User perception of a developed GCash cash-in and cash-out machine in the Philippines

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Article Info

ABSTRACT

The use of cashless credits in the Philippines has grown since the pandemic has begun. However, the transitions to these changes using cashless transactions have to be addressed. Kiosks and other machines that offer cash-in have been significant, but a model that does not use transactions through banks can be possible which can offer both cash-in and cash-out transactions. In this paper, a developed machine that caters both GCash cash-in and cash-out has been evaluated based on users' perception on functionality, acceptability, and usefulness. The machine is built with a graphical user interface (GUI) which is a programmed touch screen monitor, bill acceptor, and bills and coins dispenser. The functionality based on the 50 users' perceptions resulted in 94% excellent in loading bills, 92% accuracy on receiving the cash-in amount less the charges, 92% in dispensing bills less the charges, and 72% faster than the usual speed of transaction. All the respondents agreed that the machine is very convenient and user-friendly, while 94% said that it is very useful and they wanted it in their area. The results suggest that the machine be deployed for public use and be reproduced.

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1. INTRODUCTION

Most of the transactions that involve money are now going cashless. In the Philippines, a lot of people utilize digital payments and money transfers such as GCash and Maya [1]–[3]. With these digital payments, one can pay bills, shop online, buy in both big and small stores, and even send money. It cannot be denied that society is moving from cash into cashless [4]–[8]. Indeed, today's era is a transition from cash to cashless as several studies suggest [9]–[11]. Mobile banking will play a bigger role in these transitions in the future in which different governments try to adapt and even formulate policies for these changes [12]–[16]. Cash-in transaction can be defined as the way where a bill is converted into credits in the user's GCash account. Cash-out on the other hand is the way in which credits in GCash are converted into bills. There are several ways in the Philippines in which a cash-in transaction can be done. Some of these are through over-the-counter through pawnshop, courier services, convenience stores, banks, remittance centers, and money transfer providers. Cash-out on the other hand can be done through over-the-counter in shopping malls, pawnshops, and other grocery stores. However, there are no available machines that could do both the cash-in and cash-out transaction for GCash other than automatic teller machines which use bank transfers [17]–[19].

There has been a developed GCash cash-in and cash-out machine where one could do both cash-in and cash-out transactions. Vending machines are developed to ease up the long queues in such kinds of transactions [20], [21]. With GCash, each user can send credits without fees, while some transactions through bills payment and purchasing through online stores can have several charges [22]–[25]. Payments for riding cabs and motorcycles can also be done cashless through GCash in the Philippines. The 3D model of the design is presented in Figure 1. The developed machine utilized user-to-user transaction which is of no charge. This runs in the backend of the developed machine. A touchscreen display is programmed using vb.net and as a graphical user interface (GUI). A bill acceptor is used for inserting bills while a vacuum, coin hoppers, and motors are used for dispensing bills which are controlled by an Arduino microcontroller. A small charge can be deducted for every transaction made by the user.
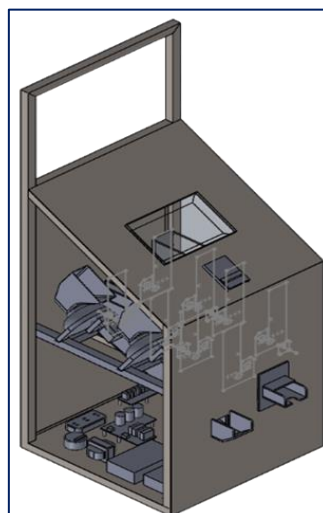

Figure 1. 3D model of the cash-in and cash-out machine

In this paper, the GCash cash-in and cash-out machine developed is evaluated by the users of different ages and genders who use GCash, which are delivery and service riders, students, and faculty. The perceptions in terms of the machine's functionality, acceptability, and usefulness are analyzed that could lead to the improvement and possible marketability of the developed machine. The succeeding sections explain the methods used for the evaluation of the machine, the results and discussion of the survey, and the the perceived conclusion.

