

# **Applying Gamification and Assessing its Effectiveness in a Tourism Context: Behavioural and Psychological Outcomes of the TripAdvisor's Gamification Users**

Marianna Sigala\*

Despite the increasing adoption of gamification and its huge potential in tourism, research in gamification is still limited. As preliminary findings show that the effectiveness of gamification depends on the context of its application and the players' use of the gamified app, this paper fills in these gaps: by exploring and analysing the application of gamification in a specific e-commerce tourism context; and assessing the gamification's effectiveness by measuring the players' gamification usage and the latter's behavioural and psychological outcomes. The gamified TripAdvisor website and its Facebook enabled gamification app are used as the specific context of the study. Findings from a survey conducted on TripAdvisor users provide useful practical and theoretical implications to gamification designers and researchers alike on how game mechanics can be designed for enhancing the users' motivation, flow, task involvement and engagement with the 'play' tasks, and so, increasing the gamification's effectiveness.

**Keywords :** Gamification, Game Mechanics, Funware, Motivation, Tourism, Tripadvisor, Behavioural and Psychological Outcomes

---

\* Associate Professor, Department of Business Administration, University of the Aegean, Greece

## I . Introduction

Gamification and big data are reported as the most important impacts of the Internet in the coming years, as it is predicted that more than 50% of the organisations managing innovation processes will gamify aspects of their business by 2015 [Gartner Hype Cycle report, 2011]. Indeed, gamification is diffused in many and various industries such as defence, education, scientific exploration, emergency management, leisure, health, politics and engineering [Xu, 2011]. Gamification is also offered as a service layer of reward and reputation systems as well as customer relationship management programmes (e.g. the provision of points, badges, levels and leader boards to customers for enhancing their loyalty and establishing bonds with the firm). For example, in order to solve the main problem of most fitness programmes (i.e. motivation), Nike+ uses a gameware design driving over five million 'players' to compete and improve their personal fitness goals. Specifically, users of Nike+ sports shoes are motivated to measure and register their running performance in order to: monitoring their progress; compete with others; gain points and peer recognition. This gamefied motivation mechanisms persuade runners to maintain and enhance their commitment, loyalty and engagement with running, the users' brand community and the brand. Overall, games are used in order to increase the users' engagement, participation, learning and motivation by directing their behaviour (i.e. increased activity, social interaction, quality and productivity of purchasing and consumption actions) through the design and affordances of positive and intrinsically motivating gameful experiences [Hamari, 2013].

However, although gamification is penetrating many business processes (e.g. decision-making, innovation, team working, marketing) [Witt *et al.*, 2011; Zichermann and Linder, 2010] and it is predicted to become the next generation application for marketing and customer relations [Zichermann and Cunningham, 2011], there is still a lack of empirical studies providing evidence of the business effectiveness of gamification [Hamari, 2013; Deterding *et al.*, 2011]. This is despite the fact that the number of academic publications in gamification is growing during the last years [Xu, 2011]. Moreover, as recent research shows that the gamification effects are greatly dependent on the context in which the gamification is being implemented, as well as on the users using it [Hamari *et al.*, 2014], research should examine the use and the impacts of gamification by focusing on a specific context and business application. However, most of the previous studies primarily examine gamification in contexts such as education, health, intra-organisational systems and innovation, and so, there is no insight into the application and effectiveness of gamification in a marketing and e-commerce context. Indeed, the effectiveness of gamification applied for influencing consumer behaviour in a marketing context is totally ignored [Hamari *et al.*, 2014]. Furthermore, despite the great potential of gamification in tourism [e.g. Cramer *et al.*, 2011], studies examining the gamification's effectiveness in tourism are also scant [Sigala, 2015; Xu *et al.*, 2013].

To address these gaps, this paper examines the implementation and effectiveness of gamification in a specific e-commerce tourism context, as tourism is an industry with a huge potential for gamification applications [Sigala, 2015]. Thus,

the aim of this paper is twofold: a) to examine the concept and application of gamification in a specific tourism context; and b) to measure the effectiveness of gamification in this context by studying the impact of two different gamification designs on the users'/players' behavioural and psychological outcomes. Specifically, the two gamifications designs that are examined include: the TripAdvisor's gamified website; and the TripAdvisor's Facebook social graph gamified application. To that end, the paper first reviews the concept and the principles for designing gamewares and then, it explains the design of these two gamified TripAdvisor's applications by showing how the company has applied gamification for supporting its business model. The paper continues by discussing the literature identifying the behavioural and psychological outcomes of gamification on its users and then, it formulates the research questions related to the measurement of the gamification effectiveness. Primary data are collected from a convenience sample of TripAdvisor's users, the findings are presented and finally, their practical and theoretical implications are discussed.

## II. Gamification

### 2.1 Gamification: Concept and Aims

Following the success of Foursquare in using points and badges to motivate users' activity and retention, the interest of firms on using gamification for revolutionising the human-computer interaction and the user experience has mushroomed. Theoretically, any application, task, process or context can be gamified, and gamification is used in several contexts such as educa-

tion, health, decision-making [Xu, 2011]. However, as marketing has always been about persuasion, motivation and manipulation, the affordances and the potential of gamification in marketing are enormous [Zichermann and Linder, 2010]. For example, in consumer-oriented websites and mobile applications, firms use gamification for encouraging people to use the e-commerce applications, for driving and enhancing customer loyalty, brand awareness and effective marketing engagement [Deterding *et al.*, 2011; Daniels, 2010].

Similarly to industry gamification applications, research in gamification is also mushrooming, which is evident by the wide use of numerous parallel terms such as "productivity games", "surveillance entertainment", "funware", "funology" "playful design", "behavioral games", "game layer" and "applied gaming". However, gamification is institutionalized as the common household term [Deterding *et al.*, 2011]. After reviewing the evolution of human-computer interaction and the literature in game studies, Deterding *et al.* [2011] defined gamification as the use of game-play mechanics for non-game applications. This widely accepted definition clearly shows the distinction between "serious game" (the design of full-fledged game for non-entertainment purposes) from "gamified" applications that only need to incorporate some (and not all) game design elements. Other gamification definitions also highlight its aim to create experiences. For example, Fullerton *et al.* [2004] described gamification as a process of designing experiences by first envisioning what kind of an interactive experience a game should create, and then proceeding by creating the necessary game designs in the form of rules and

procedures. Others [e.g. Huotari and Hamari, 2012; Hamari, 2013] also defined gamification as a process of enhancing services with (motivational) affordances in order to invoke gameful experiences and further behavioral outcomes. In defining gamification, Huotari and Hamari [2012] also stressed the role of gamification in invoking the same psychological experiences as games (generally) do.

Although the gamification definitions may vary in emphasis, they all include both a systemic component defining how the game is constructed/designed and an experiential component describing the human involvement within the game. Overall, the major aim of gamification is to effectively motivate and direct the users' behavior and to increase the users' engagement with the 'play' tasks [Lee and Hammer, 2011; Shneiderman, 2004] by using game-like techniques [such as, scoreboards and personalized fast feedback [Flatla *et al.*, 2011]] that make people feel more ownership and purpose when engaging with the 'play' tasks [Pavlus, 2010]. According to this conceptualization, gamification can be seen to have three major parts [Hamari *et al.*, 2014; Sigala, 2015]. First, the use of game mechanics that can afford and increase the users' motivations, and second and third respectively, the resulting outcomes of gamification design on the users' psychology (e.g. flow, involvement, enjoyment) and behavior (i.e. increased activity).

## 2.2 Funware: Types and Motivational Affordances of Game Mechanics

Game mechanics are rule based systems/simulations that facilitate and encourage a user to explore and learn the properties of their

space through the use of feedback mechanisms [Cook, 2008]. Funware is the use of game mechanics to encourage desired user actions and to generate customer loyalty [Zimmerman, 2009]. To achieve that, game mechanics should generate extrinsic and/or intrinsic motivation to their users. Intrinsic motivation comes from within, since the user decides whether to make an action or not in order to achieve for example altruism, competition, cooperation, sense of belonging, love or aggression. Extrinsic motivations occur when something or someone determines the user to make an action for example: classifications, levels, points, badges, awards, missions [Viola, 2011]. In reviewing the literature, Hamari *et al.* [2014] identified a great variety of different game mechanics and elements: (redeemable or social) points, leader boards, achievements/badges, levels, story/theme, clear goals, feedback, rewards, progress and challenge. However, points, leader boards, and badges are clearly the most commonly used mechanics [Hamari and Eranti, 2011]. Xu [2011] clustered game mechanics into the following categories: behavioural (e.g. discovery/exploration, ownership, community collaboration, lottery, virality, status); feedback (e.g. bonuses, countdown, reward schedules); and progress (e.g. achievements, levels, points, progress bar). Xu [2011] also made a distinction between game mechanics and game elements, as the latter aim to mainly manifest the game information to the player usually as user interface components (e.g. avatars, activity feed, leader boards, user profile, notifier e-mails).

## 2.3 Designing Effective Funwares

The literature identifies four major issues for

designing effective funwares: the integration of game activities with the business related tasks with which the users are desired to get engaged [Von Ahn and Dabbish, 2008]; the use of a variety of game mechanics for providing both extrinsic and intrinsic motivation; the selection and use of game mechanics that match the users' objectives and support the users' motivational needs [Aparicio *et al.*, 2012]; and the empowerment of the users to select and customize the game mechanics to their own motivational needs so, that they can self-identify the game goals with their own values and internalize the game activities [e.g. Zichermann and Cunningham, 2011]. The latter considerations highlight the importance to first understand the subjects (users' goals and motivations) before designing funwares. The following arguments justify the significance of these four issues.

