European Journal of Information Systems

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/tjis20

Dynamic capabilities for transitioning from product platform ecosystem to innovation platform ecosystem

Kazem Haki, Michael Blaschke, Stephan Aier, Robert Winter & David Tilson

To cite this article: Kazem Haki, Michael Blaschke, Stephan Aier, Robert Winter & David Tilson (2022): Dynamic capabilities for transitioning from product platform ecosystem to innovation platform ecosystem, European Journal of Information Systems, DOI: 10.1080/0960085X.2022.2136542

To link to this article: https://doi.org/10.1080/0960085X.2022.2136542

© 2022 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group.

Published online: 26 Oct 2022.

Submit your article to this journal

View related articles

View Crossmark data

Full Terms & Conditions of access and use can be found at
https://www.tandfonline.com/action/journalInformation?journalCode=tjis20

EUROPEAN JOURNAL OF INFORMATION SYSTEMS
https://doi.org/10.1080/0960085X.2022.2136542

OPEN ACCESS Check for updates

Dynamic capabilities for transitioning from product platform ecosystem to innovation platform ecosystem

Kazem Haki[a], Michael Blaschke[b], Stephan Aier[b], Robert Winter[b] and David Tilson[c]

[a]Geneva School of Business Administration (HES-SO, HEG-Genève), Geneva, Switzerland; [b]Institute of Information Management, University of St Gallen, St Gallen, Switzerland; [c]Simon Business School, University of Rochester, Rochester, New York, USA

ABSTRACT

Over recent decades, many platform-native start-ups and firms were founded and some are now among the world's most valuable. This study, however, focuses on an incumbent firm transitioning from a long established product platform ecosystem to an innovation platform ecosystem in response to the platform-natives' threats of disruption. We specifically investigate the dynamic capabilities needed by the incumbent firm in an enterprise software ecosystem in the transition phase. Our analysis builds on multi-perspective empirical data covering the viewpoints of all the actor types in the ecosystem, i.e., platform owner, platform partners, and end-user firms. The results imply the necessity of four dynamic capabilities: resource curation, ecosystem preservation, resource reconfiguration, and ecosystem diversification. With this study, we contribute to the emerging literature on the incumbent firms' transition to a new ecosystem organising logic, and extend the study of dynamic capabilities specifically for the case of transitioning to innovation platform ecosystems.

ARTICLE HISTORY
Received 15 May 2020
Accepted 28 September 2022

KEYWORDS
Product platform; innovation platform; enterprise software ecosystem; dynamic capability; case study

1. Introduction

The considerable attention to *digital platforms* in information systems (IS) research and other disciplines (e.g., Cennamo & Santaló, 2019; Rietveld & Schilling, 2021; Thomas et al., 2014; Tilson et al., 2010) can be explained by platform-native start-ups disrupting the long established industry arrangements and challenging the incumbent firms' positions in their industries (de Reuver et al., 2018). For example, Uber has transformed the taxi business without owning taxis, Airbnb has transformed hospitality without owning hotels, and Kickstarter has channelled funding to creative projects that would have otherwise struggled to get the attention of traditional investors.

Since platform-natives are the most salient firms in the platform economy (Kenney & Zysman, 2016; Parker et al., 2016), it is not surprising that prior research has primarily emphasised such cases (e.g., Cennamo & Santaló, 2019; Eaton et al., 2015; Huang et al., 2017; Oh et al., 2015; Tan et al., 2015). However, enterprise software are also important platforms that are gaining increasing attention from IS scholars (e.g., Ceccagnoli et al., 2012; Foerderer et al., 2019; Huber et al., 2017; Schreieck et al., 2021, 2022). Enterprise software is an interesting setting in the platform economy since their vendors (e.g., Oracle, SAP) have long offered *product platforms* (in the form of on-premises, packaged software) supported by an ecosystem of partners (Sarker et al., 2012; Shang & Seddon, 2002). Partners were engaged in the implementation, extension, and customisation of the packaged software to the individual requirements of end-user firms (Ng & Gable, 2010; Staehr et al., 2012). New entrants to the enterprise software industry (e.g., Salesforce, Workday) offered cloud-based (vs. on-premises) platforms. By design, their platforms were more accessible to third-party developers, allowing a wider range of partners to innovate new solutions building on the functionalities offered by these *innovation platforms*.

Some incumbent enterprise software vendors responded to the threats of disruption by transitioning from their traditional technological configurations (product platforms) and business models (product platform ecosystems) to innovation platforms and building much expanded ecosystems around them (Ceccagnoli et al., 2012; Schreieck et al., 2022). We adopt the terms *product platform* and *innovation platform* (and their associated ecosystems) for the technological configurations before and after the transition building on prior literature (e.g., Gawer, 2009) and a recent work studying the same type of transition[1] (Schreieck et al., 2022). This recognises that product platforms in industries such as enterprise software, banking, and insurance can be digital in nature, while also distinguishing them from innovation platforms that enable greater production, transaction, and innovation leverage (Thomas et al., 2014) and facilitate increased generativity (Tilson et al., 2010).

The transition from product platform to innovation platform ecosystems implies that incumbent firms

CONTACT Kazem Haki kazem.haki@hesge.ch Geneva School of Business Administration (HES-SO, HEG-Genève), Geneva, Switzerland

© 2022 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group.
This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives License (http://creativecommons.org/licenses/by-nc-nd/4.0/), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited, and is not altered, transformed, or built upon in any way.

turn their focal resource from a product platform to an innovation platform, fostering complementary innovations in the ecosystem (Schreieck et al., 2022). This transition is manifest in the idea of "inverted firms" (Parker et al., 2017). That is, incumbent firms leverage an ecosystem of external parties instead of only relying on their internal resources, and orchestrate the output of others instead of merely producing their own output (Parker et al., 2017; Thomas et al., 2014). In doing so, the traditional principal – agent relationships in supply chains are replaced by arms' length relations between the incumbent firms and their partners (de Reuver et al., 2018; Eaton et al., 2015; Ghazawneh & Henfridsson, 2013). Further, the value propositions shift from standalone offerings by each ecosystem actor to integrated solutions jointly created by a multitude of ecosystem actors (Stonig et al., 2022). The transition from product platform to innovation platform ecosystems thereby entails distinct ecosystem organising logics: maximising the focal firm's value appropriation vs. increasing the value of all firms in the ecosystem; controlling a focal firm's unique resources vs. leveraging the evolution of multi-partner innovation; and improving the cost and quality of standalone offerings vs. innovating to generate integrated solutions (Stonig et al., 2022).

Incumbent firms' transition to an innovation platform ecosystem requires them to enable additional sources of platform leverage (Thomas et al., 2014) and to shift the locus of innovation on the platform (Sandberg et al., 2020; Thomas et al., 2014; Yoo et al., 2010). They open up access to their focal resource (the product platform) to loosely coupled partners and build well-defined interfaces and common development kits, such that the resultant innovation platform serves as a foundation upon which a large number of partners can jointly develop innovations in the form of integrated solutions (Cusumano et al., 2019).

In general, the transition from product platform to innovation platform ecosystems involves a bandwagon effect (e.g., Sandberg et al., 2020; Stonig et al., 2022; Svahn et al., 2017). The few incumbent firms that make successful transitions enjoy enormous returns and competitive positions, while many others fail (Gawer & Cusumano, 2008; Hagiu & Altman, 2017; Yoffie et al., 2019; Zhu & Furr, 2016). In the transition phase, incumbent firms encounter many challenges such as deploying a strategic reorientation from product thinking to platform thinking (Matzner et al., 2021), attracting their existing partners to the innovation platform (Schmid et al., 2021; Svahn et al., 2017), addressing the complexity of interactions in the ecosystem (Sandberg et al., 2020), and managing identity tension between the old and the emerging ecosystem organising logics (Lindgren et al., 2015).

In effect, the latter challenge points to the fact that, transition from product platform to innovation platform ecosystems is a long and tedious process in which incumbent firms need to operate the innovation platform business and the traditional business separately while trying to integrate them to increase synergies (Matzner et al., 2021). When transitioning, incumbents must alter established roles in the ecosystem, including significant shifts in strategic direction and structure. It can create high uncertainty and disrupt the position of actors, and thereby re-specify the ecosystem's fitness landscape (Kapoor & Agarwal, 2017). Incumbents make choices that might render a substantial portion of their resource base obsolete and impact (or destroy) their relationships with their partners and end-users (Ozalp et al., 2018). They face considerable challenges because of their attachment to the old logic (product platform) and because the existing operational capabilities align with the ecosystem's traditional organising logic. In dealing with the challenges entailed in the transition phase, we posit that dynamic capabilities can provide the capacity to extend and modify incumbents' extant resource base (Helfat & Raubitschek, 2018; Karimi & Walter, 2015; Teece, 2007; Winter, 2003) to purposefully make the transition. Therefore, we seek to answer the following research question: *what dynamic capabilities do incumbent firms need to make transition from a product platform to an innovation platform ecosystem?*

Similar to existing studies' dominant focus on platform-native cases, current research mainly offers dynamic capabilities for such cases (Helfat & Raubitschek, 2018; Tan et al., 2015; Teece, 2017), with a few notable exceptions (Schreieck et al., 2021). Instead, our study focuses on dynamic capabilities for transitioning from a product platform to an innovation platform ecosystem, requiring deft reconfiguration of existing resources and prudent redefinition of existing roles and capacities. We investigate a thriving enterprise software ecosystem through multi-perspective empirical data from all its actors, i.e., platform owner, platform partners, and end-user firms. The studied case reveals the challenges encountered by each ecosystem's actors during the transition phase, the employed mechanisms by the platform owner to overcome the challenges, as well as the effects and the factors that moderate the effects of the platform owner' actions during transition. Building on the empirical data, we derive and differentiate four dynamic capabilities required for transitioning to an innovation platform ecosystem, namely *resource curation*, *ecosystem preservation*, *resource reconfiguration*, and *ecosystem diversification* along with their constituent antecedents, mechanisms, consequences, and moderators.

2. Research foundations

In this section, we first introduce product platform and innovation platform ecosystems. Subsequently,

we position our study through investigating dynamic capabilities for transitioning to innovation platform ecosystems.

2.1. Product platform and innovation platform ecosystems

An ecosystem is a community of interacting firms that are not hierarchically controlled and that depend on one another for their overall effectiveness and survival (Jacobides et al., 2018; Lusch & Nambisan, 2015). An ecosystem can be shaped around a product platform or an innovation platform.

A *product platform* is a focal resource (e.g., an on-premises, packaged enterprise software) provided by the principal firm in an ecosystem upon which partners develop complementary extensions (Schreieck et al., 2022). Accordingly, a product platform ecosystem includes the product platform's provider and a multitude of partners that create solutions for end-users (Wang, 2021). The partners' complementary extensions have to be implemented upon, and thereby intertwined with, the proprietary technologies of the product platform's provider (Schreieck et al., 2022). Using heterogeneous interfaces, the product platform and partners' complementary extensions are bundled into standalone and custom-built solutions in response to the needs of individual end-users (Schreieck et al., 2022). In the enterprise software context, this corresponds to a relatively high degree of coupling between the modules provided by all actors, limited opportunities for module reuse, and bounded generativity (Ceccagnoli et al., 2012; Ng & Gable, 2010).

An *innovation platform* is a digital technology foundation (e.g., a cloud-based enterprise software platform), providing building blocks upon which partners can jointly develop new innovations that are loosely coupled to the platform (Cusumano et al., 2019; Gawer, 2014; Tiwana et al., 2010). An innovation platform employs mechanisms such as standardised interfaces to facilitate co-creation of integrated yet reusable solutions (Ceccagnoli et al., 2012; Tiwana, 2015); flexible boundary resources (e.g., APIs, SDKs) to cultivate the development of solutions (Ghazawneh & Henfridsson, 2013); multi-sided recommender systems to tame challenges of generating solutions (Malgonde et al., 2020); and knowledge sharing and seeding channels to stimulate the development of solutions (Huang et al., 2018; Zhang et al., 2022).