2. METHOD

The two processes in the conduct of this research are the cash-in and cash-out process and the evaluation process. The cash-in and cash-out process explains the workflow of the usage of the machine. The evaluation process explains in detail the parameters of evaluation by the user.

2.1. The cash-in and cash-out transaction process

The process starts by selecting the type of transaction, either cash-in or cash-out, as presented in Figure 2. In the cash-in transaction, the text "insert cash" is displayed in the monitor to prompt the user to insert the cash in the bill acceptor as presented in Figure 3. The amount must be verified before the user selects the amount as shown in Figure 3(a). Afterwhich, the GCash number must be entered and verified. This will proceed to GCash money transfer. Once the transfer is successful, a confirmation message will be displayed. Otherwise, a message will be displayed in the monitor and the machine will dispense back the money.

In the cash-out transaction, the user has to input the gcash number and the amount as presented in Figure 3(b). A QR code or the machine mobile number will be displayed and the user has to scan it and verify the transfer via the GCash app. A verification code will be received by the user in its mobile number and this will be used to verify the transaction. Once the transaction is successful, the money will be dispensed less of the transaction fee deduction. Otherwise, an unsuccess transaction notification will be displayed in the monitor and the process will not proceed.
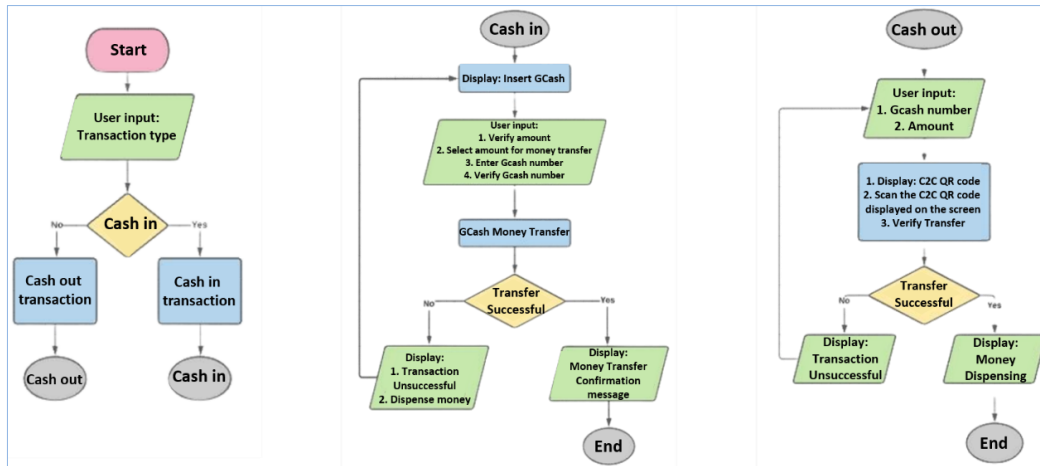
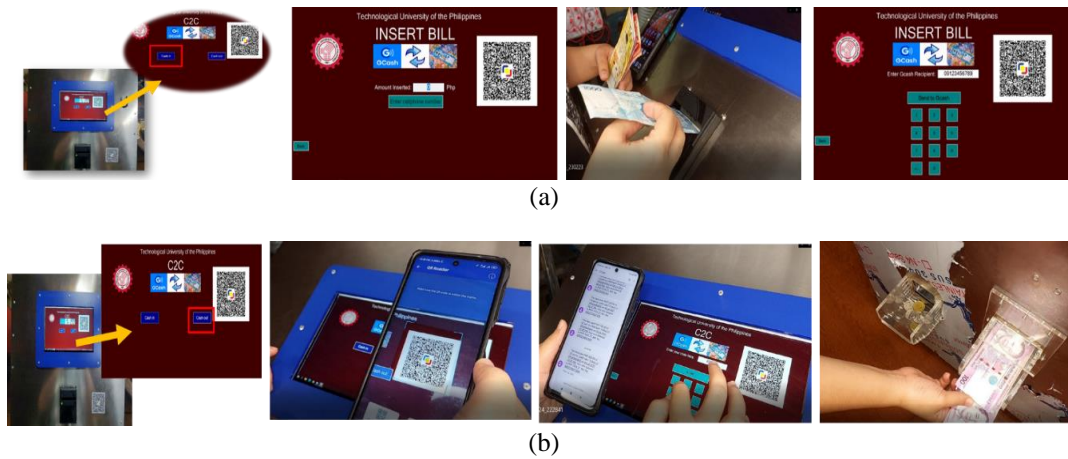Figure 2. Cash-in and cash-out process flow

