Akul Goyal

CMPS 115

July 5, 2016

Jullig

Royce Waterfall Article RAC1

“Managing the development of large software systems” was a paper written by Winston Royce published in 1970 by TRW. Royce wrote the paper as a result of his experience with developing software packages and having different levels of success in completing the project. In the paper Royce goes over certain steps he deems necessary in software development. Royce argues that while the standard “analysis and coding” method works for a small project it is set up to fail in terms of more complex development. The article argues that certain extra steps can be added to create a better software development process. These steps, such as program design, can provide a baseline to come back to in case of unforeseen complications.

Royce argues for five steps that can be added to the rest of the software design cycle to make it better. The first step to be added is to create a preliminary program design before analysis. Analysis is the process in which the program specification are broken down, it is where departments solve “orbit mechanics, spacecraft attitude determination, mathematical optimization” needed to be used in the software development. Royce argues that setting preliminary program design before analysis will create more dialogue between the designers and analyst and “..will culminate in the proper allocation of execution time and storage resources.”

Royce then works his way to the second step where he states that documentation is needed for the success of the software. Royce argues that firstly, documentation helps force designers to “..take an unequivocal position and provide tangible evidence of completion.”. Secondly, before the start of the project, the documentation is specification and design of the project and defines how the software will turn out. Finally good documentation lets anyone test the program, operate it without specific knowledge, and update it if need be.

The third step Royce argues for is creating a second version. After the preliminary design the development team should spend a miniature version of the rest of the cycle culminating in the creation of the first version of the project. Then the development team will go to the analysis and perform it on the software already created so “questions of timing, storage, etc. which are otherwise matters of judgment, can now be studied with precision.”

The fourth step Royce argues for is after the software is built and is being tested. Royce argues for a test specialist to test the software instead of the designers, a second code should take a look at the analysis and code, every logical test path should be checked, finally first get rid of all simple mistakes before turning over to the test area. Finally, as the fifth step, Royce argues for the involvement of the customer stating that the customer can “bolster the development effort.”

Although Royce does not specifically argue for the creation of the waterfall method he implies it his argument when the final picture (Figure 10) he provides resembles a waterfall method. He also advocates for completeness in each step before moving on to the next throughout his article. However, Royce’s methods are not in line with agile development. While agile development argues towards releasing of software in sprints, Royce argues in the delivery at once having to create updates if needed. The creation of the product between Royce and agile development differ where agile development requires more customer involvement.

Reading the Apollo Computers article was helpful because it provided insight on how Royce’s cycle worked and what lead to the success of the Apollo Space shuttle. It provides some context to what Royce was arguing in his article.