**ACCelerate - *MapuaCash***
**Members: Acebedo, Carballo, Cata-al**

**Overview:**
MapuaCash stands out as an intuitive financial management tool catered specifically to Mapúa University students across all campuses. Its standout feature lies in its seamless integration with the university's billing systems, allowing for effortless handling of semestral payments, club dues, and event fees directly through the app. By centralizing financial transactions, MapuaCash simplifies processes for students and university staff, reducing administrative burdens.
Additionally, MapuaCash provides an array of features that let students track their spending, create budgets, and learn more about their spending patterns. With tools like real-time spending updates and expenses categorization, students can keep on top of their budget and make wise financial decisions within the campus. The software also offers thorough financial reports, which helps students examine their spending habits and develop money management skills. MapuaCash's intuitive interface and extensive functionalities enable students to confidently manage their school finances and achieve academic and personal success while attending Mapúa University.

**Solving the Problem:**
MapuaCash efficiently resolves the challenge of decentralized payments within Mapúa University by centralizing financial transactions through its integrated platform. Prior to its implementation, students faced difficulties managing payments scattered across different campus departments and activities, leading to confusion and increased administrative burdens. With MapuaCash, students can conveniently handle semestral payments, club dues, event fees, and other financial transactions through a single, user-friendly interface. This streamlined approach not only saves time but also enhances transparency and accountability in financial management across the university, benefiting both students and staff alike.

**The Application:**

- **Application Name:** MapuaCash
- **What It Is:**
    - MapuaCash is a financial management application designed specifically for students, staff, and administrators of Mapúa University. It aims to streamline expense tracking, budget management, and cash transactions within the university campus.
- **Features:**

MapuaCash incorporates the following key features to enhance financial management for Mapúa University students:

- **Integration with University Billing Systems:** Seamlessly integrates with the university's billing systems, facilitating easy handling of semestral payments, club dues, and event fees.

- **Expense Categorization:** Users can categorize their expenses for better organization and tracking.
- **Budget Setting:** The app enables users to set budgets to manage their finances effectively.
- **Comprehensive Financial Reporting:** Provides detailed financial reports, offering insights into spending patterns and aiding in informed decision-making.

- **Questions about the Application:**
  - **Who are the potential users?**
    - Potential users mainly include students, and along with university staff, and administrators who interact with financial transactions and budgeting within Mapúa University.
  - **What tasks do they seek to perform?**
    - Users seek to facilitate cash transactions on campus, track expenses, manage budgets for various purposes (e.g., tuition, books, events), and generate financial reports for analysis.
  - **What functionality should any system provide to these users?**
    - The system should provide secure cash transaction capabilities, integration with university billing systems for easy payment processing, seamless expense tracking, and efficient budget management tools.
  - **What constraints will be placed on your eventual design?**
    - Constraints may include technical feasibility, data security requirements, budgetary limitations, and adherence to university policies and regulations.
  - **What criteria should be used to judge if your design is a success or not?**
    - Success criteria may include user satisfaction, ease of use, accuracy of financial data, efficiency in managing finances, and alignment with the goals and objectives of Mapúa University.

