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Designing an ICT tooling platform to support SME business model innovation: *Results of a first design cycle*

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Abstract

Business model innovation (BMI) is becoming increasingly relevant for enterprises as they are faced with profound changes like digitalization. While business model thinking in academia has advanced, practical tooling that supports business model innovation for small and medium sized enterprises (SMEs) is still lacking. In this paper, we design, implement and evaluate an online platform with ICT-enabled tooling that supports business model innovation by SMEs. Based on interviews with ten SMEs and SME helpers, we define requirements for the BMI tooling platform. The implemented platform offers downloadable tools, decision support for finding the proper tooling, and interactive features for building communities of SMEs. Evaluation through log data analysis and informal interviews shows that the platform is usable and provides a relevant overview of BMI tooling, although several improvements are still suggested. As next steps, we will (1) create prefilled tools and templates to speed up the process of BMI; (2) create educational videos on how to use the tooling; (3) define paths on how to move from one tool to another; and (4) enhance the community features on the

platform. The paper contributes to understanding how academic conceptualizations of BMI can be transferred into practically valuable artefacts for SMEs.

Keywords: Business Model Innovation, SME, Digital Platform, Design Science Research, ICT Tooling

1 Introduction

The topic of business model innovation (BMI) is gaining considerable attention in information systems (e.g., Osterwalder & Pigneur 2013) and management literature (e.g, Zott et al 2011). The construct of business models is typically considered as a means to explicate the value of (digital) innovations (Baden-Fuller & Haefliger, 2013; Al-Debei & Avison, 2010). While most business model research focuses on large firms, small businesses are hardly aware of BMI (Kesting & Gunzel-Jensen 2015). However, SMEs in all kinds of industries will increasingly be forced to change their business models when faced with trends like servitization, digitization and Internet-of-things or simply changing customer demands and competitive pressure.

Within Information Systems (IS), a specific area of interest is tooling to support BMI. In the community of organizational modelling, extensive ontologies, metamodels and associated tools have been developed (e.g. Roelens & Poels, 2015). However, this stream of literature is hardly concerned with how to use those tools in practice. More hands-on tooling approaches are also emerging, for instance in the work of Fritscher & Pigneur (2014). In the practitioner area, tools are being developed ranging from highly advanced (e.g. VDMBee) towards simple click-and-fill-out tools (e.g. Canvanizer). However, existing BMI tools are either limited to brainstorming tools or incomprehensible for most SMEs.

BMI tools especially designed for Small and Medium Enterprises (SMEs) are not about advanced, complexed or costly supporting environments, but about 'light', simple and easy-to-use tools. More specifically, designing BMI tools that are to be adopted by SMEs poses at least three challenges. First, since SMEs have less complex management structures, BMI tools should do more than codify and communicate strategic ideas (cf., Pateli & Giaglis 2004). Second, SMEs are typically not aware of BMI and might be reluctant to change their business logic (Kesting & Gunzel-Jenssen 2015). Third, SME managers are often less highly educated than managers in large corporations, which implies that BMI tooling has to be simple and intuitive.

Our research objective is to design and evaluate a digital self-service platform for BMI tooling aimed at SMEs. We define BMI as systemic changes in business logic of a company (or network of companies) when creating and capturing value. We conduct design science research (DSR) combined with an agile development approach in order to develop a minimum viable version

of the platform as soon as possible. This paper provides the results of a first design cycle. The artefact is evaluated through interviews with SMEs and other users of the platform. The paper is based on work done in the European Horizon2020-project ENVISION, which aims to bring BMI tooling to 200,000 European SME owners by 2018.

We follow the approach described by Verschuren and Hartog (2005) for design-oriented research. We develop requirements and specifications based on user stories that were elicited in interviews with SMEs . We develop a prototype of the artefact, and subsequently evaluate the artefact through log data analysis and informal open-end interviews. The paper is structured as follows. Section 2 provides a background on business model innovation theory as well as related work on BMI tooling in academia and practice. Section 3 develops the requirements for the BMI tooling, the platform and tooling based on interviews with ten SMEs and SME helpers (i.e. actors that advice SMEs on how to conduct BMI, such as consultants or researchers). Section 4 describes the artefact as it has been designed based on the requirements. Section 5 provides the results of the evaluation through log data analysis and informal interviews with SME helpers. Section 6 concludes the paper by discussing findings and suggesting next steps.

