Association for Information Systems

AIS Electronic Library (AISeL)

Rising like a Phoenix: Emerging from the Pandemic and Reshaping Human Endeavors with Digital Technologies ICIS 2023

IoT, Smart Cities, Services, and Government

Dec 11th, 12:00 AM

Understanding Value-based Pricing for Industrial Internet of Things

Dimitri Petrik
University of Stuttgart, dimitri.petrik@gsame.uni-stuttgart.de

Virginia Springer
University of Technology Sydney, virginia.springer@student.uts.edu.au

Gero Strobel
University Duisburg-Essen, gero.strobel@uni-due.de

Frederik Möller
TU Braunschweig, frederik.moeller@tu-braunschweig.de

Thorsten Schoormann
University of Hildesheim, thorsten.schoormann@uni-hildesheim.de

Follow this and additional works at: https://aisel.aisnet.org/icis2023

Recommended Citation

Petrik, Dimitri; Springer, Virginia; Strobel, Gero; Möller, Frederik; and Schoormann, Thorsten, "Understanding Value-based Pricing for Industrial Internet of Things" (2023). *Rising like a Phoenix: Emerging from the Pandemic and Reshaping Human Endeavors with Digital Technologies ICIS 2023*. 9.
https://aisel.aisnet.org/icis2023/iot_smartcity/iot_smartcity/9

This material is brought to you by the International Conference on Information Systems (ICIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in Rising like a Phoenix: Emerging from the Pandemic and Reshaping Human Endeavors with Digital Technologies ICIS 2023 by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

Understanding Value-based Pricing for Industrial Internet of Things

Short Paper

Dimitri Petrik
University of Stuttgart
Keplerstr. 17, 70174 Stuttgart
dimitri.petrik@bwi.uni-stuttgart.de

Virginia Springer
University of Sydney Business School
University of Sydney, Australia
virginia.springer@sydney.edu.au

Gero Strobel
University Duisburg-Essen
Universitätsstraße 9, 45141 Essen
gero.strobel@paluno.uni-due.de

Frederik Möller
TU Braunschweig/Fraunhofer ISST
Braunschweig
frederik.moeller@tu-braunschweig.de

Thorsten Schoormann
University of Hildesheim
Universitätsplatz 1, 31134 Hildesheim
thorsten.schoormann@uni-hildesheim.de

Abstract

Digital industrial platforms are increasingly implemented as an inter-organizational digital infrastructure to unlock numerous sources of value. Establishing an appropriate pricing strategy is pivotal for platform providers' success. To profit from these value sources, existing research considers value-based pricing as a superior and customer-oriented pricing strategy, enabling platform organizations to capitalize on the technological platform integration in the manufacturing domain. However, little is known about value-based pricing in the Industrial Internet of Things (IIoT) and how platform organizations understand and establish it. To advance the understanding of value-based pricing at the nexus of IIoT and digital platforms, we report on a qualitative study spanning 19 interviews with digital industrial platform providers. Our preliminary findings incorporate core characteristics, preconditions, outcomes, challenges, and guiding principles experienced by the experts, connecting the fragmented research streams on value-based pricing and digital platforms in IIoT and supporting platform organizations in crafting financially sustainable business models.

Keywords: Value-based pricing, pricing strategy, digital industrial platforms, Internet of Things

Introduction

During the last two decades, digital platforms disrupted the mechanisms of value creation in numerous domains (Parker et al. 2017). Platforms offer various advantages concerning the digitization of entire value chains and ecosystems as well as the integration of complementary services, which can ultimately lead to an increased overall value (Cennamo 2019; Pauli et al. 2021). Given their potential, we can observe a growing interest in establishing such platforms in business-to-business settings, such as the Industrial Internet of Things (IIoT), in which they act as a technological foundation and intermediary (Pauli et al. 2021; Wegner 2021). With the rising number of platforms comes greater competition for innovative third-party services (Cennamo 2019) that advances platform ecosystems. In this context, identifying and crafting pricing strategies is pivotal in building competitive and sustainable platforms (Rochet and Tirole 2006). Also, pricing is key to emerging digital platforms and their associated ecosystems wherefore an adequate

pricing strategy is essential for platform organizations to nurture value co-creation in platform ecosystems (Reuver et al. 2018). Crafting the best pricing strategy, however, is complex because platform owners have to decide which platform side to price (supply, demand, or both) (Rochet and Tirole 2006) and how the price is calculated (Parker and van Alstyne 2008).

