TECHNOLOGY CONSULTING
IN THE GLOBAL COMMUNITY

Final Consulting Report
Financial Intelligence Unit

Yidan Xu

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Financial Intelligence Unit
Executive Summary

Student Consultant, Yidan Xu
Community Partner, Hussein "Boboy" Derbai

I. About the Organization

The Financial Intelligence Unit ("FIU") was established in 2001 with the enactment of the Money Laundering and Proceeds of Crime Act of 2001. The Office of the Attorney General initially housed the FIU, followed by the Financial Institutions Commission ("FIC") in 2008. In 2014, with the latest amendment to the Money Laundering and Proceeds of Crime Act, the FIU became a fully independent agency. The FIU is not only responsible for the initial investigations of suspected proceeds of crime and terrorist property, but also for ensuring that entities subject to its supervision comply with the anti-money laundering and counter terrorism financing ("AML/CFT") requirements stipulated in the amended Money Laundering and Proceeds of Crime Act of 2001.

The mission statement of the FIU is,

Detect, disrupt, and deter money laundering, terrorism and proliferation financing, and other transnational crimes through coordination, collaboration, and cooperation with relevant domestic and international partners, while working towards alignment with international best practices and standards and promoting FIU staff growth and excellence.

The vision statement of the FIU is,

To safeguard the Republic of Palau against illicit financial activity.

II. Update and Debug the current Access database

Due to the new requirements that have emerged, FIU now has some new needs and wants to address issues within the database. I assisted Boboy in debugging the program and developing the necessary solutions. By debugging the Access Database, I updated the logic in the problematic section and cleaned up the old data.

Outcomes: By using the new version of Access Database, the option for 'Financial Institution Type' is restricted only to 'Depository Institution.' The updated Access Database is able to store more types of reports.

Outputs: I released the new version of the Access Database and the manual to help update similar drop-down options in the future.

Recommendations: Understanding the manual for updating the drop-down options is helpful for future updates of the Access Database by FIU.

III. Digitize the legacy CTR and PIT paper report of different banks

Before the CMU student started working at FIU, they used paper to store various documents, making it difficult to organize and find important data. By assisting them in digitizing the legacy reports, the updated version allows FIU to store the information in the current access database and manage the documents more efficiently.

Outcomes: Compared with digitizing the legacy paper report manually, the scripts I wrote help them expedite the overall process by at least 50%.

Outputs: I wrote several scripts to help digitize the legacy report into Excel format, which allow FIU to store them in the Access Database. The scripts include instructions to split the whole PDF into several pages, convert each PDF page into one PNG file, and convert the PNG file into the TXT file. Based on different banks, they are then able to read the TXT file and extract three bank reports' key information. I also wrote a manual for FIU to teach them how to run the scripts to digitize the rest of the paper report.

IV. Update the current FIU official website

The Financial Intelligence Unit's website offers only rudimentary information and is significantly outdated. To align with the organization's mission and enhance its effectiveness, addressing the outdated website is imperative.

Outcomes: By posting and linking new documents of laws & regulations related to the mission of FIU, it enables users to quickly find relevant information. This comprehensive content helps users gain insights into FIU's objectives, activities, and impact.

Outputs: I released the new version of FIU's official website with updated documents related to the laws & regulations.

V. Help FIU get ready with new database installation

TAIPAN, a new database for FIU, is scheduled to be installed after August. To ensure FIU is fully prepared for the implementation of the new database, the questionnaire and preparation are very important for TAIPAN to understand the circumstances in FIU.

Outcomes: By providing TAIPAN a deeper understanding of FIU's specific requirements and technical needs, it allows them to make the appropriate preparations. FIU can therefore fulfill their objectives while safeguarding crucial information from being disclosed to other countries.

Outputs: I helped FIU finish answering the questionnaire, and joined the meeting with TAIPAN staff to answer their questions related to the circumstances in FIU.

