



Ecosystems transformation through disruptive innovation: A definition, framework and outline for future research

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ABSTRACT

In this study, we develop a definition and a framework for ecosystem transformation. We suggest a circular model of four main mechanisms to provide an alternative explanation of ecosystem evolution. Interview data are used to develop a model that integrates value creation logics at its core with evolutionary mechanisms. An emphasis on firm-specific technology development sets in motion strategic and technological engagement by other firms in the ecosystem. This comes about through firms that take responsibility for change and actors that adopt new ecosystem roles to drive the whole ecosystem towards transformation around new value propositions. This signifies that disruptive innovation and technological advancement in response to market needs drive ecosystem transformation through new value creation. Our comprehensive framework offers an outline for further research in the domain of ecosystem transformation.

1. Introduction

Ecosystems can be viewed as a network of corporate entities with different interests who is linked together as a collective, where the fate of its actors is nested (Eisenhardt & Galunic, 2000; Moore, 1993). An ecosystem is a community in constant transformation because it needs to create new value through collaboration over competing alternatives (Tsujiyama, Kajikawa, Tomita, & Matsumoto, 2018). Therefore, for the most part, it is not individual firms but entire networks of companies that compete with one another in what is called the networked economy (Adner, 2006). This nested nature of ecosystems and the fact that they consistently need to evolve and adapt underline the fact that transformation is a key concern in understanding the success and failure of ecosystems (Agarwal & Shah, 2014). Given this background, the transformation of business ecosystems has become an area that has attracted increasing scholarly attention (Jacobides, Cennamo, & Gawer, 2018).

Over the past decade, research has used an actor-specific perspective on ecosystems to help better understand how executives can develop a new generation of competitive strategies (Burström, Parida, Lahti, & Wincent, 2021). Such a view is consistent with generating better firm-specific knowledge on how to navigate in a changing business

landscape. However, this prescription fails to adequately address the true impact that the ecosystem concept has on management practice and the contexts in which management decisions are taken. Ecosystem transformation is a concept that exists at a higher level of analysis – that is to say, on the level of change and evolution in the network or direct and indirect relationships in the system that surrounds a firm. Although this high-level view of ecosystem transformation can provide meaningful insights, we still lack a deeper analysis of the ecosystem transformation process and corresponding activities.

It is evident that the literature on the transformation of ecosystems is rapidly growing, but yet it is surprisingly silent on how ecosystem transformation is defined, the mechanisms through which ecosystems change and develop, and the general idea of theory development on this aspect of the ecosystem (de Vasconcelos Gomes et al., 2018). Despite increasing research, studies on the transformation of business ecosystems are scant (Mostaghel, Oghazi, Parida, & Vahid, 2022; Santos & Eisenhardt, 2005). The transformation of business ecosystems is a constant because of their unbounded and competitive nature (Iansiti & Levien, 2004). When transformation is not adequately addressed, too slow, or misdirected, transformation can threaten the viability of the business ecosystem. This situation has led researchers to call for further

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studies on the evolutionary processes involved in business ecosystem formation and transformation (Palmié, Miehé, Oghazi, Parida, & Wincet, 2022; Bharadwaj, El Sawy, Pavlou, & Venkatraman, 2013; Markus & Loebbecke, 2013).

To address this gap in previous research, we ask the research question, “why and how do ecosystems transform?” Our approach has sought to clearly define the concept of ecosystem transformation and the development of a process framework to advance research related to the above research question. We initiated research in the retail sector. This empirical setting is ideal for the study of ecosystem transformation because of its challenges, frequent shifts by ecosystem actors with new digital value propositions, and the lasting effects of the Covid-19 crisis. Our study has employed an inductive approach. In total, twenty-five interviews were conducted with experts including industry leaders and other knowledgeable persons in the retail sector, which is an area where transformation frequently occurs.

Our paper makes several contributions. First, we define the concept of ecosystem transformation. Concept clarity is a key endeavor for scholarly progress in any area. Second, we present our insights in a process framework of ecosystem transformation. This generates insights for future research to pursue on business ecosystem transformation, ecosystem formation, and ecosystem management. Third, our research outlines the importance of new value propositions in an ecosystem, which can be considered as the key to endogenous forces. This builds a conceptualization of technological advancement and of market needs driving transformation through value creation. Our research suggests that the spark for radical transformation is very much a matter of technology development and evolutionary responses in an ecosystem. This resonates with the idea of Schumpeterian competition in explaining ecosystem transformation. Finally, we establish a theoretical basis for evolutionary frameworks on ecosystem transformation. Scientific

inquiry into transformational mechanisms has been only sparsely addressed in the ecosystem literature.

