

ABSTRACT

This capstone project encompasses the development of a budget management web application for Walla Walla University's finance department. The application replaces an Excel-based budgeting system with a web based application. The Accounting department can now upload CSV files, which are displayed in an organized, widget-based interface.

Key features include role-based permissions and Microsoft Single Sign-On for authentication, ensuring that department heads can view their budgets and finance administrators oversee all departments.

The backend is built on a RESTful API model for scalable, efficient data handling. The frontend uses a mobile-first approach to ensure accessibility across devices. Development followed an agile process, with regular mentor meetings helping prioritize tasks. Continuous iteration and user feedback were key to refining and expanding features.

INTRODUCTION

Walla Walla University's current method for department heads to view their budgets is a monthly Excel spreadsheet being sent out via email. This Excel spreadsheet relies on Excel Macros with no in-house active development, leading to compatibility issues on some major operating systems.

To address these limitations, the team developed a secure, web-based budgeting application in collaboration with WWU's accounting department. Hosted by the Computer Science department and protected by Microsoft Single Sign-On, the system is a streamlined interface that handles real budget data while safeguarding user privacy.

More than just a technical upgrade, this project responds to a real administrative need—transforming change resistant macro-based system into a accessible tool for financial decision-making.

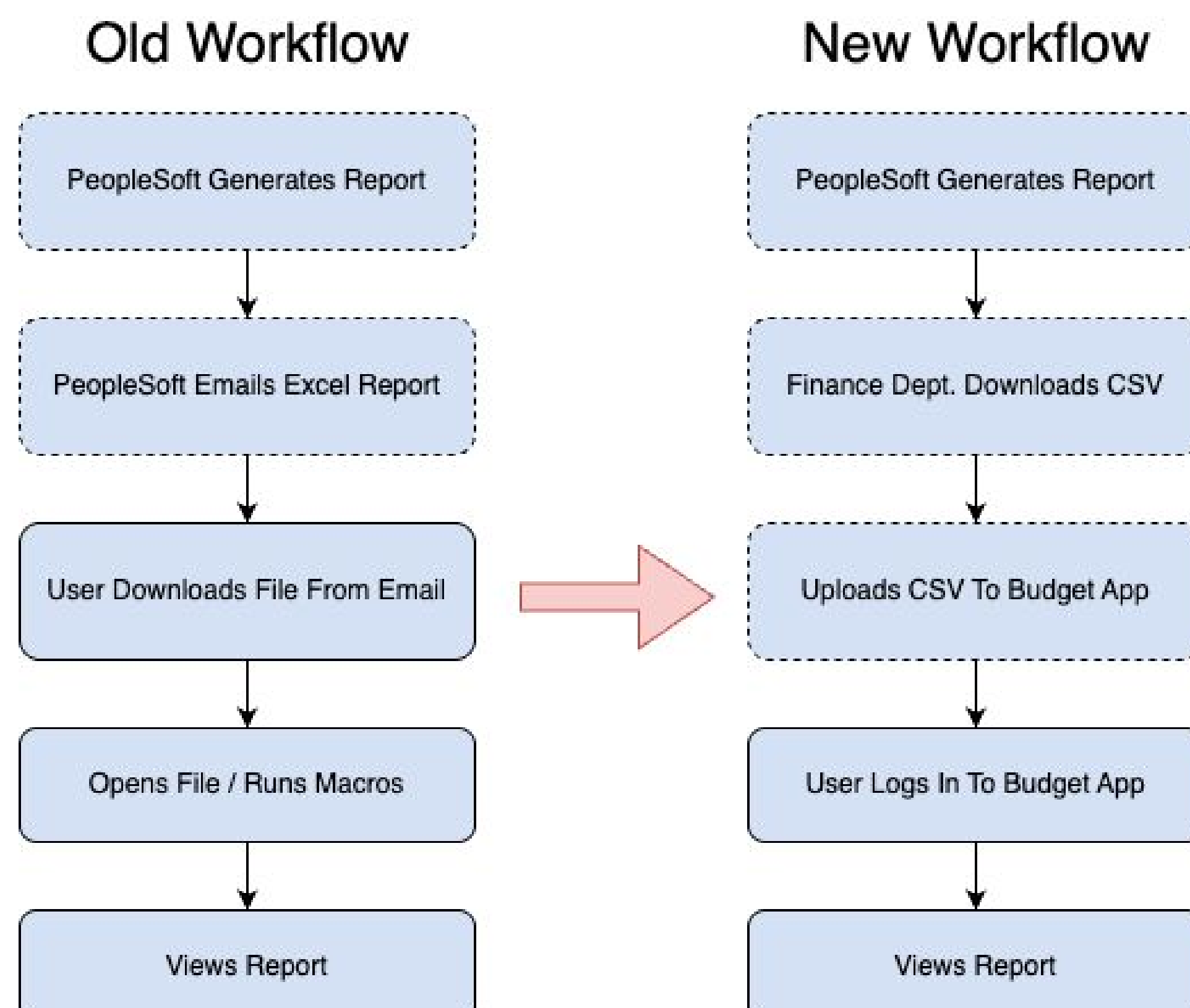


Fig. 1 Diagram of old and new workflow: Dashed cell borders represent administrative actions and solid cell borders represent user actions

EXECUTION

Upon signing in with Microsoft Single Sign-On, users are directed to the Budget List landing page. This page in figure 2 is populated by a mobile-responsive grid of budget summary card widgets—each representing a department the user has access to. Cards display key financial data for each department, with a color-coded pie chart allowing for efficient analysis.



Fig. 2 Image of Department List

Figure 3 displays all department accounts within a selected budget, including key information about the account. Users can view amount spent versus budgeted, with a progress bar for visual tracking.

