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What is Gamification? Literature Review of Previous Studies on Gamification

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Abstract

The present work is a literature review on the gamification framework in the business world. Gamification has recently gained popularity in the last decades. Controversies regarding its definition in published work, fostered the reviewing research curious interest. The defined reached consensus was in favor of considering gamification as the use of gamified design elements in non-gaming context for enhancing customer engagement. The success of a framework mandates the application of an appropriate design, however, throughout the literature reviewed, through a visited number of gamification-based solutions failed. This was interpreted on the fact that it was created based on a crowded design of mixed game elements components without a formal clear design process. A consensus was thus reached, that it is of utmost importance to identify the needs, characteristics and synthetize the methods and process of the gamification framework design to achieve the required engagement experience. this review categorized the existing reported approaches with assessment of their main features, fallacies and difficulties in a trial to support developers of gamified solutions recognize, distinguish and select the best approaches to properly understand the principles and reach solutions at different levels and scope of gamification

Keywords: Gamification, Gamification Definitions, Gamification Frameworks, Motivation Game Elements, Psychological Models

INTRODUCTION

The application of social software and online games to e-business has recently gained popularity concurrently with the emergence of the new trend "gamification", thus stimulating the user experience and promoting a higher active participation (Rodrigues et al., 2016).

Historically, the idea of recruiting game-inspired design as a tool to help improving human conditions has been used. This was manifested in the mid-2000's, where the influx of web technologies at its convergence with online-based game and digital business models allowed the implementation of this idea.

Gamification is a conceptual design where playing, experiencing fun and enhancement of all game elements can be processed and practiced in different non-gaming intended applications contexts/services (Deterding et al., 2011a). The emergence of the term "gamification" as a new terminology in the internet, was preceded by the term "funware" introduced by Gabe Zichermann, (Tahashi, 2008) as an original concept in the digital media industry (Deterding et al., 2011). Zichermann& Linder in 2010 defined funware as "*the art and science of turning your customer's everyday interactions into games that serve your business purposes"*. The principle of investing the motivational power and emotional enthusiasm associated with playing video games and their associated entertainment was the cornerstone in designing gaming in non- game contexts issues(Deterding et al., 2011; Zichermann& Cunningham, 2011). Subsequent, to the steady growth of millions of hours spent in playing video games despite age, gender and even culture (Interactive Software Federation of Europe, 2017), gamification became a pervasive widespread media in industry, since several platforms have been developed by different companies where a game element was

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implemented. (Yang et al., 2017). Further gamification modeling were integrated in educational web-sites such as Codeacademy, Q&A-platforms, Waze, Stack Overflow, and a navigation app. Moreover, gamification became an integral part in Quantified Self (QS) tradition systems, where people can readily perform tasks, while tracking and even monitoring their lives with high compatibility, a strong example is fitness app (Whitson, 2013), and (Lupton, 2016).

Although gamification can readily be used in traditional venues successfully, it is assumed that a greater impact is expected in online context. This would rely on the fact that it overcomes the lack of interaction and user motivation between the users and the website owners, thus driving their engagement. Moreover, the communication and monitoring supported by the online venues infrastructure can be upgraded for higher gamification mechanisms and hence investigating their usage in further refined purposes (Hsu & Chen, 2018b).

Since gamification is a multifactorial socio-technological emerging phenomenon, its potential beneficial social role with enjoyment would eventually promote social interaction. (Hamari&Koivisto, 2015; Deterding et al., 2011; Huotari&Hamari, 2012). It can be used to overcome the boresome nature of some otherwise unattractive tasks and activities (Francisco-Aparicio et al., 2013)

The predicted growth of gamification raised extensive discussions in the integration territory of human–computer interaction (HCI) and game studies (Huotari&Hamari, 2017; Hsu & Chen, 2018a), without overlooking the associated psychological issues (Zichermann& Cunningham, 2011). The hedonic motivation associated with fun during playing games has fostered the research in the area of potential association between the enjoyment experienced in a service based on the same game mechanics which will anecdotally invoke a positive behavioral outcome (Werbach & Hunter, 2012; McGonigal, 2011; Hamari, 2017). However, despite this rapidly growing era of gamification research, the level of awareness in the business field remains scarce (Sailer et al., 2013).

In her book entitled "Reality is Broken, McGonigal (2011) raised the value of playing games as a powerful tool in solving real problems through fulfilling human needs. Moreover, Fogg (2003), pretended that the emotional element in games is a powerful factor, since games are not solely intended for entertainment but are rather important source of engagement, persuasion and inspiration (Fogg, 2003; Almarshedi et al., 2015).

Zichermann& Linder (2010) advocated that the potential expected value of gamification in the market relies basically on the fact that successful marketing requires manipulation, motivation and persuasion (Yang et al., 2017). Researchers realized the growing technology trend in the market field as an important wide spreading practice through involving the emotional qualities of gaming in a created environment of game-like consumer experiences (Deloitte, 2013). Accordingly, a number of related studies focused on investigating the innovating adoption of the consumers' gameful experiences and its potential effect in brand engagement by increasing their loyalty and encouraging their purchasing actions (Müller-Stewens et al., 2017; Berger et al., 2017; Eppmann et al., 2018).

The reported expected growth in the gamification market size varied from USD 1.65 billion in 2015 to USD 11.10 billion in 2020 (Brouwer & Conboy, 2017) and from USD 9.1 billion in 2020 to USD 30.7 billion by 2025, recording a previewed Compound Annual Growth Rate (CAGR) of 27.4% during the forecast period (Markets And Markets, 2016).However, this adopted upward trend is lacking enough evidence supporting the inner gamification design and its internal functionality, affecting positively or negatively the related expected outcomes (Seaborn & Fels, 2015). The lack of data-driven understanding further affects the designers' decisions and the effective measuring of the gameful experience affecting its goals (Brouwer & Conboy, 2017).

BACKGROUND

Caillois in 2001 advocated that in definition game is an activity with specific characteristics including being enjoyable *fun;* occurring in specific timeand place*separate*;, with unexpected outcome *uncertain*; having no granted useful accomplishment *nonproductive*; with customized rules *ruled out*, and *fictious*. On the other hand, Schell in 2008 stated a quote defining game design as the "Act of deciding what a game should be". This was preceded by a systematic description of fundamental principles progressively applied in the process suggested by Salen and Zimmerman (2003). The process starts by understanding the design and its systems, the player's action, his choices and interaction; followed by studying both rule breaking and making with their related complexities, as well as the game presentation, experience and social interaction; and finally by establishing the connection between the preset game rules and those generated during playing and experiencing pleasure, and the eventual emerging meanings and ideologies, (Mora et al, 2017). Based on these principles, the game design process is based on collective incorporation of the identified individually isolated atomized game elements (Brathwaite & Schreiber, 2009). Accordingly, Reeves & Read in 2009 suggested that a successful game design, depends on ten relevant ingredients as three-dimensional environments; self-representations; narrative; reputations, marketplaces and economies; ranks and levels; communication; teams; time pressure and feedback.

The development of Mechanics Dynamics-Aesthetics (MDA) framework was urged to generate a formal proposal in the context of game designing (Hunicke et al., 2004). This framework constitutes a structured approach towards understanding game, in an attempt to bridge the gap between the game design and its development, in relation to game criticism and research. Subsequently, Mora et al. in 2017, considering the three main elements of fun, system and rules, further conceptualized the designer and player relationship as dictated by the MDA through its design components, where *Mechanics* based on data representation and algorithms constructs features and functions; *dynamics* relates to the run-time system-USER behavior of mechanics and *aesthetics*

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areconcerned with evoked experiences and end-user emotional responses. Traditional game design objectives are based on pure entertainment, however, the concept of game applications surpasses the limited scope of enjoyment to involve more serious game activities, simulations and gamification

GAMIFICATION DEFINITIONS

Gamification has been defined under three main conceptual headings: *The first heading is "the use of game design elements in non-game contexts".* Itis mainly based on distinguishing between two different activities "Paida or playing" referring to an expected behavior; and "ludus or gaming" characterized by rule based gaming, with predetermined goals and outcomes (Caillois, 2001; Juul, 2005; Salen& Zimmerman, 2003). It is worth mentioning that distinguishing paidia and ludus is a rather theoretical consideration than practical, since both gamified systems and games actually coincide with the playful attitudes and behaviors (Barr, 2007; Groh, 2011; Salen& Zimmerman, 2003). The main principle is thus not concerned merely on constructing a whole game, but rather focusing on the application of specific elements in the design, which main purpose is motivation in non-game context as summarized in Figure (1).

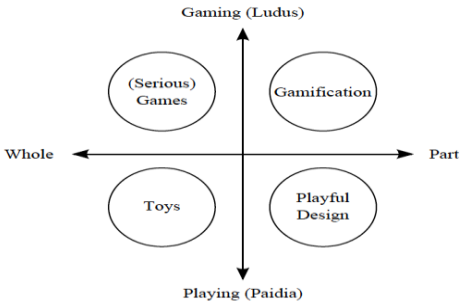


Figure (1): Classification of Gamification Based on (Deterding et al., 2011)

The second heading is"an activity that is voluntary and enjoyable" characterized by its uncertainty separated from the real world, unproductivity with no added external value and governed by predetermined rules.
The term gamefulness versus playfulness has been introduced by McGonigal in 2011, in the concept of gamification, which was overlooked by the research community despite the presence of game element isolation and adoption as an existing concept (Carroll, 1982; Carroll & Thomas, 1982; Malone, 1982), while research activities focused on playfulness of software systems (Deterding et al., 2011; Oja&Riekki, 2012).

