
- Easy access to lessons learned and new and superior practices, which enhance performance with less effort;
- Expand their comfort zone and embrace more innovative thinking approaches;
- Experiment new approaches and solutions without risk;
- Get a more engaging learning experience;
- Learn through collaboration with other professionals – enrol in a collaborative feedback loop with its peers;
- Recognition from peers based on their own contributions and ideas;

- Help to reproduce the reality and simplify difficult matters;
- Communicate, engage, collaborate and share experiences with peers.

Initial main objectives for companies were:

- Facilitate employees self-training and reduce time spend in traditional training activities;
- Help to shape an innovation culture;
- Support bottom-up decision-making instead of traditional top-down approaches;
- Support better decision-making at different levels of the organization.

Following the *Game Elements and Hierarchy* framework (Werbach and Hunter 2015), presented and explained previously in the literature review, we started building the functionalities that we felt were adequate to fit the user needs and requirements explored in the data analysis. These are explained in the next topics.

6.1.1 Dynamics, Mechanics and Components

Dynamics are the elements that "provide motivations through features like narrative or social interaction" (Werbach and Hunter 2015). They are divided in Constraints, Emotions, Narrative, Progression and Relationships.

Mechanics are the "basic processes that drive the action forward and generate player engagement" and they "represent a means of implementation of one or more Dynamics" (Werbach and Hunter 2015). This means that, in order for our game to engage players we need to find adequate mechanisms that explore the dynamics defined previously.

Components are "manifestations of the Mechanics, which are in turn manifestations of the Dynamics" and are the "tactics", and "surface aspects of a game or gamified system" (Werbach and Hunter 2015). These are the artefacts that will make the game come to life as they can be interacted with by the user.

The dynamics, mechanics and components of our gaming service are described in Table 8 below, and crossed with the functionalities in more detail in Appendixes L through N.

Table 8 - Dynamics, Mechanics and Components (Werbach and Hunter 2015)

<table>
<tr><th colspan="2">Dynamics</th><th colspan="2">Mechanics</th><th colspan="2">Components</th></tr>
<tr><td rowspan="3">Constraints</td><td>Choices</td><td rowspan="2">Challenges</td><td>Missions</td><td rowspan="2">Achievements</td><td>Defined objectives</td></tr>
<tr><td>Trade-offs</td><td>Quizzes</td><td>Missions completed</td></tr>
<tr><td>Time constraints</td><td>Change</td><td>Randomness</td><td colspan="2">Avatars</td></tr>
<tr><td rowspan="3">Emotions</td><td>Curiosity</td><td colspan="2">Competition and Cooperation</td><td rowspan="2">Badges</td><td>Represent achievements</td></tr>
<tr><td>Enjoyment</td><td colspan="2">Feedback</td><td>Number of logins</td></tr>
<tr><td>Creativity</td><td rowspan="5">Resources</td><td>Collect</td><td colspan="2">Boss fights</td></tr>
<tr><td colspan="2">Narrative</td><td>Trade</td><td colspan="2">Collections</td></tr>
<tr><td colspan="2">Progression</td><td>Real products/services</td><td colspan="2">Combat</td></tr>
<tr><td rowspan="2">Relationships</td><td>Share and help</td><td>Contacts</td><td colspan="2">Gifting</td></tr>
<tr><td>Multiplayer</td><td>Experience sharing</td><td colspan="2">Content unlocking</td></tr>
<tr><td></td><td>Meet users</td><td rowspan="3">Reward</td><td>Bonus points</td><td colspan="2">Leaderboards</td></tr>
<tr><td></td><td></td><td>Badges</td><td colspan="2">Levels</td></tr>
<tr><td></td><td></td><td>Product placement</td><td colspan="2">Points</td></tr>
<tr><td></td><td></td><td rowspan="2">Transactions</td><td>Purchases in the store</td><td colspan="2">Quests</td></tr>
<tr><td></td><td></td><td>Trading</td><td colspan="2">Social graph</td></tr>
<tr><td></td><td></td><td colspan="2">Turns</td><td colspan="2">Teams</td></tr>
<tr><td></td><td></td><td colspan="2">Win states</td><td colspan="2">Virtual goods</td></tr>
</table>

6.2 Functional Specification

In order to design our service it is necessary to develop all the blueprints that will be later used by the implementation team. These blueprints were created using the software *Microsoft Visio* and following the SB methodology presented in the literature previously and will enable us to imagine how the game will run, its features, characterisctics, possibilities and interactions between the user, application and back-office servers.

Each blueprints refers to one or more functionalities/features that are described in this section, and they also include all the elements mentioned in the previous section (dynamics, mechanics and components), which will make this game useful as well as enjoyable and engaging for its users. Figure 11 below represents the main components and features of the game service system and helps understand the connection between them as we explain them in the following subsections.

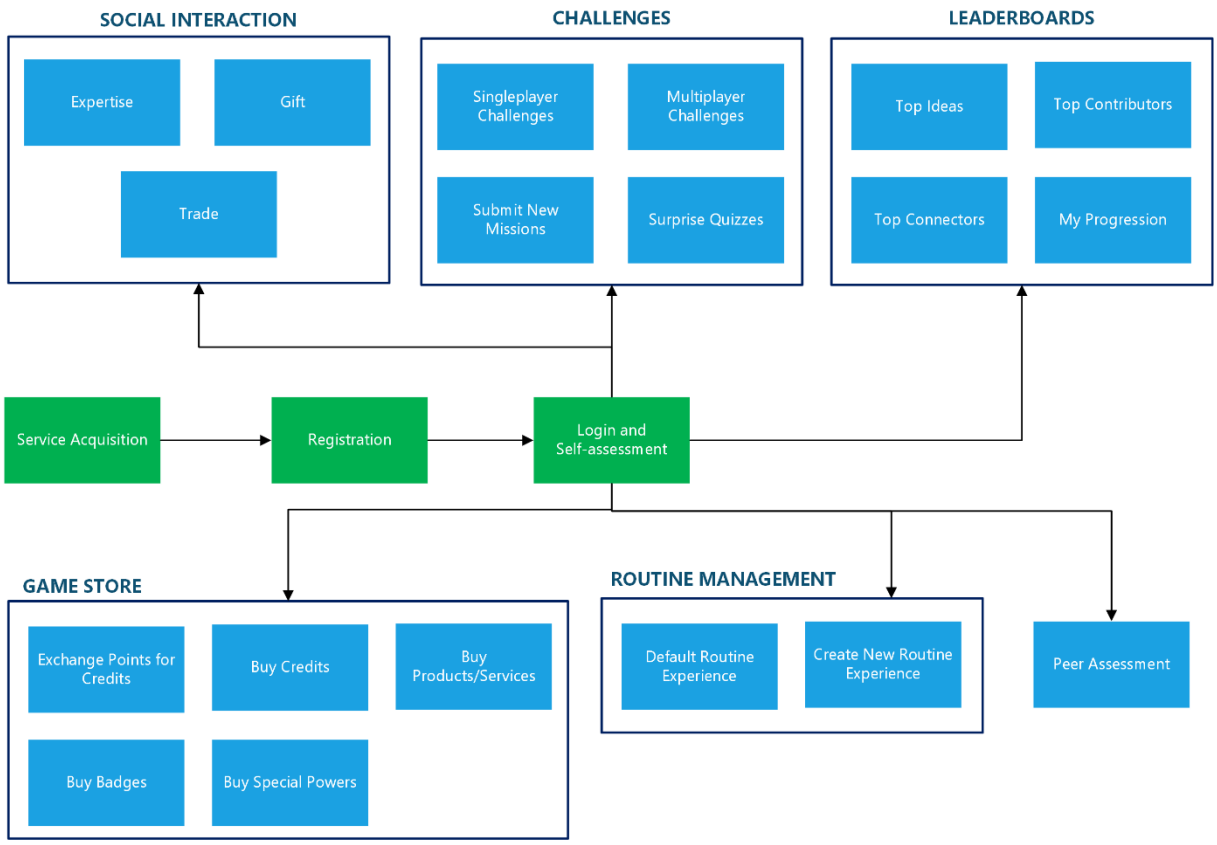

Figure 11 - Game Service System

✓ Registration

The registration process starts like almost all other processes, by starting the application. Being the first time the user is using the app, it will ask the user to register. In order to do it, the user can choose to register through Facebook, Google or simply fill a regular user form. Then, if the user chose to register inside the app, he will have to fill the presented form (username, password and email). After this user will be asked to agree with the terms and conditions shown. In the end, a confirmation email will be sent to the user in order to validate and finish the registration process. The blueprint for this process is available in Appendix E.

✓ Login and Self-assessment

This process represents the path taken by the user and the application in the login process, as well as the first self-assessment of his/hers in-game profile.

It starts with the user opening the application and then filling the login form, which includes the username or the password. There is also the possibility of the user logging in with the Facebook or Google account. After this, the user will choose if he wants the application to remember this data, which will enable faster login in the future.

After the first login is completed, the system will ask the user if he/she wants to use an anonymous avatar, use his/hers Facebook, Google, LinkedIn or Twitter profile information or choose to just show the username (previously picked in the registration process). If the user chooses the persona option, he/she will be presented with a list of possible avatars (movie characters) to select.

When this step is complete, the application will ask if the user is available to share ideas with other players. If so, this will enable other users to ask for help with their own missions/submissions.

With all these phases concluded, the application will reward the user if certain requirements are being met. For example: in is first login the user will be rewarded with a badge; after a week of daily logging in another badge will be awarded to the player; and after a month of daily logging in, another special badge will be gifted to the user. If none of these criteria is met, then the app proceeds as normal. The blueprint for this process is available in Appendix D.

- ✓ **Surprise Quizzes**

This process shows how the user will configure the surprise quizzes and how they work.

After logging in, the user will go to "Options" and choose "Quizzes". Then the quizzes configuration form will be presented to the user and he/she will have to fill the various fields, such as the number of quizzes he wants to answer per week (maximum of two), the schedule period, days of the week, etc.

During the day, if it is time for the system to send a quiz to the user, the application will show a notification on the device and the user will open it, revealing the quiz. Then, the user will answer to the stimuli and the system will register how long it took for the user to respond, using that information to calculate the number of points and experience to be awarded. After this, the user can choose to rate the quiz (which will get them extra points). If the user reached any specific achievements, he/she will be awarded the respective badge. After all these points and experience are added to the user profile, the system will calculate if the experience is enough to level up. If so, a level-up screen is shown alongside the rewards. The user will then be redirected to the "Challenge" menu where he will be "forced" to play a "boss fight" mission in order to proceed with the game course. These "boss fight" missions will present the user a more difficult multi-player challenge that requires the collaboration of three more players in order to be fulfilled. The blueprint for this process is available in Appendix K.

- ✓ **Game Store**

This process shows how the in-game store works and how it is connected with the mechanics of the game.

After logging in, the user can enter the store by choosing "Game Store" in the main menu. Inside the store the user has four options: "Trade points", Buy special powers", "Buy items" and "Buy Expertise". If the user wants to trade points for credits (in-game currency), he will choose the amount of points that he wants to trade (from the pre-set options) and the system will then proceed to trade them for credits.

If the user chooses to buy special powers, he will be presented with the list of possible special powers alongside their price. If chosen, the system will trade credits for the respective special powers.

If the user chooses to buy items, he will be shown the available items for purchase, presented by category (common, uncommon, rare, super rare). He can then proceed to buy whichever he wants, being added to the collection afterwards.

The other option is to "Buy Expertise". This will enable the user to trade credits for the collaboration of another specific user. The user will be presented a list of players available for

expertise. The app will then send a notification to the target user. The blueprint for this process is available in Appendix I.

✓ Routine Management

This process will tackle how the other aspect of the game will be presented to the user as well as its functionalities.

After logging in, the user can choose "My Routine" from the main menu. This will present them with 2 different options: "Check default program" or "Create new program". If chosen the first option, he user will be shown the default program pre-set by the application, where he can tick/untick topics.

If the second option is selected, the user will be asked to fill the new program form with all the necessary information, such as the name of the program, the description, goals, due dates, etc. After this first steps, he will be redirected to the program itself (which is empty) and will have to possibility of adding topics. These new topics will be created through a quick form as well, and then added to the program page, alongside a tick box. The user can add as many topics as he wants. The blueprint for this process is available in Appendix F.

✓ Social Interaction

This process shows how the users will interact with each other inside the application.

After logging in, the user can access its profile by choosing "My Profile" in the main menu. Then he can select the option "My Connections", which will show the user all its connections (people he has chatted with, played with, etc.). He can then choose a specific user he wants to interact with and select it. This will direct him to the target-user profile. In his profile there will be 3 options: "Chat", "Trade" and "Gift". If the chat option is chosen, he will be redirected to the chat window and will be able to start chatting.

If the trade option is selected, the trade menu will be shown. In this menu the user can choose what item he wants to trade and what item he wants in return from the other user. The target user will then be notified of the trade request, and will accept or decline it. If successful, the system will swap items between the users. If not successful the other user can choose to re-negotiate, issuing a new trade.

If the user chooses the gift option, he will be shown his own items and will choose which item he wants to gift the other user. After this, the item will be transferred and the other user will be notified of this gift.

After the chat, trade or gift process is complete, extra points and experience will be added to the user profile, as well as extra badges if any achievement (number of chats, trades, gifts, etc.) is reached.

After all these points and experience are added to the user profile, the system will calculate if the experience is enough to level up. If so, a level-up screen is shown alongside the rewards. The user will then be redirected to the "Challenge" menu where he will be "forced" to play a "boss fight" mission in order to proceed with the game course. These "boss fight" missions will present the user a more difficult multi-player challenge that requires the collaboration of three more players in order to be fulfilled. The blueprint for this process is available in Appendix H.

- ✓ **Multiplayer Challenge**

This is one of the main processes of this service. It includes all the steps the user and the application take in order to facilitate a multiplayer game session as well as all the other resultant interactions.

It starts with the user's login. Then, in the main menu, the user chooses the option "Challenges". This option will take the user to the next screen, in which they choose "Multiplayer mode". After this, the user is provided with a list of submitted missions (created by other players and made public/private) where he/she can choose the one he/she wants to play.

After choosing one mission, the app will present all information regarding this specific challenge, which includes the description, objectives, attached videos/images and its due date. The system will also ask if the user wants to invite more players (from his/her connections) to play this challenge with, which will receive a notification afterwards.

Then, after the user makes his/her contribution to the mission, he/she will be asked to rate the mission according to two criteria (creativity and feasibility). The user can then choose to share the results on social media, which will result in adding extra points to the regular ones and experience gained.

After all these points and experience added to the user profile, the system will calculate if the experience is enough to level up. If so, a level-up screen is shown alongside the rewards. The user will then be redirected to the Challenge menu where he will be "forced" to play a "boss fight" mission in order to proceed with the game course. These "boss fight" missions will present the user a more difficult multi-player challenge that requires the collaboration of three more players in order to be fulfilled.

- ✓ **Singleplayer Challenge**

This is the second main process of this service. It includes all the steps the user and the application take in order to facilitate a singleplayer game session as well as all the other resultant interactions.

It starts with the user's login. Then, in the main menu, the user chooses the option "Challenges". This option will take the user to the next screen, in which they choose "Singleplayer mode". After this, the user is provided with a list of default missions (pre-set by the creators of the game) where he/she can choose the one he/she wants to play.

After choosing one mission, the app will present all information regarding this specific challenge, which includes the description, objectives, attached videos/images and its due date (1 week from the start of the mission). The system will also have an option where the user can invite up to two more players (from his/her connections) to play this challenge with, which will receive a notification afterwards.

Then, after the user makes his/her first contribution to the mission, the system will notify him/her during the week in order to further review and complete the initial thoughts with more information.

When the due date is reached (1 week after) he/she will be asked to rate the mission according to two criteria (creativity and feasibility). The user can then choose to share the results on social media, which will result in adding extra points to the regular ones and experience gained.

After all these points and experience added to the user profile, the system will calculate if the experience is enough to level up. If so, a level-up screen is shown alongside the rewards. The

user will then be redirected to the Challenge menu where he will be "forced" to play a "boss fight" mission in order to proceed with the game course. These "boss fight" missions will present the user a more difficult multi-player challenge that requires the collaboration of three more players in order to be fulfilled. The blueprint for this process is available in Appendix G.

- ✓ **Submit New Mission**

This process shows the creation and submission of a new mission by the user.

In the main menu, the user can choose "Challenges". Inside this option, there will be a special option: "Submit new mission".

If selected, the user will be shown the submission form. This form needs to be filled with information like the title of the mission, the description, objectives and additional information that seems to be important for the owner (like videos or images). After the form is filled, the owner can choose to set this mission to public or private (possibly working in an intranet). Public means that everyone will be able to see the challenge and interact with it. Private means that only the selected users will be able to see and interact with that mission.

If the private option is chosen, the user will be asked to select which users will be able to participate in the solution. The system will then send notifications to those users, letting them know of the invitation. If the intranet option is enabled, only people inside the intranet will be able to interact with these submitted missions.

If the public option is chosen, the system will validate the mission, and then it will be available in the application for every user to interact with from the "Multiplayer mode" menu.