Innovation platforms function as the nexus of innovation platform ecosystems. The latter is a complex ecology of firms that jointly create integrated solutions on the platform (Cennamo & Santaló, 2019; Jacobides et al., 2018). In an innovation platform ecosystem, while the platform owner offers the platform, platform partners have a common interest in the prosperity of the platform for materialising their own extensions (Selander et al., 2013). Ultimately, end-users derive certain value from the integrated offerings provided by the platform owner and platform partners. As such, the platform owner plays the orchestrator role for the entire ecosystem, who simultaneously needs to improve the technological core while constantly aligning the interests and competencies of all ecosystem actors (Tiwana et al., 2010). Table 1 summarises the differences between product platform and innovation platform ecosystems.

2.2. Dynamic capabilities for transitioning to innovation platform ecosystems

While finding its roots in the field of strategy (Eisenhardt & Martin, 2000; Schilke et al., 2018; Teece, 2007; Winter, 2003), the study of dynamic capabilities is omnipresent in various fields including

Table 1. Key characteristics of product platform and innovation platform ecosystems (emphasis on enterprise software context).

	Product Platform Ecosystems	Innovation Platform Ecosystems	Literature
Platform	A platform using e.g., on-premises technology upon which partners develop custom-built extensions that are highly coupled to the platform and offered to individual end-users	A platform using digital platform technology (e.g., cloud) upon which partners develop reusable extensions that are loosely coupled to the platform and offered to various end-users	Gawer & Cusumano (2014); Schreieck et al. (2022); Tilson et al. (2010)
Types of Leverage Provided by the Platform	Production leverage to drive economies of scale and scope in the development of extensions	Production leverage to drive economies of scale and scope, transaction leverage to drive economies of search and transaction, and innovation leverage to drive economies of complementarities in the development of extensions	Thomas et al. (2014)
Standardisation of the Platform and Interfaces	Heterogeneous development environments and interfaces with little standardisation for the development and integration of extensions	Standardised development kits (SDKs) and interfaces (APIs) for the development and integration of extensions	Schreieck et al. (2022); Tiwana (2015); Wareham et al. (2014)
Level of Openness of the Platform	Control over the platform, the partners that have access to the platform, and the relationship with end-users; supports an ecosystem of selected partners	Open access to the platform to potential partners, with no control over the extensions of the platform and the relationship with end-users; supports a wider ecosystem of heterogeneous partners	Boudreau (2017); Ghazawneh & Henfridsson (2013)

IS research (e.g., Karimi & Walter, 2015; Pavlou & El Sawy, 2010). Going beyond the resource-based view of the firm, which lays emphasis on an organisation's current resource base, dynamic capabilities were introduced to shift the focus to the purposeful modifications of an organisation's resource base (Teece et al., 1997; Teece, 2007). In this regard, current research differentiates operational from dynamic capabilities.

Operational capabilities are organisational routines and processes that are developed over time through learning, and provide organisations with the capacity to undertake activities in a reliable manner (Winter, 2003). They are directed towards maintaining and leveraging the status quo and permit an organisation to "make a living" (Schilke et al., 2018; Teece, 2017; Winter, 2003).

Dynamic capabilities are forward-looking capabilities by which organisations extend, modify, or reconfigure existing operational capabilities into new ones in response to disruptive technological shifts and innovations[2] (Helfat & Raubitschek, 2018; Karimi & Walter, 2015; Teece, 2007; Winter, 2003). As the foundation of competitive advantage in regimes of rapid technological change (Teece, 2007), dynamic capabilities introduce new alternatives, new ways of performing organisational activities, and new ways of creating value (Karimi & Walter, 2015; Schilke et al., 2018). Dynamic capabilities can be categorised according to three general types of functions directed towards strategic change: to *sense* and shape opportunities and threats, to *seize* opportunities, and to continuously *reconfigure* an organisation's resource base (Teece, 2007).

Dynamic capabilities are relevant to our study because incumbent firms' effort in transitioning the organising logic of an already established ecosystem to a new one is directed towards strategic change (Helfat & Raubitschek, 2018). Such a transition requires considerable modification of existing operational capabilities to create new ways of organising the ecosystem and new ways of creating value. Further, innovation platform ecosystems have their own dynamics (Teece, 2017) in dealing with various types of uncertainties: resource uncertainty, i.e., whether the required resources to be integrated and offered as an innovation are available; coordination uncertainty, i.e., whether the required coordination of technology is feasible when resources are available; and timing uncertainty, i.e., whether the innovation is offered at the right time and at the right scale when resources are available and coordination is feasible (Venkatraman et al., 2014).

Existing research either generally theorises on dynamic capabilities in the context of platforms (Karimi & Walter, 2015), or proposes *classes* of dynamic capabilities for platforms. Resembling Teece's (2007) sensing, seizing, and reconfiguring classes of dynamic capabilities, Helfat and Raubitschek (2018) propose three categories of dynamic capabilities, i.e., innovation capabilities, environmental scanning and sensing capabilities, and integrative capabilities. There are other studies that further map existing *classes* of dynamic capabilities to different *lifecycle stages* of a platform's growth and maturity. Teece (2017) maps Teece's (2007) classes of dynamic capabilities, i.e., sensing, seizing, and reconfiguring to birth, expansion, leadership, and self-renewal lifecycle stages of a platform. Similarly, Tan et al. (2015) extract classes of capabilities from the literature and map them to different stages of a platform's development. Only recently, scholars have begun to investigate the required capabilities in the emergent innovation platform ecosystems (Schreieck et al., 2021).

In complementing existing research, the focus of our research is on dynamic capabilities for transitioning from product platform to innovation platform ecosystems rather than on platform-native cases addressed by existing research (Helfat & Raubitschek, 2018; Tan et al., 2015; Teece, 2017). This is an important inquiry in the sense that the platform is built by an incumbent firm to *re*define the organising logic of an existing ecosystem and to *re*configure a huge existing installed base and its underlying operational capabilities.

3. Research method

Studying an incumbent firm's dynamic capabilities for transitioning from a product platform to an innovation platform ecosystem requires a research approach that provides an in-depth understanding of platform ecosystems in their real-world contexts. Therefore, we opted for a single-case study research design (Eisenhardt, 1989; Yin, 2009) through overlapping data collection and analysis steps. Building on existing guidelines (Eisenhardt & Graebner, 2007; Eisenhardt, 1989), our study comprises the following steps: selecting the case, crafting instruments, entering the field, analysing data, and shaping the theory.

3.1. Selecting the case

The studied case is an enterprise software ecosystem in which the platform owner is a global enterprise software vendor. For decades, the vendor offered a pioneering ERP system as a product platform (employing on-premises architecture), which was adopted by thousands of end-user firms across the globe. The ERP system was the focal resource in a product platform ecosystem in which many partner firms were engaged in, for instance, developing extensions to fill the white spaces in the ERP system, as well as in providing consultancy, customisation, implementation, and training services to end-user firms.

As of 2012, the vendor decided to offer its focal resource on a cloud platform and provide open access to a wider range of partner firms. Instead of developing extensions that are inextricably intertwined with the core ERP, partner firms develop modular software-as-a-service applications on standardised development kits and integrate them with the core ERP via APIs. This initiative went far beyond merely transitioning to cloud technology. It has been transitioning the vendor's product platform ecosystem to an innovation platform ecosystem, making partner firms adapt their business models and their complements to the ecosystem, and creating immense potential for numerous partner firms to generate innovative solutions. In its transition phase, which is still ongoing until this writing, the vendor has attracted thousands of existing (from product platform ecosystem) and new partner firms to its innovation platform. In what follows, we elaborate on the innovation platform and the role of the ecosystem's participants, i.e., platform owner, platform partners, and end-user firms.

The studied *innovation platform* (*IP*) is the nexus of an innovation platform ecosystem (*IP-Eco*). *IP* provides digital infrastructure components such as network, in-memory storage, servers, operating systems, SDKs, and APIs for building new and extending existing enterprise applications in a cloud computing environment. *IP* is managed by its *owner* (*IPO*), i.e., the vendor of the ERP system. To complement *IP*, *IPO* collaborates with thousands of build, run, sell, and service *partners*. Build partners design and develop integrated solutions based on *IP*. Run partners offer private- or public-cloud-deployed services based on *IP* solutions. Sell partners resell *IP* solutions while managing an entire service's lifecycle. Service partners provide consulting, implementation, and training services.

IP serves *end-user firms*, most of which are large multinational enterprises. End-user firms typically operate massive arrangements of interconnected systems and technologies deployed over many years. Against this backdrop, end-user firms opt for *IP* to obtain a lower cost but more reliable state-of-the-art technology, finely customised IT solutions, and faster implementation of IT solutions. Figure 1 illustrates the actors in the studied innovation platform ecosystem.

We selected *IP-Eco* for our case study on the grounds of its revelatory nature (Yin, 2009). The studied case is a prime example of transition from a product platform to an innovation platform ecosystem. The vendor launched *IP* in 2012 and continues to persuade more of its existing partners and end-user firms from the product platform ecosystem to move to *IP*. We collected data in the transition phase five years after *IP*'s launch, which gave us sufficient time after the launch to observe the changes made in the course of the transition and their implications.

3.2. Crafting instruments and entering the field

We collected data from January to September 2017 by means of semi-structured interviews in a four-stage process: crafting the interview guide, identifying potential interviewees, testing the interview guide, and conducting interviews (Table 2).

To ensure consistency in the data collection process, we first started with crafting an interview guide. The latter starts with introductory questions to understand the interviewees' context, for instance their

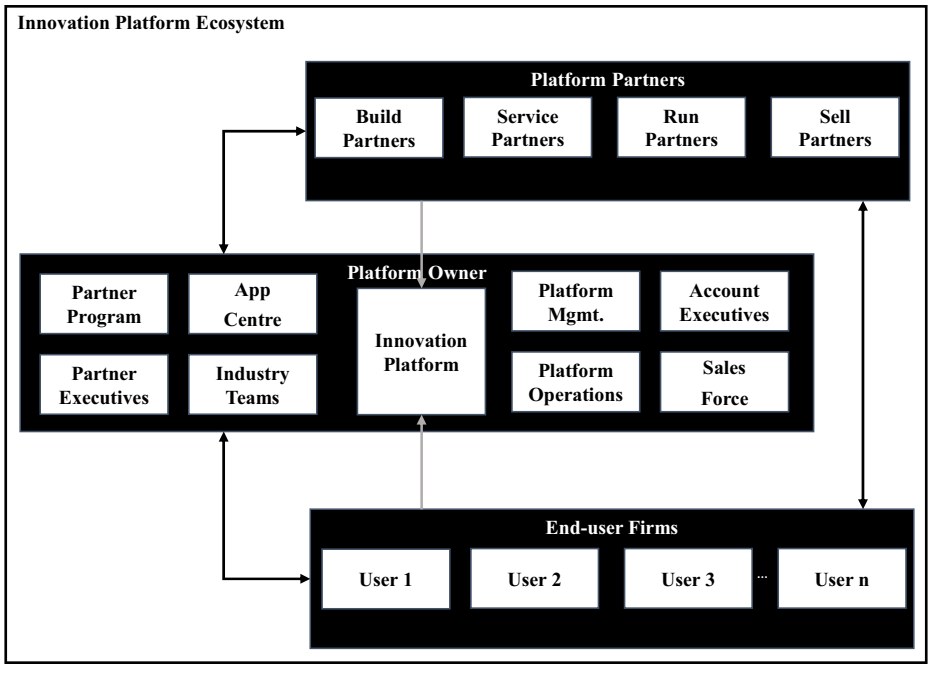

Figure 1. Overview of the studied innovation platform ecosystem.