First, research in social psychology indicates that extrinsic rewards might have a negative effect on motivation and creativity [Toubia, 2006], because: they can inhibit or even diminish the people's behavior [Deci *et al.*, 1999]; and they can have detrimental effects, when complex and creative tasks have to be performed [McCullers, 1978]. This is because once gamification is used to provide external motivation, the user's internal motivation decreases. Hence, if the organization starts using gamification based upon the provision of external rewards and then, it decides to stop these rewards, the organization will be worse off than when it started, as the users will be less likely to return to the behavior without the external reward [Deci *et al.*, 1999]. As Zichermann and Cunningham (2011: p. 27) claimed "*once you start giving someone a reward, you have to keep her in that reward loop forever*". Robertson [2010] also argued that gamification

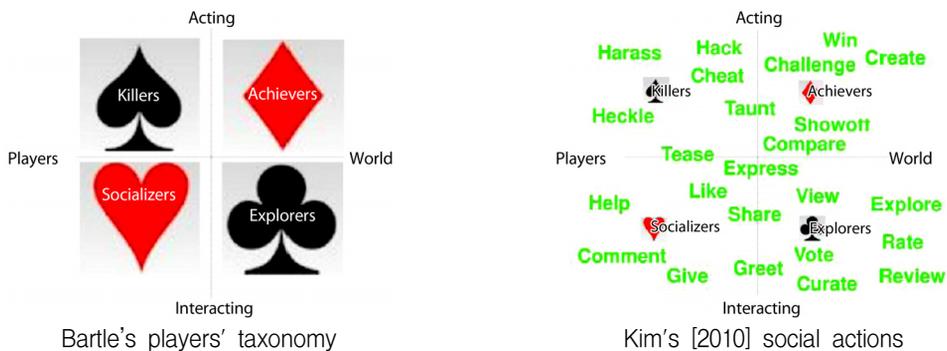
designs should avoid the superficial 'pointsfication' (defined as gamification systems that add nothing more than a scoring system to a non-game activity), as they miss elements of playfulness and experiences, which are central to what makes a game effective. Others [e.g. Deterding *et al.*, 2011; Kim, 2010] have also emphasized the need to design an effective player's experience with intrinsic rewards preferred over extrinsic rewards. This is because extrinsic rewards may lead to short-term activity increase, but reduction in long-range interest and use of a product/service [Lazzaro, 2011]. On the other hand, when people are intrinsically motivated they can even be in a state of energized focus (flow), involvement and enjoyment [Deci and Ryan, 1985; Csikszentmihályi, 1990]. Intrinsic motivators also work best when they work towards personally meaningful goals [Wu, 2011]. Consequently, to drive the users' motivation and raise their engagement, gamification design should use mechanics that combine both intrinsic (e.g. motivation due to interest, joy, self-expression and curiosity) and extrinsic motivation (e.g. motivation driven by the desire to gain points, awards) [Amabile, 1993].

Secondly, research in game psychology shows that there are 'players' with several personality types, whose behaviour is driven by different interests, needs and types of motivators [Bartle, 1996]. In her study, Bartle [1996] identified four players' types (namely, achievers, explorers, socialisers and killers) depending on whether players prefer to act or interact with other player(s) or the world(s). The *socializers* have playing motives for socializing and establishing relationships with other people; *achievers* have motives for advancement; *explorers* are players that mainly interact with the world and not its community and have

a motive to personally gain an understanding of the game world; the *killers* represent players that wish to imposition themselves upon others and improve their satisfaction by causing distress and/or affiliating anxiety and pain to others.

The Bartle's [1996] taxonomy of players has been validated in numerous game contexts, while several studies have also recently confirmed this taxonomy in various gamified contexts. For example, Kim [2010] studied the users' behaviour in numerous gamification applications and identified a series of social actions that re-confirm the Bartle's taxonomy of players in gamification contexts <Figure 1>. In reviewing the gamification literature, Hamari *et al.* [2014] also concluded that the users of gamified applications have the same motivational needs and interests as the 'traditional' gamers, and which fall into all three categories of motives: cognitive, emotional and social. Yee [2002] also identified five similar motivational factors influencing people to play online social games and gamified applications: desire for relationships and supportive friendship among the members of the social community; desire for being immersed in a make-believe construct such as fantasy world; desire for grief by using other players for one's own gains (e.g.

by killing or deceiving others); desire for achievement and power by reaching the goals defined by the game; desire for leadership by gaining the gregariousness and assertiveness in a group; desire for shared experience, i.e. the reward of being socialised into a community of gamers and acquiring a reputation within it. Actually, as concerns the last motivation (namely, the desire to get social experiences), Ducheneaut *et al.* [2006] found that although many users of online social games play alone, they have a different kind of social factor ("audience") motivator, and a different sense of social presence. Based on their findings, players use and interpret the term 'being alone together' in multi-player online games as: interacting with an audience; being surrounded by others; and laughing at and with others. In a later study, Yee [2006] provided a typology of gamification users that was developed based on their three major types of motivations: achievement (advancement, competition); social (relationship, socializing, teamwork) and immersion (discovery, role-playing, escapism, customisation). Yee's [2006] typology includes groups' of users that have analogous profiles and features with the widely known taxonomy of players provided by Bartle [1996].



<Figure 1> Comparison of Bartle's Taxonomy of Players with Kim's [2010] Taxonomy of Social Actions of Users of Online Gamification Applications

Overall, research exploring the various players' types offers critical and appropriate information to gamification designers for understanding the various goals, interests and motivations of players and then, developing game mechanics that match these users' motivational needs and preferences. In this vein, <Table 1>

summarises studies showing: the parallel of the players' types found in game contexts [i.e. Bartle, 1996] with the users' types found in gamified applications; and the game mechanics that match the motivational needs of each type of player.

The theories of motivational affordance and situated relevance also provide evidence that

<Table 1> Gamers' Types and Motivations (in game and gamified contexts) and Their Matching with Game Mechanics

Motivation of users of online games and gamification applications [e.g. Yee, 2002; Yee, 2006; Kim, 2010; Hamari <i>et al.</i> , 2014]	Gamers' types in game contexts [Bartle, 1996]	Game Mechanics [e.g. Aparicio <i>et al.</i> 2012; Xu, 2011; Hamari <i>et al.</i> , 2014]
<b>Autonomy:</b> Autonomy refers to the sense of will when performing a task	Achievers	profiles, avatars, macros, configurable interface, alternative activities, privacy control, notification control
<b>Competence</b> <i>Advancement:</i> The desire to gain power, progress rapidly, and accumulate in game symbols of wealth or status <i>Mechanics :</i> Having an interest in analyzing the underlying rules and system in order to optimize character performance <i>Competition :</i> The desire to challenge and compete with others	Status seekers, Achievers, killers	positive feedback, optimal challenge, progressive information, intuitive controls, points, levels, leader boards, status, badges, levels
<b>Relatedness/social component:</b> Relatedness is experienced when a person feels connected to others <i>Socializing :</i> Having an interest in helping and chatting with other players <i>Relationship :</i> The desire to form long-term meaningful relationships with others <i>Teamwork :</i> Deriving satisfaction from being part of a group effort	Socialisers Harmonizers	groups, messages, blogs, connection to social networks, chat, gifting items to other users
<b>Immersion Component</b> <i>Discovery :</i> Finding and knowing things that most other players don't know about <i>Role-Playing:</i> Creating a persona with a background story and interacting with other players to create an improvised story <i>Customization:</i> an interest in customizing the appearance of their character <i>Escapism :</i> Using online environment to avoid thinking about real life problems	Explorers Lurkers	Avatars Gifting items for discovery for use of the gamified application Areas/ levels unlock only when inviting others to play

the game mechanics can motivate the users only when they match the user's profile (i.e. his/her needs, values and interests) [Deterding *et al.*, 2011]. The situational relevance and the self-determination theory (SDT) advocate that the motivational affordances of the game mechanics are most effective when [Wu, 2011]: mechanics work towards personally meaningful goals; and users are empowered to design or set their own goals. This is because according to SDT, when external motivations are integrated with the underlying activity into someone's own sense-of-self, then he better understands the importance of the activity to himself and internalises its regulation, which in turn self-motivates him to also perform the activity [Zichermann and Cunningham, 2011]. Situational relevance also argues that when someone else creates goals for a user, the user perceives an external judge deciding what is relevant to him, and this in turn creates a negative feeling demotivating the user to engage with the activity [Nicholson, 2012]. So, external rewards unrelated to the user's needs (e.g. badges, points) are the least likely to be integrated by the user, as the perception is that someone else is controlling his behavior. This is because, rewards based upon gaining or losing status that tap into the user's ego create an introjected regulation of behavior, and while this can be intrinsically accepted, the controlling aspect of these rewards causes the loss of internal motivation. On the contrary, allowing the user to self-identify with goals or groups that are meaningful to him is much more likely to produce autonomous, internalized behaviors, because in this way, the user is able to connect these goals to other values that he already holds.

Research investigating the intrinsic motiva-

tional affordances of game role-playing also confirms that funwares providing users with control upon the selection of game mechanics can generate greater motivational affordances. According to Bartle [2007], virtual games 'affirms a player's self-identity through role-playing', while role playing in virtual worlds [Chan and Vorderer, 2006] enables the players to interact with the gaming world and other players by using avatars, which are customizable agents. Studies in game design strategies [e.g. Companion and Sambrook, 2008; Crawford, 1982] also identify five primary intrinsic motivations triggered by game role-playing: choice, control, collaboration, challenge, and achievement. Thus, in relation to games that externally impose game roles to their users, games that empower the players to select (i.e. choice and control) the game mechanics can provide higher motivational affordances to their users, because the latter allows the players to attain their self-selected goals (i.e. challenge, achievement) by constructing and presenting their virtual self (role) as they wish when they interact with others (i.e. collaboration) and the virtual world.

Overall, effective funwares use game mechanics that reflect the motives and the personality of the users of the gamification application. Moreover, as players may have various motives, effective funware design considers the following issues: it provides a variety of game mechanics (combining both extrinsic and intrinsic motivational affordances) in order to appeal to various users; and it allows the users to select and/or customize the game mechanics, so that they can create meaningful game elements and goals that are in line with their own interests and needs, and can drive their experiences.

## 2.4 Psychological and Behavioural Outcomes of Gamification

The effectiveness of gamification has always been assessed according to its aims to trigger and boost the users' psychological and behavioural engagement with the playful/desired experience [Hamari *et al.*, 2014]. To that end, studies have concentrated on investigating the psychological and behavioural outcomes of gamification on its users.

Research measuring the users' psychological outcomes focuses on measuring constructs such as, the users' game motives, attitudes, and enjoyment [Cheong *et al.*, 2013; Dominguez *et al.*, 2013; Flatla *et al.*, 2011; Gustafsson and Bang, 2008]. Studies exploring the users' motives of 'traditional' games and gamification applications were reviewed in section 2.3. As concerns, the players' attitudes and enjoyment, most studies [e.g. Witt *et al.*, 2011; Hamari *et al.*, 2014] have measured: the users' perceptions towards the game mechanics; the affordance of mechanics to motivate users; and the users' level of enjoyment by participating in the gamified application.

