SOEN 6841 SOFTWARE PROJECT MANAGEMENT

Feasibility Study Report

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Group No: 26

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Project GitHub Repository:

https://github.com/mahimrahman/SOEN-6841-Software-Project-Management

THE PROJECT REPORT IS PREPARED FOR

SOEN 6841 SOFTWARE PROJECT MANAGEMENT GROUP PROJECT

WINTER 2024

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Purpose:

The main purpose of this document is to provide a comprehensive feasibility study for “ColabFlow” including the assessment of its objectives, requirements, and technical, economic, and operational feasibility to determine if it’s worth to pursue this project.

System Overview:

The following is a general overview of the project’s main functionalities and requirements. This section will act as a reference for the remainder of this document.

- **Project Name:** ColabFlow
- **Responsible Organization:** COMP 6841, Concordia University
- **Project Status:** Undergoing project planning.
- **Current Version:** 1.0

ColabFlow consists of two systems: A main web application that contains the main functionalities of the system, and a mobile application used mainly for communication, notifications, and updates.

Main Application Functionalities:

- **Multiple System Views:** Provides different system dashboards and views corresponding to the type of project that was created by the user.
- **Task Management:** Provides a portal in which users can create and organize their plans, along with their specific tasks.
- **Version Control:** Acts as the sub-system that handles the traceability of created projects through continuous integration and creating different versions.
- **Document & Diagram Sharing:** Allows the users to create & share different diagrams & documents for ease of view.
- **Team Communication & Collaboration:** Provides a medium for team communications for meetings, as well as the ability to collaborate with other teams and work together.

- **Progress Tracking:** The ability to assign milestones and goals for a specific project and track the progress of it continuously based on completed tasks.
- **Integration with Other Tools:** Provides the ability to integrate and function properly with other tools such as project templates, collaboration, and communication tools.
- **Authentication:** Allows users to create accounts & log in to the system with user-defined credentials.

Mobile Application Functionalities:

- **Project View & Tracking:** Allows users to view the projects they're currently working on and track their progress, pending & completed tasks, and newly added tasks.
- **Authentication:** Allows users to log in to the system with user-defined credentials.
- **Communication:** Provides both text & voice means of communication dedicated to each project to the users to be able to share information about the projects.
- **Conference System:** Allows users to conduct online meetings within the application.
- **Notification System:** Notifies the users of any new changes that happened to the project, or any new messages sent by the project team.

Development Phases:

Incremental software methodology will be followed to develop this project. Each increment will include the following phases:

- Requirements Elicitation
- Design & Architecture
- Front-end Implementation
- Back-end Implementation
- Deployment Using Web Hosting
- Software Testing
- Deployment
- Maintenance & Monitoring

System Requirements:

Main Application Requirements:

- The user shall be able to register & log into the system using user-defined credentials.
- The user shall be able to log out of the system.
- The user shall be able to create projects, which contain both business and technical aspects.
- The user shall be able to fully perform CRUD (Create, Read, Update, Delete) for project tasks, including name, start and end dates, duration, required resources, status, and task dependencies.
- The user shall be able to change the project's version and assign it new content that separates it from previous versions.
- The system shall be able to assign access rights to each user on specific parts of the project.
- The user shall be able to view all versions of projects, including the change log for each version separately.
- The user shall be able to merge content to a current version of a project.
- The user shall be able to import and export documents, files, and diagrams in various formats.
- The user shall be able to conduct brainstorming, stand-up, emergency, general, and private meetings.
- The user shall be able to collaborate with other team members inside and outside the project and help in their projects.
- The user shall be able to create project milestones and deliverables that determine the project's progress and success.
- The user shall be able to perform auditing by tracking the current progress of the project and comparing it with the provided tasks and requirements.
- The user shall be able to add external tools, templates, frameworks, technical diagrams, and languages and integrate them into a project.
- The user shall be able to communicate with other project members using text messages through a chatting platform provided by the system.
- The user should be able to receive notifications about changes made in any projects they're involved in.

Mobile Application Requirements:

- The user shall be able to log into the system using user-defined credentials.
- The user shall be able to view the projects they're involved in and see their progress and tasks.
- The user shall be able to view the system's calendar to see upcoming milestones, deadlines, and deliverables.
- The user shall be able to communicate with other project members by either text or voice messages through a chatting platform provided by the system.
- The user shall be able to conduct online meetings with project members.
- The user should be able to receive notifications about changes made in any projects they're involved in.

