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Performance Indicators for Business Models: The Current State of Research

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Abstract

Organizations need to evaluate new and existing business models to innovate their business logic and remain competitive. One way to carry out this evaluation is through business model performance indicators. Performance indicators for business models can support organizations in quantifying their business model objectives, monitoring business model performance during and after implementation, and benchmarking their business model against competitors. However, the current literature lacks a complete picture of performance indicators that can be used to evaluate business models and monitor their performance. Therefore, we conducted a semi-systematic literature review to analyze which performance indicators are referred to in the academic literature related to business models. We provide an overview of the current state of research on this topic and discuss possible directions for further research.

Introduction

To stay competitive in today's dynamic business environment, organizations increasingly focus on innovating the way they do business. In this regard, the business model functions as a useful conceptual tool to represent, analyze, and innovate an organization's business logic (Osterwalder, Pigneur and Tucci, 2005). As a result, the business model concept has gained increasing interest in both academia and practice (Johnson, Christensen and Kagermann, 2008; Fielt, 2014; Wirtz *et al.*, 2016; Massa, Tucci and Afuah, 2017). In this study, we consider business models as "*the design or architecture of the value creation, delivery, and capture mechanisms*" of an organization (Teece, 2010, p. 172).

Although organizations need to rethink and adapt their business model continuously, business model

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innovation is a major challenge for most organizations (Frankenberger *et al.*, 2013). They are faced with several challenges throughout the innovation process, including identifying change drivers and managing the implementation of the new business model through pilots and experimentation (Frankenberger *et al.*, 2013). To reduce uncertainty during the innovation process, organizations need to evaluate new and existing business models (Gilsing *et al.*, 2022). One possible way to carry out this evaluation is through performance measurement, for which organizations can use business model performance indicators (Heikkilä *et al.*, 2016; Gilsing *et al.*, 2021).

Performance indicators are measurable constructs that enable organizations to monitor the extent to which their objectives are fulfilled (Lebas and Euske, 2007). In the context of business models, organizations need to use performance indicators to formulate measurable objectives related to the expected performance of a new business model (Heikkilä *et al.*, 2014; Gilsing *et al.*, 2021). Moreover, organizations can use business model performance indicators to monitor the performance of an organization's business model during and after its implementation (di Valentin *et al.*, 2013) or benchmark the business model performance of the organization against that of competitors (Afuah and Tucci, 2003; Montemari, Chiucchi and Nielsen, 2019).

While existing literature focuses mainly on developing methods and frameworks for representing business models, less attention has been paid to identifying performance indicators for monitoring business model performance (Burkhart *et al.*, 2011; Nielsen *et al.*, 2018). A few studies present catalogs of performance indicators to support organizations in selecting and defining indicators for their business models. However, these catalogs mainly cater to a specific domain or context, such as electronic business (Dubosson-Torbay, Osterwalder and Pigneur, 2002) and networked organizations (Heikkilä *et al.*, 2016). To the best of our knowledge, no structured review of business model performance indicators currently exists in the literature.

The main objective of this paper is to review business model performance indicators referred to in the academic literature to depict the current state of research and discuss future research directions in this field. To fulfill this objective, we conducted a semi-systematic literature review following the guidelines of Snyder (2019) and classified the identified indicators. We contribute to the existing body of knowledge by providing an overview of performance indicators for business models and categorizing them into a catalog consisting of relevant business model dimensions. The catalog can support organizations that are in the process of selecting and concretizing performance indicators for their business models to adopt and tailor these indicators for their specific business context and needs.

The remainder of this paper is structured as follows. First, we describe the methodological approach used to identify performance indicators in the literature. Next, we present our key insights regarding the categorization and frequency of the identified indicators. Finally, we discuss the key insights about the review and present our conclusions and possible directions for further research in the last section.

Methodological approach

We conducted a semi-systematic literature review following the guidelines of Snyder (2019). Accordingly, our review process comprised four main steps: design, conduct, analyze, and structure and write (Snyder, 2019). First, we defined the objective of our review (as depicted in Section 1) and established a review protocol that all authors followed during the literature search and selection process. To find relevant studies, we specified the following search string: *"business model*" AND ("performance indicator*" OR "performance measure*" OR "performance metric*" OR "KPI*")*. We included the terms (key) performance indicator, measure, and metric in the search string as these are often used interchangeably in the literature (Neely, Gregory and Platts, 2005). In this paper, we adopt the definition of Lebas and Euske (2007) and use the term 'performance indicator', as it is most commonly used in the performance measurement literature (Neely, Gregory and Platts, 2005). In addition, we decided only to include studies that (1) adopt a non-trivial definition of business

models, in line with our interpretation as outlined in Section 1, (2) present clearly defined business model performance indicators, measures, or metrics, and (3) are published in academic venues, such as journals, conference proceedings, or academic book chapters.