A pricing strategy that gets more attention in research and practice is *value-based pricing*. This strategy is more customer-centric, which can lead to increased loyalty, profit margins, and perception of value (Hinterhuber 2008; Keränen et al. 2021). Despite the promising potential of value-based pricing, we found limited insights in the enterprise context at the nexus of digital platforms and IIoT, which poses three major issues. First, while prior IS literature on platforms considers pricing in platform governance (e.g., Staub et al. 2023), it offers only fragmented insights into the decisions to subsidize complementary developers (Tan et al. 2020; Yuan et al. 2022). Second, there is a need to capture the specifics of the IIoT domain, including the heterogeneity of platform users and their sensitivity toward the platform value proposition (Petrik and Herzwurm 2020; Pauli et al. 2021). Third, there is a paucity of research evidence around pricing in the context of digital platforms (Lee 2021), though the pricing strategy may involve many other price-related decisions (Lehmann et al. 2009; Saltan et al. 2021). Although other research disciplines, such as marketing, now distinguish between different pricing strategy foundations and consider value-based pricing to be superior (Hinterhuber 2008; Liozu et al. 2011), the decision situation in which platform providers apply value-based pricing to leverage industrial customers to integrate the platform has not been investigated. In accordance with the data-driven nature of platform-based IIoT applications, value-based pricing can help platform providers to differentiate their offerings from so-called hyperscalers such as Amazon Web Services or Microsoft (Mosch et al. 2023). Therefore, a coherent understanding of value-based pricing (Christen et al. 2022) and how platform providers can leverage value-based pricing in industrial settings is required. Platform providers face the challenge of making informed decisions to establish value-based pricing and capture appropriate financial value by understanding the customers' willingness to integrate and pay for the platform. Against this backdrop, it seems meaningful to continue investigating value-based pricing. To do so, this short paper reports on an ongoing interview study with representatives of IIoT platforms aiming to provide an empirically grounded conceptualization of value-based pricing for digital industrial platforms. Because of the above, we ask: *How is value-based pricing conceptualized in the context of digital industrial platforms?*

To answer this question, we report on a study spanning 19 semi-structured interviews with 27 platform pricing experts. The platform provider perspective was selected due to the competition between industrial incumbents and platform natives in the digital industrial platform market, which necessitates the development of competitive offers for their respective industrial customers and platform users. We build our insights on companies in the competitive market for digital industrial platforms and talked to experts to reflect on insights from implementing value-based pricing. Our findings cover a set of core features for value-based pricing as well as pre-conditions, guiding principles, and barriers that need to be taken into account during the operationalization of value-based pricing. In doing this, we complement existing research on pricing and value-based pricing, particularly with real-world empirical data, and determine important aspects for the specific context of IIoT. Also, we provide practical implications with a series of principles for guiding the design of value-based pricing.

Research Background: Value-based Pricing

Traditionally, research distinguishes between three foundational pricing strategies. First, cost-based pricing utilizes cost accounting data, adding a certain margin to it. Compared to other pricing foundations, it is easy to set but diminishes profitability and has been recognized as a significant reason for business model failure (Hinterhuber 2008). Second, competition-based pricing is based primarily on external market data related to competitors. While this pricing strategy enables organizations to compete on prices, it also diverts the attention of the pricing strategy away from the customers (Hinterhuber 2008; Toytäri et al. 2017). A pricing strategy focused on the competition can miss customers' needs, for example, due to functional differences in platforms that are not perfect substitutes for each other. Therefore, competition-based pricing is a recognized strategy for commodities and mature products at the end of their life cycle. This is, however, hardly the case for the still fragmented and competitive IIoT platform market (Wegner 2021). Third, value-based pricing "uses the value a product or service delivers to a predefined segment of customers as the main factor for setting prices" (Hinterhuber 2008, p. 42). A value-based strategy considers

differences in the perceived value among diverse customer segments and converts these perceptions into pricing (Nagle and Müller 2018). In the context of platforms, it builds on the value (e.g., supporting customer business) perceived by platform users and links to specific sales processes (Keränen et al. 2021). Several studies highlight the superiority of value-based pricing due to incorporating the customer perspective and the customer's willingness to pay (Ingenbleek et al. 2003; Hinterhuber 2008. In this sense, value-based pricing is also associated with signaling theory, as companies can convey a stronger customer-centric stance than rivals by adopting value-based strategies, which may help platform providers to sustain in the competitive market for digital industrial platforms (Chase and Murtha 2019; Christen et al. 2022; Wegner 2021). As a result, value-based pricing is less standardized and requires a more intense customer relationship to understand and communicate the value between organizations (Raja et al. 2020).

Despite its apparent superiority, the lack of application of value-based pricing has already been observed in the industrial context. Besides the lack of a common definition of value-based pricing (Liozu 2017), prior research has found that most problems of implementing value-based strategies lie in assessing and communicating value to industrial customers, who are more objective than consumers and usually spend only based on evident value (Hinterhuber and Liozu 2018). In addition, problems have also been identified in sensemaking and the interpretation of value-based pricing by the sales force. If, for example, the opinion becomes established in a domain that value-based pricing is difficult to implement for a certain offer, this has a negative impact on further activities to apply value-based pricing (Hinterhuber 2008; Töytäri et al. 2017).

