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1 **Serious Games and the Gamification of Tourism**

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4 **Abstract**

5 Gamification has become a focus of attention in an increasing number of fields
6 including business, education, and health care. Through a wide range of applications
7 and support functions, its potential for the tourism industry is significant.
8 Gamification of tourism can contribute to a more rewarding interactions and higher
9 level of satisfaction, as well as increase brand awareness and loyalty to the destination.
10 As one of the first attempts to conceptualise gamification of tourism, this paper
11 examines gaming in general terms and the application of it in specific tourism fields.
12 It identifies game design elements that can contribute to a meaningful gamification. A
13 few cases of best practices are presented to show how this innovative concept can
14 benefit tourism marketing. Implications for tourism marketing and management are
15 discussed as well as future research recommendations.

16 **Keywords:** gamification, serious games, engagement, loyalty, tourism experiences

17 **1 Introduction**

18 Persuasive computing technology has become popular in our daily lives (Bogost,
19 2007; Shuib, Shamshirband & Ismail, 2015). Serious games, as a type of persuasive
20 technology, are computer/video games with a set of cognitive design properties to
21 focus on changing user behaviour and transferring knowledge, instead of the mere
22 entertainment function of traditional games (Ghanbari, Simila & Markkula, 2015).
23 They are widely used in training, medical applications and leisure activities in the last

24 decade (Oinas-Kukkonen & Harjumaa, 2008). Researchers (Xu et al., 2015, P2)
25 suggest they could “collect information about consumers, determine behaviour
26 patterns, thought processes, priorities and interests, the aims of these games usually
27 include using gaming technologies and methodologies to engage users at a deeper
28 level and to improve their experiences”. After reviewing 143 papers on games and
29 serious games, Boyle et al. (2016) claim serious games often relate to knowledge and
30 skill acquisition and lead to better performance.

31

32 The popularity of video games in the past decade, empowered by the rapid
33 development of smart mobile devices, allowing mobile experiences (Gentes, Guyot-
34 Mbodji & Demeure, 2010) and vibrant on site communication, has made gaming
35 popular and attractive to a broader group of players. Recently, serious games and the
36 application of game elements have drawn a great attention from different fields,
37 including education, health, and tourism, motivating its adoption in a non-gaming
38 context (Xu, Weber & Buhalis, 2014). The recent 5 years has seen the spread of the
39 terminology ‘gamification’ (Epstein, 2013). It usually refers to the application of
40 game mechanism outside its original domain (Deterding et al., 2011). Through a wide
41 range of applications and support functions, its potential for business is significant,
42 such as engaging customers in experiential co-creation and training service providers
43 for innovative processes and functions.

44

45 Seaborn & Fels (2015 p16) state that gamification has its “roots in marketing
46 endeavours”. For example, loyalty cards, stamp books, competition and reward

47 membership, are early approaches as customers can collect points to exchange for
48 presents and gifts. Foursquare partners with some restaurants to redeem game players'
49 virtual rewards or check-ins into free cupcakes and drinks (Frey, 2012). WTM (2011)
50 states gamification is spreading to the travel industry and predicts it to be a popular
51 future trend for travel industry. Research on gamification is emerging with only a few
52 academic papers discussing the use of gamification for marketing and service industry
53 (Huotari & Hamari, 2012; Lucassen & Jansen 2014; Xu et al., 2014). Academic
54 research on the use of gamification in tourism context is still limited with only a few
55 exemptions (Xu et al. 2014; Correa & Kitano 2015; Negruşa et al. 2015; Sigala
56 2015a). The recently published book on 'gamification in tourism' (Bulucea & Egger,
57 2015) is a welcome addition to the theoretical development.

58 The aim of this study is to investigate how gamification could support tourism
59 marketing. The objectives of this paper therefore include: 1) systematically review the
60 concept of gamification; 2) explore game design elements that are applicable in the
61 tourism industry; 3) review best case practises on the adoption of gamification in the
62 tourism industry; 4) discuss the benefits of gamification for tourism marketing.

63

64 In order to investigate how gamification can benefit tourism marketing, this research
65 has been conducted with an exploratory research nature based on mini case studies. A
66 case study is a research strategy which usually studies one or multiple cases, often
67 used when research is still in its early formative stage (Punch 2005). Gamification is a
68 new research field with multidisciplinary attention, although some scholars have
69 focused on this topic, this field is still new. In addition, this field is typically

70 characterised by the constant change in innovation and technology (Boes, Buhalis
71 &Inversini 2015). Therefore, the case study method enables researchers to gain
72 knowledge and to explore how the established cases use gamification for tourism
73 marketing. A multiple case study research strategy has been used (Yin 1994) as it
74 enables a more general overview of the results (Bonama 1985).