Account	Account Description	Budget	Spent	Remaining	Percent Used	Progress
711000	Salaries Regular - Non Faculty	\$325,743	\$345,810.17	\$-20,067.17	106%	<div style="width: 106%;"></div>
711098	HR Payroll Journals	\$0	\$7,455.38	\$-7,455.38	745538%	<div style="width: 745538%;"></div>
716000	FT Wages Hourly	\$62,978	\$57,842.6	\$5,135.4	92%	<div style="width: 92%;"></div>
716098	Wages Hourly Overtime	\$348	\$6.69	\$341.31	2%	<div style="width: 2%;"></div>
716100	PT Wages Hourly	\$32,521	\$27,096.45	\$5,424.55	83%	<div style="width: 83%;"></div>
716101	HR Payroll Journals	\$0	\$1,257.96	\$-1,257.96	125796%	<div style="width: 125796%;"></div>

Fig. 3 Image of Department Accounts

Figure 4 illustrates an itemized breakdown for a selected account, including important information to keep track of your purchases. A scrollable data table organizes this information clearly for review. Transaction data is retrieved from the RESTful API then displayed on the page. Users can navigate using breadcrumb in the title bar.

Journal ID	Date	Year	Account Description	Account ID	Department ID	Fund	Class Code	Amount
93461	2023-07-01 00:00:00.000	2024	Payroll Accrual June/July	716000	133700	11	99	\$-1,168.7
PY00093460	2023-07-08 00:00:00.000	2024	HR Payroll Journals	716000	133700	11	11	\$490.2
PY00093460	2023-07-08 00:00:00.000	2024	HR Payroll Journals	716000	133700	11	08	\$1,454.6
PY00093460	2023-07-08 00:00:00.000	2024	HR Payroll Journals	716000	133700	11	08	\$184.7
PY00093460	2023-07-08 00:00:00.000	2024	HR Payroll Journals	716000	133700	11	08	\$207.6
PY00093744	2023-07-22 00:00:00.000	2024	HR Payroll Journals	716000	133700	11	08	\$1,656.7

Fig. 4 Image of Department Account Transactions

One key feature presents is a breadcrumb trail displayed at the top of the page with clickable titles. This enables the user to know what budget they are in and the account they are looking at. Another feature is a side menu, this will allow the user to sign out of the application and has tools for administrator users.

ADMIN

Following the budget oversight view, the administrative interface used by the University accounting department is shown. In Figure 5, administrators have the ability to download current data, make changes, and upload updates or entirely new files. This interface is designed to manage and update accounts, budgets, departments, transactions, and user data.

