How to develop financial applications with game features in e-banking?

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ABSTRACT
As for Gamification, it is about business software with game characteristics, understanding the software development process will improve the practices, and will more than likely, improve the business itself (make it more efficient, effective, and less costly and mainly collect a positive influence from the customers). This study aims to develop a framework that provides the mechanisms to ensure that the software will have game characteristic and that clients will recognize it as Gamification. Our results show that the five-step framework proposal applied to the Gamification project management on this study, the Spiral development model, and the group discussion results into a positive effect on customers and e-business. The spiral development methodology used for the development of this application showed to be the appropriated for this type of project. The tests with discussion-groups proved to be a key "tool" to identify and adapt the game characteristics that has led to the improvement of customer perception of socialness, usefulness ease of use, enjoyment and ease of use that probed to have a strong positive impact on the intention to use the game.

Categories and Subject Descriptors
D.2.1 [Requirements/Specifications]: Methodologies and Tools; D.2.2 [Design Tools and Techniques]: User interfaces and Testing tools; D.2.9 [Management]: Life cycle; D.2.10 [Design]; K.6.1 [Project and People Management]: Life cycle and Systems development; K.8.0 [General]: Games.

General Terms
Management, Measurement, Design, Economics, Experimentation, Human Factors, Standardization, Theory, Verification.

Keywords: e-banking, Gamification, Serious Games, Game Design, Software Development Methodology, Project Management.

1. INTRODUCTION
The constant search for being close to what customers like, aims to increase the use of e-business and customer loyalty in this sense companies seek to develop or adapt software's and include features appreciated by customers of online gaming [19, 49].

Gamification is the term that defines the use of game design in other non-game contexts. This feature differentiates real and design games for playful interactions [18]. Implementing a holistic e-banking Gamification strategy cannot be done without selecting a Gamification development methodology. The Gamification software application will be a crucial piece for the success of any e-banking Gamification strategy, as the tracking of achievements of all players (employees, sales teams and customers) and the implementation of procedures and methodologies to measure and achieve the business goals.

In the beginning of a project that encompasses a software development, it is crucial to use a methodology that increases its success rate. To better help finding the right methodology for Gamification in e-banking, a list of requirements, processes, activities and others steps has to be checked, evaluated and implemented. [53] refer that a competitive advantage can be achieved through the use and alignment of project management with business strategy. The adoption of business strategies that transform traditional business applications in applications with game features by Banks in their electronic channels raises questions: What type of games can be developed? What methodology and what process control should be implemented that can help determine if we are on the right path to the Gamification?

This paper describes a project management framework and a software quality insurance of the Gamification develops by a Bank in the Website, designated by FuteBank (Figure 1).

Figure 1. Example of the portfolio mutual funds.

FuteBank is a digital animation based in the mutual funds portfolio management using a soccer champion league model. For the project implementation, research has been made through this studying to try to get some answers to the following questions:

a) What is the purpose of Gamification for the business?
b) What product or business application should be Gamified?
c) What type of game should be used?
d) What games characteristics are suitable to the business?
e) What software development method should be used?
f) What tools should be used in Gamification?
g) What are the assessment and monitoring processes to be implemented so that the goals of Gamification are met?
h) What controls and testes should be implemented?
i) What Gamification evaluation results should be implemented?
j) What changes should be implemented?

1. THEORETICAL BACKGROUND

1.1 Gamification

[39] concludes that, in 2011, 91% of the Gamification market was consumer-oriented and foresees that the game design within companies will become the dominant segment of Gamification. In the essence Gamification is a new way of thinking, designing, and implementing solutions aiming to change attitudes and behaviors in employees, partners, suppliers and customers, to increase business and customer loyalty. The concept of putting the user at the center of the Gamification project is so critical that it is key in the definition of meaningful "Gamification: Meaningful Gamification is the integration of user-centred game design elements into non-game contexts", [41] the implications of focusing on user-centred design can help designers avoid meaningless, or even harmful, Gamification. The development of applications Gamified enables companies of design patterns and dynamics of games [59]. Gamification applies to game mechanics for non-game, with the aim to change the behavior of individuals [9]. By 2014 over 70% of the 2,000 largest global organizations will have at least one application with features similar to those of the games [21]. In this sense we studied the process of development of game elements identified by [46] with the aim to influence customers in their attitudes and intentions to use e-banking and buy mutual funds.

1.2 Games

[51], in his study on the theory of the five forces on the adoption of a game, concluded that game have good social acceptance, low cultural resistance and a great acceptance by customers. The five main forces on the adoption of a game are: 1-cost and advantage of Hardware platforms; 2-sophistication of Software applications; 3-social acceptance of games and tools; 4- hits in other industries; and 5-innovative experiences in the industry that adopts the game. Understanding and application of these mechanisms offers a powerful tool for conveying information, change consumer behavior, influencing the decision-making process, direct, product realisation, motivate and train employees. The game mechanics (Figure 2) deployed within software applications adapted for gaming offers a great opportunity to increase the participation of users with a specific topic.