After the submission is made, the user will be asked if he wants to share this the mission on social media. This will give them extra points, adding to the regular points and experience awarded for the submission. Also, if specific achievements are met (number of missions submitted, commented etc.) special rewards will also be awarded to the user.

After all these points and experience added to the user profile, the system will calculate if the experience is enough to level up. If so, a level-up screen is shown alongside the rewards. The user will then be redirected to the Challenge menu where he will be "forced" to play a "boss fight" mission in order to proceed with the game course. These "boss fight" missions will present the user a more difficult multi-player challenge that requires the collaboration of three more players in order to be fulfilled. The blueprint for this process is available in Appendix J.

- ✓ **Peer assessment**

This process shows the peer assessment and idea evaluation processes made by users.

In the main menu, the user can choose "Challenges". Inside this option, there will be a special option: "Idea Evaluation".

If selected, the user will be shown a list of ideas under evaluation phase (after their completion). In this menu the ideas will be presented with their title, average current score and the deadline countdown.

The user will then choose which idea he/she wants to further explore and evaluate. In the next screen all idea details will be presented and, if the daily limit of three evaluations per day is not reached, the user will have the option of rating the idea according to two criteria (creativity and feasibility) from 0 to 5 stars.

After this, if specific achievements are met (number of ideas rated, ideas rated every week/month, etc.) special rewards will also be awarded to the user.

Then, points from the idea evaluation will be added to the user profile and the process ends.

✓ **Leaderboards**

This process shows the leaderboards mechanics.

In the main menu, the user can choose the "Leaderboards" option.

Inside this menu, there will be 4 different leaderboards. The one that shows firstly by default is the "Idea ranking", which shows the top submitted ideas voted by the players. Then, there's the "Top Contributors" which shows the ranking of users by number of contributions made to submitted ideas. The "Top Connections" leaderboard shows a user ranking by number of social interactions made. The last option is the "My Progression" one, which shows analytics of the user progression in the game through time (graphics with the number of points, experience and interactions).

In the end of the week/month, rewards will be sent to the top three users in each leaderboard for their achievements.

6.3 Prototyping

After the service blueprints were designed there was a need to prototype the application into something more tangible.

Prototyping "involves building a small scale version of a complex system in order to acquire critical knowledge required to build the system" (Szekely 1995).

So, our goal here was to develop a prototype that represents what we image the mobile application will look like when it is done and that shows all the game's main functionalities through interactive mock-ups.

Testing the user interface with our target users is one good way to refine it to perfection (Buxton 1980), so, this prototype was created with the objective of being tested by a sample of our target users (some of them from the interviews) in a series of focus group sessions and collect feedback their feedback for the refinement of the concept.

This first phase of prototyping consisted of analysing the service blueprints designed previously and draw the first version of the user interface on a white board. This initial prototype concept is shown in Figure 12 below.

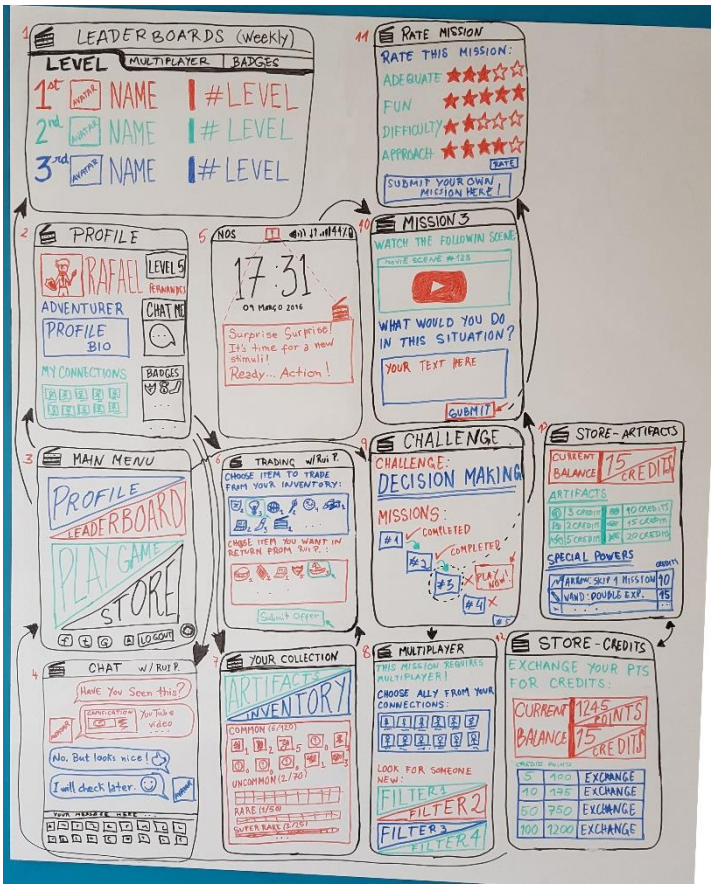

Figure 12 - Initial prototype concept

After some brainstorming on this first concept, we started designing the mobile game resorting to *Adobe Photoshop*. This was the longest process of this phase as we designed in this editing software every single main screen (except for minor transition and notification screens) that the game would show the user.

With the design was ready we resorted to the online prototyping platform *InVision*. In this platform we were able to create the connections between screens that turned the design into a real functional prototyped mobile application that can be downloaded into any mobile phone for later user testing in the focus group sessions.

Due to space limitations I cannot present all the blueprints and mock-up screens of the prototype in detail, so, we will only be presenting those components for three of the main processes: the multiplayer challenge, the leaderboards and peer assessment, already described in detail previously, which are represented below in Figures 13 through 20. The rest of the blueprints and prototype mock-up screens can be consulted in Appendixes C through K and Appendix P.