2 Background

Business Models (BM) as a concept are typically used to explicate how companies create and capture value from technological innovation (Chesbrough & Rosenbloom, 2002). BM has been investigated and used by many scholars and practitioners from various disciplines and contexts from IS and management to computer science and strategy (DaSilva and Trkman, 2014. This results in a wide variety of definitions (e.g., an overview is provided by Osterwalder et al, 2005; Pateli & Giaglis, 2004; Zott et al, 2011; DaSilva & Trkman, 2014). Generally speaking, the term BM refers to a description or model that represents a firm's logic to create, provide and capture value from and for its stakeholders (e.g., Bouwman et al, 2008; Chesbrough & Rosenbloom, 2002; Gordijn & Akkermans, 2001; Linder & Cantrell, 2000; Magretta, 2002). Specific models have been presented including BM Canvas (Osterwalder, 2004), the STOF model (Bouwman et al, 2008), and VISOR (ElSawy & Pereira, 2013).

More recently, scholars and practitioners acknowledge the need to shift the focus from conceptualization towards BMI and implementation, aiming to develop approaches to analyse BM viability and feasibility (Al-Debei & Avison, 2010; Bouwman et al, 2008; El-Sawy & Pereira, 2013; Teece, 2010). By Business Model Innovation (BMI) we refer to the ways organisations change their business logic from the moment that an idea is created, analysed, tested and in the end adapted to form their business model (Heikkilä et al, 2010) in parallel with technological, social, product or service innovation (Bouwman et al., 2014). Mitchell and Coles

(2004) looked at BMI best practices by interviewing several business model innovators and came up with several type of business model breakthroughs. Based on a case study, Bucherer et al. (2012) found strong similarities between product innovation and BMI suggesting that BMI research would benefit from building on the product innovation management literature.

Although scholars often argue that BMI increases performance or innovativeness of a firm, only few quantitative studies provide evidence of this link. Chesbrough (2007) argues that business model innovation can lead to sustained competitive advantage, assuming that other firms cannot replicate the business model. Zott and Amit (2007) find that SMEs can increase their market share by adopting new business models that allow recombining resources of the SME and its partners. Firms that focus on BMI have been shown to exhibit higher profit rates (Giesen et al, 2007). Aspara et al (2010) find that both developing radically new and replicating existing business models positively affects profit growth.

Several websites already offer BMI or strategy-making tools. As a starting point for the design, we developed a structured repository of over 100 online tools. For instance, fifteen websites were found that provide web-based support for developing a business model canvas. Several websites already exist that offer a collection of tools for BMI and Innovation management, e.g. DIYtoolkit or Tuzzit's Canvas library. Overall, existing tools can be categorized into five different purposes: explore new BM opportunities, design a new BM, test a new BM, plan implementation of the BM in practice, and grow an existing BM.

3 Requirements elicitation

3.1 Method

Requirements for the tooling as well as platform are derived from interviews with potential users. We interviewed SMEs with different levels of experience in BMI and BMI tooling, since this is the primary target group of the platform. As SMEs are often supported by consultants and advisors on BMI, we also interview these `SME helpers' as they possess knowledge on current practices and problems with BMI and BMI tooling. Typical SME helpers work at consultancy firms, chambers of commerce or university incubators. As we aim for a pan-European platform, we conduct interviews in Austria, Netherlands and Finland. Interviewees were sourced through the personal networks of the researchers involved (i.e. convenience sampling); however, we did strive for diversity and only included those interviews with `weak ties' to the researchers. See Table 1 for an overview.

