Study and Research of Gamification Design

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Abstract

In this article, the concept of Gamification, the new 'it' marketing technique, is identified and actual application cases of Gamification are reviewed. Moreover, this article draws out design elements of Gamification models and compares and analyzes difference between Gamification and traditional game methods based on the analyzed results. Gamification that achieves intended goal through game mechanism application to non-game fields is currently being combined and experimented in various fields and accordingly active research is under way. In the future, the prospect of well-designed Gamification development is that it will allow Gamification expansion to various fields from finance, entertainment, shopping, productivity and services to large scale collaboration, collective intelligence, and education.

Keywords: Gamification Theory, Gamification Analysis, Gamification Mechanics, Marketing

1. Introduction

Gamification is a new movement to create effect in non-game fields by applying game mechanics and game thinking that makes game fun not unlike points, level-up, ranking, achievements, competition, and reward. The idea conceived by the New Games Movement in U.S. derived and developed Gamification. Gamification takes enjoyment and attains voluntary user participation by offering problem-solving methods of fun facts. The advantage of Gamification is that it rewards accomplishment of action toward goal and task. Elements such as points, level-up, and ranking stimulates internal and external motives toward the subject matter and maintains voluntary participation[1]. Gamification is rapidly spreading since Gamification Summit & Conference in San Francisco, January 2011. According to M2 Research forecasts Gamification market will increase from $522 million (2013) to $2.83 billion (2016).

1) Techniques: Gamification techniques strive to leverage people's natural desires for competition, achievement, status, self-expression, altruism, and closure. A core gamification strategy is rewards for players who accomplish desired tasks. Types of rewards include points, achievement badges or levels,[ the filling of a progress bar, and providing the user with virtual currency. Competition is another element of games that can be used in gamification. Making the rewards for accomplishing tasks visible to other players or providing leader boards are ways of encouraging players to compete. Another approach to gamification is to make existing tasks feel more like games. Some techniques used in this approach include

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adding meaningful choice, onboarding with a tutorial, increasing challenge, and adding narrative.

2) History: Though the term "gamification" was coined in 2002 by Nick Pelling, a British-born computer programmer and inventor, it did not gain popularity until 2010. Even prior to the term coming into use, other fields borrowing elements from videogames was common; for example, some work in scientific visualization adapted elements from videogames. A Forbes blogger also retroactively labelled Charles Coonradt, who in 1973 founded the consultancy The Game of Work and in 1984 wrote a book by the same name, as the "Grandfather of Gamification". The term "gamification" first gained widespread usage in 2010, in a more specific sense referring to incorporation of social/reward aspects of games into software. The technique captured the attention of venture capitalists, one of whom said he considered gamification the most promising area in gaming. Another observed that half of all companies seeking funding for consumer software applications mentioned game design in their presentations. Several researchers consider gamification closely related to earlier work on adapting game-design elements and techniques to non-game contexts. Deterding et al., [survey research in human–computer interaction that uses game-derived elements for motivation and interface design, and Nelson argues for a connection to both the Soviet concept of socialist competition, and the American management trend of "fun at work". Fuchs points out that gamification might be driven by new forms of Ludic Interfaces. Gamification conferences have also retroactively incorporated simulation; e.g. Will Wright, designer of the 1989 video game SimCity, was the keynote speaker at the gamification conference Gsummit 2013.

In addition to companies that use the technique, a number of businesses created gamification platforms. In October 2007, Bunchball, backed by Adobe Systems Incorporated, was the first company to provide game mechanics as a service, on Dunder Mifflin Infinity, the community site for the NBC TV show The Office. Bunchball customers have included Playboy, Chiquita, Bravo, and The USA Network. In June 2009 a Seattle-based startup called BigDoor was founded, providing gamification technology to non-gaming websites. Badgeville launched in late 2010, and raised $15 million in venture-capital funding in its first year of operation; it provides gamification services to a number of large customers. InsideSales.com provides a gamification solution targeted to sales representatives using the Charles Coonradt principles that is integrated into Salesforce.com platform. IActionable also launched a gamification platform aimed at integrating with Salesforce.com. Among established enterprise firms, SAP AG, IBM, EMC, CA, Slalom Consulting, Deloitte, Microsoft, LiveOps, RedCritter and other companies have started using gamification in various applications and processes. Gamification 2013, an event exploring the future of gamification, was held at the University of Waterloo Stratford Campus in October 2013. The inaugural Loyalty Games 2014 Loyalty Gamification World Championship will be held Online with Live World Finals San Francisco.

