TECHNOLOGY CONSULTING
IN THE GLOBAL COMMUNITY

Final Consulting Report
National Development Bank of Palau

Tyler Lowe

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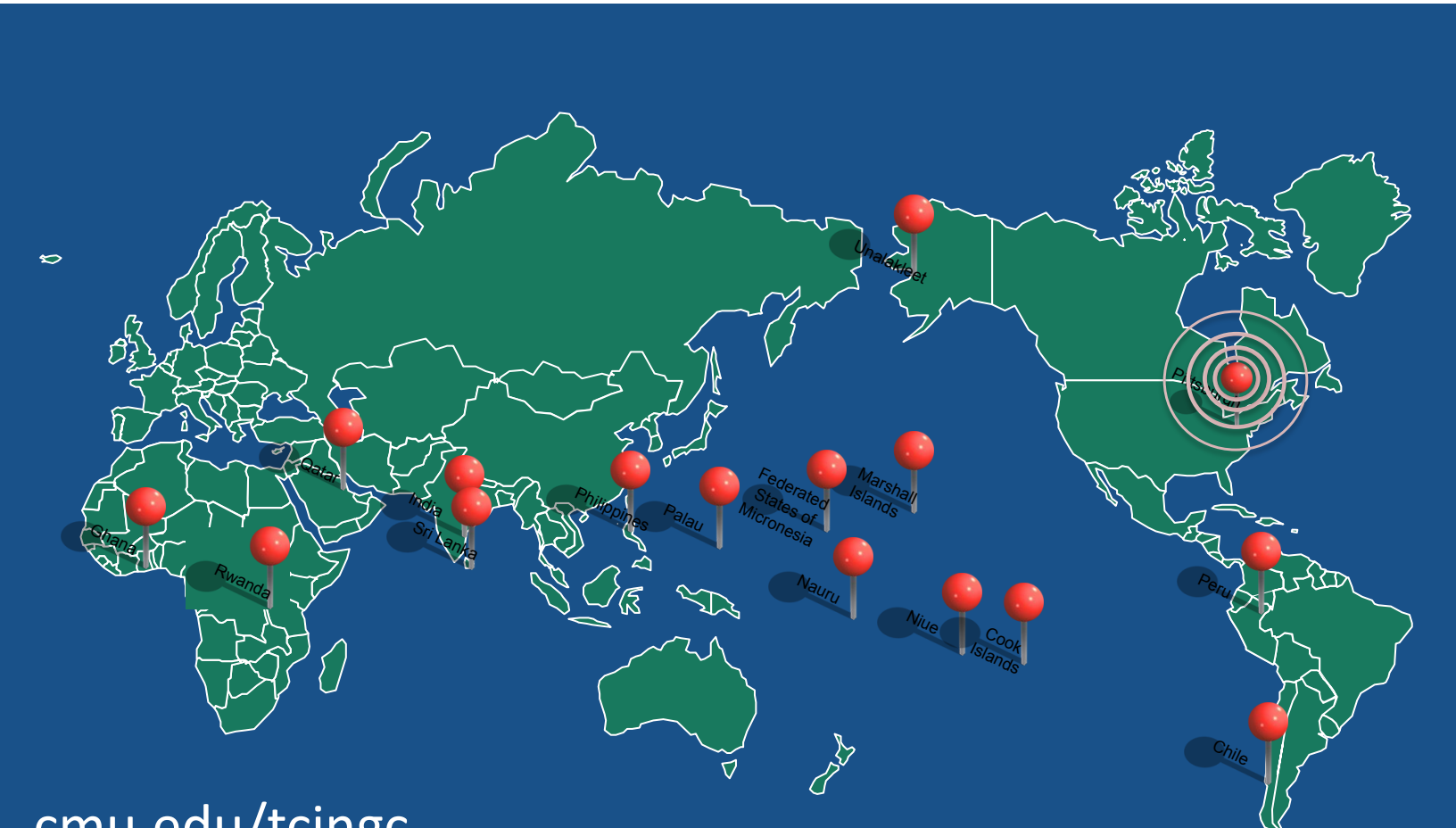
Carnegie Mellon University



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Executive Summary

Student Consultant, Tyler Lowe
Global Community Partner, Claire Harvey

I. About the Organization

The mission of the National Development Bank of Palau (NDBP) is as follows:

> *To initiate and promote sustainable economic development within the Republic of Palau.*

The NDBP is a government-owned bank whose core purpose is to provide lending towards the development of two Palauan domains: housing and commerce. Accordingly, all profits from the business go back into the general fund to finance operations and future lending. The NDBP has a single, small campus in the Palauan state of Ngetkib-Airai that houses 20 employees. From this location, they maintain relationships throughout the whole community and serve the *entirety* of Palau, working towards a goal of "financing the future of Palau." They are a continually growing company that finances about 1,000 clients and has a loan portfolio of over $36,000,000.

II. Improve Employee Efficacy – Simplify Lending Reports

A continued source of pain at the NDBP is the creation of monthly loan reports which leadership relies on to inform smart business decisions. The reports are generated manually by the operations manager and it can take up to 4 days to pull all the information required from individual reports and raw data. There have been past unrealized attempts at automating this monthly reporting process. This problem isn't just annoying, but serious, as it leads to diminished employee efficacy. It causes a direct violation of Claire's $10, $100, and $1000/hr work philosophy. The goal of simplifying the lending report process will return time to employees, allowing them to execute the tasks they are best trained for and better support the NDBP's mission.

A NDBP loans database and user interface were developed to centralize loan data at the NDBP and simplify lending reports. The project was built with Microsoft Access and provides ways for loan officers to complete their loan log and disbursement workflows from a single location as well as generate reports. It also provides a manager interface and Excel sheets that demonstrate how to analyze Access data. Project deployment was thwarted, however, by issues narrowed down to the NDBP network and IT infrastructure. Below is a summary of the key outcomes:

- Diagram of Current Lending Report Process + Idealized Process (Appendix A)
- Diagram of Loan Officers Disbursement Workflow (Appendix B)
- Loans Database Data Domain/ERD (Appendix C)

- Deployed Loans Database Project (located in the Network Public Shared Folder)
    - Microsoft Access Loans Database
    - Microsoft Access Loans User Interface
    - User Interface Video Tutorials
- Project + README for Future Consultant (located in Previous Employees/TCinGC)

The NDBP management are well aware of the deployment issues faced towards the end of the summer and debugging efforts. There are two recommendations moving forward:

1. There are plans to upgrade the NDBP servers by the fall; after completion, the project should be redeployed on the network (Norbert) to check if the upgrades resolve the outstanding issue. It is also recommended that the NDBP contact Tyler Lowe at tylerlowe@gmail.com for assistance during this time.
2. Wait for the next TCinGC consultant. The consultant's README walks through the project as well as the extensive debugging efforts that have already occurred. It leaves a series of progressive solutions that can be tried to complete the project deployment.

III. Rebuild NDBP Website – Direct Updates and Lower Costs

After analyzing the NDBP, another apparent problem is that the website needs to be rebuilt. For over a decade, Ninth Design—a website designer from Guam—has hosted and supported their site for a large monthly fee of $150. This cost does *not* include direct updates from staff, and the inefficient process is reflected in an outdated website and ineffective communication tool. Additionally, since the website was created, Palauans have become more digital with high-speed broadband internet (2017) and 4G LTE network speeds, increasing the need to have a modern website that can serve as a main gateway to the bank. These recent technological changes coupled with the undesirable and costly setup make the need for website rebuilding urgent.

While not the primary focus of the summer, progress was made to meet this goal. The core groundwork was covered such that the rebuilding of the website is a matter of design and implementation. Below are the key outcomes:

- High-Level Alternatives and Website Builders Matrix Analysis (Appendix F)
- Low-Fidelity Wireframes/Information Hierarchy (Appendix G)
- Dynamic Data Domains (Appendix H)

The implementation is not complete, and it is a goal that I would *highly* recommend a future consultant complete. The timing for the NDBP is opportune–operating costs could be cut easily by ½, and the NDBP website made more modern, interactive, and editable by NDBP staff using a modern website builder.

Consulting Partner
Claire Harvey
charvey@ndbp.com

CEO/President (former)
National Development Bank of Palau
http://www.ndbp.com

About the Consultant
Tyler Lowe
tylerlowe@gmail.com

Tyler is a 2023 graduate from Information Systems. He will begin working as a software engineer for Amazon next year.

Final Consulting Report

Student Consultant, Tyler Lowe
Global Community Partner, Claire Harvey

I. About the Organization

Organization

The mission of the National Development Bank of Palau—commonly referred to as the NDBP—is as follows:

> *To initiate and promote sustainable economic development within the Republic of Palau.*

The NDBP is a government-owned bank whose core purpose is to provide lending towards the development of two Palauan domains: housing and commerce. Accordingly, they do not provide retail banking to the people of Palau, and all profits from the business go back into the general fund to finance operations and future lending. The NDBP has a single, small campus in the Palauan state of Ngetkib-Airai that houses 20 employees. From this location, they maintain relationships throughout the whole community and serve the *entirety* of Palau, working towards a goal of "financing the future of Palau." They are a continually growing company that finances about 1,000 clients and has a loan portfolio of over $36,000,000.

Facilities

The NDBP operates from a single campus built on approximately 600m^2 of land. The area is monitored by CCTV cameras capturing the entrance and the parking areas. Security personnel also guard the area from 6 pm – 6 am every day. Facing the campus entrance, to the left is the main office building, to the right is a secondary auxiliary building, and in the middle is a parking lot. The main building is a two-story structure that houses 20 employees. The first floor houses the NDBP loan clerks, housing lending officers, finance department, servers, short-term file storage, supplies, and restrooms. The second floor houses the NDBP commercial lending officers, operations department, CEO, and board room. The largest group within NDBP—the commercial lending officers—share a large workspace with cubicles while the remaining departments mostly use single office spaces for employees. The auxiliary building is a smaller, single-story structure that houses the security guard's office, long-term file storage, and a communal kitchen where employees sometimes take their lunch.

The main building features sufficient furniture and facilities; each of its employees is retrofitted with a Windows laptop, desk, chair, storage space, power, and ethernet access. The network speeds within the building are good and have large coverage; ethernet reached 40-50mbps and Wi-Fi 20-30mbps. The NDBP does have a VPN for remote work, the Wi-Fi is password protected, and the network storage requires credentials. The building is powered partially by solar using an on-grid system and partially by the PPUC (Palau Public Utilities

Corporation). The power supply is adequate for the lights, devices, and climate control; however, they face frequent outages, both planned and unplanned. When outages occur, the employees are finished for the day.

The NDBP campus is located in the Palauan state of Ngetkib-Airai. It is near the Japan-Palau friendship bridge which links it to the most populous state, Koror. The campus neighbors include a solar power company, a Shell gas stop, and a very new and modern shopping complex called the Surangel's Supercenter.

Programs

To support their mission, the NDBP offers loans in the domains of housing and commerce.