Consulting Partner
Hussein "Boboy" Derbai
admin@palaufiu.org
Adair Fincher
director@palaufiu.org

About the Consultant
Yidan Xu
yidanxt@andrew.cmu.edu
xujessie19981013@gmail.com

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I. About the Organization

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Facilities

The Financial Intelligence Unit (FIU) is situated on the second floor of the IA Meda Korner Building in Koror, Palau, sharing the space with the Financial Institutions Commission (FIC). These two entities collaborate closely to oversee financial activities within Palau. The physical setup and organization of the FIU's office are well-suited to its current operations. The office features three desks utilized by Adair (Director) and Boboy (Senior Intelligence Analyst) for their day-to-day tasks, along with a spacious conference table for meetings. Additionally, there are two desktop computers, three laptops, and two printers available in the office. Power availability at the FIU office meets the requirements, as there are ample power outlets to accommodate all electronic devices, including computers and phones, for both the FIU staff and guests. The power supply adequately supports climate control and lighting in the office. Security measures are also comprehensive, with the office door and the second-floor entrance being locked during nighttime, ensuring appropriate access control for the FIU and FIC offices.

Programs

The major activity for FIU is to digitize the paper trail, which includes the information passed on by the financial institutions, and analyze that information and create a storyboard that is worked upon by the investigators to detect the culprit involved in suspicious transactions that may lead to money laundering.

The FIU receives information from the local retail banks and the Bureau of Customs and Border Protection and stores it for intelligence gathering. During analysis, this information is utilized to find any evidence of money laundering. Before 2015, the information was paper-driven. Searching and analyzing information was next to impossible. Therefore, the whole process was digitized during 2015. Currently, the FIU has a digital database in place and all three retail banks send the CTRs and STRs in csv format. Hussein 'Boboy' Derbai, Senior Intelligence Analyst at the FIU, needs to retrieve the data from the bank-specific portal within a limited timeframe. In August 2023, FIU is planning to install a new database called TAIPAN to improve their database capacity. Moreover, they are going to incorporate a registry process within their website to document the provider's information.

Staff

Currently, there are three full-time employees in the Financial Intelligence Unit, Republic of Palau. Ms. Adair K. Fincher is the Director of the FIU. She is responsible for the overall supervision of the FIU, which includes staff, contracts, and public affairs. She is also responsible for implementing Anti-Money Laundering (AML) policies in the Republic of Palau i.e. develop, disseminate, and verify compliance with policies to prevent money-laundering and terrorist financing. She also represents the FIU at international forums and conferences. Adair uses computers for general office work, such as email, word processing, and research. Her laptop is preloaded with Microsoft Office applications (i.e. – Microsoft Word, Excel, Access, etc.) and uses Microsoft Outlook for accessing email. She is familiar with Office tools like Word and Excel, but does not have extensive knowledge on how to use databases. Mr. Hussein 'Boboy' Derbai is the Senior Intelligence Analyst of the FIU, Republic of Palau. His role is to support the Director in the process of implementing the AML policies. He recommends the dissemination of suspicious transaction reports (STRs) to the director and supervises the process of exchanging information with foreign FIUs. His access to and use of technology is largely like Adair's, except that he has more proficiency in using the Financial Intelligence Unit's current Microsoft Access database. As such, he is primarily responsible for cleaning and uploading the data on CTRs and STRs that is uploaded into the FIU's database. Ms. Keri Demei is the Admin Specialist of the FIU and FIC, Republic of Palau. She is in charge of the administration of both FIC and FIU. Her laptop is preloaded with Microsoft Office applications (i.e. – Microsoft Word, Excel, Access, etc.) and uses Microsoft Outlook for arranging email. Sometimes, she uses a printer to print documents instead of fully relying on digital documents. Keri's access to technology training is similar to Adair's and Boboy's.

Technology Infrastructure

The Financial Intelligence Unit has five computers, whose processor specs vary from Core i7 Quad-core to AMD TurionX2 Dual-Core Mobile. All computers have Microsoft Office 2019 Package

Suite pre-installed. Moreover, all the systems have access to the Internet via Wi-Fi (with the necessary web browser).