Furthermore, The definition of gamification stated by Deterding et al. in 2011, is based on a general taxonomy generated to describe structuring game design elements, tools and methods distributed on five levels: *L1interface design patterns* where prototypical implementations secure a successful interactive design components and solutions for a recognized problem Badges, Leaderboards, Levels (Crumlish& Malone, 2009; Zichermann& Cunningham, 2011); *L2 game design patternsandmechanics* time Constraints, limited Resources, turns (Bjoerk&Holopainen, 2005; Dormans 2012); *L3 principles and heuristics*, which evaluate mainly the guidelines approaching a design or analyzing a proposed solution, *L4models* which constitutes the conceptual models of the components and experience of the game (LeBlanc, 2006), Fantasy-Challenge- Curiosity (FCC) (Malone, 1982), Game design atoms (Brathwaite & Schreiber, 2009), Core Elements of Gaming Experience (CEGE) (Calvillo-Gámez et al, 2010), *L5methods of game design* representing the game design specific processes and practices (Fullerton, 2008; Salen&Zichermann, 2003).

The third heading, defines gamification as the process that enhances the gameful experience through providing a service or system supporting the user's value creation (Huotari&Hamari, 2012). It is considered as the continuous process supporting the provided service or system with the corresponding game design elements. Several definitions in this context, further stated that gamification is using game mechanics in non-gaming applications rendering the participation enjoyable (Thom et al., 2012, Zichermann& Cunningham, 2011), while others further added that gamification increases engagement by leveraging feedback mechanisms traditionally found in games like points, leaderboards or levels (Witt et al., 2011; IActionable, 2012).

The scope of the present study, is mainly considering this third conceptual heading, since it is actually concerned with the effect of game elements in the gamification context and their influence on the user's psychological motivation, which will eventually enhance the gameful experience, hence potentially creating more customer brand engagement.

WHAT IS NOT GAMIFICATION?

Gamification and its applications should not be confused with video games, since its implementation is based on using elements and ideas from games, thus having the structure of the game rather than the game surface (Dorling & McCaffery, 2012; Xu, 2012; Kleinberg, 2012; Kohl, 2013; Muntean, 2011; Deterding et al., 2011; Liu et al., 2011). A Misused term for gamification is "serious games". This description stands for simulation games, which purpose is training, advertising and investigating (Muntean, 2011). It covers a wide scope, through using the technology of playing in the context of a call of duty as education,

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health care, emergency management, religion and politics, engineering, city planning and defense, (Ranson, 2012). Accordingly, gamification differs from serious games in that the former extracts all elements of a game, that renders it entertaining and incorporate them in a non-game context, while serious games represent all conditions of a game. The area of similarity remains limited in encompassing in their purpose entertainment. (Xu, 2012; Deterding et al., 2011; Merino de Paz, 2013; Werbach et al., 2011).

GAME ELEMENTS

The main ingredients of gamification are the Game elements. Werbach & Hunter in 2012, distinguished three main aspects of the game elements: the dynamics constituting the big picture, the mechanics representing the basic processes and the components which are the specific objectification of both the dynamics and mechanics. Kapp in 2012, further described game elements as cooperation, goals, storytelling, time, competition, conflict, reward structures, aesthetics and curve of interest.

Upshall in 2020, comprehensively enumerated the gamification elements with thorough definitions and examples description worth evaluating. *Rewards,* earned by the user as a positive feedback reflecting an accumulation of his progress for his engagement in a desired behavior, either as a real world discount code or in the digital space in the form of trophies, bonus coupons, digital badges or social gifts; *Goals/Objectives*, assigning challenging actions such as an interrupted studying, learning a language or exercising for a certain time; *Competition,* between individual users or teams in a trial to record a better achievement on a specific goal such as an opponent conflict, competing teams, timed race and leaderboard rankings beating; *Feedback/Visible Stats,* whereby the system provides information regarding the goals and action in the form of progress bar completion rate, combos, graphs representing daily activity and success record; *Levels/User Advancement,* implying a progression in hierarchical ranking not necessarily competitive but rather moving up a level or rank allowing more access with skill levels rewards; *Points/Scoring System,* through numerical or illustrative representation of the player's actions or progress, unlike rewards points are immediately rewarded with in-system value as skill points and experience points; *Cooperation/Collaboration*, constitutingcoded collaboration between two individuals or teams and working against competitors as teams group tasks and reciprocal altruism; *Avatar/Role playing,* avataris a character representing the user in the system, user interaction may affect its avatar that can change in response to a feedback, while role-playing is pretending to be another user or undertaking an unusual role; *Narrative/Story*, as fictional events such as storytelling of a sequence of events and drama fantasy; *Time Pressure*, time limitation for achieving specific tasks gives the player a sense of challenging urgency through countdown deadlines, timer and stopwatch; *Economy/Trade,* users experience trading within the system either virtually through upgrades using points as currency or for real goods, which values are set by the system or affected dynamically by the users actions as transactions, currency auctions and marketplace trade; *Social Pressure,* it makes user more accountable through the peers pressure and feedback which might deter or motivate the user; *Socializing/Social Sharing,* with active interaction with other users, through posting photos or messages and chatting, which can be open or limited as adding friends, forums and sharing; *Reminders/Scheduling,* it is a monitoring system alerting the user through notifications to perform a task in a specific task, where the user can adjust his settings as reminders, alerts notifications setting**,** schedules and deadlines setting; *User Guidance/Instruction,* it is the influence imposed on the user by the system through suggestions delivered to the user which should be beneficial or otherwise coded as uncertainty as auditory, visual, and text guidance; *Chance/Randomness,* related to unexpected events such as bets and lotteries depending on chance to win or lose; *Uncertainty/Surprise,* representing an ambiguous characteristic of the system where the user cannot predict an outcome; *Virtual World/Environment,* it is a space within the system containing geographical features as zones and landmarks. Avatar may move or may not move around these spaces, examples are 2D or 3D environment, space territory and navigable environment; *Choice,* though it could be limited to the user choice, it would affect their experience, free choice should be granted to user with no constraint e.g. choosing rewards, customization, and setting own goals; *Puzzles,* games and activities requiring reasoning skills, interference and/or deduction as number games, word games, logic puzzles and memory games; *Variation/Novelty,* implemented variation and diversity of tasks avoid repetitiveness and exposes the user to different experience; *Exploration/Discovery,* the user can optionally choose to uncover content voluntarily, which would allow exploring a virtual world and experiencing new content; *NPCs/Interacting Avatar,* built in within the system to serve a purpose or may be involved in a story or narrative as characters, which can be interacted with the user e.g. helpers antagonists and in-game characters virtual mentors; *Aversion,* a deterring threating action that inhibits the users through punitive actions to be avoided by the users as taking points away; *Rarity,* refers to the limited resources in the game limited points or currency values for uncommon items; *Renewal/Renovation;* players are allowed to replay and restart tasks, a user avatar is healed or brought back to act by the system as gaining extra lives, redoing actions, repairing boosts and restarting; *Sensation,* the user's special senses are engaged in an unconventional way while using the visual, auditory and tactile design elements to enhance and motivate user's experience e.g. smartphone vibrations and adaptable visuals.

Toda et al. in 2019, based their study on analyzing the motivation and engagement in game elements strongly correlated to gamification definitions, through the extraction of potentially affected behaviors recorded during the implementation of these game elements (Seaborn & Fels, 2015). Toda et al. in 2018, used the point element to reinforce and enhance the repetitive action and positive user's behavior in order to correctly answer a specific question. These game elements were allocated to one of the three relevant elements; affected behavior engagement,motivation and Engagement Motivation. *First Engagement*: *Acknowledgement,* represented by all the feedback kinds positively recognizing the player's actions; *Chance,* probability and randomness characteristics with possible increase of an unpredicted outcome; *Economy,* where players collaborate as teams of two

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or more for achieving a goal; *Level*, gradual advances of the player in hierarchical layers to acquire new skills; *Point*, in the form of scores or units to measure the player's performance; *Progression*, reflected as progress bars or maps allowing the user to rank themselves within a game; *Puzzles*, wherethe game challenges foster the player's thinking to perform cognitive tasks; *Rarity*, referring to the limited resources; *Renovation*, the player is allowed to restart or repeat the same action; *Sensation*, the use of the audio and visual senses to create and enhance new experience; *Stats*, as visible or pictorial information, the user uses and relate them to their outcomes; *Storytelling*, representing the script of the game through sensorial animated scenes or audio resources. *Second Motivation*:*Cooperation*,between two or more players towards a same goal; *Narrative*, describing the order of the events happening within the game influenced by the user's actions; *Third Motivation:Competition*, players competing versus each other to achieve a certain goal; *Imposed Choice*, decisions or judgements the user is forced to make towards advancing the game; *Novelty*, continuous flow of updated information; *Objectives*, the frame guiding the user's actions reaching quantifiable milestones or missions; *Reputation*, titles and status the player collects and accumulates during playing; *Social Pressure*, as peer pressure exerted by another player; *Time Pressure*, as countdown or timer within the game causing pressure through the time factor.