75

76 From Feb, 2014 to April, 2014, the researchers used search engine Google
77 (google.co.uk) and Android (UK market) and Apple (UK market) app stores, and
78 academic resources (Elsevier dataset) to check tourism/tourist games. Key words
79 ‘tourism game’, ‘travel game’, ‘gamification’ ‘tourism gamification’ ‘location based
80 game’ ‘treasure hunt game’ ‘augmented reality game’ ‘gamified app’ were used. Then
81 a careful screening of each game/app was carried out, only those related to
82 tourists/tourism games were saved. A content analysis was used for the case studies.
83 A coding scheme is developed based on the analysis of secondary research on
84 gamification and gaming elements. Each game was then coded by each researcher
85 respectively based on the coding scheme. There was no obvious disparity at this stage
86 and any ambiguity was discussed between the researchers. Key gaming elements were
87 identified for each case. This process is followed by a cross-case examination and
88 within-case examination along with literature review to develop coding clusters and to
89 support external validity. From the final results, best practices are based on the
90 following criteria: 1) respond not only to the extrinsic elements but also to the
91 intrinsic elements; 2) use at least three gaming mechanism; 3) been awarded best
92 gamification application or recommended by other researchers.

93 This paper starts with a discussion of the gaming theories, the concept of games,
94 serious games and gamification, game design elements and framework. The second
95 part includes how gamification has been used in the tourism context with case
96 practises to explain how gamification may benefit tourism marketing. Finally, the
97 paper ends up with a conclusion and possible research direction in the future.

98 **2 Gamification Theory**

99 **2.1 The Concept of Games**

100 Avedon & Sutton-Smith (1971) conclude game features include: voluntary
101 participation, having certain rules, different parties may have conflicts and usually
102 generate unequal results. Although different definitions have been used, researchers
103 agree a set of game characteristics can be used to define games, such as rules,
104 uncertain outcomes, conflict etc. (Juul, 2003; Salen & Zimmerman, 2004). After
105 reviewing several definitions of games, Seaborn & Fels (2015 p16) summarize that
106 the characteristics of games usually include “rules, structure, voluntary play, uncertain
107 outcomes, conflict, representation, resolution, etc.”. Rules build up boundaries and
108 set up instructions of game play (Huizinga, 2000). Conflict includes both competition
109 and cooperation between different parties and the game system itself (Xu et al., 2014).
110 The uncertain outcome refers to winning, losing or scoring against the game goals or
111 other players (Crawford, 2011; Reiser, 2012). Some games include an element of luck
112 as a random value determining next movement of the process, while other games are
113 driven by preference, knowledge, skill or collaboration between different players.
114 Gaming can be very addictive as players are motivated to reach a higher goal, to score

115 points against each other and gain either material or non-material gains such as
116 inclusion to the hall of honour (McGonigal, 2011).

117 **2.2 Conceptualizing Gamification**

118

119 Although there is no universal definition of gamification, Deterding et al.'s (2011)
120 definition is widely accepted that refers gamification as contextualizing game design
121 outside its original domain. Zichermann & Cunningham (2011) suggest gamification
122 is to establish brand, engage users and influence their behaviour by using game
123 mechanics in areas other than traditional gaming context. As Deterding et al. (2011,
124 p10) suggest "gamification involves applying elements of gamefulness, gameful
125 interaction, and gameful design with a specific intention in mind". For example,
126 designing a treasure hunt in a tourism destination will help visitors to explore various
127 areas and to collect points, photos, memories and experiences but may not have
128 winners or losers. Seaborn & Fels (2015 p16) further explain "gamefulness refers to
129 the lived experience, gameful interaction refers to the objects, tools and contexts and
130 gameful design refers to the practice of crafting a gameful experience". The end result
131 of gamification may or may not be a fully-fledged game and players may use it in a
132 different way. Gamification is more about motivating people to take actions
133 (Deterding et al., 2011) perhaps in a structured way and follow specific rules to
134 achieve variable outcomes. Games are more about fun and entertainment, although
135 they share the same concept of funware (Azadegan & Riedel, 2012). However,
136 Seaborn & Fels (2015) argue that sometimes it is not easy to identify game elements.
137 Therefore, it is inevitable to subjectively differentiate a fully fledged game and a
138 gamified system which uses some game mechanics but not to create a whole game.

139 Nevertheless, gamification differs with games at the purpose of play. Gamification
140 focuses on changing players' behaviour, engagement with their environment and co-
141 players who may also be fellow customers or service providers towards achieving
142 meaningful interaction and engagement and potentially achieve rewards. In contrast,
143 games focus more on entertainment and pleasure.

144 Alternative terms have also been used to gamification, such as 'game based learning',
145 'serious games' or 'pervasive games' (Bogost 2007; Kapp, 2012). This also makes it
146 difficult to differentiate the concept of 'games' and 'gamification'. Serious games
147 often focus on changing behaviour and influence the user. Researchers consider those
148 serious games as 'alternative reality games' (McGonigal, 2011) due to the fact that
149 reality has been added into the fantasy world (Seaborn & Fels, 2015). The incoherent
150 use of the terminology needs more academic clarity, particularly on how to
151 differentiate gamified systems and fully-fledged games.

152 **2.3 Theoretical Foundation of Game Design Elements**

153 The MDA model (Mechanics-Dynamics-Aesthetics) can be used to explain game
154 design from a systematic point of view (Hunicke et al. (2004). It divides game
155 systems by breaking them into three different components, *Mechanics*, *Dynamics* and
156 *Aesthetics*, which work together to create functional and hedonistic value of the game
157 play and influence player's experience.