The different types of NDBP housing loans are the following:

Name	Description	Interest Rate
Housing Loans	General-purpose housing loans	10%
First-Time Homeowner Loans	Loans targeted at first-time homeowners	8%
Micro-Finance Housing Loans	Small loans targeted at home renovations ranging from $500-15,000	6%
Pre-Development Housing Loans	Loans targeted at pre-development housing activities (recon, appraisal, inspection, titles, etc.)	6%

The different types of NDBP commercial loans are listed below—note that all commercial loans have the same requirements but differ primarily based on interest rates and fees:

Name	Description	Interest Rate
Commercial/ Business Loans	General-purpose business/commercial loans	10%
Fishing Loans	Loans targeted at fishing businesses	8%
Agriculture/ Aquaculture Loans	Loans targeted at agriculture/aquaculture businesses	6%
Micro-Finance Commercial Loans	Small loans targeted at business/commerce renovations ranging from $500-15,000	6%
Pre-Development Commercial Loans	Loans targeted at pre-development commercial activities (recon, appraisal, inspection, titles, etc)	6%

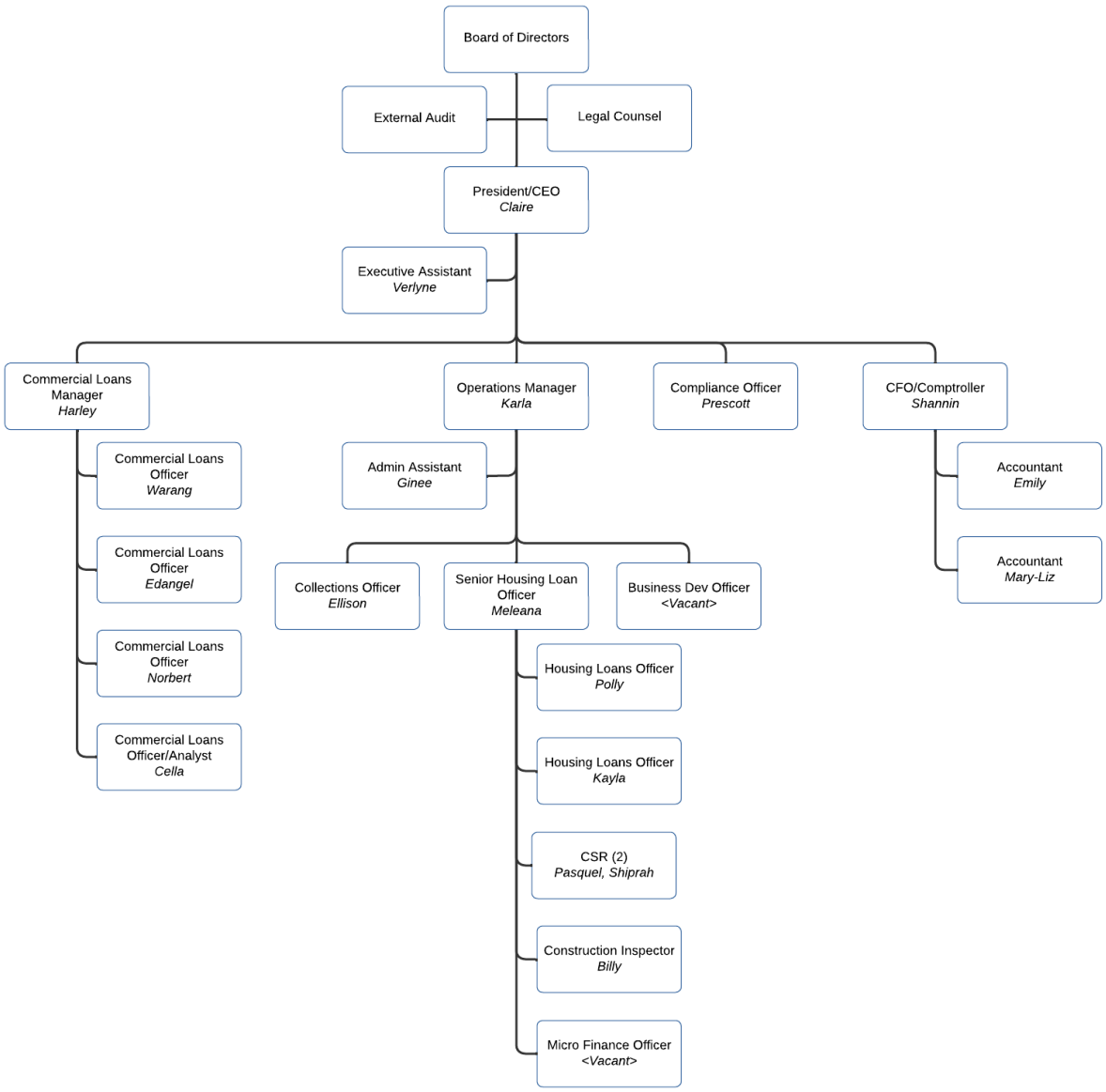
The NDBP also offers the following special programs:

Name	Description	Interest Rate
HDLP	The housing development loan program offers special rates and subsidies to projects focused on developing housing	Variable
WEDAP	The women and young entrepreneurs loan program with special funding from Taiwan allocated for women/youth business development	8%
WYEDAP	The rural women's loan program with funding from New Zealand in 2007 to develop rural businesses; being phased out in favor of microloans	Variable
Renewable Energy Loan Program	The renewable energy loans program with funding from the Asian Development Bank in 2021 to fund renewable, specifically solar, projects	6% (microloans)

Staff

The NDBP currently has 20 staff members with plans to increase to 22 with the addition of a micro-finance officer and business development officer. The workweek is 5 days long, and the typical workday is 8 am – 5 pm for office employees with support for NDBP clients between 9 am – 3 pm. Leadership is foremost headed by Claire Harvey, the President and CEO of NDBP. Supporting Claire, 3 managers lead departments: Harley with commercial loans, Shannin with finances, and Karla with operations and housing loans. There is no in-house IT specialist and they rely on an external agency to deal with technical issues. For an overview of the organization, review the chart attached at the bottom of this section.

A large number of the employees at the NDBP are loan officers and consequently, my work has a high likelihood of impacting them. They serve as the primary point of contact for clients of the NDBP and are expected to build trusting relationships and loyalty. They assist clients in completing the required forms, interviewing, evaluating creditworthiness, providing justifications, following up on payments, and providing reports to operations. Loan officers interact with computers frequently and have the necessary software to perform their job. First, they use Excel, Word, and Optimist to record and evaluate prospective NDBP clients. Second, they use a custom VBA program to auto-generate closing documents for approved loans. Third, they use ASI Insite (see ‘Information Management’) to track active loan balances and their payments. Fourth, they use Excel to create reports on loan activities from Insite data. Lastly, they use shared network drives, which facilitate the transfer of information within the organization. Loan officers' training in computers and software is minimal. They learn to use Office 365 products and Insite largely through trials and tribulations or coworker help. The last time formal computer training was used was for the custom VBA program: Karla and Norbert were trained by Halanna–a previous TCinGC student consultant–who then held a training session for the rest of the officers before deployment.



Technology Infrastructure

The NDBP has sufficient technology infrastructure in place to perform their day-to-day operations and all employees have access to the software needed to perform their duties. Below is a breakdown of the infrastructure currently in use:

IT Category	Product
Employee Laptops	Window 10; Intel Processors; Mixed Manufacturers
Servers	Windows Server 2012; Single Server On-Premises
Loans Banking System	ASI Insite v8.0.56
Accounting System	Optimist v7
Server Backups	Acronis
Network Firewall	Untangle

Network VPN	OpenVPN
Antivirus	Kaspersky Endpoint Security 10
Office Productivity	Office 365
Communication	Email; register.com

As mentioned in ‘Facilities,’ the network speeds within the building are good (by Palau standards) and have large coverage. Ethernet reaches 40-50mbps and Wi-Fi 20-30mbps. As a result of COVID-19, the NDBP team has the IT infrastructure in place to operate remotely using OpenVPN to connect to their network servers. However, because of the in-person nature of their business, since resuming normal operations, remote work is mostly dead.

A glaring IT infrastructure concern at the NDBP is their server setup—a solo server that runs on-premises and creates a single source of failure for the organization. For any bank under normal circumstances, this is a concerning setup; however, the problem is exacerbated by the frequent power outages that occur in Palau, resulting in shuttered NDBP operations. Karla has expressed concerns over this problem with a push for higher business continuity.

Technology Management

The NDBP continues to manage its technology infrastructure through an external agency called Computer Plus. The agency charges NDBP a fixed monthly fee and all services over the fixed rate (8 hours of service) are charged on an hourly basis. Internal technology management capacity is not yet built and for nearly all technical problems, an IT technician from the agency is called. It’s worth noting that the commercial loans officer, Norbert, has been trained to support the auto-closing generation tool created by Halanna last summer. He has been able to successfully add new loans to the program and make small edits to the VBA application.

Tasks related to the backup of NDBP data, installing/updating hardware, and installing/updating software are handled by Computer Plus exclusively. The backup of server data is completed through 2 strategies.

First, a daily backup is loaded on an external, 6TB hard drive. This hard drive is replaced by a Computer Plus technician every Friday and the backup drive is taken to the agency. This strategy keeps a daily backup of NDBP data on-premises and a remote backup of data, up to the last week, in the Computer Plus offices.

Second, a daily backup is completed on another 3TB hard drive. This disk is removed from the server room every day and kept in personal possession by the CFO, Shannin. This second strategy was added as a result of a malware attack on the NDBP which resulted in the loss of a week’s worth of data. This strategy ensures that a daily backup of data is stored off-premises in case of an incident with the in-office servers and data.

All the databases related to NDBP software, except for Optimist, are backed up through the server. Additionally, the NDBP staff use a shared network drive to store all client and loan-related information which is included in the backup.

Technology management itself is a mix of planned and ad-hoc. Planned activities include the backup of server data and onboarding new employees' IT equipment with Computer Plus. Ad-hoc activities include the rolling updates of software, hardware, and other fixes.

An apparent IT management concern is that while the backup procedure is executed daily/weekly, the NDBP has not verified the backups themselves or that the Acronis software completes successfully. They are betting that the backup system installed years ago is still working properly, which is a concern in an area where power and environmental disasters are likely. Prescott, the Compliance Officer, has expressed concerns over this.

Technology Planning

All decisions involving technology at NDBP are executed by the President and the board. There is not currently a technology planning committee, and any need from employees involving software or hardware should be brought to the President's attention. Additionally, there is no separate technology budget and funds are allocated on an as-needed basis.

Communication

Each NDBP employee has access to a shared network folder on the server where the organization puts business information such as loan documents, reports, and client meeting schedules. This shared folder is accessible by *all* NDBP employees, and everyone has read/write access to *all* documents inside. Additionally, each employee has a private network folder to store personal documents and managers have access to a set of shared network folders for themselves. The NDBP has an official email registered using register.com and each employee has a personal email. Internal NDBP information is passed either through shared folders or via email.

The network speeds and coverage at the NDBP are strong, giving the organization the ability to access the web easily. The organization is not present on any external communication tools/social media except for a small presence on Facebook. They do also have a website (https://www.ndbp.com), but it is updated very infrequently. They pay the company Ninth Design $150/month to host the site and any updates require going through the company.

