

Framework for Tool Examination in Interdisciplinary Collaboration

Testing the Effectiveness of Software Toolchains in a Complex Development Environment.

Student



Rafael James Novotny

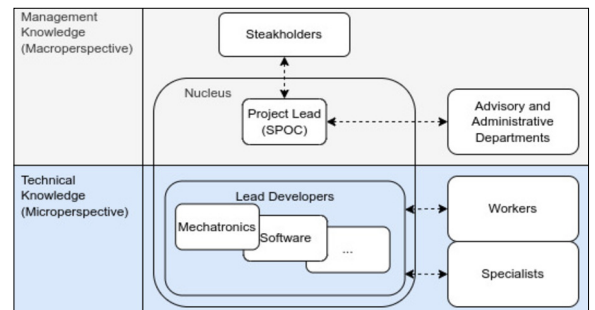
Introduction: This project aims to build a testing framework for examining a set of applications (toolchain) and to quickly determine how suitable they are for:

1. Remote communication
 2. Use on different devices
 3. Changing project participants
 4. Keeping track of contributions and know-how
- To ensure comparability, the framework consists of a communication model, development process and a task, all of which should be scalable. A small experiment should take place, using a toolchain of choice, to discover any shortcomings of the framework.

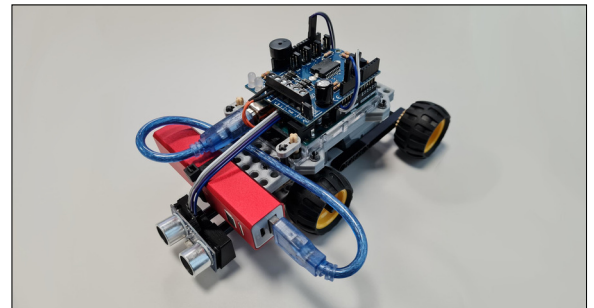
Result: To facilitate know-how retention, the project team should be organised with a core team. This idea led to the development of the Nuclear Hierarchy Model, which also accommodates a more transient work-force (e.g. outsourcing, topical use of specialists). Based on this model, and research into system engineering and product development cycles, a process was created to serve as an experimental baseline. It is not intended to be comprehensive, and may be adjusted to suit individual environments. A task, to be used in the experiment, defines the scope and requirements for the development of a product prototype. It allows for some flexibility to account for varying team dynamics and study focuses. A testing toolchain consisting of Microsoft Office 365, Innoslate, Onshape and GitLab with Gitpod was used.

Conclusion: While the experiment was a success, further research is required to more accurately determine the efficacy of the framework in testing toolchains.

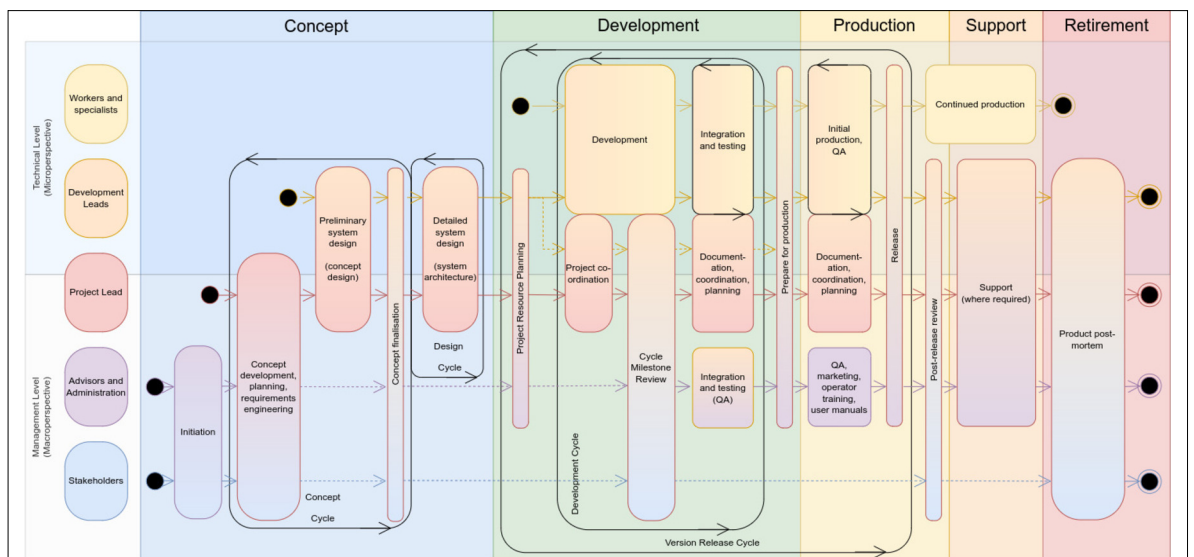
The proposed Nuclear Hierarchy Model, showing various roles and their involvement across communication levels.
Own presentation



Photograph of the prototype developed in a single 4.5-hour session using the proposed process, task and toolchain.
Courtesy of Raphael Andreas Mayer and Reto Alexander Weber



The full proposed process, separated by role and project phase.
Own presentation



Advisor
Prof. Dr. Felix Nyffenegger

Subject Area
Product Development,
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