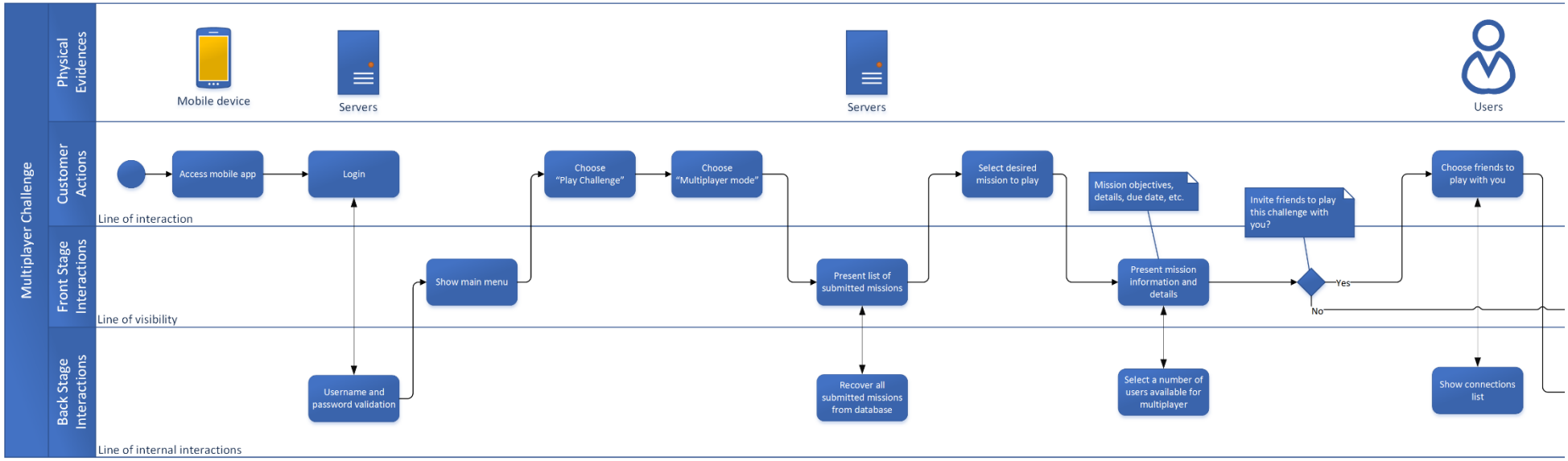

Figure 13 - Multiplayer Challenge blueprint part 1

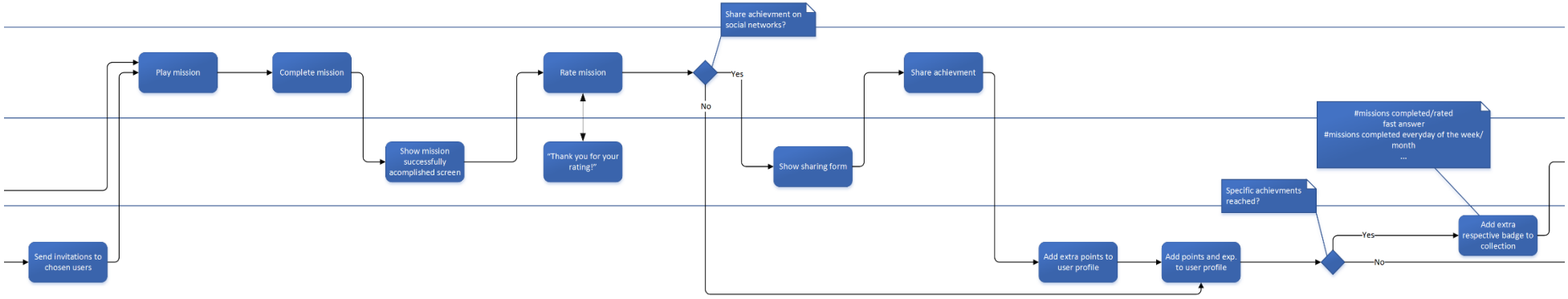

Figure 14 - Multiplayer Challenge blueprint part 2

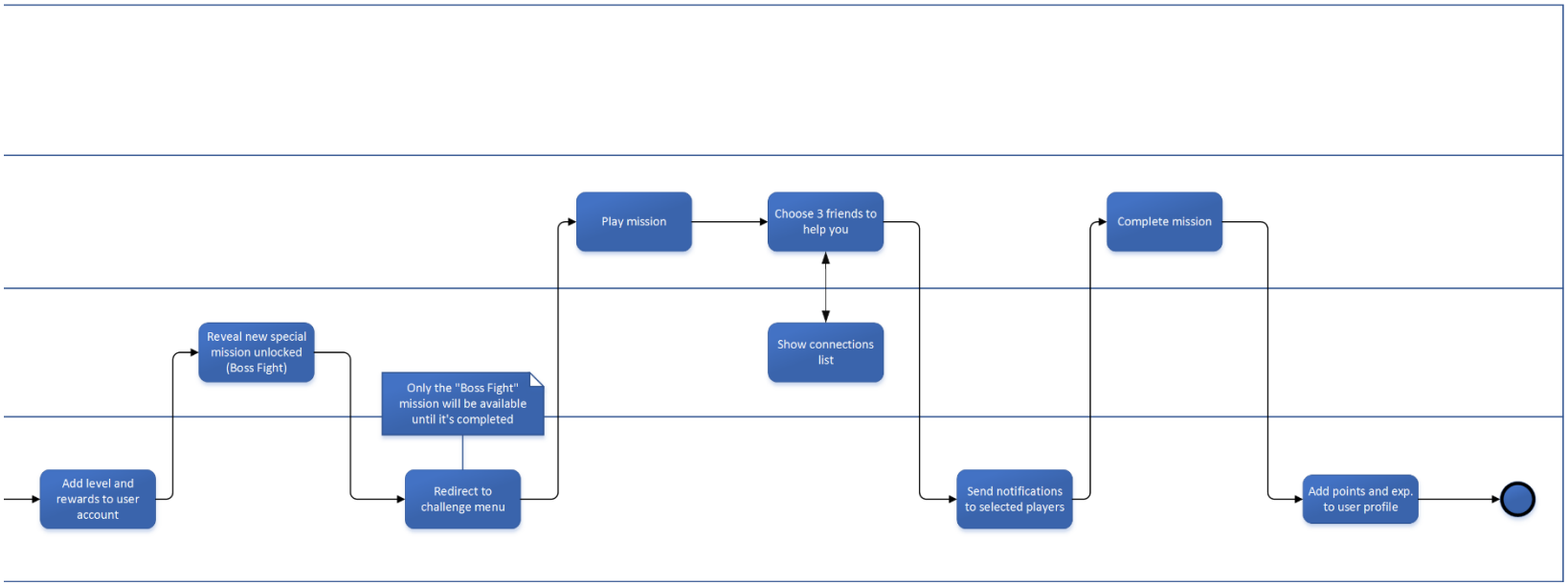

Figure 16 - Multiplayer Challenge blueprint part 3

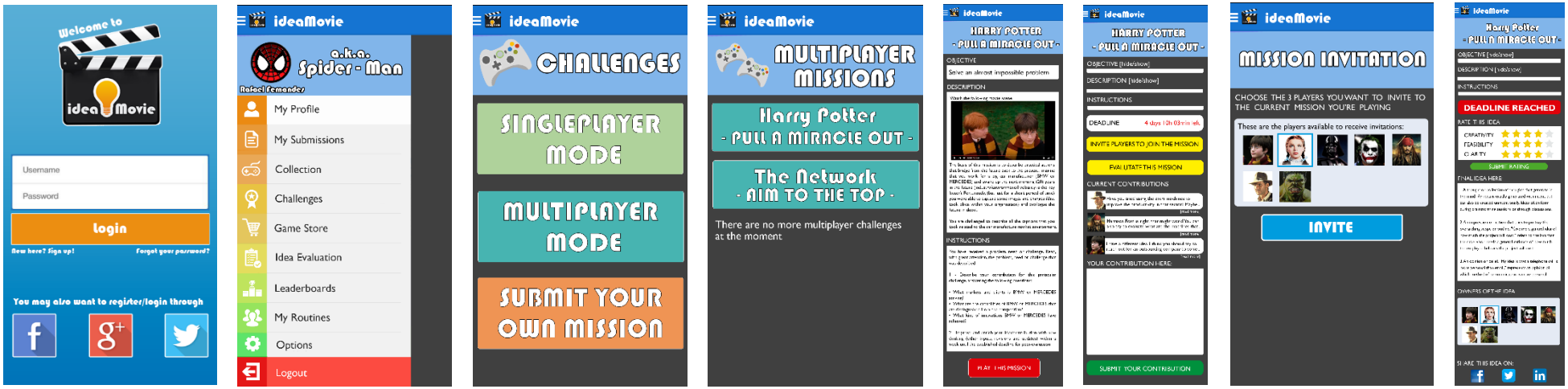

Figure 15 - Multiplayer Challenge prototype mock-ups

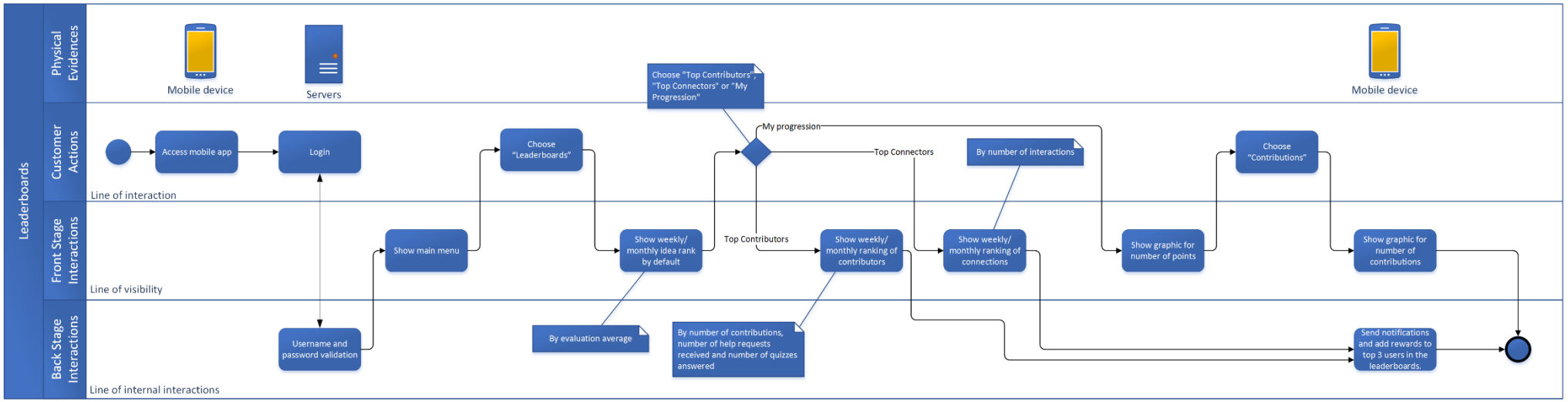

Figure 17 - Leaderboards blueprint

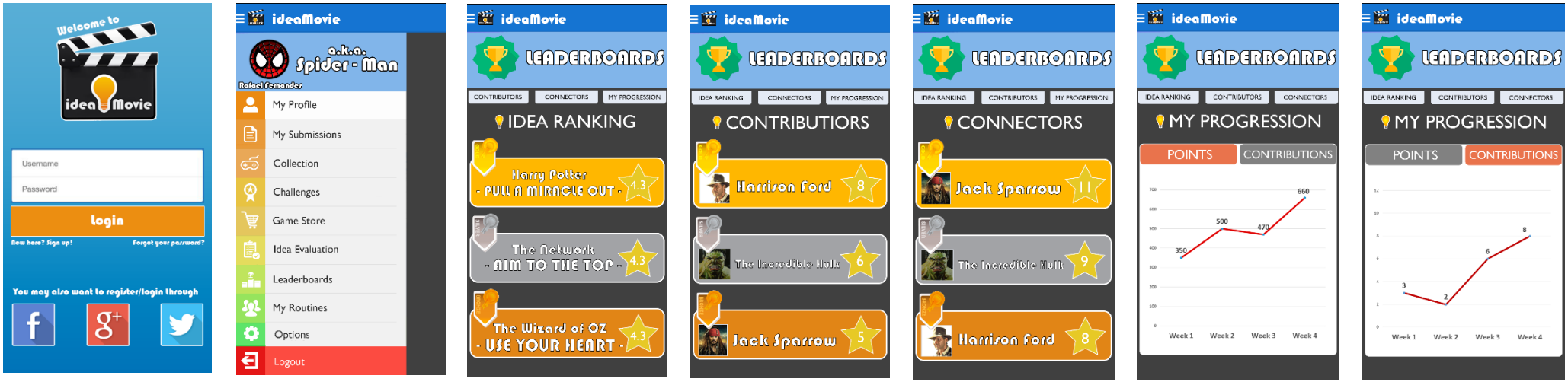

Figure 18 - Leaderboards prototype mock-ups

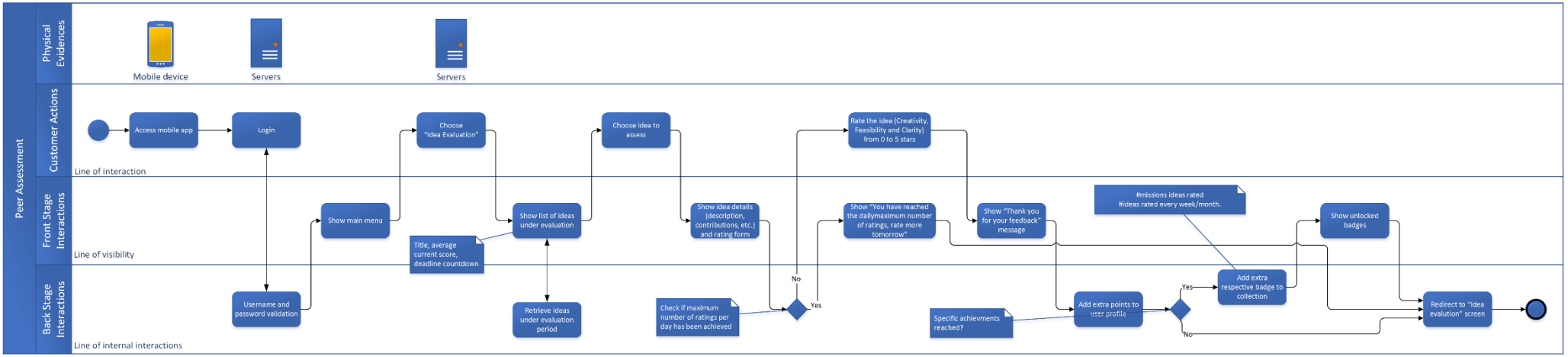

Figure 20 - Peer Assessment blueprint

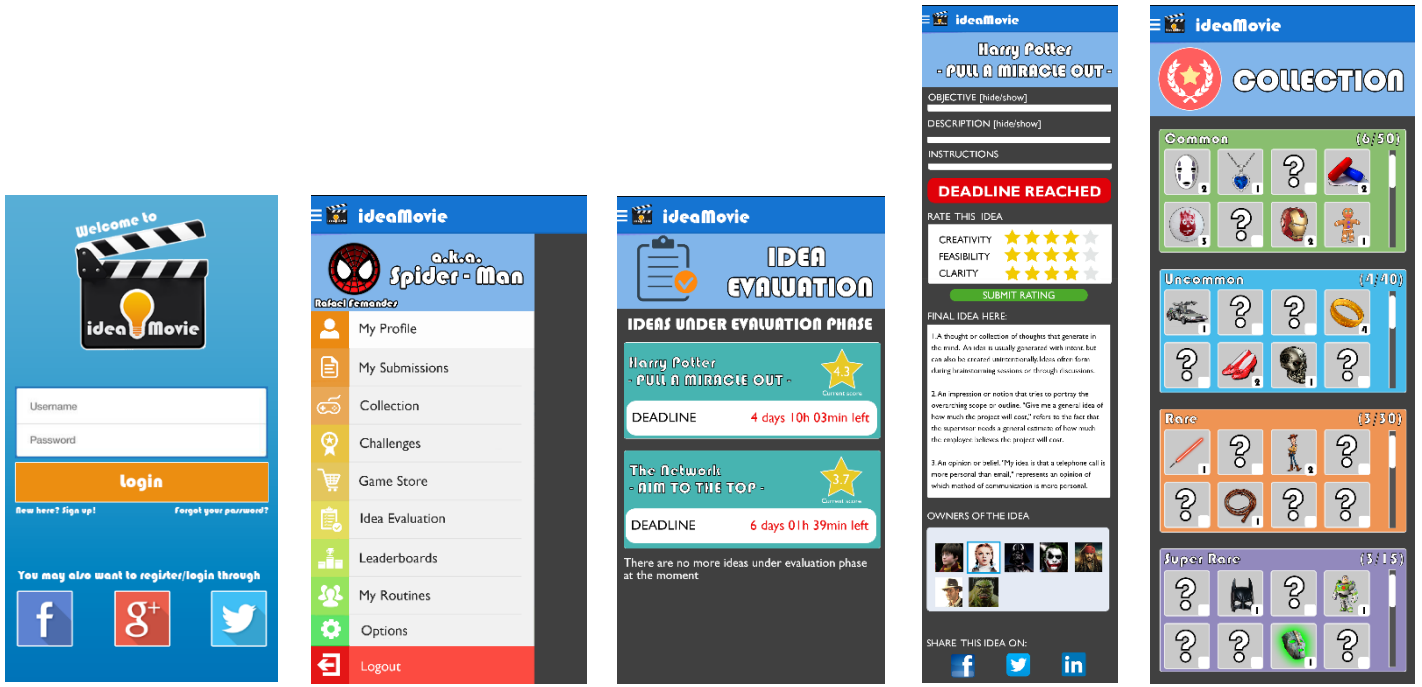

Figure 19 - Peer Assessment prototype mock-ups

6.4 Testing and Concept improvement

With the prototype completely functional and on hands, we proceeded to the testing phase. For this we organized a series of four focus group sessions and invited the people that had already participated in the interview phase as well as others that fit the target users. These sessions were all conducted in the company's offices across two weeks.

The goals here wereto :

- Present the service concept;
- Put the prototype design (functionalities hierarchy) to the test;
- Generate discussion between participants;
- Gather feedback about the concept, business model and functionalities;
- Collect suggestions for improvements.

All the participants of these sessions engaged very well in the discussions which provided us with great feedback information for improvement. From their reactions we understood that the concept was really appreciated and they perceive it as very valuable for certain people and companies. However, it was also a good experience because they provided us with ideas and different contexts that we never thought about in which the service can be useful.

In the end of the sessions, the participants were handed a survey (available in Appendix B) that we prepared with the objective of letting them express themselves formally their evaluation of the concept, business model, each of the functionalities and even give the suggestions they think are adequate for the project.

6.4.1 Renewed concept

After the focus group sessions, we collected all the feedback from the participants and, with some brainstorming sessions, redesigned the concept to accommodate the changes we felt were beneficial for the service.

The renewed concept still maintains the main idea of providing a mobile gamified approach that supports the development of critical innovation skills and capabilities in an inspiring and collaborative environment, but now it will also serve as a means for professionals and students to connect with companies they are interested in, and companies will also be able to discover talented people. This was an opportunity that we had not think of until someone suggested it in the focus group session.

Because of this change it might not be the best idea to stick with the movie metaphor, and consequently, the name *ideaMovie.* So, the company is now investigating a new name that fits and translates the whole idea of service.

The target users are now divided into three (instead of two) different categories:

- Professionals from industries/sectors where the nature of the job turns more difficult to be innovative: high-stress jobs and often long working hours, resistance to change and fear of assuming risks;
- University students with an open mind, who love innovation and are looking for new challenges;
- Innovative companies that employ over 10.000 people and are looking for the right approaches, tools and talented people to meet their growth rate targets.

The main objectives for individuals and companies have also changed in order to meet specific target requirements.

The main objectives for professionals are:

- Grow and develop innovation skills and capabilities;
- Have a quick and efficient way to self-assess and benchmark with other professionals;
- Expand their comfort zone and embrace more innovative thinking approaches;
- Experiment new approaches and solutions without risk;
- Get a more engaging learning experience;
- Learn through collaboration with other professionals – enrol in a collaborative feedback loop with their peers;
- Recognition from peers based on their own contributions and ideas;
- Help to reproduce the reality and simplify difficult matters;
- Communicate, engage, collaborate and share experiences with peers;
- Get in touch with the companies they are interested in.

The main objectives for students are:

- Grow and develop innovation skills and capabilities;
- Expand their comfort zone and embrace more innovative thinking approaches;
- Get a more engaging learning experience;
- Learn through collaboration with experienced professionals – enrol in a collaborative feedback loop with their peers;
- Recognition from peers based on their own contributions and ideas;
- Show their talent through their ideas and contributions in the game;
- Get in touch with the companies they are interested in.

The main objectives for companies are:

- Facilitate employees self-training and reduce time spend in traditional training activities;
- Help to shape an innovation culture;
- Support bottom-up decision-making instead of traditional top-down approaches;
- Support better decision-making at different levels of the organization;
- Search for talented people (open-minded students and innovative thinking professionals);
- Submit challenges to an external and internal pool of talented people.

7 Conclusion and Future Work

Having the challenges in mind: (1) how can we ally gamification and services, (2) how can we create such a service to help people overcome the problems they face in their professional lives, and (3) how can this service be used in a service design project to foster innovation within their users, we conducted a research alongside our target users, young professionals, experienced professionals and big companies. By taking advantage of the fact that technology based services, mobile in specific, are becoming trend and will continue to grow in the future, this research's goals were to understand how we could develop a service built around the concept of Gamification, resorting to SD, and using some game mechanics, dynamics and component in a service context, in order to better engage people and consequently improve their soft skills and foster innovation.

Our first task, with the problem already defined, was to make a market analysis to understand what other services already exist in the market and how we can add value with our own. Then we made a qualitative study, based on GT, where we interviewed possible target users and also reviewed literature on the relevant topics: Innovation: skills and capabilities, gamification, DT and SD. After this we analysed and organised the data collected and made some brainstorming in order to reach an initial concept to develop. This concept was then designed resorting to the SB method and later prototyped as a mobile app in order to be tested, in a series of focus group testing, with the goal of improving the concept. Then, the data gathered from those sessions was analysed and improvements were discussed, resulting in a new concept.

What we developed in the end was the functional prototype of a mobile gamified service that helps professionals to grow and develop a set of key innovation skills and capabilities (defined in the research), helping them embracing more innovative thinking approaches, learn through the collaboration with other professionals, enable them to find, communicate with other user and companies and show off their talent. The developed service also enables companies to train their employees using a new method instead of traditional training, help them shape an innovation culture and search and find talented people for recruitment.

This project contributes to the Service Design field by showcasing a case study developed from the initial qualitative study to the functional prototyping phase that explores how innovation and gamification can be allied with the service and service design concepts, involving the target users in the conceptualization and improvement of the service.

In spite of this project's achievements, we can pinpoint a clear limitation. The fact that this is only one study conducted in a specific company and with a specific kind of game in mind, can be difficult to relate to other contexts.

However, this consequently opens the doors for new opportunities to be explored, as this study can be progressed further and maybe possible to be adaptable to other environments, and as gamification and service research evolve.

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APPENDIX A: Interview script

CONTEXT

1. What are the main challenges you face on your professional day-to-day life?

2. How do you deal with those challenges currently?

3. If you had total freedom and unlimited resources how would you deal with those challenges? The same way? What would you change?

4. Which soft skills do you consider essential in order to better find solutions for current and future challenges?

5. Which methods do you use in order to develop these kind of skills? (Training, self-training, experience sharing, meditation, physical activity, others)

EXPLORATION

6. How do you think avoiding traditional methods and practices can be a good solution?

7. Are you familiarized with the concept of "Gamification"? (If not, explain)

8. Do you think this kind of approach could be a good method? Why?

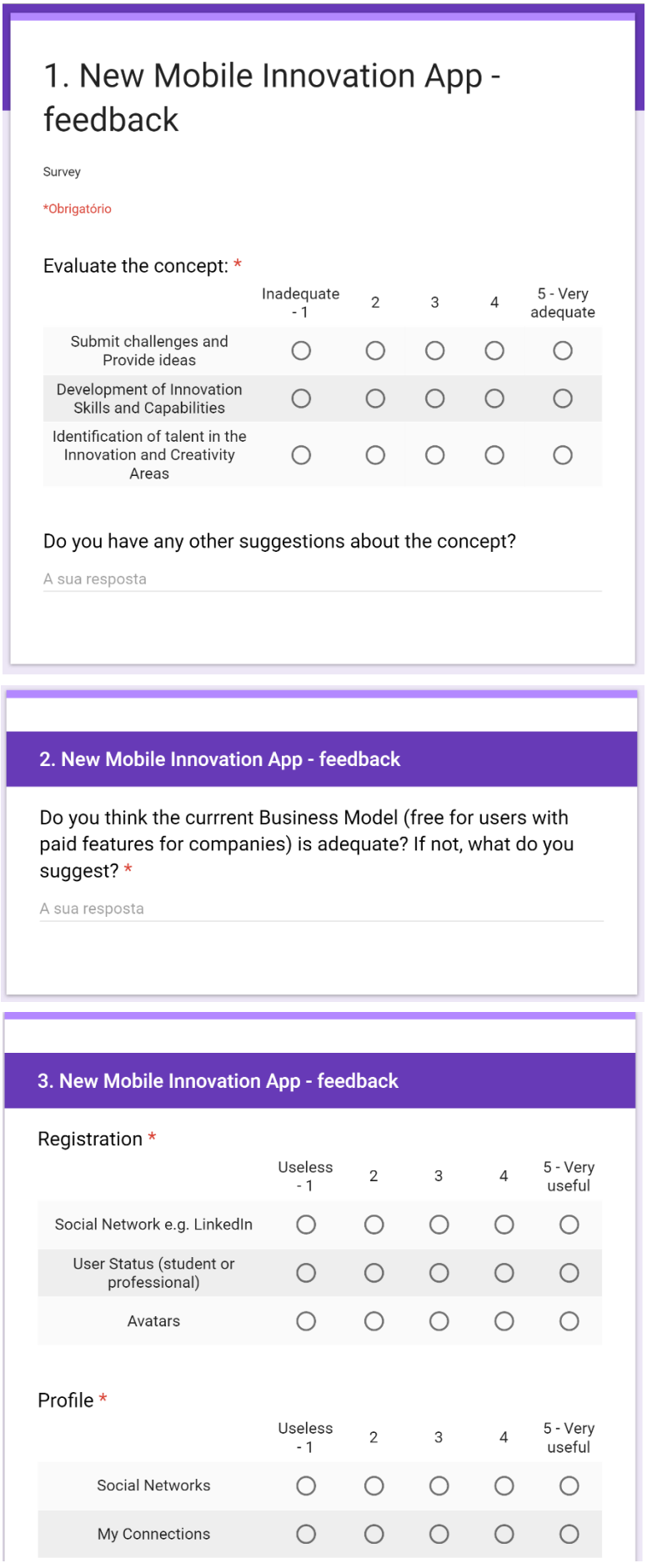
9. If you had access to a mobile application, based on the gamification concept, that would help you develop these soft skills, how do you imagine it to be?

10. Do you have any other recommendations or suggestions to this project?

Are you willing to participate in a testing session in the future if needed be?

Thank you very much for you time.

APPENDIX B: Focus group and Prototype feedback survey



1. New Mobile Innovation App - feedback

Survey

*Obrigatório

Evaluate the concept: *

	Inadequate - 1	2	3	4	5 - Very adequate
Submit challenges and Provide ideas	○	○	○	○	○
Development of Innovation Skills and Capabilities	○	○	○	○	○
Identification of talent in the Innovation and Creativity Areas	○	○	○	○	○

Do you have any other suggestions about the concept?

