Software Greengineer

Empower the people who shape the digital world day by day

Challenge Collaborator: Who is behind this challenge

Susanne Grohs-von Reichenbach - Think Digital Green, founder, digital business innovator, expert for storytelling
Eslam Shoaala – Workday GmbH - Software engineer, M.Sc Politics and Technology

Introduction

Digital data waste refers to the unnecessary or redundant digital data that is stored, processed, and transmitted across digital platforms and systems. This can include data that is outdated, irrelevant, duplicated, or simply not useful anymore. Every two years, the amount of data stored doubles and we will not see a change for that in the near future.

Digital data waste can lead to several negative consequences, such as increased storage costs, decreased system performance, and potential security risks. In addition, storing unnecessary data can contribute to higher energy consumption, as it requires additional computing power to process and store data. This implies: Digital data waste causes an unnecessary carbon footprint!

To address digital data waste, organizations can implement data management policies and practices that prioritize the effective use of data, including regular data audits and the development of data retention policies. By eliminating or archiving data that is no longer needed, organizations can reduce storage costs and improve system performance, while also mitigating potential security risks. Furthermore, by reducing the amount of unnecessary data that is stored and processed, organizations can decrease their carbon footprint and contribute to a more sustainable digital ecosystem.

Problem Definition

The software industry has had a profound impact on the world, revolutionizing communication, enabling new industries such as e-commerce, improving healthcare, enhancing transportation, and driving innovation. However, it is important to recognize that within software companies, the term "digital footprint" is not commonly used by software creators who are focused on making their solutions more robust and secure on a day-to-day basis.

To delve deeper into the world of software manufacturing, "good" software is defined by characteristics such as functionality, usability, performance, scalability, security, maintainability, computability, and support. However, there is a growing need to consider the environmental impact of software products during the software development cycle, particularly in relation to carbon emissions.

Therefore, it is imperative to raise awareness among software engineers about the importance of reducing digital waste and considering the environmental impact of software products. The concept of a "digital footprint" should become a more widely recognized term in the software industry, prompting more sustainable practices and greater consideration for the planet during software development.

This need is even urgent as universities only start to integrate this aspect in their curricula. Eslam's observation: "During my education, it never played a role. Preparing this challenge, I discussed the digital waste-topic in my software community. Nobody had been asked in his or her working place to go green."

What is the waste challenge

Digitalization is a huge thing. If the internet were a nation, It's energy consumption would be on the 6th place! How could we ensure avoid digital waste and useless spent energy while going through this transformation? Educating the software manufacturers about these practices would definitely have a positive impact on reducing the digital footprint.

- The amount of tech companies increase every year. Which steps could be taken to understand, reduce, avoid, or even recycle data in daily professional life? Think e.g., of digital decluttering, digital clean-ups, using digital services with the mindset of reducing data transfer.
- Identify the waste created during the software development processes by shadowing software engineers during their day-to-day job. By learning from the practical side and come with a process where shift left should be discussed or tried out.
- Bringing software industry to a new level that could be described in a framework in the form of the mock-up of app or a short video or a manifesto. Feel free to chose other suitable tools.

Skills needed/recommended

Open for everyone! And especially non-software engineers! This is not a technical challenge, but we need fresh eyes to show options to engineers how to do their job more sustainably.

Relevant considerations for the challenge / theme:

You will get guidance and support by your mentors on:

- getting a quick overview on the link between energy consumption of software, the lifecycle of software and existing activities to reduce digital waste in general (Eslam).
- take the opportunity to visit Eslam at his workplace. Shadow him and identify improvements to his day to day work as a greengineer. See how to use the learnings and apply them to all software engineers around the globe.
- Susanne will mainly assist you as a coach when it comes to communicating your solution(s.). How to convey the key points in a story, in a gripping and convincing way?
- As we know that digitalization, numbers, units of greenhouse gas and electricity are really abstract stuff, it will be helpful that you love to awake the recipients heart and mind by using storytelling and showing how your approach will be a change to the professional life of a software engineer.
- Furthermore, you can inspire yourselves or even base your concept on the work from the students who won the first Euroteq collider 2022 on the TUM level with their project: "DIGITAL WASTE. zip.Digital. "We are committed to compress your digital footprint." (with Susanne as mentor). They will be happy to learn that you refer to their work and carry on greening our digital world. :-) The presentation and the report on the project will be available on request.

Relevant links

1. Corporate Digital Responsiblity: CDR - framework is the organisational policy of assuming responsibility in the age of digital transformation. In Sept. 23, for organizations there will be an open data-clean-up-project to reduce digital waste for the second time. For materials etc. reach out to De. Sara Elisa Kettner, CDR-Initiative. s.e.kettner@cdr-initiative.de What is CDR about https://cdr-initiative.de/en/kodex (no.9)

2. Projekt on the UN-level: Summit for the Future/SDGs in 2024 In 2024, the UN will host a global "Summit for the Future". UN-Secretary-General António Guterres has proposed, to use this gathering of world leaders to adopt a "Global Digital Compact" (GDC). The GDC is aimed to give governments and non-state actors from civil society, the private sector, academia and the technical community some guidelines how to move into the future of cyberspace. https://dgvn.de/aktivitaeten/einzelansicht/paving-the-way-into-the-future-of-cyberspace-the-un-project-of-a-global-digital-compact

3. Energieverbrauch von Software - Overview of some deceisive criteria (German) https://blog.oeko.de/energieverbrauch-von-software-eine-anleitung-zum-selbermessen/

4. The Green Software Foundation
   a. offers a training to many roles being in the software managing topic. Reach out for learning what fields are adressed: https://learn.greensoftware.foundation
   b. Podcast: Calculating Software Emissions with Navveen Balani & Srini Rakhunathan: Calculating Software Emissions with Navveen Balani & Srini Rakhunathan https://podcast.greensoftware.foundation/e/mn43klv8-the-week-in-green-software-calculating-software-emissions-with-navveen-balani-srini-rakhunathan

5. Die Ressourcen-Verschwendung steckt in der Software. Dr. Stefan Kruijer, Bits&Bäume-Konferenz Oktober 2022
   https://media.ccc.de/v/bitsundbaeume-19215-die-ressourcen-verschwendung-steckt-in-der-software#t=29

6. Current project oft the Umweltbundesamt (until 6/23): SoftAWARE: Software Architektur-Werkzeuge für energieeffiziente und ressourcenschonende Entwicklung https://www.umweltbundesamt.de/themen/digitalisierung/gruene-informationstechnik-green-it/software/energie-ressourceneffiziente-softwareprogrammierung

7. Green Coding - Measuring energy use of arbitrary applications and software stacks (EN)

8. https://media.ccc.de/v/bitsundbaeume-19349-green-coding-measuring-energy-use-of-arbitrary-applications-and-software-stacks-en- by Arne Tarara