In order to measure the users' enjoyment, the majority of the previous studies have used the construct of flow, which is a specific kind of happiness considered as one of the most fundamental reasons that people play games [Hamari *et al.*, 2014]. Flow is a state of absorption, characterized by intense concentration, loss of self-awareness, a feeling of being perfectly challenged (neither bored nor overwhelmed) and a sense that time is flying [Czikszentmihalyi, 1990]. In order to achieve flow, the important condition is to have a balanced goal that is challeng-

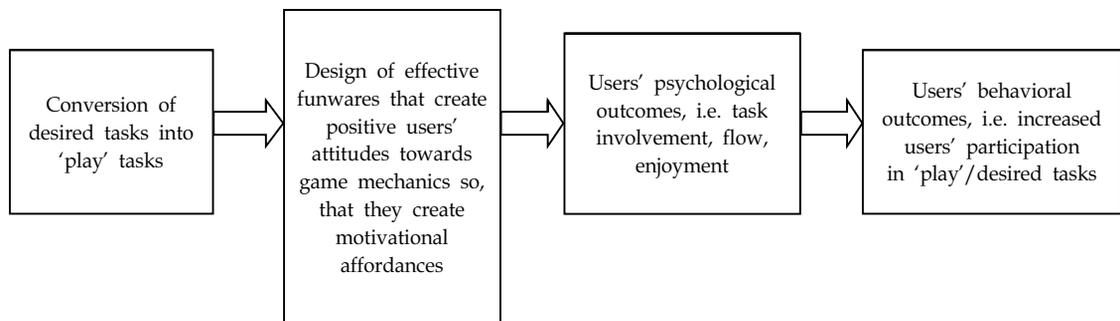
ing yet achievable within the individual's ability. This is because: a task, that is not challenging or requires excessive time to be completed, becomes boring and players lose interest; similarly, a task that is too hard also causes frustration and anxiety and so, players lose interest. Moreover, as the person's skills improve over time, the challenge needs to increase along with the improving skills. This balance between skill and challenge is referred to as the flow channel [Xu, 2011]. Achieving flow is critically important to players' enjoyment, as flow is also strongly associated with the concept of immersion [Bartle, 2007], which is the positive feeling that a player has when he feels part of and/or inside a virtual world and which contributes to his/her game enjoyment. This is because flow enables the creation of the feeling of a virtual presence [Lombard and Ditton, 1997], i.e. the illusion that a (computer) mediated experience is not perceived as the mediated experience. This sort of virtual presence enhances the players' enjoyment, because it allows the players to suspend the physical disconnect between what is shown on a digital screen and the player's sense of his/her usage of the computer [Bartle, 2007].

Another construct that previous studies have also used [e.g. Witt *et al.*, 2011] for measuring the users' enjoyment with gamified applications is the concept of task involvement. Users, who perceive an object or an activity as relevant, are happily involved in this activity or object. For example, findings show that customers with high task involvement are more focused, feel more competent to get engaged with and contribute to the play tasks as well as they feel more supported by the gamified application [Füller *et al.*, 2009].

Studies focusing on investigating and measuring the outcomes of gamification on the users' behaviour have used a variety of metrics/concepts depending on the implementation context of gamification [Hamari *et al.*, 2014]. In summary, constructs that were previously used for measuring the users' behavioural outcomes of gamification relate to [Hamari *et al.*, 2014]: users' task completion (e.g. learning outcomes achieved in an e-learning environment, number of ideas contributed in an open innovation-ideation gamified application); users' task performance in terms of task efficiency (e.g. speed of task completion, the time that learners participated in the e-learning platform, number of workers participating in the business task) and users' task effectiveness (e.g. quality of new product ideas generated by the users, quality of learners' participation); and the users' behavioural change (e.g. users' adoption of energy saving behaviour, users' exploration of a place, volunteers' participation in emergency situations).

To summarise, it is generally agreed that effective game designs should facilitate and enable the following chain of outcomes-impacts <Figure 2>: game mechanics should convert the desired tasks into 'play' tasks and they should

generate various (intrinsic and extrinsic) motivational affordances for persuading the users to get engaged with these tasks; game mechanics should afford motivational affordances for instilling users' interest and engagement in play tasks; in relation to games whereby users cannot control/select game mechanics, game mechanics that allow the users to self-identify with the play tasks and create meaningful playing experiences can be more effective in creating positive users' perceptions about their motivational affordances and so, in triggering the users' motivation to more actively participate in the 'play'/desired tasks; the users' engagement in meaningful playing experiences can in turn lead to psychological outcomes related to the users' task involvement, flow and enjoyment; and finally, when positive psychological outcomes are achieved, users become absorbed in the 'play activities', which means that the psychological outcomes can drive positive behavioural outcomes (i.e. users' increased participation and contribution in play/desired tasks). Reeves and Read [2009] named this chain of gamification impacts as the 'total gamification engagement', while others refer to it as the gamification engagement flow [Xu, 2011].



<Figure 2> The 'Gamification Engagement Flow': Chain Effects of Gamification on Users' Psychological and Behavioral Outcomes

### III. Study Context

#### 3.1 TripAdvisor's Gamification Goals

The TripAdvisor's business model is built upon its corporate mission that is to "Help travellers around the world plan and have the perfect trip". TripAdvisor is positioned as a one-stop-shop platform allowing travellers to search and evaluate a great amount of information for planning their trips. Travellers' use the TripAdvisor's services for free, while firms willing to use the TripAdvisor's marketing and booking tools pay a fee. Thus, the collection and publication of travel information on the TripAdvisor website (which in turn can drive travellers' traffic on the TripAdvisor's website and so, persuade tourism firms to pay for using the TripAdvisor's services) represents the major success factor of the TripAdvisor's business model. Gamification is applied by the TripAdvisor in order to attract and motivate travellers to contribute, upload and enrich travel content by interacting with others on its website. Gamification is adopted because, its motivational effects on travellers' behaviour (contribution and use of online content) can drive and enforce the continuous activation of vicious circles effects between content, online travel community, and tourism suppliers paying to use the TripAdvisor's services. To that end, TripAdvisor applies gamification into its business model in order to: a) attract and generate new travellers on its platform (audience building gamification goal); and b) keep the travelers continuously motivated to contribute content and interact with others online (audience engagement gamification goal) in order to increase and enrich the travel content

available on the TripAdvisor website, which in turn travelers and firms can use for their own purposes.

#### 3.2 Funware design of the TripAdvisor's Website and the Facebook Enabled Gamification App

<Table 2> analyses how TripAdvisor has applied the previously analysed principles of gamification design for implementing and integrating gamification into its website: the use of game mechanics for converting the 'business' tasks (that travellers should be engaged with) into 'play' tasks; the use of a funware design that includes a variety of game mechanics (e.g. badges, (social) points, scorecards, compliments) that combine both extrinsic and intrinsic motivational affordances (e.g. autonomy, competence, immersion, socializing) in order to appeal to a variety of users' profiles (e.g. achievement seekers, seekers of social recognition, interaction and self-status); and finally, the development of a gamification application (by integrating the Facebook social graph with the TripAdvisor website, <Figure 3>), whose funware design allows the users to select and personalize the game mechanics to their own needs, goals and social networks/friends, so, that the users can create more meaningful and engaging gameful experiences for themselves.

Specifically, the Facebook enabled gamified application allows the users to self-identify with the goals of the 'play' tasks, because:

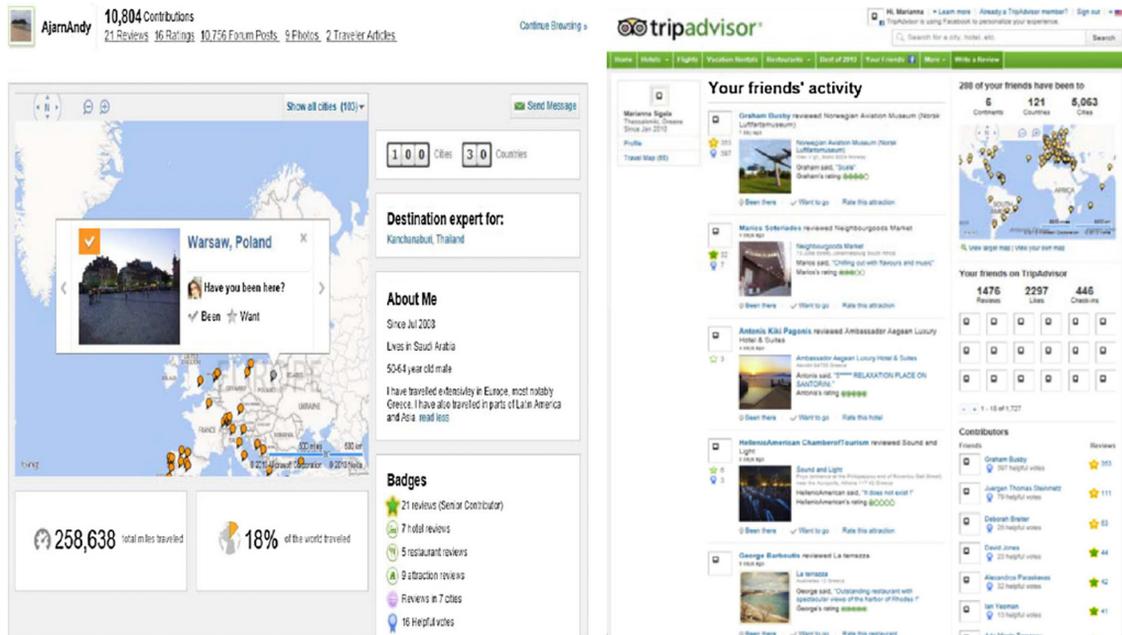
- the users are motivated to add content on the TripAdvisor website, because by doing

so, they can create their own personalised travel map, their personalised wish travel list and/or their travel profile and expertise that enhances their ego and prestige; and

- the TripAdvisor users can customise the TripAdvisor's website to filter and show content contributed only by their Facebook friends; by doing so, the TripAdvisor users: have access to travel content that they find more reliable, authentic and trustful (since it is contributed by people they know and belong to their Facebook network); and can identify themselves with their Facebook friends for sharing and discussing content as well as comparing their travel profile and scorecard performance with that of their friends (i.e. the gamification app incorporates and supports a type of a multi-player

online game and competition that can drive and motivate user engagement).

As the funware of the Facebook enabled gamified app allows the users to self-identify and connect the play tasks with their own values and preferred play roles, this means that the users are empowered to create meaningful game experiences, that are more likely to produce autonomous, internalized and engaged behaviours (according to the self determination theory and principles of game role-playing). In other words, based on the previously discussed theory, the funware of the gamified application of the TripAdvisor should afford greater motivational affordances and users' outcomes than the gamified TripAdvisor website, whose game mechanics are externally (and not internally) imposed to its users.



