Artificial Intelligence for Water Network Planning

Interim report

Aalto University

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1 Changes in objectives and scope

Our objective is to integrate AI into Sweco's water network engineering to streamline workflows and improve design quality. Through expert interviews with Sweco staff and software providers, we are creating a roadmap to elicit AI interest and enhance the overall employee experience.

There have been no major changes to the scope of the objective of the project. We have continued to work with the initial problem statement of five work packages (WP). Some work packages have had some content added to them, for example a theory of change framework has been added to WP5, to assess possible organizational changes by evaluating the impact of the possible outcomes and what resources are needed to achieve the goals.

WP1 is the literature review and covers the relevant technical background. WP2 contains mapping out the process through interviews with Sweco's designers and project managers and identifying potential use cases. WP3 contains software company interviews, finding suitable software tools, evaluating their suitability for water network planning and creating a mock-up style example to show case the use of an AI agent. WP4 contains assessment of possible changes within the organization, which roles or tasks might disappear or possible changes in business model. WP5 contains the roadmap

2 Changes in project plan and actions taken

Since no major changes in scope of project direction have been made, no action are necessary. However, in WP3 there are more software vendor interviews than originally planned. This possibility was already anticipated in the project plan, but the role of the interviews has become slightly more significant than originally expected.

3 Project status

This section covers the state project tasks, which ones have been completed and which are ongoing.

3.1 Completed tasks

WP1 and WP2 have almost been finished, they just need some finishing touches and a final round of commenting from the project supervisor Tuomas Raivio.

3.2 Current tasks

All work is currently focused on WP3. Two software company interviews have already been conducted, although the results have not yet been documented. A set of suitable software tools has been identified, but not yet been evaluated. In parallel, development of a mock-up style demo has begun, aimed at showcasing how an AI agent can be used to gather data for water network planning.

3.3 Future tasks

For WP3 the goal is to conduct more interviews and software tools need to be assessed based on their suitability for water network planning. Based on the WP3 results we will assess the adoption of AI in water network planning what tasks could be automated and how. The findings will be discussed in a workshop with the client. The project will continue to WP4, where we will assess the change and impact of AI adoption. Finally in WP5 we will create a roadmap containing recommendations for Sweco.

4 Updated schedule

The schedule remains largely unchanged, except that WPs 1 and 2 were not completed on time. As a result, WP3 will be delayed by approximately 2–3 weeks. Moreover, additional software vendor interviews have caused some delays. There is potential to recover some of this delay in later phases, as all group members can focus on a single work package during WP4 and WP5.

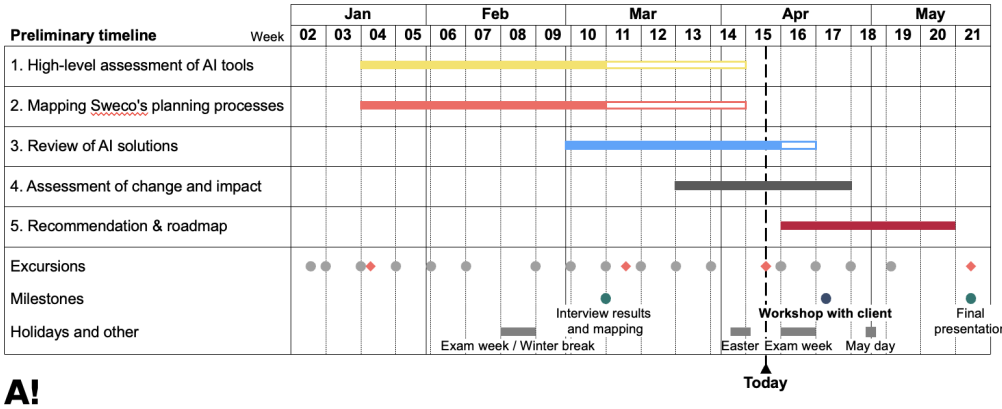

Figure 1: Updated timeline

5 Updated risk management

The goal of the project is to meet the objectives of Section 1 within the timeline specified in Section 4. The objectives are to be reached by completing the tasks in Section 3. Risks can be scenarios relating to any of the parts, either not staying in schedule or not completing the tasks well enough to meet the objectives. Specified scenarios, effects and prevention plan are detailed in Table 2. The Table also includes assessment of likelihood and impact, which have specified scales presented in Table 1.

Table 1: Likelihood and impact descriptions.

Likelyhood	**Description**
High	At least every other week
Medium	Once a month or few times during the project
Low	Once or twice during the project
Impact	**Description**
High	Project fails to deliver all the objectives or timeline is exceed by many weeks
Medium	Project fails couple of the objectives or some extension to timeline
Low	Project objectives are not fully met at the level client expects, or the timeline requires revision, but the deliverables are still on time

The risk management plan in Tables 2 and 3 remains largely unchanged. However, a new risk has been identified: cumulative delays in tasks caused by bottlenecks in the project plan, where subsequent tasks cannot begin until earlier ones have been completed.

Table 2: Risk assessment of the biggest risks.

Risk	**Effect**	**Likelihood**	**Impact**	**Prevention**
Too broad project scope	Schedule delays from increased or cumulated workload	Medium	High	Regular client alignment on objectives and scope
Limited interviewee availability	Interview delays impacting work packages 1 and 3	Low	High	Early scheduling and adequate interviewee pool
Unexpected administrative delay (e.g., late NDA requirement)	Delays to interviews and review of critical project materials	High	Low	Progressing parallel tasks while actively following up on NDA signing
Limited useful literature for first work packages	Project lacks framework and foundation, leading to client dissatisfaction	Low	Medium	Allocate time for research to identify sufficient high-quality sources
Conflicts among team due to dynamics or work preferences	Reduced motivation, compromised work quality, and potential timeline delays	Low	Medium	Early communication among team members and regular checks done by project manager to address issues proactively

Table 3: Risk assessment of the biggest risks.

Risk	**Effect**	**Likelihood**	**Impact**	**Prevention**
Inactive team members with insufficient project contribution according to their role description	Project delays, reduced team morale, increased workload for other members	Low	Medium	Clear task ownership, defined roles, regular progress tracking, and workload rebalancing
Tasks are not completed in time	This affects our ability to deliver what we planned negatively by forcing us to omit deliverables	Medium	High	Monitor the schedule and prioritize tasks and identify bottlenecks and start working on tasks that are not dependent on previous earlier tasks to maintain schedule