	Organization type	**Country**	**Role description**

SME 1	Animal care provider	Austria	Innovation manager
SME 2	Coffee bar	Austria	Business manager
SME 3	Coffee bar	Austria	Business manager
SME 4	Retail firm	Netherlands	Business manager
SME helper 1	Start-up support and consultancy	Austria	Member advisory board
SME helper 2	Consultancy	Finland	Consultant to SMEs
SME helper 3	University	Netherlands	Gives BM canvas workshops to SMEs
SME helper 4	Innovation accelerator campus	Netherlands	Consultant to SMEs Manager investor funds
SME helper 5	Chamber of Commerce	Netherlands	Advisor for entrepreneurs
SME helper 6	Consultancy	Netherlands	Co-owner

Table 1: Interviewees for requirements elicitation

Given the diversity of interviewees and lack of scientific knowledge on BMI by SMEs, interviews were semi-structured. The interview protocol contained items on (1) background of interviewee; (2) past experiences and challenges with BMI and BMI tooling; and (3) expectations and desires for new BMI tooling. Interview summaries were created and fed back to interviewees for validation.

Interview analysis focused on creating user stories. User stories are often used in agile software development as a lightweight method to document expectations from users of a system. User stories typically follow the structure *`As a <type of user>, I want <some goal> so that <some reason>'.* The advantage of deriving user stories is to force designers to think from the user perspective, which is useful in our project given the highly complex and ill-understood needs of SMEs. Based on these user stories, we derive more high-level requirements for the BMI tooling and platform, which is reported in Section 3.2 and 3.3 respectively.

3.2 Requirements for BMI tooling

Interview results indicate that SMEs and SME helpers mainly use business model canvas and SWOT analysis methods as these are easy to use, conceptually simple and suitable for group brainstorming. Less frequently mentioned tools are Blue Ocean, Business capability modelling, Designtoolkit.org, Excel, Five forces, HCI Canvas, IDO toolkit, Innovation Action Plan, Lean scientist toolkit, Powerpoint, and the STOF method. Interviewees mainly use these tools to formulate strategy, design business models and derive concrete actions.

Several interviewees do not use any BMI tooling at all as they prefer working intuitively, with an implicit understanding of the market and customer environment. Some interviewees are

outright sceptical about the use of tooling, especially if web-based, as they prefer sitting down with an SME helper to ask challenging questions directly. These sceptics also argue that domain-specific knowledge about the market of the SME is crucial to giving advice, which is difficult to incorporate into generic BMI tooling.

Interview summaries were drafted and coded into user stories. Analysis of the user stories elicits the following functional requirements. BMI tools for SMEs should:

- support a structured problem analysis, market analysis and stakeholder analysis,
- be modular, applicable in a phased process, and usable in different order (instead of strictly linear),
- preferably include domain knowledge as this is at the heart of good advice,
- lead to actions, taking into account the fact that SMEs like to do things,
- provide 'prefilled' content not just empty canvasses,
- support communication, sharing and collaboration between SME and helpers at a distance,
- allow to test ideas against strategy,
- allow to do some ballpark calculations on the business case

We elicit the following non-functional requirements:

- be visual and provide structure,
- stimulate the user to explore the tool and fit with his/her ability,
- be adapted to what the user can handle,
- have very low entry barriers,
- be simple, concrete and with clear added value,
- be easy and fast to use and provide a concrete result,
- be enjoyable and pleasant, playful, game like,
- provide an easy to use front-end, (intelligence should be in the back-end)
- provide well-known tools and methods but with additional smartness (reference models, patterns, etc.) that accelerate their use and adoption,

3.3 Requirements for a BMI platform

According to the interviewees, the BMI platform should primarily help finding the proper BMI tool for a specific context. Which BMI tool to use may depend on (1) the phase of a BMI process (i.e. exploring opportunities, designing a BM, testing a BM, implementing a BM or letting an existing BM grow); (2) the complexity and time investment a user can handle; and (3) the level of experience of a user with BMI. Based on these three dimensions, three personas were defined: Anja (low experience with BMI, established firm); Tom (low experience with

BMI, start-up firm) and Liz (high experience with BMI, established firm). The goal of being able to find appropriate tooling is defined in the following requirements. The platform should allow SMEs to:

- find more information on BMI tools, i.e. a description, background, benefits, links with more information about a tool
- download information on BMI tools
- view BMI tools through search, browsing, choosing a persona or advice tailored to the SME context
- provide feedback on a BMI tool, including recommending the tool to others