<Figure 3> TripAdvisor's Gamified App Enabled by the Facebook Social Graph: The User's Travel Map/ Profile and the User's TripAdvisor Webpage Customised to His/Her Network

<Table 2> 'Play/Desired tasks, Game Mechanics and Motivational Affordances of the Funwares of the TripAdvisor's Website and Facebook Enabled Gamified App

'play' tasks: desired tasks 'gamified' by integrating them with game mechanics	Game mechanic used for converting a desired task into a 'play' task	Motivational affordances (extrinsic-intrinsic)
<u>The funware design of the TripAdvisor's website</u>		
Upload a (hotel, restaurant, city, attraction) review, photo and/or video	Gain/add a 'point' to the user profile each time a review, photo, video is uploaded in order to achieve a higher level of contributions and gain badges Badges= users get badges depending on the number of reviews they upload. Badges have different colours and names (e.g. green, orange, top contributor badge) reflecting different number of uploaded reviews	Competence (advancement and mechanics for improving status)
Participate in online forums	Forums/groups and messaging. Users get a score depending on the number of their online contributions in TripAdvisor's forums Users can get the Badge of the 'destination expert of a place' when they exemplify by giving helpful, friendly advice and welcoming new member in the TripAdvisor's forums (http://www.tripadvisor.com/help/who_are_the_destination_experts_on_the_forums#HEADING)	Competence (achievement, competition), Relatedness, socialising, relationships
Upload a useful and reliable review, because other users can: rate the quality of your reviews; vote if the review is helpful; and give you a compliment	Users gain social points and these are added to their profile information for demonstrating personal achievement and instilling users' competition. The social points that travellers can get are of the following forms: • the rating of reviews (community rating) • the number of 'helpful' votes perceived for their reviews • the number of compliments received by other users (gifting items to others)	Competence (achievement, competition)
Provide personal information in order to get personalised travel content and notifications	<u>Notification control</u> Users can upload personal information (e.g. with whom they travel with, travel requirements, e.g. disabilities, preferences e.g. vegetarians, preferred vacations/destinations etc.), so that the website can notify and send them personalised travel information about promotions, offers, travel advices etc	Autonomy
Send a message to another user (C2C interactions enabling the provision of travel advice amongst users)	<u>Messages, chat</u> Users can send messages to other users to get specific travel advice and information	Relatedness, socialising, relationships
Add content and interact with others online in order to allow the user to enrich his/her travel experience and knowledge. By doing so, the user can continuously enhance and "complete" his/her user profile visualized online, which in turns enhances his/her ego	<u>Leader board - Scorecard, Status</u> : "activity counters" are used for showing to users their progress in 'completing' their 'travel profile' as well as their online 'play' task performance in relation to the profile and the performance of other users. The publication and the provision of feedback information about the 'play' task performance and the progression in completing the travel profile influences the status of a user and increases the chances that a user: is perceived by others as a travel expert; and is approached by others for giving them travel advice. The 'User profile' (which is a type of a scorecard) visualises and provides information about the user's performance and achievements about the following 'play' tasks: • type of badges achieved and number of compliments achieved • number of reviews contributed (total and per category i.e. hotel, restaurant, cities, attractions) • number of forum interactions, number of photos, number of videos, number of articles contributed • number of miles travelled • percentage of the world traveled • number of cities visited • number of countries visited	Competence (achievement, competition, mechanics for improving status)

<p><b>The funware design of the TripAdvisor's gamification application that is supported by the Facebook social graph:</b> Travellers log into TripAdvisor's website by using their Facebook account. This gives them the functionality/benefits of:</p> <ul style="list-style-type: none"> <li>- <i>Personalization:</i> It filters the huge amount of online travel content (e.g. reviews), as users can view content and activity contributed only by their Facebook friends (i.e. people they trust)</li> <li>- <i>Interaction and networking:</i> it allows travellers to find and interact with people they know (Facebook friends) and they do not know, but have similar Travel Maps (i.e. experiences and travel wishes) as them. For example, users wishing to visit Paris can find people that have previously visited Paris and/or have indicated in their travel map that they wish to visit Paris, so that they can contact them for getting more insights, travel tips and/or co-organising a trip to Paris together</li> <li>- <i>User personality and TripAdvisor's brand building:</i> any 'play' tasks performed by TripAdvisor's users on its website (i.e. upload review, comment on a review, update personal travel Map) is automatically diffused in their Facebook friends' network (e.g. status and profile updates in Facebook timeline). This builds up the online personality and profile of the user, but it also simultaneously increases the visibility and the awareness of the TripAdvisor's brand name and functionality to many Facebook users.</li> <li>- <i>Increased user engagement with the website:</i> Users have greater intrinsic motivation to help and interact with people that they know (e.g. by uploading content and exchanging messages), because the social and emotional gains are higher when one promotes oneself and interacts with a community of members that he/she knows</li> </ul>	<p>Leader board- Scorecard, Status (travel achievements and content of the user are shown and compared in relation to the equivalent performance of the users' Facebook friends' network); "activity counters" show to the users their progress in relation to their friends' profile, and this also gives users feedback about their progression and chances to: be perceived by their friends as travel experts; and be approached by them for travel advice.</p>	<p>Competence (achievement, competition, mechanics for improving status) Relatedness, socialising, relationships</p>
<p>Users Updating their Travel Map= status/profile update (Figure 3) Users upload content (cities, countries visited; countries wishing to visit; photos, reviews, videos etc.; ratings of others reviews) for updating and enhancing their travel map</p>	<p>Connection to social networks Competition - Leader Board: view friends' scorecards and compare it with own scorecard Messages, chatting with social network</p>	<p>Relatedness, socialising, relationships</p>
<p>Users' checking and reading their Friends' Activity (Figure 3) Users can filter and view customised travel content that is contributed only by their Facebook Friends</p> <p>Facebook diffusion of the users' performance and engagement with the TripAdvisor play tasks The user's performance and engagement with the TripAdvisor's play tasks (e.g. when a user uploads a review on TripAdvisor website and/or the users' number of reviews/photos contributed online) are automatically posted to the Facebook timeline and/or the Facebook user profile and so, they are diffused into the user's Facebook friends' network (eWOW, C2C)</p>	<p>Connection to social networks Users share their TripAdvisor's online activity and contributions with their Facebook friends' network</p>	<p>Relatedness, socialising, relationships, autonomy</p>
<p>Users' reading content included in Travel Maps=travel activity &amp; Wish list Browse and explore the Travel Map of others' for exploring places and/or finding places to visit (e.g. use the travel maps of others for creating a travel wish list, for making travel dreams)</p>	<p>Fantasy world : - view, read and immerse own self into the travel experiences of others - create a fantasy world of a travel experience (by adding cities/destinations etc. in your travel wish list) and 'virtually' escape into this world alone and/or with others - discover about travel worlds by browsing the travel stories and content contributed online by others - (co)-learn about travel worlds by reading others' travel content and interacting with other TripAdvisor experts</p>	<p>Relatedness, socialising, relationships, autonomy, immersion, escapism, discovery</p>

Source: Sigala [2015].

## IV. Methodology

### 4.1 Research aims and Constructs' Measurement

The aims of the study were twofold: a) to examine the concept and application of gamification in a specific tourism service; and b) to measure the effectiveness of gamification in this context by studying the behavioural and psychological outcomes of gamification on its users. Specifically, by using TripAdvisor as the study context, the paper analysed the application of gamification by describing the goals and the design of the funware of two gamification applications of TripAdvisor (ripAdvisor's website interface and a Facebook enabled gamified app). Later, the users' impacts of these two funware designs were measured and compared for examining their effectiveness and validating theories related to effective funware design.

To achieve the first aim, section two discussed the concept of gamification and the principles for designing effective funwares. Section three elaborated the application of this gamification theory by demonstrating how TripAdvisor has integrated gamification into its business model with the aim to build and engage audience/users into its website. Analytically, <Table 2> shows how TripAdvisor uses a variety of game mechanics (for appealing to a variety of users' types by generating both intrinsic and extrinsic motivational affordances) in order to convert the 'desired' business tasks into game/play tasks and engaging the users' behaviour into these tasks. <Table 2> presents and compares the funware design of the two gamified applications of TripAdvisor.

The second aim of the study was to measure the effectiveness of the TripAdvisor's gamification, and to that end, the related literature was reviewed. Specifically, the literature review identified the constructs that should be used for measuring the psychological and behavioural outcomes of gamification on its users.

The following constructs were used for measuring the psychological outcomes of gamification on its users: users' perceptions' on game mechanics, users' game motives, flow, enjoyment and task involvement the behavioural. To ensure content validity, scales that were used and validated in previous studies were also adopted in this study. Thus, perceptions towards game mechanics were measured by adapting the Witt *et al.*'s scale [2011] into the TripAdvisor's gamification context (i.e. the game mechanics used by TripAdvisor, as they are shown in <Table 2>). The travellers' motives for using the TripAdvisor website were measured by using items/motives based on Witt *et al.* [2011] and Yee [2002]. Flow was measured based on Witt *et al.*'s scale [2011], while enjoyment and task involvement was measured based on Füller *et al.*'s scales [2009]. All items were measured by using a five point Likert scale (1 = strongly disagree, 5 = strongly agree).

The users' behavioural outcomes were measured by evaluating the users' performance on the 'play'/desired tasks by using the task constructs that were previously identified by Hamari *et al.* [2014]. The users' performance on tasks was used for capturing the gamification's impacts on users' behaviour, because the TripAdvisor applies gamification in order to motivate the travellers to use and engage with its website tasks that are converted into 'play' tasks <Table

2>. In other words, in order to identify the impacts of gamification on its users' behaviour, the study measured how the travellers use the TripAdvisor's website tasks. Six items were used for measuring the type and the level of the travellers' use of the TripAdvisor's website <Table 3>. The six items related to the business tasks that the TripAdvisor wishes the travellers to get engaged with on its website (i.e. desired/play tasks). In addition, in order to address the Bartle's taxonomy [1996] of the users' activities within game contexts, the six items also included 'play' tasks that reflected the users' actions or interactions not only with other 'players'/users but also with the virtual game world. The survey respondents were asked to report the frequency (level) of their use of each website desired task. Thus, the research measured only the efficiency dimension (i.e. users' frequency/level of task engagement) of the users' task performance, while the effectiveness dimension of the users' task performance was not captured. This is because measuring the users' task effectiveness requires the collection of qualitative data (such as, the quality and reliability of travel reviews uploaded by the users), which are difficult to collect and very subjective. Moreover, the study also omitted to measure two other constructs/dimensions of the users' task performance namely, task completion and behavioural change of the users. These constructs were excluded, because they reflect the behavioural impacts of gamification from a users' perspective, while the study aimed to assess the effectiveness of the TripAdvisor's gamification from a business perspective.

The literature review did not only provide the constructs and the scales for measuring the users' outcomes of gamifications, but it also ad-

vocated that successful gamification should create a chain of effects (called as the gamification engagement flow) between funware design, psychological and behavioural users' outcomes as follows: the users' perceptions about the game mechanics influence the motivational affordances of game mechanics to engage users' behaviour into the play tasks, which in turn influences the psychological outcomes that the users derive from their gamified experiences and context. Thus, in order to assess the effectiveness of gamification, the study did not only analyse and measure the users' outcome of the TripAdvisor's funware design (i.e. game mechanics), but it also examined the associations between the game mechanics, the users' motivations, and the users' psychological and behavioural outcomes in order to investigate the ability of the TripAdvisor's funware to create a chain of gamification effects. To better and easier conduct these association amongst all variables, the respondents were first clustered into different groups of 'players' based on their behaviour usage patterns of the TripAdvisor's website gamified tasks, and then, the motives, and the users' psychological outcomes of these behavioural groups of respondents were investigated.

In addition, a research hypothesis was formulated in relation to the effectiveness of the funware design of the two TripAdvisor gamified applications. Specifically, based on the reviewed gamification theory, it is advocated that the most effective funwares allow their users to control and select the game mechanics according to their needs/values. In this vein, the study also developed the following hypothesis: in relation to the gamified TripAdvisor website, the gamified Facebook app can generate greater

motivational affordances and so, psychological and behavioural users' outcomes. This hypothesis was tested by conducting t-tests that investigated differences in the behavioural and psychological outcomes amongst the users of the two funware designs of TripAdvisor.