We conducted our search in the following digital libraries that publish research studies on business models: Web of Science, Scopus, and AIS eLibrary. Next, we performed a title, abstract, and keyword search using the specified search string in the selected libraries. This search resulted in an initial set of 879 studies published between 1988 and December 2021. In the next step, we excluded 236 duplicates from the initial set and conducted a title, abstract, and keyword screen on the remaining studies. We excluded 423 studies based on this initial screening, after which we read the full text of the remaining 220 papers. Finally, we selected 18 studies that were relevant based on our inclusion criteria. We used Google Scholar to snowball back and forth on the selected studies, which allowed us to find an additional 13 relevant studies. As a result, our final set consists of 31 publications (15 journal articles, 12 conference papers, and 4 book chapters) that present performance indicators for business models. The initial results of this literature review have been reported in Van de Ven et al. (2022). Appendix I presents the selected publications resulting from the literature review.

Next, we performed several review iterations on the selected papers to extract and categorize the indicators. This iterative process resulted in an unstructured set of 951 performance indicators, including duplicates. When specified in the paper, we also extracted the way in which the indicators were operationalized, for example, through a qualitative question or mathematical formula. Qualitative questions are used to measure performance in a subjective way (e.g., on a Likert scale), while mathematical formulas are used to calculate performance indicators objectively based on quantitative data. 16 of the 31 selected studies did not present a clear operationalization for the proposed indicators.

In the next step, we defined the initial conceptual dimensions of the catalog. Since the Business Model Canvas (BMC) (Osterwalder and Pigneur, 2010) is the most widely used framework to represent business models in both research and practice (Massa, Tucci and Afuah, 2017), the nine building blocks of the BMC were selected as the initial catalog dimensions: Value Propositions, Customer Relationships, Customer Segments, Channels, Key Activities, Key Resources, Key Partners, Revenues Streams, and Cost Structure (Osterwalder and Pigneur, 2010). Moreover, we adopted the term 'business model pillar' (Osterwalder, Pigneur and Tucci, 2005) to describe the meta-dimensions of the catalog, and categorized the initial nine BMC dimensions into the business model pillars 'Frontstage', 'Backstage', and 'Profit Formula' (Osterwalder *et al.*, 2020). The Frontstage pillar (Osterwalder *et al.*, 2020) includes performance indicators related to the value proposition that the organization offers to its customers (i.e., products and services), the relationships that the organization establishes and maintains with customers, the different customer segments and their characteristics, and the channels used to deliver the value proposition (i.e., communication, distribution, and sales). Next, the indicators categorized in the Backstage pillar (Osterwalder *et al.*, 2020) are concerned with the performance of key activities performed by the focal organization to deliver value to the customer, the resources required to perform these activities, and the network of partners that the organization relies on. The third pillar, the Profit formula (Osterwalder *et al.*, 2020), contains indicators related to the value capture mechanisms of the business model, including its revenue streams resulting from the delivery of the value proposition, and costs associated with performing activities, acquiring resources, and collaborating with partners.

Subsequently, we iteratively categorized the identified indicators in the selected business model dimensions. In this step, we merged similar indicators and rephrased them into more general terms. Examples of two specific indicators are '(website-related) conversion rate' (Heikkilä *et al.*, 2016) and 'premium conversion rate' (Nielsen, Lund and Thomsen, 2017). These two indicators were merged into the more general indicator 'conversion rate'. The authors frequently met to align on the tentative categorization of the indicators. We discovered that several

indicators presented in the literature were related to the profitability of business models during this iterative process of categorization and synthesis. To account for profit-related indicators mentioned in the literature, we added the new dimension 'Profitability' to the Profit Formula pillar. We also identified indicators related to market performance (for example, shareholder expectations) and the environmental sustainability and societal impact of business models. We added these categories as two distinct dimensions to the catalog, 'Market' and 'Sustainability & Society', respectively, and categorized them in a new pillar called 'Environment'. The Environment pillar includes indicators related to a business model's 'contextual logic' (Lüdeke-Freund *et al.*, 2017), which refers to the larger stakeholder environment in which the business model is embedded.

