CIS 5930 Project Proposal

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Our goal is to replicate pieces of a paper titled “Technical Debt Cripples Software Developer Productivity”. We aim to send questionnaires to and receive at least 50 responses from various professional software engineers as well as computer science students. We will compile the data to determine the two most detrimental technical debt categories such as additional refactoring and additional code analysis. A metric we will be interested in is the total percentage of time developers think that they spend in total trying to navigate technical debt. The assumption is that the time spent reducing technical debt can be utilized on other more beneficial tasks instead.

We would like to add some additional insight to the project by taking adjacent metrics such as what time in the day developers (enjoy) working, what programming language they use primarily, and how many other people work on their direct team. The survey in the paper was sent every week for 7 consecutive weeks however due to shortage of time and difficulty of asking software engineers to fill a survey every week we have decided to send one detailed survey which will answer our queries.

We will distribute surveys to software engineers who are in the market or have at least 6 months of work experience in a professional environment(this way we will also ask our classmates to complete the survey since some of them have worked before starting their graduate degrees). Each of us will be responsible for getting 20 responses from our friends and classmates since CIS 5930 is the only mutual class we share. It will be easy to find different people in our other classes and friend circle.

(Potential) Questions:

Same as the research paper:

- How often do developers feel like they are forced to introduce technical debt (because of deadlines, specific requirements, etc.)
- Demographics Metrics: Women, Men, Location, Age etc.
- Experience and Educational Level
- Programming Language they use along with the type of software system: Data Science, SaaS

Different from the research paper

- What productivity tools they use to attempt to reduce technical debt
- How does their managers react to the amount of technical debt an SE has
- How does the amount of technical debt affect their mental health

General Timeline:

- 4/10 Finish crafting survey/ questions
- 4/17 Finish secondary review and send out questionnaires
- 4/18 Send a reminder email to participants who have not filled out the form yet
- 4/19 Organize results and Make connections through charts and correlations
- 4/23 Organize our findings into a cohesive paper / rough draft

Link to Paper:
https://dl.acm.org/doi/pdf/10.1145/3194164.3194178

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Question Bank

- How often do developers feel like they are forced to introduce technical debt (because of deadlines, specific requirements, etc.)
    - How often would you say you feel rushed when submitting code for production and or review?
    - Would you say that you typically are assigned an adequate amount of time to complete your projects?
    - How often are you say you are "forced" to use legacy code or outdated versions of applications because of hardware /company limitations?
    - How long would you say that the projects take if technical debt occurs?
- Demographics Metrics: Women, Men, Location, Age etc.
    - Please enter your Gender
    - Age: How old are you?
    - Place of Work
        - Physical Location
        - Do you work remotely?
- Experience and Educational Level
    - How many years have you been programming?
    - Do you serve in a managerial/ supervisor type role?
    - How many years have you been in that role if you are a supervisor?
    - If you are not a manger/supervisor what role do you play?
    - How long have you been in the field for?
- Programming Language they use along with the type of software system: Data Science, Saas
    - What programming language do you use the most?
    - How long have you been using those languages ?
    - What are the programming languages you know?
    - What type of "software system" do you use, if any?
- What productivity tools they use to attempt to reduce technical debt

- How does their managers react to the amount of technical debt an SE has
    - How would/does your manager/ superior react if/when they saw a bug or potential security vulnerability in your code (even if minor)
- How does the amount of technical debt affect their mental health
- How much of software developers’ overall development time is wasted due to Technical Debt?
- Is it possible to distinguish any patterns from the distribution of the wasted time over a calendar period?
- On which extra activities are the wasted time spent?
- How often are developers forced to introduce new Technical Debt due to already existing Technical Debt?
- In what ways do different Technical Debt types affect the amount of wasted time?
- How aware are the developers and their managers about the wasted time due to Technical Debt? Do developers and managers consider the insight into the wasted time useful?
- How do you feel about team meetings or meetings in general wasting time and not accomplishing anything?
- Other comments

Email