If one adds the context of digital industrial platforms, both the complexity of pricing and the need for value-based pricing are exacerbated. In particular, digital industrial platforms exhibit characteristics of multi-sided platforms (Pauli et al. 2021) that give platform providers, compared to traditional products, room to maneuver in their pricing strategy. As mentioned above, platform providers can subsidize one side of the market to promote the growth of the user base and thus achieve added value, e.g., through network effects or pricing multiple user groups (Yuan et al. 2022). Each user group might pay differently depending on how they use the platform. For instance, smart factory operators are priced differently than complementary software developers. Research has already recognized that it makes sense to price the market side higher, which is less price-sensitive (Tan et al. 2020). Specifically, pricing strategies may vary based on managerial objectives (Hinterhuber 2004). As discussed in prior platform research, pricing can stimulate platform use and incentivize platform users to adopt digital platforms (Ceccagnoli et al. 2012; Schreieck et al. 2021), although not every platform provider can afford to endure years of negative financial performance. Hence, pricing is essential to create sustainable profitability from a platform provider perspective. However, existing empirical research indicates platformization may impede value capture (Schreieck et al. 2021). Thus, on the one hand, value-based pricing is designed to ensure that customers recognize the value and that suppliers are able to capture appropriate value, increasing the low supplier margins that are common in many cases in the industry (Toytäri et al. 2017). Especially in IIoT, information asymmetries prevail, as many industrial platform customers distrust platform providers due to the criticality of data, and function as "barricaded buyers" from the platform provider perspective (Pauli et al. 2021; Chase and Murtha 2019). On the other hand, there is no research on value-based pricing in IIoT contexts. Hence, this study is dedicated to the preliminary conceptualization of value-based pricing for such platforms, which will be described in the next sections.

Research Design

Data Collection

As pricing mechanisms are hardly visible (at least not on a large scale) on the websites of industrial B2B platforms, we identified the qualitative interview as a means to probe organizations and extract knowledge about digital pricing. This allowed us to explore digital pricing in the demarcated field of the informants' experiences. To construct a sample of relevant companies, we defined the following inclusion criteria: **(1)** the digital platform must offer B2B industrial services, **(2)** it must still be active at the time of the study, and **(3)** act as a global digital industrial platform provider. We searched for companies using established rankings (SP500 and DAX) combined with platform benchmarks (e.g., Gartner). We approached relevant informants, i.e., those who have in-depth knowledge about the pricing of digital platforms and can provide relevant information to our study (Weinstein 1993). The study was conducted in 2021 and 2022 through

digital channels, such as LinkedIn or our networks (see Table 1). All interviews were held digitally and recorded for transcription to counteract the volatility of the spoken word and human memories. If possible, each interview was held by at least two of the authors; to take additional notes. We chose to conduct semi-structured interviews to leave the informants as much freedom as possible to report on their rich experiences from the field while giving us the means to uphold the comparability of the interviews (Myers and Newman 2007). Therefore, we designed an interview guide based on the theoretical understanding of a carefully selected and studied literature sample, which comprises 156 scientific papers on digital industrial platform pricing (Myers and Newman 2007; Merton & Kendall 1946). In total, 19 interview sessions with one or more informants were held, and over 15 hours of audio material was collected (see Table 1).

No.	Company | Position	Length	No.	Company | Position	Length
1	*Alpha* |Senior Director Strategic Pricing	56 min	**11**	*Lambda* | Head of Industrial IoT Solutions & Strategic Partnerships	55 min
2	*Beta* | Senior Vice President Business Operations & Pricing	65 min	**12**	*My* |Managing Director Europe, Digital & Growth Marketing Expert	57 min
3	*Gamma* | Product manager	73 min	**13**	*Ny* | Global Digital Sales Leader, Electrification Business Digital Lead	48 min
4	*Delta* | Product manager	54 min	**14**	*Xi* | Ecosystem Director, Product Owner Digital Business Models, Senior Product Manager	62 min
5	*Epsilon* | Platform portfolio manager	47 min	**15**	*Omikron* | Digital Sales & IoT	57 min
6	*Zeta* | Consulting	63 min	**16**	*Pi* | Vice President IoT Platform	35 min
7	*Eta* | Presales expert	48 min	**17**	*Rho* | Head of Ecosystem Orchestration & Monetization	57 min
8	*Theta* |Principal Product Manager, Executive Manager Sales	57 min	**18**	*Sigma* | Head of Development, Marketing & Sales	23 min
9	*Iota* | Regional Lead Partner Ecosystem Success; Senior Strategy Consultant	66 min	**19**	*Tau* | Senior Technical Sales Manager EMEA IoT	58 min
10	*Kappa* | Vice President (Product-LED Growth)	60 min			