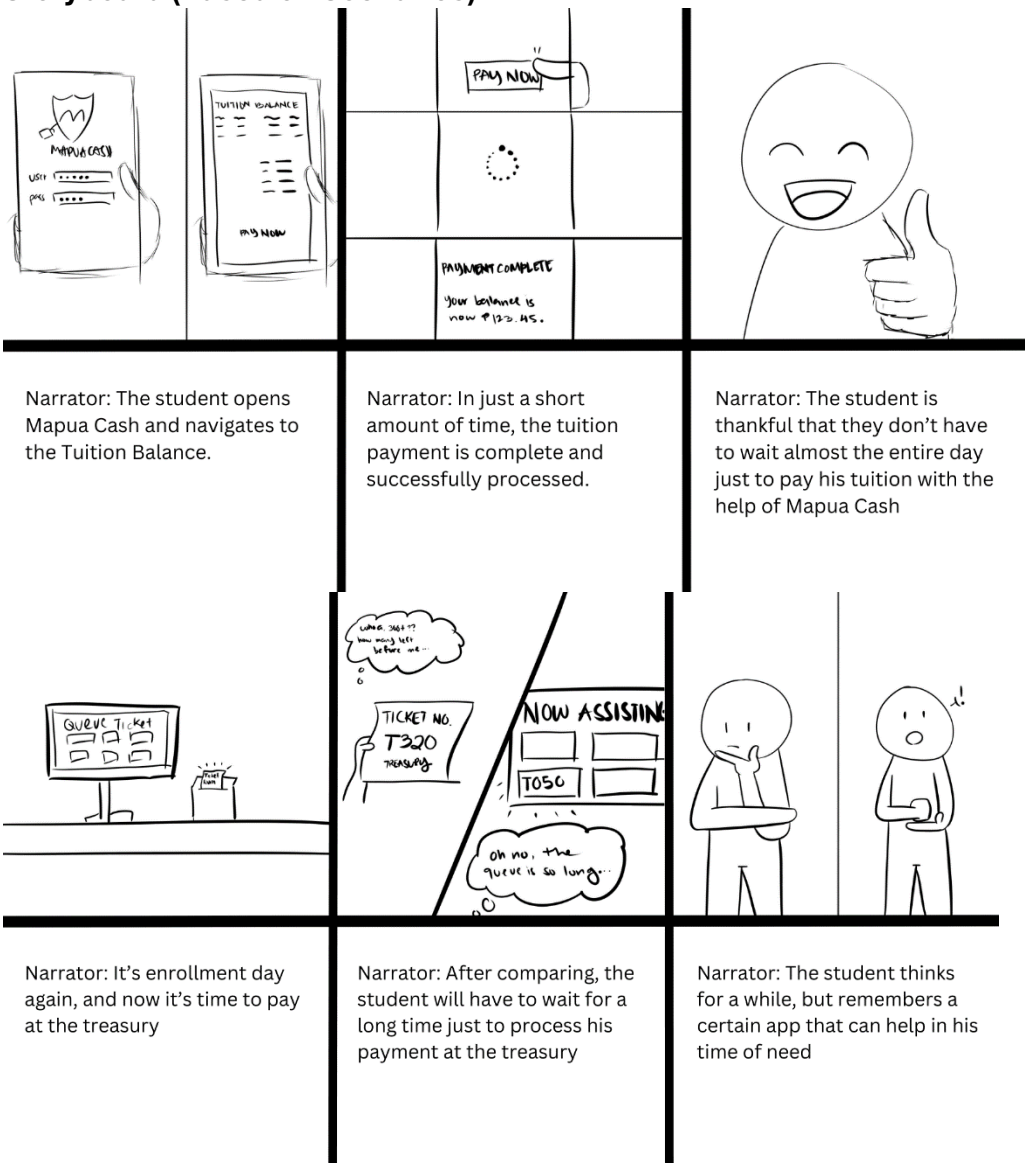
**Part 2: Design Alternatives**

**Scenario:**
**Scenario 1:** A student took advising at the faculties and after advising the student went to the treasury and found out that the line of the treasury was 100 or more and decided not to pay this time because of the line, little did the student know that ACCelerate created an app that can pay through online called Mapua Cash. Sign in to the app using the MMCM-provided username and password and go to the balance of tuition and user can see the statements and pay the tuition online without any hassle and can check the updated balances of the student.

**Scenario 2:** The student's parents forgot to give allowance to the student, or the parents are abroad and can't give allowance to the student. The parents can add allowance during enrollment using Mapua Cash, The E-cash that the parents add to the Mapua Cash app can be used at the MMCM cafeteria to grab food at any food stall in the cafeteria with a Mapua Cash Validation Certificate. The Mapua Cash also gives discounts and coupons to any food stall certified to compete with other business applications.

**Scenario 3:** Person 1 wants to buy food from the cafeteria but realizes that their money is not enough for the food they want to buy. Their friend, Person 2, approaches them and shows them that they can pay for food in the cafeteria using MapuaCash.

**Storyboard (Based on Scenarios):**



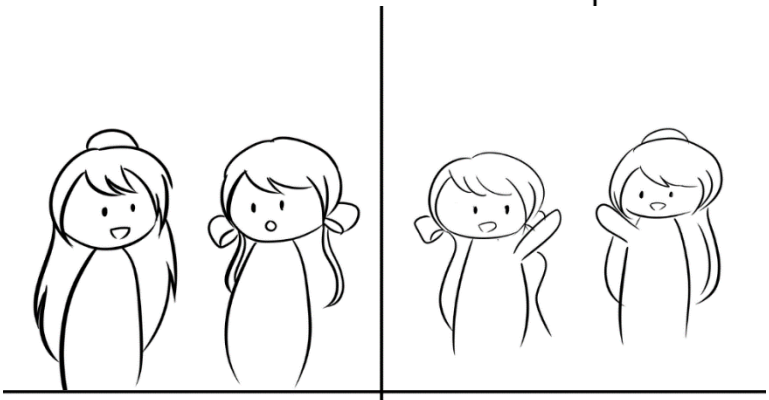

**Storyboard 1 – Enrollment Time Once Again**


| Narrator: The student finds out that he had run out of money as allowance during the start of a new term and his parents are currently abroad for a week | Narrator: The student then contacts his mom to ask if they could send him some allowance for the week | Narrator: With the help of Mapua Cash, the mom is able to send him money as allowance for the week until they get home from abroad. | Narrator: After being processed, the money is received in the student's account, now with money as allowance. |
|---|---|---|---|

**Storyboard 2 – Broke Moment**


Narrator: Clara, a student of MMCM, seems to be in a pinch after seeing the amount of cash she has on-hand
Clara: Oh no, I can't afford a meal for lunch with what I have...

Narrator: Yumi, her classmate, seems to have noticed her troubles.
Yumi: I didn't mean to eavesdrop, but did you mention that you're lacking funds for lunch?



Yumi: If you have money in your Mapua Cash app, you can use that to purchase food from the cafeteria.
Clara: Oh, I nearly forgot I *did* have money there. Thank you for reminding me, Yumi.

Clara: I'll go buy my lunch now. See you in class, Yumi!
Yumi: No problem, enjoy your lunch!
Narrator: With a quick wave, they parted ways for now and went off to their destinations during their break.

**Storyboard 3 – Broke Moment (Part 2)**

**Problem Statement:**

- Students faced difficulties managing decentralized payments across various campus departments and activities, leading to confusion.
- The fragmented payment system increased administrative burdens and inefficiencies in handling semestral payments, club dues, event fees, and other financial transactions.

**Application Icon Size comparison**



***36x36 48x48 72x72 96x96 144x144 192x192***

The icons above show the chosen application logo in different sizes. This is an important detail to know to identify how the application logo would look in many different screen ratios.

