Payment & Receipt Business Model in U-Commerce

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Abstract: The significance of U-payment in the transfer of financial information is convenience and safety. The purpose of this paper is to find an appropriate U-payment scheme which will not only promote seamlessness but also protect the consumer device and peer-based information transactions. I recommend a new business model through digital receipt which confirms to commercial decision making and transaction. I also propose U-PR (Ubiquitous Payment and Receipt) business model and system as a way to make transactions seamless, secure and privacy protected.

Keywords: U-Commerce, Payment, Seamlessness, Privacy, U-Receipt, U-Coupon, U-PR (Ubiquitous Payment and Receipt)

1. Introduction

Payments have continuously advanced from physical currency transaction to Mobile based transfer and recently it is a step ahead, we disburse in contactless mode. The next stage of payment evolution has already started, with payments from social media messenger applications, smart watches, voice-enabled devices and Internet connected home appliances. The evolution of the age of U-Payments and Receipts makes it extremely convenient for the customers to pay through any internet connected devices from anywhere in the world. So, I have furnished a way which enhances privacy protection payment method. This aims to recommend a new business model with privacy and imposed seamlessness of information called U-Payment protocol.

2. Objectives

- To know the concept of U-Commerce
- To picture the various elements of U-PR.
- To explore the procedure of U-PR.
- To list out the various information which is required for U-PR
- To analyze U-PR with other Payment models.

3. U-Commerce

U-Commerce is defined as the business interface among providers, consumers, products, and services which enable and support especially the seamless communication of each entity’s information. The most unique characteristic of the U-commerce is the seamlessness of the information between various devices or network forms. But, seamlessness of digital information has a privacy infraction especially payment. In general, for the protection of privacy, a user could make business transactions using false ID in some way. This the customer can implement when he finds it necessary or wants it to be private and protected. In the process of searching and comparing goods or haggling price, a buyer could make the deal done without revealing his or her identity at his or her will. There is a threat to maintain privacy in a U-Commerce environment because of its seamlessness which is caused by an increase in computing power device. It also results in a systematical supervision of the customers’ information.
4. Elements of U-Pr (Ubiquitous Payment And Receipt)

There are three kinds of elements related to the U-PR (Ubiquitous Payment and Receipt) business model as follows.

1. The customer device for gathering, processing, and storing the payment-related information: In U-PR, the payment-related information is read in from the payee device to the payer-device. A part of the transaction ID is generated by the customer device and it is integrated with another partial transaction ID generated by the payee device. The integrated transaction ID becomes an identical, reciprocal and unique Transaction ID. The user authentication and payment are also processed by an application which runs on the customer device. Therefore, the customer device is the main element among the U-PR business model and possesses the largest volume of payment-related Information.

2. Payee device for generating the preliminary payment-related information through the input of the service ID and generating a partial Transaction ID of the Payee: After payment, receipt information is generated to be transported to the customer device through the approval process of the Transaction ID.

3. Customer account and Payee account: The actual payment process is carried out between the two accounts. The accounts exchange minimal required transaction information and do not dominate payment-related information such as banks and credit cards.

This payment process creates a new business opportunity by generating and exchanging a digital coupon (U-Coupon) from the digital receipt (U-Receipt) that the customer keeps.

5. Procedure of U-PR (Ubiquitous Payment And Receipt)

Receiving a service or buying a product consists of 4 Phases.

Each Phase involves a series of steps.

**Phase 1 - Payment**

1.1 Customer device recognizes information such as product/service ID, price, payee ID, encrypted payee account number, and Payee Transaction ID.

1.2 Transaction approval of the customer through an authentication process rooted on the device is supported.

1.3 Customer devices deliver the integrated transaction ID to the Payee Device and simultaneously requests payment and the Transaction ID to the customer bank.

1.4 The price amount is transferred from the Customer’s account to payee’s account.

1.5 Customer banks notifies the transfer to payee device (Transaction ID and transfer result)
1.6 Payee bank confirms the receipt of money to Payee device.

1.7 Payee device transmits digital receipt and generates digital receipt Transaction ID to the customer.

1.8 Payee device uploads the receipt ID and customer information to U-Receipt server.

1.9 U-Receipt server checks if the customer is a member or not and if not, asks the customer to sign up.

1.10 Customer signs up for the membership.

**Phase 2 - Recommendation: Digital coupon Transmission**

The customer (referrer) sends U-Coupon transformed from U-Receipt to potential customer’s device.