Table 1. List of Industrial Platform Providers in the Interview Study

Data Analysis

Next, we transcribed the data and produced short vignettes condensing the essential information (Ochs 1979). These short vignettes represent our immediate understanding of the interviews shortly after they were conducted, in which each author captured initial ideas and preliminary findings conceptually (similar to memoing, see Corbin and Strauss 1990). We followed grounded theory procedures (e.g., Wiesche et al. 2017) and first open-coded the transcripts. This had the particular advantage that each author was required to develop an in-depth understanding of the underlying and emerging constructs from the interview data. In a second step, we explored the relationship between emerging categories in more detail in axial coding and pursued a deep dive into specific categories of pricing mechanisms and the overall storyline in selective coding around the categories (Urquhart 2001). In this endeavor, our coding strategy pivoted around pricing mechanisms and the decisions and impacts (i.e., the preconditions and outcomes) they entail for industrial digital platforms. For example, we explicitly looked for information on decisions on pricing mechanisms (i.e., how to price), who pays for using the industrial platform (i.e., who to price), as well as the underlying functionality spectrum the customer acquires (i.e., what to price). Given this protocol, our research builds on existing literature on platform pricing in (at least) two-sided markets and digital platforms, following the principles of abductive discovery. During the occurring meetings, the researcher team deliberated on the findings gained from the transcripts, which include real-word phenomena, and provide new concepts to the existing literature on value-based pricing. During this, we progressed from initial versions to an advanced coding system outlining interlinked categories (Glaser and Strauss 1967). We structured this coding system alongside a two-order system of concepts and aggregated dimensions, following the data structure of the Gioia diagram (Gioia et al. 2013). First, we identified relevant statements from the interview transcripts, which we then coded to sub-concepts and ultimately organized in aggregated dimensions using MaxQDA.

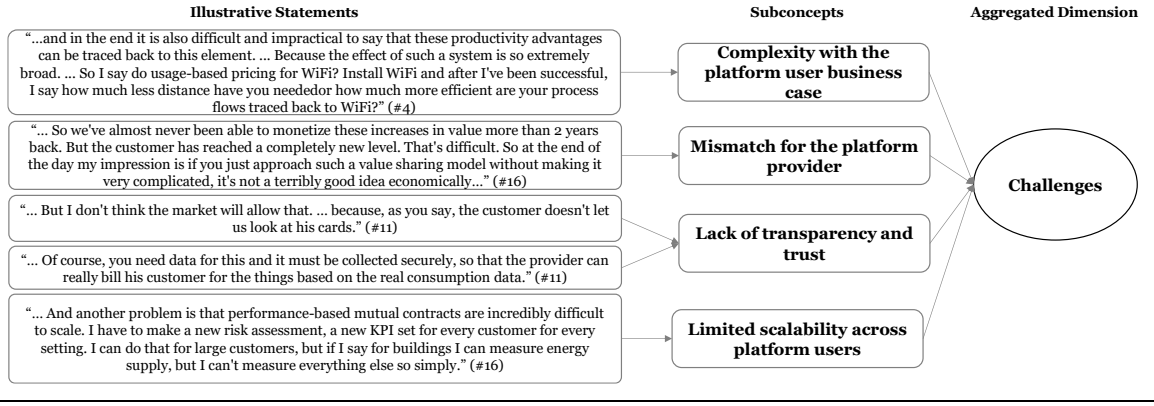

Figure 1. Data Structure with Illustrative Statements of the Coding Procedure

Towards a Conceptualization of Value-based Pricing for IIoT

Descriptive Characteristics of Value-based Pricing

The experts agreed that value-based pricing requires setting up ***individual services*** based on the digital industrial platform, which ***support the platform users' business outcomes***. Accordingly, value-based pricing goes beyond selling platform licenses and presumes the discovery of ***meaningful metrics*** critical to platform users' business. On a strategic level, the metrics increase the platform users' output or decrease their costs. Considering the variety of platform users in IIoT, these metrics can be very specific and vary between different IIoT platform user types (e.g., the metrics relevant to manufacturing operations fundamentally differ from those that determine efficiency gains in logistics). In the words of an expert:

> *"If I raise a performance from an availability of 70% to 80% or if later cost reduction by 20% we get there. Then I can get a share of that." - Vice President IoT Platform - Pi*