LITERATURE REWVIEW

Gamification has been classified as one of the most innovative processes that induces motivation, based on the fact that during playing games, a similar players' experience of a variable range of affects is perceived as holistic motivation relevant to the related context including frustration, happiness, enjoyment and disappointment (Huotari&Hamari, 2017; Landers et al., 2018; Rigby, 2015; McGonigal, 2011; Hamari&Keronen, 2017; Hassan, 2018; Morschheuser et al., 2017; Deterding et al., 2011; Liu, et al., 2013; Hassan et al., 2019). Human motivation originates from two main sources an external and internal stem. Self-determination is a human motivation theory stressing on the reality that human actions can be intrinsically or extrinsically motivated (Deci & Ryan,1985; Hamari&Koivisto, 2015). Beside gamification other novel information technology development though having different methodology, as behavioral change support systems and persuasive technology have impact on the behavioral and psychological states (Fogg, 2003; Hamari et al., 2014; Oinas-Kukkonen&Harjumaa, 2009; Oinas-Kukkonen, 2013). Further, comparable applications to gamification are the loyalty programs, which main concept is incentive collection and redeeming points through a continuous use of the service, while emphasizing on their custom loyalty and the economic rewards and incentives as their main objective goal (Sharp & Sharp, 1997). These loyalty systems evoke mainly the extrinsic motivations (Deci et al., 1999). It is worth mentioning, that although gamification is considered a kind of decision support system, yet the concept of the decision support system focuses on supporting decision making processes based on the improvement of decision making aids, through securing the availability of the information and data analysis (Sprague, 1980). Differently, gamification influences decision making through their affective rather than their cognitive process. Moreover, behavioral biases are frequently influenced in gamification by the concept of soft paternalism with its subtle impact on behavioral economics optimistically amplifying the beneficial biases and avoiding the harmful decisions (Thaler & Sunstein, 2003). Gamification through its gameful actions in non-gaming context invokes the user's intrinsic motivation (Deterding et al, 2011; Hamari et al., 2015; Huotari&Hamari, 2012; Hamari&Koivisto 2015).

GAMIFICATION IN THEORY

Distinguishing between the three main elements of gamification is important:*Gamefulness*, implies living the intended experience, *gameful interaction*, relates to the tools, objects and contexts while, *gameful design* is the actual practice of creation of the gameful experience (Deterding et al., 2011). Zichermann and Linder in 2010, defined gamification as enhancing tool branding initiatives, through the application of game elements and their mechanics. They assessed the motivation from the psychological aspect as intrinsic and extrinsic motivations. Zichermann and Linder in 2010, advocated they perceived that intrinsic motivation are not necessary or even possible since, they are variable and unreliable, they rather claim adopting external motivators as intrinsic motivators through acting as external behavior controllers. Subsequently, in 2011 they suggested that designers should equally consider both intrinsic and extrinsic motivators reciprocally affecting each other, where common intrinsic motivation might produce greater enjoyment and be more effective than individually variable motivator (Deci et al., 1999; Ryan, 2012). Seaborn & Fels in 2015, stated that the design objective of gamified systems is to benefit from the psychological effect of the games on the users. They are considering gamification as an effective alternative to the traditional motivation and rewarding elements i.e. intrinsic motivation.

SOCIAL ASPECTS

Human beings being social creatures are longing for social acceptance and value the need to relatedness. They will find answers to these needs when, the social features implemented in the system allow them to benefit from the recognition and support eventually granted through the social interaction (Deci & Ryan, 2000; Hamari&Koivisto, 2013; Hamari&Koivisto, 2015). In gamification, social influence considering the user's perception of his behavior in the eyes of others affects his attitudes (Ajzen, 1991; Venkatesh & Davis, 2000). Implemented social interaction might foster the sense of recognition representing the social

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feedback on the player's behavior during his interaction (Hernandez et al., 2011; Hsu & Lin, 2008; Cheung et al., 2011; Lin, 2008).

PSYCHOLOGY

Successful games have a strong emotional component. One important emotional characteristic is fun which becomes engraved in the user's mind. According to Schell in 2008, the designer's goal is the gameful experience, provided to the user during his practice by the game mechanics. This acquired experience is emotionally and individually linked to his mind. Intrinsic motivating factors, are self-created and are associated with the user's perception of his experience and override extrinsic factors and rewards characteristic of their limited frequency and size. In the field of organizational psychology, conceptualizations of happiness are linked to engagement in the environmental workplace. A number of theories have been introduced in this domain as the job demand-resource model (Bakker &Demerouti, 2007, Bakker &Demerouti, 2008; Demerouti et al., 2001) self-determination theory (Ryan & Deci, 2000); positive organizational behavior (Luthans, 2002) and psychological capital (Luthans et al., 2007).

For example in the job demand-resource model, engagement relies on intrinsic factors and resources, whether personal as self-efficacy, or job related as social support and environmental climate. A correlation with these job influential factors and the working hypothesis of gamification through application of the particular game mechanics, fostered higher levels of motivation and engagement (Herzig et al., 2014) as demonstrated in several qualitative and quantitative research analyses (Hamari et al., 2014; Herzig et al., 2014; Herzig et al., 2012; Thom et al., 2012). It is noteworthy to mention that the peculiarity of gamification is that the proper amount of information is delivered in the right time (Schönen, 2014), it is a psychological process rather than a technical approach, which serves as a real feedback enabler to the user. Accordingly, the user progresses to the next level in the gamified activity dynamics at the correct moment, thus enhancing a feeling of achievement through the immediate feedback mechanism, whether points and rewards or intrinsic recognition.

PSYCHOLOGY OF GAMIFICATION

Gamification is considered effective when it motivates the players engagement despite the incorporated technology(Hennessy et al., 2012), which requires a broad understanding of the human psychology (Merino de Paz, 2013). Gamification should consider all human emotionally driving elements such as discoveries, ambition, recognition, developing skills, status, principles, gain and choice, which would foster their motivation and further establish significant relationships (Hennessy et al., 2012). Zichermann in 2011, reported that the psychology to technology ratio is "75% to 25% (Bloomberg Business Week, 1998). Huotari&Hamari in 2017, proposed a description of a gameful experience in relation to specific psychological factors under three constructs. *First*, consisting the psychological status as presented in the self-determination theory, where the experiential states are mastery, achievement, relatedness and competence (Deci & Ryan, 2000; Seaborn & Fels, 2015); *Second*, recognizing the affective state secondary to emotion arousal as hedonic pleasure and suspense (Deterding et al., 2011); *Third*, consciousness altering state based on the immersion and flow psychological factors are defined as conscious state evoked by the deep engagement and motivation in an activity (Brockmyer et al., 2009;Nacke& Lindley 2008; Brouwer & Conboy, 2017).

PSYCHOLOGICAL GAMIFICATION MODELS

1. *Self-Determination Theory (SDT)*: this humanistic motivational theory is based on the inherit psychological needs required for the well-being and personal development and the environment impact with their eventual effect on the individual's motivation ((Deci & Ryan, 2008; Hill, 2011), helping in predicting the individual's goal-oriented behavior" (Gears, 2012). SDT summarizes three main needs helping the comprehension of what (content) and why (process) that when fulfilled result in positive motivation towards great personal achievement (Hill, 2011; Gears, 2012): *Competence*, it refers to feeling a sense of ability, experienced while playing through increasing user's skills and proficiency during their progress; *Relatedness*,achieved when the player succeeds in socializing with peers fulfilling the need to exercise social interaction and peer connectivity; *Autonomy*, the inherit independence of choice should be reflected in allowing user to freely choose his preference through different provided paths, which will eventually lead him towards his personal achievements and outcomes. SDT classifies motivation into intrinsic and extrinsic motivation (Deci & Ryan, 2008; Gears, 2012; Merino de Paz, 2013).
2. *Four-Drive Model*, developed by Lawrence and Nohria in 2002, and based on the evolution of biology, which states human behavior motivation is categorized into four drives: *Acquire*, gaining materialistic goods or non-materialistic things as influence and power; *Bond*, relying on creating communication and relationships between individual; *Defend*, physical or emotional protection of individual property from any threats; *Learn*, satisfying the innate biological requirement of curiosity through acquiring new skills and knowledge (Kaufman, 2011). This model while presenting a categorization of behavior motivators, furthers provides an interpretation of the people actions, and is commonly used in organizations and companies for both customer and employee motivation (Lantern Group, 2013).
3. *Fogg's Behavior Model*, is stating that the individual behavior includes *the motivation* which represents the degree of engagement; *the ability*, referring to acquired tools or skills for performing the behavior; a *successful trigger to perform the behavior*, which is a reflection of the degree to which an individual is provoked towards a behavior (Xu, 2012). All three

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components should occur concurrently in order to achieve the behavior, inquiring that the task must not be boring *motivating* not too complicated *doable* (Bloomberg Business Week, 1998; Fogg, 2009).

4. *Csikzentmihalyi's Flow Theory* advocated by Csikszentmihaly, implies that for a task to be considered fully engaging, it has to attain the state of *"flow*" a status of optimal intrinsic motivation, absorption and intense immersion and full concentration" meaning 100% engagement (Xu, 2012; Wu, 2011; Findlay, 2011). Flow further favors an *energized focus* where the users experience a feeling of complete motivation, capability and rewarded (Findlay, 2011); and a *"loss of self-awareness"* about the sense of time, physical symptoms and ego (Wu, 2011; Witt et al., 2011; Csikszentmihalyi, 1990). In order to reach the flow state three elements are to be achieved. A flow channel is *an equilibrium*, for the accomplishment and maintenance between the capability and complexity (Findlay, 2011; Xu, 2012;Bloomberg Business Week, 1998; Witt et al., 2011). *Secondinstant feedback availability* as a response a continuous change in actions adapting to environmental demands); *Third, clear defined goals* guiding the user towards the behavioral purpose (Csikszentmihalyi et al., 2005).
5. *Relatedness, Autonomy, Mastery and Purpose (RAMP) Framework* Marczewski in 2013, established these four motivational drivers; which are in turn connected to the six player types which are based on the Hexad Framework (Tondello et al., 2016; Wiklund&Wakerius, 2016). *Relatedness,* fundamentally relying on the inherit human drive for social connection (Deci & Ryan 1985); this was further recruited in a gaming setting by Marczewski, in 2013, as a social state of enjoyable interactions within the gamifying communities, with stimulated loyalty and full engagement; *Autonomy*, is the user's freedom which if impeded will face the loss of the user's motivation (Marczewski, 2013, Deci & Ryan 1985); *Mastery*, as described by Marczewski in 2013, is stated as competence by Deci & Ryan in 1985 and is related to the concept of flow previously described, assuming that user might be demotivated if the game challenges are not competitive with the user's skills (Wiklund&Wakerius, 2016); *Purpose,* individuals find their enjoyment in preferring others and putting them in front of themselves.