In terms of non-computing technology, the Financial Intelligence Unit's office is equipped with phones ("landlines") and a scanner/printer in Boboy's office that is accessible over the local network.

An undersea cable was established that provides a much higher quality Internet connection on the islands. On a recent test with internet benchmark speed, the FIU's internet bandwidth goes up to 11.4 Mbps for download and 5 Mbps for upload, which allows the FIU to communicate more efficiently, as well as transfer large files between themselves at a faster rate.

Technology Management

Since the staff at the Financial Intelligence Unit includes only 3 members, the current technology management plan is ad-hoc. In addition, the technology infrastructure involves just 2 user systems; one network device, and one printer. Therefore, technology management at the Financial Intelligence Unit is done on a largely 'as needed' basis. Since Boboy is more adept with computer hardware technology, he is responsible for solving any system issues. Boboy's current technical expertise, as it relates to technology management, largely consists of the ability to use computers, meaning he can perform tasks such as installing software or updating virus definitions through a graphical user interface. Beyond these tasks, the Financial Intelligence Unit relies on external limited services to manage its technology infrastructure. Furthermore, they currently do not have the budget to permanently hire an IT specialist like Conrad Ellechel, who is a dedicated information technician for government organizations in Palau. Given this lack of external support and internal capacity, the technology management portion of the Financial Intelligence Unit's organizational practices is limited. The data is backed up on external storage devices as they don't have the budget for cloud storage. All systems have Antivirus installed.

Technology Planning

Technology planning at the Financial Intelligence Unit is largely done by Boboy. However, the final decision of purchase is done by Adair. There is no specific budget allocated for IT management. The total budget for FIU is 159,000. Most of the budget is used by salary and 5% of the overall budget is allocated for buying office equipment. Computer equipment is bought utilizing this budget. Regarding technology planning and best practices, Adair and Boboy gain information about comparable international practices by attending conferences on money-laundering and terrorist financing prevention and dually observing the best practices showcased there. They also communicate with the other Financial Intelligence Units in attendance about their technology infrastructure.

Communication

Internally, information at the Financial Intelligence Unit is shared verbally, using a flash drive, or through email. With external organizations, it is shared via email or phone conversation. As such,

the Financial Intelligence Unit does have the capacity to share files, both internally and externally. Regarding the security of the files shared via email, the email accounts at the Financial Intelligence Unit are password-protected and have the capacity to be encrypted. Currently, the bandwidth is high enough to allow the FIU to easily transfer large files both internally and externally. For its purposes, the one-to-one communication capacity of the Financial Intelligence Unit is appropriate for its needs.

Information Management

The main role of the Financial Intelligence Unit is to store all information regarding suspected money-laundering activities and analyze it. Therefore, it handles its information management needs using a Microsoft Access database. The database application was created by two consultants participating in the Technology Consulting in the Global Community (TCinGC) program during 2015. It was further enhanced by other consultants who participated in the TCinGC program from 2016 through 2018. The organizations that submit these reports to the Financial Intelligence Unit have transitioned to electronic submission now. In August 2023, FIU is planning to install a new database called TAIPAN to improve their database capacity.

The FIU updates its database every Friday, and keeps two backups of the data, each on an external hard drive – one is left in the FIU office and another is kept off-site.

Business Systems

HR processes are taken by both FIU and the Ministry of Human Resources, Culture, Tourism & Development. After the Ministry of Human Resources receives the candidate's information, they send their resumes to the FIU office. The FIU then facilitates interviews and makes final decisions.

