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## **Trust in E-Cheque in Electronic Payments**

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### **Abstract**

Today, e-commerce has considerable portion in commercial businesses, and it has been developing. One of the most important steps in e-commerce is e-payment that has been done through different tools such as e-banking, and e-cheques. In this type of electronic transactions, there are always different worries both for payers and payees due to untruthfulness. For example, amount modifying, date modifying, not receiving, and other similar issues are some samples of untruthfulness in payments through the e-cheque. In this article, solutions for trusting in cashing the e-cheque on due date are studied and evaluated.

**Keywords:** E-Cheque, E-Commerce, Trust, E-Payment.

### **I. INTRODUCTION**

With the population growth, presenting different services in the traditional format is challengeable. Statistics show that in recent decades, e-commerce is a suitable solution for presenting different services in a modern method. One of the most important parts of

electronic intercourses is e-payment. E-payment is done through different methods such as e-money, e-coin, different banking cards, and e-cheques. The e-cheque which is similar to its paper counter, could be used in different transactions such as conditional, instalment, timed, and named payments. One of the main challenges in using the e-cheque is untruthfulness of two sides of an intercourse to this type of payment. This untruthfulness is due to different reasons, and one of them is untruthfulness to cashing the cheque on due time. By studying previous articles done before, this article concludes that the third element known as “payment guarantee” could be useful to increase trust in using this tools, and then presenting a place for this important element in the e-cheque structure. In the second part of this article, the e-cheque is presented and studied. In continuous, in the next part, there is an analysis concerning trust in e-commerce and paying systems. In the fourth part, untruthfulness challenge in the e-cheque paying system is presented. In the fifth part, with considering to results of previous researches, a solution for untruthfulness in using the e-cheque is presented, and in the sixth part, summery and conclusion is submitted.

## II. E-CHEQUE

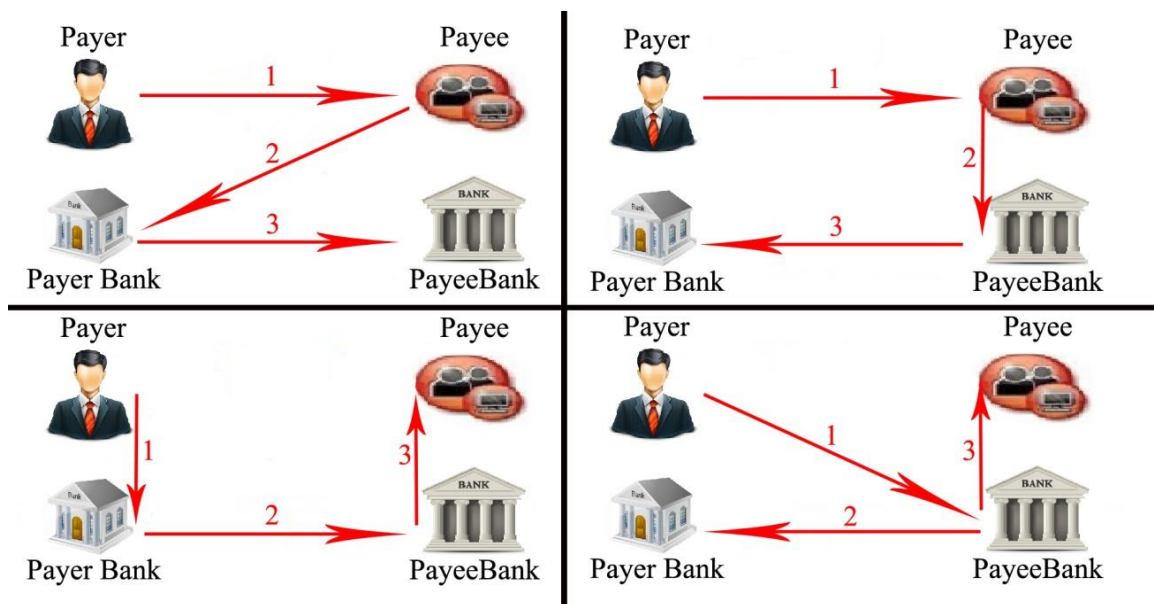
The e-cheque has all capabilities of the paper cheque. The e-cheque could be used in different payment, such as instalments, conditional, named, governmental, and without cashing money. The e-cheque includes important fields such as number, coding key, payer’s banking details, and payee’s banking details, amount, and date of payment. Number, type, limitations, and processing methods of the e-cheque fields are different due to each country’s regulations and implementation algorithm [ 14, 17, 15, 16, 18, 19]. Figure 1, demonstrates a sample of inserting information for registering an e-cheque.

