Student Universal Cashcard Cost-Effective Secure System (SUCCESS)

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Abstract – *The main objective of this study is to develop a Student Universal Cash Card System by using RFID to secure currency in the school campus. For this purpose, the proponents were able to identify the predicaments with the existing payment methods in the school. The study may help the students to be more aware and conscious of their everyday expenses in their school campus. Colleges and universities today must be on top of their game when it comes to creating functional and versatile ID cards that benefit students and make their campus lives much more efficient. In addition to making campuses more secure, university ID cards can serve other functions. For example, one ID can hold a student's attendance and act as his/her cashcard. The system provides an almost effortless buying experience. Instead of bringing cash, a student can use their RFID card to pay their enrolment fee, their canteen food, and other activities within the campus. Based on the result of the survey, the respondents highly recommend the use of the proposed system. The reports generated from the developed system could be utilized to enhance the students' ability to handle their own money. The output from the objective evaluation of the teacher's performance could also be used as a basis for merit, awards, and/or promotion. Furthermore, the innovation may encourage and improve fact-based decision making for university stakeholders.*

Keywords – *RFID, cash card, cashless, debit card.*

Introduction

Buying items such as food and supplies are part of a student's routine in college and university. As technologies in everyday transactions improve as we head towards the future, students today need to manage their money differently than they have in the past, for time is important to a student with each second they stay in school. Managing cash well is not only a good habit to learn, but it also contributes to future financial success (Stanley, 2008). As early as college, students must learn how to budget and control their cash flow as well as their time. Colleges and universities cater to some of their student's needs such as food by providing facilities like canteens, or school items by providing bookstores, and services by providing copy machines so students could photocopy their lecture notes.

However, there are students who are struggling through college. But taking on greater financial responsibility to reduce expenses and learning to live on less could actually make being poor a lifelong benefit for students. Students who master managing their cash flow will not only receive a diploma, but will graduate with practical life experience and a financial acumen that will give them a great start in life (Anderson, 2011).

There are five benefits for using cashcards compared to using cash:

1. Cashcards cannot be easily purloined compared to cash, and not anybody can claim a cashcard's ownership. Thus, it is more secure compared to cash payment.

2. Cash purchases are instant, and can be final and irreversible compared to cashcard purchases.

3. Cash purchases for goods and services priced with smaller denominations such as cents could be troublesome, as change could be given wrong and go unnoticed by customers. Also, it is hard to manage and organize coins, and they are less obvious than other forms of payment like online payment systems. Cashcards do not have this problem.

4. Cash payment can be hard to identify and leaves no paper trail or digital evidence, while cashcards are often always recorded and managed.

5. Cash flow and budgeting is easier to control when using cashcards compared to using hard cash (Hasuprobe, 2012).

Colleges and universities today must be on top of their game when it comes to creating functional and versatile ID cards that benefit students and make their campus lives much more efficient. In addition to making campuses more secure, university ID cards can serve other functions. For example, one ID can hold a student's attendance and act as his/her cashcard. Technological advancements are the fuel that powers the continued growth of new technologies. RFID or **R**adio-**F**requency **ID**entification is a good example. It makes existing applications easier to use, offers more functionality, is cheaper to implement, and drives system deployment costs down (Bhuptani & Moradpour, 2005).

By introducing RFID in systems, its identification and operation will be greatly improved. However, inside (as well as outside) the technology industry, few people understand the powerful impact RFID will have on the world (Duris, 2003). In Taylor's book "Surveillance Schools", she explores the impact that continual monitoring is having upon school children, education, and society. Surveillance schools are characterized by routine practices that identify, verify, categorize, and track pupils. With biometric technologies such as fingerprinting and iris scanning, CCTV, microchips in ID cards, 'smart uniforms', metal detectors, and police officers patrolling the school corridors with sniffer dogs, it is clear that schools have become increasingly fortified. Taylor outlines the phenomenon of the surveillance school, mapping the driving forces behind them and analyses the impact (Taylor, 2013).

