

## Gamified Point System On Mobile Device

Boyang Liu<sup>1</sup>, Soh Masuko<sup>2</sup> and Jiro Tanaka<sup>1</sup>

<sup>1</sup>Waseda University, Fukuoka, Japan

<sup>2</sup>Rakuten Institute of Technology, Rakuten, Inc., Japan

### Abstract

Point system is the most common loyalty program methodology. Frequent customers earn points, which can be used to redeem for money off in next purchase. Customers work toward a certain amount of points to redeem their reward. However, current point system is not enough to guide reasonable consumption. In this paper, a gamified point system is put forward. Points are divided into different categories based on source. We introduce mission into point system. Mission content is designed to guide consumption. In our system, point, mission and virtual pet will be spatially visualized using AR technique. The state of virtual pet depends on the evaluation for users. Users need to adjust themselves to keep their pets in a good state.

Keywords: Interactive System, Gamification, Augmented Reality

### 1 Introduction

Point system is structured marketing strategy offered by retailers to encourage consumers to keep buying goods or paying for the services. According to the spending on consumption, retailers give consumers a certain amount of points as reward. These points can be exchanged into goods or service [1].

On May 1, 1981 American Airlines launched the first loyalty marketing program of the modern era which was called AAdvantage frequent flyer program [2]. After the success of this program, dozens of travel industry companies launched similar programs within a few years. This program is also considered as the initial modern consumer reward program.

In early part of 2010, Card Linked Offers appears as a new loyalty marketing technique for retailers, brands, and financial institutions, stemming from a rise in popularity of both coupons and mobile payment. Loyalty cards are a form of tracking and recording technology that enables retailers to collect data about their customers demographic and purchase behaviors [3].

For the purpose of inspiring customer loyalty, some ideas of game-based marketing are proposed to engage customers [4]. People play games everywhere. Frequent Flyer Programs (FFPs) and other loyalty systems prove that gaming and marketing can fuse together perfectly. Modern FFPs use a number of gaming elements to engender loyalty, including point accumulation, level climbing, rewards and challenges [4].

In this paper, we propose a gamified point system framework to engage users by using game design.

### 2 Problem

Point system relies on giving points to engage users. However, due to the reduction in the redemption rate, the attractiveness of the system goes down. In addition, users are paying more and more attention to factors other than economic value while these factors cannot be reflected in the current system.

### 3 Goal and Approach

The goal of this research is to create an interactive point system guiding multi-value consumption. We propose the idea of classifying points by their source. If points are obtained from different type of consumption, they will be classified into different category. Mission will be

incorporated into the gamified system to challenge users. The theme of the mission will cover economy, health and environmental protection. If users can complete the mission given by gamified system during the shopping, they will be rewarded. Our system is build based on AR visualization.

### 4 System Design

Compared to current point system, we add new input and output into the gamified system framework.

#### 4.1 Point

Point is visualized in our system. The source of points is reflected by the objects. As shown in the figure 1, there are three kinds of points. Each object represents one source. These three points are obtained from consumption on travel, food and book respectively.



Figure 1: Points from different source.

#### 4.2 Mission

Point is an important feedback mechanism in the current point system. It is an economic feedback. However, other important factors are ignored in current system framework. In daily consumption, factors such as health and environmental protection are also important features in consumption considerations. These factors cannot be reflected in the current point system. Therefore, mission is added into our system to remind users of other value.

#### 4.3 Pet

Pet is designed as the feedback. Pet has two important features. One is two indicators and the other is level.

Each indicator is a measure of consumption. If user gets many points, the green indicator will be high. If user gets many kinds of points, the blue indicator will be high. Two

indicators are designed to determine the current state of the pet. The spatial visualization of virtual pet is shown as Figure 2. In subgraph (a), two indicators are high and the pet looks energetic. In subgraph (b), two indicators are normal and the pet is in normal state. In subgraph (c), blue indicator is low and the pet looks unhappy. In subgraph (d), two indicators are low and the pet is exhausted.

On the side of the pet, the level information is displayed. If mission is completed, pet will get experience value. When the threshold is met, point will level up. At some specific level, the new shape of pet will unlock.

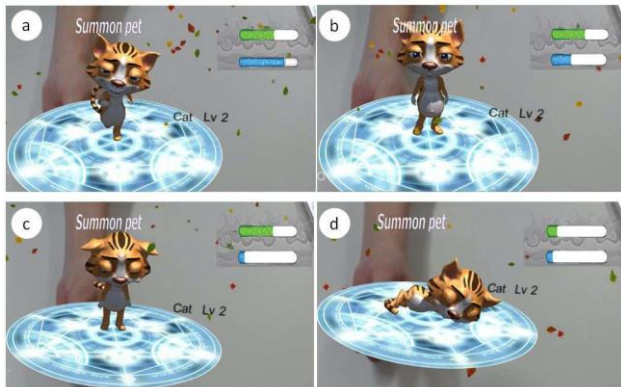


Figure 2: Virtual pet in the system. Pet is energetic in subgraph (a). Pet looks calm in subgraph (b). Pet looks unhappy in subgraph (c). Pet is sleeping in subgraph (d).