Table 2. Four-stage process for primary data collection.

Stage	Outcome	Means	Interviews
Crafting Interview Guide	An interview guide to ensure a consistent and systematic data collection	The research goal to comprehend the new organising logic in the ecosystem	-
Identifying Interviewees	Suitable interviewees at *IPO*, partners, and end-user firms	Four interviews (avg. 56 minutes), 130 emails to account executives	*IP* managers
Testing Interview Guide	Tested and refined semi-structured interview guide	Four face-to-face interviews (avg. 62 minutes)	*IPO* employees
Conducting Interviews	Recorded and transcribed interviews	15 semi-structured interviews (avg. 53 minutes) via Skype	Five *IP* managers, five *IP* partners, and five *IP* end-user firms (Table 3)

roles, goals, and new opportunities in *IP-Eco* as well as encountered challenges in the transition phase. The interview guide was specifically designed to collect data on resource contributions of *IP-Eco*'s actors, exemplary resource exchanges among actors, the use of *IP*'s mechanisms for generating integrated solutions, as well as means for transitioning to the innovation platform ecosystem, each triggered by an open question. We adapted the interview guide and its constituent questions to the role of each interviewee's organisation in *IP-Eco* (i.e., *IPO*, *IP* partner, and *IP* end-user firm).

For identifying potential interviewees, requirements were business or technology roles in relation to *IP*, employment at either *IPO*, a licenced *IP* partner, or an *IP* end-user firm, as well as in-depth familiarity with *IP*. After identifying the potential interviewees and before entering the field, we conducted pilot interviews with four *IPO* employees for testing and refining the interview guide.

The interview guide's refined version was employed to conduct interviews with key informants from *IPO*, *IP* partners, and *IP* end-user firms. Table 3 explains the organisations and the portfolio of the 15 interviewees. All the interviews were recorded and transcribed verbatim, each transcript (one per interview) containing on average 12 pages. Next to the transcribed interviews, after every few interviews the research team discussed, reflected on, and documented the major insights that they gained. These discussion sessions revealed the need for adjusting the interview guide and its constituent questions, stimulating the parallel conduction of data collection and analysis steps.

Besides semi-structured interviews for collecting primary data, the research team was granted access to secondary data on *IP-Eco*, comprising internal and public documents (e.g., *IP* marketing, architecture, external analyses, and events). We employed the secondary data as a supplement for further enhancing our understanding of *IP-Eco*.

3.3. Analysing data and shaping the theory

In analysing the primary data, we opted for a scheme-guided approach (Miles & Hubermann, 1994, pp. 55–69) in a two-step process. The coding scheme relied on a mixed strategy using both predetermined and emergent categories. The predetermined categories helped us structure the data, unfold emergent categories, and systematically present the empirical data associated with the emergent categories. We used ATLAS.ti 9 to conduct the coding in both of the steps.

Innovation platforms are essentially means for service innovation *jointly* created by various actors (Jacobides et al., 2018; Lusch & Nambisan, 2015; Wareham et al., 2014). In the first step of analysis, we thus employed the value co-creation concept (Galvagno & Dalli, 2014; Payne et al., 2008; Ranjan & Read, 2016) as a sensitising device (Klein & Myers, 1999) to track the joint creation of value among the innovation platform ecosystem's actors in our data. We included constituent constructs of value co-creation to the coding scheme, i.e., *actors* in the innovation platform ecosystem, *resource* contributions by each actor in the ecosystem, *value* of joining the innovation platform (instead of using the product platform) for each actor, *institutional arrangements* to enable co-creation of value among the actors in the new ecosystem organising logic, as well as the co-created *services/solutions* by bundling of various actors' resources (Vargo & Lusch, 2004, 2008, 2016, 2017). Next to value co-creation's constructs, we also included further codes in the coding scheme to capture transition from a product platform to an innovation platform ecosystem. We coded the triggers that brought about transition points, challenges that various actors encountered in the transition phase, goals of transition, and outcomes resulting from transition, all from different actors' perspectives (i.e., *IP* owner, partners, and end-user firms).

The first analysis step provided us with explanations of transition as well as a tentative list of dynamic capabilities that enabled the platform owner to address the challenges encountered during the transition phase. Therefore, in the second analysis step, we aimed to further code the data based on the tentative list of dynamic capabilities resulting from the first step. The objective was to shape the theory by refining and sharpening the definition and specificities of the tentative dynamic capabilities, and by tracking empirical evidence that measures and represents the refined capabilities. For this, we opted for Schilke's et al. (2018) framework for formulating dynamic capabilities with regard to their primary *antecedents*, *consequences*, *mechanisms*, and *moderators*. *Antecedents*

Table 3. Organisations and profiles of the interviewees.

Organisation (pseudonyms)	Interviewee (Position/Unit/Role/Experience[3])
IPO (large enterprise): A leading multinational enterprise software vendor with offices in 180 countries	Business Development Senior Manager/Products & Innovation/VP Operations of *IP-Eco*, Global/17, 12 (*O_M1*) Business Development Expert/Products & Innovation/Senior Director of *IP-Eco*, Americas/26, 14 (*O_M2*) Partner Recruiter/Global Customer Operations/Head of Partner & Channel Programs, Europe/17, 14 (*O_M3*) Business Development Expert/Office of the CEO/System Integrators Enablement, Global/20, 17 (*O_M4*) Business Development Senior Manager/Products & Innovation/VP Strategy and Marketing Communications of Independent Software Vendors, Global/20, 20 (*O_M5*)
IP-Partner #1 (small enterprise): Canada-based certified and award-winning build and run partner for specialised industry needs; Member of the *IPO* Partner Advisory Council for Innovation	Co-founder and Chief Executive Officer/Office of the CEO/Corporate Strategy and External Relations/11, 8 (*P1_CEO*)
IP-Partner #2 (small enterprise): USA-based certified build and service partner specialised on mobile application	Co-founder and Chief Executive Officer/Office of the CEO/Corporate Strategy and Solution Design/22, 20 (*P2_CEO*)
IP-Partner #3 (medium enterprise): Germany-based certified service partner for CRM with 140 employees, 4 offices, and over 300 customers	Director Products, Innovations & Business Development/Research & Development/Product Design and Go-to-Market/20, 20 (*P3_Director*)
IP-Partner #4 (large enterprise): USA-based certified service, build, and sell partner; Global consulting and professional services company with net revenues of $34.9 billion, 425,000 employees, and clients in 120 countries	Senior Principal/Technology Consulting/Innovation and Solution Lead for Design of *IP* Applications/23, 23 (*P4_Principal*)
IP-Partner #5 (large enterprise): Germany-based certified service and sell partner; Global IT service provider with 6,000 employees, net revenues of €812 million in 25 countries	IT Manager/Product and Custom Development/Head of IT Architecture/12, 12 (*P5_Manager*)
IP-Client #1 (large enterprise): European manufacturing company with 25,000 employees and net revenues of CHF4.6 billion	IT Program Manager/Corporate IT/Head of *IP* Applications/12, 2 (*C1_Manager*)
IP-Client #2 (large enterprise): Germany-based leading manufacturer and vendor of healthcare solutions with 5,000 products and services	Senior Researcher/Research & Development/VP Intrapreneurship & Co-Creation/0, 2 (*C2_Researcher*)
IP-Client #3 (large enterprise): Brazil-based multinational manufacturer and vendor of agricultural machinery	Senior IT Manager/Corporate IT/Head of Application Portfolio/8, 4 (*C3_Manager*)
IP-Client #4 (large enterprise): Belgium-based multinational service integrator with 1,700 employees and 27 offices in 13 countries	Senior Developer/Corporate IT/Head of *IP* Solution Development/8, 8 (*C4_Developer*)
IP-Client #5 (large enterprise): Germany-based chemicals company with 33,000 employees in over 100 countries	Senior Architect/IT Services/Application Management, Platform Management, Team Manager *IP* Landscape Architecture/34, 24 (*C5_Architect*)

denote drivers and factors that necessitate the existence of a dynamic capability. *Consequences* capture outcome factors that are influenced by a dynamic capability. *Mechanisms* refer to means through which a dynamic capability is operationalised and that eventually affect an outcome factor. Finally, *moderators* are factors that affect the strength of the relationship between a dynamic capability and its consequences. Thus, we applied the latter constructs in coding for each of the dynamic capabilities in our list of tentative capabilities across several rounds. The idea was to iteratively compare the emerged capabilities and their specificities with the empirical data to eventually reach a theory that closely fits with the data.

4. Results

Our analysis of the collected data resulted in deriving four distinct dynamic capabilities and their antecedents, mechanisms, consequences, and moderators, a structure that we employ to present each capability in this section. We also provide exemplary empirical evidence for each of the dynamic capabilities from the perspectives of the platform owner, platform partners, and end-user firms (Appendix).

4.1. Dynamic capability I: resource curation

4.1.1. Antecedent

When transitioning to an innovation platform ecosystem, *IPO* needed to own the platform layer. If *IPO* is perceived as merely the platform's provider, it would be the de facto standard of a product platform ecosystem. In contrast, if a partner or an end-user firm uses *IP*, *IPO* is in the unique position to orchestrate integrated solutions. However, an innovation platform ecosystem contains a complex pool of resources offered by various actors. Uncertain conditions in which innovation platform participants operate call for orchestrated configuration of complementary resources to form integrated solutions. In contrast to classical bilateral owner–user relationships, innovation platform-mediated services integrate various resources to meet the needs of any given subset of

end-user firms. In *IPO*'s case, it was often uncertain which platform participant is responsible for what in developing a solution. For example, if *IPO* releases an application, it is not immediately available as not all the APIs might be ready. In addition, this application may not always have the embedded licencing model available so that partners can be completely self-sufficient in adopting it.

4.1.2. Dynamic capability

The analysis of the data unfolds *resource curation* capability (Table A1 in Appendix and Figure 2). An innovation platform owner should undertake orchestration actions to mobilise complementary resources in a complex pool of resources to form a requested service. For example, *IPO* builds its resource curation capability based on a partner-to-partner scenario to serve *IP-Client #1*'s IT needs through a deliberate combination of complementary resources contributed by *IP-Partner #1* (built a module) and *IP-Partner #5* (sold and implemented *IP-Client #1*'s requested app). Resource curation captures the capability to efficiently align relevant complementary resources contributed by various partners, such that the orchestrated service works well with the other solutions currently being used by end-user firms.

4.1.3. Mechanism

Our case data reveals orchestrated *co-creational service configuration* as one of the mechanisms for resource curation. For instance, once there is a demand from a given subset of end-user firms, *IPO* employs a dedicated team (headed by *O_M3*) for partner management with sub-teams per partner engagement model (i.e., build, service, run, and sell). This team systematically identifies, negotiates with, and allocates relevant *IP* partners. Such case-by-case co-creational service configurations can also deepen the commitment of both end-user firms and platform partners to the innovation platform.

To establish co-creational service configuration using digital platform technology, *IPO* provides partners with a cloud-based extensible codebase. The latter serves as a central technological means to orchestrate end-to-end business processes entailing resources of various *IP* partners. The point of entry for all *IP* partners to the codebase is a cockpit. In contrast to regular integration platform as a service (iPaaS), *IP*'s cockpit represents an *enterprise* integration platform as a service (eiPaaS). *IP*'s eiPaaS supports the curation of resources in multi-cloud service integration (e.g., AWS, GCP, and Azure), application-to-application integration, partner-to-partner integration, and mobile application integration scenarios.