158 Hunicke et al. (2004) define game mechanics as game tools which describe the
159 specific components, which usually include achievements, collections, badges etc.
160 Game dynamics connect the player with the system, such as the freedom of making

161 choices, progression to the next level, team work or competition with other players.
162 Serious games include competitions against other players as part of the gaming
163 experience whilst often concentrate on individual experience. Game dynamics work
164 together to create a meaningful game experience, or in other words, aesthetics
165 (Werbach & Hunter, 2012). Aesthetics describe emotional responses from the player,
166 such as feelings (fantasy, sensation), emotions, and fun. The MDA works together
167 towards the range of meaningful game experiences. Players experience game play
168 from aesthetics which is influenced by game dynamics, which in effect is guided by
169 game mechanics. From another point of view, through a set of carefully designed
170 game mechanics, game designers can create the game dynamics, which will in turn
171 generate unique game experiences for players. See Table 1.

172 INSERT TABLE 1 NEAR HERE

173

174 Game dynamics, mechanics and components constitute game elements (Werbach &
175 Hunter, 2012; Seaborn & Fels, 2015). A set of game elements have been proposed by
176 Cunningham & Zichermann (2011) such as presents, collection, achievement, team
177 work, feedback etc. However, these mechanics have been criticised by other
178 researchers about whether they are crucial (Bogost, 2011; Robertson, 2010). Some
179 researchers confirm achievements, avatars, badges, leader boards, levels, points, team
180 working, unlocking and virtual goods are common game elements (Robertson, 2010;
181 Bogost, 2011; Xu et al. 2014). Yee (2006) put gaming elements into three groups,
182 namely behaviour, feedback and progress. Due to different types of games, some

183 components may be more powerful than others (Werbach & Hunter, 2012; Xu et al.,
184 2014; Seaborn & Fels, 2015).

185

186 However, some researchers state extrinsic gaming elements, such as points, badges
187 and other rewards may de-motivate people. Zichermann (2011) points out some
188 commonly used rewards, such as money, can de-motivate the player. Moreover,
189 Werbach & Hunter (2012) criticise rewards may increase short term activity, while
190 intrinsic motivation contributes to long term engagement and enjoyment. Hamari
191 (2013) reports that extrinsic motivation such as reward has no effect on increased
192 playing activity. Researchers suggest both intrinsic and extrinsic motivation need to
193 be considered to create a meaningful gamification experience.

194 **2.4 User input in gamification**

195 User Centred Design (UCD) approach is a widely used approach in game design. It
196 considers the end user's needs and wants, identifies the player's interests,
197 emphasizing user involvement in the design process (Norman, 1988; Nicholson,
198 2012). Emphasizing user input, the carefully designed gamification system should
199 identify the individual player's needs, wants, abilities and limitations, and lead to the
200 change of player's behaviour.

201 The intrinsic motivation of game play refers to playing games for the pure enjoyment
202 of game play (Ryan & Deci, 2000) and for the hedonistic value of game play.
203 Successful gamification should address this intrinsic motivation by using game
204 mechanics to respond to the players' inner call, attracting them to the pure enjoyment

205 of the activities; to the hedonic function rather than the utilitarian function of gaming.
206 Holbrook & Hirschman (1982) propose that goods and services have both utilitarian
207 and hedonic functions. From a marketing point of view, consumers can be divided
208 into two groups: 1) people who look for the utilitarian function of the product; 2)
209 people who search for hedonic value of the product, such as fun, enjoyment, fantasy
210 feelings and sensory simulation. Utilitarian functions focus on what the product does,
211 whereas, the hedonic function represents the aesthetic, intangible and subjective
212 aspects of consumption. Meaningful gamification focuses on the hedonic function of
213 gaming, addresses the intrinsic motivation of a person, leading to deep engagement
214 and great satisfaction (Deci, Koestner & Ryan, 1999; Schell, 2008; Ryan, 2012).
215 Zichermann (2011) suggests that both intrinsic and extrinsic motivation should be
216 considered in gamification and both monetary and non-monetary incentives should be
217 used. To achieve a deep engagement and high satisfaction, gamification needs to
218 respond to the players' inner call (Nicholson, 2012).

219 Three groups of intrinsic rewards have been identified according to self-determination
220 theory (Ryan & Deci, 2000): namely relation, competence and autonomy (Schell,
221 2008; Deterding, 2011; McGonigal, 2011).

222 1) Relation involves interacting and connecting with other players (Schell, 2008;
223 Deterding, 2011). Groups, messages, blogs, chat, connection to social networks are
224 usual representations of relation (McGonigal, 2011). In the tourism context, 'relation'
225 associates with socialization as an important motivation for tourists (Pearce & Lee,
226 2005). Tourists go on holiday to socialize with friends and family, to develop new
227 friendship and share their experiences or memories with friends connected via internet.

228 This is similar with the intrinsic reward of ‘relation’ in gaming experiences. Players
229 can interact with co-players and share their playing experiences with connected
230 friends in the gamification system.