During this phase, we also adapted and refined the operationalizations of the indicators. We attempted to define the operationalizations as close as possible to the original definition and context of the selected publications. If an indicator's operationalization was not provided in the original publication, we looked for appropriate definitions in the literature and discussed them to reach an agreement.

Our final step was to reorder and refine the indicators in the catalog until all authors agreed on the final form. This required several meetings until an agreement about the synthesis and categorization of the indicators was reached.

Key Insights

To analyze the business model performance indicators referred to in the academic literature, we extracted the performance indicators related to business models from selected publications and categorized them. The final catalog consists of 215 performance indicators for business models, including an operationalization for each indicator. An excerpt of the catalog is presented in Appendix II. The indicators are categorized along four pillars and 12 dimensions relevant to business models (Table 1).

Figure 1 presents the number of identified indicators per business model pillar and dimension. It shows that the majority of indicators are related to the *Profit formula* pillar of business models (73 indicators), while the *Frontstage* pillar (69 indicators) and *Backstage* pillar (51 indicators) also cover many indicators. According to these numbers, the majority of indicators in the literature are aimed at these three original pillars of the Business Model Canvas (Osterwalder *et al.*, 2020). However, we discovered only 22 indicators related to the *Environment* pillar of business models. As such, performance indicators related to the environment of business models appear to be overlooked in the current literature.

Furthermore, the number of identified performance indicators varies greatly across business model dimensions. Figure 1 shows that the Cost Structure dimension has the highest number of indicators (N=31). This number could be explained by the fact that costs are important in evaluating the business case of new business models (Turetken *et al.*, 2019) and controlling the performance of an existing business model (Wirtz, 2020). The Channel performance dimension accounts for the second-highest number of indicators, with a total of 28 performance indicators, and is part of the Frontstage pillar, which has the second-highest number of indicators. These numbers align with the argument by Wirtz et al. (2016) that an organization's customer interface design is critical to the success of a business model. At the same time, only a few indicators were discovered related to the environmental and societal context of business models (six indicators, respectively), despite the growing interest in evaluating these contextual dimensions of business model performance (Schaltegger, Hansen and Lüdeke-Freund, 2016; Lüdeke-Freund *et al.*, 2017; Turetken *et al.*, 2019; Ortuño and Dentchev, 2021).

A few performance indicators were frequently referred to in the business model literature. The most used performance indicators for business models are 'Product or service quality' (part of the Value proposition dimension) and 'Customer satisfaction' (Customer relationships dimension), which both appeared in 14 studies. The second-most used performance indicators are 'Perceived customer benefit' and 'Satisfaction of customer needs', both part of the Value proposition dimension, which were mentioned in 13 studies.

Table 1.

Business model pillars	Business model dimensions	Focus of performance indicators
Frontstage	Value proposition performance	Product and service performance, perceived customer value, price-related performance
	Customer relationship performance	Customer acquisition, customer satisfaction, and relationship-building performance
	Customer segment performance	Performance of different customer segments, customer characteristics, and behavioral performance
	Channel performance	Communication, distribution, and sales channel performance, including the performance of marketing and post-purchase customer support
Backstage	Key activity performance	Development, production, service provision performance
	Key resource performance	Performance related to physical assets, financial resources, intellectual resources, human resources
	Key partner performance	Performance of the partner network related to relationships, outsourcing, knowledge sharing
Profit formula	Revenue stream performance	Financial performance regarding sales and recurring fees
	Cost structure performance	Fixed and variable costs incurred by the company to deliver the value proposition
	Profitability performance	Value capture performance related to profit margins
Environment	Market performance	Strategic positioning and shareholder-related performance
	Sustainability & Societal performance	Environmental sustainability performance, societal impact, and non-economic environmental or societal costs and benefits

Table 1: Business model dimensions and corresponding pillars.