4.1.4. Consequence

Resource curation results in *tailored service delivery* to meet the specific needs of any given subset of end-user firms. With end-user firms receiving tailored and effectively consolidated solutions, they are more likely to move to the innovation platform rather than using the product platform. For instance, *IP-Client #1*'s IT architecture imposes substantial intricacies for *IPO*'s solutions as it operates a "solid core" of critical on-premises applications and a "flexible boundary" of customer-facing cloud applications (*C1_Manager*). Moreover, *IP-Client #1* faces the challenges of controlling an entire array of extant interconnected systems. From *IPO*'s perspective, its resource curation affords a holistic understanding of *IP-Client #1*'s IT architecture. From *IP-Client #1*'s perspective, *IPO*'s IT service works well with other resources currently being used by *IP-Client #1*. From *IP-Partner #5*'s perspective, it largely depends on *IPO*'s guidance in curating resources and implementing an appropriate IT solution in *IP-Client #1*'s architecture.

4.1.5. Moderator

The strength of the resource curation capability in effectively generating tailored services is contingent on the *interorganisational structure* of the innovation platform ecosystem. Interorganisational structure concerns multiplicity, variety, and interdependency of actors that are orchestrated when configuring a solution. With increasing complexity in the interorganisational structure of partners and end-user firms,

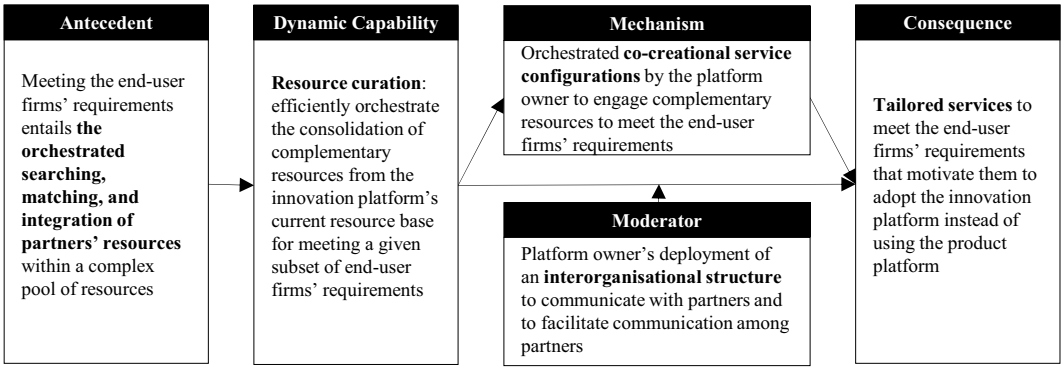

Figure 2. The resource curation dynamic capability.

more orchestration efforts are required for two reasons. First, aligning a complex set of actors ensures the organisational and technological integrity of the offered solution. Second, it ensures that value is extracted, and that costs, risks, and revenues are shared by all involved actors within the generated solution. For example, *O_M2* oversees a complex interorganisational structure of 250 partners in North America managed by a team of four partner managers. This team orchestrates these 250 partners in evaluating *IPO*'s partner program, onboarding *IP*, getting required resources (e.g., *IPO*'s licence), building their derivatives, and then ultimately putting their derivatives on *IPO*'s marketplace.

4.2. Dynamic capability II: ecosystem preservation

4.2.1. Antecedent

When launching the innovation platform, *IPO* faced the challenge of incentivising existing partners in the product platform ecosystem to adopt *IP*. In *IP*'s year of launch 2012, one of the reasons behind initial slow adoption of *IP* by "build" partners was a lack of sales support. For instance, while *IP-Partner #3* benefitted from *IP*'s technological affordances in building its modules, it suffered from little or no support in marketing them. Thus, *IPO* struggled to obtain a critical mass of partners (i.e., existing product platform partners adopting *IP*) with complementary resources to offer a wide range of solutions. Once a solution to serve the needs of a subset of end-user firms is envisaged, a unique subset of all the available resource sets is required rapidly to meet those needs.

4.2.2. Dynamic capability

The analysis of the data suggests *ecosystem preservation* capability (Table A2 in Appendix and Figure 3). An innovation platform owner should ensure positive network effects and stable benefits for all participants in its brand-new ecosystem organising logic. On the one hand, a platform owner needs to incentivise existing partners and end-user firms in the product platform ecosystem to move to the innovation platform to preserve the ecosystem's global structure. On the other hand, a platform owner needs to leverage the selection, cultivation, and dissolution of individual relationships for case-by-case value co-creation processes to preserve the ecosystem's local operations. Ecosystem preservation captures the capability to efficiently attain and retain the innovation platform ecosystem's resource capacity by *re*-establishing stable relationships in the ecosystem's new organising logic.

4.2.3. Mechanism

Our data reveal the deployment of relevant *institutional arrangements* as one of the mechanisms for ecosystem preservation. Institutional arrangements include, for instance, guidelines for partners' step-by-step onboarding on innovation platform, competitive pricing incentives, and partnership policies (e.g., revenue share with partners, ownership, licence agreements). For example, an innovation platform owner needs to continuously adjust contractual arrangements to persevere stable relations with its partners. In the case of *IPO*, while *IP* partners make these arrangements bilaterally with *IPO* and end-user firms, there are no contracts between *IPO* and the end-users as *IPO* relinquishes direct sales in its innovation platform business. An important institutional arrangement installed by *IPO* is its channel policy, enforcing that *IPO* is not supposed to bypass the existing partner–customer relations for its own benefit.

To establish institutional arrangements using digital platform technology, *IPO* offers its partners an integration and certification centre. It works as a quality management means certifying *IP* partners' resources that integrate with *IPO*'s ERP system. Through offering certifications and a plethora of integration scenarios, *IPO* incentivises partners and end-user firms to join the innovation platform and leverages individual relationships for subsequent value co-creation processes. All the certified resources are listed on a directory on *IP* serving as a sales channel and giving certified *IP* partners exposure to

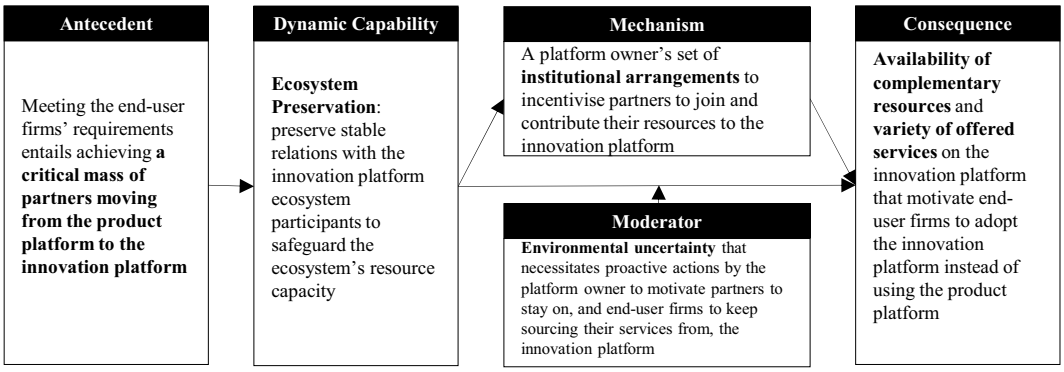

Figure 3. The ecosystem preservation dynamic capability.

a large set of end-user firms that visit the directory regularly.

4.2.4. Consequence

Ecosystem preservation results in the *availability of complementary resources* on the innovation platform due to many actors' willingness to benefit from the platform. This brings about the *variety of offered services* that motivates end-user firms to move to the innovation platform rather than using the product platform. For instance, *IP-Client #3* co-produced an innovative module with *IPO* for end-users who were farmers located all over Brazil. Thanks to preserving an ecosystem of numerous partners, *IPO* enabled effective marketing for the module by mobilising sufficient *IP* "sell" and "service" partners across Brazil. From *IPO*'s perspective, such capability has thus far ensured a thriving innovation platform ecosystem of partners world-wide. From *IP-Client #3*'s perspective, such capability allowed for an effective roll-out of its module for Brazilian farmers. Similarly, affected Brazilian-based *IP* partners benefitted from a partner management process to support their relationship with *IP-Client #3*.

4.2.5. Moderator

The strength of ecosystem preservation in attracting complementary resources is contingent on the rate and unpredictability of changes in the innovation platform ecosystem (*environmental uncertainty*). New environmental stimuli and competitive pressures cause organisational and technological changes in the ecosystem. The greater such environmental dynamism, the greater the need to proactively engage in preserving the innovation platform ecosystem. The enterprise software industry is competitive in that multiple platforms are available (e.g., Oracle, IBM, SAP, Salesforce). Each of the platform owners in this industry seek to dynamically adapt their institutional arrangements (e.g., pricing strategies, revenue share, ownership) in line with the emerging circumstances in the market to keep incentivising partners and to take advantage of their strategic resources. For example, *IPO* continuously adapts its licencing model in response to partners' changing needs in conducting business through the innovation platform. Thus, platform owners can, to some extent, intervene in managing environmental uncertainty by taking strategic actions that shape other actors' expectations, keep motivating them to contribute to the ecosystem, and reduce their assessments of the risks of committing to the innovation platform.

4.3. Dynamic capability III: resource reconfiguration

4.3.1. Antecedent

In transitioning to an innovation platform ecosystem, *IPO* needed to enable an orchestrated consolidation of partners' complementary resources (*resource curation* capability). Nevertheless, end-user firms' requirements evolve over time. If end-user firms adjust their requirements, a constant reconfiguration of organisational and technological resources is needed to leverage creation of new services or reformation of existing services. Therefore, in its transition phase, *IPO* faced the challenge of balancing an efficient and orchestrated creation of integrated solutions at a specific point in time with a flexible and bottom-up creation of new solutions in response to end-user firms' ever-evolving requirements.

4.3.2. Dynamic capability

The analysis of the data suggests *resource reconfiguration* capability (Table A3 in Appendix and Figure 4). The end-user firms' evolving needs necessitate innovative reconfiguration of existing resources to leverage the ecosystem's unfolded innovation potentials. Thus, an innovation platform owner should not only allow for unforeseen resource recombination but also facilitate uncoordinated resource (re)configuration to foster generativity. Resource reconfiguration captures the capability to flexibly and continuously reform given actor-to-actor constellations to reconfigure resources and to generate novel solutions.

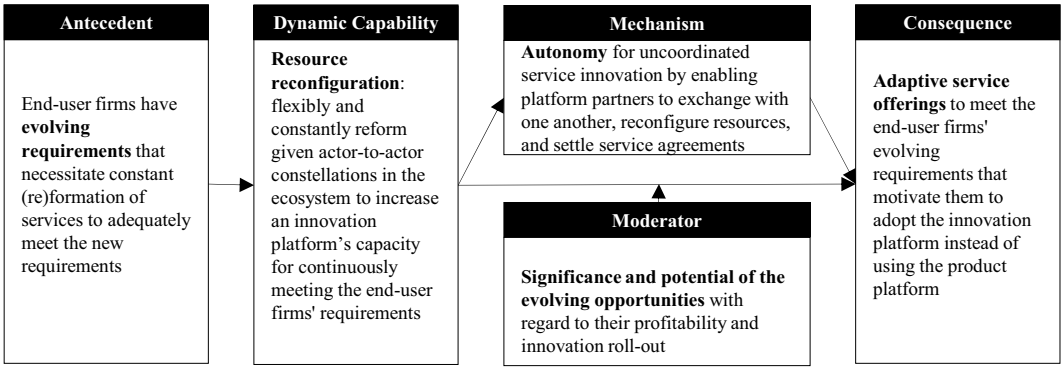

Figure 4. The resource reconfiguration dynamic capability.

