

CS 598 Senior Design 1

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Project Planning Paper
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Team Skills Analysis

According to our Team Skills matrices developed a couple of weeks ago, all of us have a decent skill set when it comes to software integration, development, and management.

Karishma is intermediate in software development methods, development environment, configuration management, debugging tools, writing code, creating flow charts. She is basic in protocols and data security and wants to learn about databases. For the electrical component, she is basic in all areas except the logical part (intermediate). For computing, she is basic in all areas except single board and microcontroller (want to learn). For general she is basic in I/O modules and has the rest of them as “wanting to learn”. For engineering business and project management, she has a diverse array of a couple of requirements. Lastly, for conducting research, she wants to learn all aspects.

Fitri is advanced in all software requirements except development methods, data security, and database (intermediate). He is basic in all electrical components except simulation (intermediate). For computing, engineering business, and project management, he has a diverse range. He is advanced in almost all areas of conducting research. He is mostly advanced in conducting research.

Tan is basic in almost all electrical parts, he has a mix of basic and intermediate in software, and basic and wants to learn in computing. For engineering business and conducting research, he has a combination of basic and intermediate. For project management, he is mostly intermediate in all aspects.

Dan is intermediate in almost all software, engineering business, and project management components. He is mostly basic in electrical, computing, and general parts. For conducting research, he is mixed between basic and intermediate.

Sriram is intermediate in all aspects of software and computing parts. He is also advanced in engineering business and conducting research parts. He has a mix of basics to want to learn for project management.

Overall, our team is proficient in software and engineering business parts which makes us a good asset in making a website for Wichita State’s incoming students. It is our hope that we will integrate what we have learnt to further use and fine-tune our skills set further by exploring servers, front-end and back-end parts. We are confident that with the current skill set we have, we are able to work on a project that is enriching, fun, meaningful, and brings value to all of us after we graduate from Wichita State University.

Legal and Ethical Analysis

Privacy Policies & Copyright Issues

Implementation of a campus map can be a challenge as we need to focus on retention of data given to the server. How secure is the data transmitted between the user and the server? Also how will the website save the data without revealing any personally identifiable information to unauthorized parties without explicit consent from the users. Another issue faced is whether the website will continue to track students after reaching their locations, and whether the scope of the map navigation would go beyond the campus. For copyright issues, this project will be for students to use therefore it will be similar to the school web design structure. Needs approval to use the school web design structures. If the website is doing good, the company can be forced to shut down due to trademark conflicts.

Domain Name Issues

Choosing a domain name needs to be free from domain name conflicts from any one of the millions of commercial names that already exist on the Internet. A domain name cannot be very similar to the ones that already exist. Otherwise, our team can no longer use that particular domain name. Customers can also accidentally mistype a domain name. For example, if our domain name is similar to someone who sells clothes, it may redirect to a spam website. This can potentially cause confusion to users and not have much web traffic.

Security Issues

Hackers can hack servers that are vulnerable that can lead to servers being compromised. Server scripting can be susceptible to coding vulnerability which can impact the safety of users information. These can include SQL injection and XSS. SQL injection is where a hacker deliberately writes incorrect SQL queries to extract sensitive information from the database. Server side scripting can also lead to security issues because of poorly implemented password protection. Server side scripting can also lead to security issues due to poorly implemented password protections. A Distributed Denial of Service (DDOS) attack can cause the server to slow down or crash.

Data Leakage

Data leakage can occur internally or physically and can lead to the user's information stolen. Poor implementation of server security, for example, can cause open ports or password weaknesses. This makes it easier for hackers to steal information and misuse them. We need to identify which data is sensitive that needs to be secured and then classify each data according to the correct security policies.

Milestones

Having milestones throughout the semester can help us be on top of our project. Our first milestone is due by 10/01/21. By this day we would like to have our research requirements completed. This information can help us answer questions that may be asked in class. We would like our second milestone to be due by 10/24/21. This information will help us from making any mistakes that could cause legal or non legal issues. We will also need to have our research regarding our constraints by this day as well as specifics to our projects. Finally, we need to make sure we have the appropriate engineering standards for our project.

The next milestone is due by 10/31/21. We will need to have our flow chart for our software with step by step descriptions. Our next milestone is due by 12/03/21. We plan on presenting our research and projects publicly. Finally, our final milestone is technical requirements, work activities, end item deliverables (work products), end test requirements, and the timeline for the team to execute the “released version” of the prototype. We will need to make sure we have a clear plan for our deliverable.

Metrics

We will use three metrics to track project performance.

Trello - A collaboration tool that organizes our projects into boards. Just at one glance, we will know what's being worked on at the moment, we can help our team which areas need to be worked on further, and any tasks that are in-progress. This will help us track our tasks and help us identify our milestones.

Google Drive is a shared folder that allows us to create and edit documents, spreadsheets, drawings, even presentations, providing our team with an online office suite. It allows convenient sharing and allows us to be more efficient and productive in editing papers and weekly minutes together, all without the hassle of sharing via email back and forth with everyone.

Discord is a free platform tool used for us to communicate with team members. It helps keep our teams synchronized and all in one page. We can set up automated bot notifications, plan out our meetings and remind everyone what their roles and responsibilities are. Discord also provides us a safe space for our team to share our thoughts and any concerns that can affect our progress on the projects.