Figure 2. Games Mechanisms, Gamification in 2012, M2Research

If the websites do not act as a game, the new generation does not provide attention [58]. According to [28] the studies of games can be an academic response to the issues of games industry regarding the development and player acceptance. The online games grow in importance as an e-business application, professionals and researchers increasingly believe that understanding the behavior of online game player is critical [61].

1.3 Design

Methodologically, the wide variety of approaches that have been followed, in most of the times are attempts to imagine the existing designs in other fields and sectors of the video game industry. The ideal strives for user-centred design in every element of the computer system and user software's usability is one part of it amongst many [38]. Current research effort in the field of usability studies proved that ease of use and navigation is two critical components in determining website usability [44]. The usability research is lacking in a model that states which contextual design dimensions are relevant to the usability of a website [62]. There is a shortcoming concerning clearly defined usability standards [50]. Usability of websites is usually subjective and is often based on either practical knowledge of experts or detailed formation guidelines [10]. The nature of the opponent (computer, friend, or stranger) influences emotional responses when playing games [45]. Customization of game avatars can affect both subjective feelings of presence and psychophysiological indicators of emotion during gameplay, which may make the gameplay, experience more enjoyable [3]. In addition, interactivity within games influences the overall emotion management effect in that only highly interactive video gamers can simultaneously increase positive effects and decrease negative effects [12]. The basic strategy for the design and development of an effective web communication strategy the website creation and

construction should: 1) provide consistent look and feel, 2) be conceptually consistent, and 3) attract positive attention [33].

1.4 Players in Game Design Process

The descriptions of the design process have small differences, but in general it can be brought around the following phases: Design concept, preproduction, production and postproduction [20, 24]. The development model of the game gave relief and importance to the role played by the players, so during the development phase was sometimes involved in testing and contributes to changes in computer application. The game designers may qualify technically the application and contribute to obtaining a final product more centred and accepted by users if they participate along all the four different phases of game development [54].

Some more concrete methods include group tests and unit tests, to stimulate the emergence of new ideas to evaluate game concepts and study the most appreciated perceptions to use the game [52]. Iterative development method of the project is based on participation and invitation to formulate opinions of players since the beginning of the project [48]. As part of this approach the designers are encouraged to build the first playable version of the game and immediately after a short presentation to a group of users, request your opinion so new ideas or make changes. [20, 48] suggest that the approach of iterative development of the game is a great concern, because it is not possible in advance to provide the all features and functionalities of the game.

1.5 Software Development Methodologies

Software has been playing a key role in the development of modern society and many process models are described in the literature such as Waterfall, Prototype, Rapid Application Development (RAD), Spiral Model, Object Oriented, Agile and Component Based Development [25]. However majority agrees that software methodologies fall under two categories that are heavyweight and lightweight [25]. Heavyweight methodologies (Waterfall Model, Spiral Model) are also known as the traditional methodologies, and their focuses are detailed documentation, inclusive planning, and extroverted design. Lightweight methodologies (XP, SCRUM) are, referred as agile methodologies. Light weight methodologies focused mainly on short iterative cycles, and rely on the knowledge within a team.

According with [23], the main categories of methodologies develop over time have been subject of many studies [1, 4, 6, 14, 15, 42]. The methodology can be considered as “agile” when software development is incremental (small software releases, with rapid cycles), cooperative (customer and developers working constantly together with close communication), straightforward (the method itself is easy to learn and to modify, well documented), and adaptive (able to make last moment changes) [1]. Over time a wide range of software development methodologies has been elaborated, therefore choosing one of them is not an easy task, mainly when the project is Gamification. In this sense other goal of this research is to identify and analyze the key factors that influence the decision of choosing the most adequate software development methodology for a Gamification project in e-banking. The methodologies that are subject of this study (Spiral and Agile) are analyzed in relation to these key factors. The findings of this analyze provides information regarding which methodology is best to be used depending on the level of each factor for a specific project.

1.6 Spiral Methodology

Spiral (Figure 3) is one of the most popular Heavyweight development methodologies is also known as Barry Boehm's model [8], using his model defined in 1986 represented as a spiral rather than as a sequence of activities with backtracking. The spiral has many cycles and each cycle represents a phase in the process without fixed phases such as specification or design.