2. Theory background and literature review

A search for “business ecosystem” in the Web of Science resulted in 108 articles in the business section. There is a clear increase in the number of publications from 2019 going forward. Fig. 1 illustrates the number of publications per year (the bar chart). We employed VOSviewer version 1.6.16 and mapped the co-occurrence of keywords, with 4 clusters, 416 links, and a total link strength of 889 (see Fig. 1). The map depicts the major keywords – namely, innovation, performance, dynamic capabilities, and strategy.

Our view of an ecosystem is based on “the alignment structure of the multilateral set of partners that need to interact in order for a focal value proposition to materialize” (Adner, 2017). This definition focuses on the individual firm’s value proposition and its fit with the ecosystem (Adner, 2017). This interpretation goes beyond the view of ecosystems as “networks of affiliated organizations” and the standpoint elaborated by Iansiti and Levien (2004) who define business networks as ecosystems, “characterized by a large number of loosely interconnected participants who depend on each other for their mutual effectiveness and survival” (2004: 8).

This perspective on ecosystems places the focus on interdependent value creation among actors (e.g., Adner and Levinthal, 2000) where the core is the value proposition. This view seeks to analyze and explain the set of actors that need to interact in order for the value proposition to be realized.

Therefore, we offer the following definition of ecosystem transformation:

Ecosystem transformation is defined by processes causing changes in the

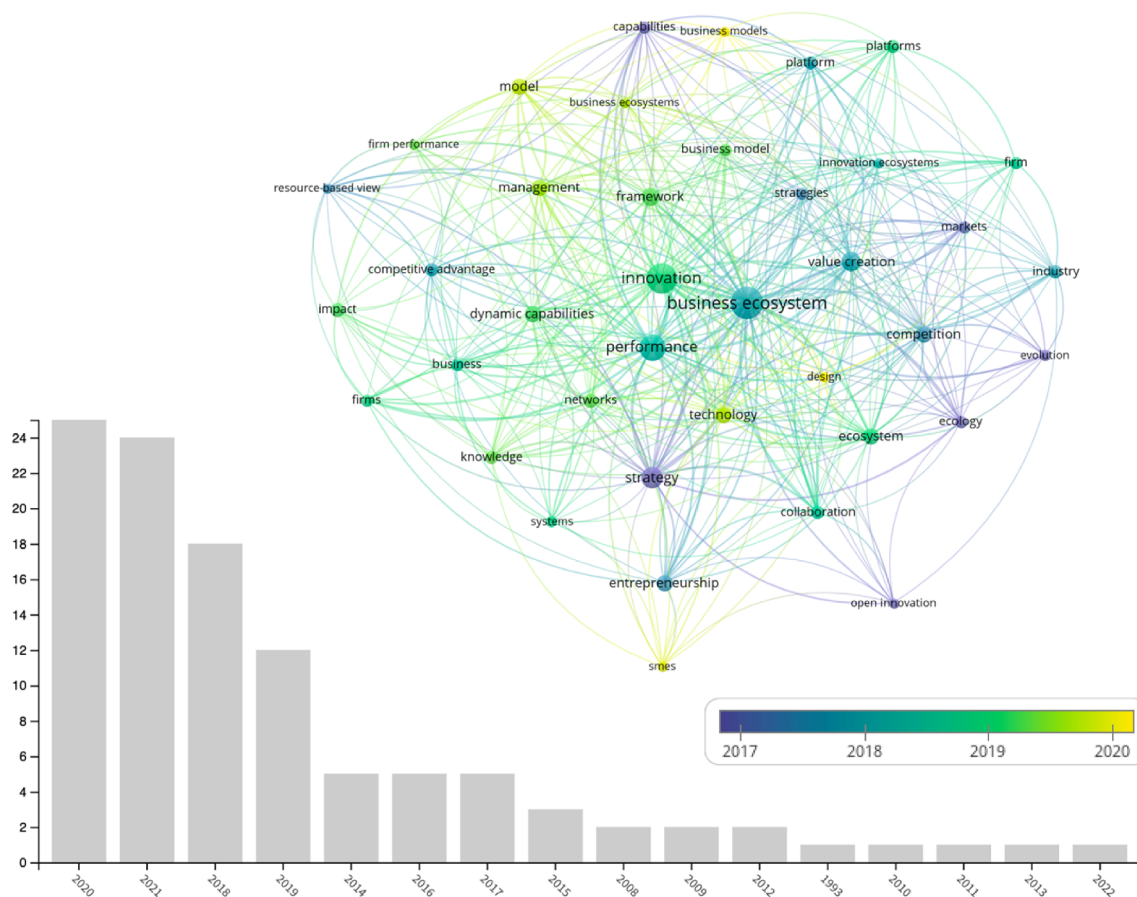


Fig. 1. Number of publications per year (bar chart) and co-occurrence map of keywords.

mutually aligned value propositions among a set of partners that are directly and indirectly linked with a purpose to stay competitive and differentiate themselves to other value propositions offered by other actors.

