**Feasibility Report – CSLabs**

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You should provide a feasibility report in the following format:

1. **Product:** A general statement of the product; give a brief description of what the proposed system will do, highlighting where the proposed system meets the specified business requirements of the organization.

CSLabs is a web application designed to create and run labs involving networking applications. This application will allow users to sign in and either run or create and edit labs. The creators of labs will be able to use a gui to design the layout of virtual machines and save those layouts for future use or editing. Users will also be able to set up an account and sign in to complete a lab. 2. Technical Feasibility: Will the proposed system perform to the required specification? Outline technical systems options you propose to use, which will give a technical solution satisfying the requirements and constraints of the system, as outlined in the terms of reference.

1. **Technical Feasibility:** Will the proposed system perform to the required specification? Outline technical systems options you propose to use, which will give a technical solution satisfying the requirements and constraints of the system, as outlined in the terms of reference.

This application can be thought of as a regular web application with an added component to enable the virtual machines used in the labs. To create this, we will use React with Typescript for the frontend of the application. We will use bootstrap to ensure uniform styling throughout the application on the frontend. For the backend, we will use C# for the business logic and API controllers, and Maria DB for the database. The database will store things including user login information and the modules for the labs themselves. To run the labs, the application will connect to virtual machines running on a server located on campus.

1. **Social Feasibility:** Consideration of whether the proposed system would prove acceptable to the people who would be affected by its introduction. Describe the effect on users from the introduction of the new system; consider whether there will be a need for retraining the workforce. Will there be a need for relocation of some of the workforce? Will some jobs become deskilled? Will the current workforce be able to perform effectively any new tasks introduced by the proposed system? Describe how you propose to ensure user co-operation before changes are introduced.

Students and professors will directly benefit from CSLabs. Instead of spending valuable time setting up virtual machines for labs on each students local machine, they can easily access the modules and labs offered by CSLabs from a web browser. There will need to be minimal training on the system for students as all they need is a web browser and account to access their modules. Administrators and Creators will need training on how to set up and distribute modules/labs to ensure access is given to the intended users with the correct information.

1. **Economic Feasibility:** Consider the cost/benefits of the proposed system. Detail the costs that will be incurred by the organization adopting the new system; consider development costs and running costs. Detail benefits that the new system will bring, direct economic benefits such as reduced costs, and indirect benefits, such as improved management information and better customer service. Illustrate the cost/benefit of the new system by applying a suitable cost/benefit analysis method such as the payback method.

The most expensive part of CSLabs is the servers that are being used to host the virtual machines and back end application. CSLabs has benefited from donation and CSG funds to equip the server room with better equipment than in the past. If CSLabs scales larger than expected than going to the cloud may be a cheaper and easier option. Indirectly, CSLabs will bring a better student experience at IUS by providing a training ground for the cybersecurity track and the CSG. The cybersecurity track will bring more attraction to IUS since it will be one of the only schools in the area with the option, which will bring in more money for the University.

1. **Market Research:** A comprehensive market research identifying a need for the product. Detail all market research you carried out, listing sources of information. Justify any conclusions you have drawn from your research. Identify the potential customer base for your product, together with evidence of customer need for the product. Describe how you propose to compete with similar products on the market.

When the CSG at IU Southeast received servers from local companies as donations, the need to utilize these servers efficiently became important. The CCDC competition requires using different virtual machines and accessing them every time for practice meant re-imaging on the local computers. It is also inconvenient to visit the data storage room every time one has to access or use them and being able to use it remotely will allow for easier and efficient management. This is where CSLabs was created, where the students and faculty at IU Southeast are able to access these machines very easily thru the web application. Due to some hardware failures in Spring 2021, we had to wipe the servers and re-image them providing with new connections. This project attempts to provide advanced functionality to users who will be utilizing the virtual machines and connect them to the user easily. Our project is a custom solution, and we do not believe there would be a better service or software available for this project.

1. **Alternative Solution:** Consideration of alternative solutions should be documented. At least two alternative business or technical systems options should be considered. Detail the differences between these options and the proposed system. Justify your choice of the proposed system and the reasons for rejecting the alternative options.

Although there are services available that would let us use virtual machines, but these will not be on our servers at the campus, and these come with a very high cost. Amazon Web Services (AWS) provides users with virtual machines with manual configurations and many other functionalities, but we lose the control of managing the servers, and the price associated with it is unreasonable for this project. Citrix also provides the same services, but we face the same issues as AWS. Having the servers at the campus allows us to perform high computation tasks at a much less expensive price, and it provides the students for an opportunity to learn server management. We would also like to have custom functionalities such as dividing these virtual machines into modules and categories. For these reasons, designing the system ourself overall is a better alternative.

1. **Project Risks:** To have success in managing a software project, the project manager needs to understand the nature of software risks, which can be defined as uncertain events or conditions that, if they occurs, can have a negative effect on a project outcome. List and discuss some the risks associated with this project.

One of the risks associated with this project is once we have developed these functionalities, it is important to be able to connect to the virtual machines and ensure they work without any significant delays. Server management is a tedious task, and in worst case scenario, there can be more hardware problems with the servers, and we cannot host the virtual machines on the web application. Since CSLabs is an existing project, there are some black boxes for us, and it is possible to run into some issues and barriers with our project. For example, we might run into some issues implementing a feature, and understanding the other aspects of the project can make it difficult and longer to debug a problem. Although, we approach the project incremental implementation to avoid such issues.

At this point, all of the planning (personnel and time frame) for the project has been done and if the feasibility study has shown that the project is likely to succeed within its constraints, then it only remains for us to start the requirements analysis and thus proceed with the project.