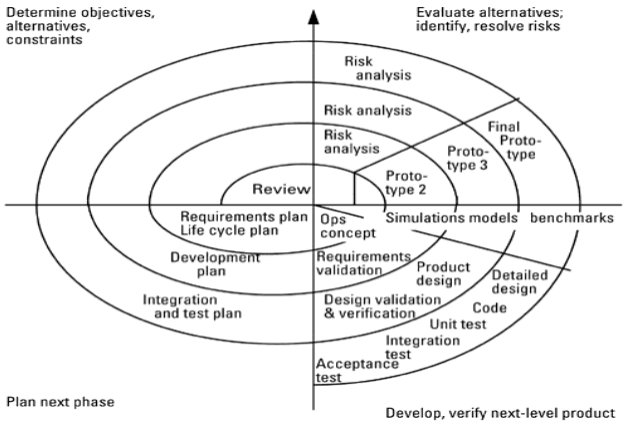

Figure 3. Spiral model, Boehm.

Spiral model are chosen depending on what it is required and the risks are explicitly assessed and resolved throughout the process where the result of that action are showed to business stakeholders and ask "what do you think?”. A Spiral project starts on a small scale, explores risks, makes a plan to handle the risks, and then decides whether to take the next step of the project to do the next iteration of the spiral. The Spiral model is an iterative form of Waterfall development, not agile development, because the Spiral model, as in all variations of Waterfall, requires significant planning to be done in the first iteration. Spiral model combines some key aspect of the Waterfall model and rapid prototyping methodologies, but provided emphasis in a key area many felt had been neglected by other methodologies: deliberate iterative risk analysis, particularly suited to large-scale complex systems [7].

1.7 Agile Methodology

Iterative development prescribes the construction of initially small but ever-larger portions of a software project to help all those involved to uncover important issues early before problems or faulty assumptions can lead to disaster. Agile it is a combination of several frameworks, with prototyping techniques that allows rapid software application development [60].
Agile (Figure 4) software development uses iterative development as a basis but advocates a lighter and more people centric viewpoint than traditional approaches. Agile processes fundamentally incorporate iteration and the continuous feedback that it provides to successively refine and deliver a software system. There are many variations of agile processes like, Extreme Programming (XP), Scrum (is the most commonly used agile process) or Dynamic systems development method.

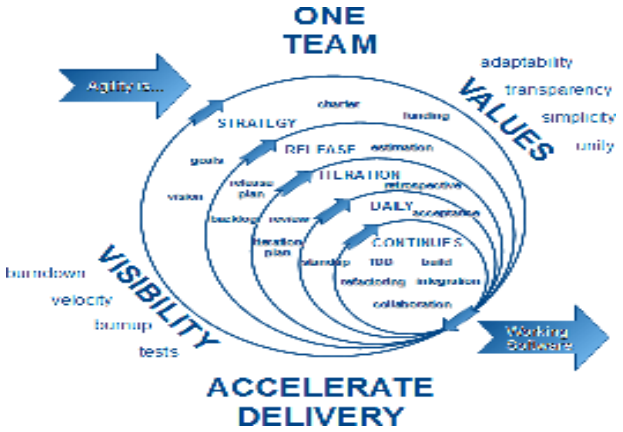

Figure 4. Agile software development, BDPA Detroit-April 18, 2013.

1.8 Project Management

The best starting point is to choose and understand the project methodology to use and collect processes, methods and toolsfor accomplishing an objective. Methodologies provide a checklist of key deliverables and activities to avoid missing key tasks, this consistency simplifies the process and reduces training and ensures that all team members are marching to the same direction. A project management methodology provides a roadmap for managing projects and the project teams who do notuse a shared methodology tend to be inefficient, resulting inhigher cost, longer schedule and the introduction of higher risk.

Research literature on project management reveals that this omission of the theoretical is no incidental phenomenon [27, 29] and concluded that the present evidence is strong enough for the claim that a paradigmatic transformation of the discipline of project management is needed and the transformation required implies that a more intimate relation between theory and practice must be created in project management. Theory and practice have to be developed concurrently, similarly to other science-based fields, where theory is explicated, tested and refined in a continuous dialog between the scientific and practitioner communities [29]. Within mind this concerns and the project characteristic it was decide to implemented a different framework that was called the five-step Gamification approach.

2. FIVE STEPS PROCESS TO GAMIFICATION

The IT Governace can be provied throug implementation of a project management framework, and the five-steps framework proposal (Figure 5) designated by 5PMG (five-steps project managemnet framework for gamification) should help project managers on the process, development, people and organization improvements to enable effective control and delivery of a Gamification project. This framework will also ensure the development of business applications with games characteristics across the people, customers and organization are involved. Project management framework is a key to mitigate the organizational risk and therefore a key element of governance, which enhances performance, improve alignment of corporate activities with the organizational strategy, whilst concurrently enhancing business benefits through effective implementation of the project [11]. The five-step framework concepts where based on best practice in industries such as the Association for Project Management (APM), PRINCE and on practical knowledge of experts. After a decision has been made to go with business Gamification, several questions are raised in the departments responsible for the development and implementation of the new software application. This five-step (I-Business objectives; II-Game model and Characteristics; III- Methodology development software and tools; IV - Game Design & Software Develop; V - Gamification quality control & Feedback) used on the Gamification project in this study is a guideline through all process and activities, to achieve the goals avoiding gaps or losing time and the most important controlling if the software development will be recognize by the customers has ease of use, usefulness and enjoyment.