Project References:

This section provides references of previously made deliverables that may be mentioned throughout this project. You can access them here:

https://github.com/mahimrahman/SOEN-6841-Software-Project-Management

Technical Feasibility:

We are expecting to have a total of 53 use cases that fully cover the functionalities of the project. Each use case will require the following artifacts:

- Use Case Description
- Activity Diagram
- Sequence Diagram
- Use Test Case

The estimated number of classes required to fully capture the project's design and architecture is 30 classes. The estimated database tables will be 11. Only one relational database diagram is sufficient to capture the entire project's back-end architecture.

The total number of test cases cannot be one-to-one with the number of use cases, as many of them are complex and include many scenarios. The most notable one is the different types of

projects that can be created (graphical collaboration, technical collaboration, or text-based collaboration). Each main and alternative flow of the use cases need to be covered within a test case. The estimated number of test cases are 84.

For the required languages, licenses, subscriptions, and frameworks that are will be used to implement the project, thorough research was done for the best tools used to develop both the web and mobile applications. It was decided that the required technologies and programming languages will be used to implement the project are:

- Enterprise Architect: For all UML diagrams.
- Django Framework (Python for back-end, HTML, CSS, and Javascript for front-end)
- Java (For the mobile application)
- MongoDB for as a database management system.
- Overleaf for shared documents.
- Amazon's Web Service for web hosting.
- Github for version control and code collaboration & integration.
- Jira for project management, tracking, test case generation, and diagram drawing.

The development team is confident that they're proficient with all the tools & languages required to fully implement the project without any delays.

No additional manpower will be required to implement any specific part of the project, unless the budget estimation suggests that the outsourcing specific components of the project will be cheaper than developing it in-house.

However, we think that some technological factors that will be essential to this project are not available within the company currently. They will be obtained in the form of outsourcing or recurring subscriptions until the project is fully implemented and closed. These technological factors are:

- Servers for web hosting.
- Database Management System (DBMS) Licenses
- Adobe Licenses
- Secure Shell (SSL) licenses for the web application
- Amazon Web Service (AWS) Subscription

Based on the technical analysis given above, we think that the ColabFlow is technically feasible and there should be no drawbacks from the technical aspect of the project.

Operational Feasibility:

To assess the operational feasibility of the project, we explain the software development methodology that we think will make the project operationally feasible.

The approach taken for this project will be the incremental methodology, where each iteration, except for the very first one will be responsible for fully implementing one of the main functionalities of the system, resulting in a total of 11 iterations. We think that the cohesion of each increment, where only 1 main functionality is implemented will make development easier since the team can give their full attention on one specific functionality of the project.

The functionalities that are present in both the web and mobile application will be implemented within the same increment.

The order of these increments was decided after careful assessment of each functionality, and a priority was given to each one to order them. The increments will implement the most important functionalities and the ones that depend on each other first. The duration required to complete each iteration is not identical, as some of them are more complex than others.

Since each iteration implements a specific functionality, the corresponding requirements, design & architecture, back-end, and front-end development will be implemented within that iteration.

Here is the list of iterations, along with a general idea about what tasks will be included in each one. More details about the content of each iteration will be provided in the project planning document:

- **Iteration 1: Requirements & UI**
  - Detailed SRS document for the entire project.
  - General UI & Dashboard implementation.
- **Iteration 2: Task Management Functionality**
  - CRUD (Create, Read, Update, Delete) Task
  - Organize Task
  - CRUD Project Plan
  - Assign Task to User
  - View Project Calendar
  - View Project Deadlines
- **Iteration 3: Graphic Collaboration System View**

- Create Project
- Assign People to Project
- Edit Project Access Rights
- View Project
- View Project Changelog

❖ **Iteration 4: Tech Collaboration System View**

- Create Project
- Assign People to Project
- Edit Project Access Rights
- View Project
- View Project Changelog

❖ **Iteration 5: Text-based Collaboration System View**

- Create Project
- Assign People to Project
- Edit Project Access Rights
- View Project
- View Project Changelog

❖ **Iteration 6: Program Tracking Functionality**

- CRUD Milestone
- CRUD Deliverable
- View Project Progress
- Audit Project
- Update Project Status

❖ **Iteration 7: Version Control Functionality**

- Request Change to Project
- View Change Request
- Approve/Decline Change Request
- Update Project Version
- Merge Versions
- View Code Changes
- Resolve Merge Conflicts
- CRUD Project Branch