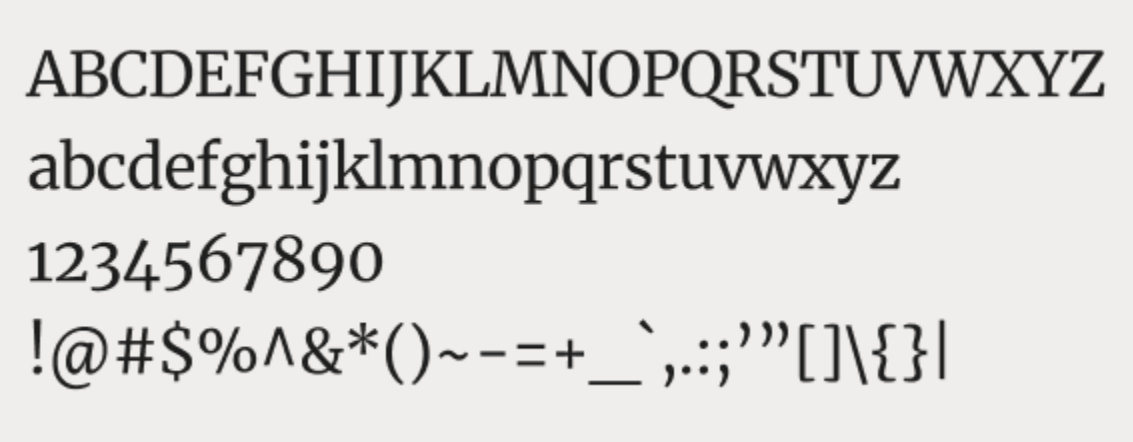
**Design**

The MapuaCash application aspires to be harmonious to the Mapuan colors to emphasize that this application was made for Mapua students and staff. The following discussed will be the: color palette, font, and GUI design of the application:

Color Palette:

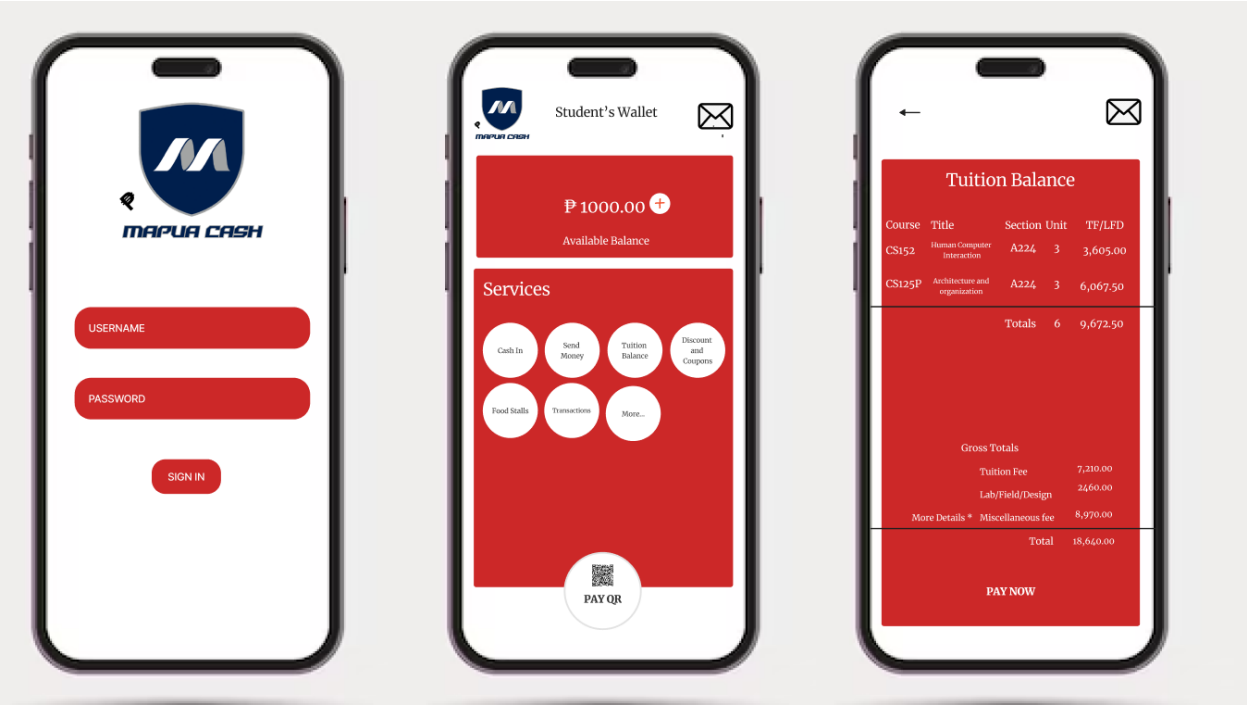

This color palette was picked from the application logo and will be used to integrate the Mapuan colors into the application. Although it is not the final color palette of the application and changes may occur in the prototyping stage, the team wants to keep the shades of red and blue as the most prominent colors of the application.

Font:

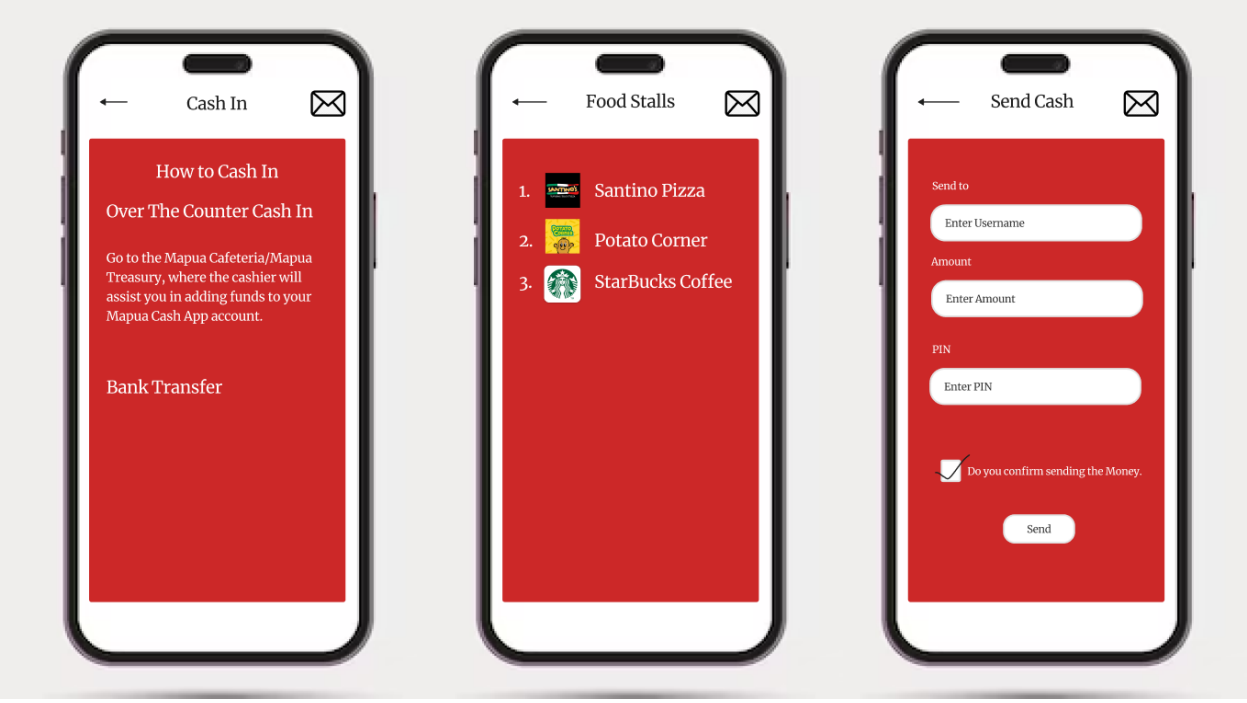


The team has decided to use a bookish/san serif type of font for the application. Albeit a bit more fancy looking than other fonts out there this font is still easy to read and gives a sophisticated look to the application.

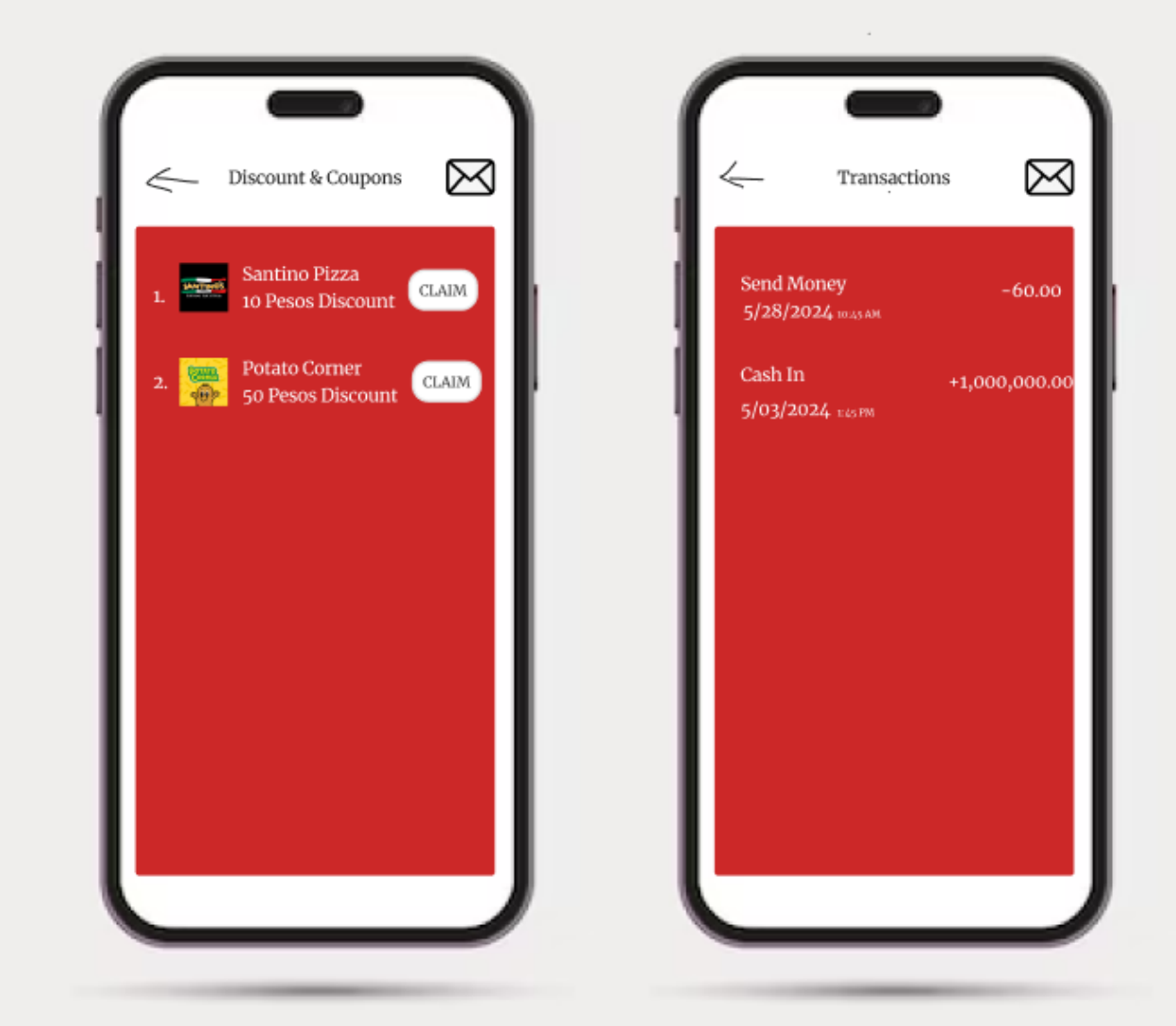
**GUI mock-up/prototype:**
The team has decided to use a mobile GUI for the application to keep it simple and not complicate the app any further by trying to adapt to other GUIs for different models. The team has created this mock-up/prototype using Figma.