Acquisition Schedule

<u>Members' Tasks</u>	<u>Descriptions</u>
Project Research	<p>Cost effectiveness, materials, research on programming languages, frameworks, databases.</p> <p>Risk: if research is behind schedule, then it will put our project back further than the due date is supposed to be.</p>
Material / Components needed	<p>Securing a Raspberry Pi computer</p> <p>Risk: if it delivers late, then that will put us behind schedule.</p>
Project Identification	<p>What our project will be:</p> <ol style="list-style-type: none"> 1 A Server hosting websites 2 Secure website 3 Web development 4 Data Linking between front-end and back-end <p>Risk: None</p>
Budget Cost	<p>Raspberry Pi, Domain name, Database, Security.</p> <p>Risk: Might need to secure alternatives if they end up being too expensive</p>
UI / UX designs	<p>A prototype model of the websites.</p> <p>Risk: Without a prototype it will be hard to implement a project blindfolded.</p>
Hardware tools	<p>Computers, Raspberry Pi, electrical wires.</p> <p>Risk: Wrong components arrive in the mail</p>
Software tools	<p>Visual Studio Code, extensions, Git, Github, Linux, Postman</p> <p>Risk: We don't know which IDE's would work for everyone and which one is</p>

	compatible with our project. But they shouldn't cause much issues.
Server testing	Testing of server responsiveness and delivery speed when requesting for a specific task. Make sure it can handle multiple packet requests. Risk: None
Website testing	Testing of website responsiveness to all platforms. Display the correct data and talk back to the server. Risk: None
Overall Testing	Make sure everything is responding to each other. Website is responsive and the server is working and handling packets as it is supposed to do. Overall linking both website and server together. Risk: None

Data Configuration Management Plan

We will be using Visual Studio Code, extensions, Git, Github, Linux, Postman as our software tools to develop our projects. As for hardware tools we will be using computers, Raspberry Pi, electrical wires.

For development, we will be using a popular library called React to create dynamic user interfaces. This technology has two different paradigms: functional and object-oriented. We will use the functional approach to code because it has more features while also having simpler syntax. Since React is written in JavaScript, we wanted to use backend technologies that use the same programming language. These are NodeJS and ExpressJS. That way, our team members will only have to learn one programming language.

Documentation for testing will include detailed specifications of all planned tests, making it easy for team members to keep track of. A testing environment documentation stores data on used hardware, software, tools, framework, and describes the product functionality in detail. This can help the team reuse the information for future cases.

Software Development Model

We are planning to go for the agile model. Our team feels that having an iterative and agile model serves us well. This is especially true with making something complicated and dynamic such as a website. For instance, if everyone works on the front-end development of the website first, then everyone can learn the tools / languages / tools needed to solve a couple of problems in making the User Interface (UI) of the website. This allows us to focus all our efforts on one small component of the website, then after creating and polishing that site, we can then move onto the back-end development.

By adopting this approach, it is ensured that no one group member sits back and relax while awaiting the rest of the group to work hard on an issue. It ensures that proper teamwork is displayed by having everyone chip in and offer to help during a difficulty. It is hoped that the iterative and incremental model allows us to work on one small sub-task, and then move onto the next. It also allows us to be more efficient with our workflow as we start making progress towards a working product.

We will be using Trello as our collaboration software tool to help us manage our work. This platform will help us break our development process into various stages called "lists". The main lists that we have in mind are backlog, to do's, in progress, testing, done, and blocked. Each of the lists contains stories, which are tasks that our team members will work on. Since we are following an agile approach, a completed task will be moved to the next workflow. For example, after a team member finishes a task from the in-progress list, it will then move into the testing list. With this system and workflows in place, everyone gets to commit to the right amount of work in a structural and efficient manner.

Overall First Semester Schedule

<u>Description</u>	<u>Due Date (By Week)</u>	<u>Discipline</u>
<ul style="list-style-type: none"> • Project Presentation • Project Requirements • Project Research 	09/24/2021-10/01/2021	CS
<ul style="list-style-type: none"> • Project Research (Continued) • Presentation Preparation 	10/01/2021-10/08/2021	CS
<ul style="list-style-type: none"> • Project Research (Continued) • Order Materials / Parts 	10/08/2021-10/16/2021	CS
<ul style="list-style-type: none"> • Project Prototype Building Phase • UI / UX Designs 	10/16/2021-10/23/2021	CS
<ul style="list-style-type: none"> • Project Prototype Building Phase (Continued) 	10/23/2021-10/30/2021	CS
<ul style="list-style-type: none"> • Project Prototype Building Phase (Continued) • Testing & Troubleshooting Phase 	10/30/2021-11/06/2021	CS
<ul style="list-style-type: none"> • Testing & Troubleshoot Phase (Continued) 	11/06/2021-11/13/2021	CS
<ul style="list-style-type: none"> • Finalize Testing & Troubleshooting • Prototype Preparation For Delivery 	11/13/2021-11/20/2021	CS
<ul style="list-style-type: none"> • Thanksgiving Break 	11/20/2021-	CS

	11/27/2021	
<ul style="list-style-type: none"> • Prototype Delivered • Prepare For Open House Presentation 	11/27/2021-12/03/2021	CS
<ul style="list-style-type: none"> • Showcase (JBC or Virtual) • Write Up 2nd Semester Work Statement 	12/03/2021-12/08/2021	CS