ReTrac:
A Document Request and Tracking System

A Special Problem

Presented to

the Faculty of the Division of Physical Sciences and Mathematics

College of Arts and Sciences

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by

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ReTrac: A Document Request and Tracking System

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Division of Physical Sciences and Mathematics

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Declaration

I/We, Candyl John F. Faeldonea, Jon Robien E. Jinon, Kent Joash A. Zamudio, hereby certify that this Special Problem, including the pdf file, has been written by me/us and is the record of work carried out by me/us. Any significant borrowings have been properly acknowledged and referred.

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Dedication

Adjusting to the new normal while working on this project has been quite a struggle. As such, we dedicate this project to our family and friends, who have been our source of inspiration and strength. This is for checking on us and motivating us to continue working on this project.

We would also like to dedicate this project to the university staff and our fellow students. Our shared experience regarding the process of requesting documents gave us the reason to work on this project. May this project help as you request documents within the university.

Acknowledgment

We would like to express our gratitude to our adviser, Assistant Professor Francis D. Dimzon, and co-adviser, Assistant Professor Christi Florence C. Calaor, for the invaluable guidance and insights throughout the duration of this study. Your patience, motivation, and insightful comments greatly helped us in writing this study.

We would also like to give our thanks to the Universitys Cash Office and CAS Office of the College of Secretary for accomodating our inquiries regarding the process of requesting documents. To Mr. Enrique Legazpi III and Ms. Maureen Kay C. Ongo, your inputs helped in making this project possible.

Lastly, but certainly not the least, our deepest gratitude to our family and friends. Your support, understanding, and motivation, especially in these trying times, made it possible for us to continue working on this project.

Abstract

Requesting documents from various offices in the University of the Philippines Visayas (UPV) is both inefficient and decentralized in nature. Some requests are not processed and some are lost tracked. Although there is an existing document request and document tracking system in the UP system, it is only used at the administration level and is not accessible to students.

Through this project, a website is created to address these issues. ReTrac is a centralized document request and tracking system designed to make the requesting and tracking of requests more efficient. Additionally, one of the key features of ReTrac is payment integration. The users would be able to pay for their requested documents within the platform itself.

Keywords: Document request, tracking system, DTS, DRS.

Contents

List of Figures

Chapter 1

Introduction

1.1 Overview of the Current State of Technology

The document request in the University of the Philippines Visayas (UPV) can be done in two ways, (1) through requesting in-person, and (2) requesting through email. Both approaches consist of downloading and filling out the request form, paying the document cost to the Cash Office, then submitting the receipt to the respective office that handles the document to be requested. After that, the requester would wait for the document to be ready which takes at least one week or longer on occasions such as the enrollment period.

Additionally, there is an existing online portal for document tracking that can be used by UP faculty and staff across the UP System. The portal, named UP Document Routing System (UP DRS), sets a tracking number for each document which is used to create a document trail from the office it originated to every office that handles it.

However, when the student request documents in-person or via email, it cannot be tracked or determined if the request was processed. The UP DRS, on the other hand, has a tracking feature, but it is only available to the faculty and staff. This study intends to close that gap by developing a platform for requesting and tracking documents.

1.2 Problem Statement

The process in the current document requesting system used by the University of the Philippines Visayas is very inefficient. Students and alumni often encounter problems with the current system among which are discussed below.

When requesting documents through email, the requester has to open the website provided by each office from which the PDF form can be accessed, then the requester would download and fill out the form before sending it to the respective office that handles the document. After sending the form, the requester has to pay the document cost to the Cash Office, which is a separate office from the one who handles the document requests, through Land Bank and GCash. After sending the required amount, the requester has to send an email to the Cash Office regarding the payment transaction. When the Cash Office confirms the payment, they will send a scanned copy of the receipt to the requester. Upon receiving the receipt, the requester has to forward it to the office that handles the document request, for the request to be processed.

There are instances where the office overlooked some requests due to high amounts of transactions flooding the email that is used for document requests, especially during the enrollment period, and on some occasions, requesters need to pass

signed documents. Requesters may also send document requests to the wrong office which adds to the delay in the processing time.

There are also difficulties for both Cash Office and requesters during the payment process since the Cash Office only caters to money transfers through Land Bank and GCash. Some students don't have Land Bank and GCash accounts so they tend to use the accounts of their friends and relatives which makes it more difficult to track who sent the payment. Moreover, payment transactions take up to 24 hours to update in the account of the Cash Office, thus delaying the sending of receipts to the requester.

Furthermore, the decentralized nature of the document request system in the University of the Philippines makes it more difficult to track the process status of the document request. Although the UP Document Routing System is usable for UP faculty and staff, it can only track documents and not create document requests to the concerned offices.

1.3 Research Objectives

1.3.1 General Objective

The study aims to develop a centralized web application that will serve as a portal for students and alumni to request documents and track their requests, as well as, for UP offices to process the said requests. This web application will be called ReTrac.

1.3.2 Specific Objectives

The specific objectives of ReTrac are the following:

- To improve the accessibility of requesting documents from offices inside the university
- To improve the efficiency of processing documents inside the university
- To make a centralized system for requesting and processing documents inside the university.
- Students and alumni can request documents, and pay through integrated payment methods through the app, and offices can see and process the said request and provide status updates.

1.4 Scope and Limitations of the Research

This study focuses on requesting, tracking, and paying for certain documents that students and alumni requests to the University of the Philippines Visayas (UPV) College of Arts and Sciences (CAS). These documents may be a copy of grades, transcripts, certificate of good moral character, certificate of enrollment, certificate of non-contact/conforme, certificate of units earned, certificate of year level standing, certificate of GWA, photocopy of form 5, and/or other documents students and alumni may want to request from the Office of the College Secretary. Payment for these documents is through the University of the Philippines Visayas Cash Office. Requesting, paying, and tracking the documents will be through ReTrac.

For now, this study is limited only to the College of Arts and Sciences Office of the College Secretary (ColSec), the University of the Philippines Visayas Cash Office, and the students and alumni of the College of Arts and Sciences. Once this study is successful, the document tracking system will later be adapted to all the other colleges and offices inside the University of the Philippines Visayas.

1.5 Significance of the Research

This study aims to solve the inefficiencies of the current system of requesting documents inside the University of the Philippines Visayas. Once ReTrac is successful and integrated into the university, it should improve the ease of requesting and paying for certain documents from certain offices inside the university for students and alumni. The system will also enable students and alumni to keep track of the current status of the documents that they requested. The system will also lessen

the burden of staff as they would not have to worry about lost requests. And since the requesters can track their requests, the staff need not respond to every email asking for the request status.

Chapter 2

Review of Related Literature

2.1 Document Tracking Systems

2.1.1 Logistic Tracking Systems

Logistics tracking refers to the systems and ways of tracking resources during their movement and storage. With logistics tracking, the sender, receiver, and moderator will know where the resources are physically located at any time and schedule delivery. Tracking systems usually use waybills, a document attached to the resources that specify at minimum their nature, point of origin, and destination.(Collins English Dictionary, 2010) As millions of cargos are transported every day, waybills in these systems make it possible to track the progress of each delivery.

According to Airspeed (2020), a tracking system works with the following sequence:

1. Bar Code Generation - a unique ID is assigned to each resource that contains the important details of the package, such as destination, name of sender and receiver, address, and crucial information needed by the buyer. Once generated, bar code generated or waybill is attached to the resources

2. Scan and Track - allows data attached to the waybill to be received by the courier service and updates the location in the database.