As it became clear in the interviews, interaction and discussion is highly important in the process of BMI. To facilitate such interaction, a secondary aim of the BMI platform is to create an interactive community of SMEs that help each other with BMI challenges. Such interaction is also important for engaging with users, ensuring stickiness of the platform and gathering feedback on the platform and tooling. The goal of fostering interactivity and a community of SMEs is defined in the following set of requirements. The platform should allow SMEs to:

- participate in a challenge on BMI, including finding, viewing, participating in, submitting to and sharing challenges with others
- leave comments for a challenge and view comments of others
- view the location of other users
- join communities on BMI topics and network with other users
- create a log-in account through social media or dedicated login

4 Artefact description

As explained in Section 2, academic knowledge on how SMEs and BMI tooling is largely lacking. Section 3 indicated a wide range of requirements and expectations on BMI tooling, as well as a degree of scepticism about online BMI tooling in general. For these reasons, in the first design cycle we aim to develop a minimum viable product version of the artefact as soon as possible, in order to allow early testing of our requirements. To avoid spending development effort on features with uncertain added value, the first design cycle reuses existing BMI tooling and platform components as much as possible.

The artefact has been developed and implemented and can be retrieved through www.businessmakeover.eu.

4.1 BMI tooling

On the platform, fourteen tools are implemented that required the least development effort, while covering the five phases of BMI elicited in Section 2, see Table 2.

BMI phase	Purpose	Tools instantiated
Explore	Providing new insights on business and context to discover new BM opportunities	SWOT Customer analysis Porter's five forces Wheel of skills
Design	Define or redefine how business creates, captures and delivers value	Business model canvas STOF business model Business model patterns
Test	Verify and validate current or new BM	Business model stress test Business case Success factors
Implementation	Realize BM design in practice	Business plan Marketing mix
Grow	Plan how to grow business through innovation actions	Cash flow analysis Balanced scorecard

Table 2: Instantiated tools

In the first design cycle, to come up with a minimum viable product as soon as possible, tools are made available as downloadable and printable templates. Explanation about the tool is added as a text.

4.2 Platform

As explained in Section 3.3, the two main goals of the BMI platform is to enable SMEs to access relevant tooling and set off an interactive community of SMEs. To enable the latter goal, we reuse existing components from an open innovation platform.

To fulfil the requirement related to accessing relevant tooling, a `Tools' page is instantiated. This page advises the SME user what tool to use based on selecting a persona or one of the five phases of BMI. When clicking a tool, users can read a short description of the core functionality and purpose. Next, users can download a tool, find more background information or view a prefilled example for better understanding on how to work with the tool. A screenshot of the Tools page is provided in Figure 1.

