Review of Coupon Systems

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Abstract. Coupons are very effective way of promoting products and widely used by merchants. As smartphones became indispensable to life and are carried by almost everybody, mobile coupons are replacing traditional paper coupons. Group coupon is one of the coupon sale types where sold coupons are money refunded unless the number of buyers reach to certain predetermined number. Groupon is an American online group-coupon sale company that refused Google’s $6 billion offer. This paper reviews coupon systems and introduces our design of a coupon system.

Keywords: Coupon, Electronic coupon, Mobile coupon, Online Shopping.

1 Introduction

It is widely believed that coupons attract more consumers to buy the goods and lead to higher profits. There are many kinds of coupons, direct mail coupons, newspaper coupons, and package coupons [1]. Electronic coupons are the coupons that can be downloaded from Internet websites or received from other end users via peer-to-peer coupon pushing services and can be stored on mobile devices [2].

This paper reviews existing coupon systems and introduce our design of a coupon system. Server components of our system include coupon management system, shopping system and distribution management system.

2 Related Works

A scenario of the peer-to-peer approach is described in Fig. 1. When a customer purchases something from a store, he gets an electronic coupon. From that moment, a copy of this coupon can be pushed to anybody through WiFi connections. A receiver also can forward a copy of the coupon to others. If a receiver redeems a coupon at the store, then a certain amount of credit or bonus is given to the forwarders [2].

WingBonus, a web and mobile system devoted to the management of partners that offer virtual coupons, is introduced in [3]. Using NFC or QR and wireless and Internet technologies, users can select, download, exchange and transfer m-coupons with a full, personalized and safe management of the information.
The architecture of WingBonus is described in Fig. 2. A smart poster is a combination of the visual impact of a traditional poster with NFC (near field communication) and a user can purchase vouchers through smart posters or obtain ones from another user who wants to transfer his vouchers (step 1). When the user sends the piece of information obtained from the smart poster to the server (step 2), the server retrieves detailed information about it by referring to the database (steps 3 and 4) and sends it back to the user (step 5). There are two alternatives to obtain vouchers. One is direct access to the server (step 6) and the other is to access through a partner establishment (steps 7 - 10) [3].

Groupon is an American online group-coupon sale company. Groupon helps local businesses to sell discounted coupons. Groupon salesmen talk directly with local businesses to persuade merchants to offer deals. Merchants publish the deals on website. The deal is 50-90% of the regular price. Instead, the deal is vanished if the number of signed up people is not greater than the predetermined number. Customers buy the deals and customers redeem their coupons. Finally, Groupon pays to merchants its share [4].

Advance selling coupon features deep discount, long coupon duration and some of them are not redeemed. Wang [5] built the advance selling model, investigated the effect of it and found optimal advance selling strategies. Near Field Communication is a radio frequency communication link between closely located devices. An NFC
mobile coupon (M-coupon) is a cryptographically secured electronic message with some value. A user obtains an M-coupon by reading an M-coupon on an issuer (for example, a smart poster or newspaper) with his NFC mobile. Later, he can redeem the M-coupon at the store. A formal definition of the NFC M-coupon requirements was presented in [6].

Huang [7] found that people repeatedly purchase coupons that belong to certain categories by analyzing sample deals from Groupon. Based on this fact, they concluded that keyword matching is a viable technique for personalized recommendation systems for these categories. The mCoupons are coupons that can be collected and stored on a mobile device and can be redeemed by the merchants. Most mCoupon systems use the Near Field Communication (NFC) technology because user can conveniently obtain and use mCoupons through NFC. However, mCoupon systems are vulnerable to attackers and illegal users. Hsiang [8] proposed a secure and efficient mCoupon scheme that may satisfy all the security requirements.

A location-based mobile coupon service pushes coupons that are issued by the stores near to the user at the moment to the user. This service might reveals user’s location information to malicious entities. A privacy protection mechanism for location-based coupons using anonymous authentication method was proposed in [9].

3 Implementation Consideration

In smart coupon circulation, near field communication (NFC) can be used to enable customers conveniently purchase coupons and ticket collectors conveniently verify coupons. NFC connects two Android device or an NFC tag to an Android device so that they can exchange data. In order to allow NFC hardware to be accessed by Android application, we have to add the following to the AndroidManifest.xml file:

```xml
<uses-permission android:name="android.permission.NFC" />
```

We also have to specify SDK (Software Development Kit) API (Application Programming Interface) level as follows:

```xml
<uses-sdk android:minSdkVersion="10" />  
```

The uses-feature should be defined as follows:

```xml
<uses-feature android:name="android.hardware.nfc" android:required="true" />  
```

Given text/plain in MIME type, we can filter for ACTION_NDEF_DISCOVERED intents with the following example [10]:

```xml
<intent-filter>
    <action android:name="android.nfc.action.NDEF_DISCOVERED"/>
    <category android:name="android.intent.category.DEFAULT"/>
    <data android:mimeType="text/plain"/>
</intent-filter>
```

When the URI is in the form of http://developer.android.com/index.html, we use the following example [10]:

```xml
...  
    <data android:scheme="http" ... />
```

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4 Conclusions

After reviewing the features of the existing coupon systems, this paper designed its own coupon system. The system sells mobile coupons and mobile group coupons to customers for merchants. The coupons are allowed to be transferred to other users.

It is well known that coupons make a great contribution to promote products sale. We are planning to implement the proposed system and launch a coupon system for local tourist attractions and local products. We expect that the coupon system will attract more tourists and increase local tourism income.

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References