3. Tracking Progress - real-time tracking becomes available to both sender and receiver as well the moderators of the logistics through a dedicated page.

4. Product Delivery - the resources have reached the destination and are received by the recipient and, indicating that the delivery is successful.

Currently, e-commerce web applications utilize both in-app tracking and logistics waybill tracking (Brand, 2021; Amadora, 2021). This implementation makes it more convenient for customers to track their parcels at a glance on the e-commerce application, and in-depth details on the logistics tracking page.

ReTrac will follow a similar concept such as the generation of a unique waybill ID from the submission of the online form and will end the tracking when the request confirms the receipt of the document. The system's real-time update will help the requester monitor the document request and as well provide adequate information in the case issues arise on that certain transaction.

2.1.2 Document Tracking Systems in Higher Education Institutions

Several document tracking systems are implemented across academic institutions, government agencies, and private institutions. However, traditional recording systems such as logbooks and pen logging are still being used as safeguard databases. The University of the Philippines (UP) System has implemented a centralized system through the UP Information Technology Development Center called UP Document Tracking System. This system is capable of tracking document trails within offices. It includes the origin office, receiving office, and personnel handling the documents. (UP Information Technology Development Center, 2020)

A similar model is tested in the Schools Division of Paraaque City (Emralino, 2010) where they created a system that helps the inter-offices to manage the document trail. However, tickets as waybills are used upon the request of the user for faster compliance in line with the Republic Act No. 9485 (Thirteenth Congress of the Philippines, 2007). The developers of the said system developed it through brainstorming, interviewing different users of the document trail, and organized orientation and training on the utilization of DoTS.

In 2019, Lingaya proposed a document tracking system for the utilization of Philippine Higher Education Institutions. Tarlac Agricultural University became the sample local of the study where user requirements specifications, design and implementation, validation, and evaluation became part of the software development process. The system is evaluated by forty (40) office personnel and five (5) experts for the user interface and functionality, database design, and security. Like the

previous study above, bureaucracy and compliance to the RA 9465 or the Anti Red-tape became one of the key factors in the development of the system.

As we adapt to paperless transactions, information systems, specifically document tracking and tracing are necessary to have an integrated, interconnected, and interpolated communication between offices and the requester (Felipe & Mendez, 2020).

DocuTrak was implemented in the year 2003 in Diliman Network (DILNET) as part of the university's initiated computerized projects such as Computer Registration System (CRS), Student Records System (SRS), Faculty Information System (FIS), Socialized Tuition and Financial Assistance Program (STFAP) Online, the Integrated Library System (iLib), and University Virtual Learning Environment (UVLE). As assessed by Sueo (2009), in-house developed DTS emphasizes the compliance of the system with the International Organization for Standardizations (ISO) definition of the records system. DocuTrak can identify and monitor bottlenecks in the document trail. Three years after the initial implementation in UP Diliman, the University of the Philippines Visayas Data and Information System Program (DISP) Office requested the same system to implement on its campuses. Unlike CRSIS, DocuTrak did not achieve much popularity and full-scale support. Unlike other records and information systems in UP Visayas and UP Diliman, DocuTrack lacks sanctions for non-use and non-users which makes the system optional since most of its features are readily available on manual DTS implemented under Memorandum Circular No. 13 back 1976. Recently, UP Visayas adopted once again the system-wide DTS called UP Document Routing System (UP DRS) at the same time maintains the usage of manual DTS (Camposano, 2021). Unlike its predecessor, ReTrac will have integration and would be accessi-

ble not only to the currently employed staff and students but also to the alumni. This will also integrate UP mail domains for authentication and payment options, thus not only as a document tracking but also as a management tool.

As tracking and tracing resources have been widespread in industries as such e-commerce, logistics, and shipment, having essential information about the status and location of resources allows better planning, scheduling, and monitoring. Implementing some form of tracking system enables monitoring of performance and behaviors of concerned offices in document processing. However, privacy issues are predominant in offices, sender, and receiver such that their essential information and work behaviors are accessible to certain roles, this perceived risk must be considered when implementing a DTS. (Jandl et al., 2021). In the process of developing ReTrac, the developers consider DocuTrak and UP DRS as their predecessors. The existing *Privacy Notice for University of the Philippines Personnel* (2019) for the Cash Office and Office of the College Secretary, *University of the Philippines (UP) Privacy Notice for Students (Revised as of the 1st Aemester/Trimester 2019-2020)* (2019) will be observed to safeguard the privacy and data of its employees, staff, students, and alumni.

2.2 Electronic Payment

According to Yu, Hsi, and Kuco (2002), the worldwide proliferation of the Internet gave birth to electronic commerce, a type of business that allows electronic transfer of transactions. Electronic commerce grew because of the openness, speed, anonymity, digitization, and global accessibility characteristics of the Internet. It facilitated real-time business activities which included advertising, querying, sourcing, negotiation, auction, ordering, and paying for merchandise.

The level of security in each step of the transaction is the main concern with electronic payment because money and merchandise are transferred with no direct contact between parties involved in the transactions. If there is even a slight chance that the payment system may not be secure, trust and confidence in the system will begin to erode, destroying the infrastructure needed for electronic commerce.

As stated in Yu et al. (2002), there are four categories of electronic payment systems: (1) Online credit card payment, (2) Electronic cash, (3) Electronic checks, and (4) Small payments. Each of these systems has its advantages and disadvantages:

- **Online credit card payment** - the most popular system widely used by many establishments because of its acceptability all around the world and it is a relatively safe mode of payment. The disadvantage of using this system is that using credit cards have high transaction fees and have a limit on how much you can charge the credit card

- **Electronic cash** - the second most popular mode of payment because of its accessibility, low transaction fees, the payment between parties, and anonymity. The disadvantage of using electronic cash is that electronic cash is not replaceable once it is lost.

- **Electronic checks** - are mostly used by government and private institutions because transactions made between institutions usually involve large amounts of money and electronic checks make transferring large amounts of money possible because they do not have a limit on how much money is transferred at a time. The disadvantage of using electronic checks is that

the cost of using electronic checks is high. They can only be used in the virtual world, and they do not protect a user 's privacy.

- **Small payments** - mostly used by establishments that provide certain services. Here, a consumer can only pay for a certain amount for a certain service that the establishment provides instead of paying for a membership for all the services. This makes it convenient for consumers that are not frequent users. One disadvantage of using this mode of payment is that they are not brought forth by financial organizations and they do not use traditional financial systems or methods as their structure.

2.2.1 Online Banking and Mobile Banking

An article by Zoleta (2021) defines online banking as any transaction involving finances that are performed over the internet through a bank's website on a user's computer. For users to use online banking services of the bank that they have accounts in, the banks usually require them to register for an online account whenever a user opens a new account or if they have existing accounts, they inform the users to register for one. Once users are registered, they can complete bank transactions (i.e. fund transfer, bills payment) anytime and anywhere without going to a physical branch of a bank.

Mobile banking is essentially the same as online banking. It also enables users to complete bank transactions online anytime and anywhere. The only difference is how these two services are accessed by users. Online banking can be accessed through computers and mobile banking can be accessed through mobile phones.

ReTrac considered using online and mobile banking as one of the payment options.

This will enable students and alumni of the University of the Philippines who have access to these kinds of services to pay for their documents.

2.2.2 E-wallets

In an article by Pobre (2021), GCash is one of the popular e-wallets used in the Philippines. Through GCash, users can top-up load, send and receive money to other users, pay bills, and transfer money to bank accounts partnered with GCash. Users can also scan QR codes generated within the GCash application for faster transactions.