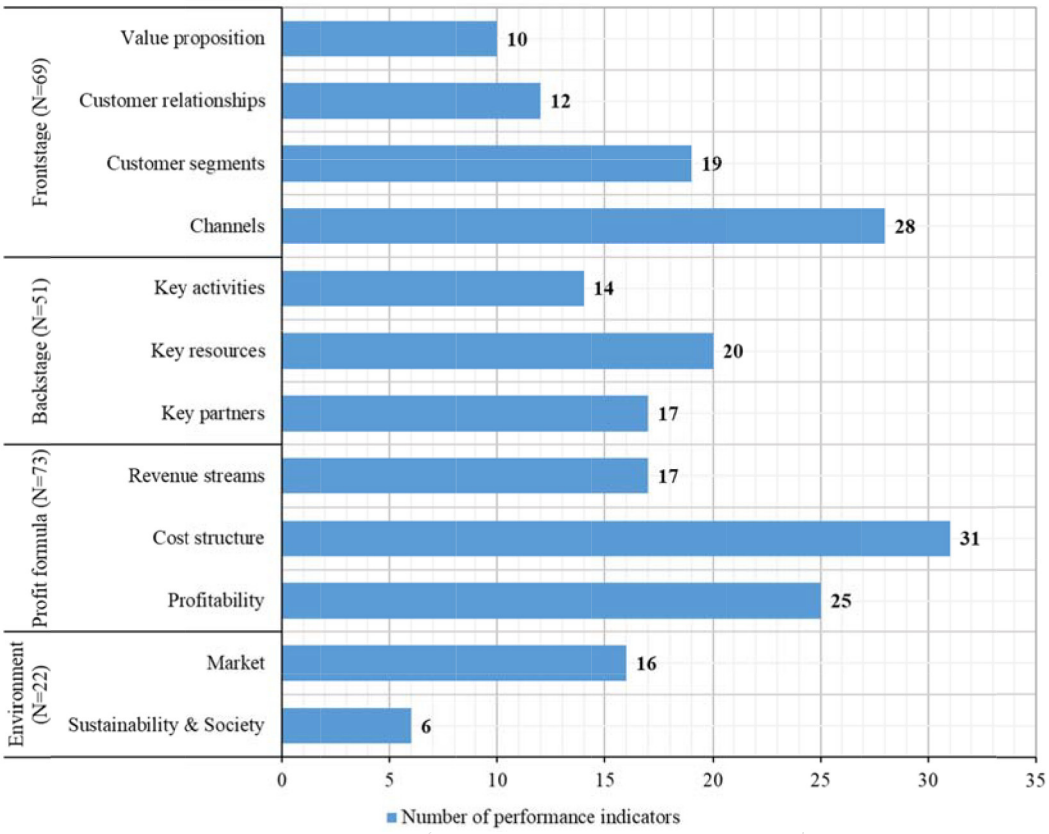

Figure 1: Number of performance indicators per business model pillar and dimension

Discussion and Conclusions

This paper reviews the academic literature to analyze the performance indicators related to business models. To this end, we conducted a semi-systematic literature review, resulting in a sample of 31 relevant studies. Based on the identified indicators in the selected literature, we developed a catalog consisting of 215 performance indicators, categorized into four business model pillars (Frontstage, Backstage, Profit formula, and Environment) and 12 dimensions relevant to business model performance (Value proposition, Customer relationships, Customer segments, Channels, Key activities, Key Resources, Key partners, Revenue streams, Cost structure, Profitability, Market, and Sustainability and Society).

A number of performance indicator catalogs for business models are presented in the literature (e.g., Dubosson-Torbay, Osterwalder and Pigneur, 2002; Heikkilä et al., 2016). However, we discovered that more than half of the identified studies in our review did not present a clear operationalization (i.e., question or formula) to measure and calculate the suggested indicators. Thus, existing research often fails to provide specific guidance for concretely measuring business model performance indicators. We aim to go beyond the state-of-the-art by providing a catalog of 215 business model performance indicators, including an operationalization for each indicator. Our research thereby responds to the multiple calls in the literature to investigate performance indicators for monitoring business model performance (Burkhart *et al.*, 2011; Nielsen *et al.*, 2018).

Business professionals who aim to select and specify performance indicators for the business models of their organization can use the catalog. The indicators can be modified to fit a particular organization and business context. The additional key contribution of our work compared to existing catalogs is that we provide an explicit operationalization for most of the indicators that can be used to measure the performance of existing or novel business models. It can serve as a starting point for selecting

indicators for each dimension of an organization's business model, which can be further concretized based on its specific context and needs.