Internally, NDBP employees communicate digitally through a variety of means: Email, SMS, Facebook Messenger, and phone calls. Digital avenues for communication are used sparingly, however, and the majority of internal communications happen either through in-person visits or team meetings. Externally, the NDBP communicates with its clients either through phone calls or mail. It is regular for clients to stop at their loan officer's desk to give or receive updates.

There are several areas for potential improvement in communications at the NDBP. First and foremost, the NDBP should consider refactoring/rebuilding its website. The current setup is not ideal. That is, paying a company large monthly fees ($150) to host a website that is out-of-date and difficult to update. They should consider bringing the website in-house by using a no-code website builder that will allow easy updates and cut costs at least in half. The timing of this is also important. Since the website was first created, Palau has gained highspeed broadband internet (2017) and their citizens are increasingly becoming digital. The website is becoming a main entry point to the NDBP rather than a phone call or office visit which makes the need for a website rebuild urgent. Second, and for a similar reason, an increased presence on sites such as LinkedIn would help increase the NDBP's reputation and visibility within the Palau and global community. Lastly, having familiarity with Office 365 products, the NDBP staff could adopt Microsoft Teams and Calendar to facilitate communication. They could set up several strategic channels (managers, commercial loan officers, operations, etc.) that allow easier dispersion and access to information instead of phone calls/emails where information can be quickly forgotten. Additionally, they could

integrate Microsoft Calendar into the team so handling meetings (internal and external) can be done easier and people's availability known. There are some efforts in this space: Claire uses Google Calendar and officers such as Cella have dabbled with Outlook Calendar. Building on these and having a unified team center with a calendar and messaging would make communication and coordination a lot easier at the NDBP.

Information Management

Information at the NDBP typically falls into one of two categories: loans or accounting. For each category, the departments have separate information management systems in place.

Loans

The critical information that is tracked about loan applications includes ID information (name, address, number, SSN, etc.), purpose of loan (loan type, business plan, amount, etc.), collateral offered (land, equipment, furniture, etc.), debts (credit, mortgage, etc.), personal financial information (income, expenses, assets, liabilities, etc.), and employment verification. This information is tracked through paper documents, Excel sheets, and Word documents.

Closed loan information at NDBP is managed through an electronic system called ASI Insite. Once a loan is closed—the loan has been approved and the paperwork signed—the loan information is added to Insite. The information on Insite is updated by the loan clerks when a customer makes a payment and can also be updated by managers. Loan officers, however, are only able to view Insite data. Note that only *closed* loan information can be added to Insite, meaning that prospective clients' information is tracked externally using a variety of Excel spreadsheets stored within the shared network drive.

Additionally, a bundle of physical papers including the client's application, signed contracts, and more is stored in the main building when the loan is closed and active. When the loan is paid, the bundle is moved to the auxiliary building for 7 years before being destroyed.

Accounting

Shannin, the CFO and head of the NDBP's accounting department, utilizes a program called SAGE MAS90 to manage NDBP finances. Using SAGE MAS90 and information stored in Excel sheets, she generates the 'Finance Presidents Report' as well as yearly budgets for Claire and the Board to review.

The information tracked by SAGE is typical for a business. It includes information on operating revenue (interest, fees, late charges, etc.), operating expenses (admin expenses, salaries, training, insurance, etc.), nonoperating revenues/expenses (solar, interest, etc.), and more. This information is essential to maintain an accurate picture of the NDBP's financial health.

Miscellaneous

The databases that the NDBP use are included in their various services (Insite, SAGE, Excel). There are no databases that were built in-house by previous developers. Additionally, the network file system was configured by the Computer Plus agency.

Business Systems

The tools aforementioned in 'Information Management' are also utilized as business systems; refer to the information in the previous section for an understanding of the information they contain and how they are used at NDBP.

The main business system used for internal reporting is Excel. Loan officers use Excel to handle their 7/90 day reports, complete loan log reports, and model prospective clients. The operations department uses Excel frequently as well, especially when creating the monthly lending report used to inform business decisions. A very primitive CRM is also implemented through Excel in a subset of the loan log report. The information includes name, contact, and type for inquiries.

Past attempts at automation included automating the monthly loan reports that Karla is responsible for. A student consultant in 2019 created Excel macros using VBA to reduce the time it took to generate the final lending report. The project included training documents, but the NDBP was unable to sustain the solution due to a short training period and lack of experience with VBA to utilize the documentation effectively. This problem is unresolved and continues to be a pain point for NDBP operations.

II. Improve Employee Efficacy – Simplify Lending Reports

Motivation

A continued source of pain for the NDBP is the creation of monthly loan reports that Karla—the NDBP Operations Manager—is responsible for. During leadership meetings, Claire and the Board rely on these monthly lending reports to inform smart business decisions. Currently, the reports are generated manually by Karla as she scavenges for information that the loan officers store in Excel reports. It can take Karla up to 4 days to pull information from the individual reports and raw data from Insite's Report Writer to compile the final lending report (Appendix A). There have been past attempts at automating this monthly loan report process. A student in 2019 created a VBA program to reduce the time it took to create the final lending report. The project included training documents; however, the NDBP was unable to sustain the solution due to a short training period, a lack of VBA experience, and a brittle solution. Halanna, last year's student consultant, also provided an updated analysis of the problem and a writeup of potential solutions for future consultants which I include below[1]. The problem remains unsolved and is such a pain point that the monthly loan reports actually became *quarterly* because of the tedious process.

This problem isn't just annoying, but serious, because it leads to diminished employee efficacy. Claire has a philosophy of work known as $10/hr, $100/hr, and $1000/hr work. The loan officers are responsible for the $10/hr work of gathering and putting information together, the managers are responsible for the $100/hr work of analyzing the information, and as President, Claire does the $1000/hr work of driving the bank's business strategy with that analysis. Karla is spending too much time on the $10/hr work of copying and pasting information between Excel sheets instead of doing the $100/hr analysis work. The goal of simplifying the lending report generation process can give Karla more time to analyze whether the lending figures met the bank's target metrics or how loans in certain business sectors are performing, which would better support NDBP's mission of promoting economic development in Palau.

To implement the project, there were three high-level solutions to consider: (1) Continue using Excel and build tools around their current processes, (2) Build a database that is incorporated in the current technology stack [MS Access], or (3) Build a new database for reports. Each of these alternatives was graded based on cost/compatibility, automation,

[1] https://www.cmu.edu/global/education/tcingc/reports/TCinGC-Palau-NDB-2022-FinalReport.pdf

customizability, and sustainability with an emphasis on automation and sustainability [Appendix D]. The highest ranked was an RDBMS solution, specifically approached from a low/no-code, web-based technology; however, as prototyping started, it became clear that loan data stored for the NDBP needed to bridge with the physical world. This means that NDBP business functions require physical reports/records that must be generated from stored data (disbursement requests, reports). Using web-based, RDBMS tools, it quickly became over-engineered and expensive to come up with a solution that could meet these requirements. Therefore, the technology pivoted to Microsoft Access which could bridge the gap easily via VBA and Access integration with other Microsoft products the NDBP already uses. Furthermore, leveraging this technology requires no additional costs: NDBP employees already utilize Office 365 so they have MS Access pre-installed and a server with a network folder already exists.

Outcomes

At the conclusion of the summer, through a series of activities, an NDBP loans database and user interface were developed to centralize loan data at NDBP and simplify lending reports. The project was implemented using Microsoft Access (see 'Motivation') and provides ways for loan officers to complete their essential loan workflows from a single location: loan logs, loan disbursements, and reports. The project does *not* introduce any new concepts, rather it intends to support existing workflows with new technology that better organizes data and speeds up internal processes. It also provides a manager interface and Excel sheets that demonstrate how to analyze Access data. The project's deployment was thwarted, however, by a non-deterministic issue (Appendix E) caused somewhere by the configuration of the NDBP network and IT infrastructure. Despite debugging efforts, due to a combination of opaque IT infrastructure and the mission-critical nature of the data, project usage by staff was postponed until the deployment issue is resolved (see 'Recommendations').

Activities and Outputs

1. Interviewed Stakeholders
    - Loan Officers – Norbert, Cella (understand loan officer workflow + datasets)
    - Loan Managers – Karla, Prescott (understand vital data + datasets usage)
    - CEO/President – Claire (understand what the priorities and constraints are)
    - ***Outputs***:
        - Diagram of Current + Ideal Lending Report Process (Appendix A)
        - Diagram of Loan Officers Disbursement Workflow (Appendix B)
        - Loans Database Data Domain/ERD (Appendix C)
2. Prototyped
    - Initial No-Code, Web-Based RDBMS Solution using BudiBase
    - Elicited Feedback from Officers + Managers
    - Pivoted to Access to Accommodate Business Needs (see 'Motivation')
    - Prototyped Database with Access Database
    - Prototyped User Interface with Access Forms + Linked Tables + VBA
    - Validated "Split" Access Database Architecture for Multi-User Environment
    - ***Outputs***:
        - Local Microsoft Access Loans Database Prototype
        - Local Microsoft Access Loans Interface
        - Deployed Prototype on NDBP Network
3. Built Production Version
    - Implemented Loans Database ERD using Access Database

- Implemented Loans Database User Interfaces with Access Forms + VBA
- Elicited Initial Feedback During Team Meeting
- Elicited Feedback during One-on-Ones with Loan Officers
  - Initial Discovery of the Deployment Issue (Appendix E)
- Integrated Feedback into Project
- ***Outputs***:
  - Production-Ready Microsoft Access Loans Database
  - Production-Ready Microsoft Access Loans Interfaces

4. Training + Deployment
   - Deployed Production Project on the NDBP Network
     - Located in Public Shared Folder, "LOANS DATABASE SOLUTION"
   - Debugged and Documented the Non-Deterministic Deployment Issue
     - Rewrote VBA Code for Better Resource Management
     - Recreated Access Files and Connections
     - Consulted MOF and other Access Developers
     - More in the README (in Previous Employees/TCinGC)
   - Created Video Tutorials on User Interface and Access for Staff
   - Conducted Last Round of One-on-Ones with Loan Officers
   - Trained Norbert + Meleana as Super Users of User Interface
   - Familiarized Norbert on Project Architecture and Access Development
   - ***Outputs***:
     - Deployed Loans Database Project
     - Video Tutorials for User Interface (on NDBP Network and in Loom)
     - Packaged Project + README for Future Consultant

Objectives

These were the objectives I set forth for this goal and their results:

Desired Outcome	Measuring	Status Quo	Results
Reduce Monthly Loan Generation to ½ Day of Work for Managers	Using the new system, we will record how long it takes Karla to create the monthly lending report and benchmark.	Currently, it can take Karla up to 4 days to create the report.	We never fully switched and migrated data to project so were *unable* to measure a result. On paper, it does seem to expedite the process substantially.
Centralize the NDBP Reporting Datasets	Using the new system, all datasets should be centralized with record ownership, roles, and access control.	Currently, the datasets Karla uses are splintered into many files.	The deployed project *effectively* centralizes loan data in a single spot (database) with loan officer ownership for each record.
Loan Officers can Complete Loan Log	Using the new system, Loan Officers should be able to faithfully keep a loan log using just the system.	Currently, the loan log is kept using Excel spreadsheets.	The deployed project *handles* maintaining loan logs (add, update, view loan data, view based on Fiscal Years, reports).
Loan Officers can Complete Loan Disbursements	Using the new system, Loan Officers should be able to perform disbursements using just the system.	Currently, the loan disbursements are kept using Excel spreadsheets.	The deployed project *handles* loan disbursements (add, update, view disbursements, reports).