4.3.3. Mechanism

One of the mechanisms for resource reconfiguration is a *fair degree of agency* to provide autonomy to partners in innovating platform services. *IPO* was criticised for employing the same approach as in its product platform business even after lunching the innovation platform. Since 2016, *IPO* is, for instance, shifting a subset of its services from a licence-based to a usage-based pricing model. The latter allows *IP* partners to move from *IPO*'s subscription-based cloud services to serverless computing with a very granular function-as-as-service (FaaS) pricing model. Such a granular FaaS pricing model gives platform partners the autonomy needed for innovating and creating their services.

In accounting for platform partner autonomy, both contractual and technical flexibility underlie resource reconfiguration. Contractual flexibility concerns the degrees of freedom in adapting a service's delivery parameters, such as payment models and cancellation periods. Technical flexibility relates to technical affordances of digital platform technology and concerns scalability and/or adaptability of a service in response to new requirements. For that, *IPO* offers a larger variety of programming languages on the innovation platform that grants *IP* partners a wide set of choices when selecting the best-suited development kit for reconfiguring their services. Further, *IPO* provides a dedicated tool for API management, allowing partners to deliberately reconfigure services and facilitate uncoordinated (re)configurations of partner resources. The tool entails API provisioning and publishing, API discovery and consumption, as well as API security and access control. As such, *IP* partners constantly expose their own internal and draw on others' APIs to flexibly reconfigure existing and generate novel solutions.

4.3.4. Consequence

Resource reconfiguration results in *adaptive service offerings* to end-user firms. For instance, *IPO* continuously tracks *IP-Client #1*'s requirements to adapt *IP* services accordingly. From *IPO*'s perspective, this capability ensures a healthy long-term relation with *IP-Client #1*. From *IP-Client #1*'s perspective, this capability allows for evolving towards an operating model of critical on-premises applications ("solid core") and customer-facing cloud applications ("flexible boundary"). From an *IP* partner perspective, resource reconfiguration allows a constant identification of gaps in *IPO*'s focal resource (i.e., the ERP system), which *IP* partners typically fill. When requirements constantly change and the ecosystem allows for uncoordinated reconfiguration of resources, partners are motivated to enhance their position in the ecosystem. This encourages partners to conduct their business on the innovation platform (instead of the product platform) due to access to a wide range of opportunities. Similarly, resource reconfiguration allows a constant catch up with the emerging requirements of end-user firms, motivating them to move to the innovation platform rather than using the product platform.

4.3.5. Moderator

Our data suggest that resource reconfiguration's effect is contingent on the *significance and potential of the evolving opportunities* (e.g., innovation roll-out, financial significance, potential for further innovation). When end-user firms' requirements evolve, the need to reform a given service comes with costs and opportunities. For example, if an end-user firm additionally requires an HR solution, this organisation comes up with a detailed request for proposal. *IPO* then needs to map the existing service to the evolving requirements outlined in the proposal. A reformed service could bring immediate financial benefits due to its relevance to a considerable number of end-user firms and/or create opportunities for further rounds of innovation. Thus, the significance and potential of the opportunity determines whether it is worthwhile to tackle the emerged requirements with a slight or a more radical reconfiguration of resources.

4.4. Dynamic capability IV: ecosystem diversification

4.4.1. Antecedent

In transitioning to an innovation platform ecosystem, *IPO* needed to incentivise a critical mass of partners to move to the innovation platform (*ecosystem preservation* capability). Concurrently, *IPO* needed to allow for uncoordinated resource reconfigurations to foster generativity (*resource reconfiguration* capability). In simultaneously enabling both, *IPO* faced the further challenge of probing its ecosystem's diversity at multiple touchpoints. As partners' entry points to the ecosystem, multiple touchpoints are required to attract and mobilise diverse partners to satisfy end-user firms' emerging needs. In effect, resource reconfiguration can only be achieved if diverse and enough *IP* partners are available.

4.4.2. Dynamic capability

The analysis of the data reveals *ecosystem diversification* capability (Table A4 in Appendix and Figure 5). An innovation platform's sustainable evolution results from a continuous enrichment of both the ecosystem's supplementary resources (to increase resource capacity) and complementary resources (to increase resource diversity) through the engagement of diverse partners. Ecosystem diversification captures the capability to continuously retain diversity in the ecosystem's resource capacity by identifying the required diverse groups of partners, and by establishing corresponding processes to attract enough partners to the innovation platform in each group.

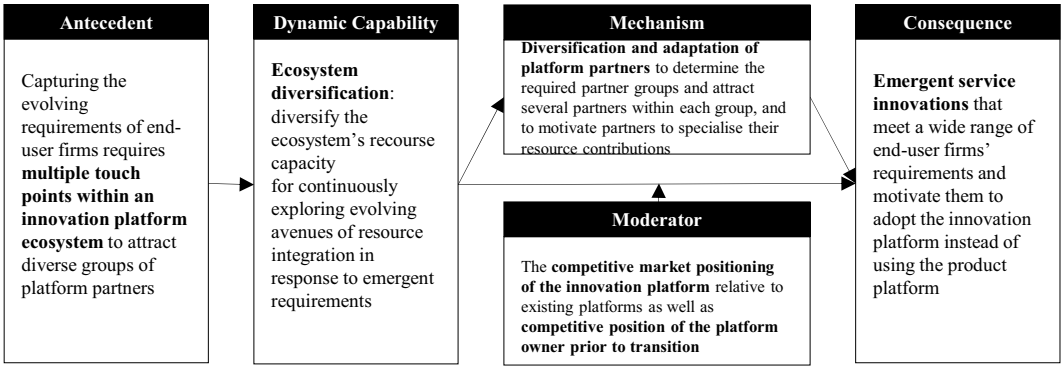

Figure 5. The ecosystem diversification dynamic capability.

4.4.3. Mechanism

Therefore, *diversification of platform partners* to determine types of required partner groups and attract partners for each group is one of the mechanisms for ecosystem diversification. For instance, *IPO* has installed a partner management programme to attract a diverse range of *IP* partners in four dedicated engagement models, i.e., build, run, sell, and service partners. Using digital platform technology, *IP* also grants dedicated tooling to each partner group. For instance, service partners (e.g., Accenture) require different tooling compared to build partners (e.g., Salesforce). *IPO*'s build partners need *IP*'s help portal, a tutorial navigator, how-to guides, cookbooks, developer communities, a cloud appliance library tool, and a rapid-deployment tool. Service partners, in turn, need online educational tools, live webinars, an enterprise architecture explorer, or a client testimonial database. Thus, dedicated tooling adjusted to each of the partner groups contributes to attracting partners in each group and to continuously retaining diversity in the ecosystem's resource capacity.

Building on empirical data, *adaptation of platform partners* is another mechanism for ecosystem diversification. Partners need to adapt themselves after joining an innovation platform ecosystem. For instance, after entering the *IPO*'s ecosystem, *IP-Partner #1*'s main goal was to make sure that it is no longer internally focused but can also sense the market and the opportunities that *IP* affords. *IP-Partner #1*'s goal is now to make sure it is able to navigate within the innovation platform ecosystem to differentiate itself from other partners. *IP-Partner #1*'s goal has also evolved to ensure that it works with diversified technologies to have an ecosystem of its own. Therefore, platform owners need to put in place processes and incentives that leverage such adaptation of partners that eventually contribute to the ecosystem's dynamics.

4.4.4. Consequence

A diversifying ecosystem affords generative recombination of resources and thereby *emergent service innovations*. The latter makes the innovation platform's service offerings more attractive and relevant to end-user firms, motivating them to move to the innovation platform rather than using the product platform. However, service innovations need to be effectively propagated to end-user firms enabling them to easily find and reach relevant services. For this, *IPO* developed an *App Centre* as the point of access. Putting third-party apps on *IPO*'s *App Centre* enriched the innovation platform's offerings and ensured that partners and their apps are known and easily accessible to all end-user firms.

4.4.5. Moderator

Our data suggest that the strength of ecosystem diversification is contingent on the *competitive positioning of the innovation platform* against competing platforms as well as the *competitive position of the platform owner prior to its transition*. With increasing competition amongst innovation platforms, ecosystem diversification becomes both more relevant and difficult. *IPO* competes with other enterprise software platforms through the innovation platform itself and the platform's multi-sidedness. From a platform perspective, *IPO* competes through a superior configuration of technological components. *IP* leverages economies of scale and scope, which are realised based on innovation of the core and peripheries. From a multi-sided platform perspective, *IPO* embodies positive network effects in the enterprise software market whereby the value of its *IP* has grown significantly due to the growth of platform users. In addition, *IPO* built on its strong competitive position and established product platform ecosystem prior to its transition to an innovation platform ecosystem. Such an established, strong ecosystem noticeably facilitates positive network effects and access to a wide and diverse types of partner firms.

5. Discussion and conclusion

This study's focus is on incumbent firms' transitioning of their product platform ecosystems to innovation platform ecosystems, considering their already established operational capabilities. Building on empirical evidence from an enterprise software case, we uncovered the key required dynamic capabilities in the transition phase. In the following, we discuss the implications of our findings for theory and practice along with limitations and avenues for future research.

5.1. Implications for theory and practice

Our study complements the growing research on digital platforms. We specifically contribute to the emerging literature on transition to innovation platform ecosystems and on dynamic capabilities for platforms.

Existing *literature on digital platforms* mainly discusses platform-native or disruptor cases (e.g., Cennamo & Santaló, 2019; Eaton et al., 2015; Huang et al., 2017; Oh et al., 2015; Tan et al., 2015). However, platforms' role in the transition of established businesses of incumbent firms has become the crux of the platform economy and is increasingly gaining traction (e.g., Sandberg et al., 2020; Stonig et al., 2022; Svahn et al., 2017). Our study complements existing research by analysing transition from a product platform to an innovation platform ecosystem in a mature rather than a nascent case, led by an established firm rather than a disruptor. Therefore, our study brings an underexplored aspect of the platform economy to the forefront of digital platforms research. That is, a platform is built by an incumbent firm to redefine the organising logic of an established ecosystem.

Our study specifically contributes to the emerging *literature on the incumbent firms' transition to innovation platform ecosystems* (e.g., Lindgren et al., 2015; Sandberg et al., 2020; Schreieck et al., 2022; Stonig et al., 2022; Svahn et al., 2017) in two ways. First, existing research raises the challenges and complexity of such transition (Lindgren et al., 2015; Sandberg et al., 2020; Svahn et al., 2017) and points to the high failure rate in realising the transition (Gawer & Cusumano, 2008; Hagiu & Altman, 2017; Yoffie et al., 2019; Zhu & Furr, 2016). Our work complements these studies by taking dynamic capabilities as a lens to specify the areas of competencies that incumbent firms need to extend and modify their extant resource base to address the challenges entailed in transition. Second, in discussing transition, existing studies primarily focus on incumbent firms (Lindgren et al., 2015; Sandberg et al., 2020; Svahn et al., 2017). When elaborating on the capabilities that incumbent firms require, we provide a multi-actor-role perspective through studying an innovation platform ecosystem as fluid actor-to-actor constellations constituted by the platform owner (the incumbent firm), partner firms, and end-user firms.