Another popular e-wallet in the Philippines is Paymaya. Paymaya is very similar to GCash. Users can also top-up load, send and receive money to other users, pay bills, and transfer money to bank accounts partnered with Paymaya. Like GCash, users can also generate QR codes within the application for faster transactions.

ReTrac will be using Paymaya as one of the payment options. This will enable students and alumni of the University of the Philippines Visayas, especially those who do not have bank accounts to pay for the documents that they requested.

2.2.3 Contactless Payment

According to Nseir, Hirzallah, and Aqel (2013), QR codes can be used to store bank account and credit card information. They can also be designed specifically to work with particular payment options. With that in mind, some e-wallets (i.e. GCash and Paymaya) use QR codes to make payment for requesting documents faster.

ReTrac will focus on contactless payment and utilization of banking portals as its primary payment method upon the availability of the said system with UPV Cash Office. With the shift to online transactions over the pandemic (Felipe & Mendez, 2020), payment options other than cash should be available to the requester in a contactless way and can be processed remotely. PayMaya utilizes QR scanning to pay feature and Landbank uses Link.BizPortal.

Chapter 3

Research Methodology

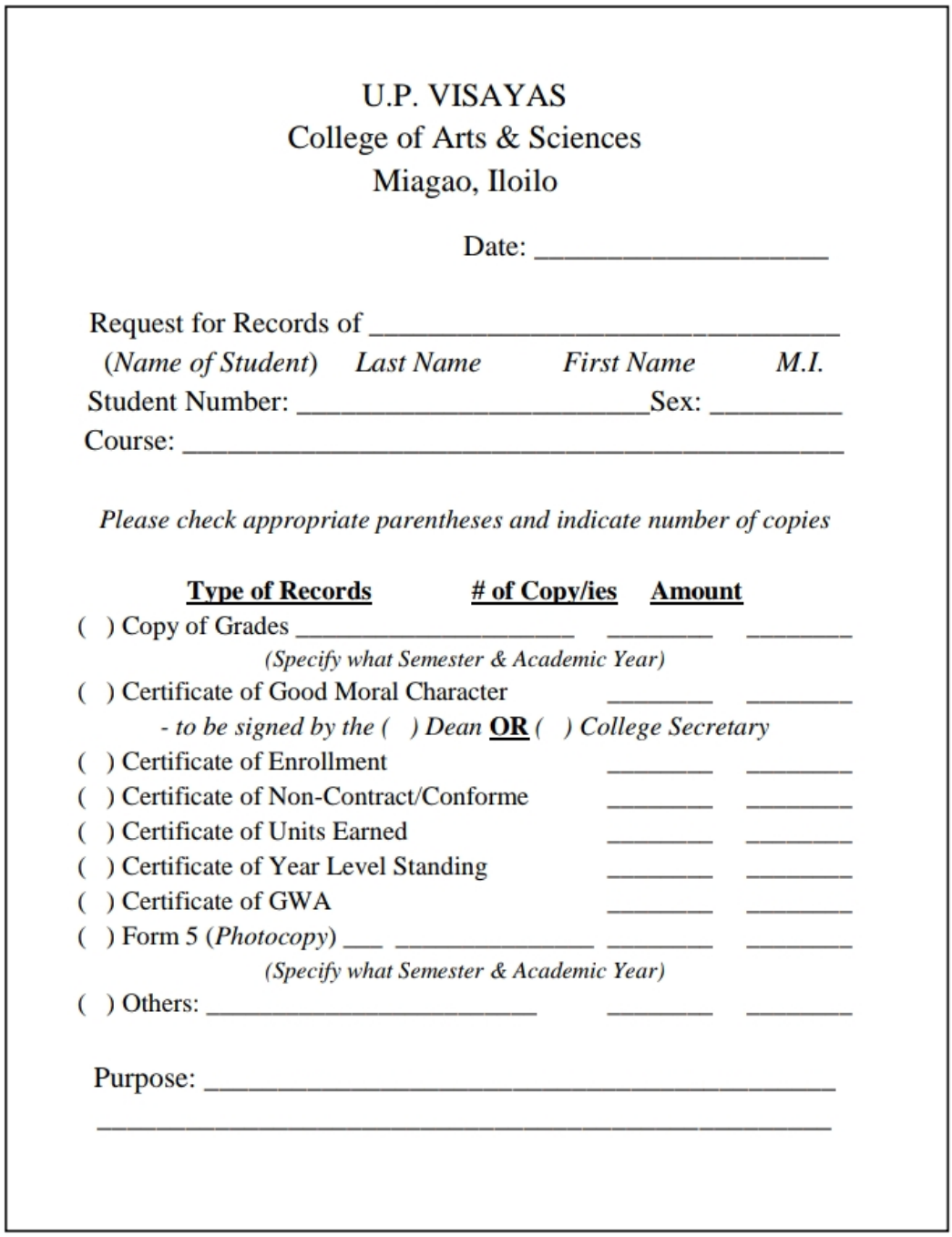
3.1 Research Activities

3.1.1 Information Gathering

The developers reached out to the College of Arts and Sciences Office of the College Secretary to decide the features and functionality of ReTrac. They asked what type of documents can be requested at their office, the cost for requesting each document, and the process for requesting the documents. The Office of the College Secretary also shared the blog site where the document request form can be downloaded. The document request form is as shown in Figure 3.1.

The developers interviewed Ms. Maureen Kay Ongco, Chief of the University's Cash Office, regarding the payment methods for requesting documents, the payment methods currently being implemented, and the payment methods they are planning to remove and/or add.

Figure 3.1: The request form currently used for requesting documents in CAS Office of the College Secretary.



U.P. VISAYAS
College of Arts & Sciences
Miagao, Iloilo

Date: _____

Request for Records of _____
(*Name of Student*) *Last Name* *First Name* *M.I.*
Student Number: _____Sex: _____
Course: _____

Please check appropriate parentheses and indicate number of copies

Type of Records	**# of Copy/ies**	**Amount**
( ) Copy of Grades _____	_____	_____
(Specify what Semester & Academic Year)		
( ) Certificate of Good Moral Character	_____	_____
- to be signed by the ( ) Dean **OR** *( ) College Secretary*		
( ) Certificate of Enrollment	_____	_____
( ) Certificate of Non-Contract/Conforme	_____	_____
( ) Certificate of Units Earned	_____	_____
( ) Certificate of Year Level Standing	_____	_____
( ) Certificate of GWA	_____	_____
( ) Form 5 (*Photocopy*) ___ _____	_____	_____
(Specify what Semester & Academic Year)		
( ) Others: _____	_____	_____

Purpose: _____
_____

The Cash Office currently supports Land Bank and GCash payment transactions. However, Ms. Ongco elaborated that the GCash payment is only temporary. It was only implemented during the pandemic since some students who request documents do not have bank accounts, specifically that of Land Bank. Ms. Ongco said that the Cash Office is currently negotiating with PayMaya and that PayMaya will be their main payment method when the negotiation pushes through.

3.1.2 Application Features

The application have the following features:

- Students can make document requests
- Students can track and see which office handles their request
- The students can retrieve the documents they requested
- The students can pay through the in-app payment integration
- The Office of the College Secretary (OCS) can see the number of pending requests
- The OCS can also retrieve and process the request
- The OCS can send the documents through the application
- The Cash Office can confirm the payment made by the students

3.1.3 Platform

There are three options for the applications platform, (1) desktop, (2) mobile, and (3) web. The pros and cons of each platform are as discussed below.