All government payroll goes through the Bureau of National Treasury, which falls under the Ministry of Finance.
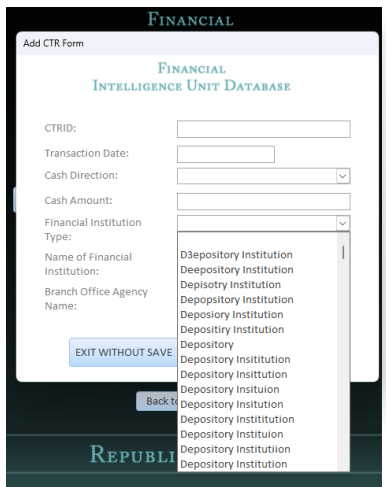
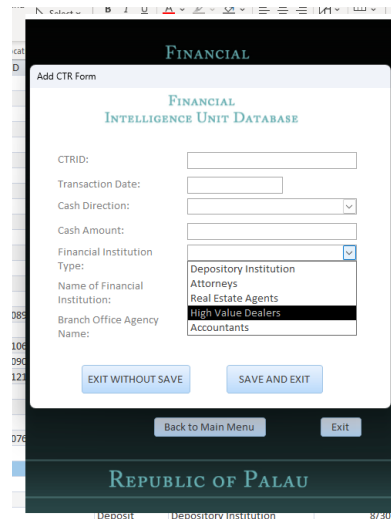# II. Update and Debug the current Access Database
Motivation

The Access Database currently in use was initially established by CMU students in 2015 and has been serving its intended purpose quite effectively. However, as with any long-standing system, it has accumulated some minor issues over time that warrant attention. While the overall functionality of the database remains intact, there is a particular aspect that requires addressing. Initially, when designing the database, the decision was made to limit the import of reports to a single institution. However, the dynamics of data collection and reporting have evolved since then. Nowadays, reports are sourced from a diverse range of institutions, rather than a single source alone. This shift in data sources necessitates an update to the database structure to accommodate a broader selection of institutions. By expanding the available choices, the database's capability is significantly enhanced, allowing it to store and manage data from various sources more effectively. This update ensures that the database remains adaptable and powerful, and capable of handling the growing volume of data while maintaining the integrity and accessibility of information across multiple institutions.

Outcomes

The updated version of the Access Database introduces new functionality that enables the import of reports from different sectors. Previously, it was not possible to clearly separate and categorize reports based on their respective sectors. However, with the database update, this limitation is overcome. The enhanced database has the capability to differentiate and organize reports effectively, ensuring that each report is appropriately categorized according to its specific sector. This improvement greatly enhances data management and analysis, as it allows for a more comprehensive and sector-specific view of the information stored in the database. Users have the ability to easily access and retrieve reports based on their desired sectors, leading to more efficient data utilization and decision-making processes.

Before   After

During the process of analyzing the logic of the Access Database, I discovered that the issue of providing so many incorrect choices was due to legacy problems. The previous logic of the Access Database for offering financial institution choices involved summarizing all the old inputs from the financial institution into the CTR form and filtering out the unique ones as dropdown choices when inputting a new report.

After discussing with Boboy and considering the new requirements, we decided to change the logic to fixed choices and rectify all the old mistakes. After completing the database update, users now benefit from an expanded range of choices when importing reports from different institutions. The updated database rectifies the existing erroneous choices that were previously present, eliminating any confusion or limitations encountered during the report import process.

The revised options provide users with a more comprehensive and accurate selection of institutions to choose from. By removing the previous mistakes and incorporating additional choices, the updated database ensures a more streamlined and error-free experience when importing reports from various institutions.

Recommendations

Due to the rapid changes in the various reports, it is crucial to comprehend the logic of the Access Database in order to better meet future needs. By understanding the process of importing a CTR design layout, Boboy is able to enhance the database independently if additional reports are required.

III. Digitize the legacy CTR and PIT paper report of different banks

Motivation

Before the CMU student built up the Access Database, FIU could only store the reports on paper and keep them in the office, making it difficult to find and store data. Boboy wants me to digitize the legacy papers by extracting the CTR and PIT forms from these papers and store them in the Access Database.

Outcomes

Before writing any code to help to store the report, the documents are stored in the rooms and difficult to find. In order to extract the CTR and PIT reports from the legacy papers, I need to scan the document into a PDF and send it to the computer. After scanning the document, the report is stored in one PDF.

By running the *split_pdf* function and *convert_pdf_to_png* function, it separates the whole PDF into single page PDFs, since most of the report is one page.

By running the *convert_folder_pdf_to_png* function, each pdf in the folder turns into one png file, which helps prepare the transport to a txt file.