State

The project is currently in a frustrating state: the development work is done, the staff largely understands the purpose of the project and how to use it, and there are training artifacts, but the non-deterministic deployment issue prevents actual usage (Appendix E). At the end of summer, the exact culprit was not found but through deliberate debugging, refactoring, and consulting other IT staff, the issue was narrowed down to the NDBP IT infrastructure. A difficult fix in a short time because (1) there are many potential sources of the problem and (2) consultants have limited access to the IT infrastructure as NDBP contracts with Computer Plus for IT. Due to the resulting instability caused by the deployment issue on a domain that is mission-critical to the organization, it felt ill-advised to leave the project in use until the issue is resolved in the future.

While the issue is difficult, there are changes happening at the NDBP in the future that give an opportunity for redeployment. They are installing a new server and network which should give a massive upgrade over the current Microsoft Server 2012 they are running on outdated hardware. Additionally, through this upgrade project, MJ [Computer Plus Agent] should get experience and understanding of the NDBP IT infrastructure and be able to assist the student consultant better (see ‘Recommendations’).

Sustainability

Sustainability was a focus during the development of the project. At first, no-code solutions were attempted to keep sustainability by NDBP staff as high as possible. However, as business needs arose, there was some forfeiting of sustainability to achieve the customizations [printed reports/request sheets] that the NDBP needed to make the project usable–Access and VBA offered these abilities at the lowest costs (see ‘Motivations’). Additionally, as mentioned earlier, the project simply aims to mimic the current workflows that Loan Officers go through only on a daily basis, making the new system feel familiar and integrated more easily.

From an administrative perspective, the project’s sustainability largely hinges on the ability of Norbert (a tech-savvy Loan Officer) to be able to manage the Access database, interface, and VBA code. Norbert was already familiar with Access databases and forms prior to the summer and received further training to understand the NDBP Loans Database project architecture and code. Norbert is not alone, however, and it is recommended that the NDBP reach out to Tyler Lowe at tylerlowe@gmail.com for assistance with problems.

Configuration

To summarize the project configuration at a high level, the NDBP Loans Database was implemented using Microsoft Access–specifically with a "split" database architecture. Splitting is a good architecture choice for Access databases when data needs to be accessible to multiple concurrent users. Access was not originally designed for a multi-user environment (one database for one user on one computer), but with splitting we can make it multi-user and parallel-friendly for a smaller organization. I developed a user interface for loan officers and managers using Access Forms, and a backend database using MS Access Tables. The entire project is deployed on the NDBP server network folder at the following path: "*/Shared Folders/Public Folder/NDBP LOANS DATABASE SOLUTION*". To use the project, the Access forms (user interfaces) are copied from the network folder onto employee local drives, but the loan data itself lives and is accessed on the network drive.

When you open the project folder on the network you will see four additional subfolders: (1) “backups” which is intended as the storage location for backups of the Access database file,

and also an untampered copy of the Access forms user interface; (2) “guides” which is the storage location for user guides and information related to the project; (3) “ndbp-loans-database” which is the home of the Access database, there is a single "ndbp-loans-database.accdb" that strictly holds tables and their data; (4) “ndbp-loans-forms-COPY-ME” which is the home of the Access forms user interface. As indicated by the name, it is important that users copy the entire directory into their local drive to properly use the Access forms. The file "ndbp-loans-forms.accdb" holds the queries, form objects, and VBA code required to run the user interface. The form’s data comes from the “ndbp-loans-database” database file. This folder also has a "/templates-DONT-TOUCH" which holds Excel template files that the Access forms VBA code use to generate appropriate reports and sheets. These generated files go into the "/generated" subdirectory.

Recommendations

The NDBP management is well aware of the project state, deployment issues faced towards the end of the summer, and debugging efforts. Unfortunately, while the issues were not able to be solved while the consultant was still in Palau, there are a series of changes happening at NDBP *afterward* that make the project potentially deployable. They are installing a new server and network which should give a massive upgrade over the current Microsoft Server 2012 they are running on outdated hardware. Additionally, through this upgrade project, MJ [Computer Plus agent] should get experience and understanding of the NDBP IT infrastructure and be able to assist the student consultant better.

There are two sequential recommendations moving forward:

1. There are plans to upgrade the NDBP servers by the fall; after completion, the project should be redeployed on the network (Norbert) to check if the upgrades resolve the outstanding issue. It is also recommended that the NDBP contact Tyler Lowe at tylerlowe@gmail.com for assistance during this time.
2. If still failing, wait for the next TCinGC consultant. The consultant’s README walks through the project as well as the extensive debugging efforts that have already occurred. It leaves a series of progressive solutions that can be attempted to complete redeployment.

III. Rebuild NDBP Website – Direct Updates and Lower Costs

Motivation

Upon analyzing the organization, one of the most immediate problems is that the NDBP website needs to be rebuilt. As mentioned in ‘Communication,’ their current website setup is less than ideal. Over a decade ago, they contracted Ninth Design—a website designer from Guam—to build their website. Since then, they have continuously paid the company a large monthly fee of $150 to host and support the site. Ninth Design does *not* allow the NDBP to update the website directly. Instead, they are required to contact Ninth Design for updates, a slow process that is hardly used. This inefficient process is reflected in the latest news article being over a year and a half old and the loan products being outdated. Ultimately, the NDBP is bleeding money on what has become an ineffective communication tool and client resource. This seems to be a common sentiment and source of frustration at the NDBP from conversations with employees.

Additionally, since the website was created, Palau has gained highspeed broadband internet (2017) and the PNCC (Palau National Communications Company) has released 4G LTE network speeds. Most Palauans have at least one network-capable device and the country is

increasingly becoming digital. Correspondingly, as citizens become more digital, the website stops being just a placeholder for the NDBP, but a main entry point for prospective clients. This increases the need to have modern website features like responsiveness, mobile-friendliness, and interactive components. These recent technological changes coupled with the undesirable setup make the need for a website remake urgent.

The goal can be implemented using one of three high-level solutions: an external developer, a custom website repository, or a website builder. Each solution was graded based on the four dimensions of cost, speed, customizability, and sustainability (Appendix F). Because of an emphasis on sustainability and cost, it was clear that utilizing a website builder tool was most appropriate. Second, which website builder was considered. The most popular platforms Wix, Webflow, WordPress, and GoDaddy were graded based on five dimensions: cost, speed, customizability, sustainability, and CMS [Content Management System, a built-in feature to add structured, dynamic data to the website]. Again, there was an emphasis on sustainability/CRM and cost (Appendix F). After grading them, Wix came out on top. It provides great value, offering speedy development, an easy interface, and a CMS to build dynamic pages for a reasonable price. It only lacks full-fledged customization because of its template-based nature; however, customization is not a large concern for this goal. Should it become necessary, we can switch to Webflow which offers finer-grain control over the UI.

Outcomes

While not the primary focus of the summer, progress was made to meet the goal. The core groundwork was covered such that the rebuilding of the website is a matter of design and implementation. Below are the key outcomes:

Activities and Outputs

1. Interviewed Stakeholders
    - Loan Managers – Karla, Prescott
        - Walk-Through of Current Website (likes/dislikes, missing/excess)
        - Identify What they Want to Communicate and to Whom
    - Loan Officers – Cella
        - Understand Client Struggles at NDBP
        - Loan Application Process
    - ***Outputs***:
        - Basic Requirements Gathering & Understanding
2. Wireframed
    - Low-Fidelity Wireframes for Website
    - Elicited Feedback from Managers on Wireframes
    - Iterated on Wireframes to build Minimum set of Features
    - ***Outputs***:
        - Low-Fidelity Wireframes/Information Hierarchy (Appendix G)
        - Dynamic Data Domains (Appendix H)
3. Alternatives Analysis
    - Researched and Analyzed High-Level Alternatives for Implementation
    - Researched and Analyzed Website Builders for Implementation
    - ***Outputs***:
        - High-Level Alternatives and Website Builders Matrix Analysis (Appendix F)

Objectives

These were the objectives I set forth for this goal and their results:

Desired Outcome	Measuring	Status Quo	Results
Reduce Website Costs by 50%	Simple monthly calculation on the new website expenses: platform, domain, hosting, etc.	The current website setup costs the NDBP $150/mo.	Website is not complete; however, from analysis, this is a *very* achievable goal using website builder platforms ($30-$40 a month).
Website Editable Directly by The NDBP Staff	Simple admin portal with forms to perform CRUD on content data: news, loans, programs, and staff. The website adapts based on these inputs.	The current website has *no* direct editing abilities, everything is proxied through Ninth Design.	Website is not complete; however, using a website builder with CMS makes this a *very* achievable and realistic goal.
The website Allows Customers to Apply Digitally	The website allows prospective clients to fill out forms digitally. Submitted forms are integrated into current loan officer workflows.	The current website only has printable PDF files, everything is done physically.	Due to business constraints (inability to handle online payments), *pivoted.* The first iteration should simply have online-fillable PDFs.
Website Reduces Loan Application Support by 30%	The website assists in filling out the loan application forms. Measured by the number of successful digital applications done w/out help.	Loan officers frequently take calls/help clients fill out forms because of confusion over inputs.	Website is not complete. This goal hinges on the creation of a robust ‘Apply’ page.

State

Through interviews with staff, wireframing, feedback, and analysis, the gathering of the fundamental requirements for the website is done. There is a strong understanding of *what* needs to be done, the *how* now needs to be executed (design and implementation). The project is currently in a state where a future consultant could easily pick up the requirements and start working towards the implementation of this goal.

Sustainability

A key focus in choosing a solution to rebuild the website was sustainability (Appendix F). Sustainability in the system will be achieved through two means. First, the website builder selected was chosen because of its ability to provide a straightforward interface to update the website. An interface, that if trained, can be used by the NDBP to maintain the website long after the student consultant leaves. There is no coding involved, just adding/removing elements. Second, by choosing a website builder that has a CMS, website content changes can be made by simple forms on an admin page. This will require foresight and embedded website logic that can dynamically build pages based on CMS data; however, it provides a far more sustainable approach because the vast majority of updates can be resolved without the use of the builder. This will be beneficial because it is far easier to teach managers and staff how to use the forms than to use the website builder tool itself. This will enable quick training of many NDBP staff to use the CMS forms and require only a few of the tech-savvy staff to know the website builder platform.