The screen on the left is the log-in screen for both students and a staff, where the username will be their school provided email or their school ID number.
The screen in the middle is the designated home screen once you have successfully logged in. It was designed similar to online cash payments apps like GCash or Paymaya. Where the user can select what kind of payment they will be making and they will be directed to that specific page.
The screen on the right is what the user will see when they click on the tuition balance button. At the bottom of the screen you can see a pay now button users can click to pay for their remaining tuition balance.




The screen on the left here is the cash in page, here you can see options on how to cash in for your MapuaCash account.
The screen in the middle of the picture is the available food stalls you can buy and pay for with you MapuaCash account (the chosen food stalls in the picture are just for example purposes).
The screen on the right is the send cash page, here you can see that to be able to send cash to another MapuaCash account, you would need the other user's username and before you can send your own money you need to enter your PIN/password for security purposes.




The screen on the left is a discount coupons page that food stalls can establish with the Mapua schools during any events.
The screen on the right is the transactions page to help users keep track of their expenses using MapuaCash.

Note: This is just the mock-up and changes may occur in the progress of development of MapuaCash.

**MapuaCash**
**ACCelerate – Acebedo – Carballo – Cata-al**

**Project Description:**

MapuaCash is a user-friendly financial management tool designed specifically for Mapúa University students across all campuses. Its key feature is the seamless integration

with the university's billing systems, enabling easy handling of semestral payments, club dues, and event fees directly through the app. This centralization simplifies financial transactions for both students and university staff, reducing administrative tasks. MapuaCash also offers features such as real-time spending updates, expense categorization, budget creation, and comprehensive financial reports, allowing students to track their spending, understand their financial habits, and make informed decisions. With its intuitive interface and extensive functionalities, MapuaCash helps students manage their school finances effectively, fostering both academic and personal success.

**Requirements Summary:**

| | | |
|---|---|---|
| **MINIMUM REQUIREMENTS** | Processor Cores | Dual Core |
| | OS | Android 5.0 or iOS 10.0 |
| | RAM | 1GB |
| **RECOMMENDED REQUIREMENTS** | Processor Cores | Quad Core |
| | OS | Android 8.0 or iOS 12.0 |
| | RAM | 2 GB |
| **OTHER REQUIREMENTS** | Permissions | Notifications, Contacts, Camera, Storage |

Table 1. System Requirements

To cater to the lower-end phone models, the application will have at most a minimum of 2 Core, 1 GB of RAM, and Android 5.0/iOS 10.0 as its OS. The requirements of the system are based on the requirements of applications like PayPal.

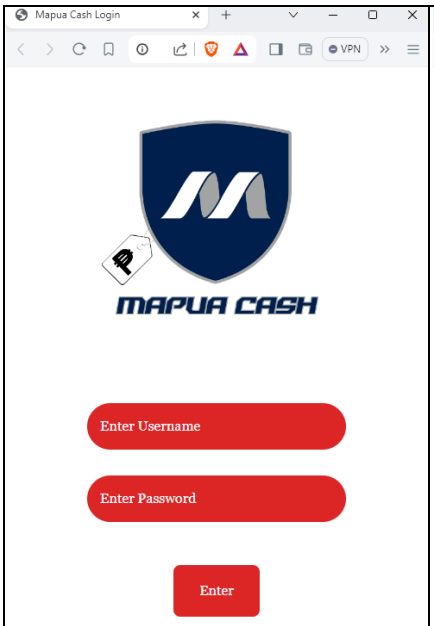
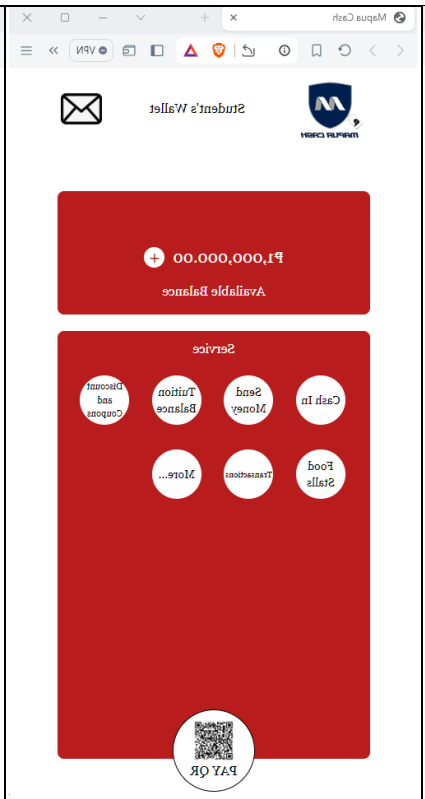
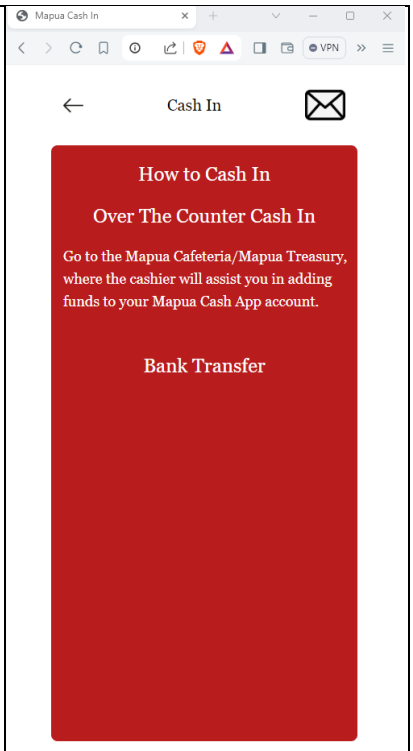
**Prototype Description:**

