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Final Year Project – To Do List

Design Document

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**Introduction**

This project was created for a separate module in the final year of the level 7 of my course, Software Development. I must come up with an idea of a web page/app/game that I would like to create and present to a panel of lecturers here in the Galway Mayo Institute of Technology. We are lucky in the sense that we can decide exactly what we want to do, decide what technologies we want to use and architecture design we would like to use to complete this project. This gives me the chance to stay where I am comfortable, like Java, or push myself to learn new things and expand on things we may be learning in other modules this year or have learned in previous years.

This document is going to outline how I came to the idea of doing a To Do List, my reasoning’s for using the technologies I have chosen and to explain how the project will be set up and how the various technologies will interact with each other. I will also be outlining how the user will interact with the program. It is my plan to get people from my course and my family to interact with the program so I can get their onions, some from the technology minded and some from the not so technology minded, and adapt my program to make the user experience more enjoyable.

This document is also going to outline any problems I may face in the development of the program and how I adapted the program to overcome these obstacles. I will then explain how I would like the program to further develop and stay up to date. For this project I have decide to use Ionic, which was a module I had last year and mongodb, as the technologies that I will use.

Since I started this document a couple of months ago, the technologies I planned on using have changed. I’m now going to use a simple HTML and PHP file to connect to a server on Microsoft Azure, where the web app is hosted.

**System Requirements**

A web app such as a To Do List has few requirements.

I simply will need a basic client side that will send a POST request from the HTML/PHP file using Ajax. Then on the server side all that is required is an SQL database and another PHP file to handle the connection from the client side, which will either be adding, deleting, or editing to the database. What I wish to do is send only variables from the client to the server, so then the PHP server script can generate a query and execute all of this on the server side. I want to have it set up as so, so that the data will be more secure being sent from the client to the server and vice versa.

**Technology Used and Why?**

I am going to be using 3 technologies, HTML, PHP and Microsoft Azure.

**HTML**

HTML stands for HyperText Markup Language. HTML is used to tell the browser how to display web applications. It uses a number of other languages for formatting and design, like CSS (Cascading Style Sheet), and uses them for the general layout of a web application. HTML has many ‘tags’ which are elements of the language and they are annotated by opening and closing pointy brackets, <>. The tags vary from <h1> to set a heading in the setting of Header 1, to <p> for a paragraph and <img> to import an image into the web page. These tags are used for adding links, styling text, setting paragraphs, links to other websites and so much more. HTML also enables the use of other languages such as JavaScript which can affect the behavior of the web app. It also allows for data to be sent between files using methods such as HTTP GET and POST.

**HyperText Transfer Protocol**

HTTP acts as a medium between clients and servers. The client will send a HTTP request to the server and wait for a response, then the response will be sent back to the client. The two most commonly used methods for a request/response are the GET and POST methods.

GET

When the GET method is used the query string is sent in the URL. GET’s have very useful aspects but only if the data isn’t of significance, meaning that no personal data such as bank account details should not be passed through. This is because the query is sent in the URL making the data easy to extract for outside users. GET allows for requests to be cached, remain in browser history and they can also be book marked. GET’s, however have length restrictions and should only ever be used to retrieve data.

POST

POST methods are essentially the opposite of the GET method. Queries are not sent through the URL but are in the body of the method. This means that POST methods are much more secure than GET methods. They have no length restrictions meaning they can query large amounts of data in one method call.

GET vs POST

Depending on what you want to achieve either of these methods could be used as they are extremely efficient. When you’re using sensitive data GET should never be used, it should always be POST. GET sends the query in the URL meaning it would not be suitable but when the user wants to be able to save/bookmark/cache the query in the browser the only option would be the GET method as the POST method doesn’t allow this. For my project I will be using a mix of the GET and POST. I will use the GET method for getting data back from the server and POST to send the query to the sever as a user will be entering data that may be sensitive in some cases.