The screenshot shows the DBS iBanking interface for registering an e-cheque. The page title is "Mail iB Cheque" and it includes a "Security and You | Logout" link. The form is divided into several sections:

- Applicant Particulars:** Includes fields for "Applicant Name" (pre-filled with "iBanking Tester") and "From Account" (a dropdown menu).
- Payee Details:** Includes a "Payee Name" dropdown menu (highlighted with a yellow box) and an "Add New Payee" link. Below this is an "Amount" field with a "SS" label.
- Instructions to Payee:** Contains text about printing details and a note about the 4-working-day processing time.
- Important Note:** States that Terms & Conditions for the Pay Easy service apply, and lists three key points:
  - iB Cheque service is absolutely free!
  - iB Cheques can only be deposited into an account with a bank in Singapore.
  - Each iB Cheque has a validity period of 2 months.

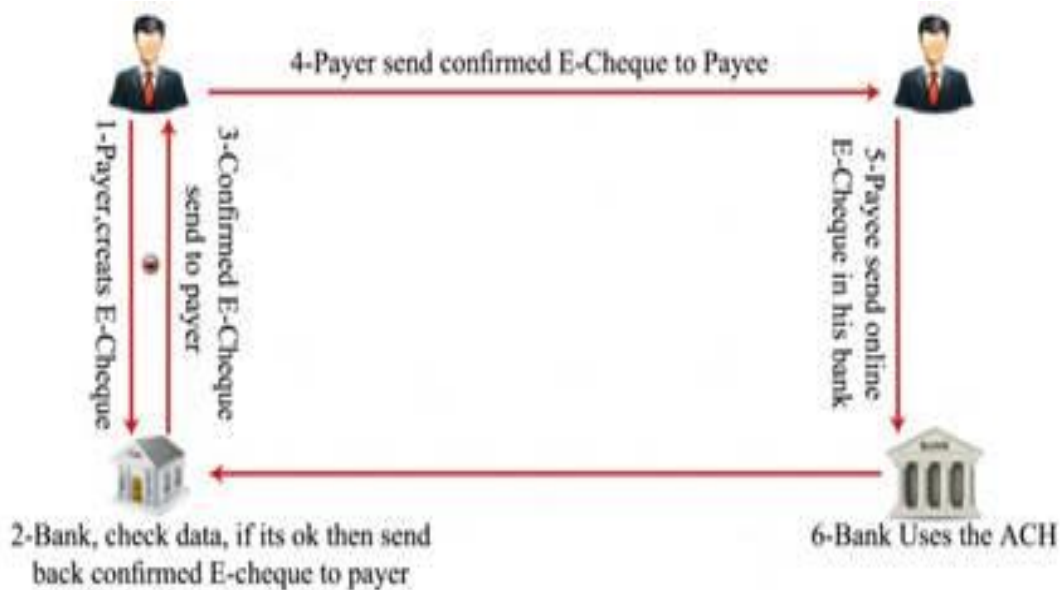
Fig. 1 A sample of inserting information for registering an e-cheque, Singapore 2014 [20]