The individual customer relationship contradicts the literature narrative of arm's length relationships in platform ecosystems. Yet, dyadic relationships raise certain expectations among platform providers. Due to the close collaboration between the platform provider and the platform user, the experts bet on the discovery of relevant metrics and the ***scaling of their revenues***. If, for instance, a platform user reaches a new level of productivity by digitizing his manufacturing or the value chain, platform providers expect a ***percentage share in this profit***. Therefore, value-based pricing scales the revenues of the platform provider differently than the pay-per-use pricing known from many market-ready platforms. According to experts, subscriptions can help realize value-based pricing. In that case, a ***subscription should be linked*** to an agreed metric, such as the number of defects on machines connected to the platform. If the tracked defect numbers decrease and a new productivity level is reached, it is converted into a monetary equivalent. In doing so, the platform provider benefits from the shared success of the industrial platform customer on a percentage basis, scaling the revenues with the increase of the platform users' outcome. Alternatively, scaling the platform providers' revenues through value-based pricing could be achieved by increasing the platform usage intensity. If the platform ***demonstrates added value*** to the customer, she/he may connect new manufacturing assets to the platform.

> *"Because ideally, you want a metric that will, as the customer gets more value out of it, the metric also grows. So if you price on that, you get more revenue based on the value that they're getting. ... The value grows and we get paid more because it's based on the number of users or it's based off of number of machines that are tied to it." - Senior Director Strategic Pricing - Alpha*

If the platform is used for complementary application development, the increasing number of actively used platform applications could be monitored. Such increases ensure the scaling of revenues. Besides, functional limitations or volume caps (e.g., in the connectivity of data points from the industrial shop floor to the platform instance) can ensure that platform users take more extensive bundles as platform use progresses. Hence, they spend more on the platform scaling the platform providers' revenues only if they perceive the added value from the platform with ***bundling*** helping to establish value-based pricing.

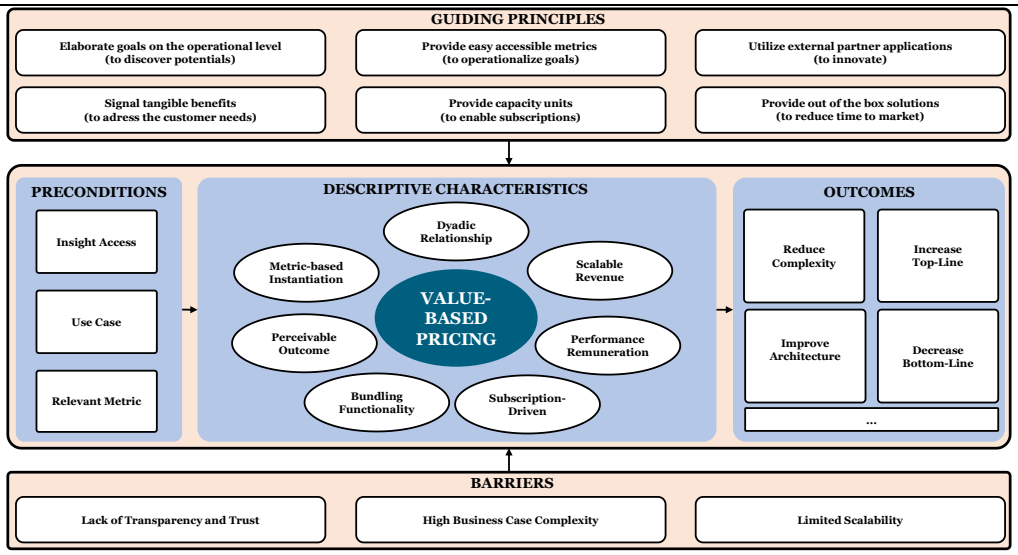

Figure 2. Value-based Pricing for IIoT

Outcomes of Value-based Pricing

Experts have described diverse manifestations of outcomes. On the one hand, value-based pricing is feasible if the platform usage provides ***top-line gains*** (e.g., higher production output or increased quality through networking manufacturing capacities with a platform). By creating digital industrial services in the form of platform-based complements, new business models can additionally be created. On the other hand, value-based pricing can be driven via ***bottom-line gains***. This includes any measures that lead to cost degression for the platform user, such as energy savings or machine downtimes. Also, the reduction of effort in developing industrial software applications can be positioned as bottom-line gains.

As another outcome, the entire production ***architecture*** can be improved beyond company boundaries. A digitized supply chain is more adaptive and can benefit customers using the pallet form, both in terms of increased revenue and reduced expenditure. The potential of platform-based data processing across multiple factories or the creation of cross-company dataspaces can also help reduce production ***complexity*** and provide answers to previously unsolved problems in plants. In the industrial shop floor, there might be quality problems that can be detected by data-based monitoring. If a digital industrial platform can help, it creates a fourth outcome type that can be communicated and pursued by platform providers to embrace value-based pricing.