#### 4.4 Usage

When users go shopping, they can start point system and enter mission interface. They can view the content of mission displayed on the GUI and select mission. If users complete the mission, it will be confirmed by the system after the consumption. If it is confirmed, the pet will receive the experience value and the information will be recorded.

Users can view the pet interface at any time. On the pet interface, there is a virtual pet. Users can know the state of pet by looking at green and blue indicators located at the top right corner of the screen. After the user gets points, green indicator will rise. If user gets points from various sources, the blue indicator will be high. Filling up the green indicator can be achieved by obtaining points. Filling up the blue indicator can be achieved by getting points from buying different goods. The two indicators will be considered together to assess the state of virtual pet. Virtual pet will make different movement according to the state. Users can help pet gain experience value by completing selected mission during shopping.

#### 5 System Implementation

The hardware devices used for the development of the prototype system include a laptop, a webcam. Windows 10 Home Edition is installed in the laptop. The processor is Intel(R) Core(TM) i7-6500U CPU @2.50GHz 2.59GHz. The RAM is 8.00 GB. Webcam is connected to the laptop for processing. The development software is Unity 2017.2.0f3(64-bit), a cross-platform game engine. Unity 3D is used to develop and render three-dimensional system. Vuforia SDK is used as a foundation for AR implementation, which uses computer vision technology to recognize and track image targets and simple 3D objects in real-time. After recognizing the image on the smartphone, virtual objects created in Unity 3D are superimposed over the image. After that, users can see

the spatial objects and interact with them. As for the database, we used WampServer Version 3.0.6 32bit consisting of the Apache web server, OpenSSL for SSL support, MySQL database and PHP programming language. Apache and MySQL are always running on the server. Communication between the mobile devices and the server is implemented in PHP.

Our system is implemented based on client-server network structure. Gamified point system will be deployed on mobile device as a client. The retailers can manage and update user information. Users access data when registering their own information and obtaining their information from database. We use the WWW class and the WWWForm class to send and receive data from Unity. When receiving from the database, the information is converted to JSON format and received. After receiving it on the Unity side, it is decoded into a string format.

#### 6 Related Work

Fabius Steinberger et al. designed gamified applications for driving [5]. They think that inattention during low traffic or routine trips can pose road safety risks. They aim to study how to design gamified applications that make safe driving more engaging. Their results indicate that the gamified conditions increased driver engagement and reduced driving speeds.

The research conducted by Dongseong Choi et al. investigated why people continue to play certain online games [6]. Their results show that people continue to play online games if they have optimal experiences and personal interaction can be facilitated by providing appropriate goals, operators and feedback.

#### 7 Conclusions

In this paper, a gamified point system is introduced. The whole system is designed and implemented based on augmented reality. We classify points by source. Points are visualized to give users intuitive feedback and virtual pet is visualized to reflect consumption. Mission is given to instruct users to make a comprehensive consumption. The purpose of our system is to help users make better choices. Users can obtain points from consumption and get feedback from pet after completing the mission given by the system. Depending on the number of points and the variety of points, the state of the virtual pet will change. Users need to complete mission to keep their pets in good state. In the current system, interaction is limited. We consider combining the social features into our system to enhance interaction between users.

#### References

- (1) Liu B, Tanaka J. AR-Based Point System for Game-like Shopping Experience[C]//Proceedings of the 2018 International Conference on E-Business and Applications. ACM, 2018: 41-45.
- (2) Kotler P. According to Kotler: The world's foremost authority on marketing answers your questions. AMACOM Div American Mgmt Assn, 2005.
- (3) Hupfeld A, Speed C. Getting Something for Nothing?: A User-Centric Perspective on Loyalty Card Schemes. Proceedings of the 2017 CHI conference on Human Factors in Computing Systems. ACM, 2017: 4443-4453.
- (4) Zichermann G, Linder J. Game-based marketing: inspire customer loyalty through rewards, challenges, and contests. John Wiley & Sons, 2010.
- (5) Steinberger F, Schroeter R, Foth M, et al. Designing gamified applications that make safe driving more engaging[C]//Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems. ACM, 2017: 2826-2839.
- (6) Choi D, Kim J. Why people continue to play online games: In search of critical design factors to increase customer loyalty to online contents. CyberPsychology & behavior, 2004, 7(1): 11-24.