According to Gene Amromin and Sujit Chakravorti's paper, entitled "Debit Card and Cash Usage: A Cross-Country Analysis", during the last decade debit card transactions grew rapidly in most advanced countries. Meanwhile, check usage declined and has almost disappeared in some countries, but the stock of currency in circulation has not declined as fast. They used panel estimation techniques to analyze the change in transactional demand for cash resulting from greater usage of debit cards in 13 countries from 1988 to 2003. They were able to disentangle cash's store of value function from its payment function by separating cash into three denomination categories, and found that the demand for low denomination notes and coins decreases as debit card usage increases because merchants need to make less change for customer purchases. They also found out that the demand for high denomination notes is generally less affected, suggesting that these denomination notes are also used for non-transactional purposes (Amromin, 2007).

In this light, the proponents focused their study in developing an application that enables a cashless system in SDCA. This will enable students to secure their spending and purchase products and services while being aware of their budget.

Methodology

This study employed Developmental Descriptive Research, and Agile Development. It is a problem-oriented and interdisciplinary research methodology. Developmental research, as opposed to simple instructional development, has been defined as the systematic study of designing, developing, and evaluating instructional programs, processes, and products that must meet criteria of internal consistency and effectiveness (Richey, 2005). This method is used for the development of prototypical software, starting from its design, development, and evaluation. The prototypical products challenges are efficiency, creativity, and practicality. Agile methods are incremental development methods in which the increments are small and, typically, new releases of the system are created and made available to customers every two or three weeks. They involve customers in the development process to get rapid feedback on changing requirements and minimize documentation by using informal communications rather than formal meetings with written documents (*Software Engineering,* 2001).

The study was limited to two hundred eighteen (218) BSBA, BSA, CS, and IT students of the School of Business and Computer Studies. Seventy-three (73) students are in the first year, sixty-one (61) are in the second year, forty-four (44) are in the third year, and forty (40) are in the fourth year.

This study looked into the current applications of RFID in the students' college IDs, and the assessment of the existing cash-based system in developing cashless cashcard automation. In addition, the study was also focused on the students' level of acceptance to the integration of cashless RFID.

Limitations

The system is only limited to the students who are currently enrolled in SDCA and have had their RFIDs registered to MySDCArd and business entities that process payment transactions. Instances of these are the cashier, the business center, and the food pantries inside the school premises.

Next, the system does not compute the student's dues and/or assess their subjects. The system will only be used in the payment stage of the student's enrollment.

Another is in the event that the user lost or damaged their RFID, the system will not be able to process any transaction for the user. This includes checking the user's balance, loading of points, and using the points in the user's account.

Finally, the system can only be used if the computer it is installed in is connected to the school's network. Given that the system requires an active connection to its database, the system would not be able to function at all without it.

The system will not be able to operate and pull up the existing RFID user accounts. The developers of the system would not have control over it, given the fact that this the cashcard system an add-on to the existing ID System. Related to this, the system would not operate during a power outage in the school premises.

If in the event the user broke or lost his/her RFID, the system would not be able to pull up the user's record from the database since the RFID is its identifier. Its loss/destruction would prevent the user to use the system at all.
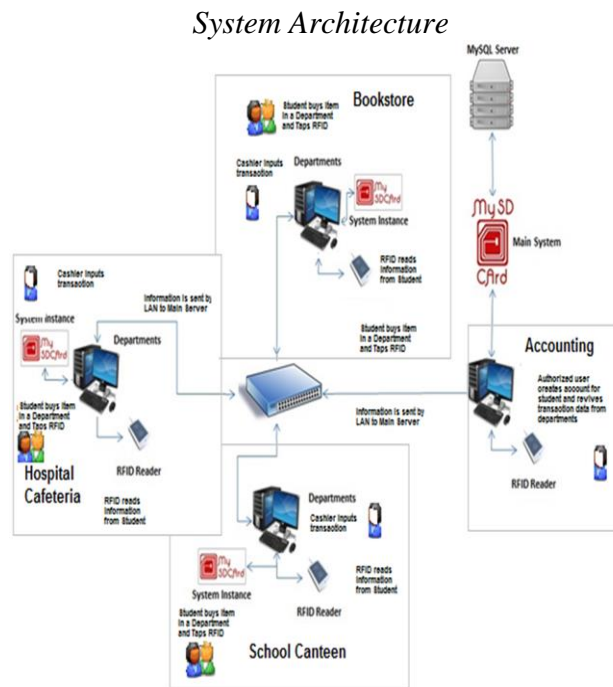
System Architecture