As the e-cheque is a complete digital document for paying electronically, therefore its security specifications for implementation is similar to e-money. A lot of protocols in international levels for implementing the e-cheque has been run, that American Financial Services Technology Consortium” (FSTC) is the first sample in coded form. Four types of processing has been given in FSTC, in that payers could be able to give the e-cheque directly to the payee, or the bank of payee, or the payer’s bank. In addition, the payee is able to cash it through either his/her bank or payer’s bank. Figure 2 demonstrates paying methods in FSTC. After FSTC, other processing for the e-cheque has been run that the most important of them are MANDATE in Europe, and the Safe-check and the e-check in some Asian countries [15, 16, 17, 18, 19, 21, 22, 23, 24].



**Fig. 2 Four processing of FSTC for the e-cheque**

Security of the e-cheque has been provided through digital signatures and restricted different attacks through the most secure methods of Authentication, Authority, Confidentiality, Integrity, Non-repudiation, and Non-repetition. Figure 3 shows a sample of a security path in the e-cheque payment [ 25, 23, 18, 19, 17, 22, 21].



**Fig. 3 A sample of a security path in the e-check payment**

### III. TRUST IN ELECTRONIC COMMERCE AND ELECTRONIC PAYING SYSTEMS

Trust issue has been taken in to account since beginning of social living of mankind [8]. Considering to trusting concept has been increased since 1980 till 1995 [5]. Intercourses could be mentioned as trust indicators [10]. A lot of definitions have been presented for trusting, Such as “believing on others for achieving our desires” [5]. Tendency toward trusting refers to inner desires towards others based on believing to humanity and its quality [29]. Trusting has been studied out of psychological point of view as well, and is considered as a personality trait [1]. As trusting in electronic paying system is taken in to account in this article, therefore, the following definition for trusting would be applicable that, trusting means one believing that other’s promise and saying, in a business relation would be reliable and he/she would adhere to his/her commitments [4, 6]. Financial and credit infrastructures in trusting electronic commerce is very important [8].

Whatever traditional services change to modern services, the consumers’ confidence will decrease [27]. Trust has considerable effect in using information technology [1]. A lot of researches have been done about trust in e-commerce and it has been analysed in different point of views. Trust is more important in e-commerce rather than traditional commerce [4, 1, 8, 26]. Researches show that lack of trust among electronic commerce parties leads to slow down growth of using it [3, 32]. Some people believe that trust in cyberspace is based on three pillars of constitutional, institutional, and interpersonal [29]. Risk and trust are always together and appear meaning to each other [30, 31]. Information quality, brand, reputation, respond ability, electronic exchange environment also play role in trusting in electronic intercourses [3, 8, 6]. It is important to make confidence, and it should be empowered frequently, and for this issue, untruthful situations should be detected [5]. Internet scams have been providing that strategies for

presenting e-commerce services would be in the way of increasing customers' confidence [6].

Buyers simply do not trust in internet sellers, and do not enter electronic businesses [4]. Electronic intercourse experience is effective in increasing customers' confidence [4, 12, 10]. Trust is one of the important parameters in electronic payment and users in electronic payment systems expect flexibility and system separation in order to run their desired expectations [12, 14]. Trust in the e-cheque payment system is one of the main priorities in electronic intercourses system [14]. In order to give priority to the electronic paying system rather than traditional paying system, reliable quality element should be seen within it. Electronic payment has security benefits such as anonymity, confidentiality, integrity. Increasing customers' confidence during transaction is very important [9]. The accuracy of intercourses both in ordinary and electronic contracts are the same by the most lawyers [11].

In modern economy, social capital is important issue which is in directly related to social trust. In the discussion of social capital, solutions for solving social problems with collaboration and union of its members are investigated. Social capital can be used as a license for personal commitment [7, 33]. According to social exchange theory, people do exchanging relationships based on trust [34, 9]. Considering to less reliance of the banks to the traditional and paper method, other methods are necessary in order to obtain confidences [2]. One of the main barriers to use electronic banking services is lack of confidence that can be obtained in some cases through the identifying new customers in banks by trusting to a third party, that somehow it is using social capital [2].

