Feasibility Report

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1 Executive Summary

The following proposed system is intended for the founder of the Symba intern management platform. The client will be represented by Symba's Chief Technology Officer, Nikita Gupta (primary client). Nikita Gupta is a co-founder of Symba and helped develop the original source code of the project and has a profound understanding of the company's needs. Furthermore, Nikita Gupta will be our primary client and will be the main point of communication throughout the project.

The main goal of the development team will be to implement an informational Dashboard into the existing internship management platform, which will give intern coordinators and company administrators insight into the profile of an onboarded intern class. The new dashboard will be designed to work with the existing platform. It will also give administrators access to information about onboarded interns such as their gender, college/major, project interest as well as information about every intern's overall performance over time as measured by their managers. The primary goal of the Dashboard is to present all of the aggregate information about interns in an easy to use visualizations that will enable a non-technical audience to learn about an intern class. Successful implementation of the Dashboard will allow for fluid data analysis, which will enhance the ability of intern coordinators and company managers to make data driven decisions about interns.

2 Clients and Teams

The client is Symba, a San Francisco start-up "dedicated to removing barriers of entry to the workforce." The company consists of 4 to 6 people, including our contact Nikita Gupta who is a co-founder and the Chief Technology Officer. Symba aims to provide a comprehensive intern management solution, allowing employers to design "best practices around their internship programs" and providing "meaningful experiences" for their interns (Symba Website).

The team currently consists of 7 members:

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3 Preliminary Requirements Analysis

In this document and in most related reports, the project as a whole, including design and code, will be referred to as **the Dashboard**. The Dashboard will be constructed as a page on the existing web system. Its basic requirements include:

- Being viewable by company administrators and HR coordinators but not in-

terns.

- Allowing users to collect information on interns.
- Displaying data visualizations concerning the interns.
- Allowing users to see all interns' basic information.
- Allowing easy navigation to intern profiles.
- Summarizing progress of different interns / intern projects.
- Displaying interns' completion of paperwork and onboarding materials.

In order to assess the feasibility of these requirements, below is a list of potential features that would satisfy these requirements, split into usage of different groups.

Users: The Dashboard will be accessible only to company administrators and HR coordinators

Company administrators are able to:

- Assign/remove managers for interns
- Have an overview of project progress across all interns

HR coordinators are able to:

- Navigate to a page where they are able to edit intern profiles to assign projects
- Not gain access to administrator profiles

Both Company Administrators and HR Coordinators are able to:

- Upload onboarding materials for interns to complete
- Update interns' progress on these onboarding materials and view their progress as a fraction of actions taken out of total actions needed
- Collect information from interns

- View the intern class's information in an interactive table. The information in this table may include:
  - basic (personal) information
  - demographic data
  - academic majors
  - areas of interests
  - project progress

This would satisfy all requirements. The Development Team has determined that this set of features is feasible given the time frame and technical challenges; details of this feasibility analysis are delineated in Technical Requirements.

4 Technical Requirements

Current Technologies at the Symba company

Current work from the Symba company uses Python, React, and PostgreSQL. The majority of this work is in a Github repository. There is not much written documentation for the codebase.

Required Technologies

- Python
- Github
- Web development tools: Primarily HTML, CSS, React, along with any other web technologies that will be used in a minor capacity.
- PostgreSQL: Used to interface the dashboard with a database for displaying intern statistics.
- Graphical Tools: Displaying intern statistics will likely involve using graphical

tools to create visuals on statistics.

- Web testing: Frameworks for web unit testing in Python include unittest and Selenium. Frameworks for Javascript web unit testing in Javascript include Jasmine.

Projected Technical Requirements

- Programming languages and web frameworks: Much of the work for the Dashboard will require programming in Python for web applications. React is used in the Symba company's codebase, and should be used for the Dashboard. Some parts of the Dashboard will likely require working with PostgreSQL.
  - Feasibility: Most members of the Development Team are familiar with Python, and several have previously used Python to develop web applications. Most members have experience with web development in some capacity, and some have extensive experience with React. A few members of the team have experience working with databases using SQL, although the Dashboard is projected to require little interaction with databases. By sharing knowledge and experience with each other, the Development Team can easily meet these requirements.

- Access to the Symba company's codebase: The Dashboard will be built directly inside the Symba product, so developing the Dashboard requires access to several parts of the Symba product's code.
  - Feasibility: Nikita Gupta has agreed to share the entire Symba company codebase with all members of the Development Team, and discussions regarding the logistics of this sharing have been accounted for in the outline plan.

