CS 499 Module Six Journal

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One of the major possibilities of future technology is in the storage of information. Currently data is stored either on spinning hard drives (which use spinning magnetic platters and a needle, much like a record, in order to write 1’s and 0’s to the platter) or with solid state hard drives which have no moving parts and store electrons in “cells”. Both of these types of hard drives have limited lifespans though advancements continue with storage capacity. A major breakthrough may be with the development of “memory crystals” which are pieces of quartz glass that can have data stored in 3D in them. According to researchers this type of storage should be able to store more than 360 terabytes of data and last for 14 billion years, however the methods for creating it are still early (Rogers).

Technology like this, should it become cheap enough and easy enough to use, would have a major impact on the tech industry and my career. Currently I work for a company that specializes in storage solutions for datacenters, and much of what takes place with modern storage is algorithms put in place to help mitigate bit-rot, or the slow break down of information in these systems, as well as failovers, backups, and redundancies for when the storage devices fail. If failure becomes a much less common occurrence then not only will data be much safer, but more of the technological resources can be put towards using the data as opposed to protecting it from corruption or loss.

Another possibility for future technology is the use of nano-technology for healthcare purposes. Currently, nano-technology is being tested to help with the diagnosis of many diseases including cancers and cardiovascular diseases. With the advancements in this field, nano technology can be used to not only detect an increasing number of diseases, but also to help cure diseases but do so in a way that is not disruptive to nearby cells that are healthy. Nano-technology can also be used to help deliver drugs to the body and pinpoint the application of the drug to a specific part of the body while avoiding other areas (*Nanotechnology is changing the way we combat disease* 2024).

With the advancement of this technology, not only can more people get better healthcare, and more diseases be eliminated, but it provides an opportunity in other fields because much more data can now be gathered about individuals and can be beneficial for study. The data also has to be stored, and database systems and physical data storage devices will need to continue to advance in order to keep up with the demand.

For my project I had to take a step back and refactor all of the code to use the traditional MVVM configuration (Model-View-ViewModel). This separates the implementation of the code from the ui elements of the code in two different ways: the Model is the data itself, in this case we have users and trips and the lists of these things, the ViewModel is the connections of the data to the UI elements. The ViewModel class focuses on interactions with the UI and how the data is affected by it, and how the data can affect it. The View is the graphical interface itself, which is primarily a layout written in xaml that connects its elements to a ViewModel class.

By refactoring the code this way it does make it easier for manipulations to the UI, as well as for navigating across the areas of the application. However it is taking time for refactoring all of the code and I am not yet completed with all of the elements of the application. The application has been almost fully refactored into MVVM structures and the SQL database has been replaced with sqlite, which now handles the user login information and the destination information. The user login is also secured with a hashing algorithm for the password.

**Status Checkpoints for All Categories**

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| --- | --- | --- | --- |
| **Checkpoint** | **Software Design and Engineering** | **Algorithms and Data Structures** | **Databases** |
| **Name of Artifact Used** | CS 250 Travel Destinations | CS 250 Travel Destinations | CS 250 Travel Destinations |
| **Status of Initial Enhancement** | All pages are present. The majority of functionality is present | Added Quicksort sorting algorithm for sorting favorite destinations | Database created in Azure. Application connected to database. User login connected to database. |
| **Submission Status** | Submitting refactored code for MVVM | Submitting refactored code for MVVM | Submitting refactored code for MVVM, Database changed to Sqlite and fully integrated into application |
| **Status of Final Enhancement** |  |  |  |
| **Uploaded to ePortfolio** |  |  |  |
| **Status of Finalized ePortfolio** |  |  |  |

References:

*Nanotechnology is changing the way we combat disease*. Oxford Global Resources. (2024, August 7). https://www.oxfordcorp.com/insights/blog/nanotechnology-is-changing-the-way-we-combat-disease/

Rogers, N. (n.d.). *‘superman memory crystals’ could store humanity’s data indefinitely | science | AAAS*. Science. https://www.science.org/content/article/superman-memory-crystals-could-store-humanity-s-data-indefinitely