Preconditions for Value-based Pricing

We collected three basic preconditions to implement value-based pricing. First, the platform providers' ***insight access*** to the platform users' value-creating mechanisms is necessary. Experts have spoken about scenario-driven efficiency analyses based on specific cases from platform customers. Second, to understand these mechanisms and discover potential outcomes, the platform provider (or its sales force) must also think in ***use cases*** beyond selling licenses or simply pricing the platform access, as industrial platform customers tie the productivity to use cases, specific use case knowledge is considered a precondition. To do this, third, ***relevant metrics*** need to be identified that positively affect the platform users' outcomes.

> *"The end customer will only spend money if he gets value somewhere … i.e., more quality, more output or lower costs." - Head of Ecosystem Orchestration & Monetization - Rho*

Guiding Principles to Establish Value-based Pricing

Based on the interviews, we found six principles that aid platform organizations in establishing value-based pricing. Considering access to business insights as a precondition, one expert stated that for platform organizations, it is critical to get ***access to the operational level*** of the potential platform user. This is

because only generic sales targets can be agreed upon at the strategic level, while purchasing lacks an understanding of complex production and logistics processes. In the spirit of a "Gemba", it is promising to discuss targets with the shop floor level in order to discover the potentials that can be achieved based on a digital industrial platform. In addition, during the scenario analyses and experiments with the operations level of the platform user, it is critical for success to communicate ***tangible added values*** through the use case orientation. Due to the already existing complexity of industrial value creation systems, which increases even more with the addition of digital infrastructure, it is particularly important to focus on ***easily understandable metrics***. They support the platform user's perception of a benefit that is attributable to platform integration. On the platform provider's side, however, it also helps to justify scaling one's revenues with this customer so that a percentage share in success works. Since value orientation goes hand in hand with increasing platform use by the customer (e.g., regular use of platform-based applications or connected machines and product lines), it is important to ***define units of capacity*** that the customer uses to scale the platform providers' revenue. With more intensive platform use, the customer needs more capacity units, so that the platform provider's revenues can scale on a subscription basis. In addition, the implementation of value-based pricing depends on platform-based innovation. Despite the individuality of industry use cases, practitioners have emphasized the ***importance of partner applications*** serving as blueprints in signaling platform-related innovation capabilities. The ability to leverage external applications can also reduce implementation time. The shortening of time-to-market in achieving outcomes through the platform was identified as another principle. To achieve this, ***ready-to-implement applications*** from the platform provider and complementary platform partners can help, as predefined data management processes can be used to support the platform's innovation capabilities.

Barriers to Reflect on when Establishing Value-based Pricing

Contrarily to guiding principles, three main barriers could be extracted. Lack of insight into the platform users' business and the possibilities to monitor industrial processes is a barrier to discovering the relevant metrics that digital industrial platforms can improve. The experts stated the ***lack of trust*** was responsible for the fact that the sales department of the platform provider was not even given the opportunity to enter into value discovery. Moreover, the ***complexity*** of certain industrial business cases hampers the possibility of assigning the value added to the platform. As an example, providing a data network within a factory can enable many benefits, but at the same time, make it more difficult to isolate metrics and the related outcomes as well as quantify them. Although value-based pricing is highly compatible with scaling revenue per platform user, the ***limited scalability*** of the value-based selling approach between platform users has nevertheless been reported due to the individuality of the effective metrics. This goes hand in hand with the special dyadic nature of corporate relationships based on digital platforms in business-to-business domains such as IIoT.

Discussion, Conclusion, and Future Research

The preliminary results contribute to the research streams on value-based pricing and platform governance and bridge the gap between them. The identified characteristics of value-based pricing extend our knowledge about this concept and emphasize the expectations of platform providers to scale value capturing without impeding platform use. Our study indicates that platform providers establish subscriptions and different platform-related bundles to execute value-based pricing. These are all characteristics that earlier studies on value-based pricing do not mention (e.g., Hinterhuber 2004; Hinterhuber 2008; Riozu et al. 2011; Toytäri et al. 2017; Raja et al. 2020; Keränen et al. 2021). Moreover, identifying multiple outcome manifestations of value-based pricing reflects the structural complexity of the concept at the nexus of digital platforms and IIoT, hinting at the heterogeneous potential for platform providers' opportunities to capture value sufficiently (Schreieck et al. 2021). The various outcomes broaden the understanding of value-based pricing and, in particular, contribute to practice in terms of decision support from the perspective of platform providers in the alignment of objectives and the quest for significant metrics. Furthermore, our results integrate the dyadic value discovery practices (Raja et al. 2020) at the nexus of between platforms and IoT, contradicting the standardized pricing manifestations we have seen from platform organizations. Research emphasizes the benefits of standardization in implementing pay-per-use pricing systems or price tiers to enable the Goldilocks rule to be applicable or to differentiate between sizes of customer organizations. However, value-based pricing requires a dyadic inhiation between the platform provider and the paying platform user. This finding challenges the prevailing narratives in the literature that platforms