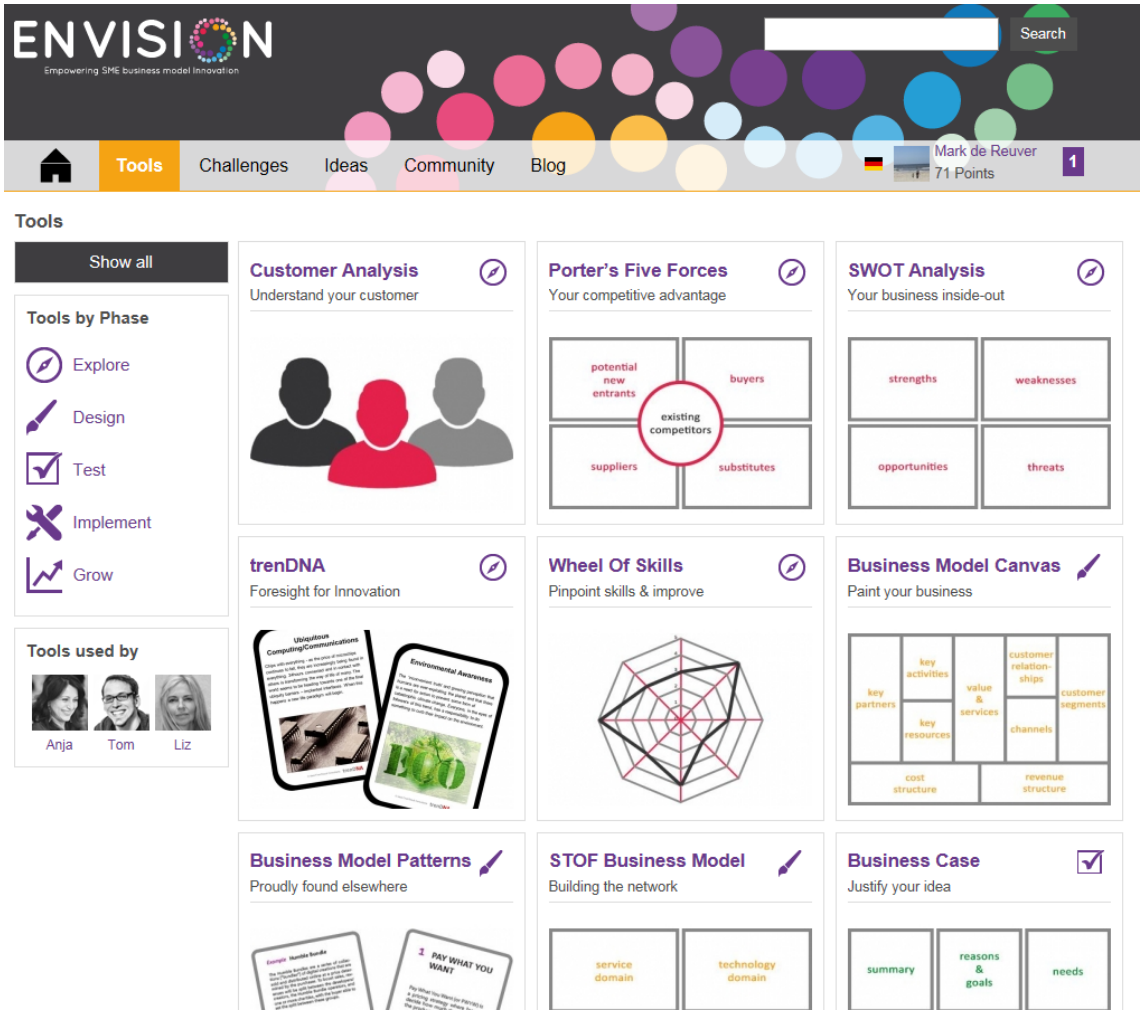

Figure 1: Screenshot of Tools page in the ENVISION platform

To fulfil the requirements related to creating an interactive community of SMEs, three pages are instantiated. On the `Challenges' page, users can find BMI problems based on actual cases, see Figure 2. Users can participate by contributing solutions to the business model problem stated in the challenge. On the `Ideas' page, users can share feedback on BMI tooling, for instance recommending what tooling they would like to use for a specific problem. On the `Community' page, users can interact with other users, find nearby users and form network ties.