231 2) Competence usually includes game player’s feeling of having the ability to master
232 the system and achieving goals, such as instant feedback, progression, leader boards
233 and levels (Csikszentmihalyi, 2008). Similarly, tourists’ leisure motivation also
234 includes challenge and mastery (Beard & Ragheb, 1983). Tourists go on adventure
235 holidays to look for self-challenge and tourists go on special holidays to learn new
236 skills and abilities. Through gamification, tourist players can also gain competence
237 virtually and have the feeling of achievement in the gamified system.

238 3) Autonomy is the personal will to action, such as the use of avatars in games (Schell,
239 2008; McGonigal, 2011).

240

241 Table 2 summarizes the extrinsic and intrinsic gaming elements.

242

243 INSERT TABLE 2 NEAR HERE

244 **2.5 Gamification Design Framework**

245 Aparicio et al. (2012) develop a framework of gamification using those intrinsic
246 motivational forces. They suggest four steps, 1) identify the reasons of using
247 gamification; 2) find out what intrinsic motivation can be addressed; 3) identify useful
248 game elements; 4) consider evaluating the framework in applied system. However, as
249 Seaborn & Fels (2015) point out the framework has not been applied yet, therefore,

250 more research work is needed. Burke (2014) proposes ‘player experience design
251 process’ which consists of seven steps, namely 1)business outcomes and success
252 metrics; 2)potential user; 3) player goals; 4)engagement model; 5)play space and
253 journey; 6) test; 7) repeat. Werbach & Hunter (2012) suggest a design framework
254 with Define-Delineate-Describe-Devise-Deploy. Yet, the above mentioned
255 frameworks have been criticised by Bulencea & Egger (2015) as they argue that
256 gamification design should not be a linear process. They argue (p58) “It should rather
257 be a multi-stage design approach that aims to enhance experiences as the nature of
258 experience design process is non-linear and unclear”. This view is supported by Tung
259 & Ritchie (2011) that the formation of experiences is a complicated process. In
260 recognition of the complicated formation process of experiences, Huotari & Hamiri
261 (2012) argue designed experience can not be assured for everyone.

262 Nevertheless, more attention should be given in exploring the design framework of
263 meaningful gamification, particularly the application and validation of those
264 frameworks, considering the nature of tourist experiences. Research on leisure
265 experiences usually includes the following aspects: fantasy and fun (Holbrook &
266 Hirschman, 1982), escape and relaxation (Beard & Ragheb, 1983), entertainment
267 (Pine & Gilmore, 1999; Farber & Hall, 2007), novelty and surprise (Dunman &
268 Mattila, 2005). Tourist experiences are full of individual significance and can be
269 emotional and subjective (Uriely, 2005; Kim, Ritchie & McCormick, 2012).
270 Therefore, the design frameworks need to consider different dimensions of tourist
271 experiences.

272 **3 Gamification in the Tourism Context**

273 The wide use of gamification is evidenced in education applications (Denny, 2013;
274 Domoingez et al., 2013), health industry (Cafazzo et al., 2012; Hori et al., 2013),
275 business training and marketing campaign (Barata et al., 2013), sustainable behaviour
276 applications (Gnauk et al., 2012; Negrusa et al., 2015) and tourism industry (Xu et al.,
277 2014; Correaa & Kitano, 2015; Sigala, 2015a).

278

279 WTM (2011) predicts gamification as a popular trend for tourism. Chaffey & Ellis-
280 Chadwick (2012) propose gamification as an important trend for marketing. There
281 is an emerging academic attention to this topic. A new book ‘Gamification in
282 Tourism’ has just been published (Bulencea & Egger, 2015), and discusses how
283 gamification can contribute to memorable tourist experiences.

284 Vargo & Lusch (2008) introduce the customer’s role in value co-creation. Tourism
285 experiences are co-created by both the tourists and the service providers (Neuhofer,
286 Buhalis & Ladkin, 2012). Tussyadiah & Fesenmaier (2009) believe these experiences
287 can be mediated by technology. With the fast development of new technology,
288 tourists are now seeking more personal, unique and memorable experiences, which
289 require a deeper engagement and a multi-sensory stimulation. New technology such
290 as virtual reality (Gretzel & Jamal, 2009), augmented reality (Yovcheva et al., 2013),
291 offer technology mediated experiences, making experiences richer and more
292 participatory. Neuhofer et al. (2012) discuss how technology including gaming can
293 help co-create experiences, a term as ‘technology enhanced tourism experiences’. A
294 number of tourism destinations and organizations have already experienced

295 gamification for marketing, sales and customer engagement. Research on
296 gamification suggests it can influence user experiences at the following aspects: social,
297 emotional, and create an immersive experience of the user (Xu, 2011; Hamari et al.,
298 2014). Sigala (2015b p202) verifies these functions through a recent questionnaire
299 survey with users of Trip Adviser, proving that gamification can enhance tourists
300 experiences by “getting tourists immersed into a simulated travel world ”, which is
301 fantasy and fun in nature.