MOTIVATION

Gamification influence is emphasized on users' motivation rather than on their behaviors (Deterding et al., 2011; Huotari&Hamari, 2012; Hamari&Koivisto, 2013). Deep understanding of human motivation is strongly required to foster the goal achievement of gamification (Rigby, 2015). Although several theories considered as the backbone of motivation studies related to gamification including the flow theory (Csikszentmihalyi, 2000) and the Self-Determination Theory (SDT) (Ryan & Deci, 2000) are important, yet the proof of their effectiveness requires selective implementation techniques (Li, 2018). In the current researches, many studies deal with gamification as a single concept based on the motivational effect generically, while in real time practice, diverse designs and environments exist (Sailer et al., 2017).

Properly tailored motivational affordances towards performance of specific tasks, need a stimulating design enhancing customer behavior, invoking psychological states and fostering them to perform intended engagement behaviors (Deterding, 2012; Hamari et al., 2014).

Stickiness of the customers to a certain product or a specific website, has been reduced by Keen competition in online market, through improving desirable behaviors by focusing on increasing excellent user experience, experienced value and benefits and eventually brand engagement which are all key elements of the business world. In the market world business brands increased the users assets using gamification to enhance effective communication. This latter practice has been evaluated in different prospective such as reputable service providers including eBay, Facebook, Twitter and other active business application as McDonald's, Samsung, Recycle bank, Pepsi and Nike, where business brands made a dramatic shift towards gamification (Insley& Nunan, 2014). Several internet platforms, namely the social websites reported a commercial success, based on a created special relationship with the users, particularly fostering "viral behavior", with a resulting boosting of the popularity of these sites (Domínguez et al., 2013). This evidenced success strongly provides gamification effectiveness in the market world, leading to actual consumer perception of a service or product's benefits, stimulating their attitude towards a brand and ending by strengthening the brand's engagement (Hsu & Chen, 2018b).

MOTIVATION IN GAMIFICATION

Zichermann in 2011, stressed on the importance of engagement and motivation in gamification. Combining motivational and psychological theories will eventually push users' intrinsic motivation towards positive participation and behavioral change (Merino de Paz, 2013).

A. Intrinsic Motivation:

It is defined as the individual's internal self-purposeful derived behavior without any external force affecting his actions. Intrinsic motivation is a behavioral confirmation of self-satisfaction and enjoyment with a willingness and a drive to continue even without a materialistic reward (Lindenberg, 2001). Consequently, it is considered a beneficial factor for the intended outcome, which might promote the environmental improvement, while neglecting external sources. In gamification, this positive correlation between improvement in user's performance and intrinsic motivation supports its efficacy in the business world (Huotari&Hamari, 2012; Ryan et al., 2006). Social and psychological needs are important in maintaining the intrinsic motivation: *autonomy; competence and relatedness.*

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B. Extrinsic Motivation

It refers to external factors motivating the user towards performing a task and being financially compensated (Hamari&Koivisto, 2015; Gnauk et al., 2012; Merino de Paz, 2013). Utilitarian systems depend on extrinsic motivation of the user towards an external goal efficiently achieved (van der Heijden, 2004; Hamari&Koivisto, 2015). It is worth mentioning that intrinsic and extrinsic motivators co-exist constituting the basic structure of the political, religious, economic and social systems". An organization directs its extrinsic rewards to positively motivate her personnel, which were anecdotally found to negatively affect their intrinsic motivation and deteriorate their sense of achievement. On the other hand, honor and recognition compensations are associated with improved intrinsic motivational behavior (Zichermann, 2011; Dorling & McCaffery, 2012).

GAMIFICATION FRAMEWORKS

Gamification is gaining popularity and invaded different fields: business; generic; educational and health.

A. Business Gamification Frameworks

Gamification is the mix of science and art, having an ultimate goal of engendering positive emotions as trust, fun and delight. For serving the business objectives, it involves emotional concept as fun, user experiences and play on one hand and measurable engineering sustainable systems on the other hand. A "Six Steps Gamification Design Framework", was proposed by Werbach & Hunter, in 2012, for developing gamified systems in six steps holding D as the first letter like "*Design"* define the objectives such as improving employees' productivity, build loyalty to brand and customer retention ; *Delineate,* target behaviors focusing on the players choices and their evaluation; *Describe players,* real people that can be segmented in to subgroups for better benefit from the system; *Devise activity cycles,* through the way from start to end operations are achieved by a series of branching and loops; *Don't forget the fun,* user perceives the fun element which attracts the user despite the complexities of the game elements; *Deploythe appropriate tools,* considered as the implementation phase selecting the mechanics, components and coding.

A "Player Centered Design Methodology" focusing on placing the player at the center of the development process and design was proposed by Kumar in 2013, and followed eight steps. *Understand the Player,* himself and his context; *Understand the Mission,* defining the target and business outcome, identifying the business scenario, and setting the gamification project mission; *Understand Human Motivation,* observing rational motivating factor thus inspiring the engaging design in the virtual world; *Apply Game Mechanics,* where player interact with points, badges and leaderboards; *Game Rules,* pulling the game mechanics into a flow motivating the player; *Engagement Loop positive reinforcement,* combined with game mechanics and connected to feedback loops enhancing player's engagement; *Manage, Monitor and Measure* the progress with regular adjustments on need; *Other Considerations in the Enterprise Context,* such as ethical and legal considerations.Wiki corporate collaboration underwent a study which resulted in a gamification design model (Gears, 2011).

The understanding of the psychological aspects that are associated with participation behavior has been guided by two principal motivation theories: the *theory of 16 basic* desires supported the explanation of innate human desires; *the self-determination theory* explained the internally regulated covered with a spectrum of active extrinsic motivation (Reiss, 2000; Deci & Ryan, 1985; Gears & Braun, 2013). From this perspective, a *"Role-Motivation-Interaction Framework* (RMI)" aimed at facilitating the architecting process of gameful interactions. Gamification designers, customized their game design patterns based on acknowledging the relation that the psychological needs for competence, relatedness and autonomy are shared by both the employee and player. (Reiss, 2000), relatedness (Deci & Ryan, 1985; Rigby & Ryan, 2011; Bjork, 2004). Furthermore, intermingling the extrinsic motivators with the intrinsic desires opportunized design for meaningful choice, which intention is the stimulation of the employee's sense of inclusion and his perception of the gained benefit, without any negative effects (Gears & Braun, 2013). Based on the interviews results conducted by Julius &Salo in 2013, they introduced "A Framework for Gamification Suited for Marketing" based on the six steps "D6 Framework for gamification" reported by Werbach & Hunter in 2012. *First, User motivation,* towards a service or a product; *Second, Player Profiles,* users should be easily profiled assigned to certain types; *Third, Activity Loops,* constituting the main driving force determining the business value of the service or product, through enhancing happy thinking experience while playing; *Fourth fun; Fifth game elements; Sixth design thinking.*

On the other hand, Popa in 2013, proposed *"Gamification of ERP"* framework, based on investigating the emotional experience of the software that would improve the outcome and enhance user satisfaction. The chronological emergence of *Gamification* Persona started in the early era of design process "User Research and Analysis phase". Subsequently, Popa, in 2006, revised Pruitt and Adlin's work in 2006, constructed persona scheme and further analyzed the Canossa's Play-Persona structure with main purpose to fulfill the engagement and fun needs of the player's profile. Gamification persona Canossa's Play-Persona included the detailed information relevant to the player's personality types and their emotional states whether enjoyment or rejection, during leisure time or work.

During designing the gamification solutions, it is important to recruit the atomic game elements and adapt them to the professional environment for designing, evaluating and solving engagement problems. On an organizational level, by Jacobs in 2013, presented a goal model design "*Gamification Framework Model*" aiming at implementing the enterprise gamification. Consequently, *"Gamification Model Canvas"* was introduced by Jiménez in 2013, as a systematic flexible tool dealing with evaluating the game design solutions that will eventually develop the behavioral pattern in the non-game environments. *"Gamification Model Canvas"* include nine sections which constitute the key elements in the design of gamification projects:

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Revenues, describing the social or economic return; *Players*, who are the people targeted for behavior development and what is their interest; *Behaviors*, determine the needed development of the actions and behaviors of the players required to secure returns from the project; *Aesthetics*, it is concerned with the intended emotional response enhanced in the users during their interaction with the game; *Dynamics*, it is related to motivation and is describing the run-time behavioral mechanics acting on the player; *Components*, representing the game elements and its characteristics creating its mechanics or to give the players feedback; *Mechanics*, concerned with the game dynamics and describing their components and the rules of the game; *Platforms*, where the game mechanics are implemented; *Costs*, related to the direct cost and investment for developing the project (Jiménez, 2013).

