

Executive Summary

Since the European information economy faces insufficient access to and joint utilization of data, data spaces increasingly emerge in B2B environments as economical solutions. Contrarily, in B2C ambits, such concepts for systematically sharing, monetizing, and utilizing personal data have not yet prevailed, impeding growth and innovativeness. Their major pitfall is European data protection law that merely ascribes humans a need for privacy while widely neglecting their participatory claims to data. Moreover, B2C data spaces are exposed to multiple technical, ethical, and economic challenges. Evidently, there is a gap in data space research concerning design knowledge about the integration of humans with their personal data into these emerging socio-technical networks. The thesis reports on a design science research approach addressing this research problem. It proposes a reference system architecture and reflective design principles for a data space centred on self-sovereign individuals. Due to the interdisciplinarity and complexity of the research problem, an extensive analysis phase is carried out in advance to support an effective design science research endeavour. To that end, design elements of personal data markets are explored, resulting in a detailed taxonomy and the proposition of archetypes. They narrow down the broad spectrum of the research problem by curtailing a specific design configuration and providing a set of fundamental design knowledge. Successively, (meta-) requirements for this artifact (i.e., a personal data market space) are generated and supportive design principles formulated. Building upon these “auxiliary artifacts” from the upstream analysis phase, the design science research approach is carried out as the main scientific effort of the thesis. Its purpose is to iteratively build, demonstrate, and evaluate a reference system architecture for personal data market spaces. The constructed model embodies a fulcrum of granular design elements and their relationships that, cumulatively, provide an answer to the research problem outlined above. The design science research approach comprises various methods to iteratively design (i.e., structured literature review, design recovery), demonstrate (i.e., prototyping), and evaluate (i.e., informed argumentation, expert interviews, user-based field testing, scenarios) the reference system architecture. Therefrom, reflective design principles are derived, precisising the ones developed in the analysis phase. The key managerial contributions of the thesis are empirically justified and multi-dimensionally evaluated design suggestions for building human-centric data spaces using the archetypical example of personal data market spaces. Given the rather abstract nature of the reference system architecture, the artifact ensures technical feasibility, compliance with European data law, ethical defensibility, and usability by human actors. It supports developers, engineers, and product owners in actually building such networks. The design principles help managers (i.e., responsible data space operators) to identify stakeholders and communicate crucial network characteristics. Scientific contributions embody novel design knowledge about integrating humans into data spaces, considering the associated legal, ethical, economic, and technical constraints. This helps researchers to anchor their work. They can build upon the reference system architecture and the design principles to verify and extend the provided design knowledge about human-centric data spaces, thus further establishing this concept in the scientific community. The thesis extends the boundaries of data space research by shedding light on the yet hardly explored design elements entailed by the integration of humans into these auspicious socio-technical networks.