302

303 Gamification can benefit tourism marketing at the following areas:

304 **3.1 Raise brand awareness**

305 One of the biggest areas in tourism gamification is destination marketing. Celtek
306 (2010) discusses how games can contribute to advertising: (1) Specifically designed
307 advergames. They are created to promote the brand, aiming at the association and
308 recall of the brand (Celtek, 2010; Sigala, 2015). Irish National Tourism Development
309 Authority is the first national tourism organization to sponsor an advergame based on
310 social media (Correa & Kitano, 2015). “Ireland town” is a game based on Facebook,
311 where potential tourists can explore Ireland’s tourist attractions, complete challenges
312 based on given tasks and win trips to Ireland; (2) Integrating the brand with a live
313 game. The brand becomes part of the game (Celtek, 2010, P269). Foursquare has
314 successful partnerships with many brands, such as Starwood, Pizza Hut, which
315 promotes these brands during the game play for check-ins and share their experiences
316 via social media (Xu et al., 2014); (3) On-site advertisements refer to banners and

317 other media in games to remind users of the brand to recall a message. Research
318 suggests people who choose the brand in the game tend to make a purchase for the
319 same brand in the real world (Çeltek, 2010). This work is on car purchasing behaviour
320 and therefore further investigation is needed in the tourism context. Afshar, Jones &
321 Banerjee (2004) suggest compared with traditional forms of advertisements, mobile
322 advergames are non-intrusive, providing a good opportunity for marketing and
323 branding. Sigala (2015a) observes advergames can be easily distributed on websites
324 or mobile phones and tourists can play them repeated while travelling, fostering an
325 interaction with the brand.

326

327 The tourism industries may place specific tourism brands when designing games. In
328 fact, some games are specifically designed to raise brand awareness, to encourage
329 travellers to visit a place. The ‘Smiled Land Thailand’ game is specifically designed
330 by Tourism Authority Thailand (TAT) as part of its digital marketing strategy, based
331 on the tourism attractions of Thailand. The game aims at potential young tourists who
332 use Facebook to generate brand awareness of Thailand as a tourist destination (Fig 1)
333 and also to increase user frequency to TAT’s social networking media and mobile
334 applications. Thailand’s iconic attractions, branded restaurants and shops are set up as
335 the virtual background for players. The Brazil Quest game was launched by the
336 Brazilian Tourist Board to promote the hosting cities of FIFA (Correa & Kitano,
337 2015). The images of tourism attractions and brands in each city as well as
338 characteristics of local culture are placed in the game. Lufthansa has developed an
339 online game that allow players to view some of their destinations (Canada, Thailand,

340 Brazil) virtually and through interactive involvement players can get to know the
341 tourism attractions and their brands (Sigala, 2015b). Such an innovative way of
342 tourism marketing uses some popular gaming elements, such as avatars, rewarding,
343 gifting, sharing and fun. It also offers an opportunity for tourists to experience the
344 destination virtually. Discover Hong Kong city walk is a gamified mobile app that
345 offers city walks structured around four different topics, such as travel through time,
346 adventure in architecture, etc (Bulencea & Egger, 2015). Tourists will be encouraged
347 to take these city walks and will be awarded a stamp when they finish at least 50% of
348 their walk, which can be shared on Facebook (Stadler & Bilgram, 2016). This app is
349 one of a few mobile apps initiated by Hong Kong Tourism Board for the purpose of
350 promoting sites and encouraging tourists to visit more places in the city.

351 Insert Fig 1 Near Here.

352

353 Besides, these games can also be used as a virtual community between players to
354 communicate information about the destination. The effect of online communities can
355 not be ignored due to their influence on the ‘world of mouth’ marketing (Buhalis &
356 Law, 2008). Researchers suggest the benefits for service providers of using online
357 communities maybe include brand awareness and feedback collection (Buhalis &
358 Law, 2008). In fact, the online gaming community of ‘second life’ has been used by
359 Starwood Hotels to test their new hotel brand W- hotel as a platform to collect game
360 players’ opinions about the hotel design(Huang et al., 2013). After reviewing 10
361 advergAMES in tourism related context, Çeltek (2010) suggests the advantages of
362 using games for advertising include building brand loyalty and capturing data about

363 players, allowing understanding the preference of the customers. Although currently
364 tourism related games are still limited, Guttentag (2010) state virtual gaming
365 community might become an important form of online community in tourism
366 marketing. Gamification, as a new technological tool, could contribute to tourism
367 marketing.

368

369 Middleton, Fyall & Morgan (2009) propose experiential information can generate
370 interest in marketing. Williams (2006) and Bogdanovych et al. (2007) also suggest
371 virtual environments can provide a stimulating, entertaining and immersive
372 experience when marketing tourism destinations. The widely used technology in
373 gaming, such as virtual reality and augmented reality, provides players an opportunity
374 to get to know the destination and experience the destination in the virtual world,
375 contributing to a memorable experience, and generate visiting interests (Berger et al.,
376 2007; Hay, 2008). Therefore gamification as a form of virtual experiential marketing,
377 offers an opportunity to experience the destination virtually in an entertaining setting,
378 increases the brand awareness, provides meaningful experience to market the tourist
379 attractions and encourages deeper engagement for tourists with the destination.

380

381 **3.2 Enhance tourist experiences**

382 In recent years, tourism experiences have become a research focus. Researchers
383 believe that tourism industry should provide a multi-dimensional and multifaceted
384 experience for tourists (Ritchie & Hudson, 2009; Kim et al., 2012). Not only can
385 gamification bring a new, innovative way of marketing, raise brand awareness, but it

386 can also be used to enhance tourist on site experiences. Gamification can add to on
387 site experiences at the following areas: fantasy, immersion and fun.