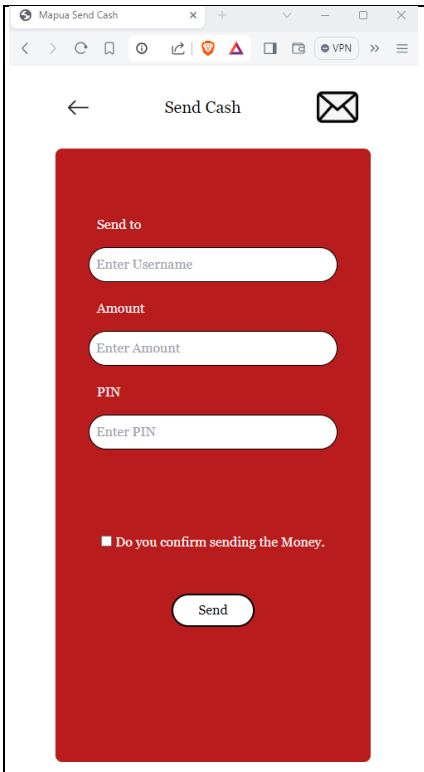
The prototype was created with the use of HTML Tailwind CSS Framework. Using this method the team created an easy and understandable mobile application layout of MapuaCash to be used by students and staff of Mapua schools.

**User Scenario:**

A student took advising at the faculties and after advising the student went to the treasury and found out that the line of the treasury was 100 or more and decided not to pay this time because of the line, little did the student know that ACCelerate created an app that can pay through online called Mapua Cash. Sign in to the app using the MMCM-provided username and password and go to the balance of tuition and user can see the statements and pay the tuition online without any hassle and can check the updated balances of the student.

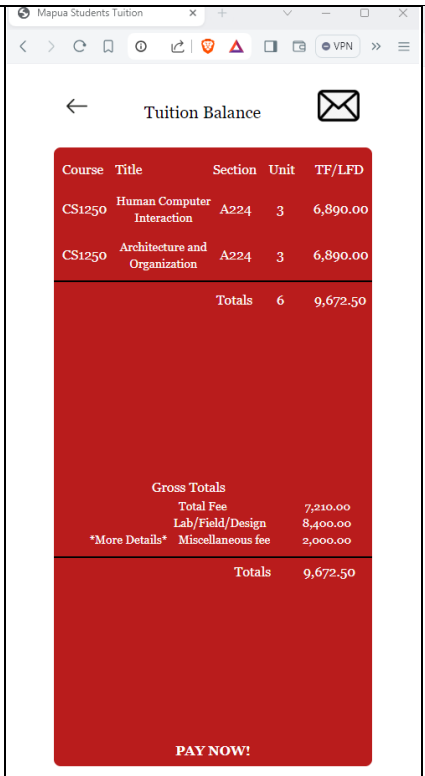
**MapuaCash Mock-Up/Prototype & Prototype Flow:**

| | | |
|---|---|---|
|  |  |  |
| **Log In Page** | **Home Page** | **Cash In Page** |
| This is the opening page of the application. Users are required to input their Mapua-provided credentials to have access to the MapuaCash application. | The home page is where the user will see all the available features of the MapuaCash application. At the bottom center there is also the option of a Payment through QR scan for easier transaction. | The Cash In page shows different ways the user can Cash In for their MapuaCash account. There is the over the counter and the bank transfer options available. |




## Send Cash Page

The Send Cash Page works like any online cash transfers. Users input the username of the person/treasury they want to send the money to.




## Tuition Balance Page

The Tuition Balance Page is where the user, more specifically the students will be able to see their remaining tuition balances.


## Discount and Coupons Page

The discount and coupons page is a page for ongoing discounts and possible coupons users can use on the available food stalls in the Mapua campus

| | |
|---|---|
|  <br><br>**Food Stalls Page**<br><br>The food stalls page is where you can see the available food stalls in your Mapua campus where you can use your MapuaCash app to pay for your food. |  <br><br>**Transactions Page**<br><br>The transactions page serves as a way for users to keep track of their spendings using the MapuaCash app. |

Table 2. MapuaCash Prototype Flow

**Rationale:**

The team opted to use HTML Tailwind CSS Framework in creating this prototype for a seamless process of adding more Quality-of-Life features and fixing of any mistakes noticed in the prototype. This method also features the simple yet eye-catching layout of MapuaCash. The team utilized the application VSCode in using the method chosen to create the prototype of MapuaCash.

**Initial Evaluation Plan:**

With the current prototype the team has decided to focus more on finishing up remaining goals left on making the application usable for the students and staff. When the changes in mind are implemented, the application will be sent out to students of Mapua Malayan Colleges of Mindanao for a test run.

**Usability Specifications:**

MapuaCash aims to provide a seamless, user-friendly experience that meets the needs and expectations of Mapúa University students and staff. The team aims for this prototype to achieve the following criteria for usability:

- ***User Interface Design:*** The application should feature a clear, simple, and consistent navigation structure. It must be responsive to the users. Lastly, the application should have minimalist designs and consistent visual language.
- ***Accessibility:*** The application should have color contrast that does not hurt the eyes of the users and especially to those who are visually impaired. Along this, the font size and readability of the application should be monitored since it is a mobile application.
- ***Performance:*** The load time should be fast and the resource efficiency of the application should be applied. Optimizing the app to consume minimal battery, processing power, and data usage to prevent device slowdown and ensure longevity of use.
- ***User Feedback and Support:*** Providing clear and helpful error messages that inform users of what went wrong and how to correct it, using simple language and avoiding technical jargon. Including an in-app help section with tutorials, FAQs, and step-by-step guides to assist users in navigating and utilizing the app's features. Allowing users to easily provide feedback and report issues within the app, ensuring their concerns are addressed promptly.
- ***Security:*** Implementing robust security measures to protect user data, including encryption, secure authentication, and regular security audits. Giving users control over their privacy settings, including the ability to manage permissions for Notifications, Contacts, Camera, and Storage.