As with any research endeavor, our work is subject to limitations. First, as the catalog developed in this study is still conceptual, future research should focus on empirically evaluating the structure of the catalog. Researchers can apply the catalog to improve and validate its applicability in different business settings. Secondly, during the review process, we found that authors of existing studies use and interpret the terms performance indicator, measure, and metric in different ways. Because we interpreted these different terms as synonyms in this study, there may have been some subjectivity involved in the process of reviewing papers and categorizing the identified indicators. We mitigated this by actively involving different authors of this paper in all research steps and by iteratively developing the categorization and synthesis of indicators.

Based on our findings, we outline several possible future research directions. First, our research showed that the Profit formula pillar of business models has received the greatest attention in terms of the number of performance indicators. The other business model pillars (i.e., Frontstage, Backstage, and Environment) need greater focus by researchers in order to identify relevant indicators and formalize their operationalizations. Second, we found that existing studies contain very few indicators dedicated to the environmental sustainability and societal performance of business models. Therefore, future research can investigate what indicators are relevant to these emerging dimensions related to the contextual logic of business models, which are quickly becoming important (Schaltegger, Hansen and Lüdeke-Freund, 2016; Lüdeke-Freund *et al.*, 2017; Turetken and Grefen, 2017; Ortuño and Dentchev, 2021). Third, researchers can evaluate the validity and utility of the catalog by conducting empirical case studies with business model professionals in various business settings. Fourth, future research can investigate how the catalog can be used during different phases of the business model innovation and management process (Wirtz, 2020; Taran, Boer and Nielsen, 2021; Lara Machado *et al.*, 2022) and how the performance indicators are possibly evolving during the development of the business model over time (Heikkilä *et al.*, 2016).

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Appendix I - Selected Publications Resulting from the Literature Review

ID	Year	Authors	Title	Source title	Type
1	2003	Afuah A., Tucci C.	Internet Business Models and Strategies	McGraw-Hill	Book chapter
2	2018	Augenstein D., Fleig C.	Towards increased business model comprehension - Principles for an advanced business model tool	ECIS 2018 Proceedings	Conference paper
3	2017	Batocchio A., Minatogawa V.L.F., Anholon R.	Proposal for a method for business model performance assessment: Toward an experimentation tool for business model innovation	Journal of Technology Management and Innovation	Article
4	2003	Bouwman H.	Designing metrics for business models describing mobile services delivered by networked organizations	Workshop on concepts, metrics & visualization, at the 16th Bled Conf.	Conference paper
5	2004	Bouwman H., Van den Ham E.	Business models and e-metrics, a state of the art	E-Life after the Dot.com Bust	Book chapter
6	2012a	Di Valentin C., Emrich A., Werth D., Loos P.	Conceiving Adaptability for Business Models: A Literature-based Approach	CONF-IRM 2012 Proceedings	Conference paper
7	2012b	Di Valentin C., Werthe D., Loos P., Weiblen T.	Quantifying the Quality of Business Models	Int. Conference in Human-Oriented and Personalized Mechanisms, Technologies and Services.	Conference paper
8	2017	Díaz-Díaz, R., Muñoz, L., Péréz-Gonzalez, D.	The Business Model Evaluation Tool for Smart Cities: Application to SmartSantander Use Cases	Energies	Article

ID	Year	Authors	Title	Source title	Type
9	2002	Dubosson-Torbay M., Osterwalder A., Pigneur Y.	E-business model design, classification, and measurements	Thunderbird International Business Review	Article
10	2021	Gilsing R., Wilbik A., Grefen P., Turetken O., Ozkan B., Adali O.E., Berkers F.	Defining business model key performance indicators using intentional linguistic summaries	Software and Systems Modeling	Article
11	2010	Heikkilä J., Tyväinen P., Heikkilä, M.	Designing for performance - a technique for business model estimation	Proceedings of EBRF 2010	Conference paper
12	2016	Heikkilä M., Bouwman H., Heikkilä J., Solaimani S., Janssen W.	Business model metrics: an open repository	Information Systems and e-Business Management	Article
13	2014	Heikkilä M., Solaimani S., Soudunsari A., Hakanen M., Kuivaniemi L., Suoranta M.	Performance estimation of networked business models: case study on a Finnish eHealth Service Project	Journal of Business Models	Article
14	2008	Johnson M.W., Christensen C.M., Kagermann H.	Reinventing Your Business Model	Harvard Business Review	Article
15	2013	Kastalli I.V., Van Looy B., Neely A.	Steering manufacturing firms towards service business model innovation	California Management Review	Article
16	2007	Khoshalhan F., Kaldi A.	Skills brokerage performance measurement through BSC	Int. Conf. on Computer and Information Technology	Conference paper
17	2010	Kijl B., Boersma, D.	Developing a business model engineering & experimentation tool–the quest for scalable 'lollapalooza confluence patterns'	AMCIS 2010 Proceedings	Conference paper