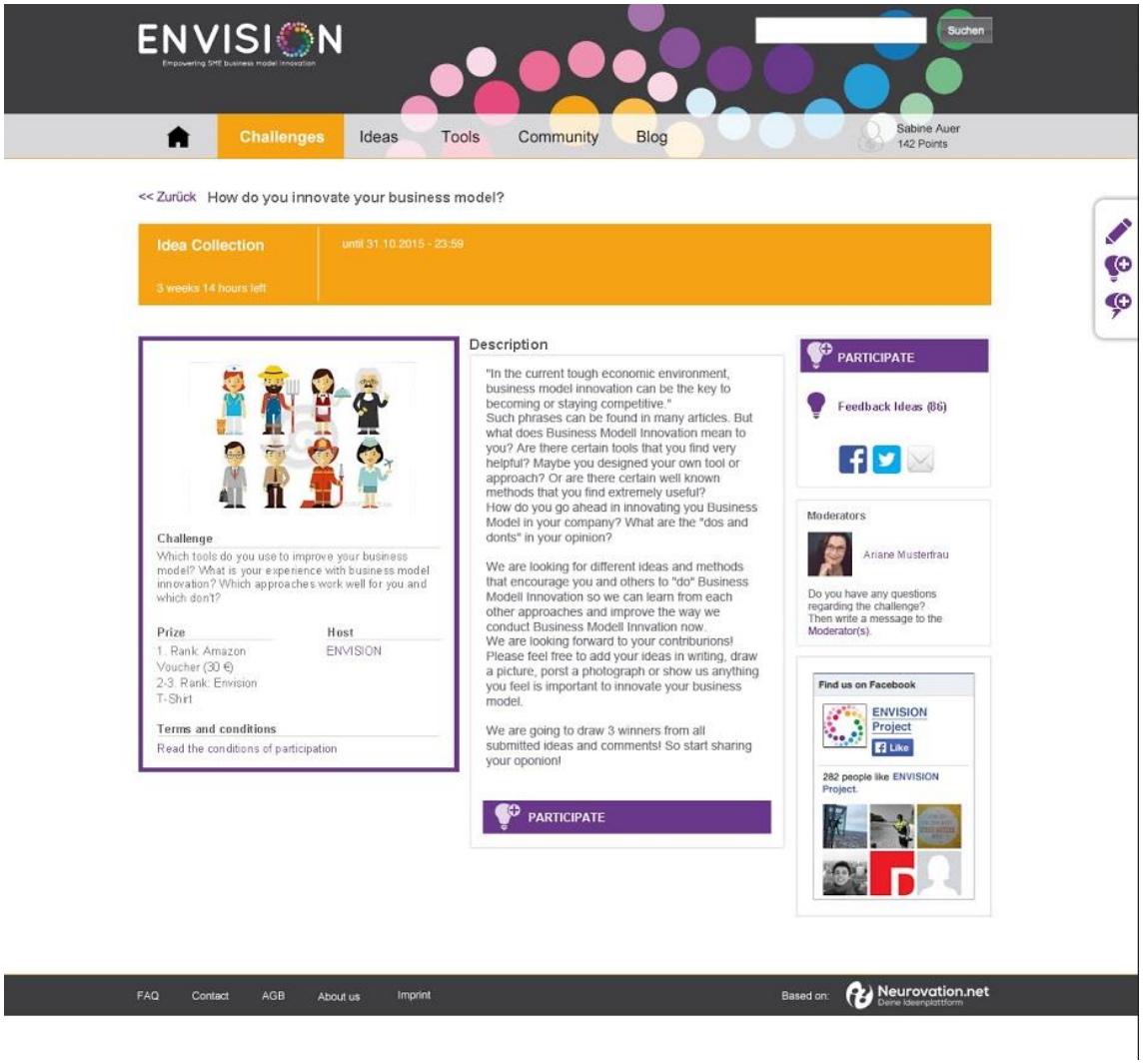

Figure 2: Screenshot of Challenges page in the ENVISION platform

Besides the core functionality, support features like “frequently asked questions”, “contact”, “terms of use”, “about us” and “legal statement” are included. A blog page provides information on events and news which is dynamically updated. The platform offers a home page, on which users can log-in, register and select a persona that is closest to their situation. Integration with social media and other channels is included, for instance users can share challenges with friends or visit the platform’s Facebook page. The platform is intended to be used on a laptop, i.e. mobile versions are not explicitly included.

5 Evaluation

The platform is evaluated through interviews with SMEs and SME helpers that have used the platform, user feedback gathered on the platform itself, and analysis of log data.

5.1 Log data analysis

The platform was launched on 10 October 2015. Between October 2015 and May 2016, 2700 unique users visited the platform with average session duration of 4 minutes and 4.6 page views per session. In total 5100 sessions were recorded, of which 47% were through a direct link, and others via Facebook, Google, a Swedish website or the project website. Visitors are largely from Austria, Netherlands, Finland and France, presumably since project participants promoted the platform to their local partners. The `Tools 'page was visited most, followed by `Challenges', `Ideas' and the blog section. Strikingly, visitors hardly used the personas to navigate through the tooling. Regarding the tooling, BM canvas and BM patterns were the most popular ones.

5.2 Informal interviews

Feedback was collected from 3 SME helpers in Austria and 2 SME helpers in the Netherlands, and was sourced through informal conversations, email and telephone.