A desktop application is more accessible for University Offices since they already use desktop computers for their day-to-day tasks. However, not all students have access to desktop computers. Most students own a smartphone that makes mobile applications more accessible to them. On the other hand, web applications can be accessed both on mobile devices and desktop computers through web browsers.

With those considerations, the developers decided to settle with using the web as the platform for the document request and tracking application. Furthermore, developing a version for the desktop and mobile separately would make it more difficult to update feature changes and patches. Developing a web application would also mean that only one application will be maintained making it faster to implement changes.

3.1.4 Technology

The design of the user interface (UI) of the system is done using Figma, a web-based graphics editor and prototyping tool.

The front-end of the system is developed using the React framework. Although there are other Javascript frameworks on the market, the developers are most familiar with React. In addition to the front-end framework, Vitejs is also used. Vitejs is a build tool for React and other frameworks, it also offers tools for

enhanced developer experience.

To make the system accessible to users, a cloud service provider is needed. The market offers a wide variety of cloud service, that includes Google Cloud, Amazon AWS, Microsoft Azure, and IBM Cloud among others. There are also services that offers free-tier or trial periods, among which is Firebase. Firebase is a Backend-as-a-Service (BaaS) web technology under Google.

The tools needed for the document request and tracking system includes:

- Hosting - a domain to make the website accessible to users
- Database - to store documents and information on the web application
- Authentication - to secure the application and only allow authenticated users to make and track requests.

The tools mentioned above are all present in Firebase. Instead of using multiple cloud services which makes it difficult to manage the web applications dependencies, it is better to use a cloud service that provides all the tools needed for the web application. Moreover, the Spark Plan, which is the free-tier offer of Firebase, can provide enough resources to deploy a big web application.

3.1.5 Development Framework

This study will use the incremental and iterative approach in developing the entire system, specifically, the Scrum Framework in Agile Development. Incremental approach breaks down the system development to smaller tasks and the iterative

approach ensures a systematic development cycle through what is called 'iterations'.

Through incremental and iterative approach, the progress is build incrementally and adapting to changes is easier since it is done in iterations.

The Scrum Framework will enable the developers to deliver the minimum viable product (MVP) as early as possible for feedback collection. The said framework would also help given the limited manpower.

Chapter 4

Results and Discussions/Analyses

4.1 Results

According to the results of the requirements analysis and methodology, the team was to identify and devise the main features of the web application such as the requestor view of request, tracking, payment, and profile dashboard. For the college secretary view, we identified implementing features such as document request dashboard, history, request status update, office profile, and request file uploading. The cash officer view, however, will consist of pending payments, history of payments, verification of payments, and uploading of original receipt files. Overall, the system will include features of request creation, payment portal, payment verification, document processing, and request tracking. These features were implemented and will be further discussed in their respective sections below.

4.1.1 Requestor View

Sign in/Sign up and Dashboard

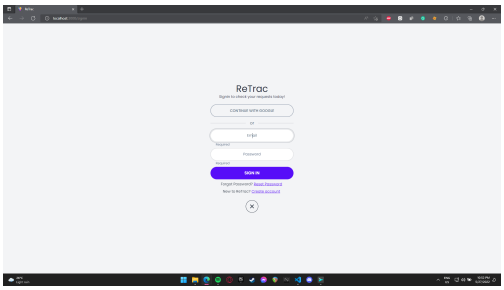


Figure 4.1: Sign in page

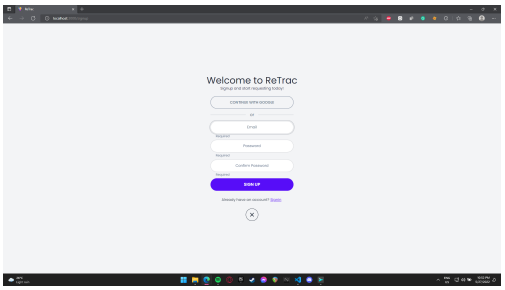


Figure 4.2: Sign up page

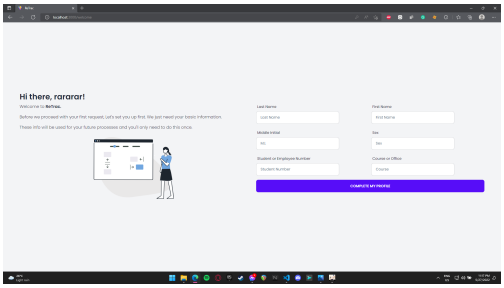


Figure 4.3: Requestor's On-boarding page

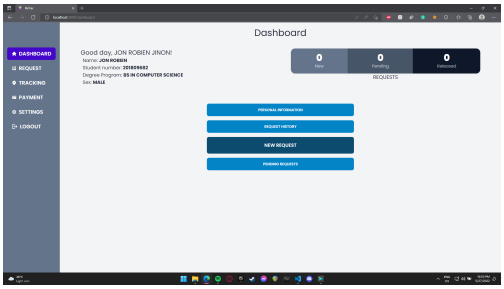


Figure 4.4: Requestor's Dashboard page

These features will let the user access their ReTrac profile in order to request documents, view pending and previous requests, and update their profile information. The user will need to sign up in order to utilize the system by providing

their information. If the user is already registered, the sign-in page will collect their credentials and will redirect them to the dashboard where they will have a quick glance at their documents request in Figure 4.4. It is further divided into three status cards called new, pending, and released. By clicking on it, it will redirect to the tracking page with filtered results which will be discussed in the tracking section below.

Request Page

The Request Page is designed as a step-by-step form. It has four (4) steps, Enter Details, Review Information, Payment, and Track Document. This page features the requesting of possible documents from the CAS College Secretary with multiple documents at an instance.

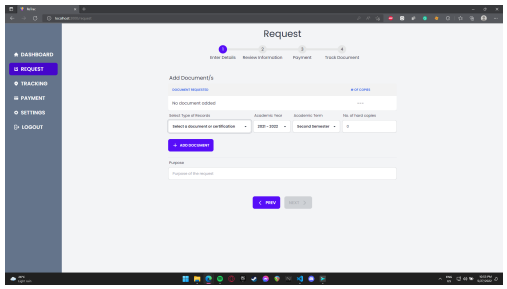


Figure 4.5: Fresh state of Request Page

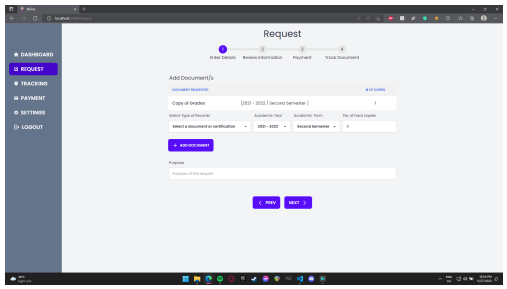


Figure 4.6: Documents added on the "Enter Details" step

When the user clicks on New Request from Figure 4.4 or on the sidebar, the Figure 4.5 Fresh State Request Page will be displayed. The requestor is then greeted with this form which it will ask for the type of document, the academic year and term, number of copies, and purpose.

Multiple documents may be requested per order or request. They can add different variants of documents using the Add Document button which will give them a cleared form with saved information of the previous documents at the top of the form as shown in Figure 4.6. Clicking the Next button will prompt the user to the Information Review page.