Our study also contributes to the emerging *literature on dynamic capabilities for platforms* (e.g., Helfat & Raubitschek, 2018; Schreieck et al., 2021; Tan et al., 2015). Resembling Teece's (2007) seminal classes of dynamic capabilities (i.e., sensing, seizing, and reconfiguring), current research either proposes classes of dynamic capabilities (Helfat & Raubitschek, 2018) or maps them to different lifecycle stages of a platform's maturity (Tan et al., 2015; Teece, 2017). We complement these studies by offering particular capabilities, i.e., *resource curation*, *ecosystem preservation*, *resource reconfiguration*, and *ecosystem diversification*. We also discuss the antecedents that necessitate each capability as well as the implementation mechanisms, the consequences, and the factors that moderate the effects of each capability. The derived dynamic capabilities in our work instantiate Teece's (2007) seizing and reconfiguring classes of capabilities. These classes of dynamic capabilities build on the necessity of managing resources and co-specialisation in orchestrating the delivery of complex solutions (Teece, 2007). That is, in making the leap to an innovation platform ecosystem, incumbent firms should be equipped with capabilities for attracting the required resources and for reconfiguring resources to generate co-specialised and innovative solutions. For this, seizing capabilities (i.e., *resource curation* and *ecosystem preservation*) concern maintaining and improving complementary resources while reconfiguring capabilities (i.e., *resource reconfiguration* and *ecosystem diversification*) concern the ability to recombine complementary resources for generating innovations (Teece, 2007).

Existing research already informs us that a platform's sustainable operation is heavily contingent on simultaneously allowing for both structural stability and change (Ciborra et al., 2000; de Reuver et al., 2018; Ghazawneh & Henfridsson, 2013; Henfridsson & Bygstad, 2013; Lusch & Nambisan, 2015; Tan et al., 2015; Tilson et al., 2010). Thus, we assert that our derived dynamic capabilities supplement one another and are all required simultaneously: *resource curation* and *ecosystem preservation* capabilities are needed for efficient and orchestrated consolidation of resources, whereas *resource reconfiguration* and *ecosystem diversification* capabilities are required for flexible and generative reconfiguration of resources. This implies that, to successfully navigate the leap to an innovation platform ecosystem, there is a need to attain and constantly maintain a balance between this set of paradoxically related dynamic capabilities. Each capability is crucial on its own but only contributes to a successful transition if balanced with the other capabilities. Therefore, incumbent firms intending to make a transition to an innovation platform ecosystem need to put in place diverging mechanisms to

simultaneously operationalise all four of the dynamic capabilities uncovered by this study.

In research on capabilities for innovation platform ecosystems, Schreieck et al. (2021) offer several capabilities (i.e., cloud-based platformisation, open IT landscape management, ecosystem orchestration, platform evangelism, platform co-selling) similar to our study. They focus on capabilities for an emergent innovation platform ecosystem. Our derived dynamic capabilities complement their inquiry by focusing on the transition phase during which the incumbent firms seek to reconfigure existing operational capabilities to adapt to the ecosystems' new organising logic. The latter is manifest in our "dynamic" capability approach (unlike Schreieck et al.) in identifying capabilities along with their primary antecedents, consequences, mechanisms, and moderators (Schilke et al., 2018).

Our findings also contribute to practice. We provide incumbent firms with a set of capabilities along with their triggering factors and implementation mechanisms. Focusing on the identified capabilities, managers might anticipate areas of concern and take appropriate measures. Reflecting on these capabilities can be valuable for incumbent firms that may be motivated to enter into innovation platform business but are unaware of inherent intricacies and the required managerial actions. This is of particular value for practitioners as more incumbent firms seek to adopt a digital platform strategy to (re)establish their position in the digital economy.

Specifically, from an ecosystem leadership standpoint (Cusumano & Gawer, 2002), the derived capabilities draw practitioners' attention to the paradoxical capacities that incumbent firms need to put in place to institutionalise a new ecosystem organising logic (Schreieck et al., 2022). These capabilities are paradoxical as while being contradictory, they need to co-exist for successfully establishing the transition. On the one hand, incumbent firms need *resource curation* to orchestrate co-creation of solutions and simultaneously they need *resource reconfiguration* to foster uncoordinated generation of innovations. On the other hand, incumbent firms need *ecosystem preservation* to preserve stable relations among ecosystem's actors and simultaneously they need *ecosystem diversification* to foster generativity of the ecosystem. These capabilities imply that, while incumbent firms need to actively participate in the innovation process, they need to carefully define the scope of their engagement to allow for both ecosystem-wide directives as well as bottom-up initiatives.

5.2. Limitations and future research

We investigate a B2B platform that is used as a foundation to provide highly complex solutions to end-user firms. Therefore, our derived theoretical insights should be interpreted in the context of similar platforms. Further, our study purposefully represents a transition case, such that the platform owner was already a major player and had an established product platform ecosystem before launching its innovation platform. Therefore, our derived theoretical insights specifically apply to incumbent firms seeking to exploit digital platform technology in redefining the organising logic of their established product platform ecosystems.

This study systematically derives dynamic capabilities in terms of their antecedents, mechanisms, consequences, and moderators. Nevertheless, due to our single-case study approach, the presented constituents of each dynamic capability are specific to the studied case. As a further step and building on our insights, we encourage future research to come up with an exhaustive articulation of the derived dynamic capabilities in this study, specifically with regard to a set of mechanisms required to realise each dynamic capability.

Moreover, platform governance (e.g., Boudreau, 2010; Tiwana et al., 2010) is a major topic in the literature. Existing research discusses numerous governance mechanisms such as intellectual property rights, revenue sharing, gatekeeping, pricing policies, among others (e.g., Gawer, 2009; Ghazawneh & Henfridsson, 2013; Tiwana, 2014). Governance mechanisms can be employed differently depending on the circumstances under which they are applied. For instance, gatekeeping can be employed by platform owners to attract a high number of platform partners, while in other circumstances it is employed as a restriction to control who joins the platform (Eisenmann et al., 2006). We posit that our set of dynamic capabilities can be used as a basis to elaborate on how and why certain governance mechanisms are employed. Each dynamic capability requires a portfolio of governance mechanisms, and each mechanism can serve several capabilities depending on the way the given mechanism is applied. Therefore, we encourage prospective research to build on our set of dynamic capabilities to systematically discuss the multi-sided implications and rationales of governance mechanisms.

Further, the main focus of our study is on the capabilities of incumbent firms transitioning to an innovation platform ecosystem. Nevertheless, these capabilities' realisation is closely related to digital affordances of platform technology such as boundary resources, modular architecture, and recommender systems. In line with Hein et al. (2020), we encourage prospective research to examine the technological properties of platforms making them the nexus of their ecosystems and providing the means to shift to a new ecosystem organising logic. Such properties are technological proxies of *mechanisms* that we discuss in

each dynamic capability. Therefore, future research is called to elaborate on technological affordances of a platform to afford a balanced establishment of all dynamic capabilities discussed in our study.

Although our empirical data includes the perspectives of the platform owner, partners, and end-user firms, the offered dynamic capabilities merely serve platform owners. Platform partners are an integral part of any innovation platform ecosystem and their investigation is an important stream in platform research (Rietveld & Schilling, 2021). Therefore, we call for inquiries on platform partners, specifically for the case of transition to an innovation platform ecosystem, as follows.

First, a critical success factor for transitioning from a product platform to an innovation platform ecosystem is to offer mechanisms that encourage partner firms to develop solutions on the innovation platform rather than the product platform (see antecedent of *ecosystem preservation* capability). If partners choose to continue generating solutions on the product platform, the innovation platform will not take off and consequently incumbent firms cannot establish the intended transition. Therefore, we encourage research to further investigate a set of mechanisms through which partners' move to the innovation platform can be effectively leveraged.

Second, research shows that joining a major innovation platform is associated with an increase in sales for platform partners (Ceccagnoli et al., 2012). Nevertheless, partners' choices to move to the innovation platform come with many challenges. For instance, partner firms need to revisit their business models and dynamically adapt their resource contributions (see mechanism for *ecosystem diversification* capability). They also need to address the challenge of their technology being replicated by other partners or even by the platform owner (Ceccagnoli et al., 2012; Foerderer et al., 2019). Therefore, partners' choices to join the innovation platform ecosystem require them converting their existing operational capabilities to critical dynamic capabilities in coping with the new circumstances. We thereby encourage future research to shift the focus to platform partners and investigate the dynamic capabilities required for their successful move to the innovation platform.

Notes

1. Other researchers employ slightly different terms: "from product system to ecosystem" (Stonig et al., 2022) and "from product to platform" (Gawer & Cusumano, 2008; Zhu & Furr, 2016).
2. Current research also gives rise to improvisational capabilities by which organisations spontaneously reconfigure existing resources into new ones to address urgent and unpredictable environmental situations (Pavlou & El Sawy, 2010).
3. Years in IT industry, years of experience with *IP* or *IPO*, respectively.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

The work was supported by the Swiss National Science Foundation (SNSF) and the RCSO & EM (University of Applied Sciences of Western Switzerland, HES-SO).

ORCID

Kazem Haki http://orcid.org/0000-0002-8807-0147

References

Boudreau, K. J. (2010). Open platform strategies and innovation: granting access vs. Devolving control. *Management Science*, *56*(10), 1849–1872. https://doi.org/10.1287/mnsc.1100.1215

Boudreau, K. J. (2017). Platform boundary choices & governance: Opening-up while still coordinating and orchestrating. *Advances in Strategic Management*, *37*, 227–297. https://doi.org/10.1108/S0742-332220170000037009

Ceccagnoli, M., Forman, C., Huang, P., & Wu, D. J. (2012). Cocreation of value in a platform ecosystem: The case of enterprise software. *MIS Quarterly*, *36*(1), 263–290. https://doi.org/10.2307/41410417

Cennamo, C., & Santaló, J. (2019). Generativity tension and value creation in platform ecosystems. *Organization Science*, *30*(3), 617–641. https://doi.org/10.1287/orsc.2018.1270

Ciborra, C. U., Braa, K., Cordella, A., Dahlom, B., Failla, A., Hanseth, O., Hepso, V., Ljungberg, J., Monteiro, E., & Simon, K. (2000). *From control to drift: The dynamics of corporate information infastructures*. Oxford University Press.

Cusumano, M. A., & Gawer, A. (2002). The elements of platform leadership. *MIT Sloan Management Review*, *43*(3), 51–58.

Cusumano, M. A., Gawer, A., & Yoffie, D. B. (2019). *The business of platforms: Strategy in the age of digital competition, innovation and power*. Harper Business.

de Reuver, M., Sørensen, C., & Basole, R. C. (2018). The digital platform: A research agenda. *Journal of Information Technology*, *33*(2), 124–135. https://doi.org/10.1057/s41265-016-0033-3

Eaton, B., Elaluf-Calderwood, S., Sørensen, C., & Yoo, Y. (2015). Distributed tuning of boundary resources: The case of apple's iOS service system. *MIS Quarterly*, *39*(1), 217–243. https://doi.org/10.25300/MISQ/2015/39.1.10

Eisenhardt, K. M. (1989). Building theories from case-study research. *Academy of Management Review*, *14*(4), 532–550. https://doi.org/10.2307/258557

Eisenhardt, K. M., & Graebner, M. E. (2007). Theory building from cases: Opportunities and challenges. *The Academy of Management Journal*, *50*(1), 25–32. https://doi.org/10.5465/amj.2007.24160888

Eisenhardt, K. M., & Martin, J. A. (2000). Dynamic capabilities: What are they? *Strategic Management Journal*, *21*

(10–11), 1105–1121. https://doi.org/10.1002/1097-0266(200010/11)21:10/11<1105:AID-SMJ133>3.0.CO;2-E

Eisenmann, T., Parker, G., & Alstyne, M. W. V. (2006). Strategies for two-sided markets. *Harvard Business Review*, *84*(10), 92–101.