Figure 1. Proposed system architecture

Figure 1 depicts the proposed system's architecture. The system architecture of My SDCArd has a main server that is directly connected to the campus' main system. The accounting terminal, with its own RFID reader, is connected to the school's main database server. From Accounting, an intermediary device is connected to the network via LAN cables to the several departments that use the system. Just like the accounting terminal, each department also has its own connected RFID reader, and each time a student transacts to a department the data is encoded by the cashier then sent to the My SDCArd system via LAN into the accounting server, which encodes the transaction and later remits the total sales from each department on a daily or weekly basis.

System Features

The SDCArd system monitors whoever accesses it. Before anyone can use the system, a proper login is required because without proper validation the user will not be authorized to use the system. Access monitoring includes keeping track of who accesses the system and the time it happened, and the process is the same for those who log out. However, the system's main feature is to complete a payment transaction without the use of cash. To elaborate, the user uses the pre-loaded cash value from their account in making payments. However, instead of using physical money, the user can complete payment transactions by using their RFID. The system locates the user's account from the database, which contains the information about the user's balance. Also, instead of using the cash value in their account, the user can complete a payment transaction using

their accumulated rebate points. Sharing the same process with completing a payment transaction, the system locates the user's rebate points from the database.

The system features an inventory of the products that will be sold by the departments connected to this system. Departments will be able to encode their products, which can be purchased by users. This will also allow the departments to specify the price of their products, modify their names, and save it into the system.

The system allows the loading of cash value into the user's account. After locating the account, the user can load cash value equivalent to the physical money they will give to their account. After this process is complete, the user then can complete cashless payments.

There are also several instances of monitoring in the system:

1. The system keeps track of all load and reload transactions within itself. The system will record when and from what department the transaction was made, the amount loaded, and the user account it has been loaded into.

2. The system also keeps track of the count of rewarded rebate points and their usage. The system will record when and from what department the rebate points were made, the amount of rebate points earned, and the user account that received them. Same goes when the user uses the rebate points: the system will record when the rebate points were spent, in what department the rebate points were used, and the user account that used them.

3. The system keeps track of the sales made within itself. The system will record the product or what was paid for, the amount paid for, the quantity (if applicable), the date it was made, from what department the sale was made in, and the user account that paid for the product.

This system also has the ability to process payment transactions. Departments using this system will be able to specify what items or products are going to be sold or paid depending on the user's needs. The total amount depending on the items or products specified by the department user will then be presented by the system, as well as the rebate points that can be earned (if applicable). The system then will deduct the amount due from the existing balance of the user's account and reward points (if applicable). Rebate availability will also be subject for change depending on the discretion of the department.

The system has the ability to register different types of user accounts.

1. In the registration of a new user account, information is added to the system's database and upon completion becomes ready for payment transaction. The user's RFID must be registered into the system first before the user can use it together with other information, like the user's name and other important details.

2. In registering a department, a department user account has to be made in order to enable it to use this system. This department will also have to specify whether or not it will reward rebate points to their customers, which can also be changed later on. This aspect will enable a department to access the system and create their own inventory within it.

The system has a feature to generate reports which is divided into four categories:

1. The sales report - Data from all sales made in the system are summarized and filtered depending on the user's discretion. Sales report can be filtered by the date the sale occurred, the department where the sale happened, and the user who made the sale.

2. The point inventory - Data gathered in all transactions involving rebate points in the system are summarized and filtered depending on the user's discretion. Point inventory can be filtered by date the rebate points were rewarded, the department where the rebate points were rewarded or used, and the user who received or used the rebate points.

3. The load history - Data gathered from all load and reloading transactions in the system are summarized and filtered depending on the user's discretion. Load history can be filtered by the load/reload date, the department where the load/reload was made, and the user who made the load/reload.