3) Applications: Gamification has been widely applied in marketing. Over 70% of Forbes Global 2000 companies surveyed in 2013 said they planned to use gamification for the purposes of marketing and customer retention. For example, in November 2011 Australian broadcast and online media partnership Yahoo!7 launched its Fango mobile app, which TV viewers use to interact with shows via techniques like check-ins and badges. As of February 2012, the app had been downloaded more than 200,000 times since its launch. Gamification has also been used in customer loyalty programmes. In 2010, Starbucks gave custom Foursquare badges to people who checked in at multiple locations and offered discounts to
people who became mayors of an individual store. There have also been proposals to use gamification for competitive intelligence, encouraging people to fill out surveys, and to do market research on brand recognition. Gamification has also been integrated into Help Desk software. In 2012, Freshdesk, a SaaS-based customer support product, integrated gamification features, allowing agents to earn badges based on performance. Gamification has also been used as a tool for customer engagement, and for encouraging desirable website usage behaviour. Additionally, gamification is readily applicable to increasing engagement on sites built on social network services. For example, in August 2010, one site, DevHub, announced that they have increased the number of users who completed their online tasks from 10% to 80% after adding gamification elements. On the programming question-and-answer site Stack Overflow users receive points and/or badges for performing a variety of actions, including spreading links to questions and answers via Facebook and Twitter. A large number of different badges are available, and when a user's reputation points exceed various thresholds, he or she gains additional privileges, including at the higher end, the privilege of helping to moderate the site.

Gamification can be used for ideation, the structured brainstorming to produce new ideas. Historically, participants were incented in two ways: based on their individual contribution or based on the group’s collective output (a method that encourages free riding because those who do not participate are nevertheless rewarded). A research at MIT Sloan found that more and better ideas were generated when participants were rewarded according to how much their contributions inspire others, and compared it to gauging the influence of academic papers by the numbers of citations received in subsequent research.

Education and training are areas where there has been interest in gamification. Microsoft released the game Ribbon Hero 2 as an add-on to their Office productivity suite to help train people to use it effectively, which was described by Microsoft as one of the most popular projects its Office Labs division ever released. The New York City Department of Education with funding from the MacArthur Foundation and the Bill and Melinda Gates Foundation has set up a school called Quest to Learn centred around game-based learning, with the intent to make education more engaging and relevant to modern kids. SAP has used games to educate their employees on sustainability. The US military and Unilever have also used gamification in their training. The Khan Academy is an example of the use of gamification techniques in online education. In August 2009, Gbanga launched the educational location-based game Gbanga Zoooh for Zurich Zoo that asked participants to actively save endangered animals and physically bring them back to a zoo. Players maintained virtual habitats across the Canton of Zurich to attract and collect endangered species of animals. In 2014, the True Life Game project was initiated, with the main purpose of researching the best ways to apply concepts of gamification and crowdsourcing into lifelong learning.

Applications like Fitocracy and QUENTIQ use gamification to encourage their users to exercise more effectively and improve their overall health. Users are awarded varying numbers of points for activities they perform in their workouts and gain levels based on points collected. Users can also complete quests (sets of related activities) and gain achievement badges for fitness milestones. Health Month adds aspects of social gaming by allowing successful users to restore points to users who have failed to meet certain goals.

Employee productivity is another problem that gamification has been used to tackle. RedCritter Tracker, Playcall, and Arcaris are examples of management tools that use gamification to improve productivity. Digital Brand Group is the first company in India to fully gamify their work process to make their work style more engaging and encouraging.

Crowdsourcing has been gamified in games like Foldit, a game designed by the University of Washington, in which players compete to manipulate proteins into more efficient structures.
A 2010 paper in science journal Nature credited Foldit's 57,000 players with providing useful results that matched or outperformed algorithmic computed solutions. The ESP Game is a game that is used to generate image metadata. Google Image Labeler is a version of the ESP Game that Google has licensed to generate its own image metadata.[39] Research from the University of Bonn used gamification to increase wiki contributions by 62%. Experts anticipate that the technique would also be applied to health care, financial services, transportation, government, employee training, and other activities. Alix Levine, an American security consultant, described gamification as some techniques that a number of extremist websites such as Stormfront and various terrorism-related sites used to build loyalty and participation. As an example, Levine mentioned reputation scores. The Anti-Defamation League has noted that some terror groups, such as Hezbollah, have created actual games to market their ideology to adolescents.

Microsoft has also announced plans to use gamification techniques for its Windows Phone 7 operating system design. Gamification has also been applied to authentication. For example, the possibilities of using a game like Guitar Hero can help someone learn a password implicitly. Furthermore, games have been explored as a way to learn new and complicated passwords. It is suggested that these games could be used to "level up" a password, thereby improving its strength over time. Gamification has also been proposed as a way to select and manage archives. Recently, an Australian technology company called Wynbox has recorded success in the application of its gamification engine to the hotel booking process.