Foerderer, J., Kude, T., Schuetz, S. W., & Heinzl, A. (2019). Knowledge boundaries in enterprise software platform development: Antecedents and consequences for platform governance. *Information Systems Journal*, *29*(1), 119–144. https://doi.org/10.1111/isj.12186

Galvagno, M., & Dalli, D. (2014). Theory of value co-creation: A systematic literature review. *Managing Service Quality*, *24*(6), 643–683. https://doi.org/10.1108/Msq-09-2013-0187

Gawer, A. (2009). Platform dynamics and strategies: From products to services. In A. Gawer (Ed.), *Platforms, markets and innovation* (pp. 45–57). Edward Elgar Publishing Limited.

Gawer, A. (2014). Bridging Differing Perspectives On Technological Platforms: Toward an integrative framework. *Research Policy*, *43*(7), 1239–1249. https://doi.org/10.1016/j.respol.2014.03.006

Gawer, A., & Cusumano, M. A. (2008). How companies become platform leaders. *MIT Sloan Management Review*, *49*(2), 28–35.

Gawer, A., & Cusumano, M. A. (2014). Industry platforms and ecosystem innovation. *Journal of Product Innovation Management*, *31*(3), 417–433. https://doi.org/10.1111/jpim.12105

Ghazawneh, A., & Henfridsson, O. (2013). Balancing platform control and external contribution in third-party development: The boundary resources model. *Information Systems Journal*, *23*(2), 173–192. https://doi.org/10.1111/j.1365-2575.2012.00406.x

Hagiu, A., & Altman, E. (2017). Finding the platform in your product. *Harvard Business Review*, *95*(4), 94–100.

Hein, A., Schreieck, M., Riasanow, T., Soto Setzke, D., Wiesche, M., Böhm, M., & Krcmar, H. (2020). Digital platform ecosystems. *Electronic Markets*, *30*, 87–98. https://doi.org/10.1007/s12525-019-00377-4

Helfat, C. E., & Raubitschek, R. S. (2018). Dynamic and integrative capabilities for profiting from innovation in digital platform-based ecosystems. *Research Policy*, *47*, 1391–1399. https://doi.org/10.1016/j.respol.2018.01.019

Henfridsson, O., & Bygstad, B. (2013). The generative mechanisms of digital infrastructure evolution. *MIS Quarterly*, *37*(3), 907–931. https://doi.org/10.25300/Misq/2013/37.3.11

Huang, Q., Chen, X., Ou, C. X., Davison, R. M., & Hua, Z. (2017). Understanding buyers' loyalty to a C2C platform: ThE roles of social capital, satisfaction and perceived effectiveness of e-commerce institutional mechanisms. *Information Systems Journal*, *27*, 91–119. https://doi.org/10.1111/isj.12079

Huang, P., Tafti, A., & Mithas, S. (2018). Platform sponsor investments and user contributions in knowledge communities: The role of knowledge seeding. *MIS Quarterly*, *42*(1), 213–240. https://doi.org/10.25300/Misq/2018/13490

Huber, T. L., Kude, T., & Dibbern, J. (2017). Governance practices in platform ecosystems: Navigating tensions between cocreated value and governance costs. *Information Systems Research*, *28*(3), 563–584. https://doi.org/10.1287/isre.2017.0701

Jacobides, M. G., Cennamo, C., & Gawer, A. (2018). Towards a theory of ecosystems. *Strategic Management Journal*, *39*(8), 2255–2276. https://doi.org/10.1002/smj.2904

Kapoor, R., & Agarwal, S. (2017). Sustaining superior performance in business ecosystems: Evidence from application software developers in the iOS and android smartphone ecosystems. *Organization Science*, *28*(3), 531–551. https://doi.org/10.1287/orsc.2017.1122

Karimi, J., & Walter, Z. (2015). The role of dynamic capabilities in responding to digital disruption: A factor-based study of the newspaper industry. *Journal of Management Information Systems*, *32*(1), 39–81. https://doi.org/10.1080/07421222.2015.1029380

Kenney, M., & Zysman, J. (2016). The rise of the platform economy. *Issues in Science and Technology*, *32*(3), 61–69.

Klein, H. K., & Myers, M. D. (1999). A set of principles for conducting and evaluating interpretive field studies in information systems. *MIS Quarterly*, *23*(1), 67–93. https://doi.org/10.2307/249410

Lindgren, R., Eriksson, O., & Lyytinen, K. (2015). Managing Identity tensions during mobile ecosystem evolution. *Journal of Information Technology*, *30*(3), 229–244. https://doi.org/10.1057/jit.2015.8

Lusch, R. F., & Nambisan, S. (2015). Service innovation: A service-dominant logic perspective. *MIS Quarterly*, *39*(1), 155–175. https://doi.org/10.25300/MISQ/2015/39.1.07

Malgonde, O., Zhang, H., Padmanabhan, B., & Limayem, M. (2020). Taming complexity in search matching: Two-sided recommender systems on digital platforms. *MIS Quarterly*, *44*(1), 49–84. https://doi.org/10.25300/MISQ/2020/14424

Matzner, M., Pauli, T., Marx, E., Anke, J., Poeppelbuss, J., Fielt, E., Gregor, S., Sun, R., Hydle, K. M., & Aas, T. H. (2021). Transitioning to platform-based services and business models in a B2B environment. *Journal of Service Management Research (SMR)*, *5*(3), 143–162. https://doi.org/10.15358/2511-8676-2021-3-143

Miles, M. B., & Hubermann, M. A. (1994). *Qualitative data analysis: A sourcebook of new methods*. Sage.

Ng, C.S.-P, & Gable, G. G. (2010). Maintaining ERP packaged software–a revelatory case study. *Journal of Information Technology*, *25*(1), 65–90. https://doi.org/10.1057/jit.2009.8

Oh, J., Koh, B., & Raghunathan, S. (2015). Value appropriation between the platform provider and app developers in mobile platform mediated networks. *Journal of Information Technology*, *30*(3), 245–259. https://doi.org/10.1057/jit.2015.21

Ozalp, H., Cennamo, C., & Gawer, A. (2018). Disruption in platform-based ecosystems. *Journal of Management Studies*, *55*(7), 1203–1241. https://doi.org/10.1111/joms.12351

Parker, G., Van Alstyne, M., & Choudary, S. P. (2016). *Platform revolution: How networked markets are transforming the economy and how to make them work for you*. W. W. Norton & Company.

Parker, G., Van Alstyne, M., & Jiang, X. (2017). Platform ecosystems: how developers invert the firm. *MIS Quarterly*, *41*(1), 255–266. https://doi.org/10.25300/Misq/2017/41.1.13

Pavlou, P. A., & El Sawy, O. A. (2010). The "third hand": IT-enabled competitive advantage in turbulence through improvisational capabilities. *Information Systems Research*, *21*(3), 443–471. https://doi.org/10.1287/isre.1100.0280

Payne, A. F., Storbacka, K., & Frow, P. (2008). Managing the co-creation of value. *Journal of the Academy of Marketing Science*, *36*(1), 83–96. https://doi.org/10.1007/s11747-007-0070-0

Ranjan, K. R., & Read, S. (2016). Value co-creation: Concept and measurement. *Journal of the Academy of Marketing Science*, *44*(3), 290–315. https://doi.org/10.1007/s11747-014-0397-2

Rietveld, J., & Schilling, M. A. (2021). Platform competition: A systematic and interdisciplinary review of the literature. *Journal of Management*, *47*(6), 1528–1563. https://doi.org/10.1177/0149206320969791

Sandberg, J., Holmström, J., & Lyytinen, K. (2020). Digitization and phase transitions in platform organizing logics: Evidence from the process automation industry. *MIS Quarterly*, *44*(1), 129–153. https://doi.org/10.25300/MISQ/2020/14520

Sarker, S., Sarker, S., Sahaym, A., & Bjorn-Andersen, N. (2012). Exploring value cocreation in relationships between an ERP vendor and its partners: A revelatory case study. *MIS Quarterly*, *36*(1), 317–338. https://doi.org/10.2307/41410419

Schilke, O., Songcui, H. U., & Helfat, C. E. (2018). Quo vadis, dynamic capabilities? A content-analytic review of the current state of knowledge and recommendations for future research. *The Academy of Management Annals*, *12* (1), 390–439. https://doi.org/10.5465/annals.2016.0014

Schmid, M., Haki, K., Tanriverdi, H., & Aier, S. (2021). *Taming complexity in business ecosystems: Investigating the role of platforms*. 42nd International Conference on Information Systems (ICIS 2021), Austin, TX.

Schreieck, M., Wiesche, M., & 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), 365–390. https://doi.org/10.1177/02683962211023780

Schreieck, M., Wiesche, M., & Krcmar, H. (2022). From product platform ecosystem to innovation platform ecosystem: An institutional perspective on the governance of ecosystem transformations. *Journal of the Association for Information Systems*, (42), Forthcoming. https://doi.org/10.17705/1jais.00764

Selander, L., Henfridsson, O., & Svahn, F. (2013). Capability search and redeem across digital ecosystems. *Journal of Information Technology*, *28*(3), 183–197. https://doi.org/10.1057/jit.2013.14

Shang, S., & Seddon, P. B. (2002). Assessing and managing the benefits of enterprise systems: The business manager's perspective. *Information Systems Journal*, *12*(4), 271–299. https://doi.org/10.1046/j.1365-2575.2002.00132.x

Staehr, L., Shanks, G., & Seddon, P. B. (2012). An explanatory framework for achieving business benefits from ERP systems. *Journal of the Association for Information Systems*, *13*(6), 424–465. https://doi.org/10.17705/1jais.00299

Stonig, J., Schmid, T., & Müller-Stewens, G. (2022). From product system to ecosystem: How firms adapt to provide an integrated value proposition. *Strategic Management Journal, Open Access*, *Strategic Management Journal, Open Access*, 1–31. https://doi.org/10.1002/smj.3390

Svahn, F., Mathiassen, L., & Lindgren, R. (2017). Embracing digital innovation in incumbent firms: How volvo cars managed competing concerns. *MIS Quarterly*, *41*(1), 239–253. https://doi.org/10.25300/MISQ/2017/41.1.12

Tan, B., Pan, S. L., Lu, X. H., & Huang, L. H. (2015). The role of is capabilities in the development of multi-sided platforms: The digital ecosystem strategy of Alibaba.Com. *Journal of the Association for Information Systems*, *16* (4), 248–280. https://doi.org/10.17705/1jais.00393

Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal*, *28*(13), 1319–1350. https://doi.org/10.1002/smj.640

Teece, D. J. (2017). Dynamic capabilities and (digital) platform lifecycles. In J. Furman, A. Gawer, B. Silverman, & S. Stern (Eds.), *Entrepreneurship, innovation, and platforms (advances in strategic management)* (Vol. 37, pp. 211–225). Emerald Publishing. https://doi.org/10.1108/S0742-332220170000037008

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, *18* (7), 509–533. doi:https://doi.org/10.1002/(SICI)1097-0266(199708)18:7<509:AID-SMJ882>3.0.CO;2-Z

Thomas, L. D. W., Autio, E., & Gann, D. M. (2014). Architectural leverage: Putting platforms in context. *Academy of Management Perspectives*, *28*(2), 198–219. https://doi.org/10.5465/amp.2011.0105

Tilson, D., Lyytinen, K., & Sørensen, C. (2010). Digital infrastructures: The missing is research agenda. *Information Systems Research*, *21*(4), 748–759. https://doi.org/10.1287/isre.1100.0318

Tiwana, A. (2014). *Platform ecosystems: Aligning architecture, governance, and strategy*. Morgan Kaufmann.