4. The access history - This has two classifications: "Log in" and "Log out". Data gathered from all instances of system access are summarized and filtered depending on the system administrator's discretion. Access history can be filtered by the access date and time, the user account used to access the system, and the department where the system was accessed at.

The system will always ask for a user account's RFID before doing any transaction. Not only is this needed to pull up the information of the account, it is also designed that way to prevent unauthorized users from accessing the account.

The system has an updates feature that is classified into different instances:

1. When the user reloads their account, the system would update their balance according to the amount reloaded. Afterwards, the user can then use the updated balance for their payment transactions.

2. When the user makes a payment with their account, the system updates the user's account balance depending on the user's payment due.

3. After the user earns rebate points from a payment transaction, the system updates the user's account with the points.

4. When the user decides to use their rebate points for payment transactions, the system will update the user's rebate points depending on the amount used.

5. When a department needs to add items into their inventory, the system will update these changes.

6. When a user or a department user needs to change their account details, the update can only be done by the system administrator.

Results and Discussion

The proponents prepared a questionnaire to determine the respondents' regarding the concept of the developed system.

The standard criteria used in evaluating transaction processing systems was the software evaluation instrument used for this system. It determines the system's usability in terms of

functionality, reliability, usability, and efficiency. These are also the characteristics and/or sub-characteristics provided by ISO/IEC 9126 standards.

The attributes in the usage of cash compared to debit cards (security, convenience, accuracy, and budgeting) are based upon Amromin's (2007) study entitled "Debit Card and Cash Usage: A Cross-Country Analysis".

The proponents used the Likert scale to measure the respondents' perception. A Likert scale is a psychometric response scale often used in questionnaires, and is the most widely used scale in survey research. When responding to a Likert questionnaire item, respondents specify their level of agreement to a statement. The researcher used ranks from one to five, with five being the highest rank and one being the lowest rank.

Summaries of the Current Applications of Students RFID in their School

Table 1. Summary of current applications of students' RFID in their school

Type of RFID Application	Votes	Rank
Payment of tuition fee	0	2.25
School log-in and log-out	218	1
Enrollment.	0	2.25
Library	0	2.25
Others	0	2.25

Table 1 displays the summary of current applications of RFID in the school. It can be seen that only the school log-in and log-out application was selected by all the respondents at one hundred percent (100%). It also ranks first.

Summaries of the Assessments of the Respondents in the Cash-based System

Table 2. Summary of the assessment of the respondents in the cash-based system on security

Statement	Mean	Descriptive Rating	Rank
2.1.1 Using of cash is safe and it cannot be easily lost or stolen.	3.42	Partial Agree	2.5
2.1.2 Using of cash is reliable when buying items at school.	4.25	Agree	1
2.1.3 Carrying large amounts of cash at school is of no concern.	3.42	Partial Agree	2.5
2.1.4 Cash can be borrowed by friends to buy items at school	3.33	Partial Agree	3
OVERALL MEAN	3.60	Partial Agree	

Table 2 displays the summary of the respondents' assessment of the cash-based system on security. The statement "Using cash is reliable when buying items at school" ranks first, with a mean of 4.25 interpreted as "Agree". The statements "Carrying large amounts of cash at school is of no concern", and "Using of cash is safe and it cannot be easily lost or stolen," are tied and rank second, with a mean of 3.42 interpreted as "Partial Agree". The statement "Cash can be borrowed by friends to buy items at school", ranks last, with a mean 3.33 interpreted as "Partial Agree". Overall, the mean for the security assessment is 3.60, interpreted as "Partial Agree".