Regarding the tooling, informants appreciated the overview of tooling. A common point of advice was to explain more clearly how to use the tooling, select the most suitable tool and proceed through the five BMI phases. Multiple informants recommended short and comprehensive video tutorials. Others advised giving more real-life or best practice examples. One informant was concerned that certain tools are too complex for SMEs to use, saying that `they already have trouble maintaining their administration on a weekly basis'. One informant was sceptical about the use of BMI tooling in general. The informant argued that an intermediary is required to discuss the business activities, give advice and take away concerns of the entrepreneur.

Regarding the platform, initial impressions from SME helpers were positive. Informants suggested additional features such as saving, printing and sharing ideas and tool preferences. Multiple informants argued the platform should be more entertaining, for instance by adding gamification elements or success stories from entrepreneurs. Enriching the contents was also a common suggestion. For instance by adding industry trends to the blog, making the challenges more real-life oriented and adding details on the business problems of the personas. Other suggestions were giving feedback on ideas submitted and cooperate with other platforms to enhance visibility.

6 Discussion and conclusions

In this paper, we designed and evaluated a BMI tooling platform for SMEs. The artefact is original as existing online BMI tools are typically not tailored to SMEs, and existing academic ontologies and tools are too complex to be used by SMEs. Our artefact is a first step towards making BMI tooling available and relevant for SMEs. The functional requirements elicited in this paper inform future design science research studies on what BMI functions to focus on.

In this paper, we provide only a preliminary evaluation of the first version of the tooling and platform. The log data analysis shows which tools are frequently used, and the expert validation with SME helpers shows that the tooling platform are considered promising. As next steps, we will conduct a summative evaluation on the tooling and platform, i.e. evaluating how usage increases innovativeness and performance of the SME. To do so, we will conduct action design research case studies on the use of the developed tooling in the future. In the case studies, we will apply BMI tooling to solve the problems of actual SMEs, and observe the long-term impacts of doing so on innovativeness and performance.

While the evaluation results of the first design cycle are encouraging, we see four main challenges for improving subsequent versions of the platform. First, SMEs typically engage with consultants or advisors to conduct BMI. A fundamental concern for any BMI tool is therefore whether and how an online platform could replace such real-life interactions, for instance because deep domain knowledge on the market conditions of SMEs are crucial. We will address this challenge in subsequent design cycles by adding prefilled BMI tools. For instance, typical answer categories may be added to a BM canvas, reference models may be displayed or BM patterns may be given. Such predefined patterns will be made domain-specific for a limited number of industries. In this way, the BMI process can be sped up to boost creativity. The next version of the platform will also include thematic communities in which SMEs can help each other in solving BMI challenges, for instance by posting challenges. We will also explore how the platform can facilitate SME helpers in their online and face-to-face interactions with SMEs.

Second, the evaluation results suggest that SMEs may still struggle using our tools in practice. We are currently preparing educational packages, including tutorial videos, to teach users how to use the tools. In addition, in a separate part of the project, a repository of BMI cases is being compiled, which will generate examples on how to apply the tools in practice. These cases may also form the bases for best practice examples in the future. Through action design research with actual SMEs, we will also deepen our knowledge on if and how our tools can be used independently by SMEs, and what kind of support is still required.

Third, the evaluation shows that SMEs may still struggle to find the right tooling for their needs and context. Our approach to have personas represent archetypical user needs was hardly adopted by users. We will address this challenge by predefining subsets of the tools common to SMEs. These subsets of tools will be linked to `I want to' statements that are derived from our BMI case repository. We also defined a metamodel to link up tooling that is instrumental in doing so. For instance, a SWOT analysis may logically link up to a BM canvas which is then used as input for a business model stress-test. However, such integrative approach raises ontological as well as technical issues such as where to store customer data and how to handle security and confidentiality.

Fourth, engaging with a community of SME users is difficult in practice. In the first cycle, we experimented with several options from an open innovation approach, such as sharing ideas, responding to challenges and building communities. In subsequent design cycle, we will explore which of these options are most valuable for engaging with SMEs. Our aim in doing so is creating thematic communities where SMEs help each other. Being able to store and share filled out canvases, working together through collaboration environment and chat functions are further options we will explore.

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