ID	Year	Authors	Title	Source title	Type
18	2021	Kostin, K.B., Steinbiss, K., Petrinovic, O.	Determining the KPIs of the German engineering industry based on the evaluation of contemporary business models	Strategic Management	Article
19	2016	Kriegel J., Auinger K., Reckwitz L., Schmitt-Rüth S., Weissenberger S., Tuttle-Weidinger L.	AAL service performance measurement cube - key criteria for AAL new service development	Proceedings of eHealth2016	Conference paper
20	2017	Lüdeke-Freund, F., Freudenreich, B., Saviuc, I., Schaltegger, S., Stock, M.	Sustainability-Oriented Business Model Assessment—A Conceptual Foundation	Analytics, Innovation, and Excellence-Driven Enterprise Sustainability	Book chapter
21	2020	Minatogawa V.L.F., Franco M.M.V., Rampasso I.S., Anholon R., Quadros R., Durán O., Batocchio A.	Operationalizing business model innovation through big data analytics for sustainable organizations	Sustainability	Article
22	2019	Montemari, M., Chiucchi, M.S., Nielsen, C.	Designing Performance Measurement Systems Using Business Models	Journal of Business Models	Article
23	2018	Mourtzis D., Papatheodorou A.-M., Fotia S.	Development of a key performance indicator assessment methodology and software tool for product-service system evaluation and decision-making support	Journal of Computing and Information Science in Engineering	Article
24	2017	Nielsen C., Lund M., Thomsen P.	Killing the balanced scorecard to improve internal disclosure	Journal of Intellectual Capital	Article

ID	Year	Authors	Title	Source title	Type
25	2001	Palanisamy, R.	Evolving internet business model for electronic commerce using flexible systems methodology	Global Journal of Flexible Systems Management	Article
26	2015	Rodríguez-Rodríguez R., Alfaro-Saiz J.-J., Verdecho M.-J.	A performance-based scenario methodology to assess collaborative networks business model dynamicity	Working Conference on Virtual Enterprises	Conference paper
27	2022	Stalmachova K., Chinoracky R., Strenitzerova M.	Changes in Business Models Caused by Digital Transformation and the COVID-19 Pandemic and Possibilities of Their Measurement—Case Study	Sustainability	Article
28	2021	Udo Y., Ishino Y.	Two-Stage Lean Startup Model for Subscription Business	KES International Conference	Conference paper
29	2020	Wirtz B.W.	Business model management: Design - instruments - success factors	Springer	Book chapter
30	2014	Yu C.-C.	Developing value-centric business models for mobile government	EGOV 2014	Conference paper
31	2006	Yu C.-C.	A hybrid modeling approach for strategy optimization of E-business values	BLED 2006 Proceedings	Conference paper

Appendix II - Catalog of performance indicators for business models (excerpt)

Business model pillars	Business model dimensions	Performance indicators	Operationalization
Frontstage	Value proposition	Perceived customer benefit	Extent to which the product or service is better than current alternatives of competitors (qualitative scale from high to low) which can be measured based on various dimensions (e.g., security, protection of privacy, skills or learning provided, comfort, ease of use of the service, brand image, trust) and scales (e.g., Customer Effort Score, CSE)
		Satisfaction of customer needs	• Extent to which the product or service meets the requirements or needs of the customer (qualitative scale from high to low) • Number of customer requirements satisfied divided by total number of requirements requested by the customer (e.g., performance according to service-level agreement) • Number of additional and value added services offered on top of the main product or service offering
		Product diversification	• Number of different products or services, • Number of different product or service categories • Percentage of specific type of products (e.g., fresh products) of total product portfolio
	Customer relationships	Conversion rate	Number of conversions of free customers to paying customers divided by total number of interactions per time period
		Customer satisfaction	• Customer Satisfaction Index (CSI) • Satisfaction barometer