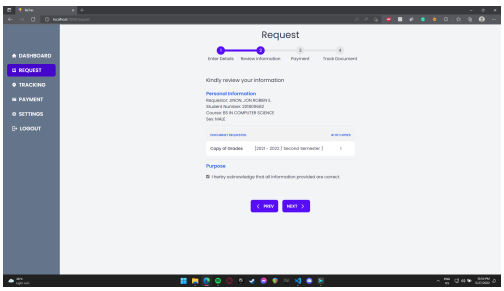


Figure 4.7: Information Review page

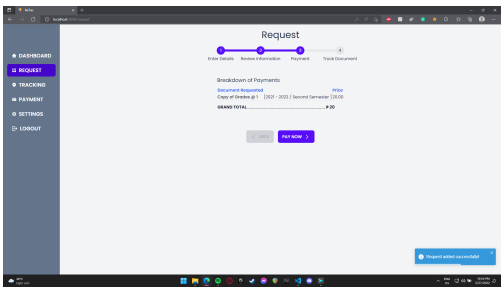


Figure 4.8: Payment Breakdown page

The Information Review Page will display a summary of documents requested as well the information of the requestor that will be processed by the CAS College Secretary. A safeguard checkbox is added so that the user will confirm that all the information provided is correct to the best of their ability. Figure 4.8 shows the breakdown of payments based on the documents requested. The user can then pay using the QR code provided by the Cash Office in Figure 4.9.

The Payment QR page is under the payment step where the requester will be scanning the QR code of an online payment provider. The user then enters the transaction reference number manually for verification by the Cash Office which

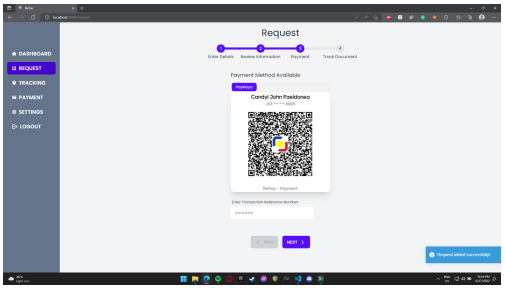


Figure 4.9: Payment QR code page

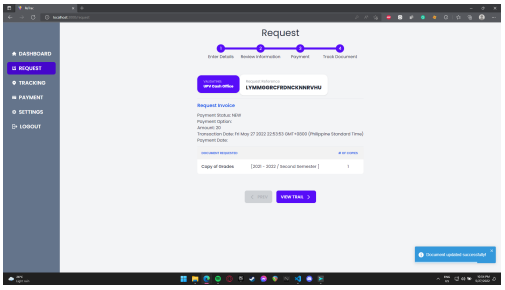


Figure 4.10: Invoice Page

will be discussed in the later section. After entering the number, it will display the initial tracking page and transaction information which includes the request transaction code, transaction dates, and documents requested. The requestor has options to either cancel the entire transaction or view the trail of requests, the latter will redirect them to the tracking page feature.

Tracking Page

The Tracking Page will help the requester track the documents requested into four (4) categories: All, Paid, Processing, and Completed. The requester on the feature will be able to see the request trail, download documents, confirmed receiving of documents, and get status updates.

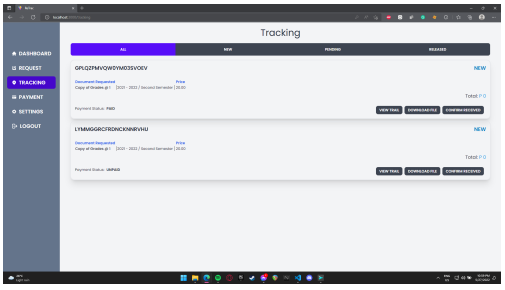


Figure 4.11: Tracking Main page

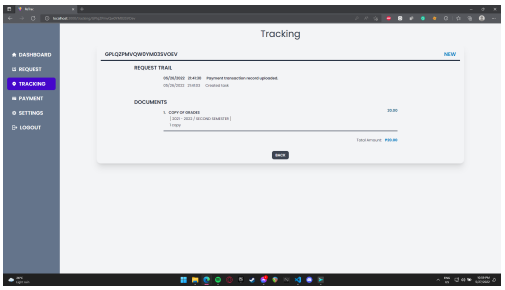


Figure 4.12: Tracking - Request Trail page

The Tracking Main Page shown in Figure 4.11 shows all paid requests made by

the user. The user can further filter out the request by Paid, Processing, and Completed. In the case where the status of the document is Paid or Processing, the requester will only be able to see the request trail. When the status is set to completed, the requester can access the request trail, download the file immediately, and/or mark the request as received. On Figure 4.12, this shows the offices where the paper is currently being processed. It also displays the date stamps of the request milestones. In the case the College Secretary uploads the file, an email notifcation will be sent to the requestor, and the user will have a week to confirm receipt of the documents before it is automatically marked as received.

4.1.2 UPV Cash Office View

This section will discuss the different features of the UPV Cash Office View which will be used by the staff of the UPV Cash Office.

Dashboard

The Cash Office will have the same Sign up page as the requestor, however, the system will redirect them to their own privileged dashboard as shown in Figure 4.13.

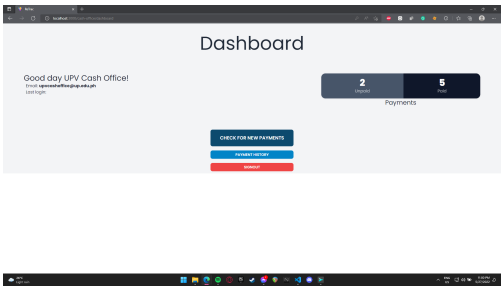


Figure 4.13: Cash Office Dashboard page

The dashboard will show the credentials of the cash office. The upper-ride corner holds statistics of the receivable payments in the form of Unpaid, Paid, and Confirmed. The page's center houses buttons that will redirect the office into accessing their profile, payment history, payment verification, and payment information forwarding. All of these will be discussed further below.

All Payments View

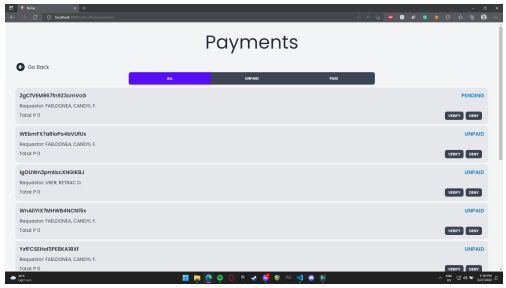


Figure 4.14: List of Active Payment Page

This page will show all the active payments that are not forwarded to the College Secretary. This further classifies the payments into Unpaid, Received, and Confirmed. For payments with the status unpaid, the cash office may follow up or deny the request. For received, they verify the payment made by the requestor. Lastly, when the status is confirmed they have the option to forward information to the college secretary, then the record will only be visible on the Payment History Page.

Verification and Original Receipt Forwarding

This page will display the partial payment details entered by the requestor in Figure 4.9. The office will need to enter the reference number they received on their end and when verified will redirect them to the official receipt uploading

page in Figure 4.16 where they will be entering the official receipt transaction number and the file itself for the record of the college secretary. This will then archive the transaction.