- Integration with the Symba company's codebase: Since the Dashboard will

be built directly on a part of the Symba product and several features have dependencies on several parts of the Symba product, integration with the Symba company's codebase will need to be a continuous effort.

  - Feasibility: The majority of the Development Team is proficient in Python and web development, so navigating the Symba company's codebase should not be difficult. However, it is not feasible for every member of the Development Team to learn every part of the Symba company's codebase. There will be a meeting near the beginning to study the source code at a high level. The Development Team will maintain a simple Google Document providing general documentation on the purpose of different parts of the codebase, as well as the names of members of the Development Team who are more familiar with different parts of the codebase. With this methodology, the Development Team will split up the effort of integrating with the Symba company's codebase and specializing each member's knowledge of the codebase, making this task more than feasible.

- Versioning and Compatibility: As the Symba company is in a stage of fast development, both the Symba company and the Development Team must work to ensure that the Symba company's development does not significantly hinder the Development Team's work while the Development Team's work is testable on the Symba company's latest version and can be integrated into the Symba company's codebase at the end of the development process.
  - Feasibility: The Development Team will create a primary development branch of the Symba company's source code on GitHub where they will add in weekly program updates. Moreover, the Development Team could take one of two approaches for versioning: either make periodic pull requests to the Symba company's master branch, which may require more frequent contact with the Symba company employees, or fully develop the

Dashboard within the newly branch and perform a single merge after the Dashboard has been tested and approved, which would not require as much contact with the Symba company employees.

- Web Unit Tests: Web unit testing involves designing unit tests, using web testing technologies to implement those tests, and understanding the results.
  - Feasibility: Several members of the Development Team have experience with web testing and browser simulation technologies. All members have had exposure to unit testing. So, no matter which of unittest, Selenium, and Jasmine is used for unit testing, the technical aspect of web testing is feasible.

- Graphical Tools: Since the current product backend is written in Python, the most feasible graphical tools to use are Python graphical tools.
  - Feasibility: Several members of the team have extensive experience using Matplotlib, tkinter, and other Python graphical tools. While these may not be the tools used in the Dashboard, experience with these tools will transfer over to ability to learn new Python graphical tools.

- Dashboard design: The Development Team will be playing a part in designing the layout of the Dashboard. This involves designing a system that meets aesthetic standards and reasonably facilitates human-computer interaction in the context of the Symba product's existing design.
  - Feasibility: Several members of the team have relevant coursework in human-computer interaction and/or experience designing user interfaces. However, ensuring that the Dashboard design is in compliance with the design goals of the rest of the Symba product will require a large amount of input from the Symba company. For that reason, guidelines for communication are outlined in Visibility to ensure clear communication between

the Development Team and the Symba Company, and an iterative refinement model will be adopted to complete the initial dashboard design so that feedback from the Symba company can be regularly received and integrated.

- Server: The Development Team will need to run the existing product as well as the Dashboard on a server.
  - Feasibility: The Symba company has given the Development Team permission to use the AWS server that the Symba company currently uses. The exact logistics of use will be discussed during codebase sharing.

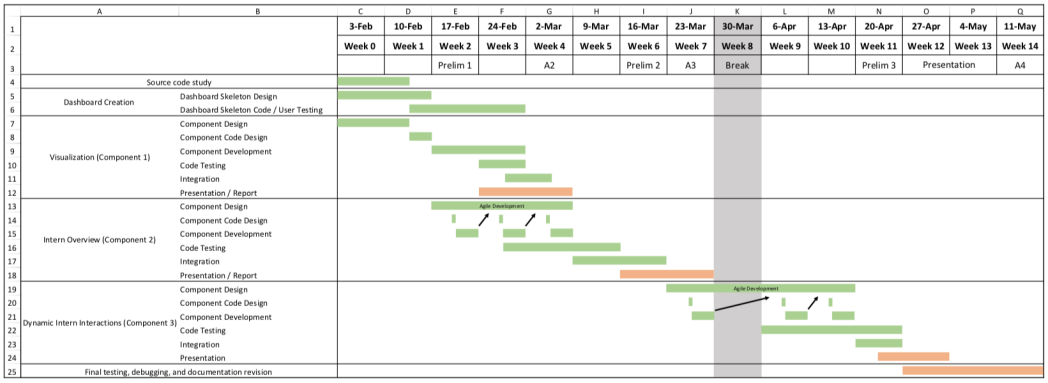
5 Processes To Be Followed

Our overarching development scheme will be Spiral Development since the project consists of a dashboard containing several modular Feature Elements — each element on the Dashboard can be developed individually and integrated upon completion. Within this overall Spiral Development scheme, we split up the dashboard skeleton from the modular Feature Elements on the Dashboard.