The research instrument also collected data about the demographics (i.e. age, gender and nationality) of the TripAdvisor's users. The questionnaire also requested the respondents to report whether they log into the TripAdvisor's website with a TripAdvisor's account or with a Facebook account. This was necessary for identifying whether respondents use or not the Facebook enabled gamified app. The research instrument was pre-tested with two academics and eight international travellers, who claimed to be users of the TripAdvisor's gamification applications. The pre-tests were concluded when no more respondents could identify any more issues that had to be corrected and/or clarified. The pre-tests took place during a conference focusing on tourism and technology, as this was an appropriate context for identifying qualified people to run the pre-tests. Consequently, some editorial changes were done for making the questions easier to be understood.

## 4.2 Sample design

A convenience sample was used for collecting data. Eight Greek travel companies (5 hotels and 3 travel agencies) agreed to e-mail the research questionnaire to their customer databases (3,137 travellers in total). The research instrument used a filtering question for identifying appropriate respondents. Specifically, the

travellers were invited to respond to the questionnaire if they declared to have used the TripAdvisor's website for reading and contributing travel content (e.g. by writing and rating of at least one review). Contributing content on the TripAdvisor website requires users to log into the website, and so, this filtering question identified travellers with experience on the TripAdvisor's funware. The e-mail survey took place during August and September 2013 and 463 fully answered responses were received.

## V. Analysis and Discussion of the Findings

### 5.1 Respondents' Profile

The respondents represent a good mix of genders (53% = male), but they tended to be older than 30 years old (> 18 years = 2%, 19~30 years = 18%, 31~50 years = 46%, < 50 years = 34%). Respondents also represent a good mix of nationalities, despite the fact that only English speaking travellers were able to respond to the questionnaire, as the latter was written in English (Europeans = 39%, N. Americans = 19%, Australians = 17%, Russians = 14%, S. America = 10%, Africans = 1%). The majority of respondents (64%) logged into TripAdvisor website with a Facebook account, while the remaining logged with a TripAdvisor account. Chi-square tests compared the age, gender and nationality profile of the users and the non-users of the Facebook gamified application. Findings did not reveal any statistical significant differences regarding the demographic profile of these two groups. Thus, comparisons of the

users' outcomes of these two groups cannot be attributed to the users' demographic variables.

## 5.2 Users' Behavioural Outcomes

### 5.2.1 Descriptive Analysis of the Users' Behavioural Outcomes of Gamification

<Table 3> provides the findings regarding the users' behavioural outcomes of the TripAdvisor's gamification (an acceptable reliability score,  $\alpha = 0.77$ , was found). The respondents reported relatively high usage of the TripAdvisor's website tasks, as the mean values of all the items measuring the behavioural outcomes are higher than the average value of 2.5 <Table 3>. Thus, the respondents represent TripAdvisor users with a high engagement level into the website's tasks.

### 5.2.2 Impact of Funware Design on Users' Behavioural Outcomes

In order to examine the impact of funware design on the users' behavioural outcomes, the study investigated the association of the funware design of the two TripAdvisor gamified applications with the users' behavioural outcomes. Specifically, t-tests were conducted for investigating whether respondents using only the TripAdvisor's gamified website reported significant different outcomes in relation to the respondents using the Facebook enabled gamified app. Results revealed that the Facebook gamified app users 'contributed content' (t-value = 2.36,

$p < 0.01$ ), 'interact with others' (t-value = 1.11,  $p < 0.05$ ) and 'updated their Travel Map with travel content' (t-value = 2.14,  $p < 0.05$ ) significantly more often than non-users of the Facebook gamified application. This confirms the previous theories that in relation to the website's funware, the funware of the Facebook gamified application provides greater motivational affordances and so, the users to get more engaged with the gamified website tasks. Actually, the findings show that in relation to the gamified TripAdvisor website, the Facebook gamified application is more effective in engaging users with 'play' tasks that require the users to devote increased efforts and time; i.e. the tasks "contributing content", "interacting with others" and "constructing one's online Travel Map/profile" require the users to spend more cognitive effort and time than the tasks such as, "browsing and reading the TripAdvisor content." The greater motivational affordance of the funware of the Facebook gamified application might be attributed to the enhanced social and relatedness motivational affordances provided by its game mechanics [e.g. Nicholson, 2012]. As explained in <Table 2>, in relation to the funware of the TripAdvisor website, the Facebook gamified app uses game mechanics that connect the users to their social network of friends/peers in order to trigger relatedness, social and peer competitive motivational affordances to their users (i.e. peer pressures and social needs), which in turn drive the users to engage in social oriented gamified tasks (i.e. interact with and help their known groups/ Facebook friends, promote themselves as travel experts for achieving social recognition within their friends' network).

<Table 3> TripAdvisor Users' Behavioural Outcomes: Level and Type of Travellers' Engagement with the TripAdvisor's Gamified Website Functions/Tasks

Users' behavioural outcomes (use of TripAdvisor's gamified website tasks) <i>5 point Likert scale (1 = never, 5 = very often) (α = 0.77)</i>	M	S.D.
How often do you contribute content (e.g. reviews, videos, photos) on TripAdvisor?*	3.10	1.41
How often do you evaluate others' content (e.g. rate reviews, give compliments for reviews) on TripAdvisor?	2.60	1.32
How often do you update your Travel Map/profile with travel content on TripAdvisor?	2.94	1.23
How often do you interact with others (e.g. send messages, post in Forums) on TripAdvisor?	2.59	1.18
How often do you browse the Travel Map of others on TripAdvisor?	3.20	1.29
How often do you read others' travel reviews on TripAdvisor?	3.86	1.23

\*  $p < 0.05$ , \*\*  $p < 0.01$  (differences between users and non-users of the Facebook gamified application).

### 5.2.3 Respondents' Behavioural Typology Based on their Use of Gamified Website Tasks (Cluster Analysis) and Association of Funware Design with Users' Typology (chi-square tests)

In order to further explore the association of the users' behavioural outcomes with the funware design of the TripAdvisor's gamification (i.e. first stage of the gamification engagement flow), the study first employed a two-stage clustering analysis for categorising respondents based on their patterns of use of the gamified tasks <Table 4> and it then conducted chi-square tests <Table 5> for investigating any differences in the usage patterns of the users of the two funware designs of the TripAdvisor's gamification applications.

#### Respondents' behavioural typology: cluster analysis of respondents' usage patterns of the gamified tasks

For conducting the cluster analysis, first, the Ward's method was adopted to generate possible cluster solutions. Then, the sets of cluster solutions were analysed by the K-means method for aggregating different indicators of the

usage of desired/play tasks into possible patterns of usage of the TripAdvisor website. An analysis of variance (ANOVA) and post hoc Scedge tests were used for examining the inter-cluster differences across the six items measuring the respondents' usage of the six desired/play tasks. The results showed that the four cluster solution yielded the clearest distinctions amongst clusters and provided more meaningful explanations for the different usage patterns of the usage of the desired/play tasks on the TripAdvisor website. This is because significant differences were found amongst the clusters for all the usage indicators of the six desired/play tasks.

Based on the cluster analysis results, the respondents were categorised into four major groups exhibiting distinctive characteristics in relation to their usage frequency of the six gamified tasks of the TripAdvisor website. These four clusters of respondents also demonstrated analogous qualities with the typologies of the players/gamification users that had been previously identified by past studies. Specifically, the usage patterns of the gamified tasks' exhibited by the four clusters: reflect similar activity profiles with that shown by the types of

players found by Bartle's [1996]; and they also resemble with the social actions undertaken by the gamification users found by Kim [2010]. Because of that, the four clusters are labeled and interpreted as follows.

Cluster 1 includes 132 respondents (representing 28.5% of the study's sample). Compared with other clusters, the respondents in cluster 1 had: significantly higher usage frequencies for the two tasks namely "How often do you contribute content (e.g. reviews, videos, photos) on TripAdvisor?" and "How often do you update your Travel Map/profile with travel content on TripAdvisor?"; and significantly lower usage frequencies for all the other tasks. Hence, the respondents in cluster 1 tend to exert great efforts and time in contributing content and updating/enriching their profile on the TripAdvisor website (and so, achieving points, badges and improving their profile and scorecard), while they do not spend time for conducting tasks that engage them with others (i.e. interacting with others or reading the content contributed by others). In this vein, the respondents of cluster 1 adopt an individualist approach when using the TripAdvisor's website. Therefore, the individualists reported a usage pattern of the gamified tasks that is parallel to the activities undertaken by the players called as achievers [Bartle, 1996], since the achievers are also motivated to engage with play tasks that increase their personal advancement by acting upon the game elements and the game world/context, and not the other players. The usage patterns of the gamified tasks exhibited by the individualists also resemble with the social activities conducted by the achievers [i.e. the gamification users identified by Kim, 2010], who

heavily engage into gamified tasks such as: creating one's personal social profile; showing off; comparing performance with others; and winning.

Cluster 2 includes 138 respondents and it is the largest group amongst all clusters (as it counts for 30% of the study's sample). Compared with other clusters, the respondents in cluster 2 reported the highest usage frequency for the task "How often do you interact with others (e.g. send messages, post in Forums) on TripAdvisor?". In relation to cluster 1 (individualists), the respondents in cluster 2 also exhibited significantly higher usage frequency for the three tasks related to the use and evaluation of content contributed by others, but significantly lower usage frequency for the two tasks related to content contribution and uploading of information for updating the user profile. In relation to clusters 3 and 4, the respondents in cluster 2 demonstrated significantly higher usage frequency for the tasks related to contributing content and updating their profile, but significantly lower frequencies for the tasks related to exploring, reading and evaluating the content provided by others. In other words, the respondents in cluster 2 tend to interact significantly more frequently with others rather than act upon the content provided by others. Thus, the respondents in cluster 2 can be labelled as socialisers and they can be paralleled to the socialisers, i.e. the players who, according to Bartle [1996], are heavily motivated to play games for socializing and establishing relationships with other people. The study did not collect detailed data in relation to the specific activities in which the respondents are engaged with when they interact with others on the TripAdvisor's

website. However, it can be hypothesised that the socialisers adopt social actions similar to the actions exhibited by the gamification users called as the 'socialisers' [Kim, 2010], such as the following: help and give (i.e. helping others to organize their trips by giving travel advises and tips); share (i.e. sharing their travel experiences); and comment (i.e. commenting on others' travel plans). Thus, future studies should further explore and inform gamification designers about the specific social activities that the 'socializers' seek and wish to engage with when interacting with others. Finally, as the socialisers represent the cluster with the greatest majority of the study's respondents, this provides evidence that the Tripadvisor aims to adopt a social approach in implementing gamification (i.e. an approach that triggers social motivational affordances to its users) that can in turn support the success of the Tripadvisor's business model on the construction, maintenance and reinforcement of a virtual community of website users.