#### **IV. UNTRUTHFULNESS CHALLENGES TO E-CHEQUE**

Although e-cheque is a necessary tool for most of intercourses, and it is a suitable paying tool in electronic intercourses, untruthfulness leads it to become pale in use of it. This untruthfulness has many dimensions. Many risks of the e-cheque are the same as other similar paying systems which have been decreased to an acceptable level through security services-such as Authentication, Access Control, Auditing, Confidentiality, Integrity, Availability, Non repudiation- and have been able to obtain confidence of the agents and parties in electronic intercourses [14, 18, 15, 16, 17, 19].

But there is another risk in the e-cheque that paying attention to it could have considerable impact in trusting to use this paying tool. Sometimes, due to some reasons, the payer cannot increase his/her balance of account to the issued cheque amount on due date. The payee needs to decrease this risk in order to use this paying method with more trust. As the e-cheque is a tool for making income for the banks, more trust and low risk in cashing the e-cheque could be also important for the banks.

#### **V. A SOLUTION FOR MORE TRUST TO THE E-CHEQUE**

Researches show that trading experience and background has an important role in obtaining confidence of the electronic service users. So records of cheques which have

not been passed can play an important role in trusting to the e-cheque. In the paper cheque, one of the ways to minimize the risk for recovering the amount is signature and guarantee of a third party in back of the cheque. Furthermore, studies have shown that social capital issue and using the third party validation could be an important factor in decreasing the risk of the e-cheque recovering, and trust to recover it on due date.

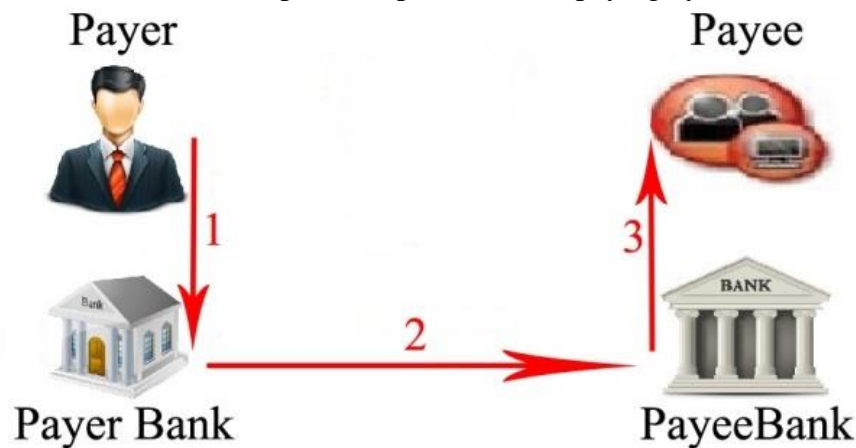
Considering to the above mentioned issues, it is possible to make some modifications in the structure of the e-cheque to implement methods of increasing confidence for recovering the cheque on due time. In this article, we modify the e-cheque structure so that whenever it is necessary, the payer would be able to use it through trusting to a third party as the guarantee for the payee to recover it. According to the paper cheque experience, the guarantee could be a person, or an organization such as insurance.

Without coding, the e-cheque at least includes the fields such as the payer, the payee, date of issue, cheque number, amount, date of payment, cheque status. Table I shows an example of this structure.

**Table I MINIMUM FIELDS IN THE E-CHEQUE WITHOUT CODING**

Status	Payee	Date of Payment	Amount	Cheque No.	Date of Issue	Payer
Empty	Empty	Empty	Empty	Empty	Empty	Empty
⋮	⋮	⋮	⋮	⋮	⋮	⋮

The e-cheque is paid through a coded system such as E in an exchange cycle like FSTC. Figure 4 is one of the simple examples of FSTC paying cycle for the e-cheque.