The dashboard skeleton consists of a web layout that enables users to view and control the individual elements that will be on the Dashboard. For this skeleton, we will use Iterative Refinement to incorporate continuous input from the Symba company. As the exact functionality of the dashboard skeleton is expected to be refined during the development of the Dashboard, and continue to change even after the Symba company takes ownership of the Dashboard, unit testing will be lightweight. As Feature Elements are added to the dashboard skeleton, integration testing will be added as part of the iterations.

Each of the Feature Elements may require a slightly different development process. However, the general approach will be Agile development for each Feature Element. The work on each Feature Element will be separated into Time Boxes. Each Time Box will end with a working version that fulfills a subset of the Feature Element's final requirements. At the end of each Feature Element's development (note that this directly before integration, and not after each Time Box), full documentation and unit testing will be completed. This is also in compliance with the overall Spiral Development process, which requires each Feature Element to be documented and thoroughly tested before integration.

6 Outline of Plan



7 Suggested Deliverables

- Progress Reports
  - These reports serve to document the development team's progress throughout the time period and any changes to scope that may have been made. These help to inform the client of what has been completed thus far and

what will be accomplished if further work remains.

- Prototypes
  - We will provide low-fidelity, mid-fidelity, and high-fidelity prototypes for the client. These prototypes will allow the client to gain a better understanding of what the final product might look like. They will also provide an easy way for the client to provide feedback on the project's features and designs.

- Documentation for Use and Mechanics
  - The client will be provided documentation both explaining how to use our system, describing its underlying mechanics, and allow upgrade and reuse of code for future use. This would aid future engineers to familiarize with the system, and the documentation will be useful for reference needs.

- Source Code
  - This will be the core deliverable for the client. It will consist of a coded, web-based interface. We will be providing a dashboard satisfying the needs of the client. All the code of the webapp will be delivered at the end of the project. The system will undergo testing with simulated data to make sure privacy and efficiency is balanced.

- Unit Tests
  - Short test cases to verify the correctness of specific components in the Dashboard, and to prevent any regressions in the program logic. Documentation will be provided to explain how to execute the given tests if desired.

- Demonstrations
  - Along with the delivery of the source code with both code documentation and written feature documentation, we will also provide a demonstration

on how a user can use the interface. If needed, this demonstration will include how different users (e.g. company administration as opposed to coordinators) interact with the interface.

8 Visibility

A Slack workspace has been set up. Every member of the Development Team is a member of this Slack workspace and has access to every channel — there will be no private workspaces.

Visibility of Development Team's Progress

There is one channel on the Slack workspace, which will be referred to here as #Symba-contact, dedicated to communication between the Development Team and the Symba company employees. Every member of the Development Team will remain a member of this channel as long as they are a member of the Development team. Nikita Gupta is currently a guest in the Slack workspace who has access to this channel. If Nikita Gupta requests that Dylan Tsai give any other Symba company employees access to this channel, Dylan Tsai will, in a prompt manner, add them as guests to the Slack workspace with access to this channel.

Non-written communication between the Development Team and the Symba company will be conducted primarily through Zoom calls, though group phone calls may be used at times if the Symba company requests it. All Zoom calls between the Development Team and the Symba company will be set up as needed through #Symba-contact, and the Zoom link will be posted in #Symba-contact at the time that the meeting is set up. Each meeting will have a designated

moderator from the Development Team, who will go over the meeting's agenda at the beginning of the meeting and then ensure that all meeting points are discussed. After each non-written meeting, a member of the Development Team will provide a short summary of the meeting outcomes in #Symba-contact.

The Development Team will provide weekly updates to the Symba company through #Symba-contact each weekend. In alternating weeks, this update will either come in the form of a written message from one member of the Development Team (designated as the Progress Reporter), or it will be a Zoom/phone call between the Development Team and the Symba company. While only one member will act as Progress Reporter and not all members need to attend the call, the work of all members of the Development Team will be relayed in each of these updates. If a member of the Development Team does not provide an update on their progress to the Progress Reporter / a call attendee and is also unresponsive, then their progress will be noted as unknown in the weekly update. At each fortnightly update call, one item on the agenda will be reviewing the quality of communication between the Development Team and the Symba company as well as discussing potential adjustments.