and IoT technologies foster data-driven pricing. In the process of establishing value-based pricing, an individual relationship between sales and the operational level of the industrial platform user is at first necessary to understand the use cases, discover the value potentials, and set the targets for outcomes that have meaning for the customer. This initiation phase is based on the individual skills of the platform sales staff and can only be standardized to a limited extent. Only once this initiation phase has been completed and the platform has been integrated into customers' operations, platform provider can drive data-driven pricing optimization and create a knowledge repository for future initiation phases with other customers. Nevertheless, this pricing establishment remains individual. As indicated by the preliminary results, pricing is a complex evolutionary process that informs future research on the evolution of platform governance more broadly and platform pricing more narrowly based on primary data.

Based on the example of value-based pricing, our results show that using assumptions from business-to-consumer platform cases is wrong when designing and implementing a pricing strategy in the context of digital industrial platforms (Pauli et al. 2021). In particular, as value-based pricing depends on individual value metrics and entails individual percentage shares in success, it undermines the potential for pricing standardization. Therefore, we propose that value-based pricing fosters pricing discrimination between different platform users, even if value-based pricing requires a fixed subscription to start charging platform users. This is a paradox, as the expectation of software platforms, especially through the use of the cloud, was to automate sales and take out complexity through standardization. We venture the hypothesis that value-based pricing promotes exactly the opposite. It is, therefore, the goal of the research team to explore this in the future by collecting more primary data. Furthermore, our results also indicate the paradox that the unwillingness to collaborate still exists in the platform context. The dominant position of proprietary platform providers even reinforces this barrier to establishing value-based pricing. In addition, the unwillingness of industrial platform users to share a percentage of their success confirms the agent problems of value-based pricing for digital industrial platforms. The future application of signaling theory to investigate how to overcome existing information asymmetries and master value-based platform selling to barricaded industrial buyers (Chase and Murtha 2019) is a promising research avenue.

Answering the call from Pauli et al. (2021), the overarching objective of further research is the isolation of managerial decisions during the establishment of pricing strategies for digital industrial platforms. Accordingly, the next steps incorporate refinement of the conceptualization, focusing on potential mediators and confounding factors that impact business outcomes, and further empirical validation. We also hope that research encourages other researchers to design new approaches and process models to explain how scalable value-based pricing, a strategy that connects pricing decisions to customer metrics, can be implemented and how intelligent information systems can help in this process, expanding method engineering research for metric discovery and value quantification (Hinterhuber 2008; Raja et al. 2020).

References

Ceccagnoli, M., Forman, C., Huang, P., and Wu, D. J. 2012. "Cocreation of Value in a Platform Ecosystem: The Case of Enterprise Software," *MIS Quarterly* (36:1), pp. 263–290.

Cennamo, C. 2019. "Competing in Digital Markets: A Platform-based Perspective," *Academy of Management Perspectives* (35:2), pp. 265-291.

Chase, K.S., and Murtha, B. 2019. "Selling to Barricaded Buyers," Journal of Marketing (83:6), pp. 2-20.

Christen, T., Hess, M., Grichnik, D., and Wincent, J. 2022. "Value-based pricing in digital platforms: A machine learning approach to signaling beyond core product attributes in cross-platform settings," *Journal of Bus. Research* 152, pp. 82-92.

Corbin, J., and Strauss, A. 1990. "Grounded theory research: Procedures, canons and evaluative criteria," *Zeitschrift fuer Soziologie* (19:1), pp. 418- 427.

de Reuver, M., Sørensen, C., and Basole, R.C. 2018. "The digital platform: a research agenda," *Journal of Information Technology* (33:2), pp. 124-135.

Gioia, D.A., Corley, K.G. and Hamilton, A.L. 2013. "Seeking Qualitative Rigor in Inductive Research: Notes on the Gioia Methodology," *Organizational Research Methods* (16:1), pp. 15–31.

Glaser, B.G., and Strauss, A.L. 1967. *The discovery of grounded theory: Strategies for qualitative research*, Aldine.

Hinterhuber, A. 2004. "Towards value-based pricing - An integrative framework for decision making," *Industrial Marketing Management* (33:8), pp. 765-778.