(a)

(b)

Figure 3. Graphical user interface; (a) cash-in and (b) cash-out

2.2. Evaluation process

The evaluation process is conducted where the respondents have to experience using the machine. A survey form is given to the respondents which asks of general information, functionality perception, acceptability, and usefulness of the machine. The results of the survey will help the developers to further enhance and deploy the machine for general use. The general information consists of the age and profession of the respondents. The functionality of the machine is evaluated based on loading of bills, receiving of GCash cash-in amount, dispensing of bills, and the respondents' perception of the speed of transaction. The acceptability and usefulness are determined by the user-friendliness and the demand for the machine respectively.

3. RESULTS AND DISCUSSION

3.1. General information

The actual cash-in and cash-out machine was developed as presented in Figure 4 where the instructions can be read in its front, as shown in Figure 4(a). It was evaluated by users both for cash-in and cash-out transactions as seen in Figure 4(b). A survey was conducted and the results were presented in Figure 5. There are 50 respondents composed of GCash users in which 74% are ages 20-39 as presented in Figure 5(a). Majority of the respondents are students who are GCash users as presented in Figure 5(b). These students use GCash in their day-to-day transactions. In the Philippines, most commuters ride a jeep and they pay cash. Therefore, GCash credits need to be converted back to bills. For quick cash-out transactions, this machine can be used.

Figure 4. Developed cash-in and cash-out machine; (a) actual cash-in and cash-out machine and (b) evaluation by the user
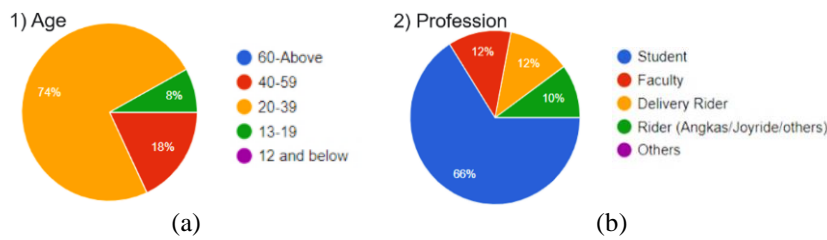

Figure 5. General information of respondents; (a) respondents' age distribution and (b) respondent's professions