Visibility of Symba Company's Decisions

The Symba company is expected to be transparent about relevant changes to the codebase or company direction and give fair warning for planned developments that would affect the Development Team's work. In the case of such changes, the Development Team will communicate closely with the Symba company to ensure, to a feasible extent, that the Dashboard's features, code, and documentation are compatible with the projected state of the Symba product after the projected changes.

Communication within the Development Team

Within the Development Team, most discussion will happen in person. All team meetings will be open to all members of the Development Team and most will be announced in a public Slack channel. The Slack provides a way to set up meetings, ask quick questions or hold small discussions, and most importantly, keep members up to date on the progress of each part of the Dashboard and reports. There will be a Slack channel dedicated to progress updates.

Communication for subprojects will be done primarily through channels, so that all members of the Development Team can view the discussion as needed, as opposed to group direct messages.

Deliverables and Presentations

Reports: The Symba company will be presented with copies of each of the four written progress reports, including this Feasibility Report, as outlined in Suggested Deliverables. These reports will help summarize progress, record any major design decisions made, and include an updated plan for the remainder of the semester. The reports will also contain specifications for any parts of the Dashboard that have been completed.

Presentations: Along with the written progress reports, there will be three one-hour presentations. The Development Team, as well as Professor William Arms and the course's teaching assistant, will attend in person. The Symba company will attend through a Zoom call, and will be provided with the slides for the presentation beforehand.

9 Risk Analysis

There exists the risk of not delivering a functional, completed, satisfactory project to our client on time due to technical difficulties. Even though most group members have experience with the programming languages and softwares used in this project, unanticipated technical problems could easily arise and lead to a delayed timeline. Our primary plan with mitigating this risk is a detailed and stringent outline of plans. The team members would follow the internal deadlines noted in the Gantt chart, with each phase's team leader enforcing the timeline. This plan would be a well-defined development process that breaks the project into small deliverables and assigns team members to each task.

We can also prepare for this risk by ranking the functionalities by several factors. As shown in Outline of Plan, we would prioritize the required functionalities, producing deliverables before we begin on the optional functionalities. Our team believed the second component, a view of all interns, would be the most complex. Thus, we put the task after the first component so we would have a greater level of familiarity with the system. Since the third component is an optional functionality built on the second component, we would have ample time to fix the intern overview if problems arise. We would communicate effectively both within the team and with the client. If one team member encounters difficulties on their responsibilities, they would inform the team immediately so another member could help out. We would continuously update the client on our progress, showing them our current deliverables and progress each meeting.

If these measures still lead to a delayed project with the required functionalities missing, we would reassess the required functionalities with the client. We would thus select the most essential functionalities to focus on in the remaining time.

10 Business Considerations

Several business considerations must be taken into account when determining the feasibility of the Symba Intern Management Platform project, including but not limited to: disclosure of trade secrets and sensitive information, copyright and trademark issues, and considerations with regards to patents.

Trade Secrets and Sensitive Information

As far as the development team gathered from discussions with Nikita Gupta, there aren't any trade secrets or sensitive information that will be dealt with in the implementation of the Symba Intern Management Dashboard. Since the information that the Dashboard displays will be sensitive, we will develop methods to ensure that sensitive data is guarded through several security measures. The existing platform already has password-protected logins and uses Hypertext Transfer Protocol Secure (HTTPS) protocols to prevent malicious users and software from accessing the sensitive information displayed on this screen.

Copyrights and Trademark

Since this project is being completed for the Symba Intern Management Platform, the Development Team owns the copyright to the software we create in this project. The Development Team intends to transfer the copyright to Symba and to provide the client with an unrestricted license to the system. The Development Team is not responsible for maintaining any code made during this contract and shall not be held responsible for any damages that may incur from this system. It is just possible that this project may develop concepts that could be patented. If such a situation arises, Symba owns the rights to all patents associated with the system and its derivations. Since the team does not plan

to trademark any names in relation to the software system, trademark is not foreseen as being an issue.

11 Conclusion

From the results of the feasibility study, the Development Team finds that the Intern Coordinator Dashboard for the Symba Intern Management Platform is feasible in terms of technicality, the skill of team members, and time. Given the time constraint of one semester, the Development Team is confident that the project is manageable and that the client's requirements can be fulfilled upon completion. The Development Team also possess the necessary skills to implement the Dashboard and are familiar with the needed software that will be used in this project. The conclusion of this feasibility report is to move forward with this software development project.