Recommendations

The goal is not complete, and it is a problem that I would *highly, highly* recommend a future consultant complete. The timing for the NDBP is opportune: operating costs could be cut easily by half, and the website made more modern, interactive, and editable by NDBP staff using a website builder. These are the recommended (basic) steps moving forward to complete the goal:

1. Review the Matrix Analysis, Low-Fidelity Wireframes, and Data Domains (Appendix F, G, H)
2. Contact Ninth Design
    - Inquiry about current hosting, tech stack, and domain name information
    - Possible they will not respond or cooperate
3. *High-Fidelity Wireframes (optional, website builders enable quick enough edits)*
4. Implement Website Static Pages
    - Consult Karla/Harvey to Add the *Actual* Paragraphs/Phrases Desired
5. Implement Website CRM Data Objects + Dynamic Pages
    - Consult Karla/Harvey to Add Initial Set of Data
6. Integrate Norbert's Web-Fillable PDFs into 'Apply' Page
7. Elicit and Integrate Feedback (repeat this as many times as necessary)
8. Implement the Website Mobile View (repeat steps 4-7 for mobile)
9. Purchase Domain and Acceptable Website Plan
10. Deploy Production Website + Transfer Credentials to NDBP
11. Train the Staff:
    - Train NDBP Staff on Using the *Website Builder* (Prescott, Norbert)
    - Train NDBP Staff on Using the *Website CMS Forms* (Managers, Norbert)

IV. Additional Recommendations

Create a Disaster Contingency Plan

Typhoon Manwar–the typhoon that hit Guam and delayed students by a week–made it abundantly clear the dangers that a small island nation in Southeast Asia faces. It is not just natural disasters that Palau faces, but man-made as well: there are frequent power outages and occasional internet outages (there was a week without internet this summer), to name a couple. Despite the dangers that the NDPB faces, from my discussions with Prescott Yuri, the Internal Auditor, there was no real disaster contingency plan for the NDBP when problems inevitably strike.

Creating an NDBP contingency plan is a *very important* activity because (1) they operate in an area with a high probability of disaster/failure, (2) they store important and sensitive financial information they want to keep, and (3) they operate an important service for Palauans that should be kept up. Before leaving, Prescott began the legwork for creating an NDBP Disaster Contingency Plan. It is not important to create the most robust contingency plan possible, but it is important to have *a* plan in place that the NDBP knows how to perform. To complete the plan, it is important for the policy-makers to take these basic steps (feel free to add any additional):

1. Risk Analysis
    - Brainstorm with staff the Different Possible Disasters and Failures

        - Ex: Internet Outage for a Week, Building Collapse, Weak Typhoon, Strong Typhoon, Power Outage, etc.
    - Consider the Probability and Impact of Each to Define the Risk
2. Contingency Planning
    - For Each Risk, Brainstorm with staff a Contingency Plan for the NDBP
        - Involve Management, Officers, Front Desk, and Board
        - Place Special Emphasis on Highest Risk Scenarios
        - Include emergency response plan, backup operations plan, and post-disaster plan for their operations
        - Create a *Realistic* Plan that the Bank can Execute on
3. Practicing
    - Implement a Simulation for Disasters to Practice the Contingency Plan
    - Elicit Feedback from Trial and Update Plan as necessary
    - *Important*! An Untested Plan Has No Guarantees

Test Data Backup and Recovery

The 'Technology Management' section outlined the backup data procedures that the NDBP executes. Over the course of the Summer, I observed some gaps in the procedures that need to be rectified: (1) Computer Plus/NDBP does *not* ever test that the data backups actually work. They have never tried restoring data from a backup drive and are hoping that it will work if they need it. (2) There is a confusing mess of different backup jobs that are running on the server, and when inspected, many of them actually *failed.*

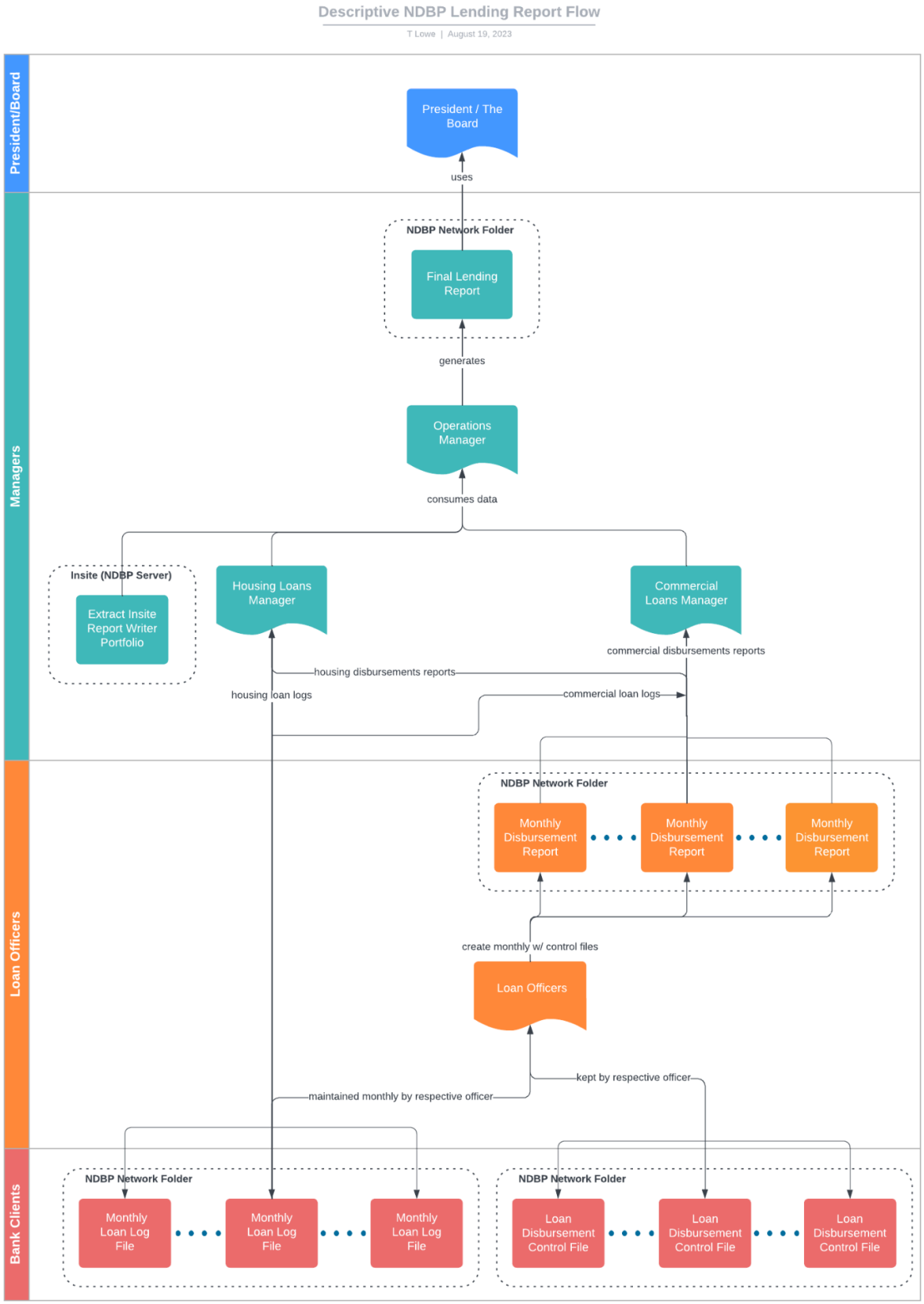
These gaps–testing data backup and recovery–are important to fix because the data stored on the servers is *mission-critical.* The scenario where the backups are needed and fail is *devastating* to the bank's operations as they could lose weeks of important financial data on their clients. Furthermore, as explored in the previous section, the NDBP operates in an area with a high probability of disaster/failure which makes having a tested data backup plan even more critical. Currently, the effectiveness of their data backup plan hinges on hope, and hope is not an effective strategy. Rectifying these issues would be a good task for Prescott Yuri, who already understands the current policy. An appropriate time to tackle this recommendation would be after the fall server upgrades. The basic steps include:

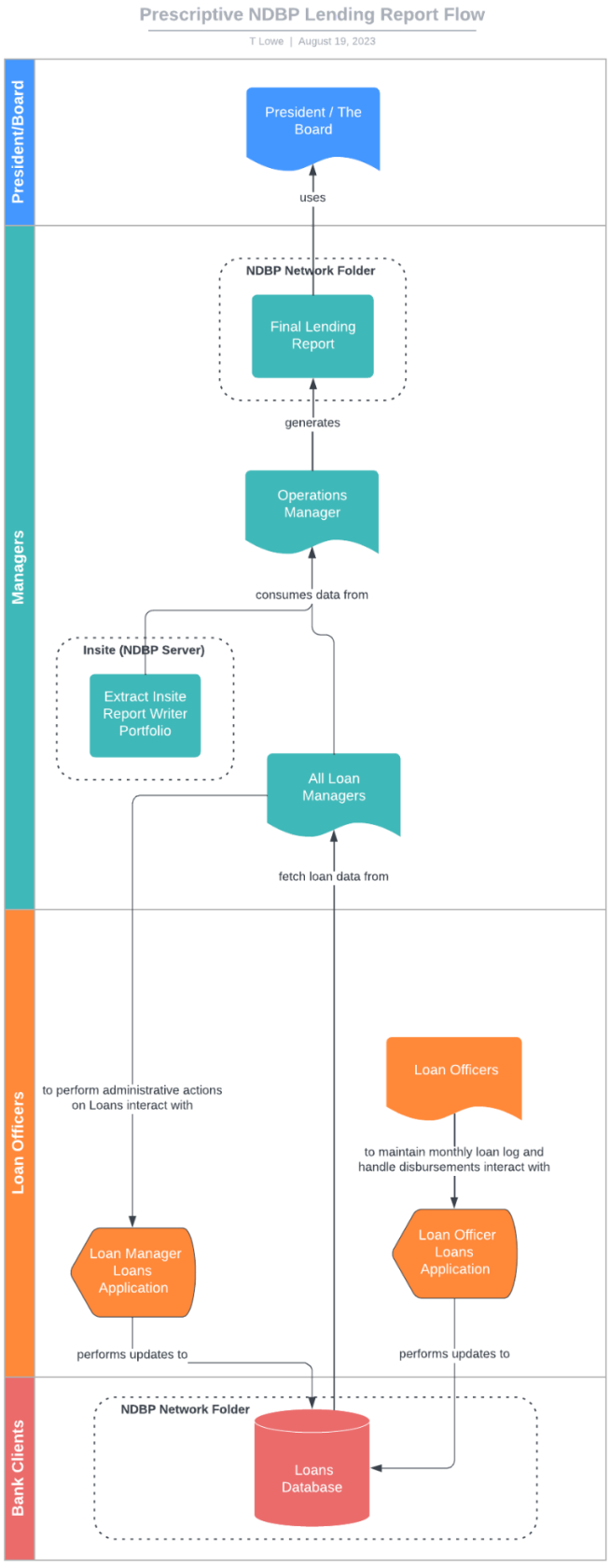
1. Tidy the Backup Jobs
    - Brainstorm with Staff to List the Most Important Data
    - Consult Computer Plus to Clean the Data Backup Jobs with Better Naming, Scheduling, and Appropriate Backup Data Scope
    - Document These Tidied Jobs and their Scopes, Ensure Backups Capture the Most Important Data
    - *Validate* All Backup Jobs Complete and do so in a Satisfactory Time Window
2. Test the Data Backups
    - Create a Plan to Test the Data Backups at Least Once a Quarter
    - Validate that Data Restored from Backup Matches the Data Expected
        - Likely Require Computer Plus Assistance to Figure out How to Test and the Testing Environment
    - Rotate Data Hard Drives Used for Testing to Validate Hardware as Well
3. Audit Data Backup Plan
    - Update NDBP Data Backup Plan Policy with Expected Procedures
    - Observe Backup Plan to Ensure that the NDBP Data Backup Plan is Executed Faithfully and as Documented (and keep occasionally auditing)