Cluster 3 includes 107 respondents that represent 23% of the study's sample. The respondents in cluster 3 showed the highest usage frequency for the task "How often do you evaluate others' content (e.g. rate reviews, give compliments for reviews) on TripAdvisor?", and the second highest frequency usage for the task "How often do you interact with others (e.g. send messages, post in Forums) on TripAdvisor?". In comparison to clusters 1 and 2, the respondents in cluster 3 exhibited significantly lower frequencies for the tasks related to contributing content and updating user profile, but significantly higher usage frequencies for the tasks related to browsing and reading content provided by others. In comparison to cluster 4,

the respondents in cluster 3 reported a significantly higher usage frequency for all the tasks apart from the two tasks related to browsing and reading others' content. Thus, it seems that the respondents of cluster 3 tend to exercise great efforts and spend considerable time on the TripAdvisor website for conducting the following tasks: contributing content and enhancing their profile; searching and acting upon the content provided by others; as well as interacting with others. Thus, the respondents in cluster 3 do not interact with others because they wish to learn from them and/or their content, but because they wish to act upon the content itself by evaluating, commenting and enriching it. Because of that, the respondents in cluster 3 share very similar features with the features displayed by the players called as killers [Bartle, 1996]. However, the respondents in cluster 3 were characterised as critics and not as killers because of the following. Although the critics are similar to the killers in terms of their gamified behaviour (i.e. they both wish and adopt activities in order to imposition themselves upon the others), the two groups may differ in terms of the motivational forces of their behaviour. So, although the killers' behaviour is driven by their desire to achieve satisfaction by causing distress and affiliating anxiety and pain to others, the behavioural drivers of the respondents in cluster 3 were not investigated in this study. In this vein, since the findings provide insight only into the behaviour of the respondents in cluster 3 (i.e. focus on commenting upon the content contributed by others), which may be driven by both positive and negative intentions, but this is unknown, the respondents in cluster 3 were called as critics (a

<Table 4> Clusters of TripAdvisor Users Based on their Usage Frequencies of the Website Gamified Tasks (Mean/Standard Deviation)

	Cluster 1: Individualist/ achievers (n = 132, 28.5%)	Cluster 2: Socialisers (n = 138, 30.0%)	Cluster 3: Critics/Killers (n = 107, 23.0%)	Cluster 4: Hitchhikers/ explorers (n = 86, 18.5%)	F (ANOVA)
How often do you contribute content (e.g. reviews, videos, photos) on TripAdvisor?	4.76/1.03	3.17/1.05	2.33/0.94	1.41/1.07	9.28***
How often do you evaluate others' content (e.g. rate reviews, give compliments for reviews) on TripAdvisor?	1.81/1.07	2.94/1.11	4.41/1.15	0.97/0.96	12.92***
How often do you update your Travel Map / profile with travel content on TripAdvisor?	4.58/1.14	3.34/1.16	2.27/1.03	0.64/0.98	15.23***
How often do you interact with others (e.g. send messages, post in Forums) on TripAdvisor?	0.94/1.04	4.48/1.24	3.26/1.14	1.26/1.02	12.358***
How often do you browse the Travel Map of others on TripAdvisor?	1.33/1.16	3.34/1.26	4.02/1.16	4.82/1.22	10.262***
How often do you read others' travel reviews on TripAdvisor?	2.58/1.02	3.94/1.09	4.51/1.25	4.87/1.18	11.484***

\*\*\* p < 0.001.

neutral word) and not as killers (a word that usually has a negative connotation). Thus, in order to better understand the respondents in cluster 3, further research should provide detailed insight into the profile, the motivation, the behavioural drivers and the specific social actions [based on Kim, 2010] undertaken by the users of this group.

Cluster 4 represents the smallest group of users, as it includes 86 respondents representing 18.5% of the study's sample. Respondents in cluster 4 exhibited the highest usage frequencies for the tasks "How often do you read others' travel reviews on TripAdvisor?" and "How often do you browse the Travel Map of others on TripAdvisor?" and the lowest usage frequencies for the three tasks related to contributing content, updating user profile and evaluating others' contributions. The respondents in cluster 2 interact with others significantly more than the respondents in cluster 1, but significantly less than the respondents in clusters 2 and 3.

Thus, the respondents in cluster 4 tend to "hitch a ride", since they tend to use the TripAdvisor's website solely for finding and reading the content provided by others, and not for helping others by contributing content to the website or interacting with them. In this vein, it is also quite possible that the reported interactions of these respondents with the others may also be driven by the respondents' desire and intention to seek information from others rather than their willingness to provide information to them. Hence, the respondents in cluster 4 are labelled as hitchhikers. The hitchhikers' behaviour is also parallel to that of the players called as explorers by Bartle (1996), since the latter also mainly interact only with the game world and not its community members. However, this study did not investigate the specific behaviour in which the hitchhikers are engaged with when they interact with the 'game' world of the TripAdvisor website (i.e. its online travel content and context). Thus, further research is required in order to

<Table 5> Association of the respondents' usage patterns of the TripAdvisor's website gamified tasks and the type of the funware they use (i.e. number of users or not users of the Facebook gamified app)

	Use of Facebook gamified application		TOTAL number of respondents
	Users	Non-users	
Hitchhikers	11	75	86
Individualists	94	38	132
Socialisers	102	36	138
Critics	89	18	107
TOTAL	296	167	463

Chi-square = 27.16, Phi = 0.43, Cramer's V = 0.43, p < 0.001.

understand and identify the specific social activities of hitchhikers.

Association of the users' behavioural outcomes and funware design: chi-square tests investigating the relation between the users' behavioural typology and funware design

A Pearson's chi-square test was also performed for identifying any association between the respondents' usage patterns of the TripAdvisor's website gamified tasks and funware design (measured based on which funware design respondents use, i.e. users or not of the Facebook gamified application). The results <Table 5> revealed significant associations between the use of the Facebook gamified app and the users' behavioural typology. Specifically, individualists, critics and socialisers are more likely to be users of the Facebook gamified application, while hitchhikers tend not to be users of the Facebook gamified application. This finding again confirms that in relation to the funware of the TripAdvisor website, the funware of the Facebook gamified application is more effective in motivating and engaging the users into more active, social and interactive behavior/tasks on the TripAdvisor's website.

### 5.3 Users' Psychological Outcomes

#### 5.3.1 Descriptive Analysis of the Psychological Outcomes

<Table 6> provides the findings regarding the psychological outcomes of the TripAdvisor's gamification on its users. All constructs had an acceptable reliability (cronbach  $\alpha$  > 0.70). Respondents reported relatively high psychological outcomes in all constructs (mean values of items are higher than the average value = 2.5), which means that the implementation of gamification by the TripAdvisor has succeeded to trigger and generate positive gameful experiences to its users. Specifically, the findings reveal that the respondents held positive perceptions towards the game mechanics, which in turn explains why the respondents also reported relatively high positive perceptions for joy, flow and task involvement. In other words, the findings confirm the chain effects of gamification (i.e. effective game mechanics lead to positive psychological outcomes). The respondents also claimed to be motivated by all the types of motivational drivers (i.e. high values reported for all the types of motives), which in turn confirms the theory claiming that various motives can simul-

taneously drive the players' behaviour [Bartle, 1996]. Moreover, the findings about the respondents' motives also reveal that the gamification users of the TripAdvisor represent a great variety of players who are motivated to use the website for various different reasons. Nevertheless, as the motive related to "gaining points" received the lowest average value (i.e. 2.84), this finding shows that the motive to gain functional benefits (performance, achievement and competition motives) tends to motivate the respondents to use the TripAdvisor website less than all the other motivational drivers.

### 5.3.2 Statistical Analyses Investigating the Association between: The Users' Psychological Outcomes, Funware Design and Users' Behavioural Outcomes

T-tests were conducted <Table 6> for investigating the association of the users' psychological outcomes and the two funware designs (i.e. the Facebook gamified application and the TripAdvisor's gamified website). In relation to the respondents not using the Facebook gamified application, the results revealed that the respondents using the Facebook gamified application have significantly more positive perceptions towards the four items related to the game mechanics that reflect the social and emotional (self-promotion) motivational affordances. This is not surprising since the funware of the Facebook gamified application aims to appeal, empower and trigger the users who are seeking more social and emotional 'play' experiences than solely 'cognitive' or functional (gaining points) 'play' experiences. This is also verified based on the t-tests' results investigating the

differences regarding the motives driving the behaviour of the users and the non users of the Facebook gamified application. Analytically, in relation to the non users, the users of the Facebook gamified application reported to be more significantly motivated to use the TripAdvisor's website by the social motives such as, to interact with others and become affiliated within a travel community. This finding confirms again that in relation to the funware of the gamified TripAdvisor website, the funware of the Facebook gamified application is significantly more effective in triggering social motivational affordances. In addition, t-tests (investigating the psychological outcomes of the two types of users) also revealed that in relation to the funware of the gamified TripAdvisor website, the funware of the Facebook gamified application can: generate to its users significantly more enjoyment (i.e. "fun"); enhance the users' task involvement (i.e. "It is stimulating to use the TripAdvisor's website"); and increase the flow experienced by the users (i.e. "Time passes quickly for me").

Overall, t-tests revealed that in comparison to the funware of the gamified TripAdvisor website, the funware of the Facebook gamified application: can generate significantly greater and more stimulating motivational affordances (and specifically, drive social and emotional motivational affordances); and can lead to greater users' psychological outcomes in terms of the level of flow, enjoyment and task involvement experienced by the users. This findings confirm the research hypothesis claiming the superiority of the Facebook gamified app to have greater users' behavioural and psychological outcomes than the gamified TripAdvisor website. To further investigate the differences in the users' outcomes

that these two funware designs can generate, the following data analyses [examining the relation between the users' behavioural outcomes (types of travellers' based on their usage of gamified tasks) and the users' psychological outcomes] were also conducted.