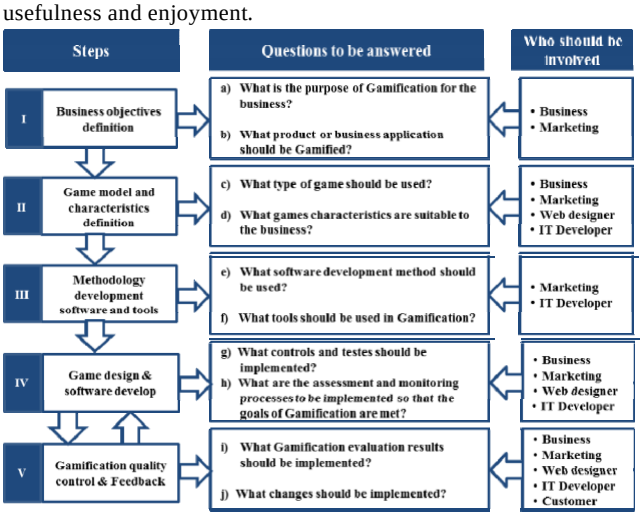

Figure 5. Five-steps project managemnet framework for gamification (5PMG) used in FuteBank.

2.1 Step I - Business objectives definition

There are numerous advantages to banks offered e-banking services such as innovation of new products and services, more performance, effective marketing and lower costs [57]. In conclusion e-banking improve customer loyalty that results in higher customer retention and growing organization value [2]. According with business strategic the first step is very important to define why and for what the application is required, and what product and business application will be Gamified. The business objectives are essential to design the game application and for all development process, in the case of our study it was customer loyalty, mutual funds promotion and portfolio growing.

With the traditional mutual funds software application customers are allowed to perform all financial operations such as portfolio management or buy and sell transactions. The business has decided to Gamified this application, creating new software with a game design approach, new graphic interface, including digital animation, virtual assistant (Avatar), ratings and prizes with the goal to be similar to a soccer champion league game, were mutual funds are players, portfolio is the soccer team and the customer is team manager. Some other important business requirements were added in the new application *e.g.* (the game should provide information on the main characteristics of a mutual fund, risk classification, profitability since the beginning of the year and others that let the costumer quickly analyze his portfolio.

2.2 Step II - Game model and characteristics definition

After business objectives the IT software development, Marketing and business teams should be in place to start defining the business and technical specifications and decide what game modelshould be chased: board game, investigation game, puzzle, quiz, and adventure game or other that could create analogy between the financial product and a digital animation. The storyboard designer and the development team need to work together to structure the application scenarios and match it up with a fun scenario. They mainly have to describe the elements of the virtualenvironment such as the storyline, the character, the design and the different places associated to the business application and product that is Gamified. The three main characteristics of a gameshould be fun to learn and provide the appropriate level of challenge should use abstractions and fantasy to make it more interesting and should arouse the curiosity of the player [36]. It isconcluded that the essential characteristics of computer games andother inherently pleasant situations can be organized into three categories: Challenge, fantasy and curiosity.

Along with Gamifying the way in which we are working as team we can also keep in the forefront of every software developers, business analyst and product owner's mind the question "How can I build a product that not only meets the needs the business outcomes but also enables the customer to feel like they are playing a game, that there is fun and a sense of achievement built in?". The key characteristics of a game are: Challenge, Curiosity, Control and Fantasy [37]. Fantasy, rules/goals, sensory stimuli, challenge, mystery, and control are the six features that characterize games [22].

2.3 Step III - Methodology development software

The IT team according with the business and marketing requirement should select tools and design, programing software needed to develop the business application with game characteristics. This is the moment were the designers can search the database to see if any of these components suit their needs and what they need to design from scratch. Also the IT systems and development team define and setup all infrastructure and software for development and testing environments. The project was developed according to the methodology of interactive development set to "Spiral", however the Agile models was discussed but after better analyze was dropped [8]. The Spiral model was selected for the game software development process, because it combines elements of design and prototyping in appropriate stages to an innovative project, complex and not knowing all the requirements and definitions at the beginning of the project. Between the stages of development and delivery of new prototypes and evaluation discussion group tests and questionnaire were carried out to assess the acceptance of the users and customers of software application to support the game.

The Heavyweight methodologies like Spiral are based on a sequential series of steps, such as requirements definition, solution build, testing and deployment and mainly focus detailed documentation, inclusive planning, and extroverted design. Early spirals can achieve goals of producing quick-to-market prototypes which can be tested or presented to customers for early feedback, which produces valuable information for later spirals. This approach mitigates project risk and allows requirements to be evolved and refined incrementally, keeping the project agile in that software is built incrementally and that the approach caters to the reality of evolving requirements. Agile model is normally used in smaller project (not our case of mutual funds application), emphasize real-time communication, preferably face-to-face, over written documents (the Bank has legal entities that obliged to have all project documentation in place) and only senior developers are in a better position to take the decisions necessary for the agile type of development, which leaves hardly any place for newbie programmers, until it is combined with the senior's resources and produce very little written documentation relative toSpiral model.