About the Consultant

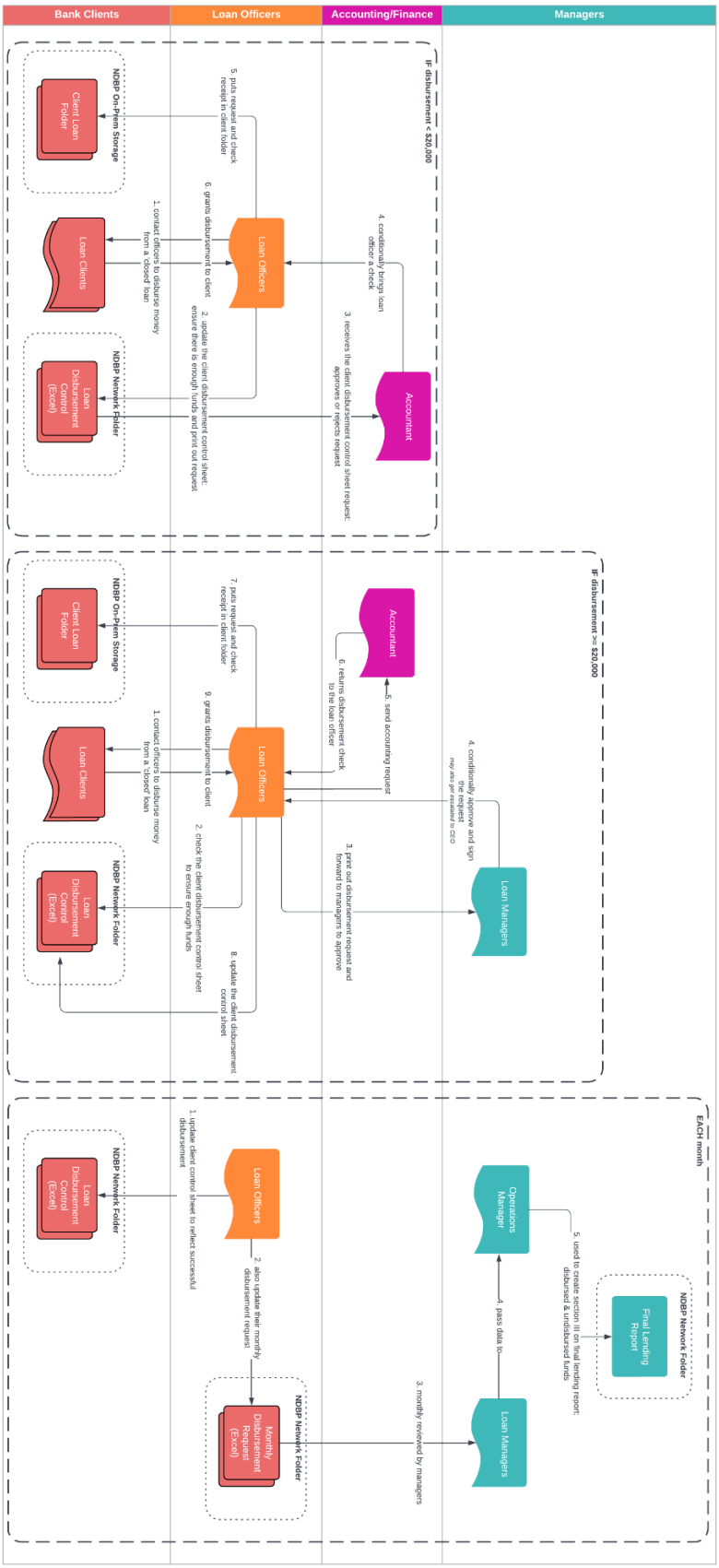
Tyler Lowe is a recent Information Systems graduate from Carnegie Mellon University with minors in Software Engineering and Business Administration. He will be taking part in the Technology Consulting in the Global Community internship over the summer and return in the fall to start a career at Amazon.

Appendix A: Diagram of Current + Ideal Lending Report Process

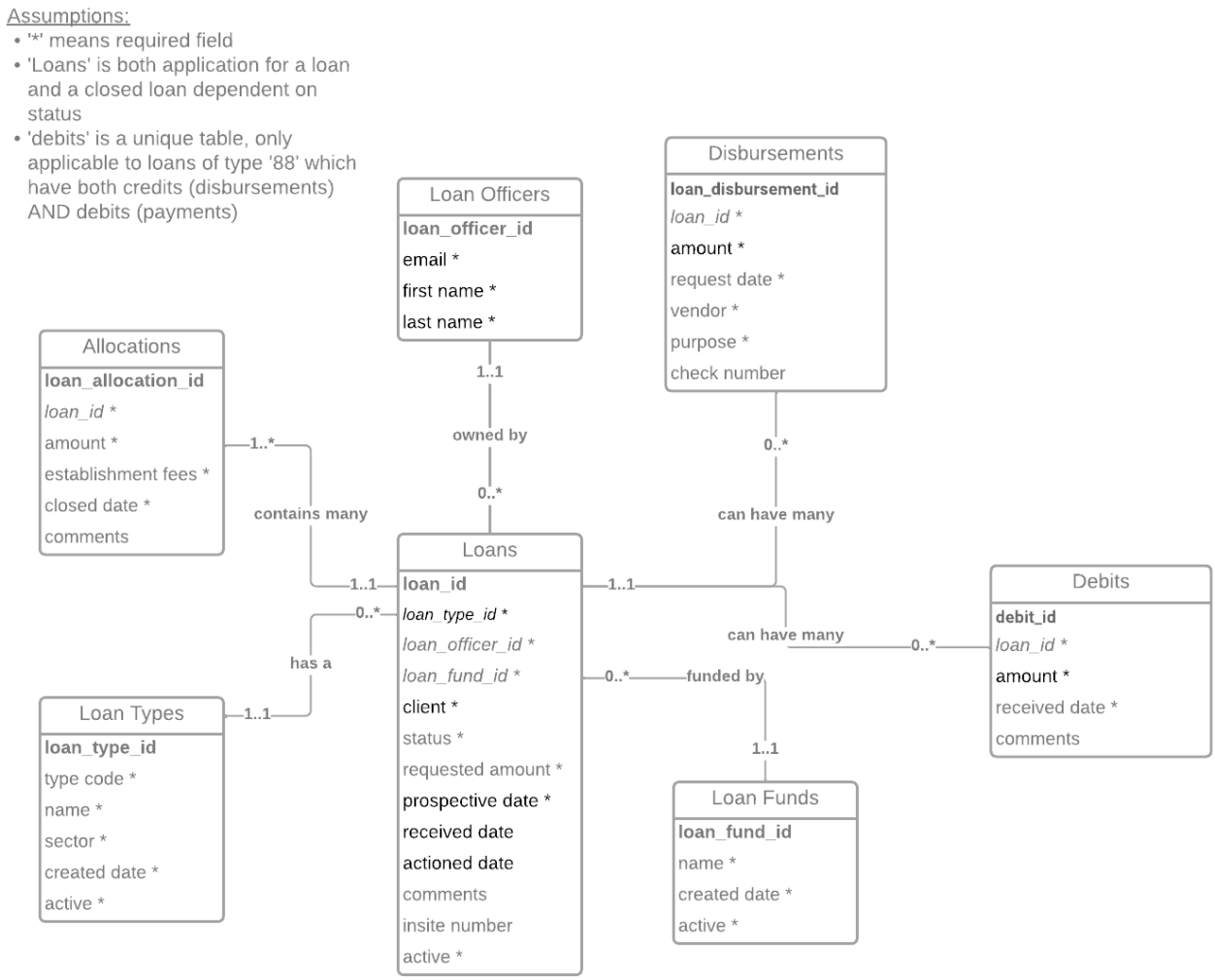



Prescriptive NDBP Lending Report Flow
T Lowe | August 19, 2023
President/Board
President / The Board
uses
Managers
NDBP Network Folder
Final Lending Report
generates
Operations Manager
consumes data from
Insite (NDBP Server)
Extract Insite Report Writer Portfolio
All Loan Managers
fetch loan data from
Loan Officers
to perform administrative actions on Loans interact with
Loan Officers
to maintain monthly loan log and handle disbursements interact with
Loan Manager Loans Application
Loan Officer Loans Application
performs updates to
performs updates to
Bank Clients
NDBP Network Folder
Loans Database

Appendix B: Diagram of Loan Officer Disbursement Workflow



Appendix C: Loans Database Data Domain/ERD

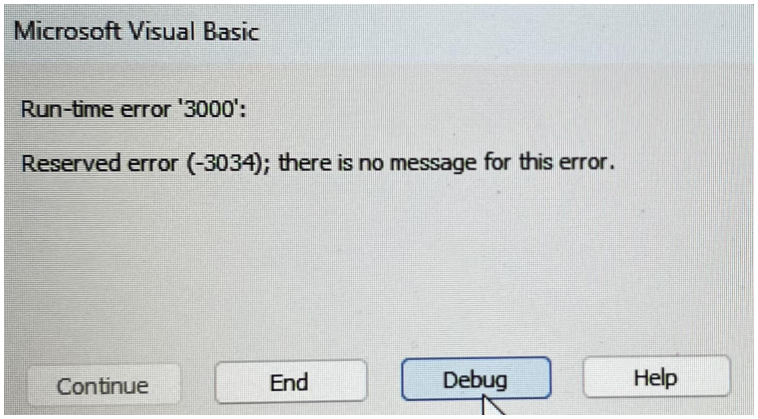


Appendix D: Lending Reports Solutions Matrix Analysis

Alternative	Cost + Compatibility	Automation	Customizability	Sustainability
Excel Sheets	Runnable on current hardware and no updates to team processes	Slow—separate Excel sheets will still exist, the underlying problem is still there	Low—the solution options will be bound by the current processes, just simple automation	Low—potentially a very brittle solution (Excel not a DB) and breaking changes can be introduced easily
MS Access	Runnable on current hardware, but the team might have to learn some new processes	Fast—there will be a unified data set where all reporting datasets are stored	Medium—VBA and Access Forms to create solutions; limited creative ability	Med—potentially a more robust solution; however, the team might not have the capacity to fix problems with Access
No-Code RDBMS	Maybe runnable on current hardware and the team will have to learn new processes	Fast—there will be a unified data set where all reporting datasets are stored	Highest—strong control over how the system will look and feel	High–a well-implemented solution will be robust and require few changes; no-code UI easier to train staff (dependent on ease of UI..)