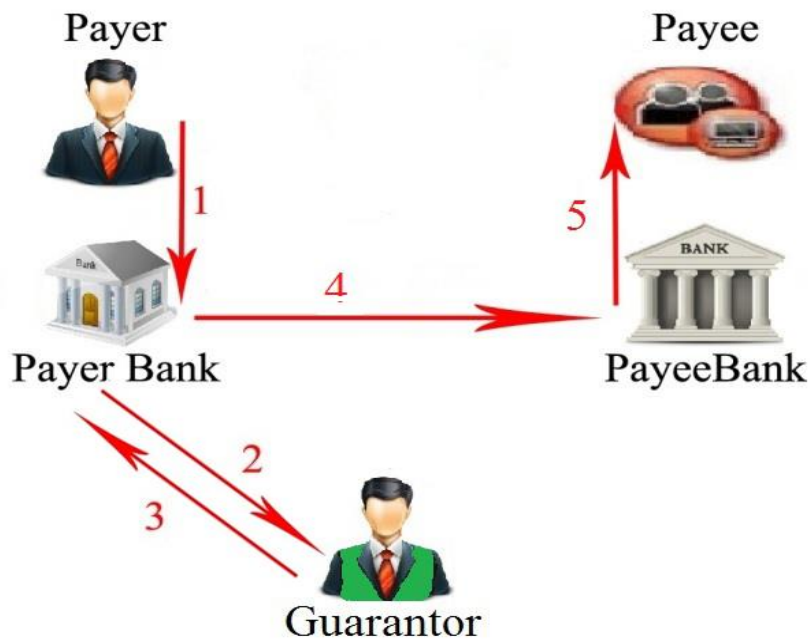
**Fig. 4 One of the FSTC’s methods for paying the e-cheque**

In these systems, if the initial condition is provided, by the payer’s willingness, the e-cheque would be issued and would be entered in to the paying cycle. But in third party guarantee method, the e-cheque should be issued by the willingness of both the payer and the guarantor simultaneously, and would be entered in to the paying cycle. For this purpose, the guaranteed e-cheque, without coding, can be structured like table II.

**TABLE II MINIMUM FIELDS IN THE E-CHEQUE WITH GUARANTOR**

Status	Payee	Date of P	Amount	Cheque No.	Date of Issue	Guarantor	Payer
Empty	Empty	Empty	Empty	Empty	Empty	Empty	Empty
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮

In order to apply the willingness of both the payer and the guarantor in issuing the cheque, the security cycle is used. By symmetric coding, the issuer (the payer) through a public key (such as  $K_1$ ), and the guarantor through a public key (such as  $K_2$ ) will complete the e-cheque and enter it in to the paying cycle. Figure 5 shows this paying cycle.

**Fig. 5 The e-cheque paying cycle with the existence of the Guarantor**

In the first step, the payer sends a request to the bank for issuing the cheque. Following this step, coding key " $K_1$ " is acted on his/her record through coding technique. In the second step, a request would send to the guarantor from the bank to guarantee the cheque. In the third step, by confirming the guarantor, the coding key " $K_2$ " is acted on the record. In the fourth step, the payer's bank will send the record to the payee's bank. In the fifth step, payee's bank will act to decode and to recover the cheque and to notify the payee.

## VI. SUMMARY AND CONCLUSIONS

Today, e-commerce is one of success keys in electronic intercourses. In each electronic intercourse, electronic payment is one of the main pillars. A lot of electronic paying tools have been presented. The e-cheque is one of the paying tools which are used in special intercourses. But there is always risk for not recovering it, and also trusting to this paying tool is low. Numerous studies have been conducted about trusting in e-commerce and it has been studied from different point of views. One of the ways to

increase confidence is using social capital and trusting to a third party. Using this approach and combining it with one of the FSTC methods help to present a structure for the e-cheque payment that the third party plays the guarantor role and increases the confidence to recover the e-cheque on due time.

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