By running the *convert_folder_images* function and *png_to_txt* function, each png in the folder converts to a txt file, which is able to be used to extract the necessary report information.

Based on the different banks, I wrote different scripts to extract the CTR and PIT reports, because each bank has a different report layout. The legacy paper contains three banks, which are the Bank of Hawaii, Bank of Pacific, and Bank of Guam.

Bank of Hawaii:

After checking the layout of the report from Bank of Hawaii, I wrote ***bankofhawaii.py***, which includes two different functions to extract the CTR report and PIT report in each txt file.

Read_folder_CTR() in ***bankofhawaii.py***: Due the result txt file is well formatted, I use regex to match the values that should be in the CTR reports. The values are:
- ctr_id
- trans_date
- branches_id
- transaction_type
- amount

After reading each text and collecting the values I needed, I stored them as one row in Excel. After all files finished reading, the CTR report of Bank of Hawaii was stored in one Excel file. Based on

the output, I went through the rows that have blank, or too much, information to double-check the values and ensure accuracy.

Read_folder_PIT() in ***bankofhawaii.py***: Due the result txt file is well formatted, I use regex to match the values that should be in the PIT reports. The values are :
- ctrid
- name
- occupation
- address
- city
- state
- zipcode
- address_country
- dob
- contact_number
- id_type
- id_number
- id_country
- account_number
- cash_direction
- cash_amount
- email

After reading each txt and collecting the values I needed, I stored it in one row in Excel. After all files finished reading, the PIT report of the Bank of Hawaii was stored in one Excel file. Based on the output, the person in charge needs to go through the rows that have blank, or too much, information to double-check the values and ensure accuracy.

Bank of Pacific:

After checking the layout of the txt file for the Bank of Pacific, I found that the CTR ID is related to the transaction date, which means I only needed to extract the PIT form, and henceforth use it to get the CTR form, so I wrote ***bankofPacific_PIT.py*** to extract the values of the PIT report.
In the ***bankofPacific_PIT.py,*** due to the chaotic format of the txt result, I chose to store the important values line and use Excel to do the following update. The values I extracted are:
- name
- occupation
- address
- accountnumber

After reading each txt and collecting the values I needed, I stored them as one row in Excel. After all files finished reading, the PIT report of the Bank of Pacific was stored in one Excel file. Based on the output, the person in charge needs to manually input the money amount and CTRID due to the confusing layout. By having the PIT report, I was able to run the *convert_date_format* function to extract the transaction date and store it in the CTR report.

Bank of Guam:

There are two different formats for the Bank of Guam's report. The quantity of the previous format is minimal. Therefore, I chose to manually input the CTR report and PIT report instead of writing a script for this new layout. For the newer version's format, I wrote ***bankofGuam_new.py*** to extract the PIT report, and then used the PIT report to generate the CTR report. By checking the format of the report, due to the chaotic format of the txt result, I chose to store the important values line and use Excel to do the following update. The values I extracted are:

- name
- occupation
- address
- city
- accountnumber
- ctrid
- cashin
- cashout
- idtype

After reading each txt and collecting the values I needed, I stored them as one row in Excel. After all files finished reading, the PIT report of the Bank of Guam was stored in one Excel file. Based on the output, the person in charge needs to manually check the result for accuracy and remove any redundancy.

I conducted tests using the three banks each month. Meanwhile, Boboy carried out tests on the Bank of Hawaii over a two-month period. Further details and script usage are available in Appendix A.

IV. Update the current FIU official website

Motivation

The old Financial Intelligence Unit's website offers only rudimentary information and is significantly outdated. This outdated state has a detrimental impact on visitors, creating a negative impression of the FIU. To align with the organization's mission and enhance its effectiveness, addressing the outdated website is imperative. By doing so, the website can be revamped to provide up-to-date and comprehensive information, thereby offering a more positive and valuable experience to its users.