2. Gamification Application

According to Entertainment Software Association (ESA) 72% of U.S. households play games and have reported that those over 50 account for 29% of game players, which indicates that game is no longer for children's only. More and more people in various age groups are enjoying games in their leisure time, and game is becoming more than a play for entertainment. Gartner Group, a consulting firm, forecasted that prior to year 2014 70% of the top 2,000 companies in the world will utilize and adopt application of Gamification concept and by year 2015 more than 50% of the organizations managing innovative process will gamify their business[2].

2.1. “Samsung Nation” and “Gold Rush” Promotion of Samsung Electronics

Samsung Electronics activated consumer participation by timely applying Gamification elements such as points, score, badge, level and reward. For instance, Samsung Electronics have regularly awarded house products such as Galaxy Tab or digital cameras to those active members in the leader board, which anyone may become a member. This can be done by joining 'Samsung Nation' on the Samsung U.S. website, leaving comments after watching PR video, participating in Q&A session, or sharing product information through SNS and registering products, which gives either points or various badges. Through such strategy, Samsung Electronics have eradicated consumer resistance against product commercials and used Gamification so that members actively and voluntarily came in contact with the commercials.

2.2. Foursquare Reward System through Smart Phone App and Badges

Gamification also influences scientific world. This three-dimensional puzzle game ‘FoldIt’ of protein folding process has stimulated space reasoning capability and imagination of gamers and within 3 weeks identified protease structure that concerns AIDS and cancer generation. It suggests that the reason for solving a problem that has eluded scientific world
over a decade is due to combining "competitiveness" and "fun factors" of Gamification and bringing "collective intelligence."

2.3. Integration of Sports and App

Gamification is also bringing energy into daily lives by connecting sports. The representative example of this is the 'Nike Plus App.' Nike Plus App is a system that calculates and transmits distance ran and calories burned of a person mounting and running in a specially sensed running shoes synced with an iPod. By default it promotes social fun by using it with friends, and aids user to plan, share, and compete exercise plans through an app [5].

2.4. Fun Theory Campaign of Volkswagen

Gamification also played a role in human behavioral change. Volkswagen installed an electronic piano keyboard stairs at the subway exit for the people who rarely use the stairs. This installation plays a scale according to the level of the stairs and have lead as many as 66% of subway users to use the stairs. Under the motto of "fun will bring better behavioral change," this project is a case study of successful Gamification application that promoted people's health by using stairs while enjoying the usage.

2.5. Gamification Utilization for Social Survey

Gamification also eases data collection by increasing subject matter participation. Researchers at KAIST and Seoul National University utilized Gamification when investigating political consciousness of people. In order to obtain popularity of visitors, visitors were instructed to vote For or Against a bill that have actually been participated by an assemblyman. The method employed displayed an assemblyman who have voted closely to the result. Survey also raised curiosity of the participants by only displaying result of the choices made and a party register, not disclosing the actual name of the assemblyman for every question answered. This is a case study that suggests Gamification may become a useful tool for the social surveys by opening up the minds of modern people who are reluctant to share one's views.

2.6. Siemens "Plantville," a Recruitment System using Gamification

Some corporates discover talents through Gamification [6]. First, such attempt works because it matches prospective employees' age group, which is between the ages of 10 to 20 who generally play games. Siemens, a German engineering and electronics company, devised a game called 'Plantville' that enables Facebook users to indirectly experience infrastructure constructions. Users enjoy constructing virtual plants that provide efficient infrastructure such as employing workers and expanding systems for safety through Facebook. Different challenges are given for each type of plants and in the process, users are able to construct and manage plants, which is an indirect way of experiencing such work. Borrowing game type to promote and hire talents in a natural manner is expected to increase in the future [7].