Hinterhuber, A. 2008. "Customer value-based pricing strategies: why companies resist", *Journal of Business Strategy* (29:4), pp. 41-55.
Hinterhuber, A., and Liozu, S.M. 2018. "Thoughts: premium pricing in B2C and B2B," *Journal of Revenue and Pricing Management* 17, pp. 301-305.
Ingenbleek, P.T.M., Debruyne, M., Frambach, R.T., and Verhallen, T.M.M. 2003. "Successful new product pricing practices: A contingency approach," *Marketing Letters* (14:4), pp. 289–305.
Keränen, J., Terho, H., and Saurama, A. 2021. "Three Ways to Sell Value in B2B Markets," *MIT Sloan Management Review* (63:1), pp. 64-70.
Lee, I. 2021. "Pricing Models for the Internet of Things (IoT): Game Perspectives," *Internet of Things* 15, 100405.
Lehmann, S., and Buxmann, P. 2009. "Pricing strategies of software vendors," *Business & Information Systems Engineering* (1:6), pp. 452-462.
Liozu, S.M., Hinterhuber, A., Boland, R., and Perelli, S. 2011. "The conceptualization of value-based pricing in industrial firms," *Journal of Revenue and Pricing Management* (11:1), pp. 12-34.
Liozu, S.M. 2017. "State of value-based-pricing survey: Perceptions, challenges, and impact," *Journal of Revenue and Pricing Management* 16, pp. 18–29.
Merton, R.K., and Kendall, P.L. 1946. "The Focused Interview," *American Journal of Sociology* (51:6), pp. 541-557.
Mosch, P., Majocco, P., and Obermaier, R. 2023. "Contrasting value creation strategies of industrial-IoT-platforms – a multiple case study," *International Journal of Production Economics* 263, pp. 108937.
Myers, M.D., and Newman, M. 2007. "The qualitative interview in IS research: Examining the craft," *Information and Organization* (17:1), pp. 2-26.
Ochs, E. 1979. "Transcription as Theory," in *Developmental Pragmatics*, E. Ochs and B. Schieffelin (eds.), Massachussets: Academic Press, pp. 43-72.
Parker, G. G., and van Alstyne, M.W. 2008. "Managing Platform Ecosystems," in *Proceedings of the 29th ICIS*, Paris, France.
Parker, G., Van Alstyne, M., Jiang, X. 2017. "Platform Ecosystems: How Developers Invert the Firm," *MIS Quarterly* (41:1), pp. 255-266.
Pauli, T., Fielt, E., and Matzner, M. 2021. "Digital industrial platforms", *Business & Information Systems Engineering* (63:2), pp. 181-190.
Petrik, D. and Herzwurm, G. 2020. "Towards the IIoT Ecosystem Development - Understanding the Stakeholder Perspective," in *Proceedings of the 28th ECIS*, Virtual AIS Conference.
Raja, J.Z., Frandsen, T., Kowalkowski, C., and Jarmatz, M. 2020. "Learning to discover value: Value-based pricing and selling capabilities for services and solutions," *Journal of Bus. Research* 114, pp. 142-159.
Rochet, J.-C., and Tirole, J. 2006. "Two-sided markets: a progress report," *RAND Journal of Economics* 35, pp. 645–667.
Saltan, A., and Smolander, K. 2021a. "Bridging the state-of-the-art and the state-of-the-practice of SaaS pricing: A multivocal literature review," *Information and Software Technology* 133, 106510.
Schreieck, M., Wiesche, M., and Krcmar, H. 2021. "Capabilities for value co-creation and value capture in emergent platform ecosystems: A longitudinal case study of SAP's cloud platform," *Journal of Information Technology* (36:4), pp. 1-26.
Staub, N., Haki, K., Aier, S., and Winter, R. 2023. "Governance Mechanisms in Digital Platform Ecosystems: Addressing the Generativity-Control Tension," *Communications of the AIS* (51:1), pp. 906-939.
Tan, B., Anderson, E.G. Jr., Parker, G.G. 2020. "Platform Pricing and Investment to Drive Third-Party Value Creation in Two-Sided Networks," *Information Systems Research* (31:1), pp. 217-239.
Toytäri, P., Keränen, J., and Rajala, R. 2017. "Barriers to implementing value-based pricing in industrial markets: A micro-foundations perspective," *Journal of Bus. Research* 76, pp. 237-246.
Urquhart, C. 2001. "An encounter with grounded theory: Tackling the practical and philosophical issues," in *Qualitative research in IS: Issues and trends*, E. Trauth (ed.), Hershey, IGI Global pp. 104-140.
Wegner, P. 2021. "IoT Platform Companies Landscape 2021/2022: Market consolidation has started," https://iot-analytics.com/iot-platform-companies-landscape/
Weinstein, B.D. 1993. "What is an expert?," *Theoretical Medicine* 14, pp. 57–73.
Wiesche, M., Jurisch, M.C., Yetton, P., and Krcmar, H. 2017. "Grounded theory methodology in information systems research," *MIS Quarterly* (41:3), pp. 685–701.
Yuan, N., Feng, H., Li, M., and Feng, N. 2022. "Penetration or Skimming? Pricing Strategies for Software Platforms Considering Asymmetric Cross-Side Network Effects," *Journal of the Association for Information Systems* (23:4), pp. 966-998.