

Project Amethyst Summary

CS 440 Design Project

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Project Amethyst is an application designed for gemstone enthusiasts, gemologists, or gemstone buyers and collectors, offering **AI-Assisted Gem Identification** supported by a **Comprehensive Database That Catalogues And Displays Information On Common Gemstones**. It also includes a **Marketplace For Buying And Selling Gemstones** and a **Discussion Forum** for users to share knowledge and finds, seek help, and discuss any topic that relates to gemstones.

The *Gem Identification* consists of a form that the user attaches photos of their find, and fills out additional details such as estimated weight, dimensions, location found, and etc. The AI then compares this to its database of known gems and narrows down each possibility to give its best guess on what the gem described could be, its estimated price, and other interesting bits of information.

The *Catalogue* contains the database of gems known to the AI on the application, organised and displayed in a readable drop-down-bar list. Each bar expands to show images and a general description of the gemstone, where it is usually found, any special meaning behind cultures have for it, etc. This catalogue will ideally contain information about the most common and sought after gemstones, have its contents verified by industry experts for correctness, and be expanded by the contributions and discoveries of users.

The *Marketplace* is where users go to list their finds for sale, as well as make purchases from other users. Functioning similarly to an Amazon Shopping page, gems are displayed by image with important details as weight and price. Users can view in greater detail the offer, seller, stock, etc, and can make the purchase by adding to cart and checking out with delivery location and payment.

The *Discussion Forum* acts as social networking and a help site for users. It aims to connect hobbyists, sellers, collectors, and the industry with one another via a place to share finds, ask questions, and directly connect with other users. Its second goal is to act as a backup in case the Gem Identification fails to identify the gem with confidence. In this case, users can seek help identifying their gemstone from the community by making a post there.

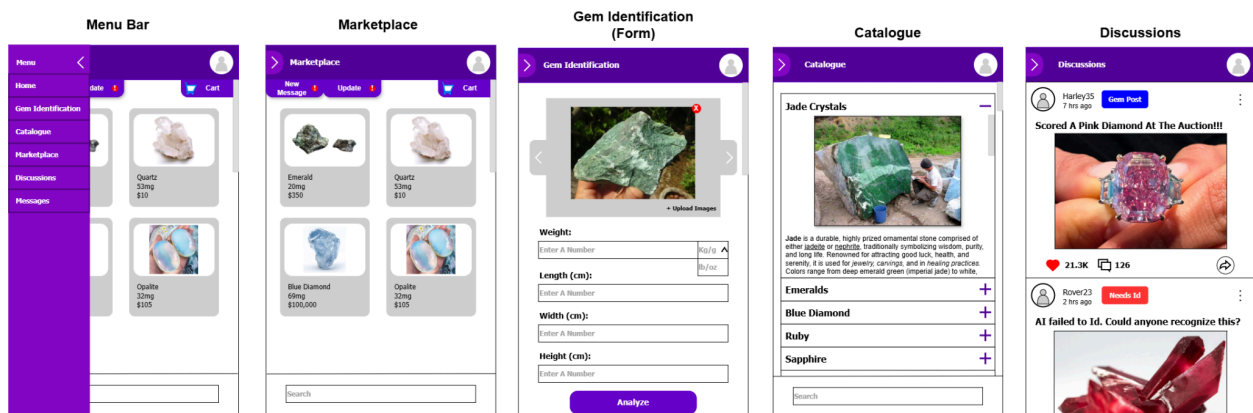


Figure 1 - Project Amethyst Wireframes For Each Page

The main system design revolves around these 4 pages, connected together by a menu sidebar for navigation. This is structured together by a Model View Controller (MVC) architecture where the client side would handle only the UI, taking in GUI inputs, uploads and text, and display of output information, and the server side handles the bulk as AI-identification, database interactions, latest public discussion forum states, and marketplace listings and transactions. This MVC model also separates each main function into distinct parts, allowing for development, management and refinement to be separated easily between teams.

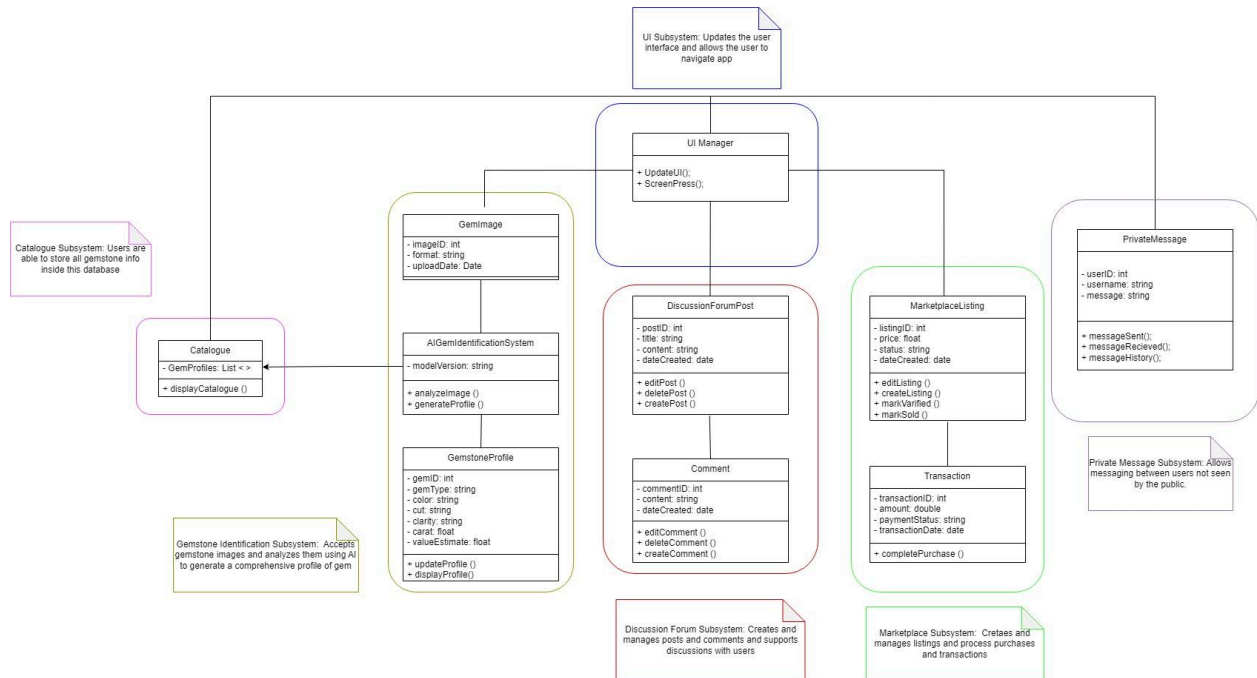


Figure 2 - Project Amethyst System Design

Because this project dwells in several different platform types as online retail, transactions, and public spaces, it will require a full understanding and thorough testing of compliances with regulations regarding such software, and may have to adapt to laws depending on the region of planned release. Initial development and first release of an alpha is estimated to require \$300K in research, development, and acquiring professionals in the field of gemology and mining to assist in refining design and functionality ideas and expectations. Furthermore, maintenance of servers, databases and the teams required to do so is expected to incur further costs depending on deployment strategy, though this can be limited with the usage of cloud servers in the initial stages.