388 The fantasy experiences and the freedom to act in a virtual world are important
389 motives for game players (Xu et al., 2015). In video games, the environment has been
390 used to stimulate this fantasy, for example, location, weather, and a specific season,
391 which all add to stimulate fantasy emotions (Bulencea & Egger, 2015). In a carefully
392 designed gamified system, tourists can choose their avatars and have the freedom to
393 play someone else, to enhance their fantasy experiences in a fun, and more
394 stimulating way, leading to a higher level of satisfaction.

395 Regensburg is a UNESCO World Heritage Site in Germany. In order to improve
396 tourists' active learning about the history at the destination, a mobile app 'REXplorer'
397 has been developed (Waltz & Ballagas, 2007). Using fantasy role play, tourists can
398 act as assistants to a virtual figure 'Rex' to explore the destination. Tourists, guided
399 by the mobile app, play the game whilst seeing the sights, interact with historical
400 buildings and characters. They can take pictures and receive a personalized geo-
401 referenced weblog of their walk when they finish the game (Fig.2). This game offers
402 the virtual avatar, allowing tourists to play someone else to experience Regensburg.
403 The nature of this experience becomes fantasy and personal, and adds fun to the
404 visitor. Rather than passively seeing the historical buildings, the game encourages
405 tourists to actively explore the history behind each building and attraction, to engage
406 with the destination in a fun way, offering a deeper understanding and meaningful
407 experience.

408

409 INSERT FIG 2 NEAR HERE

410

411 The concept of immersion from gaming can also be used to enhance tourist
412 experiences. McMahan (2003) defines immersion as the psychological components of
413 concentration, emotion and cognitive evaluation of the game. Takatalo et al. (2010)
414 propose immersion as an important part of the game experience. Ermi & Mayra
415 (2004) categorize three types of immersion, namely: 1) sensory immersion (the
416 stimulate of the game, such as sound); 2) challenge-based immersion (challenges and
417 abilities); 3) imaginative immersion (imagination, fantasy and empathy). In the
418 tourism literature, Pine & Gillmore (1999) explain the feeling of getting immersed
419 and emotionally attached to the environment/destination can be part of the tour
420 experiences. Kim, Ritchie & Macornic (2013) suggest tourists' immersion within the
421 destination contributes to their memorable experiences. Through the stimulating of
422 augmented surrounding environment, the virtual sound, the imaginative stories, and
423 the challenges brought by the game tasks/missions, players could immerse themselves
424 in sensory, challenge-based and imaginative immersion, which all contribute to a
425 deeper level of personal experiences.

426

427 For example, 3D technology, virtual technology and Augmented Reality as main
428 technology tools in games, can offer a stimulating and immersive experience to the
429 tourist players. Some tourism destinations offer augmented reality tours for their
430 mobile apps such as Tuscany, Hong Kong and Scotland. The pop up text, sound
431 stimulation and the virtual pictures, augmented with the surrounding environment,
432 encourages the visitor to interact with his surrounding attractions, providing an even

433 more stimulating and immersive experiences with the real environment. The
434 foundation of Hellenic World in Athens (Foundation of the Hellenic World 2016)
435 offers a 3D virtual tour to Ancient Miletus, providing an immersive experience of
436 attractions including theatre, harbour, Tholos etc. to tourists. Through this sensory
437 immersion, a gaming enhanced aesthetic experience is delivered to tourists.

438 3.3 Engagement

439 In the gaming literature, a set of gaming mechanisms work together to improve the
440 players' engagement with the game system (Ermi & Mayra, 2004). Player's high
441 engagement contributes to their game experiences (Klimmt, 2003; Jennett et al., 2008;
442 Brown & Vaughn, 2009), and the emotional enjoyment of playing leads to more
443 engagement of game play. In the marketing literature, researchers believe customer
444 engagement with the brand will improve brand loyalty (So et al., 2016). Vivek, Beatty
445 & Morgan (2012) believe a high engagement with the costumer contributes to the
446 formation of positive attitudes towards the brand. Engagement is also an important
447 dimension of co-creation in services management. The concept of co-creation
448 emphasise the role of tourists, focusing on the user involvement in the dynamic
449 design process of experiences. How to encourage tourists to engage more with the
450 destination is critical for destination competitiveness. Researchers believe that the
451 tourism industry should provide a multi-dimensional and multi-faceted experience for
452 tourists (Ritchie & Hudson, 2009; Kim et al., 2012). Experiences could happen
453 through all contact points (Hoarau & Kline, 2014). Pine & Gilmore (1999) conclude
454 four levels of engagement for tourists, such as emotional, physical, intellectual and
455 spiritual engagement, which is part of their personal experiences. Games provide a

456 means of dynamic interaction through suggested tasks/missions, and link with
457 surrounding physical locations (location based games), challenge the player virtually,
458 providing instant feedback for the player's achievements, responding to the players
459 emotions in a fun and rewarding way before, during and after trip.