<Table 6> Users' Psychological Outcomes: Descriptive Statistics and T-Tests Investigating Differences between Users and Non-Users of The Facebook Gamified Application

	M	S.D.
<b>Perceptions towards game mechanics (based on Witt <i>et al.</i> 2011 and the funware of the TripAdvisor, &lt;Table 2&gt;) When using TripAdvisor.... (α = 0.73)</b>		
Sharing my travel experience with others makes me happy	3.04	1.06
Increasing my performance on the TripAdvisor (e.g. by gaining points, badges or compliments) makes me happy	2.81	1.27
The allocation of points/badges/compliments is comprehensive	3.17	1.21
Increasing my performance on the TripAdvisor (e.g. by gaining points, badges or compliments) enhances my motivation to contribute travel content on the TripAdvisor's website	3.26	1.30
I check my performance (e.g. scorecard/badges/reviews' ratings) on TripAdvisor very often	3.11	1.13
Getting low ratings to my travel reviews makes me feel less happy*	3.57	1.21
Improving my scorecard results makes me feel happy	2.87	1.31
Improving my scorecard results increases my motivation to contribute more content on the TripAdvisor's website*	2.96	1.10
The calculation of the scorecard results is comprehensive	3.74	1.26
Getting low ratings to my travel reviews lowers my motivation to contribute content on the TripAdvisor website	3.43	1.38
I check my performance (e.g. ratings, points, badges and scorecard results in my TripAdvisor profile) very often	2.94	1.29
Reading the content/activity of others on TripAdvisor's website makes me happy	3.64	1.18
Reading the content/activity of others on TripAdvisor's website increases my motivation to contribute more travel content	2.86	1.09
Interactions with others on the TripAdvisor's website makes me happy**	3.24	1.21
Interactions with others increases my motivation to contribute more travel content**	3.19	1.21
Enhancing my travel profile on TripAdvisor makes me happy	3.47	1.36
Enhancing my travel profile on TripAdvisor motivates me to contribute more content on my 'Travel Map**	3.24	1.27
<b>Motives for using TripAdvisor website (Witt <i>et al.</i>, 2011; Yee, 2002) What motivates you to use the TripAdvisor's website? (α = 0.76)</b>		
Find travel content - knowledge	4.04	1.09
Gain rewards (e.g. points/badges etc.)	2.84	1.16
Fun/entertainment	3.04	1.31
To interact with other travellers*	3.26	1.22
To increase my status/profile by showing off my travel experience/knowledge	3.21	1.27
To help others	3.38	1.19
To become affiliate with a travel community*	3.26	1.18
<b>Flow (Witt <i>et al.</i> 2011) When using the TripAdvisor's website ... (α = 0.77)</b>		
Time passes quickly for me**	3.48	1.19
I feel content	2.84	1.24
I think of other things when contributing travel content online	3.38	1.26
I am distracted from writing	2.71	1.14
<b>Enjoyment (Füller <i>et al.</i> 2009) Using the TripAdvisor's website is... (α = 0.76)</b>		
Enjoyable	3.53	1.09
Exciting	3.14	1.29
Fun*	3.44	1.23
<b>Task involvement (Füller <i>et al.</i> 2009) (α = 0.75)</b>		
It is enjoyable to use the TripAdvisor's website	3.07	1.21
It is interesting to use the TripAdvisor's website	2.97	1.17
It is stimulating to use the TripAdvisor's website*	3.22	1.32
It is exciting to use the TripAdvisor's website	3.04	1.16

\* p < 0.05, \*\* p < 0.01 (5 point Likert Scale, 1 = strongly disagree, 5 = strongly agree).

ANOVA analyses were conducted for investigating the association between the users' behavioural and psychological outcomes. To that end, the psychological outcomes of the four behavioural clusters of the respondents were examined. <Table 7> summarises the results of the ANOVA analyses (F statistics are given for the items whereby significant differences were found). Analytically, the individualists were found to have significantly higher positive values for five items reflecting the users' perceptions towards the game mechanics that refer to issues related to increasing personal performance and personal profile/status (personal achievement, enhancing self-esteem through performance). In relation to all other groups, the socialisers also reported to feel significantly more happy when interacting with the others (i.e. item "Interactions with others on the TripAdvisor's website makes me happy"), while the hitchhikers reported to feel significantly more happy when reading the others' content/activity (i.e. item "Reading the content/activity of others on TripAdvisor's website makes me happy"). These findings confirm the previously discussed theory that stressed the need to match the game mechanics to the personality, motives, goals and needs of the funware users. The findings also provide evidence of the existence of the concept of the chain of effects (gamification engagement flow), which advocates that the design of funware (i.e. selection of different game mechanics) leads to (different) behavioural outcomes (i.e. players' use and engagement level with the play tasks) [Reeves and Read, 2009; Xu, 2011]. Consequently, it can be concluded that, since the gamification applications need to appeal to and drive the behaviour of a great variety of users/players, their funware design should incorporate various game

mechanics in order to trigger various motivational affordances and so, address the needs and profiles of the various users [e.g. Bartle, 1996; Kim, 2010].

ANOVA results comparing the motives of the four behavioural groups of respondents also confirm the various motivations driving these groups to use the TripAdvisor's 'play' tasks. So, in relation to the other groups: the hitchhikers are significantly more motivated to use the TripAdvisor website in order to find travel content; the socialisers are significantly more motivated to use TripAdvisor in order to interact with others; while the individualists are significantly more motivated to contribute content on the website in order to increase their status/profile. Hence, the findings confirm again the need to match the motivational affordances triggered by the various game mechanics with the behavioural types and motivational profiles of the gamification users [Bartle, 1996; Hamari *et al*, 2014; Kim, 2010; Yee, 2002].

The ANOVA results suggest that the four behavioural groups of respondents do not significantly differ in terms of the level of flow, enjoyment and task involvement experienced by the users, except of some differences in two items. Specifically, the socialisers reported significantly higher values for the items "enjoyable" and "It is stimulating to use the TripAdvisor's website". This might be attributed to the fact that the majority of the socialisers are also users of the Facebook gamified application <Table 5>, which, as it was previously discussed, can make the interface and the usage of the TripAdvisor website more stimulating and enjoyable, because it allows the users to filter and customise the website content according to the activity and the content contributed by their Facebook friends.

Overall, since the four behavioural groups do

not significantly differ in terms of the experienced level of flow, enjoyment and task involvement, this means that the type and pattern of use of the gamified tasks do not significantly influence the users' psychological outcomes. Thus, the findings suggest that any type of fun-

ware can create good gameful experiences (in terms of users' experienced flow, enjoyment and task involvement) provided however that it uses game mechanics that can trigger the motivational affordances that match and meet the profiles and needs of the gamification users.

<Table 7> Association between the Users' Behavioural Outcomes (Behavioural Groups of TripAdvisor Users) and the Users' Psychological Outcomes (F, ANOVA)

	Cluster 1: Individualist/ achievers	Cluster 2: Socialisers	Cluster 3: Critics/ Killers	Cluster 4: Hitchhiker/ explorers
<b>Perceptions towards game mechanics</b>				
Sharing my travel experience with others makes me happy				
Increasing my performance on the TripAdvisor (e.g. by gaining points, badges or compliments) makes me happy	3.026**			
The allocation of points/badges/compliments is comprehensive				
Increasing my performance on the TripAdvisor (e.g. by gaining points, badges or compliments) enhances my motivation to contribute travel content on the TripAdvisor's website				
I check my performance (e.g. scorecard/badges/reviews' ratings) on TripAdvisor very often				
Getting low ratings to my travel reviews makes me feel less happy				
Improving my scorecard results makes me feel happy	2.848*			
Improving my scorecard results increases my motivation to contribute more content on the TripAdvisor's website	4.042**			
The calculation of the scorecard results is comprehensive				
Getting low ratings to my travel reviews lowers my motivation to contribute content on the TripAdvisor website				
I check my performance (e.g. ratings, points, badges and scorecard results in my TripAdvisor profile) very often	3.836**			
Reading the content/activity of others on TripAdvisor's website makes me happy				4.728*
Reading the content/activity of others on TripAdvisor's website increases my motivation to contribute more travel content				
Interactions with others on the TripAdvisor's website makes me happy		3.937***		
Interactions with others increases my motivation to contribute more travel content**				
Enhancing my travel profile on TripAdvisor makes me happy				
Enhancing my travel profile on TripAdvisor motivates me to contribute more content on my 'Travel Map'	4.048**			
<b>Motives for using TripAdvisor website</b>				
Find travel content - knowledge				3.371***
Gain rewards (e.g. points/badges etc.)				
Fun/entertainment				
To interact with other travellers		4.003**		
To increase my status/profile by showing off my travel experience/knowledge	2.372**			
To help others				
To become affiliate with a travel community				
<b>Flow</b>				
Time passes quickly for me				
I feel content				
I think of other things when contributing travel content online				
I am distracted from writing				
<b>Enjoyment</b>				
Enjoyable		2.946*		
Exciting				
Fun				
<b>Task involvement</b>				
It is enjoyable to use the TripAdvisor's website				
It is interesting to use the TripAdvisor's website				
It is stimulating to use the TripAdvisor's website		3.004**		
It is exciting to use the TripAdvisor's website				

\* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001.

#### IV. Conclusions, Implications, Limitations and Ideas for Future Research

Despite the growing academic and industry interest in gamification, research examining the business impacts of gamification is scarce. This study aimed to fill in this gap by investigating the application and the effectiveness of gamification within a specific tourism environment, because the impact of gamification heavily depends on its implementation context. To that end, the paper reviewed the concept of gamification and explored the principles and the theories that need to be considered for designing effective funwares. The applicability, verification and implications of this theory were also shown by analysing how TripAdvisor has designed its funware in order to implement gamification and trigger positive users' behavioural (i.e. use of website tasks) and psychological outcomes (i.e. flow, enjoyment and task involvement) that support the success of its business model.

Specifically, in order to examine the effectiveness of the TripAdvisor's funware to implement gamification in an appropriate way, the study also collected primary data from users of the gamified TripAdvisor website. The findings confirmed the influence of the TripAdvisor's funware on the users' psychological and behavioural outcomes. The findings also provided evidence of the theory advocating the ability of the various types of game mechanics to trigger various motivational affordances and so, to appeal and drive different outcomes to various gamification users. Specifically, the findings confirmed the need to match the game mechanics, and the motivational affordances that the

latter generate, with the profiles and the types of the gamifications users in order to ensure that the funware can lead to positive users' behavioural and psychological outcomes. The findings also verified the theories (e.g. situational relevance, SDT and motivational affordances) advocating that the funware designs that adopt a user-centred design (by allowing the users to select and customise the game mechanics to their own needs and values) can create more meaningful motivational affordances to the users, which in turn can lead to greater users' psychological and behavioural outcomes. Overall, the results provide very useful implications for gamification designers and researchers alike in relation to how to design effective funwares that enable and foster gamification engagement flow (i.e. chain of effects).

However, because of the context specificity of the study, its findings are confined within the implementation of gamification in an e-commerce tourism environment. Thus, future research should aim to replicate and refine the present findings by conducting studies in other contexts, industries and gamification contexts (e.g. gamification supporting various business operations such as, open innovation, suppliers' relation, e-learning). Future studies can also further investigate the users' behavioural impacts that the various game mechanics can generate by identifying and looking into the specific 'play' tasks that various types of gamification users enjoy being engaged with. In this vein, future studies could aim to address the following questions: what type of gamified social actions and play tasks [similar to Kim, 2010] can be designed in order to appeal to various types of gamification users? What is the impact of these

social actions on the psychological outcomes experienced by the gamification users? Are some social actions more effective in generating users' outcomes in specific gamification contexts or not? Future gamification research should also investigate the impact of various contextual variables (e.g. users' culture, personalities and lifestyles, device or platform used for using gamification, e.g. smart phone or PC) on the design of funwares and their effectiveness to generate business benefits. For example, future re-

search can aim to answer the following questions: is there any relation between the players' game profiles and their personalities and cultural profiles? Does a match between the players' profile in the game and their profile in the real life influence the ability of a funware to lead to positive users' psychological and behavioural outcomes (i.e. is the effectiveness of gamification dependent on the ability of the funware to achieve a congruence between the users' personality in the game and in the real life)?

