

Sustainability tool for Software Development teams

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Proposal

Motivation

Sustainability is a growing concern amongst every nation, and many moves are being made around the globe to address the issue of sustainable development. A prime example we can see of the direction the world is moving in is the UN's Sustainable Development Goals. There is a determined effort to encourage (and soon, enforce) better, more sustainable practices amongst every developmental industry, yet the technology industry seems to be behind the times.

There are currently a major lack in resources on how to be a sustainable developer, never-mind tracking progress in synchronicity with your team. There is also a real lack in the visibility for a developer as part of an organization to see the kind of sustainable efforts that are being made by their product, as well as higher ups not having a way of knowing what certain teams are producing. This growing concern calls a need for a tool to bridge the gap, and hold sustainable accountability at every level of an organization involving software development.

Aims

This project aims to address the gap in sustainability tools for the tech industry, more specifically the issue with accountability for sustainable development practices going right down to the developer. Every member in a software development team should be able to use my app to track their own sustainable practices, to contribute to a larger team report, and to view their teams progress with each report. The app should be built in a way that fits into the industry standard agile practice. It should offer suggestions on sustainability goals that the team should try to meet, as well as offer information and resources on how to meet those goals.

Progress

- Completed a lot of research into sustainability practices in software development and produced comprehensive reviews on each of the sustainability dimensions (technical, environmental, economic, social, individual)
- Planned and designed my app (both backend and frontend) using er-diagrams, user stories, site-maps, lo-fi wireframes on paper and detailed wireframes on Figma
- Created a React – Next.js app and implemented all of the account creation (login/signup) functionality, so that a user can join as either a developer or a scrum

master, create a 'team' for others to join, and their information is stored in the backend

- Set up my backend in firebase with both firebase auth and firestore, and linked the backend up to my react app
- Implemented the 'skeleton' code for the rest of the app once signed in – dashboard has been created with styling ready for the rest of the functionality to be input
- Have written up the questions for the reporting feature of the app based on the research I have done
- Have found multiple plugins to help calculate carbon footprint of project, looking to implement in semester 2
- Made a first draft of the abstract, introduction and literature review for my dissertation.

Problems and risks

Problems

So far, the major problem I have had is that there is not a huge amount of research on the subject, so I have been slightly limited when it comes to researching the topic. I have also struggled to find concrete ways to calculate an exact carbon footprint of a teams software product, as there are many extraneous factors which contribute to a carbon footprint which cannot be gathered from a simple report being filled out

I also had an issue this semester with the scope of the project. I found that, since the topic is so broad, I felt I could not narrow it down and was therefore having trouble with limiting the scope of the app to a reasonable size for a dissertation project.

Unfortunately there is not much I can do to resolve the issue with research, however the few papers I have found which relate to the topic have been very helpful. I have also found an API (climatiq) which can help me with calculating carbon footprints – the caveat to this is that I will have to make some assumptions with the teams knowledge of their exact energy consumption. This cannot be helped, and I hope that it becomes clear in my dissertation that the scope of the project simply would not allow for the time spent on finding and implementing ways to harvest this data about a teams project through the app – if not only for privacy reasons.

About the scope issue – I have tried to combat this by cutting out certain parts of the initial design which I thought were not as important, by using the MOSCOW model of prioritization and my user stories.

Risks

Time will be my biggest risk for this project, as there is a lot of implementation to go ahead. I also am worried about implementing the climatiq API into my app, as a lot of the

calculations I plan to do depend on it. I will be structuring my project time a lot more this semester, so this hopefully should be fine.

Plan

- January
 - 2 weeks – implement dashboard sustainability dimensions pages (this will be the resources in which teams can refer back to when trying to reach sustainable goals)
 - 1 week – implement user settings and team settings as well as profile personalisation
 - 1 week – implement questionnaire for report
- February
 - 1 week – link questionnaire up to backend
 - 1 week – implement climatiq API to calculate carbon footprint of team
 - 2 weeks – implement issue tracker for teams (and finish climatiq api if not done already)
- March
 - 1 week – finalise styling for app, fix any bugs with reports or issue tracker
 - 2 weeks – buffer of time to finish up implementation if necessary but mainly work on dissertation, aim to have dissertation draft done by march 15
 - 1 week – pure dissertation work
- April
 - Work on diss until deadline