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Proposal

Title: Improving Documentation Quality in Software Development: A Review of Practices and Challenges

Objective: The goal of this project is to identify best practices and challenges in creating and maintaining documentation for software development. The project will work to create recommendations for improving the quality of documentation by analyzing surveys and interviewing software developers to gather insight on their perceptions and experiences with documentation. Ultimately the project seeks to enhance the effectiveness of documentation through industry feedback and analysis.

Background: Documentation is an important aspect of software development and computer science. Documentation is necessary for the communication between developers, the transfer of knowledge on systems, and maintenance of the software systems (Hildenbrand). The quality of software development documentation can vary widely, affecting developers across teams and companies, as well as limiting productivity (Huang, Babar). Many issues are arising as a result of software running on legacy code with poor documentation and few individuals that know how to manage or maintain these older systems. Agile methodology, the standard for the Computer Science industry relies heavily on strong documentation to allow teams to develop many different pieces at the same time and pull them together (Huang, Babar). Currently there are few standards for what is considered quality documentation, with each company and developer having their own ideas of what is a proper way to document, hence the need for a standard, or at the very least rules for what must be required in documentation (Meijden and Deursen).
Significance: This project is significant because it seeks to address the current gaps in knowledge on documentation quality and its impact on software development outcomes. By synthesizing existing research and conducting surveys and interviews with software developers, the project aims to develop recommendations for improving documentation quality and usability, particularly in the context of agile development. The project outcomes could provide valuable insights for software development teams, project managers, and documentation specialists on how to create and maintain effective documentation that supports better software development outcomes. Ultimately, the project could contribute to improving the quality of software systems and enhancing the productivity of software development teams.

Research Methods: The research methods used for this project will be literature review: reviewing existing research on documentation quality in software development drawing from academic journals, conference proceedings, and industry reports. In addition, the project will utilize surveys: surveying software developers at the Viva Technology Convention, in late June. While at this convention interviews may also be used to get in-depth insights of developer's perceptions and experiences with documentations. These interviews will be recorded to allow for analysis. After surveying and interviewing developers' data analysis will be conducted, using regression analysis, thematic analysis, and content analysis. After receiving our findings, we will validate them with a sample of developers using online survey tools. These findings will be published and presented at Viva Technology Convention in 2022.

Expected Outcome: The expected outcome of this project is to develop recommendations for improving documentation quality in software development, particularly in the context of agile development. These recommendations will be based on a comprehensive review of existing literature, as well as surveys and interviews with software developers to gather insights on their perceptions and experiences with documentation. The recommendations will include specific guidelines on documentation structure, content, and format, as well as best practices for creating and maintaining documentation. Ultimately, these recommendations could support better communication, knowledge transfer, and maintenance of software systems, leading to improved software development outcomes and greater productivity and satisfaction of software development teams.

Preliminary Work and Experience: Prior to this project the team has written code and projects for computer science, while using documentation to develop the coding solutions. Additionally, members of the team have experience with using documentation for troubleshooting of issues as related to their work.

IRB/IACUC: Not required for this proposal.

Budget:
2 Plane tickets to Paris: $1,100
Passes for Viva Technology Convention Provided by Viva Technology
2 Night Stay at AirBNB: $300

Total Budget: $1,400

Works Cited:
Ameller, David, et al. "Documentation in Software Engineering: A Practitioner's Survey."

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van der Meijden, M., and A. Deursen. "Technical Documentation Quality: A Systematic

Mapping Study." Information and Software Technology, vol. 82, 2017, pp. 102-119. doi:

10.1016/j.infsof.2016.10.004.

Hildenbrand, Tobias, et al. "Improving Software Documentation Quality: Findings from a

Systematic Literature Review." Journal of Software: Evolution and Process, vol. 28, no.

3, 2016, pp. 191-221. doi: 10.1002/smr.1744.

Huang, Yuanfang, and Muhammad Ali Babar. "The Role of Documentation in Agile Software Development." Journal of Systems and Software, vol. 119, 2016, pp. 270-283. doi: 10.1016/j.jss.2016.06.034.