Dockerized WebTool for the Impact Framework

Product Vision and Architecture Document

**Version History**

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| ***Version*** | ***Date*** | ***Authors*** | ***Comments*** |
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# Purpose and scope of the document

*describes the purpose and scope of the document, its intended audience, the approach followed to elaborate this document (e.g. what method was used, who was consulted) and the status of the document.*

# Product Vision and Requirements

## Business Goals

*Describes the main business goals, business drivers, and constraints for the product.*

|  |  |
| --- | --- |
| User-friendliness | A user-friendly application with UI that implemented based on IF. |
| Data visualisation | Display visualised data, giving straightforward feedback information for environmental impacts based on the given model/parameters. |
| Data Comparison and optimizable suggestions | Allows user to compare energy consumption/environmental impact between different configurations and provide visualized data (as previous one described). In case that optimizable options are found, provide config optimization suggestions. |
| Accessibility to non-technical background users | Omitting all technical details behind the app, allows users with non-technical background been able to understand everything in the app. |
| Manifest file generation | Allows user to import/export manifest files and editing its components (like graph or other properties) in an specific editor. |
| Focus on UI/UX design | UI design should be intuitive, self-descriptive, no extra training should be needed to use this app. Fluent interaction and aesthetic interface is always an essential to help improve UX. |
| Performance optimisation | The app should have some optimization mechanism when processing batch of tasks. (e.g. comparison between multiple configuration/scenarios) |
| Comparison and Optimisation | Develop a simple but powerful comparison feature that allows users to assess and optimize different software configurations quickly. This includes the ability to analyze and visualize the environmental impact metrics to make informed decisions. |
| Integration with Existing Tool | Ensure seamless integration with the IF tool |
| Deployability | make it dockerized and ensure that it can be deployed without difficulty from any platform |
| Enhance the accuracy of Impact Calculation | It is crucial to improve the accuracy of the simulations and calculations of IF to reflect the environmental impact of software truthfully. |
| Real-time monitoring | IF should be able to provide real-time feedback on the carbon footprint of the software for the ease of adjustments. Consider using equivalent data conversion/real-life examples to give users a more concrete idea of environmental impact (e.g. how many tons of CO2 emission, how many trees you saved) |
| Collaborate with environmental, educational and governmental organisation | In order to expand the user base, the software could be adapated to cater the needs, and adhere to the requirements of larger organisations. |
| Enhance data security | Since IF would require to scan user’s device, privacy and data security could be the concern of the user, especially for larger organisations such as private company or government agencies. |
| Automatic Model Management | Import or install the correct model from the repository where manifest file specified. Users should not need to manually download and import the model. |
| i18n (Internationalisation/Localisation) | In terms of calculating the impact on environment, it is important to note that the carbon footprint per kWh of electricity in each region/country is different. Thus it is important to adjust it accordingly. Multi-language support  1. Layout support for RTL languages (e.g. Arabic, Hebrew) 2. Unit conversion |
| a11y (Accessibility) | a11y related functions (e.g. screen reader support) |
| 【Optional】Improve user stickiness /Cultivate the habit of using IF (Feedback Loop) | a11y related functions (e.g. screen reader support) |
| 【Optional】  Automated Parameter Adjustment | Automate the adjustment of key parameters based on environmental impact goals so that the users don’t have to manually tweak settings, making the process more efficient and less error-prone. |
| 【Optional】  Incentivisation Mechanism | Implement award features that incentivise users to adopt environmentally friendly software practices. This could include gamification elements,and achievement badges |

## Stakeholders

*Describes the main stakeholders and their interests.*

The IF web tool has the following stakeholders.

| **Stakeholder** | **Concerns, wishes and expectations related to the project** |
| --- | --- |
| Anyone involved in software develop & deploy process | * They will use the tool to assess and optimize the environmental impacts of their applications and also compare different configurations of their app to find the most optimized one. |
| Green Software Foundation | * GSF may concerns the development and operation costs, reputation and strategic objectives. GSF may expect that the tool can be adopted widely and make a significant impact on reducing the software emissions. |
| End users | * End users may indirectly benefit from more environmentally conscious software development practices. |
| NGO | * Want to ensure that the tool would have a meaningful impact. * Seek to raise public awareness of the environment. |
| Environmental Engineers / Researchers | * They will analyse the data based on the result generated by the tool. |
| National and local government politicians | * Want the tool ready before next election. * Use data and insights gained from the tool to make policy and regulatory standards related to environmental sustainability. |
| UCL Team | * Develop and implement user-friendly solutions to help users simulate, measure, and monitor the impact of their software on the environment. |
| Large corporations | * They might use the environmental impact of their software as a selling point. * Trying to increase a profit by reducing energy consumption. |
| General Public | * More sustainable software can be used, reducing the impact on the environment. |
| Future Generations | * Want living in a better, safer place that doesn't waste resources. |

## The Product Context

*Context diagram describing the world in which the system operates and the interactions of the system with users and other systems.*

## Overview of Requirements

*A summary of the main architecturally significant functional and quality requirements for the system.*

*Do not include detailed requirements - if you have detailed requirements such as gherkin scenarios you can present them in an appendix, or better in an online repository with a link.*

*Section 2 can include additional subsections relevant to the business analysis of the system under study, for example a domain conceptual model, description of workflows, domain scenarios, a risk analysis, reference to standards, analysis of competitors, technology opportunities, etc.*

# Product Architecture

*The structure of this section may vary from group to group.*

*We expect all reports to include:*

* *a functional view of the system with clear description of functional elements, their responsibilities and interfaces;*
* *a deployment view if the system is composed of multiple nodes*
* *a discussion of how the architecture supports all important system qualities outlined in Section 2.4.*
* *a discussion of trade-offs and key architectural decisions*

*The section can include other architectural views that are relevant to describe the system and rationale for important architectural decisions.*

*You can select sections from Nick Rozanski and Eoin Woods' architecture description template, available on Moodle, that are appropriate for the analysis of your systems. You can also take sections from the structure of design documents at Google, also available from the course Moodle page.*

*See the marking sheet for information to include in this section.*

# Development and Evaluation Plan

*This section will define your development and evaluation plans for the term 2 project. How will you split the term 2 project into small increments? How will you test and evaluate the success of your project?*

*What you intended to develop in term 2 may be a subset of the requirements and architecture components defined in the previous section. This subset must be a self-contained product. Make sure your description of your development plan is consistent with and make clear references to requirements and architecture elements in the previous sections.*