A sua resposta

2. New Mobile Innovation App - feedback

Do you think the currrent Business Model (free for users with paid features for companies) is adequate? If not, what do you suggest? *

A sua resposta

3. New Mobile Innovation App - feedback

Registration *

	Useless - 1	2	3	4	5 - Very useful
Social Network e.g. LinkedIn	○	○	○	○	○
User Status (student or professional)	○	○	○	○	○
Avatars	○	○	○	○	○

Profile *

	Useless - 1	2	3	4	5 - Very useful
Social Networks	○	○	○	○	○
My Connections	○	○	○	○	○

Share Expertise *

	1 - Useless	2	3	4	5 - Very useful
Chatting	○	○	○	○	○

Collecting *

	Useless - 1	2	3	4	5 - Very useful
Badges (awards)	○	○	○	○	○

Gifting *

	Useless - 1	2	3	4	5 - Very useful
Offer Badges (awards) to other players	○	○	○	○	○

Trading *

	Useless - 1	2	3	4	5 - Very useful
Trade Badges (awards) with other players	○	○	○	○	○

Challenges *

	Useless - 1	2	3	4	5 - Very useful
Singleplayer Mode	○	○	○	○	○
Multiplayer Mode	○	○	○	○	○
Mission Submission	○	○	○	○	○
Quizzes	○	○	○	○	○
Boss Fights (min. 6 players)	○	○	○	○	○

Store *

	Useless - 1	2	3	4	5 - Very useful
Exchange Points for Credits	○	○	○	○	○
Buy Credits	○	○	○	○	○
Buy Exclusive Movie Items	○	○	○	○	○
Buy Special Powers	○	○	○	○	○
Product Placement	○	○	○	○	○

Peer Assessment *

	Useless - 1	2	3	4	5 - Very useful
Idea Evaluation	○	○	○	○	○
3 Criteria (Feasibility, Creativity and Clarity)	○	○	○	○	○
Scale (1-5)	○	○	○	○	○

Leaderboards *

	Useless - 1	2	3	4	5 - Very useful
Top Contributors	○	○	○	○	○
Top Connectors	○	○	○	○	○
Top Ideas	○	○	○	○	○
My Progression	○	○	○	○	○
Check My Submissions	○	○	○	○	○

Routines *

	Inútil - 1	2	3	4	5 - Muito Útil
Default Experience	○	○	○	○	○
Create New Experience	○	○	○	○	○

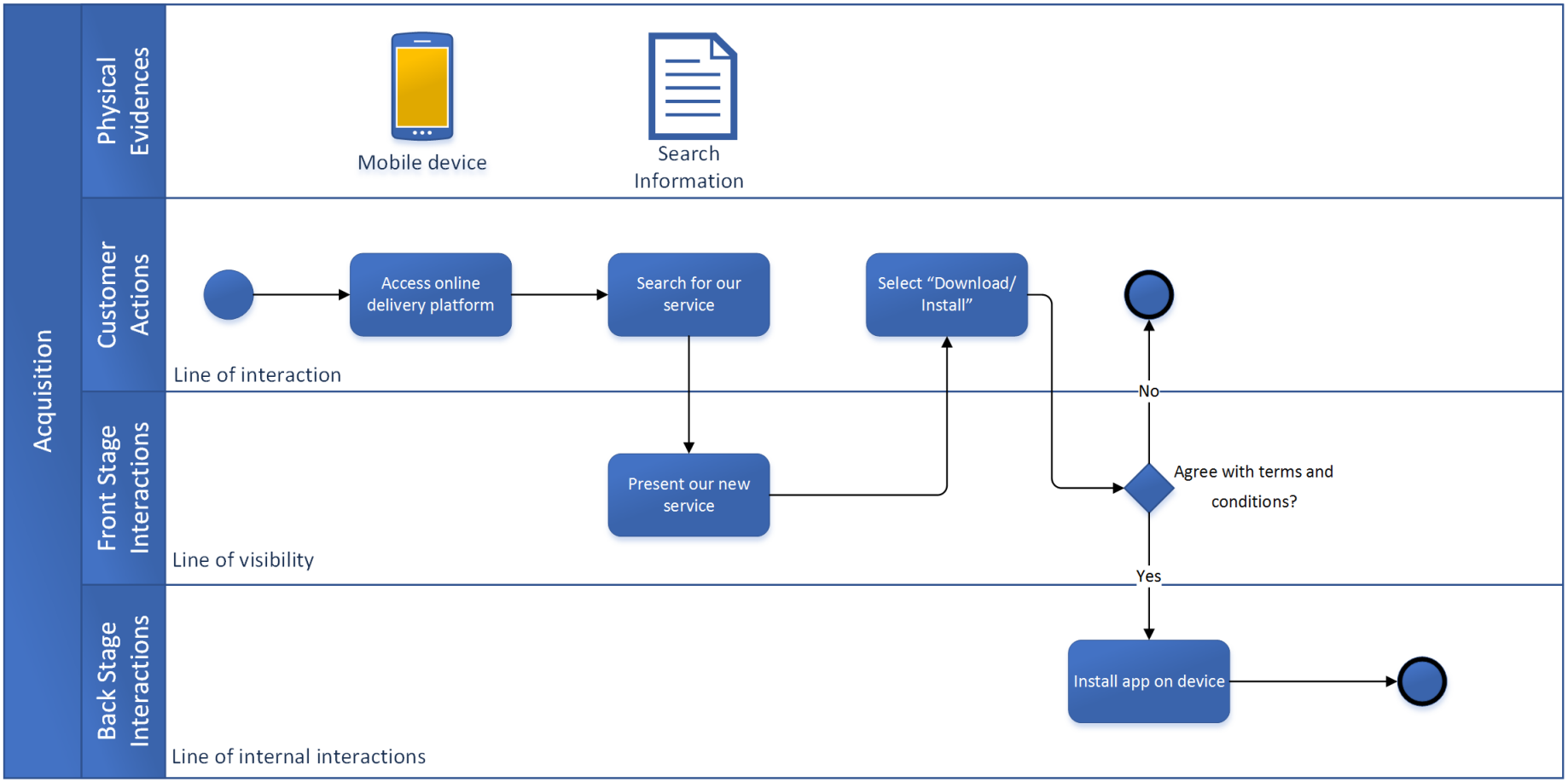
Options *

	Useless - 1	2	3	4	5 - Very useful
Active and Configurate Quizzes	○	○	○	○	○
GPS Possibility	○	○	○	○	○

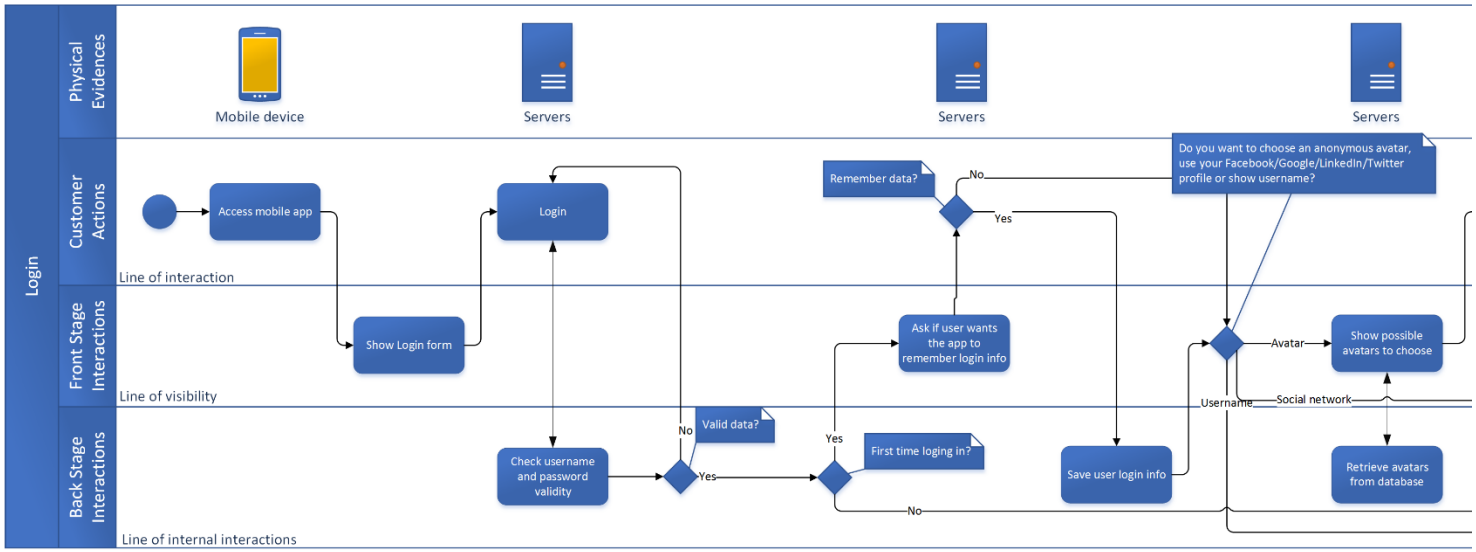
Any other features that you suggest?