The *"Gamification Development Process"* has been developed by Herzig in 2014. It is divided into ten processes: *FirstGeneral Process*, based on the Rational Unified Process (RUP) introduced by Kruchten in 2004, which was further translated into phases of a specific workflow, business modeling, requirements, design, provisioning, implementation, testing and deployment phases; *Second Gamification Process*, explaining the actions related to the aforementioned workflow and describe relevant roles and responsibilities: the end user, gamification experts, Business experts and IT experts; *ThirdBusiness Modeling*, getting all types of participants on a common understanding of the goals and vision of the project, as well as the merits and drawbacks of the business processes; *Fourth Requirements*, based on the modeling phase the motivation, participation and engagement of the identified target user's group have to be analyzed; *Fifth Design*, related to an iterative process from a classical application design or game to the specification of or gamification design; *Sixth Provisioning*, analysis the gamification solutions of the specification of the gamification design in relation to the market are analyzed by the IT experts; *Seventh Implementation*, the final gamification information systems are finalized through integrating, assembling and implementation of all the game components; *Eighth Test*, filtering all artifacts by IT experts as identified from previous workflows and remove from the actual prototype; *Ninth Deployment*, IT experts achieve their final deployment of the landscapes and open the access to all end users; *Tenth Monitoring of the gamification, after* deployment should be maintained through undertaking additional steps (Salen& Zimmerman, 2003).

Sustainable Gamification Design (SGD)" was advocated by Raftopoulos, in 2014, through applying the 'meta game-thinking' approach, where the designer acts as the player's management advocate aiming at benefiting from all game elements within an enterprise context. In this respect, a previous, design technology accounting for human values have been incorporated as values-conscious design by Friedman et al. in 2008. This exceptionally invites stakeholders to participate in all stages of the design process and develop project values relevant to the project's frame in through phases: *Phase A: Discover Purpose*, of the users and contexts of the system; *Phase B: Reframe Purpose*, analyze the information retrieved from discovery phase and reach potential solutions and opportunities; c) *Phase C: Envision Purpose* identify and explore a selected solution; *Phase D: Create Purpose* design and implement the gamified solution.

Subsequently, "The Player Experience Design Process" was proposed by Burke in 2014, which main objective is understanding the player's motivation in the gamified experience. The design process follows a logical order focusing on the goals achievement and controlling the risk and time of the relevant solution: *Business outcomes and Success Metrics*, should be clearly stated, including successful metrics and achievable; *Target Audience; Player Goals*, analyzing any potential of goals overlap; *Engagement Model*, describing the user's interaction with the solution; *Play Space and Journey* the virtual space that exists within the network, while the player journey represents the planned path towards the solution; *Game Economy* composed of the rewards and incentives granted to the users for achieving a task; *Play and Test and Iterate* continuous sustainable addition new functions, stimulating the audience.

"Gamification of Online Surveys" framework was first introduced by Harms in 2014, a new process for the gamifying online surveys. The layers of the form design and the MDA were unified and linked in order to form the steps for the intended structured design process: *First Aesthetics and the Relationship Layer* where target population, tasks and context are defined by the designers; *Second Dynamic And Conversation Layer* designers can use the MDA framework or any dynamics from literature and apply them to the intended aesthetics; *Third Mechanics and the Conversation & Appearance Layers* designers can employ gameful playful elements and dynamics from any related literature to produce the desired aesthetics and dynamics; *Fourth Prototyping, Evaluation and Iteration* defining the journey of progression from vagueness during the first and second step of brainstorming towards a more specific evaluation and prototyping (Mayhew, 1999).

Schönen in 2014, considering the relationship of Gamification and its role in change management, proposed a "Gamification Decision Model". Four stages were *first*, the use of a framework that spans the business transformation lifecycle, from initial analysis to the post implementation phase, followed by the Gamification Process. It is of utmost importance to define the gamification process on the level of the project management, then map change management process using gamification to assume the change elements and tools and improve the prospective success. *Second*, examination of the process at the beginning of the Decision Model for Gamification through examining the safety and flawless technicalities in the process. *Third*, the focus is then on the user and his needs that should be reflected on the approach of the process avoiding the friction losses. *Fourth*, classify the nature of the task needs whether repetitive, creative or cognitive, since each task requires a special approach that entails different implementation process and maintenance activities, taking in account the decision the cost-benefit ratio for the Game/No-Game decision.

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Technology Acceptance Model (TAM), is a theoretical information system, which principle is based on user's acceptance of the technology as a tool. Flow serving as a determinant of the perceived usefulness (PU) and further the perceived ease of use (PEOU), and their impact on the user is measured and evaluated on the individual's level according to Delone& McLean. D&M IS Success Model is a multidimensional comprehensive IS success model, which goal is to synthetize previous relevant studies into a coherent body compiling knowledge and providing guidance to researchers (Shannon, 2001; Delone, 2003). Furthermore, TAM was revisited, where "attitude" is removed in its last version as included in "Gamification Theoretical Framework in a Workplace IS Context" presented by Li in 2014, while "enjoyment" as an antecedent of PEOU exists only in TAM 3. In summary, the model features involve: *First Theory of Reasoned Action (TRA)* replaces TAM's place, thus combining both PU & PEOU into Attitude, the modified model is also including subjective norm; *Second*, since the flow theory is removed, Design Quality and Game Motivation serves as the antecedents of Attitude; *Third* the net final benefits collectively represent the improvement of gamification (Venkatesh & Davis, 2000; Venkatesh &Hillol, 2008; Li, 2014).

A "Framework for Gamification in Enterprise" was proposed by Neeli in 2015, to manage various factors including the goals, the users, the organizational structure and culture, the compensation mechanisms and the motivational and challenging factors. The generic characteristic of this framework, relies on the fact that it does not relate to a specific gamified environment or game, since the analysis concerned with the motivations and challenges are contextual rather than specific, thus both the designers and the implementers have to apply this framework, and deduce the gamified environment based on their analysis. This analysis is performed through six steps: Set the Goals and Objectives, Understand the Challenges in Attaining the Set Objectives, Analyze the Factors for Motivation and Management of Challenges, Designing Gamified System, Measure and Improve, and Engagement Boosters (Neeli, 2015).

Brito in 2015, implemented a conceptual framework, supporting the design of gamification in the enriched crowdsourcing applications, the "Gathering, Analysis, Modeling and Execution (G.A.M.E.) Framework". G.A.M.E. is the acronym representing the main phases: *First Gathering* the main goal is understanding the application's theory through gathering all relevant information, and perform data analysis based on the domain of the application, then using the game design techniques to model the gameplay; *Second Analysis*: the proper target should be identified either to fix a weakness or enhance a strength of the gamifying application; *Third Modeling Game Design* combining the users' stories with the gameplay interaction result in supporting the design of a collaborative system; *Fourth Execution, Implementation and Testing* of the gameplay design (Brito, 2015).

Robson et al. in 2015, suggested the "Mechanics, Dynamics and Emotions (MDE) Framework", presenting the roles of game players, spectators, observers and designers defined three main gamification principles; emotions, mechanics, and dynamics. *Emotions* as a term is more linked to user's engagement, in describing the evoked desirable response in users, while playing, than aesthetics which is computer-game specific. Two fundamental dimensions are adapted in describing the involved parties in a gameful experience, which are participation and connection to the gamified environment. Participation points at the active or passive involvement of the player in the gameful experience, while player connection refers to the type of environmental relationship (immersion vs. absorption) uniting the user with the experience; *Mechanics* they specify the settings, goals, context, rules, boundaries and interactions, used in gamifying a non-game context. They precede the start of the experience and remain constant; *Dynamics* gamification dynamics describe the in-game actions, behavior and interactions of the user during experiencing the play.

"Software Process Improvement (SPI) Gamification Framework was considered by Herranz et al. in 2016, it constituted a methodological framework which takes into account features regarding the organization personnel and processes. It claims that this framework through gamification, aims at increasing the commitment and motivation in the management of the SPI organizational change fostering improvements. This framework when first implemented underwent evolutionary changes, aiming at the improvement of the flexibility and efficiency in practice based of on the Lean Startup methodology (Build-Measure-Lean) cycle introduced by Ries in 2011 described in five activities. *Phase 1 Feasibility,* through having top managers commitment and the necessary resources as well as a competent SPI infrastructure; *Phase 2Business and SPI Goals,* the objectives and their associated KPIs established are defined according to SMART criteria, which represent the highest motivators, and are aligned with SPI objectives and identify their metrics; *Phase 3 Player definition and motivations,* analyzing the roles of the SPI and the software professionals, while identifying the players' type; *Phase 4 Activities and behaviors to enhance,* focusing on defining the SPI activities and the user's behaviors; *Phase 5 Gamification proposal,* presenting a definition for each SPI activity: game elements, mechanics, dynamics, metrics, and feedback; *Phase 6 Implementation; Phase 7 Measurement* of theSPI business metrics KPIs and the defined elements of the game; *Phase 8 Learning,* sustaining learning, analysis of the situation, evaluation of the results, and the identified flaws of the process for future improvement of the SPI; *Phase 9 Refine loop,* necessary iteration adjustments are achieved (Doran, 1981; Herranz et al., 2013; Moskowitz & Grant, 2009; Baddoo& Hall, 2002; Hägglund, 2012; Pries-Heje& Johansen, 2010; Herranz et al., 2016).

Wiklund&Wakerius in 2016 suggested a theoretical framework describing the creation of gamification experience "The Gamification Process: A Framework on Gamification" in the following steps: *Understand gamification and define business objectives* to foster the engagement and drive the behavior; *Identify the target group users and what motivates them; Match Player*

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with motivation through identification of the players types and allocate them to their proper triggers and motivation drivers from the framework "RAMP"; *Build the gamified experience* so as to suit the users and their motivational drives; *Consider engagement loops and progression* that would eventually lift the player to the state of flow; *Before releasing* focusing on players' perception of fun before release of the gamified experience; *Control and Adjust* of the gamified experience being controlled after launching.