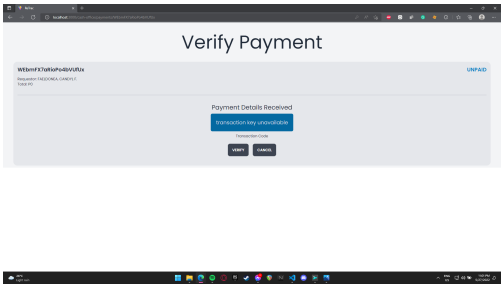


Figure 4.15: Payment Verification Page

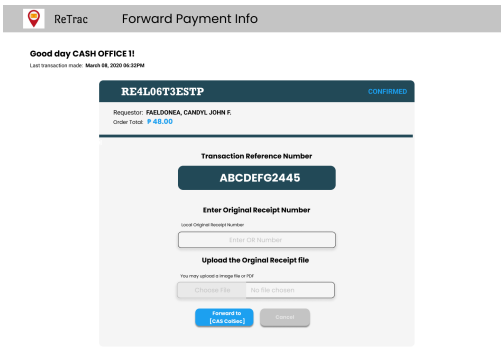


Figure 4.16: OR file uploading page

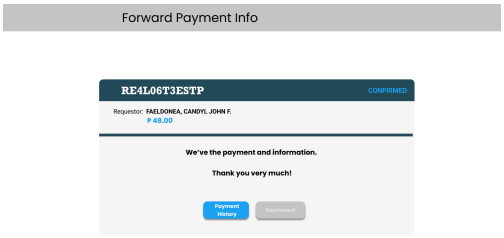


Figure 4.17: Payment and OR Confirmation notice

In case the payment code provided by the user doesn't match the code received by the office, they can mark the transaction as invalid and will request for the requester to re-enter the code.

Payment History

This page will give the cash office payment reports as well as monitoring of all the transactions that go in and out of their office.

A read-only Request History page will feature a table report where the office

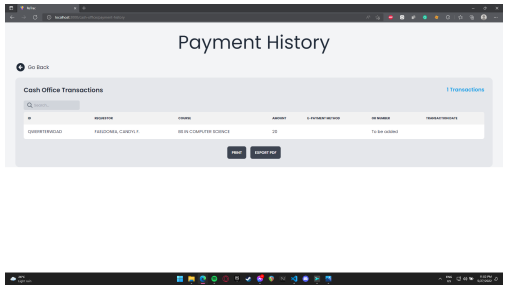


Figure 4.18: Payment History Code

can either print or export the tables as a PDF file. It has sorting and search features. This will give the office a quick glance at the transactions including those forwarded to the college secretary.

4.1.3 CAS College of the College Secretary View

This section will discuss the different features of the CAS Office of the College Secretary View which will be used by the staff of the CAS Office of the College Secretary.

Dashboard

The College Secretary will have the same Sign up page as the requestor, however, the system will redirect them to their own privileged dashboard as shown in Figure 4.19.

This dashboard will show the credentials of the college secretary. This will give a visual guide on who currently modifies the request cards. On the right-hand side, resides the notification statistics of the document requested in the form of New, Pending, and Released this mirrors the notification on the view of the requestor. The middle portion of the page contains buttons that will redirect the office into

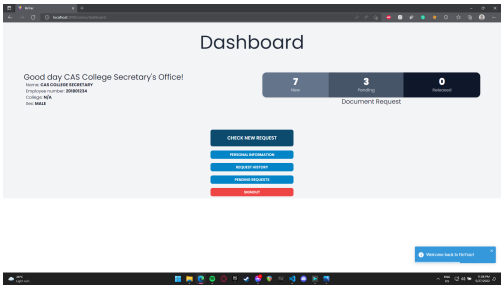


Figure 4.19: CAS College Secretary Dashboard

accessing their profile, history of request, new request, and pending request. This will be further discussed below.

All Requests View

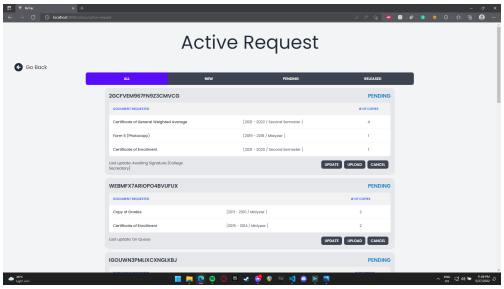


Figure 4.20: List of Active Request Page

This page will show all the active requests that are not archived by the office. This is further classified into New, Pending, and Release. For requests with the status new, the college secretary may check or reject the request. For pending, they can provide updates specifically on the request trail or upload the file to be released. Lastly, when the status is completed they have the option to archive the file which will only be visible on the Request History Page.

Specific Request Check, Update, and Upload View

This page features a specific request view where the office can check the information of the request including the requestor, the documents needed, and the payment status.

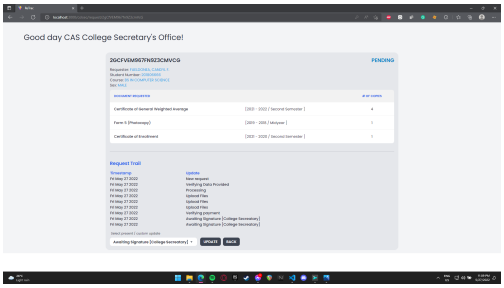


Figure 4.21: Check and Status Update page

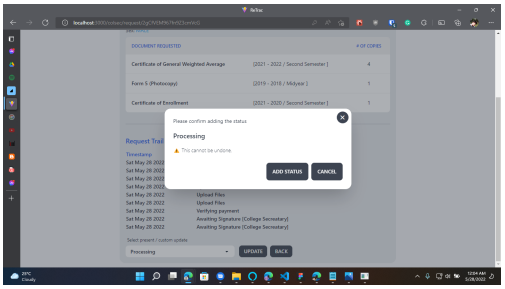


Figure 4.22: Status update prompt

The check and status page will be a single page directed when the request status is marked as new or pending. The office can add request status such as for approval by the dean, awaiting signature, and custom update. In case the secretary wants to upload the file requested, it will then proceed to the file upload page where the office can upload multiple PDF, JPEG, and PNG files.

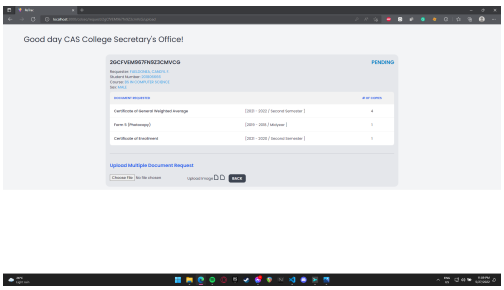


Figure 4.23: Multiple files uploading bin

The office view will then display the file releasing page where it previews the files uploaded. The OR received from the cash office will automatically be added to

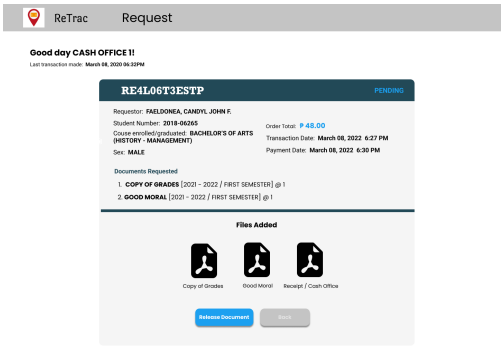


Figure 4.24: File preview and releasing page

the file pool the user can download. Pressing the Release Document will mark the document/s as released and will let the user access the document/s.

Request History

The last view of the college secretary's office will aid them in documenting report as well as monitoring the requests that go in and out of their offices.

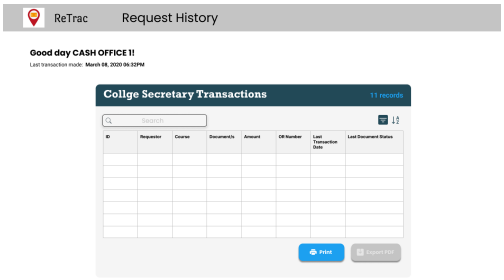


Figure 4.25: Read-only request history page

The Request History page will feature a table report where the office can either print or export the tables as a PDF file. It has sorting and search features. However, this table will be read-only for monitoring and report purposes. This

will give the office a quick glance at the transactions including those archived.