**Phase 3 - Potential customer: Repeat the Phase 1**

**Phase 4 - Provide Incentives**

The potential customer uses the coupon that the referrer sent, then the referrer receives incentive from the store.

6. **Essential Information for Payment Process**

   [1] Payment Amount: Refers to the price information of a product or service. Refers to the total amount when there are a number of products and service.

   [2] (Encrypted) Payee Account number: The account number of the payee is the most important payment-related information required in the seamless payment process. This is encrypted and transported to protect the privacy of the payee.

   [3] Product List: When possessed by a party who is not the customer the individual product name can be a serious hazard to privacy. Therefore, this information should be directly possessed by those who are involved in the payment.


   [5] Payee ID: Information required when confirming the payment of the payer in financial transactions between financial institutions.

   [6] Transaction ID: The unique Transaction ID of each transaction enables a payment and refund process could be executed using an ID for the relevant transaction without the Payer and Payee having to possess each other’s ID. Such Transaction ID combines the information that is independently generated by the Payer and Payee.

   [7] Membership Information: The basic information of membership in U-Receipt Business (e.g. Name, Cell Phone Number, Address, etc.)

   [8] U-Receipt ID: The unique digital receipt number

   [9] U-Coupon ID: The unique digital coupon number

7. **Analysis of U-Commerce with Other Payment Models**

U-PR was designed to enhance seamlessness and safety of privacy in Ubiquitous commerce environment. The comparison of U-PR with other payment methods such as cash payment, credit card, and mobile payment is shown below. It is nevertheless observed that, while improving seamlessness the U-PR enhances the protection of privacy. The aspect of evaluation includes seamlessness, privacy, architecture, and PIB (Personal Information Base). Here I refine the privacy dimension to five elements:
information centralization, buyer identification, seller identification, product (service) information, and privacy protection mechanism.

Firstly, U-PR is in the higher level of seamlessness than cash payment, credit card, and mobile payment because U-PR accepts the mobile device to read information about product or service from the product itself or environment.

Secondly, in terms of information centralization, cash is very low as it does not save any information on the customer. Information centralization in mobile payment is high because the credit card company and the mobile Tel Company may save all the payment information for later bill. There can also be an information revelation in factors such as buyer identification, seller identification for the same reason. Meanwhile, U-PR saves minimum information of customer, payee, and bank. U-PR does not hold any records of product/service information. In addition, privacy protection mechanism does not exist within cash or mobile payments, while U-PR’s Transaction ID has the mechanism, making it more reliable and dependable for privacy.

Thirdly, cash payment and U-PR have a peer-to-peer payment mechanism while credit card and M-payment have a client/server architecture saving a large part of commerce and payment information.

U-PR also enables the so called peer-to-peer payment where both the payment systems of customer and payee are integrated within an individual device. It suggests a way of safe transactions between a seller and a buyer whose IDs are not exposed through the use of Transaction ID in the flow process of payment information.

The following table contains the information of differences between U-PR and other payment methods:

<table>
<thead>
<tr>
<th></th>
<th>Cash</th>
<th>Credit Card</th>
<th>Mobile Payment</th>
<th>U-PR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seamlessness</td>
<td>Non-existing</td>
<td>Non-existing</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Low</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Privacy</td>
<td>Non-existing</td>
<td>Revealed</td>
<td>Revealed</td>
<td>Protected from Seller</td>
</tr>
<tr>
<td></td>
<td>Non-existing</td>
<td>Revealed</td>
<td>Revealed</td>
<td>Protected from Buyer</td>
</tr>
<tr>
<td>Product (Service) Information</td>
<td>High Protected</td>
<td>Revealed</td>
<td>Revealed</td>
<td>Protected from financial institution</td>
</tr>
</tbody>
</table>
8. Conclusion

This paper explains U-Payment and U-Receipt business model designed to improve privacy protection while promoting the seamlessness between economic entities. Even more, the U-Payment environment opens a new secure business opportunity. This business model is an experimental model of U-commerce which is possible in a seamlessness environment. Certainly its escalation of computing power will work as a great medium to connect transaction business model and marketing model.

9. References