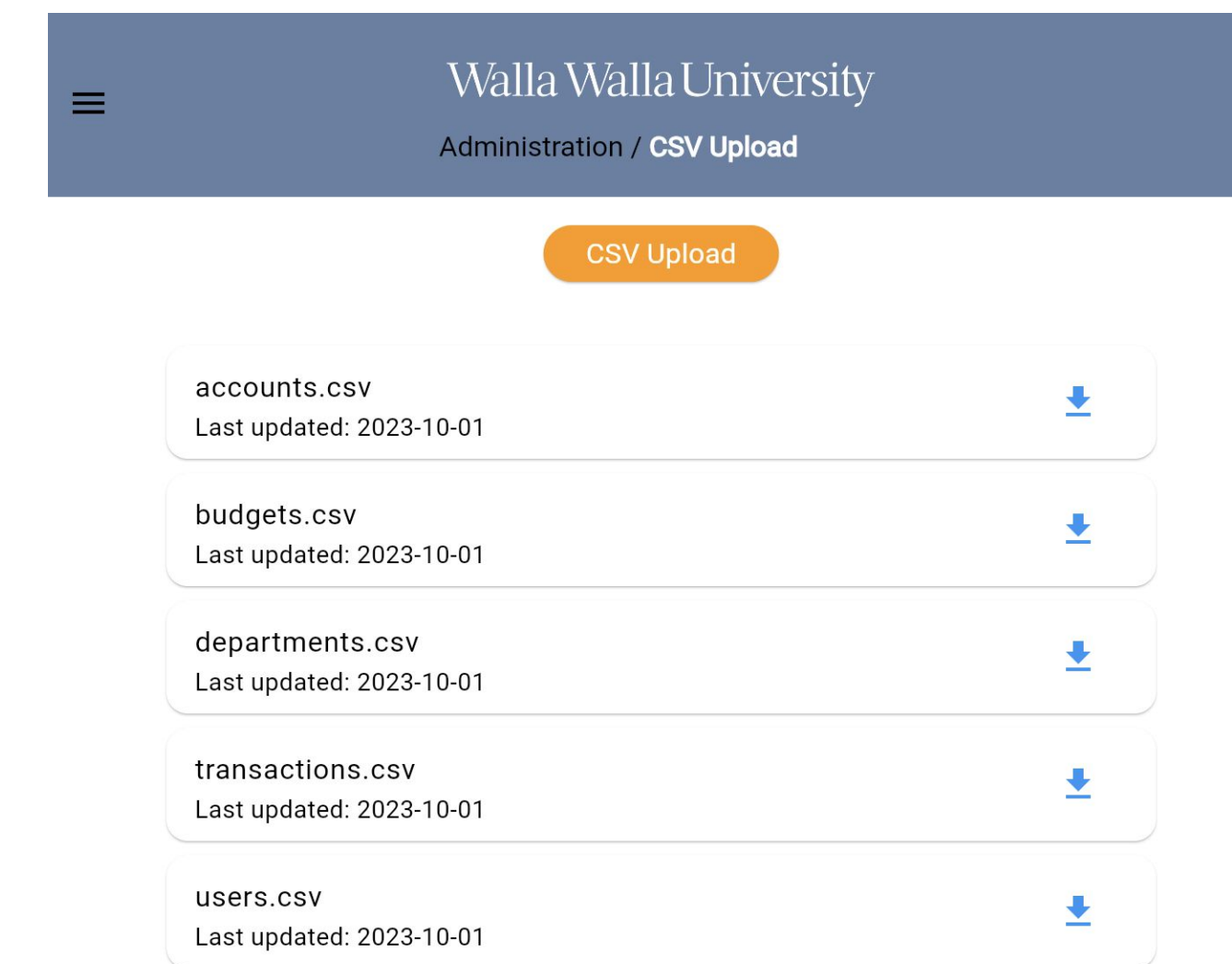


Fig. 5 Image of CSV Upload

Each user account is tied to specific information, such as their employee ID and budgets they have access to. Once the users.csv file is updated and uploaded the page shown in figure 6 will display all current users along with their access permissions.

Employee ID	Name	Department Budgets
dev-user	Dev User	133700, 133701, 133702, 133703
dev-admin	Dev Admin	133700
1421543	Preston Carman	133700, 133701, 133702, 133703
2030450	Hunter Kimes	133700, 133701, 133702, 133703
2075235	Benjamin Wachter	133700, 133701, 133702, 133703
2115487	Aaron Martinez	133700, 133701, 133702, 133703
2111772	Michael Austin	133700, 133701, 133702, 133703
2070625	Raven Chester	133700, 133701, 133702, 133703

Fig. 6 Image of User Management

SUMMARY

This project replaced a macro-dependent Excel system with a secure, and user-friendly web application. Designed for cross-platform compatibility and real-time access, this tool empowers department heads to review and track budget activity with greater ease and reliability. By removing the need for Excel spreadsheets and enabling Single Sign-On through Microsoft, the application delivered a solution that is both accessible and secure.

This web application also provides a solid foundation for a long-term financial management tool that supports better budget transparency across the university. While fully functional, there's room for future teams to enhance user roles, implement data hierarchies, and expand overall features and functionality.

REFERENCES

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