

# The Assumption of Independence in Multiversion Programming (Assignment 1)

Project Management and Research Methodologies

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# Objectives

The aim of this report is to read, analyze paper [5]. The main focus on this work is to determine if the mentioned article is presented as scientific method, engineering design or none of them. There will be used mostly slides used for presentations from lectures of this subject during obtaining the knowledge for determining the method which has been used in [5], but also theory about science and engineering and their distinguishing from [2].

Another requirement in this assignment was to provide articles, papers or another sources dealing with fault tolerance systems, multiple versioning software programs regarding reliability etc. Following had been chosen: [4], [7],[3], [6] and [1].

The rest of this report will be written in the first person since this report should be written from a subjective point of view.

# Report

I will start my thinking with one simple question: Its the goal of their work to determine some question (science), or they have some problem which needs some solution (engineering)? According to the article, there have been some observations like that in computer hardware people also use more modules which focus on the same input and produce same outputs, but implementation is different. There have been more questions regarding this idea, but in computer software systems, like question of independent failures and so on. So from these observations and ideas they formulate hypothesis and made some predictions and from there they made some tests and experiments and new observations. So far so good, it's according to description of the scientific method and its cycle from [2]. But there is a catch now - they didn't confirmed old theory and didn't proposed a new one, also a hypothesis they had showed as wrong. They didn't thoroughly redefined it, which means that this shouldn't be considered as a scientific method according to its definition. I personally think that this is a true and I have some extra comments in the next section. I think that from that paper it could be a solid scientific work, but only if the authors would continue in formulating a new hypothesis and continuing with experiments. Another discussions about what could happen are beyond of the scope of my assignment, but I believe that this is not a scientific method even it it has many common properties of a one. And since it has different approach then an engineering one, it is definitely not even engineering method. First of all, as I already mentioned, they got hypothesis and they wanted to test it and saw the results etc. In engineering work there is no hypothesis, but problem which requires (mostly) technical solution. Additionally, in engineering and technology we at the end know the concrete thing and in science we ended up with something in general, but in this work they didn't ended up with a concrete solution or observation which would lead to some general conclusion. They mapped one problem to a particular set of experiments. There is no proper discovery or invention. But I think that it definitely has some signs of science, technology and development.

# Last notes

In this last section I would like to write about some of my observations during reading paper [5]. I found some grammar errors which the original author did. Also I personally think that there should be more citations which would provide more explanations to some of things they were writing about. It also should be noted, and now I will be more specific in a technical manner, that during the experiments in the original work, they were using very similar conditions - operating system, programming language and also its compiler. In theory there could be also errors in those big pieces

of software or some software libraries which are being used in there. From time to time, such error can occur. In comparison hardware modules which are dealing with reliability in high critical systems (also can be less or almost unavailable, like some modules in space stations), they contain different designs and implementations. In my opinion there could be more variety in their work, no mentioning the usage of students for implementation purposes. There is no guarantee that they were all working individually and also they used only two universities for their purpose.

## **Conclusions**

As it was explained in the second section, my personal opinion is that this work is not representing a scientific method neither an engineering one. There is also some of my comments and criticism in the previous section.

# Bibliography

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