By updating the website with the latest information and improving its layout, it enhances the user experience by providing up-to-date and relevant information, ensuring visitors have a positive impression and experience easy navigation. Secondly, an updated website boosts the organization's reputation and credibility, showcasing its commitment to staying current and reliable. Thirdly, it increases user engagement, capturing their attention and encouraging deeper exploration of the organization's offerings. Moreover, an updated website facilitates effective communication and information dissemination to stakeholders. Lastly, a revamped website ensures accessibility across different devices, expanding the organization's reach and impact. Overall, these benefits collectively contribute to the organization's success and strengthen its relationship with its audience.

Outcome

By updating the current FIU website, I aimed to enhance its overall user experience and provide visitors with more relevant and up-to-date information. The first step in this process involved removing the old legacy introduction and act, which was no longer reflective of the institution's current values and goals.

Furthermore, I followed the requirements of director Adair, which included keeping the website content fresh and informative. To achieve this, I added several posts related to the regulations that FIU focused on, such as the Money Laundering Proceeds of Crime Act, Financial Institution Regulations, and DNFBP Regulations. These additions not only showcase FIU's ongoing contributions to financial regulations, but also serve as valuable resources for the public.

One of the most significant improvements I made during the update was linking vital documents directly from the website. By providing accessible and downloadable links to crucial acts and regulations, it fosters transparency and facilitates easy access to essential information for all stakeholders.As illustrated below, each link provides a document on this topic available for readers to download.
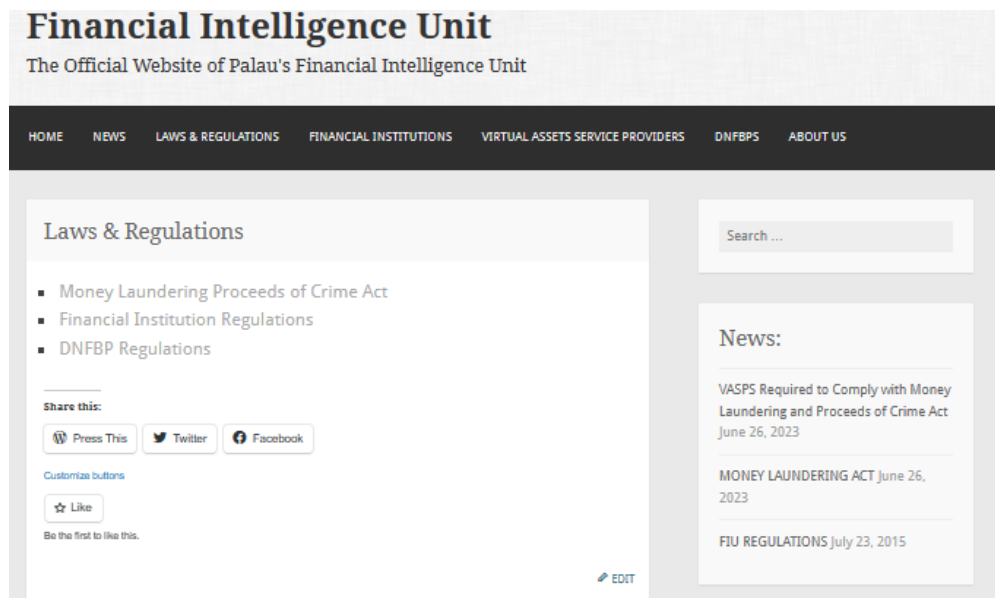
In conclusion, the website update seeks to present FIU in the best possible light, representing the institution's progress and dedication to financial institution regulations. Through the removal of outdated content, the addition of fresh and relevant acts, and the implementation of an improved layout and document linking, I endeavored to create an online platform that commits to fostering a stronger regulatory community.

IV. Help FIU get ready with new database installation

Motivation

TAIPAN, a new database for FIU, is scheduled to be installed by the company in September. To ensure that the FIU is fully prepared for the implementation of the new database, TAIPAN has sent out a comprehensive questionnaire. Based on the responses provided in the questionnaire, TAIPAN arranged a meeting to further discuss the requirements and details necessary to facilitate a smooth installation process in September.