2.4 Step IV - Game develop

Different approaches have been followed to study the problem how to design and develop games ([16, 47]. To develop the best games is necessary examining the common characteristics of the games and understand how they relate to each other and studying the gameplaying experience from the point of view of the player [5, 30, 43, 55]. Much of this research is also to define and establish a vocabulary to describe the games and study the development of new games [13, 31] All through the designing phase, the authors have to produce a certain number of mock-up models and documents that will later be passed on to the developers so they can work on the develop phase. The descriptions of the design process have small differences, but in general it can be brought around the following phases: Design concept, preproduction, production and postproduction [20, 24]. The development model of the game gave relief and importance tothe role played by the players, so during the development phase was sometimes involved in testing and contributes to changes in computer application. The game designers may qualify technically the application and contribute to obtaining a final product more centered and accepted by users if they participate along all the four different phases of game development [54]. As part of this approach the designers are encouraged to build the first playable version of the game and immediately after a short presentation to a group of users, request your opinion so new ideas or make changes [20]. The approach of iterative development of the game is a great concern, because it is not possible in advance to provide the features and functionality of the game [48]. Some more concrete methods include group tests and unit tests, to stimulate the emergence of new ideas to evaluate game concepts and study the most appreciated perceptions so the acceptance to use the game [52].

This step received constant feed-back from the testers and quality insurance process during the develop phase in order to improve the overall quality of the project, and the success implementation of the games characteristics in the business application.

2.5 Step V - Gamification quality control & feedback

Since the Gamification requires different approach from tradition business application development, it's important to implement quality process control and monitoring to confirm that the business objective and the customer's perceptions of ease of use, usefulness, and enjoyment are fully achieved [17]. To minimize the customer rejection of the new application we set up a pre-evaluation process with a discussion group represented of overall

bank customers and employees. A first set of tests was run by qualified IT testers to check technical bugs or slow process. For a more thorough testing, we invite groups of business, employees and customers to play with the game in order to collected their perceptions and study their behavioral about the application. The objective of these testing is receiving inputs to adding, removing or changing games characteristics, graphic design or usability process in order to be more accepted. The most critical thing to learn from the testers is their all-important 'first experience' with the game. Could they get into it easily? Was it intuitive? Where the general ergonomics friendly and not frustrating? Could they find the answers to their questions quickly and easily within the game's components?

This step is also extremely critical to design more games. This is the step where we collected feedback from the users of discussion group to see what is right or wrong through an open questionnaire that will be study in the detail on the next topic.

3. CHECKING IF YOUR DEVELOPMENT APPLICATION HAS GAMIFICATION CHARACTERISTIC

The discussion group allows verbalizing the problem addressed, namely discovers the terms, expressions and opinions of the people, without formalisms, and allows understanding the spontaneous perceptions. Focus groups can be used for program development and evaluation, planning, and needs assessment [32]. The purpose of focus group is designed to encourage divergent thinking and disclosure of user's perceptions and behaviors and the participant selection are selectively invited, based on similar characteristics [34]. The discussion groups are an informal technique where a group of four to nine people from different backgrounds and with different skills discusses without constraints and concerns about the application prototype, with the aim to identify needs and feelings, what they think, the things that are important to them and what they want. Discussion groups can support and ideas for the elaboration of proposals for a new concept of product, plus they help users in the analysis of their own problems, identifying features and processes that must be changed in the system under study and to support the development and to facilitate their implementation and integration with other systems [35, 40]. For being a less formal method, inexpensive, fast and the results are easily interpretable is an excellent way to generate hypotheses, particularly when the requirements and specifications are poorly known, like our case, which is why this method was applied. So during the development phase of the game, tests has been performed and created discussions groups to collect prior information about the users' reaction and perceptions that could help to realize the levelof acceptance and what changes to make to improve the adoption and use of the game by the costumers.

3.1 Objectives of the Discussion Groups

The main purpose of the discussion groups was to examine the games characteristics of the mutual funds application Gamified through an open questionnaire and open discussion in order to received feedback from a sample of players. More specifically, the goals of the discussion groups were to gain an understanding of the interaction between the players with the game and to understand more about the future costumer reaction with the application, check if the development design is in the right way with the business objectives of the Gamification in order to find what is real motivates the costumers to respond or to refuse to use the application. Finally is also important to share the development process and collect feedback from the employee's special the sales people that will assist and support the customers if their needed.