❖ **Iteration 8: Teams Communication & Collaboration**

- Establish Communication API

- Implement Chatting Platform
- Receive Notification

❖ **Iteration 9: Document & Diagram Sharing**

- Import Document
- Export Document
- Create Document
- Create Diagram
- Import Diagram
- Export Diagram

❖ **Iteration 10: Authentication**

- Login
- Registration

❖ **Iteration 11: Integration with Other Tools**

- Create Template
- Import Template
- Create API for Tools

The tasks under each iteration will ensure that all the provided functionalities are fully met and implemented. The outcome of iterations 2-11 is the fully & working functionality integrated with previously implemented functionalities. The following operation plan makes the project operationally feasible, as everything is cohesive and straight forward.

Economic Feasibility:

This section will provide a rough estimate of the expenses of everything that is involved in the project in the form of a budget breakdown table. The table will include human resources, technological, outsourcing, and iteration costs.

The cost breakdown of each category will be shown individually in its own table, then all the costs will be summed up in one table showing the total cost of the estimated budget for this project.

Human Resources Costs:

Role	Manpower Required	Required Hours/day	Hourly Rate	Monthly Salary (USD)	Duration (Day)	Duration (Month)	Total Cost (USD)
Senior Software Engineer	2	8	-	10000		32	640000
Back-end Developer	4	8		7500		32	960000
Front-end Developer	2	8		7000		24	336000
UI/UX Designer	2	8	29		23		10672
Quality Assurance Personnel	1	8		6000		32	192000
Software Tester	1	8		5500		5	27500
Offensive Security Engineer	1	8		5800		3	17400
Defensive Security Engineer	1	8		5800		3	17400
Infrastructure Security Engineer	1	8		5800		32	185600
Marketing Manager	1	8		6400		3	19200
Product Marketing Specialist	1	8		6000		3	18000
Full-Stack Developer	2	8		7500		2	15000
Search Engine Optimization Speciali	1	8		4000		1	4000
Social Media Manager	1	8	18.5		67		9916
Customer Service Representative	2	8	18		67		19296
Customer Tech Support	2	8	19.64		67		21054.08
Tech Writer	1	8	22.85		67		12247.6
Animation & Video Editor	1	8	25.03		67		13416.08
Graphic Designer	1	8	22		67		11792
						TOTAL	**2530493.76**
						** These durations has been calculated with 2 month buffer time	

Technological Cost:

Technological Costs	Quantity	Months	Cost/piece	Total Cost (USD)
Database Cost	1	32	57 /Month	1824
System Server Subscriptions	1	32	66 / Month	2112
Domain Name and Hosting	1	6	5.95 / Month	35.76
Digital Marketing			10000	10000
Emergency Bug Fixes/Updates			5000	5000
Adobe Licenses	1	12	59/Month	708
SSL License	2	12	50/Year	100
Play Store	1	1 Time Payment	25	25
App Store	1	12	99/Year	99
				19903.76

Potential Outsourcing Costs:

Outsourced Product	Cost (USD)
Product Marketing Content	5000 (Outsourcing from South Asia)
Product UI Design	10,000
	15,000

Other Costs:

Other Costs	Cost	Total Cost (USD)
X Verified	32 / Year	32
Meta Verification	27.99 / Month * 3	83.97
		115.97

Miscellaneous Costs:

Miscellaneous Expenses	Cost	Total Cost (USD)
Meetings	1% of total cost	25,537
Communication	100 x 4 / Month * 3	1200
Travel	3% of total cost	76,611
		103,348

Budget Estimation Table (Total Project Estimation Cost):

Activity	Cost
Human Resources Payment	2518701.76
Technological Costs	19903.76
Outsourcing Costs	15,000
Miscellaneous Costs	103348
Other Costs	115.97
Iteration 1	8000
Iteration 2	3000
Iteration 3	3000
Iteration 4	3000
Iteration 5	6000
Iteration 6	2000
Iteration 7	5500
Iteration 8	1000
Iteration 9	2000
Iteration 10	1000
Iteration 11	1000
	2692569.49

Based on the budget estimation table above, the project will approximately cost 2,692569.49 CAD over the project's duration (30 months + 2 buffer). So, for the project to economically feasible, the detailed budget calculation should not exceed the amount mentioned above.

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