The questionnaire covers a wide range of technical aspects, including server hosting, internet settings, and firewalls. Answering these questions enables TAIPAN to better understand the specific technical requirements that FIU needs, and ensures that all necessary preparations are made prior to the installation. It also assists in efficient resource allocation and human resource arrangements, allowing for a well-coordinated and successful implementation of the TAIPAN database.

By actively engaging in the questionnaire via providing accurate and detailed responses, and answering questions to provide necessary help to the installation team for the TAIPAN system, I contributed to a more seamless and efficient installation process. This collaborative effort between FIU and TAIPAN ensures that the installation is properly tailored to FIU's specific needs, maximizing the benefits and functionality of the new database.

Outcome

I assisted FIU in answering the questionnaires from TAIPAN, which enhance the efficiency and smoothness of the installation process. Furthermore, it enables TAIPAN to better allocate their human resources effectively.

By actively participating in answering the questionnaires, FIU contributes to streamlining the installation process of TAIPAN. The responses provided help TAIPAN gain a deeper understanding of FIU's specific requirements and technical needs, allowing them to make appropriate preparations. This collaborative effort ensures that the installation progresses efficiently, minimizing any potential challenges or delays. Understanding the specific requirements and scope of the installation allows TAIPAN to allocate the appropriate personnel and expertise, ensuring a well-coordinated and successful implementation.

Moreover, by offering appropriate assistance, the FIU can fulfill their objectives while safeguarding crucial information from being disclosed to other countries, all the while facilitating the sharing of necessary information.

About the Consultant

Yidan is a master student in Information Systems at Carnegie Mellon University. She is interested in distributed systems, information security, and machine learning. She will graduate in May 2024.

Appendix A.

1. Open the Dell Computer inside the conference room, open the folder titled 'CMU'. This folder includes the scripts I mentioned above, the transition documents, and also the report's results.
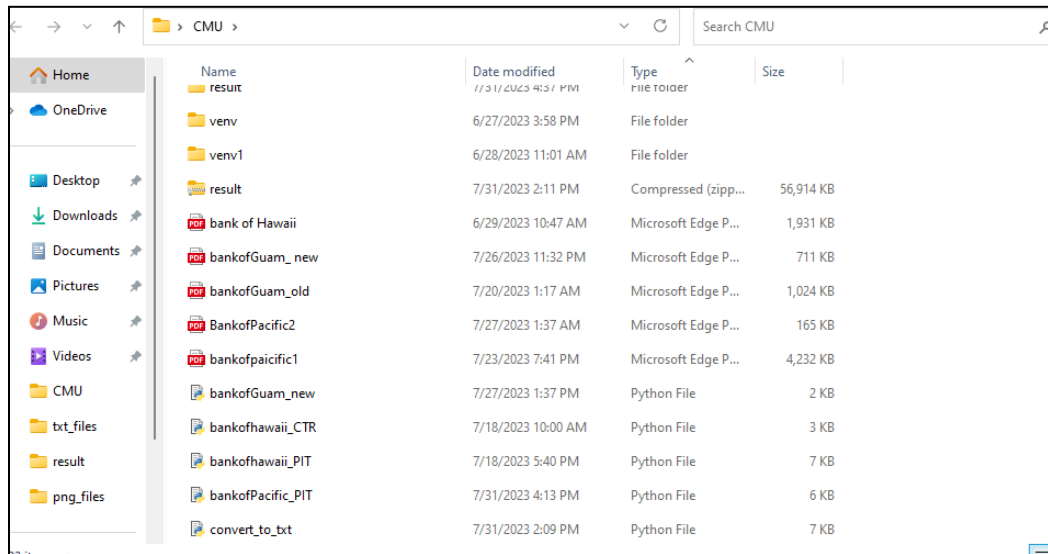
2. After scanning the report, put the report into this folder, then run the *convert_to_txt.py* script; it will have a folder that contains txt files.
3. Based on the reports' bank, run the according scripts to extract the information. The result will show up in this folder.
4. Look through the Excel output and compare it to the paper documents to correct discrepancies.