Table 3. Summary of the assessment of the respondents in the cash-based system on convenience

Statement	Mean	Descriptive Rating	Rank
2.2.1 Cash is easy to carry to school every day.	3.32	Partial Agree	2
2.2.2 No worry about exact prices of items when using cash.	3.25	Partial Agree	3
2.2.3 Getting of cash from wallet is hassle free and not difficult.	3.42	Partial Agree	1
2.2.4 Counting of change after a transaction (if any) is easy.	2.64	Partial Agree	4
OVERALL MEAN	3.16	Partial Agree	

Table 3 displays the summary of the respondents' assessment of the cash-based system on convenience. The statement, "Getting of cash from wallet is hassle free and not difficult", ranks first, with a mean of 3.42 interpreted as "Partial Agree". "Cash is easy to carry to school every day" ranks second, with a mean of 3.32 interpreted as "Partial Agree". The statement "No worry about exact prices of items when using cash", ranks third, with a mean of 3.25 interpreted as "Partial Agree". The statement "Counting of change after a transaction (if any) is easy" ranks last, with a mean 2.64 interpreted as "Partial Agree". Overall, the mean for the convenience assessment is 3.16, interpreted as "Partial Agree".

Table 4. Summary of the assessment of the respondents in the cash-based system on accuracy

Statement	Mean	Descriptive Rating	Rank
2.3.1 Change in cash transactions (if any) in always exact.	4.12	Agree	2
2.3.2 Buying of items at school using exact cash.	4.35	Agree	1
2.3.3 Cash can always buy items as long as it is affordable.	3.42	Partial Agree	3
2.3.4 Parents/Guardians always provide exact amount of cash.	2.54	Partial Agree	4
OVERALL MEAN	3.60	Agree	

Table 4 displays the summary of the respondents' assessment of the cash-based system on accuracy. The statement "Buying of items at school using exact cash" ranks first, with a mean of 4.35 interpreted as "Agree". "Change in cash transactions (if any) is always exact" ranks second, with a mean of 4.12 interpreted as "Partial Agree". The statement "Cash can always buy items as long as it is affordable" is at the third rank, with a mean of 3.45 interpreted as "Partial Agree". The statement "Parents/Guardians always provide exact amount of cash" ranks last, with a mean of 2.54 interpreted as "Partial Agree". Overall the mean for the criteria accuracy is 3.16, interpreted as "Agree".

Table 5. Summary of the assessment of the respondents in the cash-based system on budgeting

Statement	Mean	Descriptive Rating	Rank
2.4.1 Allowance per week in cash basis is sufficient.	3.21	Partial Agree	2
2.4.2 There is savings from cash allowance (left over money).	3.35	Partial Agree	1
2.4.3 Target items to be bought for the day are reached and items bought are tracked	2.40	Disagree	4
2.4.4 Discipline in buying is observed and the temptation to buy non-essential items are limited	2.63	Partial Agree	3
OVERALL MEAN	2.89	Partial Agree	

Table 5 displays the summary of the respondents' assessment of the cash-based system on budgeting. The statement "There is savings from cash allowance (left over money)" ranks first, with a mean of 3.35 interpreted as "Partial Agree". "Allowance per week in cash basis is sufficient" ranks second, with a mean of 3.21 interpreted as "Partial Agree". The statement "Discipline in buying is observed and the temptation to buy non-essential items are limited" is at the third rank, with a mean of 2.63 interpreted as "Partial Agree". Lastly, "Target items to be bought for the day are reached and items bought are tracked" ranks last, with a mean 2.40 interpreted as "Disagree". Overall, the mean for the criteria budgeting is 2.89, interpreted as "Partial Agree".

Summaries of the Assessments of a Cashless-based RFID System

Table 6. Summary of the assessment of a cashless-based RFID system on security

Statement	Mean	Descriptive Rating	Rank
3.1.1 Using of My SDCArd is safe and it cannot be easily lost or stolen.	4.30	Agree	2
3.1.2 Using of My SDCArd is reliable when buying items at school.	4.33	Agree	1
3.1.3 Carrying large amounts of currency loaded in My SDCArd at School is of no concern.	3.46	Partial Agree	3
3.1.4 My SDCArd can be borrowed by friends to buy items at school	2.27	Disagree	4
OVERALL MEAN	3.59	Partial Agree	

Table 6 displays the summary of the respondents' assessment of the cashless RFID system on security. The statement "Using My SDCArd is reliable when buying items at school" ranks first, with a mean of 4.33 interpreted as "Agree". "Using of My SDCArd is safe and it cannot be easily lost or stolen" ranks second, with a mean of 4.30 interpreted as "Agree". "Carrying large amounts of currency loaded in My SDCArd at school is of no concern" ranks third, with a mean of 3.46 interpreted as "Partial Agree". The statement "My SDCArd can be borrowed by friends to buy items at school" ranks last, with a mean of 2.27 interpreted as "Disagree". Overall, the mean for the security assessment is 3.59, interpreted as "Partial Agree".