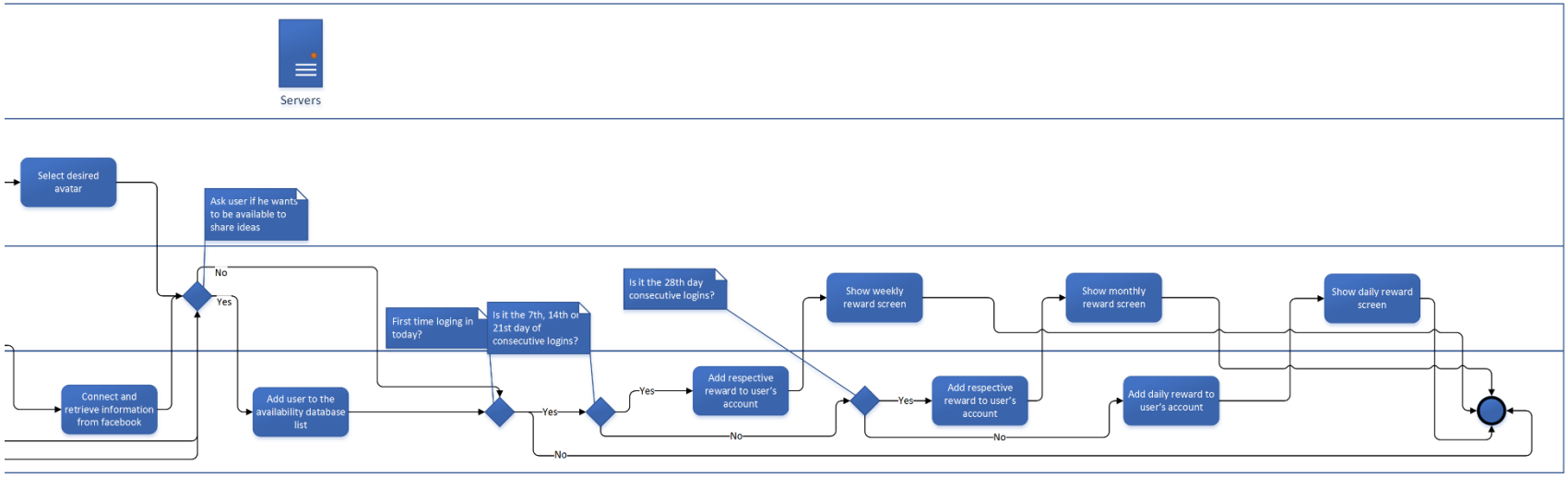
A sua resposta

APPENDIX C: Service Acquisition blueprint

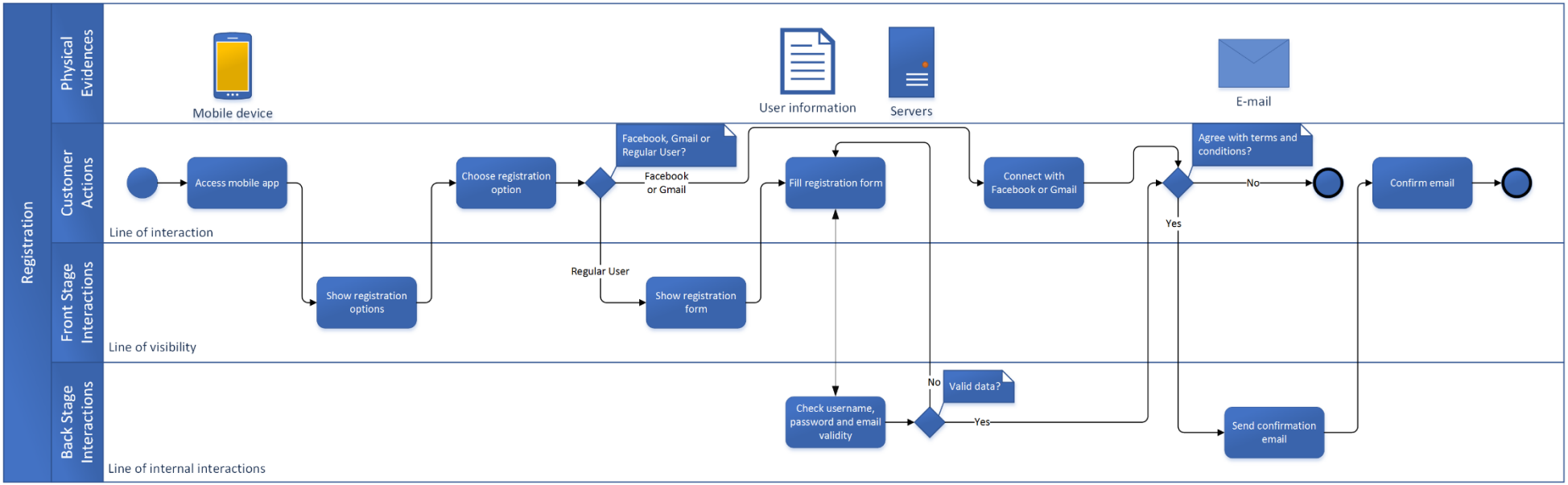


APPENDIX D: Login blueprint

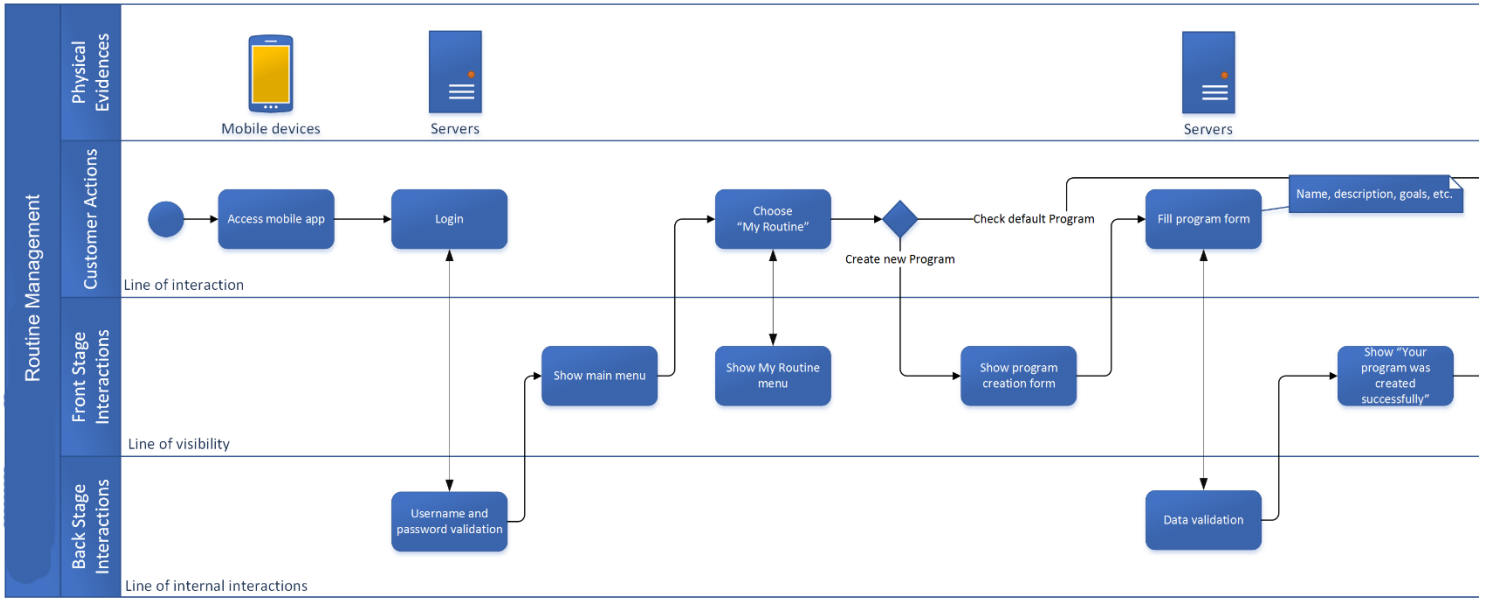


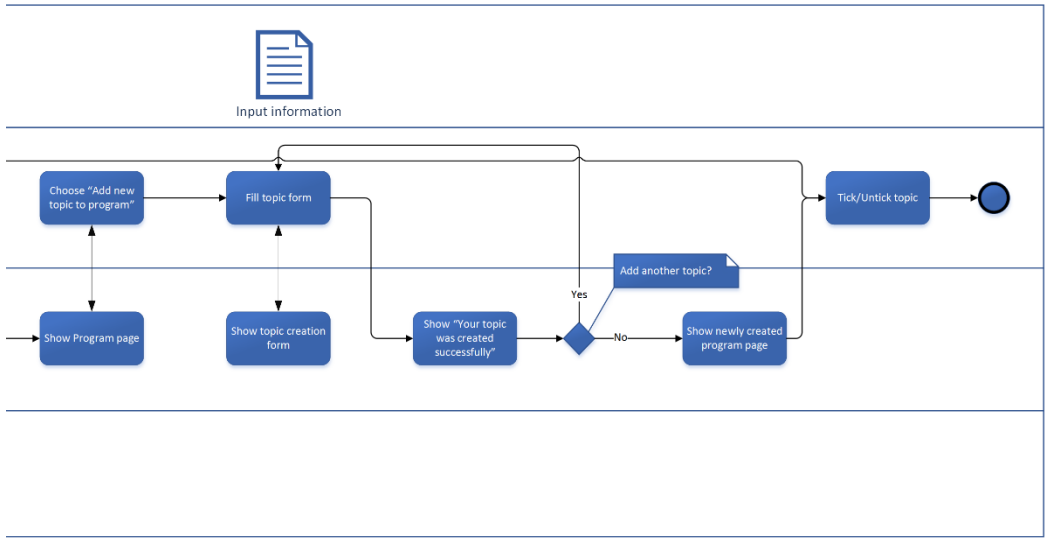


APPENDIX E: Registration blueprint

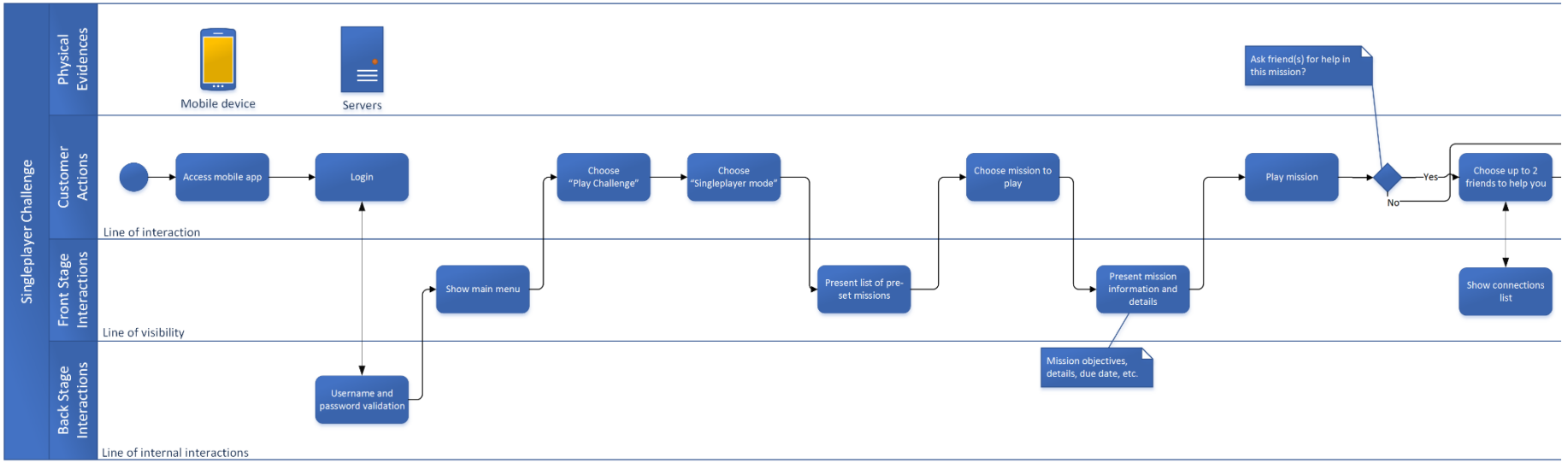


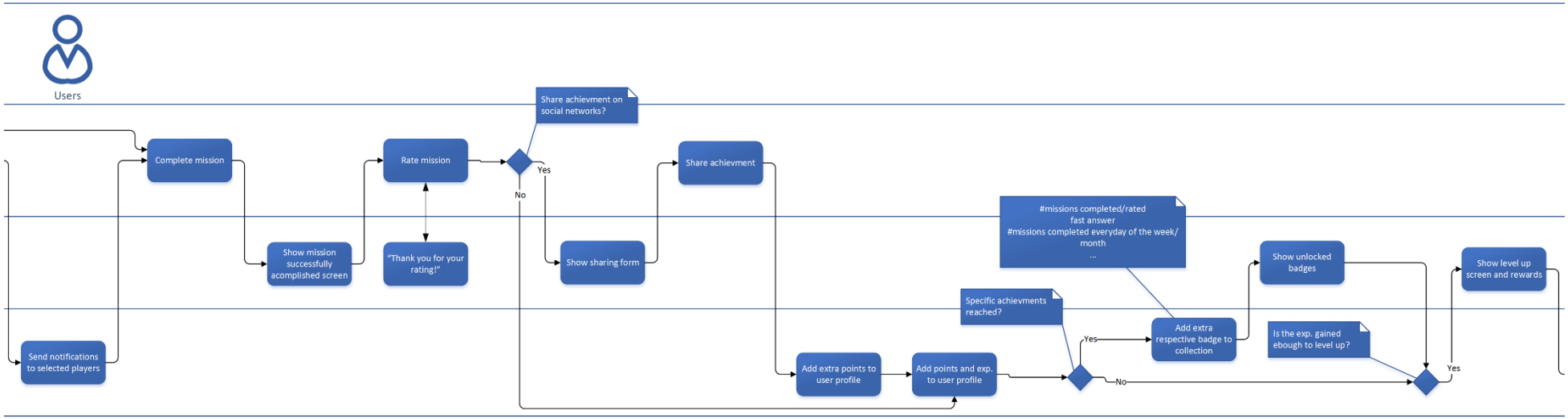
APPENDIX F: Routine Management blueprint

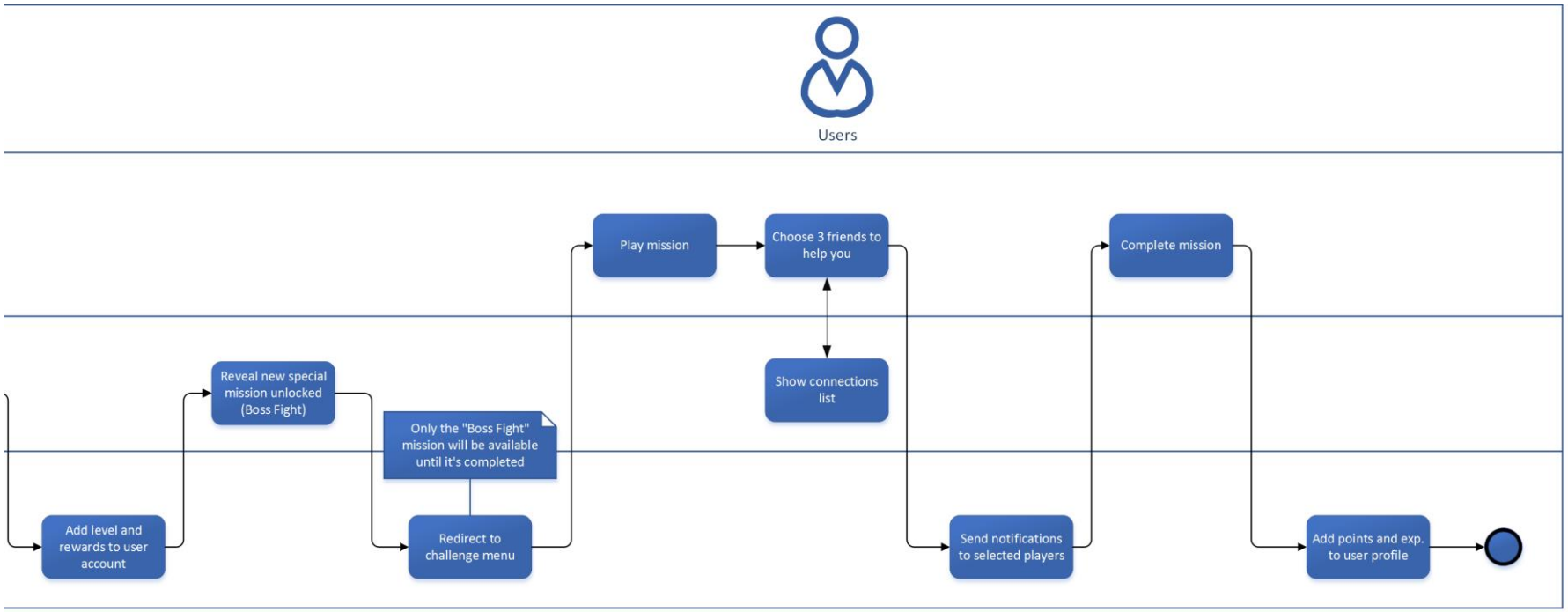




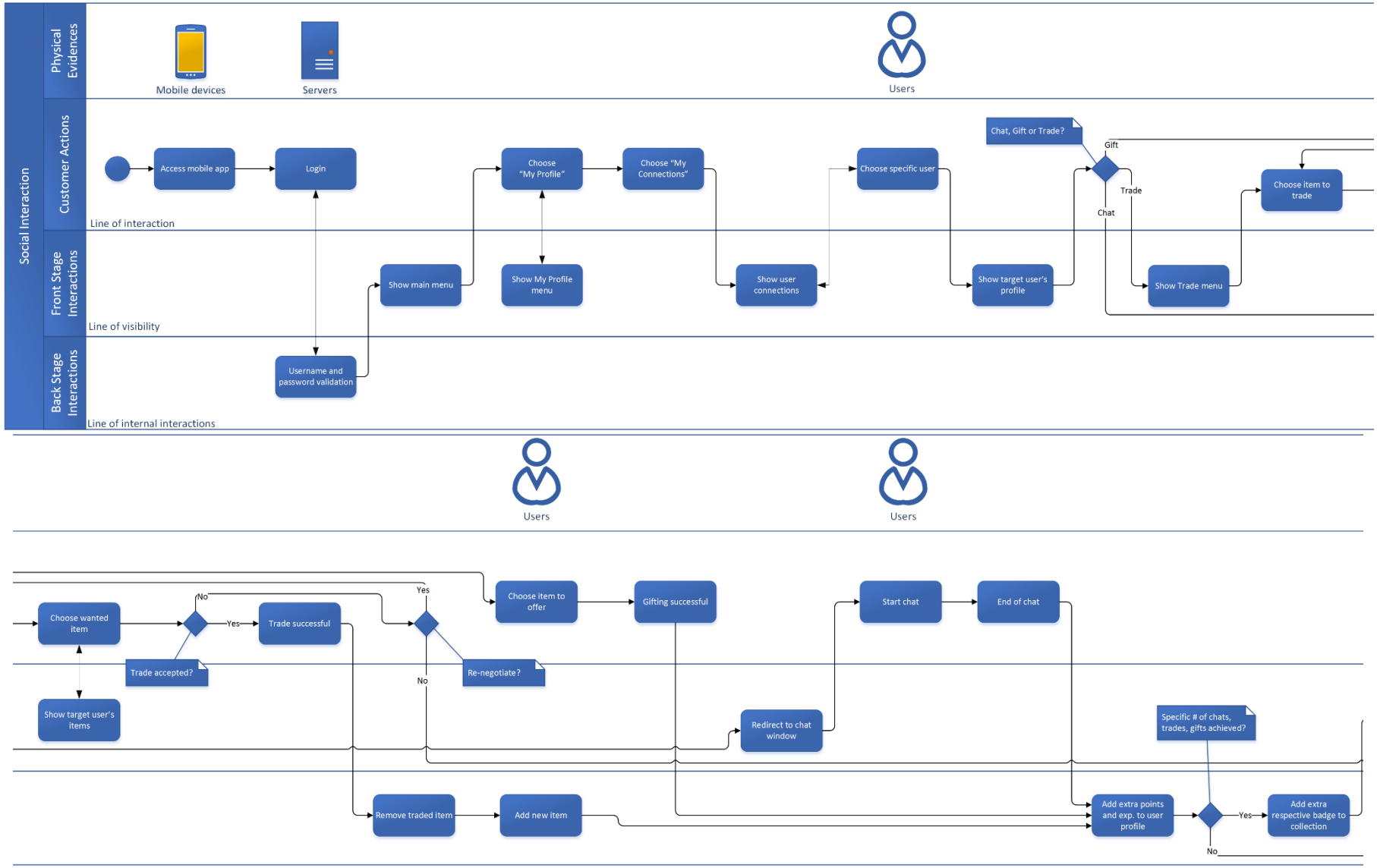
APPENDIX G: Singleplayer Challenge blueprint

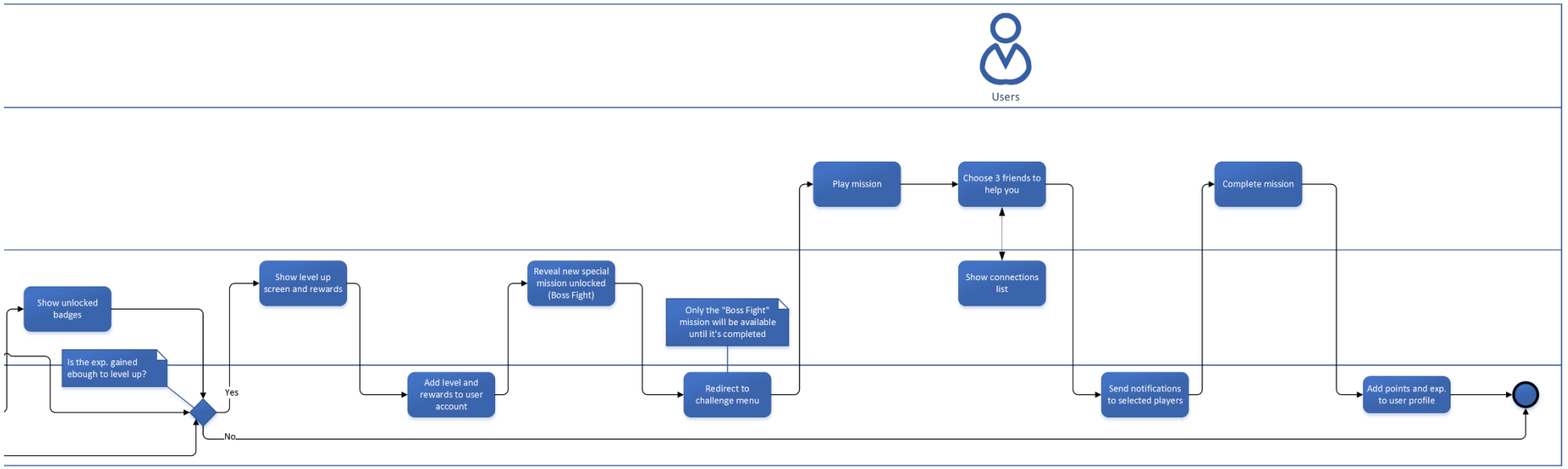




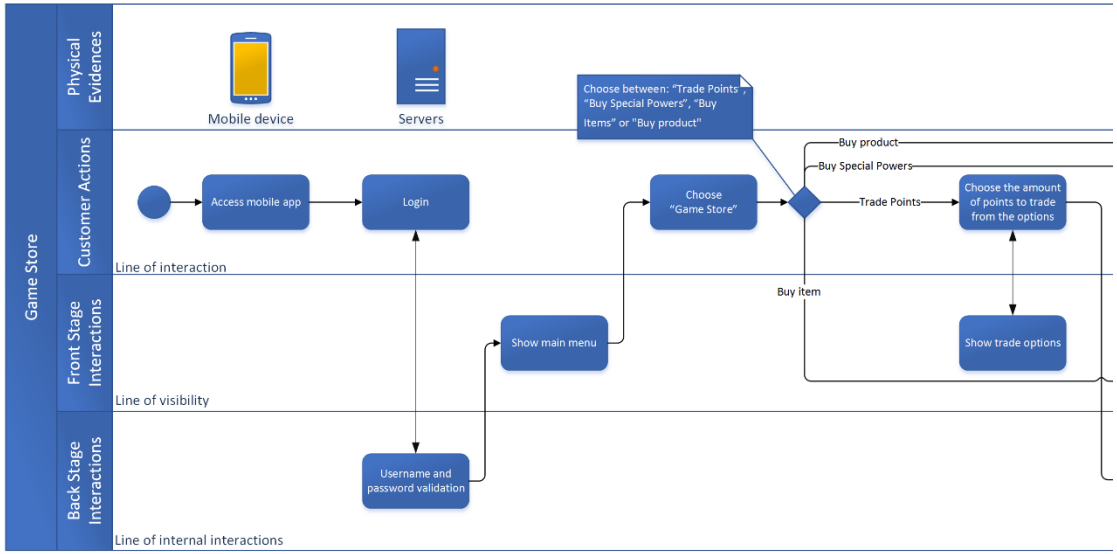

Users
Play mission
Choose 3 friends to help you
Complete mission
Reveal new special mission unlocked (Boss Fight)
Show connections list
Only the "Boss Fight" mission will be available until it's completed
Add level and rewards to user account
Redirect to challenge menu
Send notifications to selected players
Add points and exp. to user profile

