CS115 HomeWork #1

The first article we were required to read is titled *"Managing the Development of Large Software Systems"*, by Dr. Windston W. Royce. This paper was published in August of 1970 in *Technical Papers of Western Electronic Show and convention.* Royce's motivations for writing the paper stem from his near decade of experience constructing large software-system for the space and aerospace industries, where he was able to see first hand both projects that succeeded and failed because of either good or bad software-engineering practices.

One of Royce's main tenets is that comprehensive documentation is central to any successful software project. He maintains this position for a variety of reasons :

1. Documentation forces developers to fully-flush out their ideas. This avoids disputes over the technicalities of verbal-contracts that arise when the specifics of a software system are not defined by thorough documentation.
2. Documentation makes implicit details of a project explicit, which allows developers and testers more opportunity to catch bugs early on.
3. Proper documentation allows for more thorough testing and for testing to start earlier in the design process. This is because, with proper docs, testers can write tests for code and interfaces that do not exist yet. If there is no documentation, the testers must wait for the code they are testing to be written in order to be able to learn how to interact with what they're supposed to be testing.
4. Proper documentation allows others to come in and take over a project more easily than if the entire structure of the project only exists inside the heads of the original programmers. Often, after initial development, one wants to bring in people who specialize in operations. This is not possible if there is no documentation for new people to reference when they arrive.

Royce is credited with inventing the waterfall model, but this is only partly true. While the model advocated by Royce does resemble the infamous waterfall model, he also suggests multiple iterations of the process (like always giving the customer the 2nd version of something, using the first as the reference when building the second) and using variations when different stages of the process communicate with and affect the actions taken by one another. So while the popularity of the waterfall process if often credited with the publication of this paper, Royce does not strictly advocate for the waterfall process.

The author talks about the acts of analysis and preliminary design. By analysis, Royce means a comprehensive look at the requirements for the project, and the raw engineering materials (databases, data-structures, etc) that will be needed to conduct the project. Royce claims that preliminary design should come first, by which he means that some understanding of the resource constraints for the project must be obtained before a formal analysis of the project can be complete, because the information gained from the preliminary design will guide the analyst.

The methods described by the author are not consistent with the agile methodology. This is because the author does not focus on having a deliverable at every stage of the process not the other steps that are required for this to occur. There is little to no focus on user stories and on ensuring that there is always something to give to the customer and every point in the process.

It makes sense that the author would not be describing something that is compatible with the agile techniques, because the agile manifesto was not released at the time that this paper was.