Table 7. Summary of the assessment of a cashless-based RFID system on convenience

Statement	Mean	Descriptive Rating	Rank
3.2.1 My SDCArd is easy to carry to school every day.	4.57	Strongly Agree	2
3.2.2 No worry about exact prices of items when using My SDCArd.	4.41	Agree	3
3.2.3 Getting of allowance that is pre-loaded in My SDCArd is hassle-free and not difficult.	4.16	Agree	4
3.2.4 Counting of change after a transaction (if any) is easy.	4.58	Strongly Agree	1
OVERALL MEAN	4.43	Agree	

Table 7 displays the summary of the respondents' assessment of the cashless RFID system on convenience. The statement "Counting of change after a transaction (if any) is easy" ranks first, with a mean of 4.58 interpreted as "Strongly Agree". "My SDCArd is easy to carry to school every day" ranks second, with a mean of 4.57 interpreted as "Strongly Agree". "No worry about exact prices of items when using My SDCArd" ranks third, with a mean of 4.41 interpreted as "Agree". The statement "Getting of allowance that is pre-loaded in My SDCArd is hassle-free and not difficult" ranks last, with a mean 4.16 interpreted as "Agree". Overall the mean for the convenience assessment has a value of 4.43, interpreted as "Agree".

Table 8. Summary of the assessment of a cashless-based RFID system on accuracy

Statement	Mean	Descriptive Rating	Rank
3.3.1 Change in My SDCArd transactions (if any) in always exact.	4.51	Strongly Agree	2
3.3.2 Buying of items at school using exact amount.	4.44	Agree	3
3.3.3 My SDCArd can always buy items as long as it is affordable.	4.21	Agree	4
3.3.4 Parents/Guardians always provide exact amount of allowance.	4.58	Strongly Agree	1
OVERALL MEAN	4.43	Agree	

Table 8 displays the summary of the respondents' assessment of the cashless RFID system on accuracy. The statement "Parents/Guardians always provide exact amount of allowance" ranks first, with a mean of 4.58 interpreted as "Strongly Agree". "Change in My SDCArd transactions (if any) is always exact" ranks second, with a mean of 4.51 interpreted as "Strongly Agree". "Buying of items at school using exact amount" ranks third, with a mean of 4.44 interpreted as "Agree". The statement "My SDCArd can always buy items as long as it is affordable" ranks last, with a mean 4.21 interpreted as "Agree". Overall, the mean for the accuracy assessment is 4.43, interpreted as "Agree".

Table 9. Summary of the assessment of a cashless-based RFID system on budgeting

Statement	Mean	Descriptive Rating	Rank
3.4.1 Allowance per week in loaded My SDCArd basis is sufficient.	4.32	Agree	4
3.4.2 There is savings left over load from My SDCArd to be used the next day.	4.47	Agree	3
3.4.3 Target items to be bought for the day are reached and items bought are tracked	4.51	Agree	2
3.4.4 Discipline in buying is observed and the temptation to buy non-essential items are limited.	4.54	Strongly Agree	1
OVERALL MEAN	4.46	Agree	

Table 9 displays the summary of the respondents' assessment of the cashless RFID system on budgeting. The statement "Discipline in buying is observed and the temptation to buy non-essential items are limited" ranks first, with a mean of 4.54 interpreted as "Strongly Agree". "Target items to be bought for the day are reached and items bought are tracked" ranks second, with a mean of 4.51 interpreted as "Strongly Agree". The "There is savings left over load from My SDCArd to be used the next day" statement ranks third, with a mean of 4.47 interpreted as "Agree". The statement "Allowance per week in loaded My SDCArd basis is sufficient" ranks last, with a mean of 4.32 interpreted as "Agree". Overall, the mean for the budgeting assessment is 4.46, interpreted as "Agree".