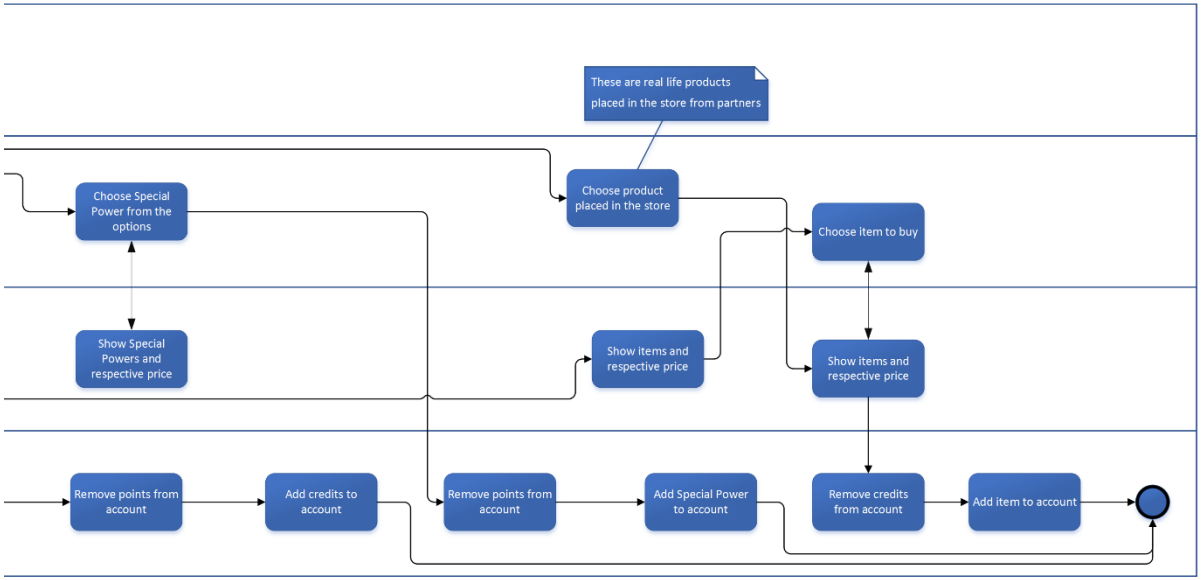
APPENDIX H: Social Interaction blueprint



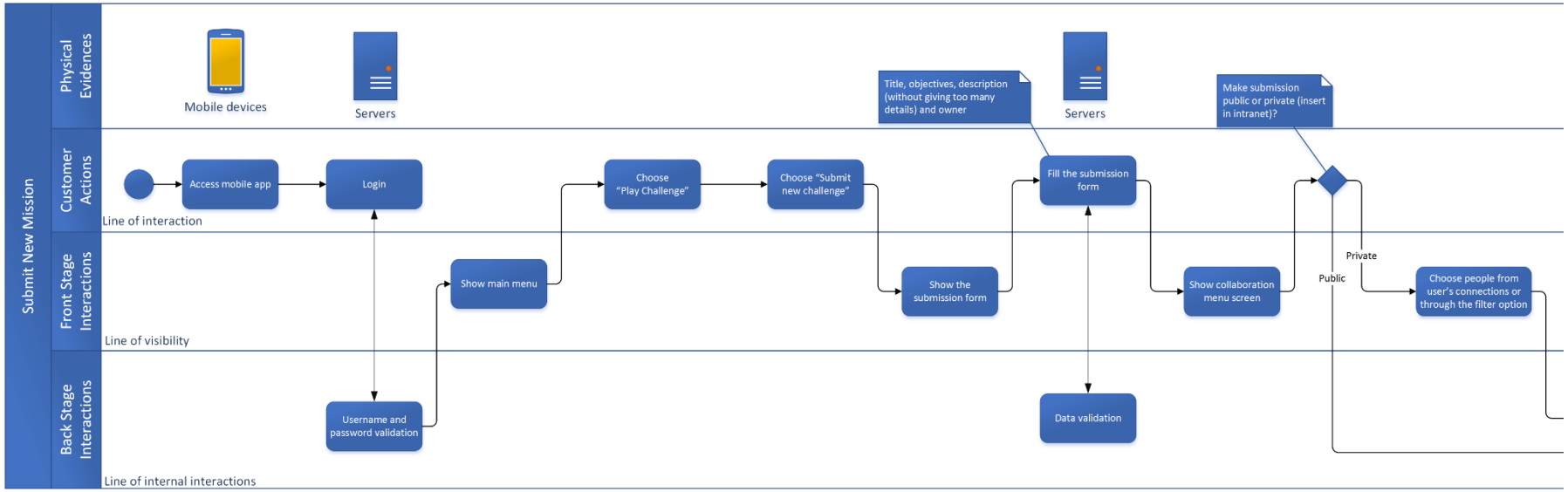

Users
Show unlocked badges
Is the exp. gained ebough to level up?
Yes
No
Show level up screen and rewards
Add level and rewards to user account
Reveal new special mission unlocked (Boss Fight)
Only the "Boss Fight" mission will be available until it's completed
Redirect to challenge menu
Play mission
Choose 3 friends to help you
Show connections list
Send notifications to selected players
Complete mission
Add points and exp. to user profile

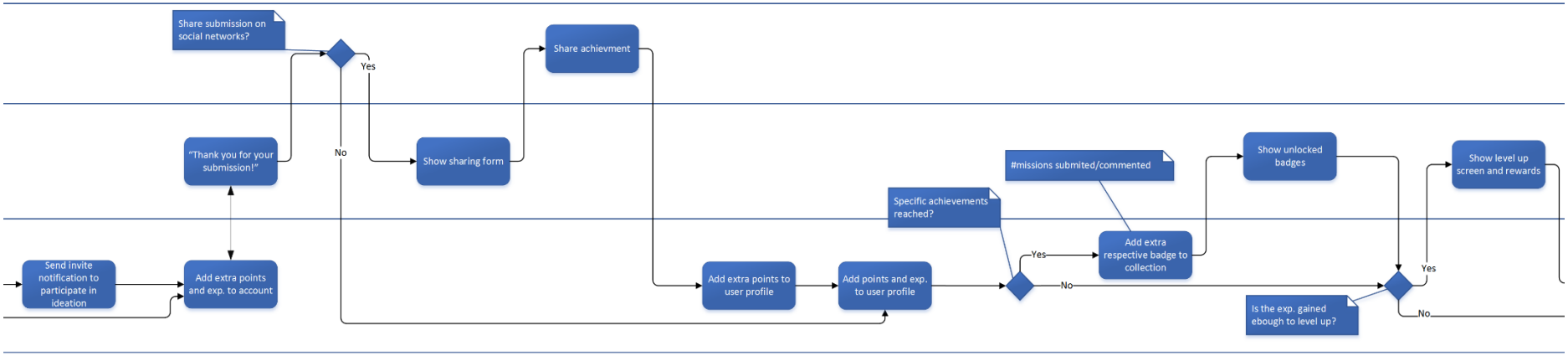
APPENDIX I: Game Store blueprint

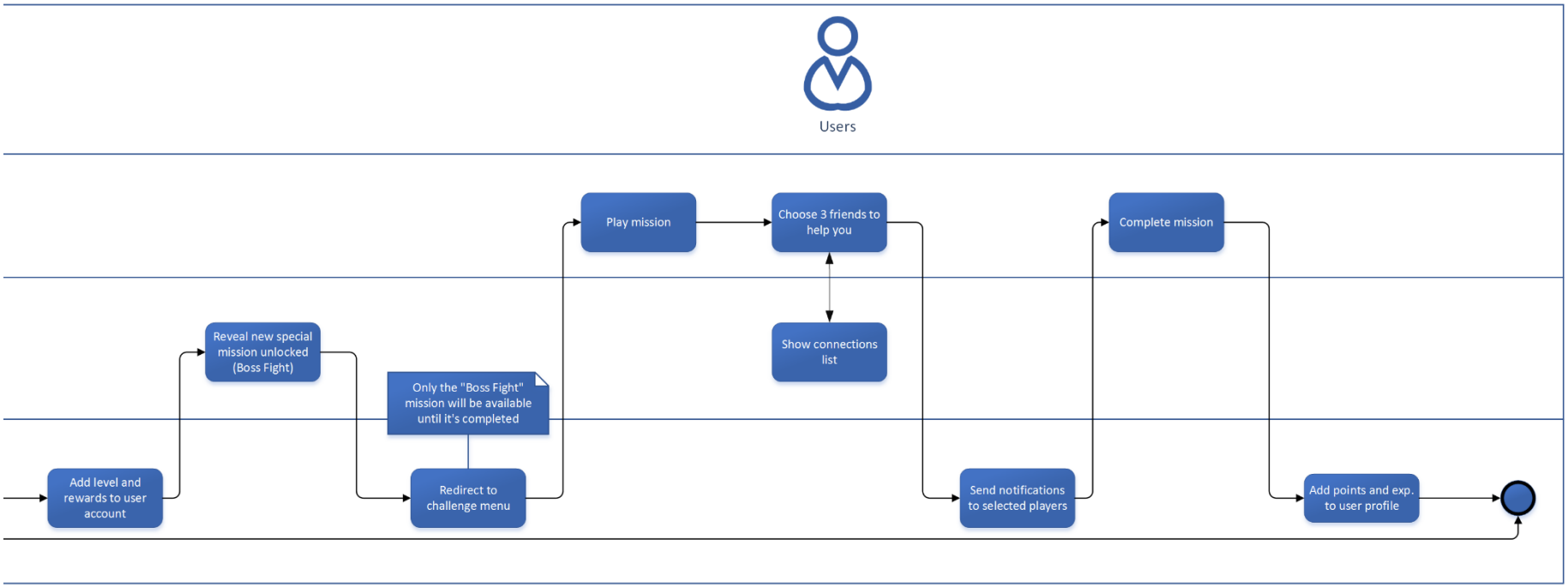




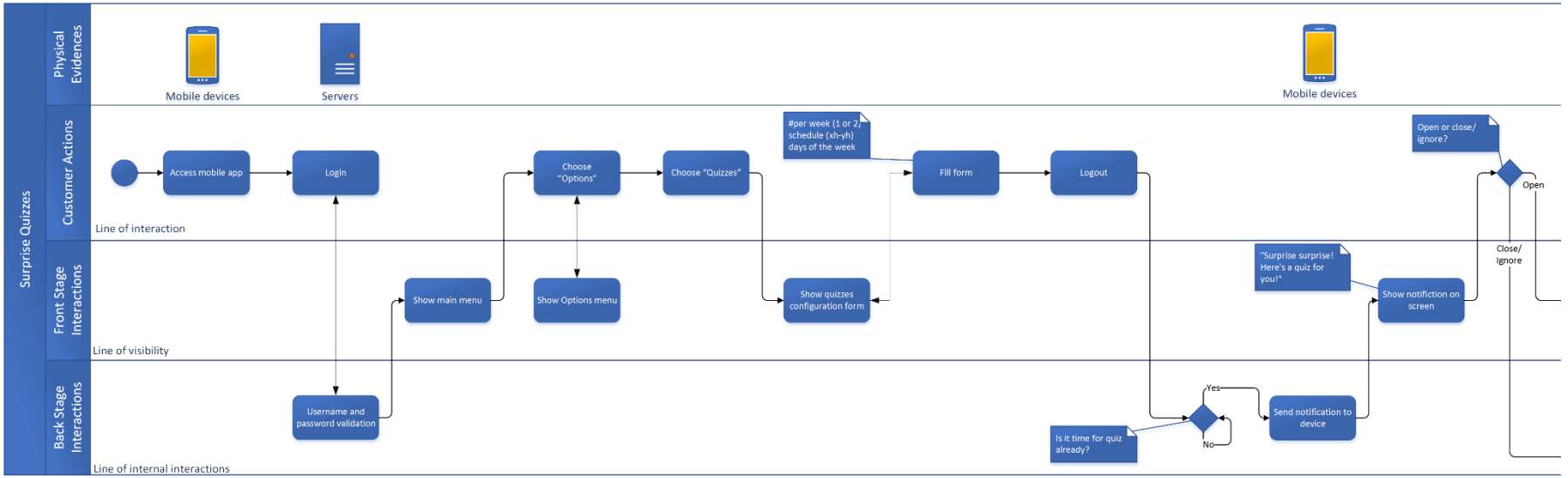
APPENDIX J: Submit New Mission blueprint

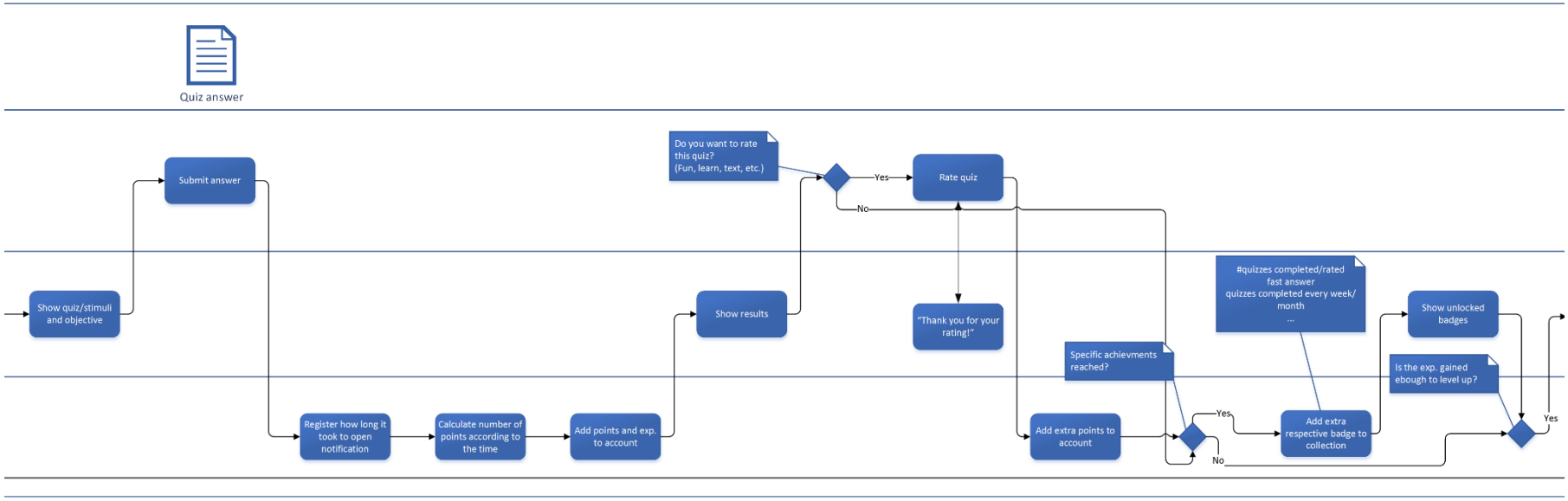


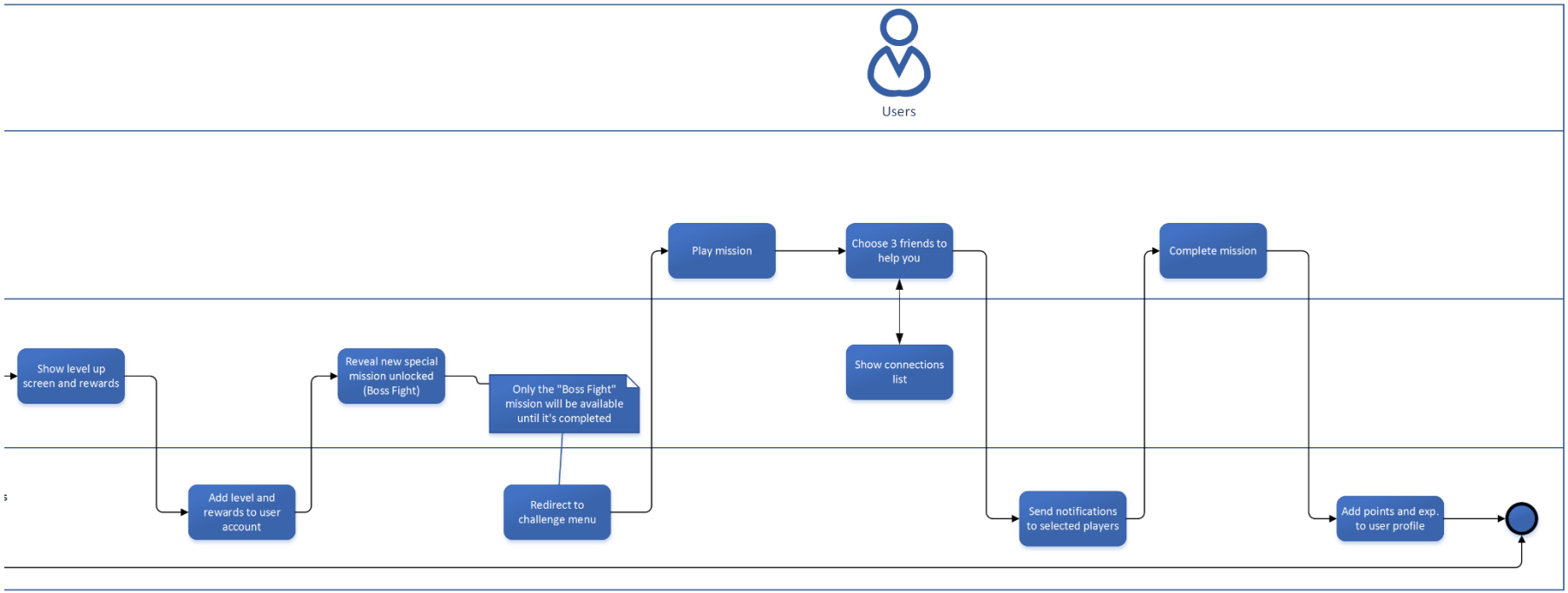



Users
Add level and rewards to user account
Reveal new special mission unlocked (Boss Fight)
Only the "Boss Fight" mission will be available until it's completed
Redirect to challenge menu
Play mission
Choose 3 friends to help you
Show connections list
Send notifications to selected players
Complete mission
Add points and exp. to user profile

