

Designing a Usable Inverse Transparency Dashboard

Master's Thesis

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Context

In today's information economy, data increasingly become a value in themselves. Business models and whole industries are based on utilizing data in new and innovative ways [1]. A key area of innovation are internal planning and management systems.

Work processes utilizing software tools create process data on the side. These data are only used selectively for reporting or managing. For example, a company might create insulated reports based on their issue tracking system data. It is uncommon to combine these data with other systems or integrate heterogeneous data, as the required skills and tools often do not exist within the companies themselves. Therefore, external providers for such analyses offer technical solutions to try to generate insights from the raw data.

Potential privacy and transparency issues arise from this process, though. Management and employees might therefore be wary of their data being used by a third-party provider for reporting and analytics, even if they are aggregated. For management, data security and sovereignty can be key to ensure that competitors do not get access to key information about their business. For employees, the risk of profiling without oversight by their worker's council, all while not producing direct value for them, makes these systems an unclear value proposition.

A potential solution to this challenge could be Inverse Transparency. Its core idea is that data access is enabled on a more case-by-case basis, but data usages are made visible (transparent) to data owners. The goal is to give them oversight to ideally increase their trust and willingness to share.

Company Partner: ValueWorks

This thesis is conducted in collaboration with [ValueWorks](https://www.valueworks.ai/)¹, who develop an executive management system with integrated analytics and smart insights. The student working on this will get access to their internal architecture and system design, and can work directly with key employees.

ValueWorks acts as an intermediary as described above, managing data and creating analytics insights for their customers. Therefore, they are an interesting real-world partner.

Goal

This thesis aims to bring the concept of Inverse Transparency from its theoretical state into reality, integrating it with real-world stakeholder concerns and needs. The goal is to develop a production-ready central Inverse Transparency “dashboard” or “cockpit”, similar to Google's “My Account”² or the transparency cockpit that is used in Estonia for government data [2]. The dashboard could be provided per-company (similar to Google), or centrally (similar to the approach in Estonia). Existing work and findings from the Inverse Transparency toolchain [3] will be integrated into the work, with the dashboard prototype used as a basis for the implementation.

Two main pillars are to shape the work: Real-world application (at ValueWorks), and a user focus (user experience and trustworthiness). Therefore, work is split into phases: The theoretical, the implementation, and the evaluation phase.

Theoretical phase: The state of the art in privacy cockpits and dashboards will be analyzed and an overview over exemplary systems given. In a literature survey, theoretical foundations of user experience, privacy, and transparency will be researched and discussed. In addition, the status quo at ValueWorks will be researched, summarizing the software architecture, common customer agreements, and stakeholder interests. Of special note will be the incentive structure, put in place for data owners to be more inclined to share their data, and the information security guarantees given by ValueWorks to reduce potential customer concerns.

¹<https://www.valueworks.ai/>

²<https://myaccount.google.com/>

Implementation phase: Second, the privacy dashboard will be implemented based on the researched theoretical foundations and the existing dashboard prototype. In this phase, it will be vital to regularly convene with stakeholders to make sure that their needs are addressed. Furthermore, existing work and past research on user experience and trustworthiness will be integrated to arrive at a usable and fully integrated tool.

Evaluation phase: In the final phase, the implementation will be evaluated based on hypotheses derived from the theoretical phase. The focus points of the first phase, namely the real-world applicability as well as user experience and trustworthiness, will be put to the test with stakeholders provided by ValueWorks. This empirical evaluation will comprise of a two-step mixed-methods approach. Firstly, qualitative interviews will be used to assess stakeholder perspectives on the developed solution. Stakeholders will include ValueWorks employees and customers. From these interviews, core hypotheses for a quantitative evaluation will be derived, laying the groundwork for a questionnaire-based second evaluation step. Here, potential differences between industries, an individual's role, or other factors will be carved out.

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Work Plan

1. Research related literature.
2. Analyze status quo at ValueWorks.
3. Implement a privacy dashboard based on the findings from (1) and (2).
4. Assess the implementation in a two-step mixed-methods evaluation.
5. Document the work in the thesis.

Deliverables

- Source code of the implementation.
- Transcripts or recordings of interviews.
- Results of questionnaire evaluation.
- Thesis written in conformance with TUM guidelines.

References

- [1] Porat, Marc Uri, and Michael Rogers Rubin. *The information economy: definition and measurement*. Vol. 77. No. 12. Office of Telecommunications (DOC), 1977.
- [2] Barlow, Mike and Lévy-Bencheton, Cornelia. *The smart nation where everyone owns their personal data*. SmartCitiesWorld, 24th October 2018. Online: <https://www.smartcitiesworld.net/special-reports/the-smart-nation-where-everyone-owns-their-personal-data>
- [3] Zieglmeier, Valentin, and Alexander Pretschner. "Trustworthy Transparency by Design." arXiv preprint arXiv:2103.10769 (2021). Available: <https://arxiv.org/pdf/2103.10769>