3.2 Methodology Discuss Group

A total of three discussion groups were conducted (two in Lisbon and one in Porto), with an average of 8 to 12 persons each, to analyze and test FuteBank. The population under study was 28 people represented by 16 employees of the Bank (about 8% of employees), 8 customers (about 0.013% of the Private Bank's customers) and 4 external Financial Consultants (about 8% of the external sales network). At first, it was made a generic presentation of the features and the goal of the game, after a real demonstration of a "beta" version of the game. After the presentations, open discussion has carryout and request to write their perceptions, feelings and opinions on an open questionnaire with six main topics: "What did you feel?"; "What else did you like?"; "The least liked?"; "Propose changes in the game?"; "What is missing or should be removed from the game?"; "What are your suggestions?".

The data were collected through an open questionnaire delivery after the discussion meetings between February and March, 2012. From the 28 testers 92% was male, 81% were aged between 25 and 40 years and 18% had more than 40 years. Regarding the education 84% had a graduated degree, 16% had a bachelor's degree.

3.3 Sample data analysis

The feedback received from discussion groups through the 6 open questions were analyzed and filtered to the comments that was considered most relevant to the customers' acceptance and on the changes impact to be carried out before the implementation. The most relevant answering/feedback were the following:

- "The videos of the week uninteresting and very short" proved to be very important, since the promotion and dissemination of the game included a set of videos that were considered too short. The videos have been changed to be more explicit and a little longer.
- "Some design look old" was important to the extent that the puppets "Avatars" representing the figures of players and the coach were not "state of the art" in terms of design. All website design was reviewed and created modern animations in 3D more appealing and attractive.
- "No minimum amount for investment" was important, to improve the search engine, to allowing more selection criteria's, such the minimum subscription amount, among others to allowing faster selection of mutual funds to buy.
- "Game directed to Men's" was raised because the game only have men's figures, due to this note the figures of coaches now also include female Avatars.

The use of Tropes Software may allow a quick and accurate linguistic analysis of the text of responses from users to detect the other perceptions, feelings and emotions that were expressed during the trial use of the game, as well as identify shortcomings or weaknesses vis-à-vis the goals and expectations of the intention

to use the game that could be more difficult to detect without a Software of this type. To find more improvements we decided to process the answered in Tropes.

3.4 Data processing tools

Originally written by Pierre Molette in 1994, Tropes is a self-extracting parser that uses the syntactic-semantic criteria, created in 1994 in its first version was had ability to analyze literary works such as the novel. To analyze the content using syntactic- semantic criteria, the Tropes uses the resources of a syntagmatic grammar and a standardized scenario determined prior to analysis. This grammar is already built into the Tropes, covering nouns, verbs, adjectives, determinative, connectors, modulations and relative pronouns and personal.

3.5 Tropes results and interpretation

With Tropes software v.7.2.3 we obtained the following repeated data: Verbs {to be (10) ; power (6) ; have (5); like (5) ; duty (4) ; play (3)}; Adjectives {small (5) ; short (4) ; great (4); confused (3) ; male (3) ; good (3)}; Frequencies{game (18) ; mutual funds (15) ; idea (14); innovation (14) ; short time to play (14) ; good association mutual funds to soccer team (9) ; design (9) ; enthusiasm (6) ; interactivity (6) ; customer (6) ; information (6) ; animation (3)}.

Analyzing each question references more repeated was: What you felt? {interest (8); enthusiasm (6); discovery (6); idea (5); fun (3)}; What did you most like? {idea (9); discovery (7); game (7); interactivity (5); design (4); soccer (3)}; What did you least liked?{game (3)}; What changes did you propose? {design (4); continuity (4); open not only to customers (4); playing without real investments (3)}; What is missing or removed from the game? {there was no relevant references}; Other suggestions to thegame? {extension/continuity (5)}.

3.6 Graphical tropes results and interpretation

To better analyze and interpret the answers to the questions of the discussion group, we used the Ball Graphic of Tropes, which represents each reference by a sphere whose surface is proportional to the number of words contained in the responses to the questionnaire conducted in the discussion group. This chart type allows the context analyzing of a reference, or category. The references are directed and presented to the left of the central class are the ones that come before, and those that are represented on the right are the ones that come after. Using the Ball Graphic we studied the following references and relationships consideredmost relevant: A: game (18) → enthusiasm (6); B: interest (9) →idea (14); C: enthusiasm (6) → interest (9).

