Appendices

Appendix A: DSR Project Overview

Table A1 presents an overview of the entire DSR project (Vom Brocke & Mädche, 2019).

Dimension	Our paper	Section
Problem	Lack of integration between the design and assessment of BM prevents short feedback cycles in the BM development process; particularly important for complex offerings such as smart services.	1
Input knowledge	SBMC (Zolnowski, 2015), tool-based financial projections of a BMC (Jesus & Mira da Silva, 2012), meta-model for SBMC assessment (Zolnowski et al., 2017), and design-integrated assessment (Anke, 2019).	2 and 4
Research process	(1) Derive requirements from problem statement and extend existing meta-model; (2) build artifact; (3) evaluate artifact.	3
Key concepts	SBMC; factor refinement; cost-benefit analysis; impact-effort matrix.	4
Solution description	A web-based BMDT allows the refinement of SBMC factors with assessment information based on a meta-model.	5
Output knowledge	Applicability of factor refinement as an approach for design-integrated assessment of SBMs in BMDTs; meta-model that captures design knowledge; recommendations/design knowledge for BMDT implementers.	4-7

Table A1: Overview of the DSR project

Appendix B: Think-aloud Session Details (Episode 1)

B1 Description of the real-world case – Smart service BM

The service case deals with usage-based insurance, which extends the car insurance BM through data-based elements from sensors (Desyllas & Sako, 2013). The insurer provides a vehicle tracking device that must be installed into the car. This device is connected via Bluetooth to the customer's smartphone. All necessary data are transmitted to the insurer using a dedicated application. The insurer can process data about the driving behavior to assess a specific driver's risk and adjust the premium. If the driver drives carefully, the insurer offers discounts up to 25% of the monthly premium. The more aggressively the insurant drives, the less discount he or she will get. Hence, from a customer perspective, this SBM provides an opportunity to reduce car insurance premiums. This will appeal particularly to younger customers, as it is common that they must pay higher premiums for the car insurance, because of a higher risk of inexperienced drivers. We consider this case as suitable, as it represents an innovative SBM to which many people can relate.

B2 List of tasks

1. Open the SBMC editor and explain what you see.
2. Please refine the factors using the following information:
    T1. Tracking device cost: TOMTOM LINK 100 (70€)
    T2. Access to Tomtom MyDrive Connect (5€ per user per month)
    T3. 96€ premium per month (normal premium 110€ minus 15% discount)
    T4. Number of potential customers of the group "Young Drivers" - 1.000 people in the first year
    T5. App development 100.000€ as a one-time cost
    T6. Cost for IT operation 100€ per month (as cloud service)
    T7. For insurance claims, provisions must be made in the amount of annual sales (1,152,000€). In the new UBI insurance, these are reduced by 10%
    T8. The use of the online channel is associated with a medium cost but a high impact
    T9. The activity "Tracking of driving score and risk assessment" is associated with a high level of effort but also has a high impact
3. Open the report and explain what the results mean

B3 List of participants

Parti-cipant	Category	Role	Know-ledgeable in BMC	Know-ledgeable in smart services	Duration for task processing (hh:mm)
A	Student	Master student in IS	X	X	00:20
B	Student	Master student in IS	X	X	00:21
C	Researcher	Professor of information systems	X		00:23
D	Student	Master student in IS	X	X	00:19
E	Student	Master student in IS	X	X	00:20
F	Researcher	Professor of information management	X		00:20
G	Student	Master student in IS	X		00:19
H	Researcher	PhD student on smart service innovation	X	X	00:25
I	Practitioner	IT consultant & cloud architect	X	X	00:19
J	Researcher	Assistant professor of information management	X	X	00:20
K	Practitioner	Innovation manager digital products & services	X	X	00:20

Table B1: List of participants for the think-aloud sessions

Appendix C: Applicability Survey (Episode 2)

Category	Statement	Likert scale (1=not agree to 5= fully agree)					N
		1	2	3	4	5	
Importance	The solution solves a real problem.	--	--	--	4	6	10
	The solution solves an important problem.	--	--	3	1	6	10
Accessibility	The solution is easy to understand.	--	--	--	5	5	10
	The solution is easy for me to comprehend.	--	--	--	5	5	10
Effectiveness	The solution is easy to use in practice.	--	1	4	5	--	10
	The solution provides sufficient guidance.	--	--	1	3	6	10

Table C1: Detailed results of the Applicability Survey

Appendix D: Business Model Representation Terms

Category	Definitions	Naming/terms
Canvas-based business models	• Business Model Canvas with **nine components** (e.g., value proposition, customer segments, revenue streams) and **instantiations** (or **elements**); **elements** describe **components** by using **sticky notes** (Szopinski et al., 2019) • **Elements** and relationships (Schoormann et al., 2023)	Component / Elements as instantiations
	• **Building blocks** (Ebel et al., 2016)	Building blocks
Business model ontology / meta model / conceptual framework	• Business model ontology with nine interrelated **building blocks**, or simply business model **elements**; Value Proposition is the first of the nine **elements** (Osterwalder, 2004)	Building blocks as elements
	• Nine **building blocks** (Johnson et al., 2013) • Canvas **building block**, canvas **elements** (Gottschalk et al., 2023) • Business model **elements** and **architecture** (Lambert, 2008)	Building block / Elements
	• **Components** as fundamental **constructs**; Atomic business model **elements** such as **components**, **functions**, **attributes**, or **pillars** (Pateli & Giaglis, 2004)	Elements, such as components, functions, …
	• **Adoption factors** capture criteria for ex ante analysis of business models to guide, rather than assess (Pateli & Giaglis, 2004)	Factors (for ex ante analysis)
Canvas: Service	• Nine **blocks**; **element** such as "Cost Structure" (Zolnowski, 2015)	Blocks as elements
	• Cost items and revenues: **factors** for decision making (Zolnowski et al., 2017) • **Factors** integrated into the BMC depict feasible **instantiations** of each **dimension** (Zolnowski et al., 2014)	Factors as feasible instantiations / Dimensions
	• Nine **blocks** (Simanjuntak, 2021) • **Block** of the canvas (Ojasalo & Ojasalo, 2015)	Blocks
	• Different **perspectives** (Zolnowski et al., 2014) • **Block** of the canvas, **viewpoint** (Ojasalo & Ojasalo, 2015)	Perspectives, viewpoints
Canvas: Product	• Nine **building blocks** are organised around three key **perspectives** (Hasan et al., 2025) • Business model **elements** (Fruhwirth et al., 2020)	Building blocks and elements / Perspectives
Canvas: PPS	• **Design elements** in the form of entities (Terrenghi et al., 2018)	Design elements
Visual inquiry tool	• BMC nine **elements** of the Business Model Ontology **as empty building blocks**; **nine components** (Avdiji et al., 2020)	Elements as building blocks
	• Conceptual model to describe relevant **building blocks (components**) (Avdiji et al., 2020)	Building blocks as components

Table D1: Overview of business model representation terms

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