Task 4

The Systems Development Life Cycle (SDLC) is a foundational framework for planning, creating, testing, and deploying an information system. It proceeds through seven distinct, interconnected steps: planning, requirements gathering and analysis, design, development, testing, deployment, and maintenance. Notably, the design phase occupies a critical middle ground, acting as the essential bridge between understanding what the system needs to do (requirements) and actually building how it will do it (development).

Software design is the process of creating a blueprint for the system. This involves defining the overall system architecture, mapping out modules, defining interfaces, and determining data structures. During the preceding planning and requirements phases, high-level business and user requirements are collected, which are then translated into detailed technical specifications that the development team can execute. An ideal software design minimizes ambiguity, identifies potential integration issues early, and ensures the final product is scalable, secure, and maintainable. This pre-planning is imperative to preventing costly rework during the later development and testing stages.

The execution of the design phase is heavily influenced by the chosen software development methodology. In a traditional Waterfall approach, the design phase is comprehensive and entirely completed upfront before any code is written, treating the design document as a fixed contract. In essence, it is a more rigid approach towards software design. Conversely, in Agile methodologies, design is an iterative and continuous activity. Compared to the Waterfall approach, it is a much more flexible methodology. A high-level architectural sketch is created early, but the detailed design of specific features is performed just in time for each short development sprint. Regardless of whether the approach is predictive (Waterfall) or adaptive (Agile), the goal remains the same: producing a clear guide for implementation that meets the stated needs and budget of the project, thus ensuring the SDLC proceeds efficiently toward a successful deployment.