3.2. Functionality test results

The machine was able to load bills at 94% success as presented in Figure 6. The 6% unsuccessful loading of bills is due to crumpled and old bills rejection as shown in Figure 6(a). 92% of the respondents received the cash-in amount successfully with less of the transaction fees as presented in Figure 6(b). The 8% mismatch is due to the rounded-up computation of the fees. This evaluation is for the cash-in transaction. The dispensing of bills is the evaluation for the cash-out transaction. 92 % of the transactions were successfully dispensed while 6% mismatched, which is also due to the rounding off of the amount less the transaction fees as presented in Figure 6(c). The 2% or 1 unsuccessful dispensing of bills is due to the network error since the GSM module relies on the cellular network signal strength. This was resolved by interlocking the process with the signal strength of the service provider network. The speed of transaction was compared to the usual GCash credit transfer. On average, it takes 30 seconds for both cash-in and cash-out transactions to complete. The perception of the users' in terms of the transaction speed is presented in Figure 6(d).
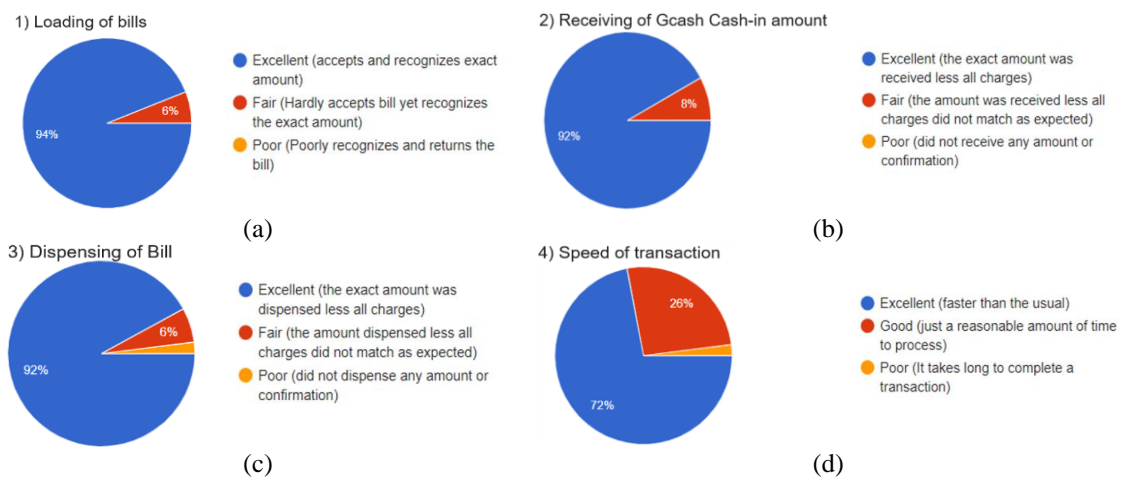

Figure 6. Functionality test results; (a) loading of bills, (b) receiving of cash-in amount, (c) dispensing of bill, and (d) speed of transaction

3.3. Acceptability and usefulness

Overall, the respondents said that it is very convenient to use despite 1 unsuccessful cash-out transaction as seen in Figure 7. The process is acceptable to the users. 48 or 95% of the respondents said that the developed machine is very useful and they wanted to have it in their area. These results are presented in Figure 7(a) and Figure 7(b). These results recommend that the machine can potentially be deployed to public places for use.
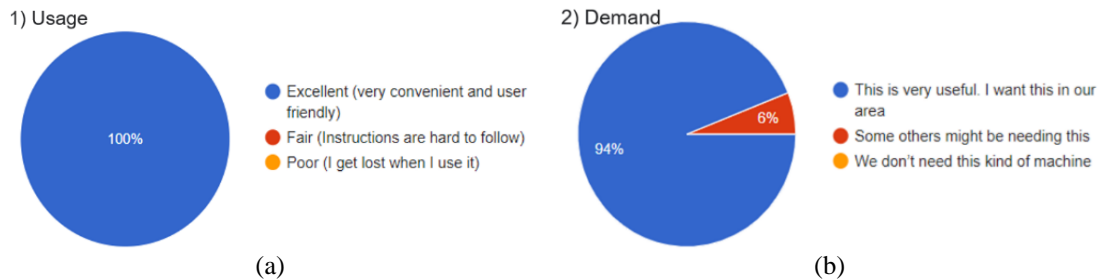

Figure 7. Acceptability and usefulness survey results; (a) usage and (b) demand

4. CONCLUSION

The cash-in and cash-out machine have been proven to function well for GCash cash-in and cash-out transactions. The machine has been evaluated by 50 respondents based on its functionality, acceptability, and usefulness. The respondents were composed of students, faculty, delivery riders, and riders. Based on the survey results, it turned out to be excellent in terms of functionality, except for the speed of transaction which is reasonable enough for its process. In terms of acceptability and usefulness, it turned out to be very useful and is needed by the majority. These results can be used as the basis for the improvement and marketability of the developed machine.

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