**PHP**

I have chosen PHP as it is very suited to be embedded in HTML. I plan on using PHP to write my functions and all processes on my web app. The HTML will be used for design. PHP can be put in a HTML file simply by using the tags, <?php ?>. While HTML is concentrated on the client side, PHP is for the server side. While this may sound intimidating to a new comer to server side scripting, like myself, it is very easy to learn and very easy to use. Any problem you may have can be easily found online with a solution. PHP is going to be my bridge between my client and my database on my Azure server. For PHP to be used you need to have a web browser, web server and a PHP parser. While testing on my local machine I will be using xampp which runs many languages such as Apache which will be used by myself to run the PHP locally.

**Microsoft Azure**

Azure is a collection of integrated collection of cloud services. It is used to build, deploy and manage apps. Azure can do many things and supports a vast amount of languages. It supports python, PHP and allows you to create server types of your choice. I made an SQL sever as this is where my database will be hosted with the PHP/HTML file connecting to the server and then calling the database. You can also make Virtual Machines on Azure, this is the second way I was considering hosting my app. While VM’s are very useful and relatively easy to use, I decided it would be too much work just for a simple To Do List application. Azure is a simple and easy way to host a website as it integrates with github and once a commit is made on github the hosted site will automatically update to the new changes. Having github is a great option, especially for people like myself who are familiar with github and how to use it.

**Architecture of the Solution**

The aim for my app is to have a HTML file, formatted with CSS and Bootstrap, with PHP embedded in the app. The PHP will then connect the web app to the Azure server. This will then open the connection between the PHP file and the database allowing for a user to add, edit and delete from their lists. I will be using GET and POST methods for the queries.

Azure

Web app built with HTML with embedded PHP

PHP

PHP requests

**Design Methodology**

When creating this web app I have a few items I want to do in order. They are:

1. Create basic web app from HTML
2. Set up server and database on Azure
3. Use PHP to request and send data to the database
4. Format the HTML page using bootstrap and html

The most important part of getting the web application up and running is the PHP connecting to the server. When I have a very basic HTML file set up I will then move on to getting the server and database up and going. I will then return to the HTML and add in the PHP need to make a basic connection to the server. Once this has been achieved I will then move deeper into the PHP and trying to get it to connect to the server on Azure.

When I am happy with the way the PHP and the server are communicating with one another I will then begin to design the HTML page to look more appealing to a user.

**Features of the Implementation**

For me to be able to use these technologies I will not have to install much on my machine. I will need to ensure I download a version of PHP that allows connections to the Azure website. I will also need to be careful when setting up my Azure server and database. Because I am knew to both PHP and Azure I am apprehensive about where to start. As the web app will be deployed on Azure users will not need to download anything onto their devices as they can simply type in the URL and they will have the web app there before their eyes.

**Recommendations for Future Development**

If I were to make another web app using PHP and Azure, I would do a lot more research and spend a lot more time studying PHP sessions as they seem to be an efficient way to get the PHP up and running and connecting to Azure. If I was ever using Azure again I would consider using their virtual machine and servers of different types are I only used an SQL server. If I were to continue on with this project I would add in a user login page, I would then use the username to set up a database for them, then the list name would be used as the id.

This would mean any user could have multiple tables in a database all as different formats. In my opinion this would make it easier for queries to execute on the server as they may not have as many places to search before finding the table being looked for.

**Conclusions**

After having a difficult start to this project, I feel as if I pushed myself out of my comfort zone which is what I wanted to do, in this project, feel as I may have pushed myself too much. Having never really touched on PHP properly before I feel as if I took on too big of a task and have now fallen at the last hurdle. While I really enjoyed learning PHP and using Azure I feel like I didn’t have enough time to do what I wanted with the amount of problems that I encountered. Although in saying that I would recommend that everyone should learn the basics of PHP as it is a very universal language. I would also recommend that people use Azure if the chance ever arose as it is very different to anything I have used before