

Reading and Comment Assignment 1

Managing the Development of Large Software Systems is an article by Dr. Winston Royce published in August 1970 from *Proceedings, IEE WESCON* by The Institute of Electrical and Electronics Engineers and originally published by TRW. In his presentation, Royce describes the waterfall model; he explains why the waterfall model doesn't work. Instead, Royce suggests an iterative approach. This paper was motivated by Royce's assignments he had during the past nine years; software package development – more specifically for spacecraft mission planning, commanding and post-flight analysis. Royce calls for extensive documentation because "management of software is simply impossible without a very high degree of documentation" (Royce 332) according to Royce. The author illustrates a simple example; to produce 5 million dollars of software around 1500+- page specifications would be required to document. Such extensive documentation is needed for several reasons; some of the are: **a)** verbal and written record between the interface designer and management or customer. **b)** the documentation is the design during the first phase of building and designing the software. **c)** basically, during the testing and operational phase a good and detailed documentation is needed for the developer to do a good job. Without the documentation, the software must be operated by the people that built/designed the software. **d)** Good documentation also permits for later redesign updating and managing the software. According to the article, "there are two essential steps common to all computer program developments, regardless of size or complexity. There is first an analysis step, followed second by a coding step." (Royce 328). Royce addresses the Waterfall model; he talks how the model has fundamental flaws and how it can be unsuccessful. Royce describes the Waterfall model and then states that he believes in it but the implementation of can lead to risk and failure. He then proposes how he could improve and make the model successful. One of the reasons Royce points out is that the testing in the waterfall model is at the end. So, it means that it could be days, or even several months passed after the project has started. If the testing phase results in failure, we must return to the beginning which will cost time and money. In this context, **analysis** encompasses the process of analyzing and determining the needs, conditions and processes of the software product. Royce suggests that the preliminary design precedes the Analysis because by this technique "the program designer assures that the software will not fail because of storage, timing, and data flux reasons" (Royce 331). I think that this paper isn't completely agile, but it contains some ways and thoughts that can be classified as agile. Royce prescribes an iterative approach or better an agile approach. Basically, the overall solution that Royce proposes is a waterfall model with an iterative approach; agile ideas contained within the model – two iterations of the software to get it working right and focus on the testing phase. *So, I can conclude by saying that the author's approach is consistent with the agile approach.* Even though the *Apollo Computers* article is separate from Royce's article, I believe that on one hand it has helped me to better understand Royce's document. Royce's article talks about the management of the development of large software systems, and the Apollo article talks about this kind of large software. Apollo article gave me an insight how large software (back then this was huge) are developed and managed. Also, it was an interesting article in general and the fact "that a USB memory stick today is more powerful than the computers that put man on the moon" (Apollo

article) is amazing. It also describes how at that time there were limited amount of resources and how they still managed to follow certain analysis steps.