

dedicated features that allow SUs to provide effective IM support in collaborative settings with SMEs. This prototype is an extension of an earlier prototype known as PlanDigital by Hermann et al. [5].

2 Artifact Design

2.1 Version History and Implementation Choices

Throughout about two and a half years (from 10/2019 until 03/2022), three distinct versions of PlanDigital, i.e., *easily-document*, *pretty-UI*, and *better-collaborate* have been implemented (see Figure 1). All versions have been implemented and evaluated in the context of the Mittelstand 4.0 Kompetenzzentrum Lingen, an initiative that qualifies as a publicly-funded SUs. In what follows, key differences between these three versions and important design decisions are outlined. The design of *easily-document* was initiated with the objective to support documentation activities in on-site workshops with SMEs. In those workshops, the documentation of an SME's DT goals, business model, or environmental aspects has commonly preceded core IM activities. To that end, *easily-document*'s purpose was to prepare IM in SMEs by documenting these aspects digitally. The decisions for technical implementation details were mainly aimed at the rapid delivery of a usable prototype to support documentation in ongoing projects. More specifically, the Python web framework Django has been chosen, which is known to be especially helpful for rapid prototyping. To further speed up development time, *easily-document* relies on the template-system that Django provides by default. More details are depicted in [5]. In summary, *easily-document* can be considered a first working alpha-version of PlanDigital with an apparent focus on preparatory IM- and SME-related features.

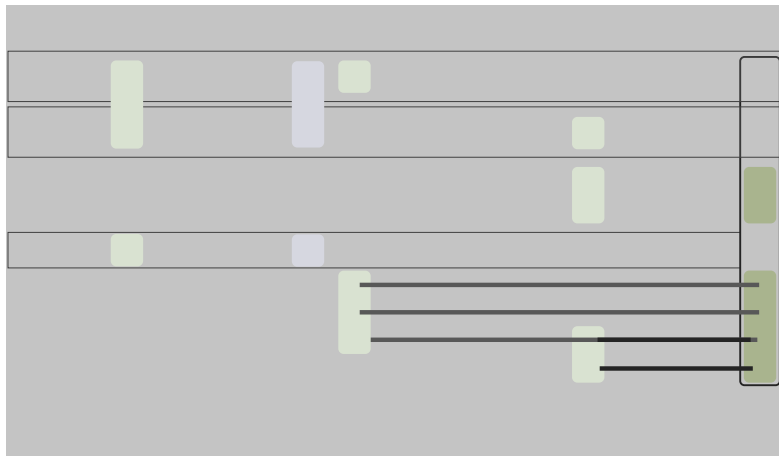


Fig. 1. Version History of *PlanDigital*.

The motivation for pretty-UI was to create a stable version that can be used in old environments [7]. Building upon easily-document the objective was to rework its frontend and add features that yet remained in the backlog. To get to a modern and responsive frontend, the Javascript library React extends the technology stack of PlanDigital. React enables the decoupling of the core Django application from its frontend and allows to design state-of-the-art User Interfaces. Characterizing for pretty-UI is a new frontend and an emergent focus on collaboration support for SMEs and SUs. Inspired by feedback from evaluation activities, better-collaborate was born. The focus of better-collaborate has been to equip PlanDigital with a comprehensive library of collaboration features. Attention has also been paid to "supporting the supporters" themselves, i.e., to also improve the daily work of SUs. In addition, the technology stack was slightly ad-

3 Significance to Practice & Research

IM and the integration of SUs are meaningful means for supporting SMEs in their DT. Yet, practice lacks IT tools that facilitate externally supported IM activities. PlanDigital provides a theoretically grounded solution for a practice-inspired problem. The proposed prototype offers a digital IM environment for SMEs and SUs that facilitates collaborations between these actors. Its feature set (see Section 2.2 and [5]) enables more efficient IM in SMEs, supports SU in their daily work, and allows governmental authorities to implement more effective DT initiatives for SMEs. The IT tool mirrors real-world workshop settings in on-site and virtual scenarios, which proved equally important throughout projects in the COVID-19 pandemic. Thus, the tool offers different pathways (e.g., wizard vs. canvas) and accounts for critical success factors of external support (e.g., Consensus Building). Last but not least, the prototype is supposed to inform and inspire software vendors to pay attention to the presented features.

Although DT in SMEs is a vivid research realm, there are only a few propositions with respect to IT support for externally supported IM. Such IT support requires a plethora of concepts from adjacent research realms to be integrated and harmonized into one system. The final version of PlanDigital, i.e., better-collaborate, marks the end of a complex design science research journey, resulting in different kinds of design knowledge that has been evaluated, among others, with the different versions of PlanDigital (see Section 2.1). The implemented IT tool is the instantiation of this prior formulated knowledge. Scholars may use the prototype to gain further knowledge about IM as well as DT in SMEs. Also, data that is collected in real-world applications of the prototype enables future re-