4.2 Analysis

The prototype system analyzed by this paper is housed in a GitHub Repository `https://github.com/joashdev/retrac`. This features the front-end developmental components of the system that mirrors the traditional face-to-face and online request protocol utilized by the CAS College Secretary, and UPV Cash Office. However, it borrows several user interface designs and experiences from the systems currently used by the college but considers minimalism and client bandwidth. It is expected to be deployed online `https://retrac.web.app/` for internal testing, debugging, and implementation.

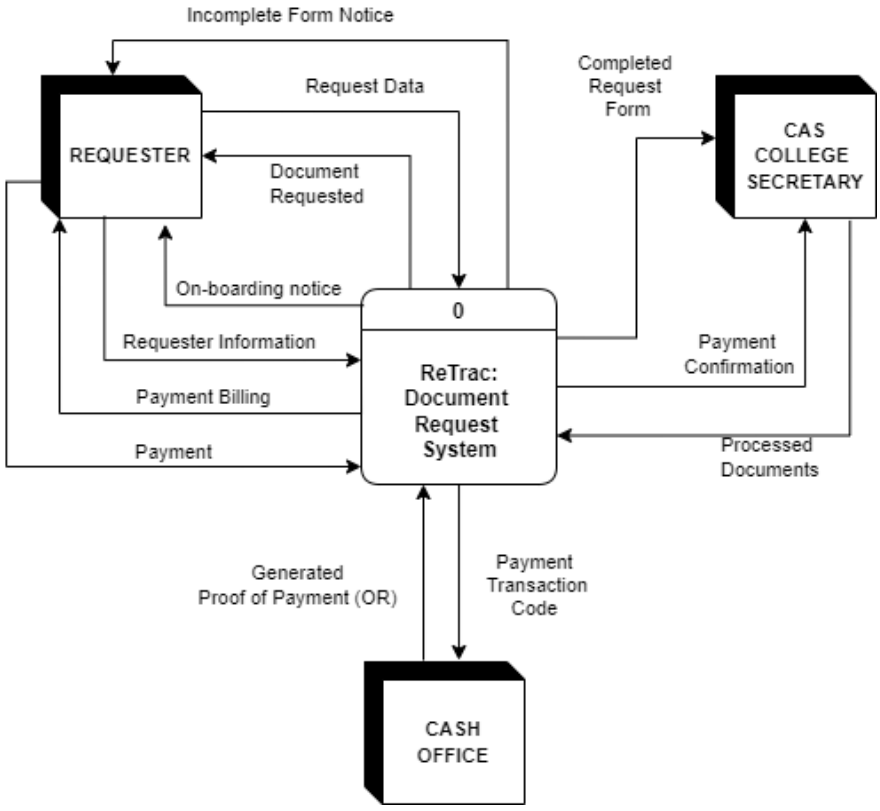


Figure 4.26: Context Diagram of the request system

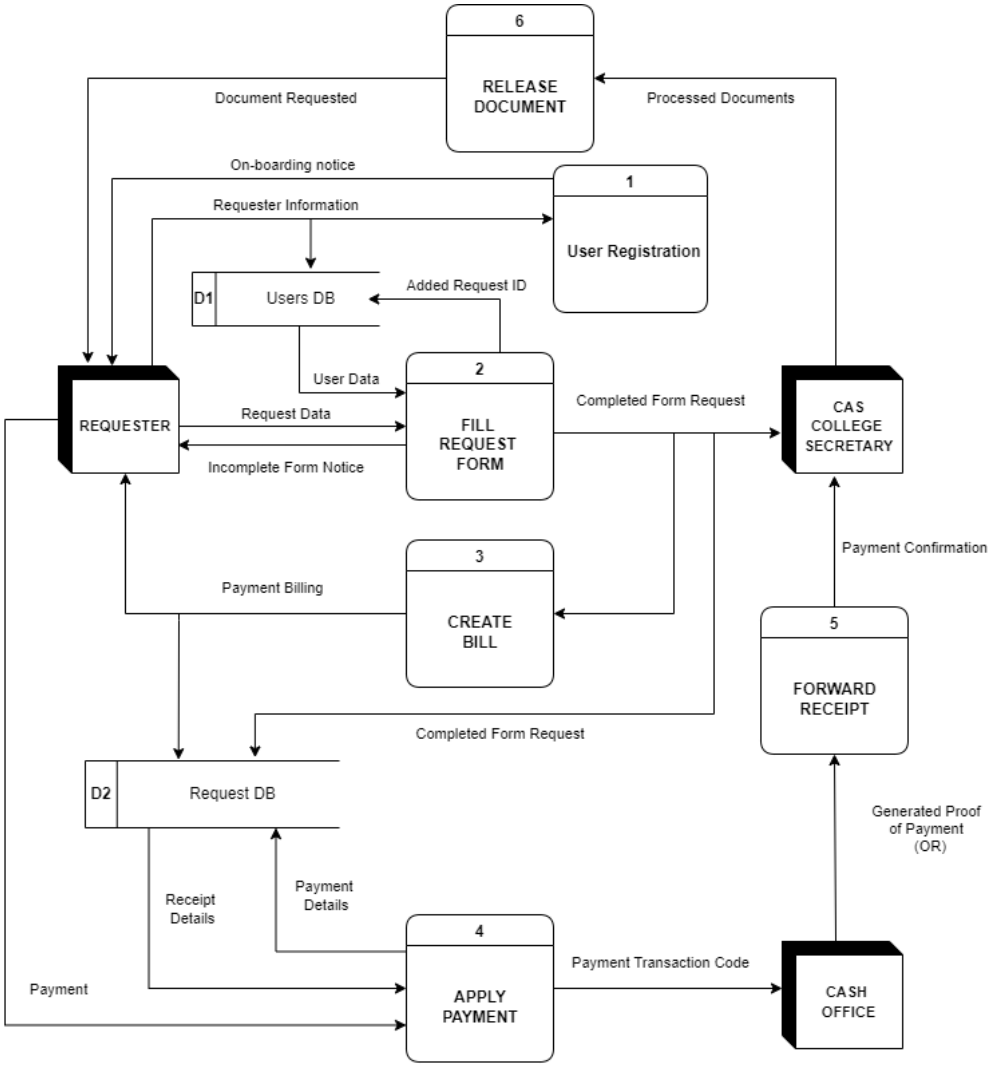


Figure 4.27: Diagram Level 0 of the request system

The Context Diagram Flow Diagram of ReTrac shows the system prototypes high-level processes and the relationship of the system with external entities, in this case, the Requester (student, alumni, faculty), Cash Office, and College Secretary of the College of Arts and Sciences. In Figure 4.26, we can see how the system captures information, and communicate the interaction and flow of data between offices.

The current process is in-line with the face-to-face and online request sequence

where the requester must be a verified student, alumnus, or a graduate of the CAS to be able to request their documents. It is then required to pay the billing given by the college secretary, and then provide the original copy of the payment receipt from the cash office. Then, the documents requested will be processed and released after several days.