3. Comparing Gamification Case Studies

<table>
<thead>
<tr>
<th>Service name</th>
<th>Gamification Elements</th>
<th>Beneficiary</th>
</tr>
</thead>
</table>
| **“Samsung Nation” and “GoldRush”** | **“Reward”**  
(e.g. Points, Score, Badge)  
**“Status”**  
(e.g. Level)  
**“Achievement”** | **Corporation**  
(Promotion)  
User  
(Quality of life) |
|**Smart Phone App of “Foursquare”** | **“Status”**  
(e.g. Level)  
**“Self Expression”**  
(e.g. Avatar)  
**Competition**  
**Achievement** | **Corporation**  
(Promotion)  
User  
(Quality of life) |
|**Game “Fold It”** | Competition  
**“Reward”**  
(e.g. Points)  
**Mission**  
**Interest**  
**Achievement** | **Corporation**  
(Promotion)  
User  
(Compensation)  
Society  
(Medical Science) |
|**“Nike Plus” Application** | Competition  
**Fun interest** | **Corporation**  
(Promotion)  
User  
(Health Care) |
|**Campaign of Volkswagon** | Willing participation  
**Fun interest** | **Corporation**  
(Promotion)  
User  
(Health Care) |
|**Use of Gamification for social survey** | Willing participation  
**interest** | **User**  
(Quality of life)  
Society  
(Politic) |
|**Ziemen “Plantville”** | Mission  
**Achievement** | **Corporation**  
(recruiting)  
User  
(Quality of life) |

### 4. Design elements of Gamification

This The definition of human desire in relation to Gamification is self-expression, reward, status, achievement and competition.

#### 4.1 Self-expression
Provide one's own cyber space or allow possessing avatars. Moreover use SNS or cyber space to provide area to express one's own opinion.

4.2 Reward
Provide mileage or virtual goods depending on the level of activity achievements. Otherwise, guide toward avatar growth or item purchase as a reflective means to a virtual space of the increase rate on the level of activity achievements during previous activity period. At this time, make sure to increase loyalty toward activities by instantly rewarding activity participants. In case digital device is not in use, ensure to attach badge or stickers.

4.3 Status
As players possessing level, depending on the level of activity achievements, assign level to the activists. And as done so in the guild formation for allies in game, invest into providing exclusive service group attributes that restrict the number allowed for leisure activity group participation to give recognition toward one's status.

4.4 Competition
Provide mileage or virtual goods depending on the level of activity achievements. Otherwise, guide toward avatar growth or item purchase as a reflective means to a virtual space of the increase rate on the level of activity achievements during previous activity period. At this time, make sure to increase loyalty toward activities by instantly rewarding activity participants. In case digital device is not in use, ensure to attach badge or stickers.

5. Difference between Gamification and traditional game methods
The biggest notable difference between existing game and Gamification is in the sustainability after "Engagement" and "Reward" have been made[8]. In the Gamification the method of the simplest form of "Engagement" and "Reward" such as presenting 1 free coffee after collecting 10 stamps, is now evolving to actively adopt user game pattern - getting away from the form of giving and receiving to borrowing game element in the form of play. More expansive game element has been noted in the concept of statue by utilizing such "Engagement" and "Reward." This article intends to analyze the difference between still unfamiliar Gamification and traditional methods, and to suggest Gamification method that is to be developed hereafter[9].

Table. 2 Difference between Gamification and traditional game methods

<table>
<thead>
<tr>
<th>Traditional game methods</th>
<th>Methods using Gamification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clear beginning to end of game</td>
<td>Maximizes participation level as starting a game at anywhere is possible</td>
</tr>
<tr>
<td>Importance of user and computer relationship</td>
<td>Importance of user relationship through various communications</td>
</tr>
<tr>
<td>Require contract for reward</td>
<td>Unweighted participation</td>
</tr>
<tr>
<td>Tiresome progress to the result</td>
<td>High retention/achievement due to process and reward sustainability</td>
</tr>
</tbody>
</table>
6. Prospect of Gamification

Although material results of Gamification of companies are yet incomplete it is anticipated to see Gamification utilization in more friendly and various ways than methods of numbers and diagrams. It is also anticipated to see such services spread as existing game companies are developing various and better game accessibility through opening-up and collaborating in different fields. As such Gamification development is expected to widen and in order to fully utilize such opportunity it is necessary for the Gamification business model to diversify. The current proposition of Gamification that is to seek all of its answers inside what makes game fun is still the only existing method suggested in the form of marketing[10]. However as reviewed by many case studies abroad, it is anticipated that the Gamification is to become the unavoidable general trend in the field of games in the future. Biggest

7. Conclusion

In this article, actual case studies have been analyzed by identifying and investigating concept of Gamification. Moreover, this article proposes design elements and utilization area of Gamification model from the analyzed content, and compares and analyzes it with traditional game methods. A method of increasing media viewers and content users by using Gamification elements, which is part of core game mechanism should play a vital role for the content business and content users. Consequently when a model is developed that covers these elements in the right places, it can be expected to see Gamification utilized in public knowledge growth and information collection not only in businesses related to content.

References

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Systematic Mapping Study Design. The main research questions behind this study were: "What educational contexts has Gamification been applied to?" and "What game elements have been used in gamifying educational systems?". We have used a systematic mapping with information allowing the classification of the current research and work in the field along the following dimensions: 1. Game elements.