Business model pillars	Business model dimensions	Performance indicators	Operationalization
Frontstage	Customer relationships	Recommendation ratio or willingness to refer	• Net Promotor Score (NPS) (i.e., willingness of customers to recommend the service to their friends) • Number of referrals divided by total number of customers per time period
	Customer segments	Profitable customers	Number of customers that are profitable divided by total number of customers
		Online customers	Number of customers who order products or service online / Total number of customers
		Average order size or customer expenditure	• Average amount of money a customer spends in one transaction • Average amount spend by a customer per purchase multiplied by the purchase frequency over a certain time period
	Channels	Website performance	• Average number of page-views over a certain time period • Number of click-throughs on the website divided by the number of times the website is shown to the customer • Ease of finding and navigating through the website (qualitative scale from high to low) • Average time to load a web page • Maximum number of users logged in at the same time on the website
		On-time delivery	• Number of on-time deliveries divided by total number of deliveries • Percentage of late deliveries

Business model pillars	Business model dimensions	Performance indicators	Operationalization
Frontstage	Channels	Sales performance	• Number of companies contacted by the commercial department over a certain time period • Number of deals closed with companies by the commercial department over a certain time period • Time to first proposal • Average sales per sales person (monetary value) • Number of sales orders received but not completed yet)
Backstage	Key activities	Process throughput	Number of completed cases per time period (e.g., customer complaints)
		Product or service development speed or time-to-market	• Average time from idea to prototype (i.e., development time of new product or service concept) • Time from product development to product or service placement on the market (i.e., product or service launch)
		Production performance	• Time to produce a single product (i.e., completion time) • Number of products that are built-to-order per time period
	Key resources	System architecture or Information Technology (IT) infrastructure performance	• 24-7 availability and downtime • Response time (e.g., API response) • Number of help desk calls per time period • Number of disaster recoveries per time period • Mean time between failures • Data security or integrity • Number of applications • Extensibility of applications • Percentage of service providers' data base visits • Percentage of cross-system collaboration (i.e., interoperability of systems)

Business model pillars	Business model dimensions	Performance indicators	Operationalization
Backstage	Key resources	Internal collaboration performance	• Number of units and departments involved in the business model • Number of organizational layers involved • Number of different roles and responsibilities
		Workforce size	• Number of employees • Number of Full-time equivalent (FTE) employed
	Key partners	Partner network control or coordination	• Type of coordination (Middle, high, none) • Centrality of specific actors in value exchange
		Vertical integration of activities	• Degree of co- or outsourcing of activities (e.g., logistics, manufacturing) • Owned activities compared to outsourced activities
		Partner collaboration and innovation	• Number of new projects started with partners per time period • Percentage of cross-unit or organizational collaboration • Improvement of the degree of collaborative innovation per time period
Profit formula	Revenue streams	Volume or value of traded goods	• Number of products and/or services sold per time period • Value per product multiplied by total number of products traded per time period"
		Sales growth	Net sales of the prior period minus net sales of the current period, divided by net sales of the prior period
		(Premium) subscription revenue	Revenue from customers through recurring (premium) fees multiplied by number of time period intervals (often regular intervals, e.g., weekly, monthly, or annually)

Business model pillars	Business model dimensions	Performance indicators	Operationalization
Profit formula	Cost structure	Personnel costs	Average costs per working hour, total salary costs
		Operating expenses (OPEX)	Direct costs of goods sold and other operating expenses over a certain period of time
		Sales and marketing expenses	• Total expenses made to market and sell products and services • Total costs of sales (e.g., distribution costs, marketing costs, wages, commissions)"
	Profitability	Return on investment (ROI)	Profit divided by total capital (i.e., efficiency of the total capital)
		Net profit margin	Revenue minus cost, divided by revenue
		Earnings Before Interest and Taxes (EBIT)	Annual net profit plus or minus taxes and interest (operating profit excluding tax and interest)
Environment	Market	Positioning	Extent to which business model is affected by competitive forces from (qualitative scale from high to low): rivalry, customers, complementors, suppliers, potential new entry, substitutes (Porter's Five Forces)
		Earnings per share (EPS)	Net income minus preferred dividends, divided by outstanding shares
		Shareholder value	Total (monetary) value delivered to the equity owners of a company due to management's ability to increase sales, earnings, and free cash flow

Business model pillars	Business model dimensions	Performance indicators	Operationalization
Environment	Sustainability & Society	Unit energy consumption	All energy consumed in a production cycle divided by production quantity
		Wastage degree	Scrap quantity divided by planned scrap quantity
		Non-economic benefits	Non-economic aspects of the business model that are beneficial to society and the environment (e.g., development goals related to knowledge development, innovation productivity, creativity, social cohesion)