Appendix E: Loans Database Deployment Issue

Towards the end of the summer a problem occurred when deploying the project. A *non-deterministic/transient* error started occurring as soon as we deployed using a split Access database architecture. Specifically, the issue would occur in the VBA code when a loan officer attempted to generate a disbursement or loan log report. This is the unhelpful error that appears:



This error only occurs sometimes. A report generation that fails 1 minute ago may succeed only 2 minutes later and vice-versa. Additionally, when the report generation eventually succeeds the results are accurate (even if it had been failing 1 minute earlier). The exact culprit is unclear but there is a pattern for most computers. If the error shows once, then it is very likely that it will error again if tried; however, if no errors show then it is likely in a period of stability (the error seems to come in waves of stability-instability). It also seems to be on a per-computer basis because while some computers fail, there are others that succeed on the same operation in parallel. All computers seem to reach this error at some point, but there are differences in the probability of failure. For example, Polly's computer at the bottom of the bank has the highest likelihood of failure that I have observed. I can not confirm this, but there also seems to be an increased chance of failure after a computer boot.

At the time of my leave, I was unable to pinpoint the exact culprit of the error but have narrowed down the potential causes. While debugging, to generalize the cause of the error I tried copying the database to the loan officer's local computer and running the project. The moment the database was copied to the local drive instead of going across the network, the program did not fail. In fact, running the same task in parallel on the same computer, the Access forms using the local database succeeded while the Access forms using the network database failed. Furthermore, the Access forms that use the local database have not failed once on a Loan Officer's computer (Polly) which would fail often when using the network instead. I have repeated this over several days to validate the results. I was able to conclude with a very high degree of certainty that the issue seems to be caused by a network misconfiguration at NDBP. This is a tricky problem because student consultants do not have access to the NDBP Server and the technician (MJ) is new to NDBP and has a clear lack of experience. This diagnosis was supported by the visits from the Ministry of Finance and Tim. They also concluded that structurally the Access project was OK, and although a lot of queries are called to create a report, Access should be able to handle it (and does in their systems). Additionally, they concluded that there is likely a network issue at play as well. Advisors Joe and Julia helped me walk through debugging steps and finally, they too concluded that it is likely due to a network problem. Consult the README file in the NDBP network folder for more information.

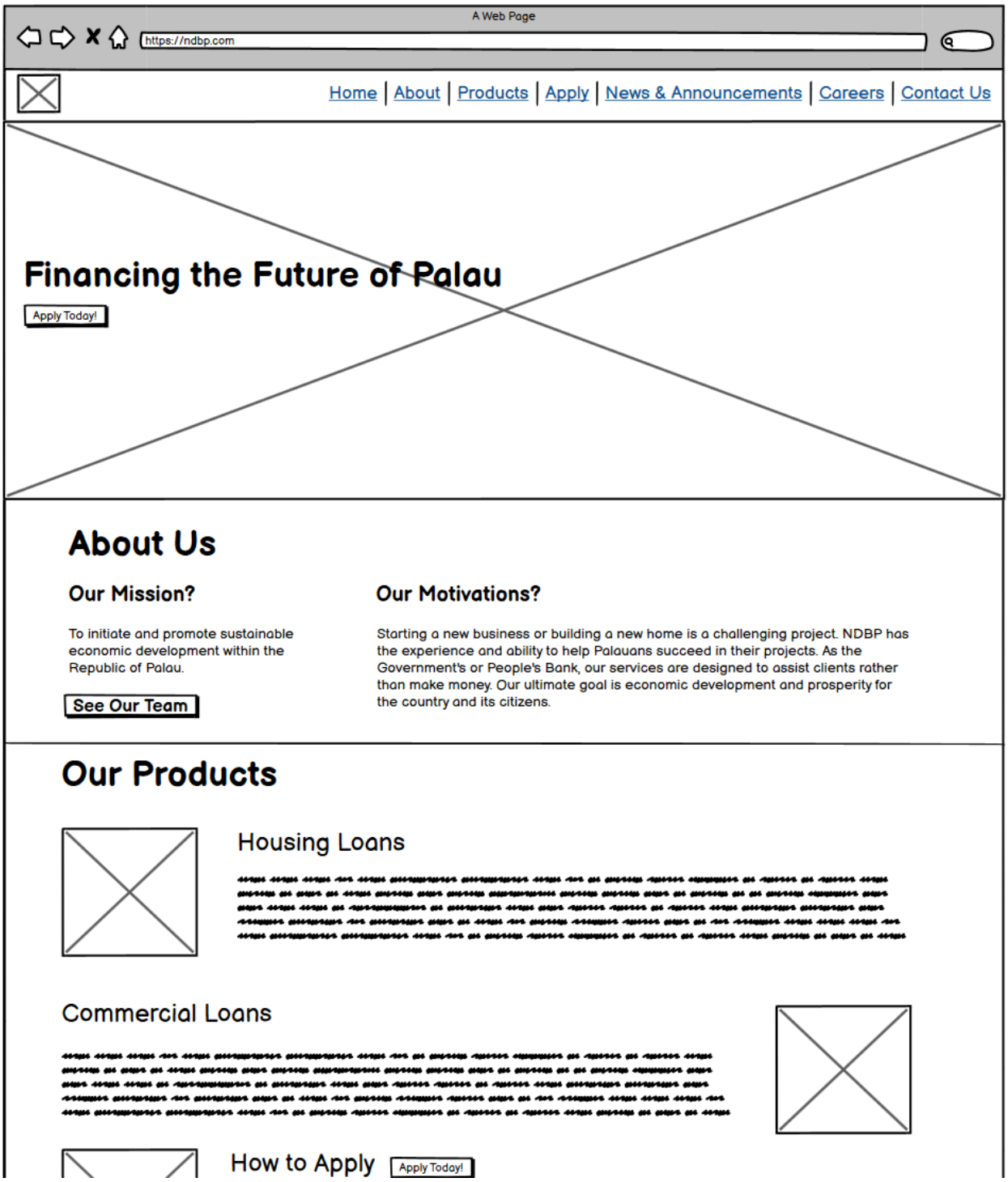
Appendix F: High-Level Alternatives + Website Builders Matrix Analysis

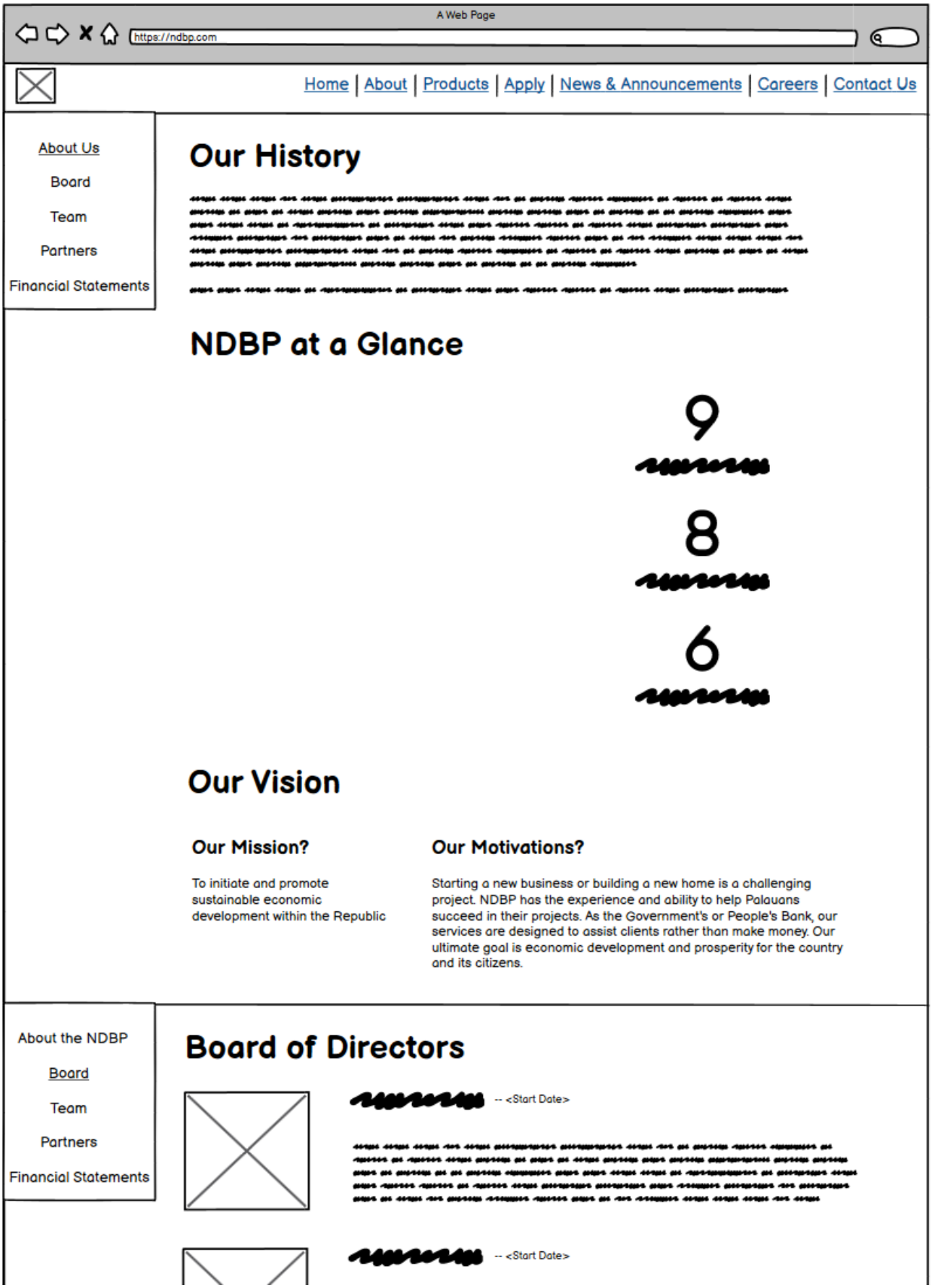
Alternative	Cost	Speed	Customizability	Sustainability
External Dev	Highest—large sums of money will be required to build the site + monthly hosting/support	Fastest—a dedicated website developer to build the site to our designs	High—a dedicated dev should be able to build the site exactly as we want it	Low—any changes would require either editing code or contacting the dev, leads to a similar situation as now
Custom Website	Lowest—only monthly costs associated with hosting the website	Slowest—I know web dev, but it will take me time to learn/build the site	Highest—custom site means unlimited control over the look and feel of the website	Low—any changes would require editing the code, the NDBP does not have the capacity for this
Website Builder	Low—monthly costs for the platform and hosting	Fast—website builders allow quick prototyping and iteration	Medium—depends on the builder used, they offer varying controls over the look/feel of the site	High—any changes can be done via builder + CMS can be used for main content changes