In Figure 4.27, the same processes mentioned previously are shown as processes. Process 1 (User Registration) for student/alumnus verification and capturing of details. Process 2 (Fill Request Form) for filling out request form like Figure 3.1 but implemented online as seen in Figure 4.5. Process 3 (Create Billing) where the web application computes the billing of the requestor, like how close annotates the request form in face-to-face request and be forwarded to the cash office for payment. Process 4 (Apply Payment) where the cash office receives the money paid by the requester in the form of cash, bank, or mobile payments. In our system, we limit the payment option to PayMaya due to limitations set by the Commission on Audit. This will just prompt users to enter the transaction code generated by PayMaya from their phones when they scan the QR code and pay the fees from billing. Lastly, in process 5 (Forwarding Receipt), in the old-fashioned request protocol, the requester will hand-carry the O.R. from Cash Office back to the College Secretarys Office. In the system, however, the cash office entity would verify the transaction code if the money sent by the requestion matches what it is on their record. In the case the code or the payment made is incorrect, the office will prompt the user to re-enter the code or repay the billing. If the information provided to the cash office is a match, the O.R. will be uploaded and will be visible to the ColSec and the request card will be marked as VERIFIED PAYMENT. This will signal the Colsec to process the Documents and prompt

process 6 (Release Document) to the requester.

All of these real-life step-by-step transactions are reflected in Data Flow Diagram 0. The system also, utilized a step-by-step user experience in Requesting Documents for a guided online flow. This will also make the interface friendly to ffirst-time users of the application.

ReTract is a webapp prototype designed to help the UPV College of Arts and Sciences handle requests and documents. However, it was not developed in the context of records management. Furthermore, as a request system project, it was not completely supported by the university's present centralized management system architecture, but was designed to suit the urgent demands of the college secretary's office, cash office, and requesters. As a result, the system is self-contained and not linked to the framework used by the University of the Philippines in the Visayas' Computerized Registration and Student Information System, the UPV Learning Management System, and the recently adopted UP Document Tracking System.

Furthermore, the comprehensive approach to system initiatives was not observed. Prior to real system development, all relevant system aspects including people, processes, technology, and tools must be identified and properly in place, according to the holistic approach.

4.3 Discussions

This system allows the requestor to request student documents from the College of Arts and Sciences College Secretary. The web application works at optimum in a desktop environment and is designed to step-by-step process or minimize clicks

and touch on some of its components. The User Interface and Experience are both designed to utilize less data and storage by minimizing rasterized images and implementing a minimalist approach similar to current systems used in UPV. In this study, the researchers are yet to implement an automated online banking payment method. However, this will be added in the recommendation section of this paper and will be implemented in some updates in the future.

As shown in the results section of this paper, the developers were able to implement the core components of the web application and its functionalities: sign in and sign up, dashboard access, request forms, payment portal, tracking page, and various office functionalities such as payment verification and request status update. Each of the mentioned functionalities and features was implemented based on the review of related literature and methodology.

A portion of the web application is currently available thru local access backed with firebase remotely. Currently, it is in the internal debugging and testing phase.

Chapter 5

Conclusion

5.1 Summary

ReTrac is a document request and tracking system primarily designed for the use of the College of Arts and Sciences College Secretary, Cash Office, Students, and Alumni of the University of the Philippines. Traditional Document Request appears to be time-consuming and requires various emails to be sent between the college secretary and the cash office. The current face-to-face and online process require days of checking emails and some requests were overlooked due to the flooding of emails received daily by both offices. This makes the request trail hard to trace back nor provide up-to-date information regarding its status. Many students and alumni faced issues such as delay, and unavailability of bank accounts. Meanwhile, the office of the College Secretary was overwhelmed by requests during a certain season, this will help them manage how many requests they can receive daily and set forms that would be available for a specified season.

The said system also integrates payment QR for faster payment processing.

Some recommendations for improving ReTrac would be to add online wallet payment integration (i.e. Paymaya, GCash, etc.). Currently, the payment integration available is through the PayMaya QR Code. Our application for check-out payment is still pending as of the writing of this paper. Another would be to preregister accounts via UP mail, since the it is the official email of the university.

Chapter 6

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Appendix A

Appendix

A.1 JSON Schema for User Request

```
{
  "$schema": "http://json-schema.org/draft-04/schema#",
  "type": "object",
  "properties": {
    "reqid": {
      "type": "string"
    },
    "requester": {
      "type": "object",
      "properties": {
        "studentNumber": {
          "type": "integer"
```

```
},
"uid": {
  "type": "string"
},
"firstName": {
  "type": "string"
},
"degreeProgram": {
  "type": "string"
},
"middleInitial": {
  "type": "string"
},
"sex": {
  "type": "string"
},
"lastName": {
  "type": "string"
},
"displayName": {
  "type": "string"
},
"email": {
  "type": "string"
}
```

```
    },
    "required": [
      "studentNumber",
      "uid",
      "firstName",
      "degreeProgram",
      "middleInitial",
      "sex",
      "lastName",
      "displayName",
      "email"
    ]
  },
  "timestamp": {
    "type": "string"
  },
  "documents": {
    "type": "array",
    "items": [
      {
        "type": "object",
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            "amount": {
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            },
            "semester": {
              "type": "string"
            },
            "acadYear": {
              "type": "string"
            }
          },
          "required": [
            "type",
            "copies",
            "amount",
            "semester",
            "acadYear"
          ]
        }
      ]
    },
    "trail": {
      "type": "array",
```

```
"items": [
  {
    "type": "object",
    "properties": {
      "time": {
        "type": "object",
        "properties": {
          "seconds": {
            "type": "integer"
          },
          "nanoseconds": {
            "type": "integer"
          }
        },
        "required": [
          "seconds",
          "nanoseconds"
        ]
      },
      "update": {
        "type": "string"
      }
    },
    "required": [
      "time",
```

```
            "update"
          ]
        }
      ]
    },
    "purpose": {
      "type": "string"
    },
    "status": {
      "type": "string"
    },
    "proofOfPayment": {
      "type": "string"
    },
    "paymentStatus": {
      "type": "string"
    },
    "paymentOption": {
      "type": "string"
    },
    "paidAmount": {
      "type": "number"
    },
    "completePayment": {
      "type": "boolean"
```

```
        },
        "transactionKey": {
          "type": "string"
        },
        "transDate": {
          "type": "string"
        }
      },
      "required": [
        "reqid",
        "requester",
        "timestamp",
        "documents",
        "trail",
        "purpose",
        "status",
        "proofOfPayment",
        "paymentStatus",
        "paymentOption",
        "paidAmount",
        "completePayment",
        "transactionKey",
        "transDate"
      ]
    }
```

A.2 JSON Schema for Users


```
{
  "$schema": "http://json-schema.org/draft-04/schema#",
  "type": "object",
  "properties": {
    "degreeProgram": {
      "type": "string"
    },
    "email": {
      "type": "string"
    },
    "lastName": {
      "type": "string"
    },
    "sex": {
      "type": "string"
    },
    "middleInitial": {
      "type": "string"
    },
    "uid": {
      "type": "string"
    },
    "studentNumber": {
      "type": "integer"
```

```
    },
    "photoURL": {
      "type": "string"
    },
    "displayName": {
      "type": "string"
    },
    "firstName": {
      "type": "string"
    },
    "requests": {
      "type": "array",
      "items": [
        {
          "type": "string"
        }
      ]
    }
  },
  "required": [
    "degreeProgram",
    "email",
    "lastName",
    "sex",
    "middleInitial",
```

```
        "uid",
        "studentNumber",
        "photoURL",
        "displayName",
        "firstName",
        "requests"
    ]
}
```

Appendix B

Resource Persons

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