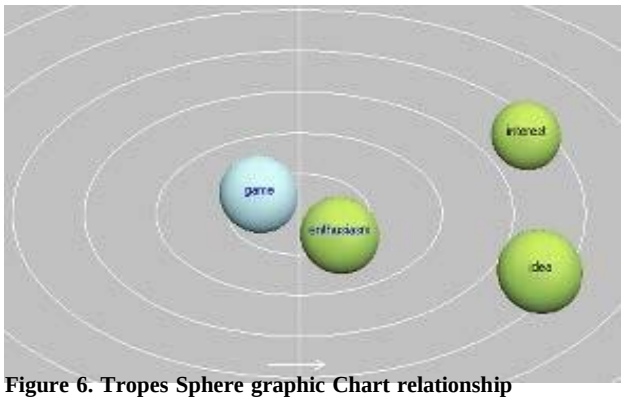

Figure 6. Tropes Sphere graphic Chart relationship

Analyzing (Figure 6) the relationship A) game → enthusiasm the reference “game” appears eighteen times and the reference “enthusiasm” nine times, meaning that are of great importance, and are associated more closed with references such as "interest" and “idea”. Analyzing the relationship B) interest → idea the reference "interest" was mentioned 9 times and the reference "idea" forth teen, meaning that are of great importance, and are associated more closed with "enthusiasm” and “game”. Analyzing the relationship C) enthusiasm → interest the reference "interest" is mentioned six times and the reference "idea" nine times, meaning that are of great importance, and are associated more with “game” and “idea”.

Continuing to analyze the answers was used the Star Chart of the Tropes that indicates the relationship between references, or between a category of words and references. The numbers that appear in the chart indicate the amount of relationships (frequency of occurrence) that exists between the references. This chart type allows the context analyzing of a reference or a category. The references are in the chart, and the references listed to the left of the central class are the ones that come before the text, which is presented to the right, are the ones that come after the text. Using the Star Graph we study the following relationships between references, considered more relevant: game (18); discovery (14); idea (14).

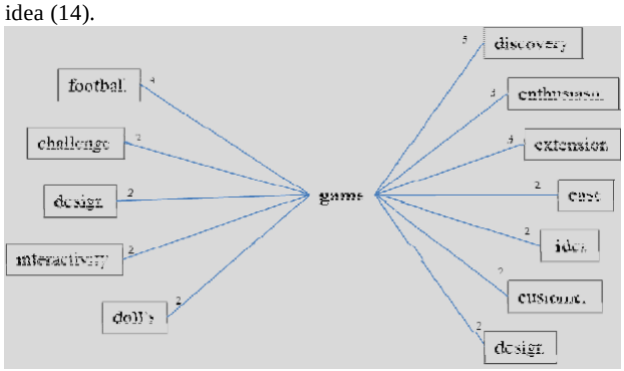

Figure 7. Tropes Star graphic Chart relationship between the reference “game”.

The Star Graph (Figure 7) shows the relationships with the reference more repeated "game", and we can see that this has much stronger relations before reference. On the left group: 4 times {football}; 2 times {challenge, design, interactivity, and doll’s}. On the right group: 5 times {Discovery}; 3 times {Enthusiasm, extension}; 2 times {ease, idea, customer, design}.

3.7 Discussion and Conclusion Test Group

Analyzing the presented study we conclude that the result of the discussion groups has allowed adapting and changes the game that on other way, or other process or using other tools should be very difficult to identify following fundamental findings:

- At the level of the computer game application development: 1-The videos for the marketing campaign has been changed to be more explicit and a little longer; 2-The 2D and 3D animations players and the coach were revised and improved from the point of view of design to make them more modern and appealing; 3-The search engine of funds was significantly amended to include more selection and search options, allowing faster selection of mutual funds to buy; 4-The feminine figures and dolls of the game were include.
- At the level of the perceptions and emotions of the participants of the discussion groups using Tropes we conclude that the game, was a good idea, interest, incentive to discovery, interactive, enthusiastic, provide information and iscustomer oriented, as resume on Figure 8.

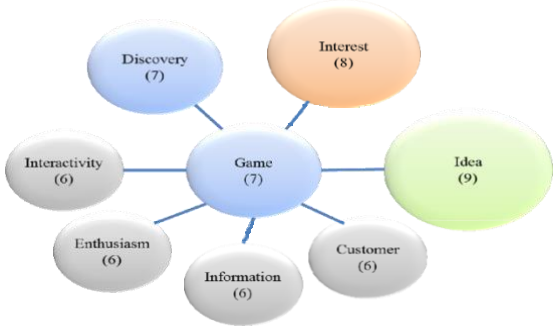

Figure 8. Relations diagram of the perceptions and emotions, based on Tropes.

Humans process better intuitive information, to see and interact with data and exploring patterns and relationships. The view improves the understanding because the human brain is able to process images and better recognize patterns. The Visual effects and interactivity of the game cause reactions in Users that must occur within certain time limits. According to [56] the principles of the best experience of game players begin with VIIC: Visual (Visual), Interactive (interactive), Immediate-(immediate) and Contextual (Contextual). As a way to validate that the FuteBank sets standards in accordance with the principles of the best experience of the players we can checked from the answers collected in the discussion group, that there is recognition of the key features: V-Visual: is equivalent to "shape/image", repeated 5 times; I–Interactive: is equivalent to "interactivity", repeated 6 times; I–Immediate: is equivalent to "temporary measures", repeated 13 times; C–Contextual: is equivalent to "information" repeated 6 times. Based on the information collected and the processing of the data, we can organize the most used references and sort the reactions of Participants, by the weight of each reference (number of times repeated) and set a diagram of relationships of the revelantes factors of the game as shown in Figure 9 and conclude that the "Idea" of the project, caused "interest" in the Participants, for the "discovery" of the "game", where the "client" shows "Enthusiasm" for "Interactivity" and "information" which is available in computer application.