Tiwana, A. (2015). Platform desertion by app developers. *Journal of Management Information Systems*, *32*(4), 40–77. https://doi.org/10.1080/07421222.2015.1138365

Tiwana, A., Konsynski, B., & Bush, A. A. (2010). Platform evolution: coevolution of platform architecture, governance, and environmental dynamics. *Information Systems Research*, *21*(4), 675–687. https://doi.org/10.1287/isre.1100.0323

Vargo, S. L., & Lusch, R. F. (2004). Evolving to a new dominant logic for marketing. *Journal of Marketing*, *68* (1), 1–17. https://doi.org/10.1509/jmkg.68.1.1.24036

Vargo, S. L., & Lusch, R. F. (2008). Service-dominant logic: Continuing the evolution. *Journal of the Academy of Marketing Science*, *36*(1), 1–10. https://doi.org/10.1007/s11747-007-0069-6

Vargo, S. L., & Lusch, R. F. (2016). Institutions and Axioms: AN extension and update of service-dominant logic. *Journal of the Academy of Marketing Science*, *44*(1), 5–23. https://doi.org/10.1007/s11747-015-0456-3

Vargo, S. L., & Lusch, R. F. (2017). Service-dominant logic 2025. *International Journal of Research in Marketing*, *34* (1), 46–67. https://doi.org/10.1016/j.ijresmar.2016.11.001

Venkatraman, N., El Sawy, O. A., Pavlou, P., & Bharadwaj, A. (2014). Theorizing digital business innovation: Platforms and capabilities in ecosystems, (pp.15-080). Fox School of Business Research.

Wang, P. (2021). Connecting the parts with the whole: Toward an information ecology theory of digital innovation ecosystems. *MIS Quarterly*, *45*(1), 397–422. https://doi.org/10.25300/MISQ/2021/15864

Wareham, J., Fox, P. B., & Giner, J. L. C. (2014). Technology ecosystem governance. *Organization Science*, *25*(4), 1195–1215. https://doi.org/10.1287/orsc.2014.0895

Winter, S. G. (2003). Understanding dynamic capabilities. *Strategic Management Journal*, *24*(10), 991–995. https://doi.org/10.1002/smj.318

Yin, R. K. (2009). *Case study research: Design and methods* (4th ed.). Sage Publications.

Yoffie, D. B., Gawer, A., & Cusumano, M. A. (2019). A study of more than 250 platforms reveals why most fail. *Harvard Business Review*.

Yoo, Y., Henfridsson, O., & Lyytinen, K. (2010). The new organizing logic of digital innovation: An agenda for information systems research. *Information Systems Research*, *21*(4), 724–735. https://doi.org/10.1287/isre.1100.0322

Zhang, Y., Li, J., & Tong, T. W. (2022). Platform governance matters: How platform gatekeeping affects knowledge sharing among complementors. *Strategic Management Journal*, *43*(3), 599–626. https://doi.org/10.1002/smj.3191

Zhu, F., & Furr, N. (2016). Products to Platforms: Making the leap. *Harvard Business Review*, *94*(4), 72–78.

Appendix

Table A1. Exemplary empirical evidence for the resource curation dynamic capability.

Perspective	Exemplary Evidence
Platform owner orchestrates multiple partners' distributed resources at a given point in time	"*the customer gets the demand satisfied from one integrated architecture – so also in an easier to maintain way. The important point is [. . .] that business processes run end-to-end across multiple systems*." O_M5 *"IPO will build a product and will address needs, but invariably [the needs] are things we [IPO] don't have. Imagine some niche services like scanning of a bar code in a store – we [IPO] may not build technology to do that but there are other vendors who do that, and they need to provide those services integrated with the cloud platform"*. O_M2
Platform partners form a service with platform owner to contribute their distributed resources	*"From the partner side, definitely the simple and very flexible way to implement the solutions with the full lifecycle management of the solution is one of the [winning] elements. [. . .] then definitely we have a very good and promising platform"*. P4_Principal *"IP is more reliable and versatile technology. It is really a big benefit to be able to deliver our software solutions faster and in a more agile manner within IPO's cloud ecosystem as would have been possible on-premises. [. . .] It is not one partner doing it but you have a real system [of partners] that can interact"*. P5_Manager
End-user firms' specific needs require orchestrated bundling of complementary resources from a complex pool of distributed resources	*"We also use the platform to ramp up a new IoT service or IoT platform which also runs on IP and that is also a collaboration between IP and our company. [. . .] We have C1 providing the [IoT] service and we have another partner who is basically implementing the service in one of our applications which are developed for C1"*. C1_Manager *"We have all actors that are responsible for maintaining and developing IP: [. . .] The C3 software development team, IPO Labs software development team, and the C3 customer. [. . .] We can add other actors [. . .] that are joining the same platform"*. C3_Manager

Table A2. Exemplary empirical evidence for the ecosystem preservation dynamic capability.

Perspective	Exemplary Evidence
Platform owner ensures positive network effects and stable benefits for all ecosystem participants in its brand-new innovation platform ecosystem	*"There are several competing platforms in the market. [. . .] With IP, [. . .] the partners who decide to choose our [IPO] technology not only find a very strong technology offering, very competitively priced, but at the end of the day, it has a willing ecosystem of sales and account executives in IPO who want to sell those apps that are on IP. So [. . .] we can provide them [IP partners] both opportunity in the cost side, which is providing the resources, but also provide them an opportunity to drive revenue. And that is different from anywhere else. [Competing innovation platforms] are not helping their partners who use their platform to sell their applications"*. O_M3 *"We have a channel policy which is specific to the channel partners, which basically says IPO is not supposed to overtake or ignore the partners and customer relation in order to take some benefit out of that. The most blatant example would be we [IPO] are working with a partner in one department, and the partner has an opportunity with an end customer. IPO has put this channel partner policy in place where [IPO's approaching this end customer directly] is strictly forbidden"*. O_M1
Platform partners rely on stable relations and mechanisms within the new ecosystem organising logic to exploit the given network at a given point in time	"*Even when you are a baby and you are born in this partnership, they [IPO] give you step-by-step guide [with] step 1, step 2, step 3. Then you mature. You go to like grade 1. Then you start working with the platform and then you go to grade 2. Then you start working with the partner manager and you go to grade 3. As you progress, you get more tools and you get step-by-step guidance almost like a school or college*." P1_CEO *"From the technology side, good interaction between IPO and the partners is a very important point because knowledge sharing, showing how simple the solution could be, and providing to the partners a lot of tools to simplify the development of apps, this is one of the main reasons from the technology perspective about the success. If the platform is providing insufficient technology, relations are not stable, [and] it would be hard for the partner to make the implementation"*. P4_Principal
End-user firms are attracted to those platforms on which stable relations afford efficient delivery of integrated solutions	*"During the discussion with the insurance company, we had a question about who can see data and who cannot see the data [. . .]. We were able to say [. . .] that was settled by IP, and we could avoid that kind of discussions on all the local regulations [. . .] so that we do not have to mangle as a partner with all the local regulations in cloud. That for me is a good thing. That enables us to sell cloud much faster"*. C4_Manager *"One good example is that the main IPO developer meets once a month with our development team during the development phase; and when we want to test the new versions, new releases of the solution, we go to the farmer's site and then we test in a real case together with the IPO development person, with our development person and the customer. [. . .] Once a month, we talk about the roadmap and the development plan"*. C3_Manager

Table A3. Exemplary empirical evidence for the resource reconfiguration dynamic capability.

Perspective	Exemplary Evidence
Platform owner leverages the constant reform of given actor-to-actor constellations to meet end-user firms' changing requirements	*"We have [. . .] partner councils [. . .] to bring certain key partners in different aspects together, for example, in a quarterly meeting. We have, for example, a quarterly meeting with 20 of our key partners to understand from them what is good, what is bad, what needs to be improved, certain joint collaborative projects, and in order to improve our offering and also to help the partners improve their offering. Then, we have, of course, things like communities where these development partners can exchange ideas and issues and problems in a community platform"*. O_M2 *"So, for the customer, it [reformed service] is a better service [. . .] to his changing needs, to the agility that he needs. Also, in tracking the cost in the markets and the market requirements and the customer requirements that he faces through an ecosystem that is broad, through [. . .] a platform solution that is comprehensive and that gives all the capabilities that are needed in order to quickly set up new solutions that are needed"*. O_M5
Platform partners engage into various actor-to-actor constellations to meet end-user firms' changing requirements	*"We go to a customer together [with IPO] and IPO sells a core product and you [IP partner] sell your own product by bundling it on the platform. That would be the most important to us because, first, we are doing it together [to meet end-user demands]. Second, it really reduces our customer acquisition costs tremendously. And, third, we have a lot of credibility to begin with when we go with them"*. P1_CEO *"A partner has that deep insight into the core business of the customers. The drive to innovate has to come from the intrinsic motivation of the customer. And that is something that it has to deliver to the partners and or to IPO in order to be able to create new solutions on the IP"*. P5_Manager
End-user firms have continuously evolving requirements that can be met by the (re)form of services	*"I am responsible for the so-called Flexible Boundary Stream [for evolving requirement]. It [. . .] takes care of and comprises all the different applications which are [. . .] not part of the core system. We basically create a common platform – that is the IP – to host those applications and to also have the integration possibility with our core system"*. C1_Manager *"The advantage for the customers is that a customer can innovate very actively – in a very agile and rapid manner – his solutions via such a platform which is integrating into its backend systems. We do not really want to touch [the backend systems] because you do not change a running system. This is what the business depends on critically and this needs to be totally reliable 100% and just needs to work and operate"*. C3_Manager

Table A4. Exemplary empirical evidence for the ecosystem diversification dynamic capability.

Perspective	Exemplary Evidence
Platform owner constantly diversifies the ecosystem's resource capacity and leverages end-user firms' access to a wide range of innovative services	*"There are 1,300 individual partners which have a partner contract with IPO. We have different partner tracks or engagement models or partner types. The sell partnership is for the value-added resellers. There are service partners who are doing services for or with IPO and then there are the build partners. [. . .] Currently, we have 1,967 [build] partners. We have an additional 300 that are in [. . .] a limited-period-of-time engagement which lasts for a year for the partner to try free of charge"*. O_M1 *"We have the digital front [. . .] App Centre 2.0 which has just been launched, where these partner apps are being published and the end-user can either directly purchase them from the App Centre or [. . .] clients can basically click on it and get in contact with the partner who sells these apps"*. O_M1
Platform partners contribute to and take advantage of the innovation platform's wide use in response to end-user firms' emergent needs	"*For IPO and its partners, we think value is a proportion of savings on lower [. . .] TCO [Total Cost of Ownership] you offer the client organisations, parts of the lower cost of running operations using ERP systems, client loyalty, and, lastly, insights regarding necessary enhancements to IPO's ERP package within the particular industry verticals or necessary enhancements for the complementary part in the modules*." P5_Manager *"When we started, we actually explored several markets with Microsoft, even with Google and IPO. And we found most success working with IPO just because of [. . .] their enterprise [software] experience. [. . .] We were actually already working with Azure or even Amazon because on the cloud side IPO were starting a little bit behind. So, when it came out, we jumped on it [IP] because of the enterprise [software] ecosystem"*. P1_CEO
End-user firms contribute to and take advantage of the ecosystem's diverse resource set to meet their own emergent needs	*"Our goal is to be able to connect to a diverse ecosystem that provides even more value to our end customers so we can have a single platform to manage all of his farm with the different machines that he has and different information that he has to deal with. So, our goal with the initiative is to be able to connect to this ecosystem and bring value to our customer"*. C3_Manager *"IPO has no industry competence. That is what the partners have. But even this I cannot really believe because real industry competence has a customer by itself. And that is what is a little bit missing on the IPO side. I do not think that partners can compensate this because every company has special processes and so on. [. . .] That [industry competence] is what the customers bring in – and the customer has a lot of experience"*. C5_Manager