This standpoint largely follows the view of Adner and other researchers in the sense that it positions the value proposition as central to the ecosystem, adding that the process around adjustment of the value proposition is what defines transformation.

An ecosystem transformation approach is about outlining rationales for ecosystem change and considering how actors identify and execute new value propositions. Even though the concept has not been specifically defined, a few models and frameworks have been developed that identify the processes, concepts, and mechanisms behind ecosystem transformation. Although these models are useful in describing the processes involved in how actors define new propositions and how they come together to organize around different value propositions, they fail to provide a symmetrical or comprehensive view. They fail to explain how different mechanisms link together, how cycles of transformation can best be understood, and what are the fundamental forces that underpin ecosystem transformation. Our point of departure is that such a view is required for a deeper understanding of how transformation in ecosystem occurs.

Here, we acknowledge that the terms – framework, mode, and theory – are used in various ways. Our view on the concept of *framework* is that it helps identify concepts that are important to understand a phenomenon, but specification of the linkages between them is more limited. *Theory* has a higher ambition in determining causal evidence and in understanding why and how the concepts are linked to each other (Whetten, 1989). *Model* is focused on specifying these linkages in a certain and specific context related to the purpose of the analysis.

The extant literature is filled with studies on innovation business ecosystem (e.g., Panetti et al., 2019; Parida et al., 2019; Pigford et al., 2018; Salavisa et al., 2012; Oh et al., 2016). However, a limited number of studies have focused on the transformation and evolution of ecosystems. For instance, a framework to map an innovation ecosystem is multi-layered innovation ecosystem mapping (MIEM) that analyses network communities at the meso level (Xu, Hu, Qiao, & Zhou, 2020). This framework identifies communities in the ecosystem and recognizes the strategic role of actors within them. However, the enablers of evolution and the necessary components for ecosystem evolution are neglected in this framework.

From reviewing the literature, NEST, the nested business environment framework, is shown to be quite a well-developed and comprehensive framework. Building upon a value proposition perspective, Möller, Nenonen, and Storbacka (2020) developed what is perhaps the most integrated framework across multiple levels. At the macro level, institutional arrangements and political and technological forces operate, which define the lower levels where regulations, norms, and the overall complexity of ecologies are located. Here, the characteristics of the field technologies in use are also found. At the lower meso and micro levels, the focal ecosystems and their actors operate. Value logics and innovativeness are also found as are the existing resource bases and business models. The idea of the framework is to reveal a more comprehensive and realistic understanding of complex business environments, such as ecosystems. One of the less developed ideas of the framework is that it neglects ecosystems from equilibrium analysis, theoretical consent to real responses to change, and how responses set ecosystem structures and actors in motion. This is necessary to make progress in theorizing ecosystem transformation.

A framework that partly resonates with the NEST framework terminology (with conditioning forces from the environmental equivalent to the macro level, and moderating frames that influence actor perception, such as technological insight, latitude for strategic change, and business model boundaries) is the empirically grounded managerial model of transforming ecosystems (Penttilä, Raval, Dahl, & Björk, 2020). This framework places more weight on specific mechanisms for ecosystem adaptation through the enactment and selection of new and

existing partners, and specifically on actor responses to forces that activate change. However, when it comes to mechanisms, it remains largely at the micro level, and no integration of the evolutionary components takes place.

An earlier framework with emphasis on such evolution is the study of Lu, Rong, You, and Shi (2014) who developed a three-dimensional theoretical framework that includes the stages of the business ecosystem life cycle. This framework places ecosystem stakeholders and their functional roles at the core of ecosystem transformation. The framework also develops the view of an agent-based system for ecosystem transformation. As an analytical tool to understand the importance of individual actors and the connections to the larger macro level, it is clear that the framework has value. However, it is limited to the extent that it omits important aspects of actor motivations and the processes that transform the ecosystem.