**Roles:**

The team's aims to get at least 10 participants in conducting the evaluation of MapuaCash. The three members of ACCelerate are divided into these three roles:

| Developer / UI Designer Manager | Task(s) |
|---|---|
| Angela Coleen Acebedo | will record the duration of user interactions with a task section, document the user's experience, and communicate the task that the participant will perform |
| James Paul Carballo | will record the duration of user interactions with a task section, document the user's experience, and communicate the task that the participant will perform |
| JC-Rey Cata-al | will record the duration of user interactions with a task section, document the user's experience, and communicate the task that the participant will perform |

Table 3. Team Member Tasks

*Time Interpretation for MapuaCash*

| Task | Highly Acceptable (Successful) | Not Acceptable (Unsuccessful) |
|---|---|---|
| Log In | Within 1 minute or below | Above 30 seconds |
| Navigate to Tuition Balance | Within 3 minutes or below | Above 1 minute |
| Complete a Tuition Payment | Within 2 minutes or below | Above 3 minutes |
| Cash In | Within 2 minutes or below | Above 2 minutes |
| Send Cash | Within 2 minutes or below | Above 2 minutes |
| Check Transaction History | Within 1 minute or below | Above 1 minute |
| Apply Discount/Coupon | Within 2 minutes or below | Above 2 minutes |
| Navigate to Food Stalls Page | Within 1 minute or below | Above 1 minute |

Table 4. TIme Interpretation

This table will be used to assess the efficiency of the MapuaCash application. Tasks completed within the specified "Highly Acceptable" timeframes will be considered successful, indicating that the app's design facilitates quick and efficient user interactions. Tasks exceeding these timeframes will be deemed unsuccessful, suggesting areas for improvement in the app's design and usability.

**Heuristic Evaluation:**

The team's evaluation of MapuaCash will utilize the 10 Usability Heuristics method developed by Jakob Nielsen. This approach ensures a comprehensive assessment of the app's usability and user experience.

***Visibility of System Status***

MapuaCash will keep users informed about what is happening within the app through clear and timely feedback. For instance, loading indicators, transaction confirmations, and notification badges will provide real-time updates on actions and processes.

***Match Between System and Real World***

The app will use familiar language and concepts that align with the users' expectations and real-world scenarios. Terms like "Tuition Balance," "Cash In," and "Send Cash" are straightforward and reflect common financial activities, ensuring clarity and ease of use.

***User Control and Freedom***

MapuaCash will offer users clearly marked options to undo actions or exit unwanted states without hassle. Features such as a "Cancel" button during transactions and an easily accessible logout option will enhance user control and freedom.

***Consistency and Standards***

Consistency will be maintained throughout the app to ensure that users do not have to guess whether different words, situations, or actions mean the same thing. The design, terminology, and layout will follow established conventions and Mapúa University branding guidelines.

***Error Prevention***

Preventive measures will be in place to minimize the occurrence of errors. For example, input validation for transaction amounts and confirmation prompts before finalizing payments will help users avoid mistakes.

***Recognition Rather Than Recall***

MapuaCash will make objects, actions, and options visible to reduce the reliance on memory. Key functions like transaction history, balance checks, and payment options will be easily accessible and prominently displayed.

***Flexibility and Efficiency of Use***

The app will cater to both novice and experienced users. Advanced users can benefit from shortcuts like QR code payments, while new users can follow guided tutorials and tips. This dual approach ensures efficiency for all user levels.

***Aesthetic and Minimalist Design***

MapuaCash will feature a clean and minimalist design, displaying only relevant information. This approach avoids clutter and helps users focus on their tasks without distractions, enhancing overall usability.

***Help Users Recognize, Diagnose, and Recover from Errors***

Error messages within the app will be clear and constructive, avoiding technical jargon. These messages will explain the problem in plain language and suggest steps to correct it, helping users quickly recover from issues.

***Help and Documentation***

Users will have access to comprehensive help and documentation directly within the app. This includes searchable FAQs, step-by-step guides, and contact options for further assistance, ensuring users can easily find the information they need.

**Evaluation and Feedback**

| **Evaluate the chosen design according to Nielsen's Heuristics and Justify** | | | | | |
|---|---|---|---|---|---|
| **Area of Evaluation** | **5** | **4** | **3** | **2** | **1** |
| A. **Visibility of System Status**<br>• The system design provides appropriate feedback like message prompts in response to user actions | | | | | |
| • The message prompts are clear, visible and understandable | | | | | |
| **Evaluation**<br>The system does give feedback on certain parts like the login information, there are some parts where there is no specific feedback yet. | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| B. **Match between the system and the real world**<br>• Used words, phrases, and concepts according to users' language | | | | | |
| **Evaluation**<br>The system is simple and uses easy to understand words and phrases with concepts already known by many. | | | | | |
| C. **User control and freedom**<br>• The system design provides ways of allowing users to easily "get in" and "get out" if they find themselves in unfamiliar parts of the system. | | | | | |
| **Evaluation**<br>The system has a login feature to get in and has a back button to go back to the main page when navigating through the features | | | | | |
| D. **Consistency and Standards**<br>• The colors, text, labels, buttons and other elements in the design are uniform from start to finish | | | | | |
| • Text and icons are not too small or too big | | | | | |
| • Menus and other features of the system are arranged and positioned in a consistent way. | | | | | |
| **Evaluation**<br>The app and its features are all uniformed in fonts, text size, and buttons to achieve consistency. | | | | | |
| E. **Error Prevention**<br>• The system design provides an automatic detection of errors preventing them to occur in the first place. | | | | | |
| • Idiot proofing mechanisms are applied | | | | | |
| **Evaluation**<br>There is error prevention in the current system but not all corners have been covered. | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| F. **Help users recognize, diagnose and recover from errors**<br>• Error messages and the terms used are recognizable, familiar and understandable for the user. | | | | | |
| **Evaluation**<br>Evaluation similar to (E.) there are error preventions and feedback for certain parts of the system but not all. | | | | | |
| G. **Recognition rather than recall**<br>• Object, icons, actions and options are visible for the user.<br>• Objects are labeled well with text icons that can immediately be spotted by the user and matched with what they want to do. | | | | | |
| **Evaluation**<br>The system's design was made to have easy to understand features for users to utilize. | | | | | |
| H. **Flexibility and efficiency of use**<br>• The system design provides easy to navigate menus<br>• The system does not make wasteful time of system resources | | | | | |
| **Evaluation**<br>The system is easy to navigate since there is a main page. | | | | | |
| I. **Aesthetic and minimalist design**<br>• Graphics and animation used are not difficult to look at and does not clutter (mess) up the screen.<br>• Information provided is relevant and needed for the system design | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| **Evaluation**<br>The system's design is simple and stays true to the colors of Mapua. | | | | | |
| J. **Help and Documentation**<br>• The system design provides information that can be easily searched and provides help in a set of concrete steps that can easily be followed. | | | | | |
| **Evaluation**<br>The system is easy to understand. | | | | | |
| Suggestion for improvements | | | | | |
| The system mostly needs to improve on error prevention, error feedback, and adding of sections like FAQs and working QR scanner. | | | | | |