"Gamification Framework for Designing Online Training and Collaborative Working System" was proposed by Isdiyanto, YusepRosmansyah in 2016, consists of six main stages: objective definition, scenario delineation, user needs, specification of the system, implementation and evaluation. This framework is available for researchers and as a gamification process in an organization to engage and motivate its employees with the gamified information system as groupware systems and e-learning. The measurement criteria are based on the design element with which the employees interact while performing the activity. These elements include the preexisting motivational factors as management feedback, benefits rewards, and compensation and the cultural context of the organization. This conforms with the established gamification design experiences which depend on contextual analysis of the preexisting behaviors, cultures and processes (Morschheuser et al., 2017).

Carreño in 2018, introduced a "Framework for Agile Gamification of Personalized Learning Experiences" structured in four phases: *Declaration* focusing on gathering information, where four key concepts are declared sequentially: Problem that should be solved by the gamification techniques, demotivation, reaching expected outcomes and test the final motivational and behavioral actions involving the learners and phases; *Creation* ; *Execution; and Learning*. *Creation Phase* for each of the steps of the acceptance tests, all design components are covered in "metaphor" a narrative layer, where description of game design and all its elements as well as players types description. The engagement cycle occurs in the *Execution Phase* consisting of intermingled experiences involving the learners; The *learning phase* focuses on the measurement and analysis of activities according to predefined metrics and their KPIs.

In summary, several concepts related to business focus approaches have progressed and evolved and are worth considering as follows: *a)* Most current *non-theoretical frameworks* adopt iterative processes as the main design principle, however with two exceptions (Gears & Braun, 2013; Isdiyanto, YusepRosmansyah, 2016); *b) User-centered design principles* in various frameworks as a predominant feature (Raftopoulos, 2014; Herranz et al., 2016; Wiklund&Wakerius, 2016; Isdiyanto, YusepRosmansyah, 2016); *c) Technology* it is an integral part in frameworks (Brito et al., 2015; Harms et al., 2014; Herzig, 2014; Kumar, 2013; Li, 2014; Raftopoulos, 2014; Ruhi, 2015; Herranz et al., 2016; Wiklund&Wakerius, 2016; Isdiyanto, YusepRosmansyah, 2016); *d) MDA game design framework* focusing on four frameworks, while 6D framework consists the basis for most frameworks (Hunicke et al., 2004; Harms et al., 2014; Neeli, 2015; Robson et al., 2015; Ruhi, 2015), while the 6D framework is the basis for many of them (Brito et al., 2015; Julius &Salo, 2013; Herranz et al., 2016; Wiklund, &Wakerius, 2016; Isdiyanto, YusepRosmansyah, 2016); e) Two frameworks only depict relevance to motivational and psychological theories (Gears & Braun, 2013; Brouwer & Conboy, 2017).

B. Generic Gamification Frameworks

Gamification frameworks have been developed for either specific or general purposes environments. DiTommaso, in 2011, developed a framework based on the SDT "A Framework for Success", following several steps: identifying and discovering the players' profiles; setting the goals and objectives; depicting the skills; describing the intended outcomes, defining the play-testing and finally polishing the process (Mora et al., 2017). This framework involved the three intrinsic motivational needs: *First Competence*, focusing on feedback to recognize the meaningful information and identify progress, to which rewards should be relevant to enhance long term users' engagement; *Second Autonomy*, loyalty is fostered to the user delivering a sense of ownership, regarding the control, choice, personal preferences which will undoubtedly lead to deep engagement; *Third Relatedness*, this relates to the intrinsic user's motivation towards meaningful connections with community of interest or even avatars, which will help users recognize their preferences and increase their engagement and determination of their goals.

In 2012, Nicholson introduced a framework "A User-Centered Theoretical Framework for Meaningful Gamification" comprising: *1) Organismic Integration Theory (OIT)* considered as a sub-theory of SDT related to the field of education, its principle is the integration of the activity within the user's own sense of self, where internalizing motivation is achieved as a results from external control through rewards; *2) Situational Relevance and Situated Motivation* its purpose is determining the efficacy of algorithms and search tools. Researches compared search tools, while looking at the same query posed at the different systems, and evaluated the response to that query. Schamber in 1994, concluded that determining the relevance of a query is solely identified by the user's answer; *3) Universal Design for Learning (UDL)* the rationale is that the design of the course and its content should support variable ways students' learning through three strategies:*First*, introducing new methodologies to deliver the content "What"; *Second* providing variable activities to help the learner explore and the master the content "How"; *Third* increase the learner's engagement and motivation through proposing new paths "Why"; *4) Player-Generated Content* called "Gaming 2.0" it has the advantage of allowing players to generate contents that could be used by other users, which will eventually extend the life of this game and allow designers to allocate users creativity, and accordingly be directed towards the need of the gamification system; *5) User-Centered Design* the concept of considering the user as the central focus of the gamification process constitutes the key in meaningful gamification, and will result in positive enhancement and user's mindset change (Deci & Ryan, 2004; Schamber, 1994; Rose & Meyer, 2002; Djaouti et al., 2010; Norman, 1988).

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"Value-based Gamification Design Framework" advocated by Sakamoto in 2012, is unique in that it presents a design that promotes the users' self-efficacy and reinforce their belief in their ability of achieving their goals through self-motivation. The concept of this framework is based on five values: *First, the informative value*, providing the users with sufficient information guide him towards a better decision making; *Second, theempathetic value*, adding a virtual character to the service; *Third, the persuasive value*, giving the user the feedback about his current situation; *Fourth, theeconomic value*, giving the user a sense of ownership as well as physical tangibility with the sense of object ownership; *Fifth, theideological value*, reminding the user of ideological concepts as justice and friendship. This transtheoretical model constitutes the basis of the psychological model to change the user's attitude in this framework, depending on using the empathetic, persuasive and economic values as tools offering people extrinsic incentives, while the informative value fosters better decision making. The ideological theory on the other hand, spiritually support user's dream positively enhancing the intrinsic motivation. This combined stimulated intrinsic and extrinsic motivations helps user takes action and increases confidence, enthusiasm and self-efficacy.

"Kaleidoscope of Effective Gamification" suggested by Kappen&Nacke in 2013, a cumulative model based on Ryan & Deci (2000); Deterding et al. (2011); Przybylski et al. (2010) and Hamari&Eranti (2011) models, with an added a "perceived layer of fun". The principle of this framework in gamification is the illustration of the interconnectedness of the user's behavioral change. The proposed five interrelated layers occur as rings: *Layer one, Effective Gamification Core* it is the central nucleus of the user's experience; *Layer two, Motivated Behavior Layer* the designer moving from the central core recognizes the player's needs and their related extrinsic and intrinsic motivation; *Layer three, Game Experience Layer* the game designer integrates the actions, achievements and challenges, enabling the creation of a stimulating gamified experience in the application; *Layer four, Game Design Process Layer* this term replaces the term game design elements. These elements are functioning as integrated lenses and subsystems in a process aiming at creating a fun experience to the player; *Layer five, Perceived Layer of Fun* is the outer ring layer having a converging synergistic effect towards the central layer. The kaleidoscope of effective gamification consists of interconnected objectives relevant to each layer elements establishing vertical and 3D relationship with upper and lower layers. Game designers use this layered system as a tool for gamified business services and apps (Heintz, 2012; Hamari&Eranti, 2011; Deterding, et al., 2011; Schell, 2008; Kappen&Nacke, 2013).

The "Process of Gamification" framework which goal is to identify the game dimensions through which the game design is perceived, has been proposed by Marache-Francisco &Brangier in 2013. The gamification design consists of two major steps: context analysis and iterative conception, where several tools guided the designers through the process. *First step – Context Analysis*, it is considered as the prerequisite of clear understanding of the player, profile, intentions context, task and situation of use; *Second step-Iterative Conception*, it focuses on the choice of the design for a specific game experience, based on the conception grid for elements selection, then the decision tree follows and ends by the evolution of the game interaction. At this point the iterative concept is carried out, through prototypes and mockups tested on users until efficiency of the system is granted.

Based on the macro SDT of human motivation, Francisco-Aparicio et al. in 2013, defined the "Francisco-Aparicio et al. Framework" allowing the determination of the type of game mechanics implementing the activities that will answer the social and psychological needs of the user's motivation and in the same time assessing the efficacy of the gamification process, its properties, degree of improvement for a quality model. The game is split into three parts from the functionality prospective: *the game core* representing the game elements, their characteristics, different nature, the user interaction through software modules, applications or subsystems; *the game interface* displaying the final appearance and content of the games with which the player will interact; *method* involving a sequenced activities: *First*, performing theanalysis of the types of users; *Second*, identify the main goal and objective of the gamified task; *Third*, recognizing the interesting underlying objectives; *Fourth*, selection of the related game mechanics to the types of interactive experiences; *Fifth*, analyzing the efficacy of the implemented gamification regarding the fun, customer satisfaction, quality indicators and the quality of the service (González Sánchez, 2010; Francisco-Aparicio et al., 2013).

A similar simplified framework "GAME" was suggested by Marczewski in 2013, and was based on two phases: *the planning stage* of gathering information and knowledge from the users, and the *task related stage* including relevant game elements, metrics, analytics, feedback and implementation.

Moreover, Merino de Paz in 2013, implemented the "Steps to Gamification" framework divided into two cycles and incorporated them in a gamified design: the "engagement loops" and the "progression stairs". The engagement loops main objectives are what are the players goals and actions, and the system response to the player's activities at the "micro level". However, they overlook showing the users their progression, which reflects a repetitive rather boring experience, accordingly, the progression stairs close the loop through depicting the users transition as they proceed in the activity, this represents the "macro perspective during the whole players' journey" (Werbach & Hunter, 2012; Merino de Paz, 2013).

