Software Requirements Specification for McMaster Engineering Society Custom Financial Expense Reporting Platform: subtitle describing software

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18 Open Issues

The key open issues currently revolve around undecided functionality, particularly regarding the integration of automated reporting features and the appropriate level of customization for the needs of various student groups. Other considerations include:

- How granular the platform should be in tracking compliance for audit purposes.

- Whether the system will support all financial workflows such as reimbursement requests, intramural funding, and payment tracking.

- Ensuring that the user experience is intuitive for both administrators and students.

These decisions will significantly influence the overall architecture of the solution and the development timeline.

19 Off-the-Shelf Solutions

Accounting and invoicing software is readily available, however MES refrains from implementing these existing solutions due to a variety of factors. Commonly cited concerns include:

- Lack of control over platform customization to meet the specific needs of MES.

- High subscription fees that are unsustainable for a non-profit organization.

- Data privacy concerns, especially in handling sensitive financial information.

- Limited support for integration with existing MES infrastructure.

19.1 Ready-Made Products

Examples of existing financial management tools that were considered but not implemented include:

- **Wave Accounting** (https://www.waveapps.com/) - A free accounting platform suited for small businesses but lacks customization for non-profit needs.

- **FreshBooks** (https://www.freshbooks.com/) - A paid tool offering invoicing and expense tracking, but deemed too expensive and restrictive for MES.

- **Xero** (https://www.xero.com) - Cloud based accounting platform, for invoicing, inventory and bank reconcillation

- **QuickBooks Online** (https://quickbooks.intuit.com/) - Widely-used platform for small to mid sized businesses

19.2   Reusable Components

There are numerous reusable components that could be adapted to suit the needs of the MES. These include:

- **LedgerSMB** (https://ledgersmb.org/) - An open-source accounting tool that could be modified for more specific MES needs.

- **Plaid API** (https://plaid.com/docs/api/) - For integrating bank data and managing student group transactions.

- **Stripe API** (https://docs.stripe.com/api) - For handling payments and reimbursements.

19.3   Products That Can Be Copied

While no single product fully meets MES requirements, certain features from established platforms could inspire the design of the financial management system:

- **QuickBooks** - Budgeting tools and expense tracking can provide a model for managing student group funds.

- **Expensify** - Reimbursement workflows and receipt tracking features.

20   New Problems

20.1   Effects on the Current Environment

The implementation of a new centralized platform for financial management may affect MES's current environment in the following ways:

- Increased demand on server resources, especially as more financial processes move from local and manual to online and automated.

- Potential need for server upgrades if the platform requires more CPU, RAM, or storage than the existing DigitalOcean infrastructure provides.

20.2   Effects on the Installed Systems

MES currently uses DigitalOcean for its infrastructure. Introducing a financial management platform could result in:

- Increased usage limits, potentially necessitating the purchase of higher-tier virtual machines.

- A larger database capacity for tracking all transactions and handling potentially higher loads during peak reporting periods.

20.3   Potential User Problems

User challenges may arise from:

- The steep learning curve for administrators and student groups transitioning from the current system of Google Forms, PDFs, and spreadsheets to a new, fully automated platform.

- Potential resistance from users who are accustomed to the manual processes and may find it difficult to adapt to a new system.

20.4   Limitations in the Anticipated Implementation Environment That May Inhibit the New Product

Potential limitations include:

- Resource constraints on the DigitalOcean infrastructure, which could limit the performance and scalability of the platform.

- Increased operating costs due to the need for more powerful virtual machines or cloud services.

20.5   Follow-Up Problems

After implementation, follow-up issues could arise, such as:

- Reconciling the codebase of the new platform with existing MES systems and ensuring seamless integration.

- Ensuring that the new platform adheres to financial compliance and audit standards, particularly in the first few months of operation.

21 Tasks

21.1 Project Planning

Key tasks in project planning include:

- Defining the scope of the system and establishing clear, achievable goals for each phase of development.

- Setting a timeline for system rollout, including key milestones like system design, development, testing, and deployment.

21.2 Planning of the Development Phases

Development should proceed in phases:

- **Phase 1:** Initial research and requirements gathering from MES staff and student groups.

- **Phase 2:** Core system design, focusing on the backend ledger management and reimbursement workflows. This phase would be the most intensive.

- **Phase 3:** UI/UX design to ensure the platform is user-friendly and accessible to all MES members.

- **Phase 4:** System testing and debugging, including user feedback to refine functionality.

- **Phase 5:** Final deployment and training for users.

22 Migration to the New Product

22.1 Requirements for Migration to the New Product

To successfully migrate to the new financial platform, MES will need to:

- Train existing staff and student group representatives on how to use the new system.

- Ensure all historical financial data is correctly transferred to the new system and remains accessible for auditing purposes.

22.2 Data That Has to be Modified or Translated for the New System

The data to be migrated includes:

- Historical financial data such as past reimbursements, transactions, and budget allocations.

- Any audit-related data to ensure compliance with financial reporting requirements.

23 Costs

While MES already has existing infrastructure on DigitalOcean, additional costs may arise from:

- Server upgrades to accommodate increased resource demands from the new platform.

- Potential third-party services for payment processing or APIs (e.g., Plaid, Stripe).

24 User Documentation and Training

24.1 User Documentation Requirements

User documentation must:

- Be clear, concise, and accessible to both administrators and student group representatives.

- Include examples for common tasks, such as submitting reimbursements and tracking group budgets.

- Be easy to navigate, with a search feature and organized sections for quick reference.

24.2 Training Requirements

Training will involve:

- "Getting Started" guides for both administrators and general users.

- Video tutorials or live training sessions to walk users through the system's core functions.

- Ongoing support through help desks, FAQs, and troubleshooting documentation.

25 Waiting Room

The following features are under consideration for future development but are not part of the immediate project scope:

- SMS notifications to update users on the status of reimbursement requests.

- Authentication via McMaster CAS 2FA (Central Authentication Service) for enhanced security.

- Integrated Phone Application

26 Ideas for Solution

The proposed solution involves leveraging a form of the traditional web full stack, potentially (MongoDB, Express, NextJs, React) to handle both frontend and backend requirements. This stack allows for:

- Efficient data integration with existing MES systems.

- A scalable, modular design that can be extended with additional features like payment APIs or compliance tools.

- Maintainability after the capstone is complete

Appendix — Reflection

The information in this section will be used to evaluate the team members on the graduate attribute of Lifelong Learning. Please answer the following questions:

1. What knowledge and skills will the team collectively need to acquire to successfully complete this capstone project? Examples of possible knowledge to acquire include domain specific knowledge from the domain of your application, or software engineering knowledge, mechatronics knowledge or computer science knowledge. Skills may be related to technology, or writing, or presentation, or team management, etc. You should look to identify at least one item for each team member.

   Austin: A mindset: being able to overcome the anxiety that can arise from approaching a problem that you have never seen before especially at this scale. For most team members this is the largest scale project to have be worked on. This can obvioiusly be daunting. A message to those that feel this way, just dive head first, learn and fail. Each failure is a stepping stone to success, do not be afraid to fail.

2. For each of the knowledge areas and skills identified in the previous question, what are at least two approaches to acquiring the knowledge or mastering the skill? Of the identified approaches, which will each team member pursue, and why did they make this choice?

   Austin: Well to reiterate again, I think this choice of "skill" is widely applicable to many areas of life, the capstone provides a safe mechanism for learning this. An approach to aquiring the skill of facing a challenge is to embrace the mindset of continuous failure towards eventual success. (*A bit unorthodox of a response, but I still think is equally valuable*)