**Design Implications:**

*Does your prototype need to be altered to address the results of the analysis, or was it completely successful?*

The MapuaCash prototype of is successful, according to the heuristic evaluation, although there are a few things that could be done better:

For the error prevention and feedback, the system has some places where error prevention tools and feedback are lacking. In order to reduce the likelihood of errors, users require more proactive steps and more explicit prompts when mistakes are made. Comprehensive assistance and documentation are absent from the application. A help area, FAQs, and guides would all help users navigate the software more efficiently. Although a lot of functions are simple to locate, users' cognitive load may be lessened if labeling and iconography are given more attention.

*What improvements could be made to the design to address any shortcomings?*

- **Enhanced Error Handling:** Introduce more robust error detection and prevention mechanisms throughout the application. Provide clear, user-friendly error messages and potential solutions.
- **Comprehensive Help Section:** Develop a detailed help section that includes searchable FAQs, step-by-step guides, and tutorial videos.
- **Consistent Feedback:** Ensure that every user action, particularly those involving transactions, has immediate and clear feedback.

**Critique and Summary:**

*What were the advantages and disadvantages of your evaluation?*

***Advantages:***

- Thorough Assessment: Using Nielsen's Usability Heuristics provided a comprehensive evaluation of the prototype.
- Identified Key Areas for Improvement: The evaluation pinpointed specific areas where the user experience could be enhanced.

- Structured Feedback: The methodical approach helped in systematically documenting and assessing the prototype's strengths and weaknesses.

***Disadvantages:***

- Limited User Feedback: The evaluation was conducted by team members, potentially missing real user insights.
- Scope of Evaluation: Certain aspects, like performance under load and long-term usability, were not covered.
- Resource Constraints: The evaluation was limited by time and resources, impacting the depth of the analysis.

*What would you have done differently knowing what you know now (both designwise and evaluation-wise)? Given more resources, what could you have done that would have produced significantly more insightful evaluation results (again, whether this is an improved prototype or a different evaluation path).*

What ACCelerate would have done to enhance the design of MapuaCash, was to conduct extensive user-centric testing with a diverse group of students to gain practical insights into usability and functionality. Through iterative prototyping, the team will gradually refine the application based on ongoing feedback, incorporating advanced features such as predictive expense analysis and personalized financial tips. Evaluation-wise, the team aims to involve a larger and more varied group of participants to capture a wider range of experiences, test the app in real-world scenarios for better performance understanding, and implement long-term usability studies to assess the application's performance over extended periods. Given more resources, the evaluation could be significantly enhanced by utilizing advanced prototyping tools to create more interactive and high-fidelity prototypes, conducting extensive user testing sessions including usability testing, focus groups, and hiring professional usability experts for in-depth evaluation and insights. Additionally, more performance testing would ensure the app works efficiently on all supported devices, thorough accessibility testing would make the app usable for individuals with disabilities, and establishing a continuous feedback loop would allow users to report issues and suggest features, ensuring ongoing improvement and adaptation. By addressing these aspects, MapuaCash can be refined to better meet the needs of Mapúa University students and staff, ensuring a seamless and effective financial management experience.

**Summary of the Project**

MapuaCash is a comprehensive financial management tool designed specifically for Mapúa University students across all campuses. Its primary feature is the seamless integration with the university's billing systems, allowing for easy handling of semestral payments, club dues, and event fees directly through the app. This centralization simplifies financial transactions for both students and university staff, significantly reducing administrative tasks. Additionally, MapuaCash offers real-time spending updates, expense categorization, budget creation, and comprehensive financial reports, enabling students to track their spending, understand their financial habits, and make informed decisions. The prototype, created using the HTML Tailwind CSS Framework, features an intuitive interface that ensures a user-friendly experience.

*Although the MapuaCash Interface was created, time constraints have led to the application to have an incomplete backend on the side of error handling and missing components which then resulted to the lack of surveys besides the three group members testing out the application on their own devices to create the Evaluation and Feedback*.

In order to enhance MapuaCash, multiple evaluations and design changes have been suggested. These include employing iterative development to include continuous feedback and carrying out comprehensive user-centric testing with a varied range of pupils. To improve functioning, more sophisticated features will be added, like personalized financial advice and predictive spending analysis. Long-term usability research, real-world scenario testing, and a larger participation base will all be part of the evaluation process. With more funding, sophisticated prototype tools, in-depth user testing, skilled usability consultants, thorough performance and accessibility testing, and an ongoing feedback loop might all greatly enhance the evaluation process. The purpose of these endeavors is to guarantee that MapuaCash efficiently fulfills the requirements of Mapúa University personnel and students, offering a smooth and effective money management encounter.