APPENDIX K: Surprise Quizzes blueprint






Users
Show level up screen and rewards
Add level and rewards to user account
Reveal new special mission unlocked (Boss Fight)
Only the "Boss Fight" mission will be available until it's completed
Redirect to challenge menu
Play mission
Choose 3 friends to help you
Show connections list
Send notifications to selected players
Complete mission
Add points and exp. to user profile

APPENDIX L: Functionalities and Dynamics matrix

Functionality \ Dynamic		Constraints			Emotions			Narrative	Progression	Relationships		
		Choices	Trade-offs	Time constraints	Curiosity	Enjoyment	Creativity			Share knowledge and Help	Multiplayer	Meet users
Registration	Social Networks	✓			✓	✓				✓		
	User status											
	Avatar											
Profile Bio	Social Networks	✓			✓	✓	✓		✓	✓	✓	✓
	Contacts											
Share Expertise	In-game Connections				✓	✓	✓			✓	✓	✓
	Chatting											
Collecting	Movie Props		✓		✓	✓			✓			
Gifting						✓				✓	✓	
Trading			✓			✓			✓	✓	✓	
Challenges	Singleplayer Mode	✓		✓	✓	✓	✓	✓	✓	✓		
	Multiplayer Mode	✓		✓	✓	✓	✓	✓	✓	✓	✓	
	Mission Submission	✓		✓	✓	✓	✓	✓	✓	✓		
	Quiz	✓		✓	✓	✓	✓		✓	✓		
	Boss Fights	✓		✓	✓	✓	✓		✓	✓	✓	
	My Submissions	✓		✓	✓	✓	✓	✓	✓	✓		
Store	Exchange Points for Credits	✓	✓		✓	✓			✓			
	Buy Credits											
	Buy Badges											
	Special Powers											
	Product Placement											
Peer Assessment	Idea Evaluation	✓		✓	✓	✓			✓	✓		
	3 Criteria											
	Scale: 1-5											
Leaderboards	Top Ideas			✓	✓	✓			✓	✓	✓	
	Top Contributors											
	Top Connectors											
	My Progression											
Routines	Default Experience	✓		✓		✓	✓		✓			
	Create New Experience											
Options	Accept Connections	✓										
	Activate Quiz											
	Sound											
	GPS Location											
	Contact Form											

APPENDIX M: Functionalities and Mechanics matrix

Functionality \ Mechanic		Challenges	Change	Competition	Cooperation	Feedback	Resources	Reward			Transactions	Turns	Win States
								Bonus Points	Badges	Product Placement			
Registration	Social Networks		✓				✓	✓	✓				
	User status												
	Avatar												
Profile Bio	Social Networks				✓		✓	✓	✓		✓		
	Contacts												
Share Expertise	In-game Connections				✓	✓	✓		✓		✓		
	Chatting												
Collecting	Movie Props		✓	✓	✓		✓	✓	✓		✓		✓
Gifting			✓		✓		✓		✓		✓		
Trading			✓	✓	✓		✓		✓		✓	✓	
Challenges	Singleplayer Mode	✓		✓	✓	✓	✓	✓	✓			✓	✓
	Multiplayer Mode	✓		✓	✓	✓	✓	✓	✓		✓		
	Mission Submission	✓	✓	✓	✓			✓	✓				
	Quiz	✓	✓			✓		✓	✓			✓	✓
	Boss Fights	✓	✓		✓			✓	✓			✓	✓
	My Submissions	✓				✓							
Store	Exchange Points for Credits		✓	✓			✓		✓	✓	✓		
	Buy Credits												
	Buy Badges												
	Special Powers												
	Product Placement												
Peer Assessment	Idea Evaluation		✓	✓	✓	✓		✓	✓			✓	
	3 Criteria												
	Scale: 1-5												
Leaderboards	Top Ideas			✓		✓			✓				✓
	Top Contributors												
	Top Connectors												
	My Progression												
Routines	Default Experience		✓					✓	✓				✓
	Create New Experience												
Options	Accept Connections		✓			✓							
	Activate Quiz												
	Sound												
	GPS Location												
	Contact Form												

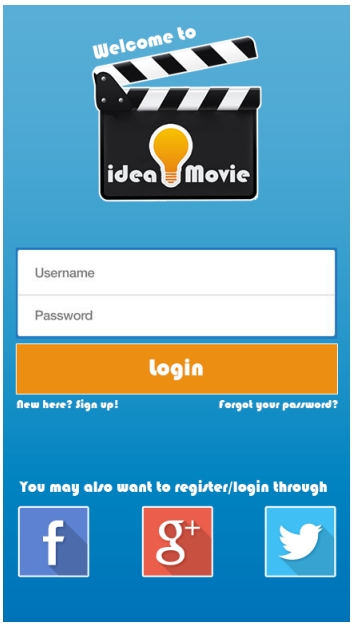
APPENDIX N: Functionalities and Components matrix

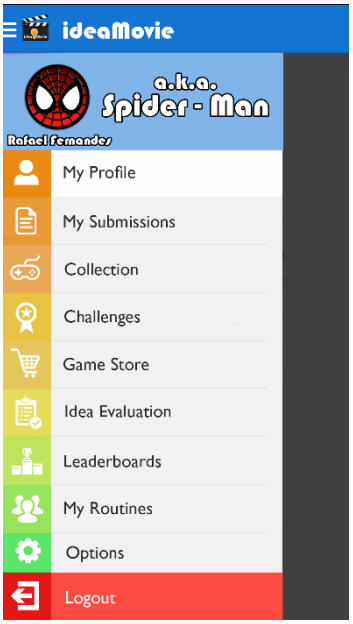
Functionality \ Component		Achievements	Avatars	Badges	Boss Fights	Collections	Combat	Gifting	Content Unlocking	Leaderboards	Levels	Points	Social Graph	Teams	Virtual Goods
Registration	Social Networks		✓	✓		✓									✓
	User status														
	Avatar														
Profile Bio	Social Networks									✓	✓		✓		
	Contacts														
Share Expertise	In-game Connections		✓							✓		✓	✓		✓
	Chatting														
Collecting	Movie Props	✓		✓		✓		✓							✓
Gifting				✓		✓		✓							✓
Trading				✓		✓									✓
Challenges	Singleplayer Mode	✓	✓	✓					✓	✓	✓	✓			✓
	Multiplayer Mode	✓	✓	✓	✓				✓	✓	✓	✓	✓	✓	✓
	Mission Submission	✓	✓	✓							✓	✓	✓	✓	
	Quiz						✓				✓	✓			✓
	Boss Fights	✓		✓	✓				✓		✓	✓		✓	✓
	My Submissions									✓		✓		✓	
Store	Exchange Points for Credits			✓					✓	✓	✓				
	Buy Credits														
	Buy Badges														
	Special Powers														
	Product Placement														
Peer Assessment	Idea Evaluation		✓	✓						✓		✓	✓		
	3 Criteria														
	Scale: 1-5														
Leaderboards	Top Ideas	✓		✓						✓		✓	✓	✓	✓
	Top Contributors														
	Top Connectors														
	My Progression														
Routines	Default Experience	✓										✓			✓
	Create New Experience														
Options	Accept Connections								✓						
	Activate Quiz														
	Sound														
	GPS Location														
	Contact Form														

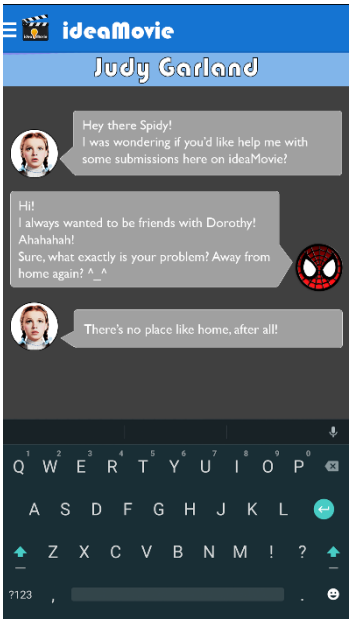
APPENDIX O: Functionalities and Target Users matrix

Functionality / User		Professional/ Student	Company
Registration	Social Networks	✓	✓
	User status		✓ - Company Status
	Avatar		✓
Profile Bio	Social Networks	✓	✓
	Contacts		
Share Expertise	In-game Connections	✓ - Transaction	✓ - Free
	Chatting		
Collecting	Movie Props	✓	✓
Gifting		✓	✓
Trading		✓	✓
Challenges	Singleplayer Mode	✓ - Always public	✓ - Private Option
	Multiplayer Mode		
	Mission Submission		
	Quiz		
	Boss Fights		
	My Submissions		
Store	Exchange Points for Credits	✓	✓
	Buy Credits		
	Buy Badges		
	Special Powers		
	Product Placement		
Peer Assessment	Idea Evaluation	✓	✓
	3 Criteria		
	Scale: 1-5		
Leaderboards	Top Ideas	✓	✓
	Top Contributors		
	Top Connectors		
	My Progression		
Routines	Default Experience	✓	✓
	Create New Experience		
Options	Accept Connections	✓	✓
	Activate Quiz		
	Sound		
	GPS Location		
	Contact Form		

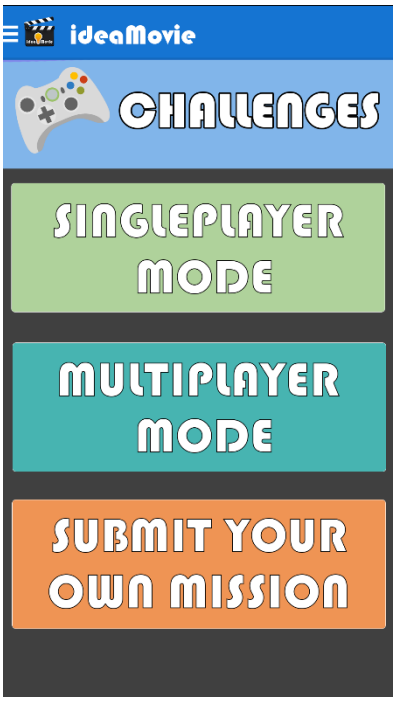
APPENDIX P: Prototype mock-up screens

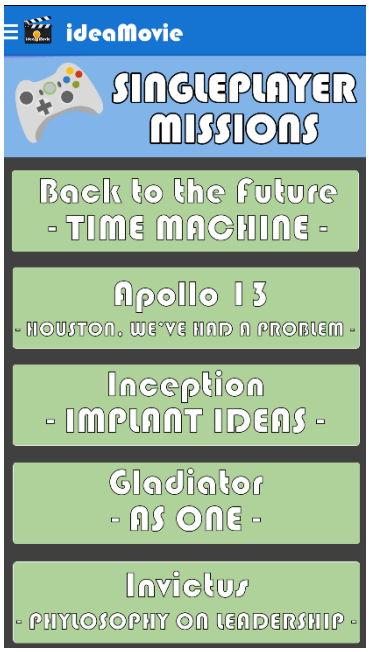


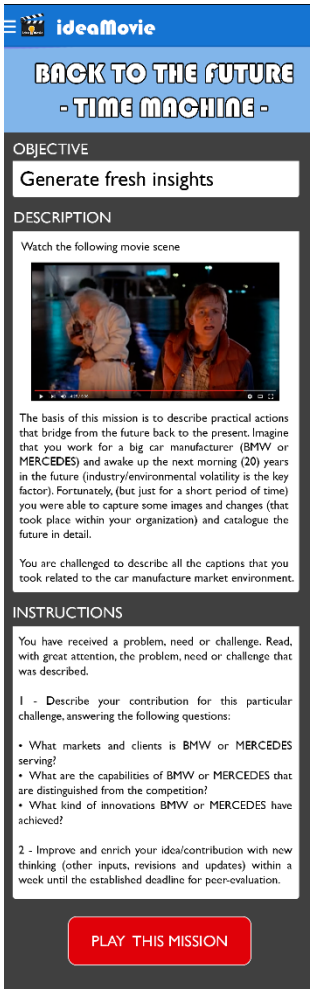


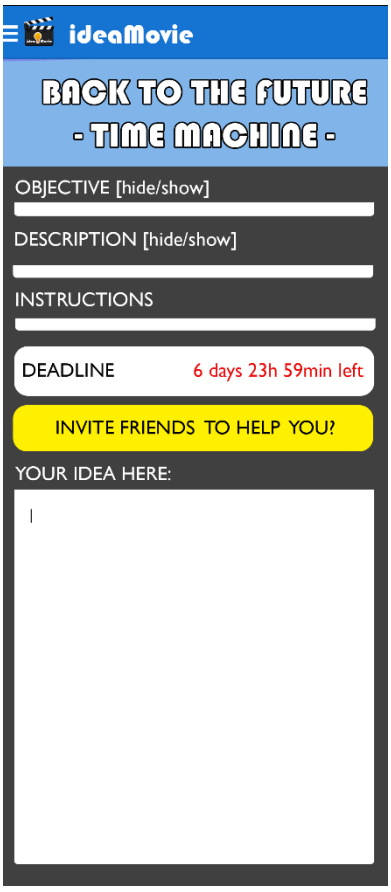



ideaMovie
COLLECTION
Common (6/50)
Uncommon (4/40)
Rare (3/30)
Super Rare (3/15)


ideaMovie
CHALLENGES
SINGLEPLAYER MODE
MULTIPLAYER MODE
SUBMIT YOUR OWN MISSION

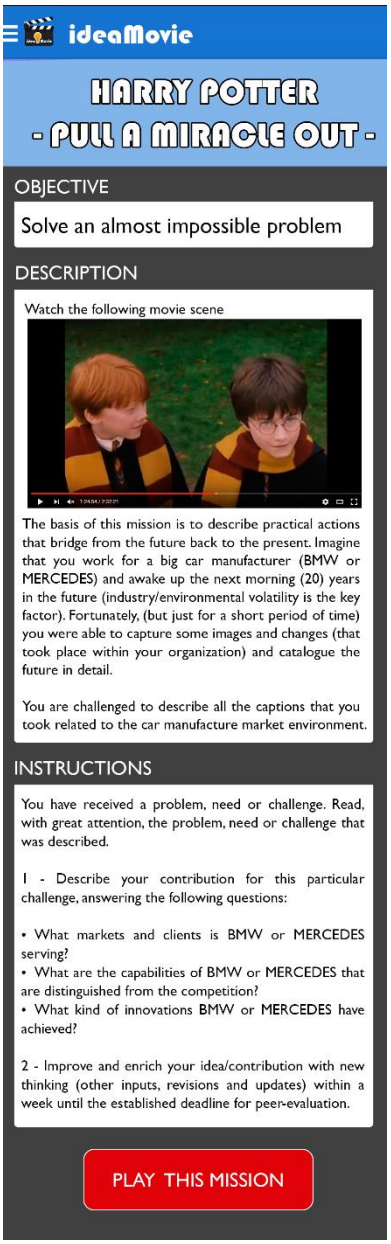

ideaMovie
SINGLEPLAYER MISSIONS
Back to the Future
- TIME MACHINE -
Apollo 13
- HOUSTON, WE'VE HAD A PROBLEM -
Inception
- IMPLANT IDEAS -
Gladiator
- AS ONE -
Invictus
- PHYLOSOPHY ON LEADERSHIP -