From an ethical prospective Versteeg in 2013, introduced a "Moral Framework for Taking Responsibility", that is embedding in its design a framework of ethical design methods for moral principles to avoid and further address any potential uncovered unethical step, even with the best intentions. It consists of the following steps: *Moral principles and values* revisiting moral

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principles upon which the design methodology of the moral gamified framework will depend; *Conceptual investigation* predicting the outcomes of the system and determine the support or possible harm of the values or moral principles; *Involve stakeholders* collective quantitative and qualitative data through surveys and interviews regarding their feedback and opinion; *Evaluate and iterate* the resulting data analysis of the ethical inquiry will constitute the base for incorporating specific technical related features.

"The Storytelling, Mechanics and Aesthetics (SMA) Model" adopted by Manrique in 2013, was based on 4Qs (WHY, WHAT, WHO and HOW); it represents an iterative framework aiming at reaching a design providing an excellent gamified experience in relation to happiness, fun and motivation in any gamification context. It can be used for both internal or external gamification context and can be individual or community focused. This experience depends on 4 variables, where four questions carrying a clear answer are addressed: Q1 WHY are designers applying gamification? The answer is Goal; Q2 WHAT do designers want people to do? The answer is Actions; Q3: WHO are designers designing for? The answer is Players using internal and external data for their identification; Q4 HOW can designers design it? The answer is System, designers should know how to use aesthetics, storytelling and mechanics and which steps to follow. These steps should be based on three levels: *Level 1* based on experience; *Level 2* theme selection and *Level 3*achieving the design process.

Subsequently a more detailed gamification design framework the "Octalysis: Complete Gamification Framework" was developed by Chou in 2015 and derived its name from the octagonal shape having eight core drives respective to each side. The right side of the octagon focuses on the core drives related to creativity, social dynamics and self-expression. and *First, Epic Meaning & Calling* emanating from the person's belief that they are performing an action greater than themselves; *Second, Development & Accomplishment* it consists the intrinsic drive towards achievement, progression, skill development, reaching mastery, and eventually conquering challenges; *Core Third, Empowerment of Creativity & Feedback* it represents the creative engagement experienced by the user through successively discovering different areas and try new combinations; *Fourth, Ownership & Possession* it is the controlling and ownership feeling that motivate the user towards improvement; *Fifth, Social Influence & Relatedness* where all social motivating components are incorporated as acceptance, mentorship, companionship and even envy and competition; *Sixth, Scarcity & Impatience* when the motivating element is rarity or difficult attainability; *Seventh, Unpredictability & Curiosity* it represents the anticipation of the future next actions; *Eighth, Loss & Avoidance* of any potential negative action or outcome. A Ninth hidden core drive " the sensation" defines the pleasure user experiences during performing an action. As noticed organization of the octagon, the positive motivation core drives are located on the top while, the bottom depicts the negative motivating core drives.

"Gamification Design Framework" was promoted by Fitz-Walter in 2015, as a tool to operationalize the process of the gamified design used in industrial examples and previous research works, through breaking the design in three layers; goal identification, linking goal to game element through using the available sensing. The purpose of this framework is to complement an existing design process through adding activities relevant to the gamification design, within the three aforementioned layers. *Goals* identifying the encountered problem clearly will help designer addressing it; *Sensing* allocating the most accurate and automatic way to sense problems. Reinforcement of the game elements within the in gamification systems can be achieved in three ways: *First*, automatic capturing of the interactions and using them as game input with the aid virtual, physical and logical sensors; *Second* the sensed behaviors and actions and the related game input can be used to create the needed game experience to further support the goals; *Third* game elements rules determining and promoting the intended behaviors can be specifically selected.

The "Framework for Design and Research of Gamified Systems" supported by Liu & Santhanam in 2015, in which the main meaningful engagement represented by overlapping goals of the gamified system, are highlighted as consisting of experiential and instrumental outcomes. They claimed that meaningful engagement reflects the dual outcomes of the gamification design that should emphasize equally on enhancing the instrumental task outcome together with the enjoyable experiences. Towards the center of the design, the user system interactions consists the dynamics "run-time behavior of mechanics" of the gamification elements as inputs in conjunction with the users actions as outputs. At the left side of the framework, fitting of the design elements with the target is needed, their choice depends on the user task as well as the technology platform.

A framework depending on flow dimensions based on previous research, resulted from the work of Almarshedi et al. in 2015, "Framework for Sustainable Gamification Impact (SGI)"; the Pink's elements driving motivation (Pink, 2009) and SDT (Ryan & Deci, 2000). SGI is a spiral framework that advocates focusing on the flow dimensions and the motivational determinants to engage and sustain the gamified experience. Identification of the user's purpose competence and relatedness is the central focus. On the other hand, mastery is depicted in the outer circle as an eventual achievement reached through competence, challenges and skills over the time. The spiral design of the SGI will prevent a backward move of the user, but rather with the cumulative improvement and mastery he will become an expert.

"Gamification Service Framework (GSF)" was developed by Klapztein&Cipolla in 2016 secondary to Action Design Research (ADR) methodology previously adopted by Sein et al. in 2011. Its principle is to apply game design concepts in the design service practices, through transposition and application of the understood motivating concepts of the gameful experience to service design with engaging centric strategies organized into the GSF framework. ADR (Action Research and Design Research) is a fusion between design and action research), works on generating a design based on gathered knowledge about a special problem within the organization through the process of building, then intervention and lastly evaluation. Based on the seven

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principles of the ADR, the GSF framework is based on 4 stages: *First, Problem Formulation* (Practice-Inspired Research and Theory-Ingrained Artifact); *Second, Building, Intervention and Evaluation* (Reciprocal Shaping, Mutually Influential Roles, Authentic and Concurrent Evaluation); *Third Reflection and Learning* (Guided Emergence); *Fourth*, Formalization of Learning (Generalized Outcomes).

Morschheuser et al. in 2017, derived their framework "A Method for Designing Gamification" from a series of interviews stating that most of the models follows generally the same model with difference in details. The activities can be defined into seven stages: *First, Project preparation*, execution of all activities before starting the project, clarifying the objectives of the gamification project; *Second Analysis of users and context*, applying gamification enriches the information services and systems with motivational enhancement for the gameful experiences; *Third Ideation* it focuses on the playable prototypes; *Fourth Implementation of a design* which purpose is the development of a pilot, which would be used for evaluation of the gamified design; *Fifth Evaluationand testing* of the gamified process, its aim is investigating if the planned gamification solution meets the predefined objectives; Sixth Monitoring after release of the gamification project from start to end (Werbach & Hunter, 2012; Huotari&Hamari, 2017; Fitz-Walter, 2015; Hamari et al., 2014; Kapp, 2012; Klevers et al., 2015; Herger, 2014; Gartner, 2011; Hamari&Koivisto, 2015; Hamari et al., 2014; IEEE, 2014; Morschheuser et al., 2017).

The "Gamification Design Framework (GDF)" proposed by Marczewski in 2017, consists of three phases based on iterative steps during planning and preparing the solution: Define; Design; Build and Refine. First Discovery aims at identifying the real problem and the concerned people in three steps problem, users and success definitions; Second Design based on five pillars: a) Design the user journey by starting to build the concept of the gameful experience, discover, Immerse, on-board, master and replay, b) Behavior, answering the questions about what is the users preference? what is the need for the current behavior, c) Motivation relate to RAMP, d) Emotions the feeling experienced by the user , fun, fear, humor love, etc. and e) Mechanics driving the system with user's engagement; Third Action/Feedback Loops starts by a call to the action with eventual engagement in feedback loops then back to start.

In summary, few the of related issues to the generic listed frameworks are collected, reviewed non-theoretical framework considered the iterative processes as the main principle of design: User-Centered Design principles (Merino de Paz, 2013; Manrique, 2013; Klapztein&Cipolla, 2016); Three frameworks depict a clear technological approach (Liu & Santhanam, 2015; Merino de Paz, 2013; Klapztein&Cipolla, 2016), Cross-references reveal that the MDA framework is conceived as the source of two approaches (Kappen&Nacke, 2013; Fitz-Walter, 2015), while the 6D (Werbach & Hunter, 2012) is only inspired in one of the approaches (Merino de Paz, 2013), A few of the frameworks rely heavily on psychological and motivational theories (Nicholson, 2012; Francisco-Aparicio et al., 2013; Chou, 2015).

C. Learning Gamification Frameworks

"Social Gamification Framework" resulted from the work of Simões et al. in 2012, has as objective to provide assistance to the educators and the schools offering a robust set of educational tools for improving students' motivation and the learning outcomes. Common game elements adapted to K-6 education. Moreover, this framework enables the teachers to organize their course contents in the platform, and choose the suitable gamification tools while considering some guidelines: a) allowing repeating the experiments; b) Including rapid feedback; c) Adapting the tasks to promote the skill levels; d) Gradual increase of the tasks' difficulty in relation students' skills improvement; e) Breaking of difficult and complicated tasks into simplified subtasks; f) Allowing different routes towards success; g) Allowing reward and recognition given by the teachers, parents and peers (Klopfer et al., 2009; Lee & Hammer, 2011; Linehan et al., 2011).