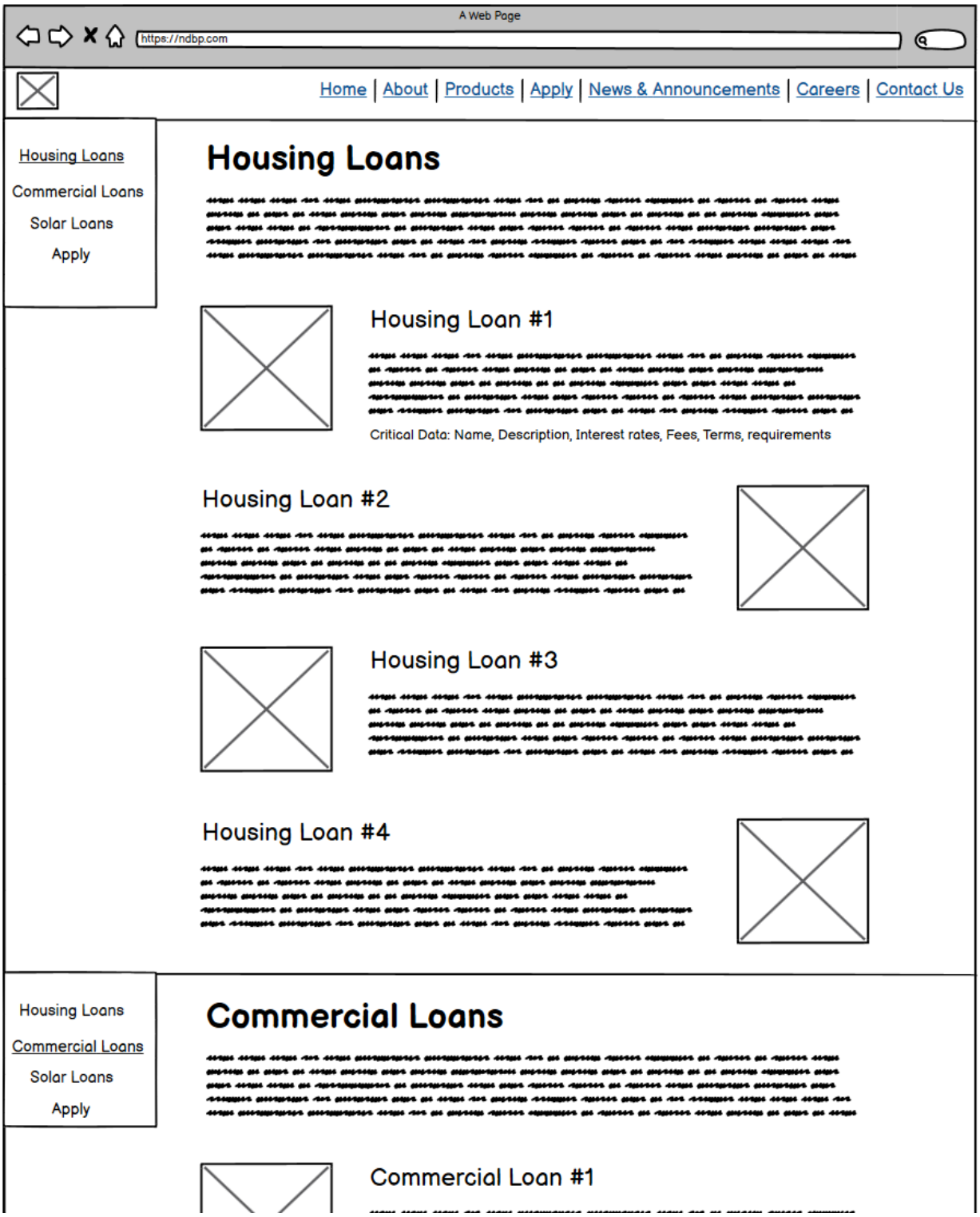
Alternative	Cost	Speed	Customizability	Sustainability	CMS
Wix	Med—$22/mo for an adequate plan	Fast—Wix provides templates and easy editing of components to create website view	Low—Wix provides templates with the ability to add components and customize	Highest—Wix allows website edits through UI; also has CMS to handle content changes easily	Yes—Wix has a 'Content Manager' to store and manage site content
Webflow	Med—$23/mo for an adequate plan	Med—Webflow has templates with fine-grain editing of website view	High—Webflow allows you to edit the website as if you were coding	High—Webflow has no-code UI; also has CMS to handle content changes easily	Yes—Webflow has a 'CMS' to control content for the website
WordPress	Low—$0/mo for the platform + ~$5-10/mo for hosting	Med—WordPress has auto-generated features and plugins/themes; however, some changes require coding	High—WordPress allows developers to code to make the website look exactly as desired	Lowest—Hosting issues and small changes will involve staff needing to edit code	Yes—WordPress is a CMS framework
GoDaddy	Med—$16/mo for an adequate plan	Fast—GoDaddy provides templates and easy editing of components to create website view	Low—GoDaddy provides templates with the ability to add components and customize	High—GoDaddy allows website edits through UI; however, their CMS is unclear which could make changes tedious	Unsure—GoDaddy has a blogging feature but unsure about full CMS

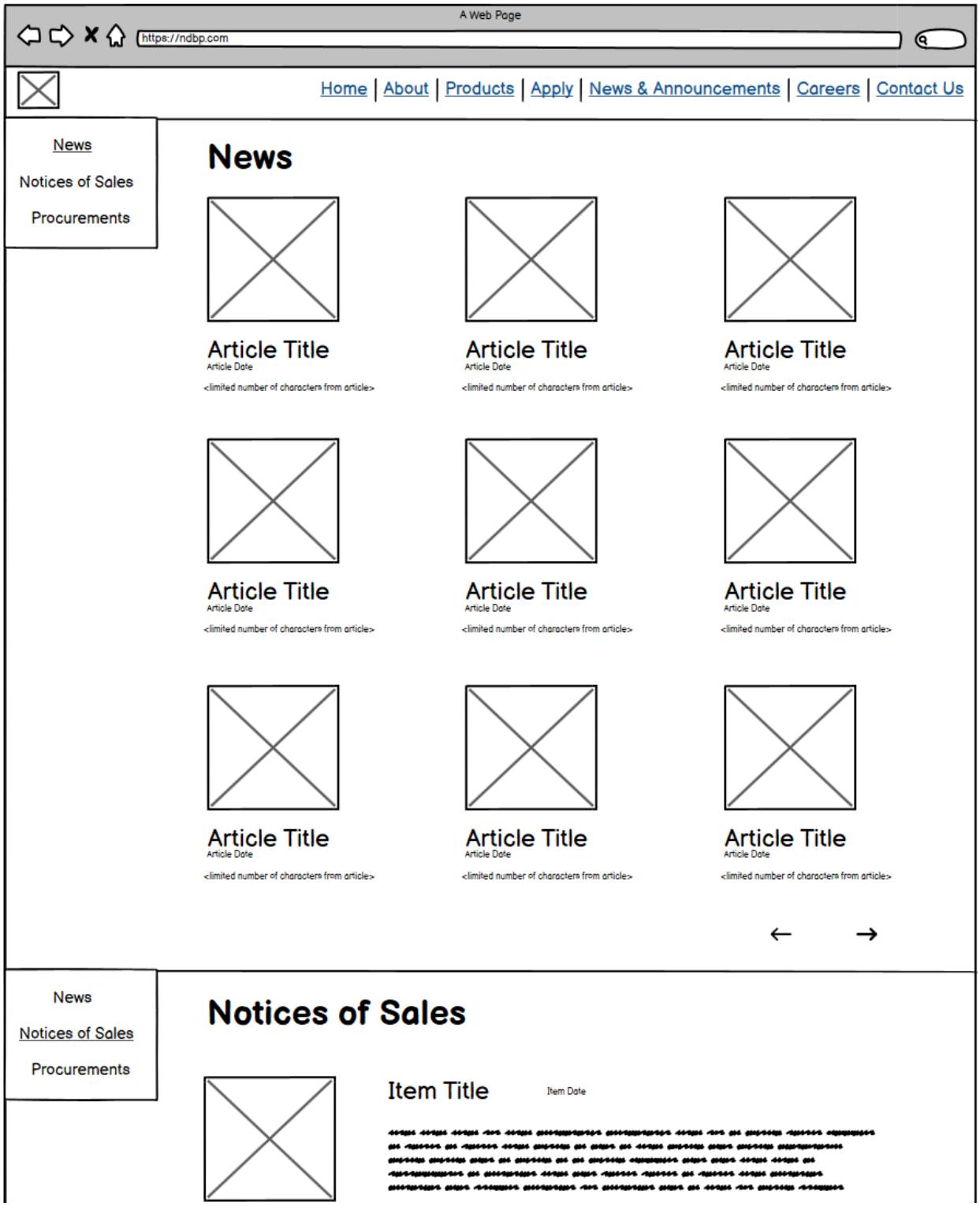
Appendix G: Low-Fidelity Wireframes/Information Hierarchy

The following are some incomplete screenshots of the Lo-Fi wireframes developed. To actually view/interact with the wireframes appropriately, download the file “lofi-ndbp.bmpr” from my drive and open it using the Balsamiq tool (used to create the wireframes). These wireframes show the approved structure for the website and the information hierarchy.




A Web Page
https://ndbp.com
Home | About | Products | Apply | News & Announcements | Careers | Contact Us
About Us
Board
Team
Partners
Financial Statements
Our History
NDBP at a Glance
9
8
6
Our Vision
Our Mission?
To initiate and promote sustainable economic development within the Republic
Our Motivations?
Starting a new business or building a new home is a challenging project. NDBP has the experience and ability to help Palauans succeed in their projects. As the Government's or People's Bank, our services are designed to assist clients rather than make money. Our ultimate goal is economic development and prosperity for the country and its citizens.
About the NDBP
Board
Team
Partners
Financial Statements
Board of Directors
-- <Start Date>
-- <Start Date>


A Web Page
https://ndbp.com
Home | About | Products | Apply | News & Announcements | Careers | Contact Us
Housing Loans
Commercial Loans
Solar Loans
Apply
Housing Loans
Housing Loan #1
Critical Data: Name, Description, Interest rates, Fees, Terms, requirements
Housing Loan #2
Housing Loan #3
Housing Loan #4
Housing Loans
Commercial Loans
Solar Loans
Apply
Commercial Loans
Commercial Loan #1


A Web Page
https://ndbp.com
Home | About | Products | Apply | News & Announcements | Careers | Contact Us
News
Notices of Sales
Procurements
News
Article Title
Article Date
<limited number of characters from article>
Notices of Sales
Item Title
Item Date

Appendix H: Website Dynamic Data Domains

These are the domains that the NDBP staff will be updating regularly. Therefore, these domains need to be encapsulated into data objects in the CMS which can be updated by the staff via website forms. Each of these data domains needs to map to a website page that will render the associated data objects inserted by staff.

Board of Directors:
- Name (string)
- Title (string)
- Start Date (date)
- Description (string)
- Image (media)

Staff:
- Name (string)
- Title (string)
- Type (Manager, Finances, Housing, Commercial)
- Description (string)
- Start Date (date)
- Image (media)

Financial Statements:
- Year (number)
- Financial Statement (media)

Housing Loans:
- Name (string)
- Description (string)
- Interest Rates (string)
- Fees (String)

Commercial Loans:
- Name (string)
- Description (string)
- Interest Rates (string)
- Fees (String)

Solar Loans:
- Name (string)
- Description (string)
- Interest Rates (string)
- Fees (String)

News:
- Title (string)
- Publish Date (date)
- Cover Photo (media)
- Body (markdown string)
- Images (list media, optional)

Notices of Sales:
- Title (string)
- Publish Date (date)
- Cover Photo (media)
- Body (markdown string)

- Images (list media, optional)

Procurements:

- Title (string)
- Publish Date (date)
- Description (string)
- RFP File (media)

Careers:

- Title (string)
- Publish Date (date)
- Body (markdown string)
- Active (boolean)