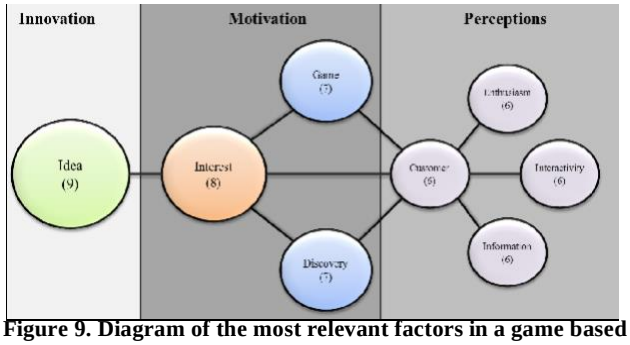

Figure 9. Diagram of the most relevant factors in a game based in Tropes.

In conclusion the data collected through discussion group and further analyzed with Tropes, proved to be an effective method for the project team, to check the perceptions and future customer acceptance of the new application Gamified. The method has identified a wide range of characteristic and webdesign changes that proved to be in the right way for what the business and costumers was expecting.

4. BUSINESS RESULTS AND GAME ADOPTION

The game results on high customer participation has we could confirm on the following data collected from a statistical database: more 16% customer website access before the game, more 16% of visitors, and more 37% of total access to mutual funds product. On the total 862 customers have use the application, and 232 have manager their mutual funds portfolio that results on increasing of 15% on total funds manager assets. It is important to mention that at the financial level, the game had positive financial impact, and even with the possibility of customers being able to buy mutual funds by traditional website as through the game, 11% of all subscriptions of funds were held in the computer application type game. The availability of 3D Design pages (tactical change, incoming and outgoing funds/players who would participate in the journey) didn't have much support by customers (5,206 access on 2D and 1,856 on 3D team webpage). The page "Top Players" that facilitated the research and selection of funds/players for the information offered about the funds with greater appreciation recorded high turnout weekly (2,245) followed by market access page (1,399) that provided the information of all funds/risk players or position of thrown in the football field.

5. DISCUSSION & LIMITATIONS

Given the social importance of the games and being an activity that involves hundreds of millions of players around the world, the lack of studies and researches on the characteristics and contents of the games influence the players is still insufficient [26]. So hopefully with the experience and results of this study can somehow to give up other studies and research in the field of serious games or Gamification in eBanking. The methodology of analysis and development of the game adopted in the application develop process made various tweaks and changes in to the game to bank costumer to be use in other sector more study should be performed, and probably other conclusion will be taken. During the Tropes analysis most words were mentioned were the game, backgrounds, idea, discovery, innovation, deadlines, interest,

curiosity, enthusiasm, investment team, interactivity, information, and client characteristics and associations that are in accordance with the reactions expected in the use of new technology associated with that associates financial investment Game, however probably will be different in other business sector and different animation.

While the theoretical basis for the various perceptions analyzed in this game is supported in this empirical study, the implementation of various types of ' social ' technologies and in different contexts of e-banking requires further study. Future research is needed to determine the extent to which the perceptions of the customers on the use of this application changed to Game can contribute to using Gamification in e-banking.

6. CONCLUSIONS

Iterative development method of the game between the designer and the users is a major concern, because it is not possible in advance to provide the features and functionality of the game [48]. The work presented in this study aims at defining tools and methods to help design innovated business software applications with feature fun characteristics like a video games. The main contributions are a five-step project manager framework for Gamification development project (5PGM) showing the different process and tasks to be accomplished.

The importance of choose the right software development methodology for a unique project that not all business requirements are define in the beginning neither the design or games characteristics and a set of a tools like Spiral Model and discussion groups and open questionnaire with Tropes to check if the development software are in according with the business objectives, proven as appropriated to use in innovating projects of Gamification on e-banking. The perceptions collected during the discussion groups were in accordance with the principles of the best experience of game players (VIIC) that proven that the application development has games characteristic that could influence the customer behaviors to use and accept the new e-banking application Gamified.

Results of this study suggest that the tools and methodology applied in the business application with game characteristics has achieving a good result and can contribute to be use in other e-banking Gamification projects. However, caution is still required with respect of applying these findings to any Gamification project because it has required more studying of new types of games applied to different type of business goals. We also believe that comparison studies with other banks or e-business technologies should be carried out in order to better understand the Gamification process effectiveness.

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