460 Goecatching is a popular outdoor game based on the classic treasure hunt (Fig 3).
461 Players use GPS enabled devices (such as smart phones) to find treasure boxes on site.
462 Initially, it was not specifically designed for tourism, but now Goecatching also
463 partners with local tourism associations to create special treasure hunt tours. Based on
464 the location and description provided, players look for the hidden treasure (Bulencer
465 & Egger, 2015). Through this engagement, players are encouraged to interact with
466 the destination on site. Sighter is another location based game developed by
467 Waterways Ireland. Players select a sight, find it and snap a photo of it to win points,
468 they can unlock the sight description and discover other photos related to that sight.
469 Both games are typical location based treasure hunt games, providing a way of
470 vividly experiencing the destination, encouraging tourists to engage with the
471 destination. Linaza, Gutierrez & Garcia (2014) suggest tourists could learn about the
472 destination when they follow recommended attractions/treasure in those games, which
473 will improve their on site experiences. Involving tourism organizations can also create
474 awards such as free tickets, food and engage local enterprises in co-creation.

475

476 INSERT FIG 3 NEAR HERE

477

478 3.4 Improve customer loyalty

479 Marketing researchers suggest customer loyalty include behavioural loyalty,
480 attitudinal loyalty, and composite loyalty (Jacoby & Kyner, 1973; Jacoby & Hestnut,
481 1978). Gamification could improve loyalty programs by adding fun and relatedness,
482 bringing dynamic interactions between different players through team working,
483 sharing and between the player and the game itself through challenge and
484 achievement (Clanton, 1998; Schiano & White, 1998). By using game mechanism
485 such as points, rewards, leader board, sharing and competition, gamification can
486 respond to both behaviour and psychological needs of the customer, link to both
487 behaviour and attitudinal loyalty, stimulate a more dynamic and fun process towards
488 building behaviour loyalty, attitudinal loyalty and composite loyalty.

489

490 Airline frequent flyer programs are mainly designed to create customer loyalty by
491 offering advantages if the customer flies regularly. Air Canada has developed an
492 application ‘earn your wings’ to gamify their loyalty programs. Players could get 200
493 points with each take-off and landing when flying with Air Canada. To climb up to
494 the top of the leader board, the player needs to fly from designated airports named Pit
495 Stops (<http://earnyourwings.aircanada.com/en>). Leader board, progress bar, levels,
496 rewards, gifting and sharing are used to increase customer loyalty in this gamified app
497 (Fig 4).

498 INSERT FIG 4 NEAR HERE

499 3.5 Entertainment

500 Fun is a basic gaming element for every game. Games will bring fun and
501 entertainment to marketing (Zichermann & Linder, 2010). Games as an entertainment

502 tool, can be played before, during and after the trip. From tourists' point of view, pre-
503 trip games are mainly played to kill time, while during trip games are played to
504 enhance on site experiences particularly those location based games (Xu et al., 2015).
505 Stratford upon Avon, the hometown of Shakespeare, has developed a new app 'Eye
506 Shakespeare'. This gamified mobile app, uses augmented reality tool to provide the
507 tourists with a 3D virtual 'Shakespeare', who introduces his birth place, shows
508 tourists around and allows tourists to take a photo together with this virtual figure (Fig
509 5). Instead of traditional tour guides, this virtual figure of 'Shakespear' telling his own
510 stories is much more fun. By using some gaming elements such as reward, story
511 telling, fun, it provides tourists with a fun, interactive, and engaging experiences.

512 INSERT FIG 5 NEAR HERE.

513 3.6 Employee management

514 Gamification can also be used as employee management and training tool, an inward
515 function of gamification.

516

517 'Marriot my hotel' is a game based on Facebook launched by Marriot Hotel Group.
518 Players can play as managers of a "virtual" restaurant in the hotel,
519 (www.news.marriott.com). They can create their own restaurant, where they can buy
520 equipment and ingredients on a budget, hire and train employees, and serve guests.
521 When they proceed, they can also play other roles in the hotel. Points will be given
522 when they satisfy a customer's need. In the end, players will get rewards if they make
523 a profit ([http://news.marriott.com/2011/06/my-marriott-hotel-opens-its-doors-on-](http://news.marriott.com/2011/06/my-marriott-hotel-opens-its-doors-on-facebook.html)
524 [facebook.html](http://news.marriott.com/2011/06/my-marriott-hotel-opens-its-doors-on-facebook.html)). The aim of this game is to get people to know the operation of hotels,

525 generate interests to work in hotels, and stimulate new staff training for human
526 resources (Xu et al., 2014).

527

528 Table 3 summarizes some of the best practice cases in the tourism industry.

529

530 INSERT TABLE 3 NEAR HERE

531

532 In addition, some of the useful gaming elements have also been used in tourism
533 sectors without developing a specific game. For example, KLM uses the gaming
534 element of surprise and gifting, to deliver a surprise gift to KLM travellers using data
535 generated from Foursquare and Twitter (Bulencea & Egger, 2015).

