

### **3-2 Milestone Two: Enhancement One: Software Design and Engineering**

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The artifact that I chose for this milestone is my Android-based Inventory Management application that I had originally created for my CS-360 Mobile Architecture and Programming class. This application allows users to create an account, log in securely, and manage a list of inventory items stored in a local SQLite database. Its core functionality is to allow users to add new items, edit item quantities, delete items, and view inventory details in a grid-based user interface.

I selected this artifact for my ePortfolio because it clearly demonstrates my ability to design, enhance, and maintain a full software solution while using industry standards, tools, and best practices. This artifact also highlights my skills in Android development, object-oriented design, database interaction, user interface design, and system configuration management.

There are also several components of this artifact that highlight my growth as a software developer. For example, I implemented a dedicated settings screen that allows users to control application behavior, such as changing the application's font size, adjusting SMS notification preferences, permission management, and an account logout option. I also made thoughtful architectural decisions throughout the process of making these enhancements such as creating a centralized AppPreferences utility class to manage shared preferences and apply dynamic font scaling through `attachBaseContext()` to ensure consistency across activities.

I also made enhancements in the UI by adding a display for warehouse location data within the inventory grid, added confirmation dialogs for destructive actions such as deleting items from the inventory list, implemented per-user settings persistence, and improved navigation through a properly configured app bar and back navigation.

All of these enhancements align with course outcomes I planned to address in Module One. Specifically, this artifact shows substantial progress towards the outcome of *using well-*

*founded and innovative techniques, skills, and tools to implement computing solutions that deliver value.* The use of Android system services, shared preferences, SQLite databases, and modular utility classes all show industry-standard software engineering practices.

My artifact also supports the outcome of *designing and evaluating computing solutions that solve a given problem while managing trade-offs*. For example, the design decision of separating preference management from UI logic, gating application access based on login state, and handling permission revocation through system settings all reflect intentional trade-offs between usability, security, and platform constraints.

Enhancing this artifact was a valuable learning experience that really showed me the importance of thoughtful and intentional software design and that there is more to the process than simply making features work. One of the biggest lessons that I learned was how small architectural decisions like separating concerns into utility classes or managing configuration centrally can all greatly improve a code's readability, maintainability, and scalability.

One challenge that I faced during this process was implementing the settings screen and ensuring that certain UI elements, like the app bar and back button navigation, behaved correctly across all devices. Addressing this challenge required not only thoughtful and careful debugging, but also a deeper understanding of Android's layout and lifecycle mechanisms. Resolving these issues also helped to strengthen my ability to locate and diagnose UI problems and apply appropriate solutions.

Overall, this enhancement helped me to move on from focusing solely on functionality and to thinking more holistically about software quality, user experience, and industry best standards and practices. I feel that the resulting artifact better reflects my current skill level and also serves as an example of my growth within the computer science program.