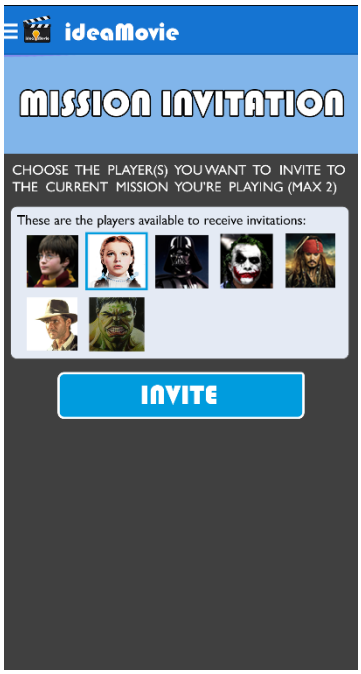

ideaMovie
BACK TO THE FUTURE
- TIME MACHINE -
OBJECTIVE
Generate fresh insights
DESCRIPTION
Watch the following movie scene
The basis of this mission is to describe practical actions that bridge from the future back to the present. Imagine that you work for a big car manufacturer (BMW or MERCEDES) and awake up the next morning (20) years in the future (industry/environmental volatility is the key factor). Fortunately, (but just for a short period of time) you were able to capture some images and changes (that took place within your organization) and catalogue the future in detail.
You are challenged to describe all the captions that you took related to the car manufacture market environment.
INSTRUCTIONS
You have received a problem, need or challenge. Read, with great attention, the problem, need or challenge that was described.
1 - Describe your contribution for this particular challenge, answering the following questions:
• What markets and clients is BMW or MERCEDES serving?
• What are the capabilities of BMW or MERCEDES that are distinguished from the competition?
• What kind of innovations BMW or MERCEDES have achieved?
2 - Improve and enrich your idea/contribution with new thinking (other inputs, revisions and updates) within a week until the established deadline for peer-evaluation.
PLAY THIS MISSION

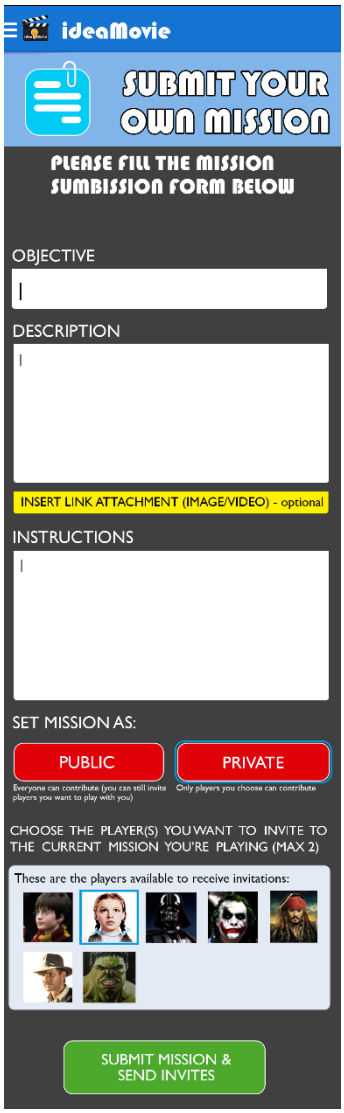

ideaMovie
BACK TO THE FUTURE
- TIME MACHINE -
OBJECTIVE [hide/show]
DESCRIPTION [hide/show]
INSTRUCTIONS
DEADLINE 6 days 23h 59min left
INVITE FRIENDS TO HELP YOU?
YOUR IDEA HERE:

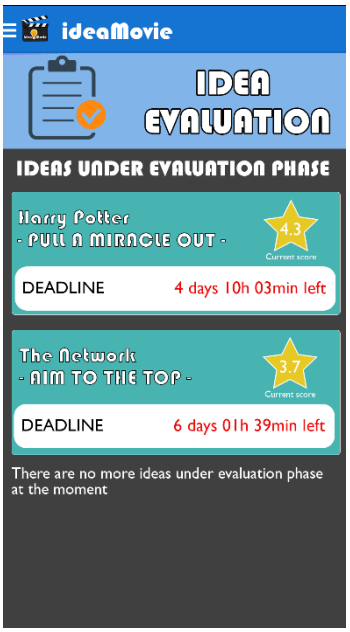

ideaMovie
GAME STORE
CURRENT BALANCE
1267 pts 50 credits
Exchange points for credits
100 points 5 credits Exchange
175 points 10 credits Exchange
750 points 50 credits Exchange
1200 points 100 credits Exchange
Buy store-exclusive artifacts
Captain America's shield 20 credits
Guy Fawk's mask 50 credits
Charlie Chaplin's fedora 80 credits
Willy Wonka's chocolate 100 credits
Buy special powers
2x POINTS Double points in the next mission 20 credits
2x EXP. Double experience in the next mission 50 credits
1.5x TIME 1.5x more time to solve the next mission 80 credits
2x TIME Double the time to solve the next mission 100 credits
Buy credits
100 credits 3.99 € Exchange
500 credits 7.99€ Exchange

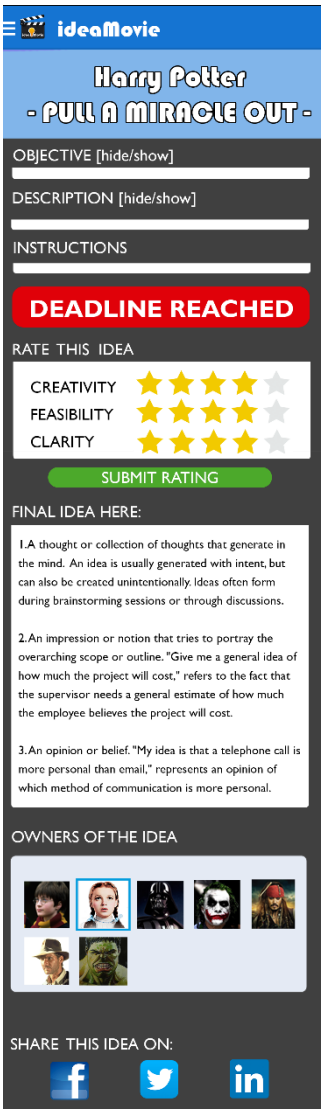

ideaMovie
MULTIPLAYER MISSIONS
Harry Potter
- PULL A MIRACLE OUT -
The Network
- AIM TO THE TOP -
There are no more multiplayer challenges at the moment


ideaMovie
HARRY POTTER
- PULL A MIRACLE OUT -
OBJECTIVE
Solve an almost impossible problem
DESCRIPTION
Watch the following movie scene
The basis of this mission is to describe practical actions that bridge from the future back to the present. Imagine that you work for a big car manufacturer (BMW or MERCEDES) and awake up the next morning (20) years in the future (industry/environmental volatility is the key factor). Fortunately, (but just for a short period of time) you were able to capture some images and changes (that took place within your organization) and catalogue the future in detail.
You are challenged to describe all the captions that you took related to the car manufacture market environment.
INSTRUCTIONS
You have received a problem, need or challenge. Read, with great attention, the problem, need or challenge that was described.
1 - Describe your contribution for this particular challenge, answering the following questions:
• What markets and clients is BMW or MERCEDES serving?
• What are the capabilities of BMW or MERCEDES that are distinguished from the competition?
• What kind of innovations BMW or MERCEDES have achieved?
2 - Improve and enrich your idea/contribution with new thinking (other inputs, revisions and updates) within a week until the established deadline for peer-evaluation.
PLAY THIS MISSION

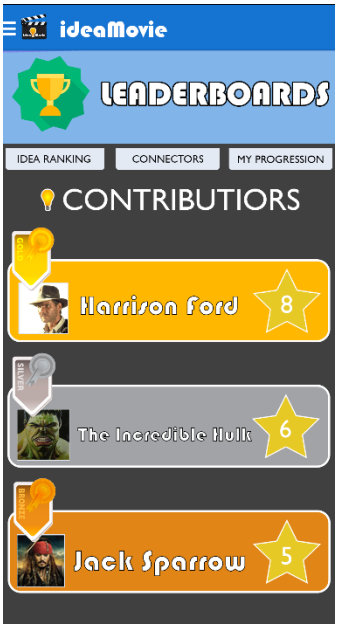

ideaMovie
MISSION INVITATION
CHOOSE THE PLAYER(S) YOU WANT TO INVITE TO THE CURRENT MISSION YOU'RE PLAYING (MAX 2)
These are the players available to receive invitations:
INVITE

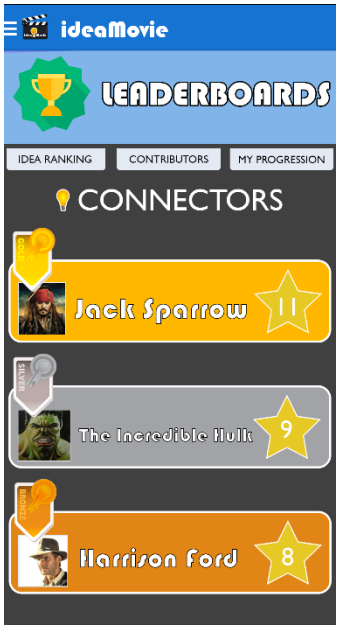

ideaMovie
SUBMIT YOUR OWN MISSION
PLEASE FILL THE MISSION SUMBISSION FORM BELOW
OBJECTIVE
DESCRIPTION
INSERT LINK ATTACHMENT (IMAGE/VIDEO) - optional
INSTRUCTIONS
SET MISSION AS:
PUBLIC
PRIVATE
Everyone can contribute (you can still invite players you want to play with you)
Only players you choose can contribute
CHOOSE THE PLAYER(S) YOU WANT TO INVITE TO THE CURRENT MISSION YOU'RE PLAYING (MAX 2)
These are the players available to receive invitations:
SUBMIT MISSION & SEND INVITES

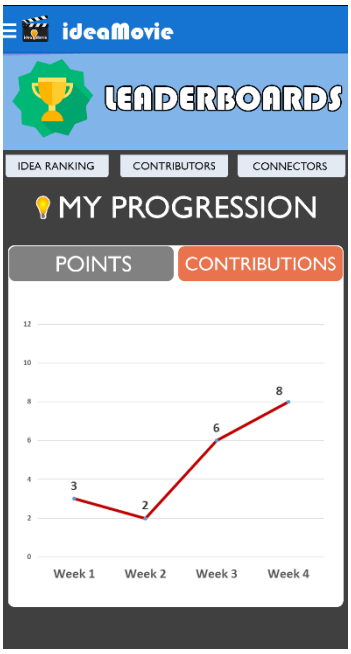

ideaMovie
IDEA EVALUATION
IDEAS UNDER EVALUATION PHASE
Harry Potter
- PULL A MIRACLE OUT -
4.3
Current score
DEADLINE
4 days 10h 03min left
The Network
- AIM TO THE TOP -
3.7
Current score
DEADLINE
6 days 01h 39min left
There are no more ideas under evaluation phase at the moment

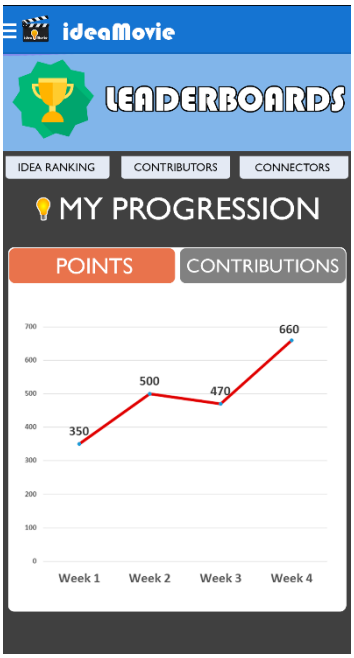

ideaMovie
Harry Potter
- PULL A MIRACLE OUT -
OBJECTIVE [hide/show]
DESCRIPTION [hide/show]
INSTRUCTIONS
DEADLINE REACHED
RATE THIS IDEA
CREATIVITY
FEASIBILITY
CLARITY
SUBMIT RATING
FINAL IDEA HERE:
1.A thought or collection of thoughts that generate in the mind. An idea is usually generated with intent, but can also be created unintentionally. Ideas often form during brainstorming sessions or through discussions.
2.An impression or notion that tries to portray the overarching scope or outline. "Give me a general idea of how much the project will cost," refers to the fact that the supervisor needs a general estimate of how much the employee believes the project will cost.
3.An opinion or belief. "My idea is that a telephone call is more personal than email," represents an opinion of which method of communication is more personal.
OWNERS OF THE IDEA
SHARE THIS IDEA ON:

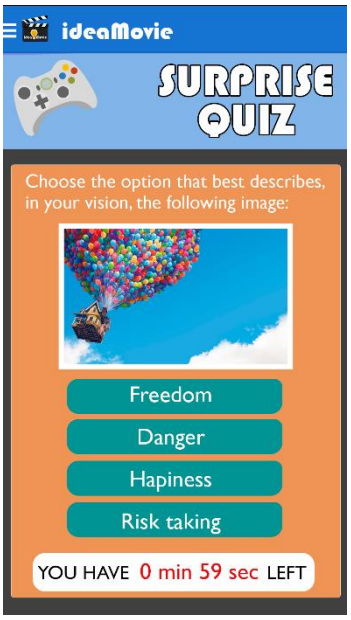

ideaMovie
LEADERBOARDS
CONTRIBUTORS
CONNECTORS
MY PROGRESSION
IDEA RANKING
Harry Potter
- PULL A MIRACLE OUT -
4.3
The Network
- AIM TO THE TOP -
4.3
The Wizard of OZ
- USE YOUR HEART -
4.3

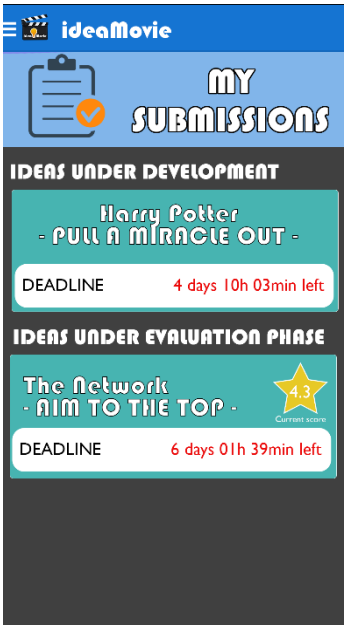

ideaMovie
LEADERBOARDS
IDEA RANKING
CONNECTORS
MY PROGRESSION
CONTRIBUTIORS
Harrison Ford
8
The Incredible Hulk
6
Jack Sparrow
5


ideaMovie
LEADERBOARDS
IDEA RANKING
CONTRIBUTORS
MY PROGRESSION
CONNECTORS
Jack Sparrow
11
The Incredible Hulk
9
Harrison Ford
8

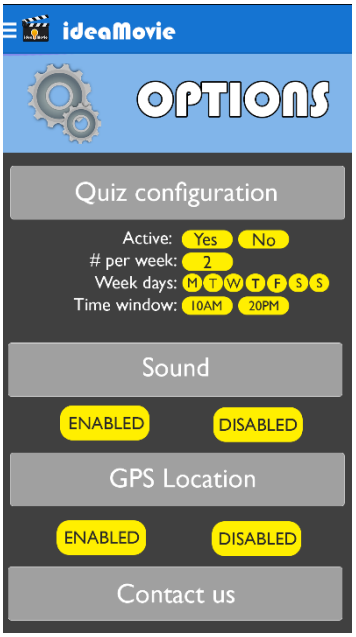

ideaMovie
LEADERBOARDS
IDEA RANKING
CONTRIBUTORS
CONNECTORS
MY PROGRESSION
POINTS
CONTRIBUTIONS
Week 1
Week 2
Week 3
Week 4


ideaMovie
LEADERBOARDS
IDEA RANKING
CONTRIBUTORS
CONNECTORS
MY PROGRESSION
POINTS
CONTRIBUTIONS
350
500
470
660
Week 1
Week 2
Week 3
Week 4


ideaMovie
SURPRISE QUIZ
Choose the option that best describes, in your vision, the following image:
Freedom
Danger
Hapiness
Risk taking
YOU HAVE 0 min 59 sec LEFT


ideaMovie
MY SUBMISSIONS
IDEAS UNDER DEVELOPMENT
Harry Potter
- PULL A MIRACLE OUT -
DEADLINE
4 days 10h 03min left
IDEAS UNDER EVALUATION PHASE
The Network
- AIM TO THE TOP -
4.3
Current score
DEADLINE
6 days 01h 39min left


ideaMovie
MY ROUTINES
CREATE NEW EXPERIENCE
- login tomorrow
- Submit 1 mission this week
- Play one multiplayer mision
- Reach level 2 this week
- Collect 5 badges


ideaMovie
OPTIONS
Quiz configuration
Active: Yes No
per week: 2
Week days: M T W T F S S
Time window: 10AM 20PM
Sound
ENABLED
DISABLED
GPS Location
ENABLED
DISABLED
Contact us

APPENDIX Q: Action Plan

		March			April				May					June				July			
Phases	**Activities**	**14/mar**	**21/mar**	**28/mar**	**04/abr**	**11/abr**	**18/abr**	**25/abr**	**02/mai**	**09/mai**	**16/mai**	**23/mai**	**30/mai**	**06/jun**	**13/jun**	**20/jun**	**27/jun**	**04/jul**	**11/jul**	**18/jul**	**25/jul**
1. Market Analysis	**Primary data collection**																				
	Secondary data collection																				
	Market availability Report				05/abr																
2. Concept Specification	**Concepts design**																				
	Concepts selection																				
	M2- Concepts Report							30/abr													
	M2- App Specification Design v1										16/mai										
	User feasibility test											23/mai	31/mai								
	M2- App Specification Design v2													06/jun							
3. Prototype Development	**Technical feasibility test**																				
	Prototype development																				
	Prototype testing																				
	M4- Proof of concept																				25/jul
4. Business Development	**Business model**																				
	Small batch production																				
	Market test																				
	M5- Business Plan																				