536

537 Table 4 identifies the benefits of tourism gamification. Generally speaking, the
538 benefits of tourism gamification include two aspects: the outward function and inward
539 function of gamification. The outward function refers to tourists' experiences before,
540 during and after trip. Before the trip, tourism specific games (Online games; mobile
541 games) feed tourism information to potential tourists, generate interests, and stimulate
542 visiting inspiration. Useful tourism information may convert to sales/purchases.
543 During the trip, location based games as an entertainment tool can encourage tourist
544 engagement, enhance on site experiences. After the trip, on line games can recall
545 memories, invite friends to share experiences and advocate the destination.
546 Rewards/coupons in the game and gamified loyalty programs may encourage repeat
547 visits. The inward function of gamification mainly includes the use of games to

548 familiarize the employee, and the use for staff training programs such as in the case of
549 Marriot hotel.

550

551 INSERT TABLE 4 NEAR HERE

552 **4 Conclusion and Further Research**

553 Gamification has become a focus of attention in an increasing number of fields
554 including business, education, and health care. This paper reviews the trend of
555 gamification, systematically conceptualizes gaming and gamification in general terms
556 and in specific tourism fields. Drawn on MDA model, it identifies game design
557 elements, and discusses intrinsic and extrinsic motivational factors that contribute to
558 meaningful gamification. It recommends some of the best practises of gamification in
559 the tourism context and discusses the benefits of gamification in tourism marketing.
560 Extensive literature review demonstrates that gamification is a vital movement for
561 business in general, and it is also emerging as a future trend for tourism. A wide range
562 of tourism sectors are applying gamification into tourism marketing practices, co-
563 creating tourism experiences and training employees.

564

565 A set of gaming elements has been identified, such as, the commonly used badges,
566 rewards, points (extrinsic elements), relation, autonomy and competence (intrinsic
567 elements). As intrinsic elements respond to the players' inner call, focusing on the
568 hedonistic function of gaming, it is often found to be more influential, and will
569 contribute to a deep engagement and great satisfaction (Deci et al., 1999; Ryan, 2012).
570 Meaningful gamification should not only emphasize extrinsic elements but also focus
571 on intrinsic elements (Zicherman, 2011). Based on the self-determination theory

572 (Ryan & Deci, 2000), some design frameworks of gamification have been proposed
573 (Aparicio et al., 2012; Werbach & Hunter, 2012; Burke, 2014).

574 Through a wide range of applications and support functions, the potential of
575 gamification for the tourism industry is significant, such as engaging tourists in
576 experiential co-creation and training service providers for innovative processes and
577 functions. Gamification can be used to enhance tourist on site experiences, and also to
578 be used as an innovative marketing tool before the trip or to share experiences and
579 stimulate repeat visit after the trip. Gamification is emerging as an innovative way of
580 marketing that can attract potential tourists, build up unfamiliar tourism brands,
581 particularly for those less well known destinations. A few best practise cases show the
582 innovative concept of gamification has been widely used within the industry,
583 including Destination Management Organizations (DMOs), airlines, hotels etc..
584 Gamification of tourism can contribute to a more rewarding interactions and higher
585 level of satisfaction, as well as increase brand awareness and loyalty to the
586 destination. Based on game design elements, tourist players will experience
587 challenges, rewards, competition, story telling, fantasy, role play etc, enhancing their
588 on site experiences at the destination. The gamified system creates fun, engaging,
589 rewarding tourist experiences, contributes to a deeper engagement, understanding and
590 learning, higher satisfaction with the tourism company, establishes a fun and personal
591 experience, which contributes to increased brand awareness, built up customer loyalty,
592 and enlarged profit for the tourism company. To the tourists, the benefits of
593 gamification include both the hedonistic value of the game play, such as the
594 enjoyment and fun of playing games, and utilitarianistic value of the game, for

595 example, the tourism information provided in the game, the rewards (free tourism
596 tickets and sales coupons) generated from game play. To the tourism company, the
597 benefits also include a dynamic engagement with the customer, increased brand
598 awareness and promotion and added customer loyalty. However, gamification has its
599 own weakness and limits, for example, it usually appeals to younger generation and
600 the results of gamification maybe context specific, therefore, a careful design is
601 needed.

602

603 Nevertheless, gamification is an emerging research topic in many fields, such as
604 education, business management, marketing, health, sustainability and computer
605 science. Academic research on the application of gamification in specific tourism
606 field is still scarce. As tourism gamification is still in its infancy, only a limited
607 amount of existing research is relevant. This paper is only an exploratory research
608 that tries to conceptualize gamification in the tourism context with a few case
609 examples. Besides, gamification is involving rapidly in the industry and new games
610 and new applications are emerging everyday, such as the popularity of Pokémon GO.
611 Research on gamification of tourism needs to be constantly re-validated and a
612 continuous investigation is needed. Based on the results in the paper, the researchers
613 would like to suggest the following research directions: 1) the difference between a
614 fully fledged game and the gamified system and whether this would influence user
615 experiences; 2) the design process of gamification in the tourism context based on the
616 nature of tourist experiences; 3) the successful implication of useful gaming elements
617 in different sectors in tourism; 4) in-depth case studies and empirical research on the

618 effectiveness of gamification's influence on sales and purchase behaviour in the
619 tourism context. 5) tourists' and service providers' preference on tourism gamification
620 from a user perspective.

621

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