Level of Acceptance of the Integration of a Cashless-based RFID System

Table 10. Summary of the level of acceptance of the integration of a cashless-based RFID system on functionality

Statement	Mean	Descriptive Rating	Rank
4.1.1 System's design and characteristics are appropriate to its intended use.	4.44	Acceptable	1
4.1.2 System features (i.e. Loading, Balance Inquiry) works properly.	4.31	Acceptable	4
4.1.3 The system serves its purpose as a cash less system.	4.40	Acceptable	2
4.1.4 System displays information after successfully checking the user's credentials.	4.38	Acceptable	3
OVERALL MEAN	4.38	Acceptable	

Table 10 displays the summary of the respondents' level of acceptance of the integration of a cashless-based RFID system on functionality. The statement "System's design and characteristics are appropriate to its intended use" ranks first, with a mean of 4.44 interpreted as "Acceptable". "The system serves its purpose as a cash less system" ranks second, with a mean of 4.31 interpreted as "Acceptable". "System displays information after successfully checking the user's credentials" ranks third, with a mean of 4.38 interpreted as "Acceptable". The statement "System features (i.e. Loading, Balance Inquiry) works properly" ranks last, with a mean 4.40 interpreted as "Acceptable". Overall, the mean for the criteria functionality is 4.38, interpreted as "Acceptable".

Table 11. Summary of the level of acceptance of the integration of a cashless-based RFID system on reliability

Statement	Mean	Descriptive Rating	Rank
4.2.1 Reloading cash into the card are easily processed and done correctly.	4..20	Acceptable	4
4.2.2 Payments using cash cards are done without discrepancy.	4.28	Acceptable	3
4.2.3 The system provides complete information about the transaction that was done.	4.41	Acceptable	1
4.2.4 The system and its features are always available even from different departments.	4.34	Acceptable	2
OVERALL MEAN	4.32	Acceptable	

Table 11 displays the summary of the respondents' level of acceptance of the integration of a cashless-based RFID system on reliability. The statement "The system provides complete information about the transaction that was done", ranks first with a mean of 4.41 interpreted as "Acceptable". "The system and its features are always available even from different departments" ranks second, with a mean of 4.34 interpreted as "Acceptable". "Payments using cash cards are done without discrepancy" ranks third, with a mean of 4.28 interpreted as "Acceptable". The statement "Reloading cash into the card is easily processed and done correctly" ranks last, with a mean of 4.20 interpreted as "Acceptable". Overall, the mean for the reliability assessment is a value of 4.32, interpreted as "Acceptable".

Table 12. Summary of the level of acceptance of the integration of a cashless-based RFID system on usability

Statement	Mean	Descriptive Rating	Rank
4.3.1 Texts are of the right size and style to help in using the system and in providing the information	4..40	Acceptable	3
4.3.2 Desired information can be obtained even with less knowledge of the system.	4.28	Acceptable	4
4.3.3 Buttons and forms have captions that properly describe its function or use.	4.43	Acceptable	1
4.3.4 Arrangement of the buttons and texts does not interfere to the user's experience of using the system.	4.41	Acceptable	2
OVERALL MEAN	4.38	Acceptable	

Table 12 displays the summary of the respondents' level of acceptance of the integration of a cashless-based RFID system on usability. The statement "Buttons and forms have captions that properly describe its function or use" ranks first, with a mean of 4.43 interpreted as "Acceptable". "Arrangement of the buttons and texts does not interfere to the user's experience of using the system" ranks second, with a mean of 4.41 interpreted as "Acceptable". "Texts are of the right size and style to help in using the system and in providing the information" ranks third, with a mean of 4.40 interpreted as "Acceptable". The statement "Desired information can be obtained even with less knowledge of the system" ranks last, with a mean of 4.28 interpreted as "Acceptable". Overall, the mean for the usability assessment has a value of 4.38, interpreted as "Acceptable".