### ⟨References⟩

- [1] Amabile, T.M., "Motivational synergy: Toward new conceptualization of intrinsic and extrinsic motivation in the workplace," *HRM Review*, Vol. 3, No. 3, 1993, pp. 185-201.
- [2] Aparicio, A.F., Vela, F.L., Sanchez, J.L.G., and Montes, J.L., *Analysis and application of gamification*. Interaccion'12, Oct 3-5, 2012, Elche, Alicante, Spain, 2012.
- [3] Bartle, R., "Hearts, clubs, diamonds, spades: players who suit muds," *Journal of MUD research*, Vol. 1, No. 1, 1996, p. 19.
- [4] Bartle, R., "Virtual worlds: Why people play," *Massively Multiplayer Game Development*, Vol. 2, 2007, pp. 1-16.
- [5] Chan, E. and Vorderer, P., Massively multiplayer online games. In P. Vorderer and J. Bryant (Eds.), *Playing video games: motives, responses, and consequences* (pp. 77-88). Hillsdale, NJ: Erlbaum,
- [6] Cheong, C., Cheong, F., and Filippou, J., Quick Quiz: A Gamified Approach for Enhancing Learning. In Proceedings of Pacific Asia Conference on Information Systems, June 18-22, 2013, Jeju Island, Korea.
- [7] Companion, M. and Sambrook, R., "The influence of sex on character attribute preferences," *CyberPsychology and Behavior*, Vol. 11, No. 6, 2008, pp. 673-674.
- [8] Cook, D., What are game mechanics?. lostgarden.com, available online at <http://lostgarden.com/2006/10/what-are-game-mechanics.html> [accessed: 26/3/2008], 2006.
- [9] Cramer, H., Ahmet, Z., Rost, M., and Holmquist, L., Gamification and location-sharing: some emerging social conflicts. In proceedings of the international conference of the ACM on Computer-Human Interaction, 7-12 May, 2012, Vancouver, Canada, 2011.
- [10] Crawford, C., *Art of computer game design*. Berkeley, CA: Osborne/McGraw Hill, 1982.
- [11] Csikszentmihályi, M., *Flow: The Psychology of optimal experience*. Harper Collins, NY, 1990.
- [12] Daniels, M., Businesses need to get in the game, Marketing Week. <http://www.marketingweek.co.uk/disciplines/market-research/opinion/businesses-need-to-get-in-the-game/3018554.article>, 2010.
- [13] Deci, E.L. and Ryan, R.M., *Intrinsic motivation and self-determination in human behavior*.

- Plenum Press, New York, 1985.
- [14] Deci, E.L., Koestner, R., and Ryan, R.M., "A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation," *Psychological Bulletin*, Vol. 125, No. 6, 1999, pp. 627-68.
- [15] Deterding, S., Dixon, D., Khaled, R., and Nacke, L., From game design elements to gamefulness: defining gamification. Proceedings of the 15th International Academic MindTrek Conference: Envisioning Future Media Environments, September 28-30, 2011, Tampere, Finland, ACM, pp. 9-15.
- [16] Deterding, S., Sicart, M., Nacke, L., O'Hara, K., and Dixon, D., Gamification. using game-design elements in non-gaming contexts. *Proceedings of CHI Abstracts*, 2011, pp. 2425-2428.
- [17] Domínguez, A., Saenz-de-Navarrete, J., de-Marcos, L., Fernández-Sanz, L., Pagés, C., and Martínez-Herráiz, J.J., "Gamifying learning experiences: Practical implications and outcomes," *Computers and Education*, Vol. 63, 2013, pp. 380-392.
- [18] Ducheneaut, N., Yee, N., Nickell, E., and Moore R.J., Alone together?: exploring the social dynamics of massively multiplayer online games. In Proceedings of the SIGCHI conference on Human Factors in computing systems, ACM, 2006, pp. 407-416.
- [19] Flatla, D., Gutwin, C., Nacke, L., Bateman, S., and Mandryk, R., Calibration Games: making calibration tasks enjoyable by adding motivating game elements. UIST 2011, S.Barbara, California ACM, 2011, pp. 403-412.
- [20] Füller, J., Mühlbacher, H., Matzler, K., and Jawecki, G., "Consumer empowerment through Internet-based Co-creation," *Journal of MIS*, Vol. 26, No. 3, 2009, pp. 71-102.
- [21] Fullerton, T., Swain, C., and Hoffman, S., Game Design Workshop: Designing, Prototyping, and Playtesting Games. Focal Pr, 2004.
- [22] Gartner, Gartner's 2011 hype cycle special report evaluates the maturity of 1,900 technologies. <https://www.gartner.com/it/page.jsp?id=1763814>, 2011.
- [23] Gustafsson, A. and Bång, M., Evaluation of a pervasive game for domestic energy engagement among teenagers. Proceedings of the 2008 International Conference on Advances in Computer Entertainment Technology, December, 2008, Yokohama, Japan, ACM, 2008, pp. 232-239.
- [24] Hamari, J. and Eranti, V., Framework for designing and evaluating game achievements. In Proceedings of DiGRA 2011: Think Design Play, September 14-17, 2011, Hilversum, The Netherlands, 2011, pp. 122-134.
- [25] Hamari, J., "Transforming Homo Economicus into Homo Ludens: A Field Experiment on Gamification in a Utilitarian Peer-To-Peer Trading Service," *Electronic Commerce Research and Applications*, Vol. 12, No. 4, 2013, pp. 236-245.
- [26] Hamari, J., Koivisto, J., and Sarsa, H., Does Gamification Work?-A Literature Review of Empirical Studies on Gamification. In *proceedings of the 47th Hawaii International Conference on System Sciences*, Hawaii, USA, January 6-9, 2014.
- [27] Huotari, K. and Hamari, J., Defining gamification: a service marketing perspective", In Proceedings of the 16th International Academic MindTrek Conference, October 3-5, 2012, Tampere, Finland, ACM, 2012, pp. 17-22.
- [28] Kim, A.J., Designing the player journey, <http://www.slideshare.net/amyjokim/gamification-101-design-the-player-journey>, 2010.

- [29] Lazzaro, N., Chasing wonder and the future of engagement. [www.slideshare.net/NicoleLazzaro/chasing-wonder-and-the-future-of-engagement](http://www.slideshare.net/NicoleLazzaro/chasing-wonder-and-the-future-of-engagement), 2011.
- [30] Lee, J. and Hammer, J., "Gamification in Education: What, How, Why Bother?," *Academic Exchange Quarterly*, Vol. 15, No. 2, 2011.
- [31] Lombard, M. and Ditton, T., "At the heart of it all: the concept of presence," *Journal of Computer-Mediated Communication*, Vol. 3, No. 2, 1997.
- [32] McCullers, J.C., Issues in learning and motivation. In (Lepper, M.R.; Greene, D., (Eds.), *The Hidden Costs of Reward*. Erlbaum, Hillsdale, 1978, pp. 5-18.
- [33] Nicholson, S., A User-Centered Theoretical Framework for Meaningful Gamification. Paper Presented at *Games+Learning+Society 8.0*, Madison, WI, 2012.
- [34] Pavlus, J., The Game of Life. *Scientific American*, Vol. 303, 2010, pp. 43-44.
- [35] Reeves, B. and Read, J.L.(2009, *Total engagement: using games and virtual worlds to change the way people work and businesses compete*. Harvard Business School Press
- [36] Robertson, M., Cant play, wont play. <http://www.hideandseek.net/2010/10/06/cant-play-wont-play/> [accessed 21 August 2013], 2010.
- [37] Shneiderman, B., "Designing for Fun: How Can We Design User Interfaces to Be More Fun?," *Interactions*, Vol. 11, No. 5, 2004, pp. 48-50.
- [38] Sigala, M., The application and impact of gamification funware on trip planning and experiences: the case of TripAdvisor's funware. *Electronic Markets: The International Journal of Networked Markets*, 2015.
- [39] Toubia, O., "Idea generation, creativity, incentives," *Marketing Science*, Vol. 25, No. 5, 2006, pp. 411-425.
- [40] Viola, F., *Gamification I videogiochi nella vita quotidiana*, published by Arduino Viola, 2011.
- [41] Von Ahn, L. and Dabbish, L., Designing Games With a Purpose. *Comm. ACM*, 2008, pp. 58-67.
- [42] Webster, J. and Watson, R.T., "Analyzing the past to prepare for the future: writing a literature review," *MIS Quarterly*, Vol. 26, No. 2, 2002, pp. xiii-xxiii.
- [43] Witt, M., Scheiner, C., and Robra-Bissantz, S., Gamification of Online Idea Competitions: Insights from an Explorative Case. *INFORMATIK 2011. Proceedings of the Jahrestagung der Gesellschaft für Informatik*, 4.-7.10.2011, Berlin, 2011.
- [44] Wu, M., Sustainable gamification: Playing the game for the long haul. <http://lithosphere.lithium.com/t5/Building-Community-the-Platform/Sustainable-Gamification-Playing-the-Game-for-the-Long-Haul/ba-p/33601>, 2011.
- [45] Xu, F., Weber, J., and Buhalis, D., Gamification in Tourism. In *Information and Communication Technologies in Tourism 2014* (pp. 525-537). Springer International Publishing, 2013.
- [46] Yee. N., Facets: 5 motivation factors for why people play mmorpgs. [www.nickyee.com](http://www.nickyee.com) [21/09/2013], 2002.
- [47] Yee, N., "Motivations for play in online games," *Cyberpsychology and Behavior*, Vol. 9, No. 6, 2006, pp. 772-775.
- [48] Zichermann, G. and Cunningham, C., *Gamification by design: Implementing game mechanics in web and mobile apps*, Sebastopol, CA, O'Reilly Media, 2011.
- [49] Zichermann, G. and Linder, J., *Game-based marketing: inspire customer loyalty through rewards, challenges, and contests*. Wiley, 2010.

◆ About the Authors ◆



Marianna Sigala

Marianna Sigala is Associate Professor at the University of the Aegean, Greece. Prior to her current position she lectured at the Universities of Strathclyde and Westminster in the UK. She also has professional hospitality industry experience. Her interests include service management, Information and Communication Technologies (ICT) in tourism and hospitality, and e-learning. Her work has been published in several academic journals, books and international conferences. She is currently the editor of the journal *Managing Service Quality* and the *Journal of Hospitality & Tourism Cases*. She is a past President of EuroCHRIE and has served on the Board of Directors of I-CHRIE, IFITT and HeAIS.

Submitted : September 05, 2014

1st revision : January 08, 2015

Accepted : February 18, 2015