Nah et al. in 2013 suggested a "Framework for Gamification" based on 3 parts; Principles of Gamification; System Design Elements and Elements and Engagement. *First, Principles of Gamification* where five principle of gamification are identified: a) *Goal orientation* clear definition of the goals fosters learner's engagement and motivation;*b) Achievement* educational games increasing the learners' engagement will eventually lead to achievement; *c) Reinforcement* through compliments, rewards either tangible or intangible and verbal praises will stimulate behavioral learning motivation, *d) Competition* increasing engagement on the learning task, *e) FunOrientation*; *Second, System Design Elements* Design mechanism outlined before the system development depends on the effect of its elements on enhancing user's experience including; points, levels, challenges, leaderboards, quests, immediate feedback, badges, teams, social engagements, marketplace, economics, social dynamics, virtual, avatars, customization, space, narrative context, sounds and roleplay. Game based learning enhances clear/cognitive absorption which refers to the learner's degree of deep involvement and attention, as a direct outcome while an indirect outcome is reflected through his achievement. Assessing the direct outcome is based on two measures; *The first* advocated by Zichermann& Cunningham in 2011, used five metrics: Recency, Duration, Frequency, Virality and Ratings, *The second* proposed by Agarwal &Karahanna in 2000, assessed cognitive absorption subjectively using five metrics: Control, Curiosity, Focused Immersion and Heightened Enjoyment and Temporal Dissociation.

On a more oriented education framework, a "Gamification of Education" framework was adopted by Huang &Soman in 2013, based on a five step process: *First, Understanding the Target Audience and the Context* identifying the target audience and the context and environment of the education program; *Second, Defining Learning Objectives* aiming at accomplishing the education program; *Third,Structuring the Experience* breaking down the education program into points; *Fourth,Identifying Resources* needed for gamifying the education; *Fifth, Applying Gamification Elements.*

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A "Gamification Framework Model" based on "Social Engagement in E-Learning 2.0", was proposed by Wongso et al. in 2015, focused on increasing the student's engagement and motivation in e-learning based on gamification and Web 2.0 technology. In designing the educational framework, the Design Science Research (DSR) Methodology has been used in steps: *First, Analysis* through preparing gamification and Web 2.0 social features; *Second, Design* resulting features from the analysis will be listed and designed in a blueprint, containing comment, chat, learning contents, and discussion; *Third, Development* Web 2.0 features will be collaborated with gamification elements; *Fourth, Implementation* implementing all design and development elements in the e-learning system; Fifth Evaluation assessing the learner's competence.

Furthermore, "A Gamification-Based Framework for Developing Learning Activities of Computational Thinking" was developed by Kotini&Tzelepi in 2015, based on the principle of "student-centered gamification framework", where the student's ability to choose his learning path and even formulate his learning objective and content, would foster his enhancement and involvement. Accordingly, the characteristics of the framework focusing on readjusting elements of game design in a learning environment include: *Constructivist Learning Theory Pillars*, teaching activities are reinforced and enriched with gamification elements; *Gamification Elements*; *Computational Thinking Skills*, enhancing the intrinsic motivational skills of students; *Computational Thinking Disposition* and *Behaviors and Computational Thinking Vocabulary*.

Subsequently, Klock& da Cunha in 2015 in their "Conceptual Model for Gamification of E-learning Environments" based their design on four dimensions based on who, why, how and what elements closely interrelated? *Who?*, refers to the individuals involved in the gamification process; Why?, identifying the desired behaviors gamification will improve while student is interacting with the system; *How?* Focus on the implemented game elements; *What?*,Relates to the involved data in the process of gamification. A developed inter-dimensional relationship is granted, while based on presumed potential behaviors: accessing the concepts, delivery of tasks and exercises, more exercise performance, implementing forum threads, using chatting and discussion board, and frequently accessing the system.

Moreover, within the same educational concept a system introduced by Mora et al. in 2016, "Fraggile: A framework for Agile Gamification of Learning Experience" was structured based on four phases: *First, Declaration,* focusing on information acquisition and description of needed assumptions is based on four sequential concepts; *the problem,* managing the problems' *root cause*, taking *appropriate actions* and *testing* the efficacy of the undertaken behaviors in problem solving; *Second, Creation* incorporation of the design components under a narrative layer leading to valued Minimum Viable Product (MVP), through describing the variable player's profile, the game mechanics, the stages of development, and the implemented actions; *Third, Execution* correlating and tracking the learners' experiences and interaction, while achieving the planned objectives; *Fourth, Learning* measurement and analysis of activities, evaluating the achievement of the Acceptance Tests, based on predefined metrics, their Key Performance Indicators (KPIs) and checkpoints regularly verified.

From the perspective of supporting the teachers interested in applying gamification in the classroom Baldeón et al. in 2016, proposed an iterative gamification framework, "LEarner-Centered GAmification Design Framework" LEGA. This framework aligned with educational approach and the Gamification Design Frameworks (GDFs) and the Outcomes Based Education Theory (OBE) strongly focuses on the learners' characteristics both playing and learning styles through supplying the teachers with Gamification Mechanics aligned with the intended learning outcomes (ILOs). LEGA follows five stages: identifying ILOs, knowing the players/learners and context, design gamified learning metrics and activities, performing and deploying the "fun" learning sessions and evaluating the gamified learning framework literature (Sunseri, 1994; Spady, 1994; Burke, 2014;Chou, 2015;Francisco-Aparicio et al., 2013;Escribano et al., 2016;Marache-Francisco &Brangier, 2013; Marczewski, 2015; Werbach & Hunter, 2012).

In summary, some issues in the literature relevant to these aforementioned designed educational frameworks are presented: Social relevance (Simões et al., 2012; Wongso et al., 2015); in contrast, one of the frameworks is focused on researchers and software designers, making it unsuitable for application by teachers (Nah et al., 2013); whereas two frameworks recognize the use of an e-learning platform as a necessary environment to conduct the gamified experience (Wongso et al., 2015; Klock& da Cunha, 2015); four frameworks stress particularly on the relevance of an iterative process (Huang &Soman, 2013; Wongso et al., 2015; Mora et al., 2016; Baldeón et al., 2016); MDA framework in general is considered in several frameworks (Klock& da Cunha, 2015; Mora et al., 2016) as well as 6D framework (Klock& da Cunha, 2015; Carreño, 2018).

D. Health Gamification Frameworks

A new Internet-Based Learning (IBL) platform called "Gamification for Internet Based Learning in Health Professions" following the Medical Research Council (MRC) framework and the Medical Research Council in 2000 was tested and developed by Rojas et al. in 2014. The "Observational Practice Educational Networking" (OPEN) designed to support the health professions education is an IBL platform (Sweller et al., 1998). Anecdotally, OPEN though highly flexible and customizable for a range of purposes, was developed without considering any learning theory, yet it demonstrated effectiveness when applied in the appropriate context.

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Burke in 2011, developed the GAMER framework, with the purpose of engaging and motivating people to perform rehabilitation games at home, while creating webcams, and augmented reality games. It proved efficiency in mapping the required therapy goals to physical gameplay elements and embedding the positive feedback aesthetics. Another gamification framework emerging from GAMER, placing a strong emphasis on the users' motivation is the "PACT" which is the acronym of the four dimensions: people, aesthetics, context and technology. PACT is designed in three phases: *Phase 1, Requirements gathering phase* proper data gathered from patients, researchers, clinicians and other community stakeholders constitute the basis on which the therapeutic goals and users' needs influence the design; *Phase 2 Core design, is* based on Marczewski'sHexad gamification typology, Bartle's player types and RAMP intrinsic motivation model; *Phase3, prototyping* the system software is implemented and integrated with the appropriate hardware (Marczewski, 2014; Bartle, 1996; Charles & McDonough, 2014).

Some issues in the literature reviewed in the health environments fieldare summarized as follows: Prototyping and experimenting and defined design steps, in addition to measuring and iterating are essential for the design of health frameworks. The Gamification design issues and its elements depict the diverse theoretic issues and variable implementation targets, including both the designers and the researchers (Charles & McDonough, 2014; Rojas et al., 2014; Carreño, 2018).

Although no consensus has been reached in the literature regarding gamification scope and definition, Deterding et al. in 2011, stated the most accepted definition "The use of game-design elements in non-game contexts". Most reviewed publications adopt this definition, yet with minor connotations (Merino de Paz, 2013). The proposed definition stated by Pelling in 2011, differed from the original definition as being "an application of game like accelerated user interface design to make electronic transactions both enjoyable and fast". The heterogeneity of the diverse approaches of variable frameworks prevented the provision of a successful uniform definition required for proposing any framework (Raftopoulos, 2014; Sakamoto et al., 2012). Whereas interestingly several studiesimbedded technology in the conception of frameworks with minor homogeneity (Burke, 2014; Charles & McDonough, 2014; Ruhi, 2015; Versteeg, 2013; Wongso, et al., 2015). Accordingly, in the analyzed design processes, three major approaches considering the center of focus and the development process have been proposed: *First, User-Centered* where the user and his goals are the focus and the development process focusing on the user and his goals "UCD processes from the Human-Computer Interaction"; *Second, Game-Centered enter of focus is the* game design and its artifacts; Third, Technology-Centered: concerned with modeling and technological artifacts, relying on the defined architecture as the basis of any gamification design and deployment (Carreño, 2018).

FINDINGS AND CONCLUSION

It has been stated that almost half of the actual frameworks consider storytelling as an important feature in the design process. *User experience (UX):* although most of gamification are user-centered not all frameworks explicitly consider user experience. The impact exerted by gamification on user experience needs more investigation instead of being limited to behavior change and motivation (Fitz-Walter, 2015); *Technology:* the controversy between the concept of gamification and its involvement in the technology, inquires that frameworks should use technology for the deployment of a gameful design (Mora et al., 2017).

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