Table 13. Summary of the level of acceptance of the integration of a cashless-based RFID system on efficiency

Statement	Mean	Descriptive Rating	Rank
4.4.1 A transaction can be completed with just a few steps.	4..56	Highly Acceptable	4
4.4.2 The system does not have noticeable effect on the computer's speed when it is running	4.60	Highly Acceptable	3
4.4.3 Swiping or Tapping of RFID for identification is fast (takes less than a minute)	4.80	Highly Acceptable	1
4.4.4 The computer can still run other applications smoothly even when the system is open.	4.71	Highly Acceptable	2
OVERALL MEAN	4.67	Highly Acceptable	

Table 13 displays the summary of the respondents' level of acceptance of the integration of a cashless-based RFID system on efficiency. The statement "Swiping or Tapping of RFID for identification is fast (takes less than a minute)" ranks first, with a mean of 4.80 interpreted as "Highly Acceptable". "The computer can still run other applications smoothly even when the system is open" ranks second, with a mean of 4.71 interpreted as "Highly Acceptable". "The system does not have a noticeable effect on the computer's speed when it is running" ranks third, with a mean of 4.60 interpreted as "Highly Acceptable". "A transaction can be completed with just a few steps" ranks last, with a mean of 4.28 interpreted as "Highly Acceptable". Overall, the mean for the efficiency assessment is a value of 4.38, interpreted as "Highly Acceptable".

Suggestions for Improvement in "My SDCArd"

Table 14. Summary of suggestions for improvement in "MY SDCARD"

Suggested Recommendation	Votes
Can borrow rebate points	55
School employees can also use the system.	21
Grade School / High school can also register	36
Credit option	95
Others	11

Table 14 displays the summary of suggestions to improve "MySDCard". The statement "Credit option" has 95 votes, ranking first. "Can borrow rebate points" has 55 votes, ranking second. "Grade School/High school can also register" has 36 votes, ranking third. "School employees can also use the system" has 21 votes, ranking fourth. "Others" has 11 votes, ranking last. These suggestions include enabling a students' parents to avail the system, giving away extension cards, and making the system available online.

Conclusions and Recommendations

The proponents conclude that the implementation of the cashless system will involve everybody in SDCA—from the accounting department, the school businesses, down to the students. This was made clear when the proponents had the system evaluated. Certain students, faculty, staff, and officers of the school will be involved in payment transactions. Specifically these are, but are not limited to, the cashiers, food pantry staff, business center staff, and the students.

The proponents also concluded that the flow of information for the existing payment system of the school is linear. Also, the places where payment transactions happen in SDCA act as different or separate entities. Examples of these places are the cashiers and food pantries. After a payment transaction is completed and recorded, the flow of information stays only at that department. MySDCArd, compared to the existing flow of information, will be more centralized. Information gathered from a specific department can be consolidated with information from other departments, having a more centralized flow of information.

The proponents also concluded that MySDCArd, utilizing RFID technology, will be an effective means of further increasing a student's financial security, especially since this system aims to minimalize and even eliminate the students' need to carry physical cash.

The system is effective in terms of functionality, and performs its required functions like loading cash points and displaying important information about the RFID cardholders well. The system is also reliable in completing purchase transactions with consistency and no discrepancies between the information inside the different kiosks within the system. To add more safety, information being inputted into the system is also checked before the completion of the transaction, and the system also presents the summary of the transaction collectively or individually.

The system's interface and its contextual clues makes navigation through the system highly acceptable. Desired information can be seen with a few clicks of the system's available tools. And because of the system's minimalist design, the system only asks little information from a user to complete a transaction without sacrificing security. Also, the system does not interfere with the computer system it has been installed into, thus preserving the other tasks it shares the computer with. Finally, the user is always well-informed of any problems that might occur in the process of using the system.

The respondents raised some suggestions and possible improvements on the system. Most of these ideas revolved around making the system more available and accessible to its users. Examples of these suggestions are:

1. Making the system available online. This will allow the RFID cardholders to be able to view their information even at home or at a place that has an internet connection.

2. Making SDCA officers and staff into RFID cardholders as well. This will allow them to use the system and benefit from cashless transactions.

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