Recently Burström, Parida, Lahti, and Wincent (2021) studied how manufacturing firms successfully adopted AI (artificial intelligence) and transformed their business models and ecosystems. They illuminate the dynamics behind the transformation process and present a dynamic model considering both intra-firm micro-elements and ecosystem macro-dimensions.

All of the above studies are important in defining the boundaries of elements and mechanisms that must be included in order to understand ecosystem transformation. The drawbacks are the mechanisms omitted and the lack of a clear underlying theory that has integrative potential to underpin a comprehensive perspective on further developments. A key problem is that, although both ecological and evolutionary ideas are presented in all of the studies, there is no clear linkage of the mechanisms to one underlying theory in which market or value-based logics, social dimensions, and evolutionary elements are integrated. A compendium list of pertinent literature is presented in Table 1.

In our empirical study, we observed that evolutionary theory and the idea of Schumpeterian competition provides a serving base for mapping the transformation of ecosystems because of its emphasis upon transformation of value propositions. It has also linked very well with previous frameworks of ecosystem transformation. This offers a broader perspective, with the focus on strategic value creation of individual firms and evolution at the ecosystem level (Van der Borgh, Cloodt, & Romme, 2012). The perspective comprises two discrete economies: the research economy, which is driven by technology advancements, and the commercial economy, which is driven by customers (Oh, Phillips, Park, & Lee, 2016).

Extending the ideas from evolutionary theory and Schumpeterian competition into ecosystem transformation and how actors agree and adjust to new value propositions, we develop the idea that the core of the transformation within and between ecosystems is technical advancement and changed preferences, which proceed through an evolutionary process. In this process, new value propositions are competing with each other (cf. Parida, Burström, Visnjic, & Wincent, 2019). When a broad technology is developed, a wide variety of strategies to develop value propositions is taken by different ecosystem actors (e.g., Nelson & Winter, 1973). When only a few value propositions are selected and only a very few look promising, ecosystems formulate around these changes and firms organize their new value propositions in new niches (Pigford, Hickey, & Klerck, 2018), where new value propositions are disseminated among and executed by the actors.

Although not highlighted in the business ecosystem literature, we identify a set of evolutionary mechanisms in our data to motivate actors in the business ecosystem to push technology and customer needs into new offerings. We develop this theme in the empirical section. We also elaborate on the ecosystem implication of the Anderson and Tushman (1986) study, which showed that, when new technologies are launched in existing industries, which by extension is also true for ecosystems, two kinds of scenario are possible: either competence enhancing or competence destroying. When a potentially superior alternative technology or change is developing, actors either upgrade or destroy the capabilities in

Table 1
A compendium list of pertinent literature.

Study	Major focus	Theory / approach	Major limitation(s)
Penttilä et al. (2020)	Managers' interpretation and implications of the ecosystem transformation.	Network strategizing and sensemaking theory.	Evolutionary components are not integrated.
Lu et al. (2014)	Three-dimensional ecosystem	Stakeholder theory.	Omits important aspects from the motivations of the actors and the processes that transform the ecosystem.
Burström et al. (2021)	Business model and ecosystem transformation	Business ecosystem theory and business model innovation theory.	Not including stakeholders beyond industrial boundaries.
Letaifa et al. (2016)	Transforming service ecosystems	Used service-dominant logic framework.	Actors' reflection on the ecosystem transformation is missing.
Möller et al. (2020)	Proposed nested business environment framework (NEST)	Built on value proposition perspective. Drawn from sociological and economic theories and institutional theories.	It neglects ecosystems from equilibrium analysis, theoretical consent on real responses to change, and how responses set motion of ecosystem structures and actors.
Xu et al. (2020)	Multi-layered innovation ecosystem mapping (MIEM)	Newman topological clustering, network community perspective.	Evolutionary components are not integrated.
Salavisa et al. (2012)	Sectoral differences affect firms' networking behavior	Social network and network positioning.	No discussion on transformation.
Panetti et al. (2019)	Characteristics of a smart innovation ecosystem with relational perspective	Network structure and network portfolio.	Evolutionary components are not integrated.

the search for new value propositions (Tushman & Anderson, 1986). We develop the notion that this forms the basis for how ecosystems in transformation organize around different value propositions.

The essence is that the capture of value comes from technology and its subsequent transformation by actor responses in new or changed ecosystems. A new way of value creation is at the core of the current changes. Value creation is about how customers perceive products and what is valuable. Thus, future value creation differs both in degree and in nature from what is currently executed in the ecosystem.

3. Research methods

3.1. Overall approach and context

The research question was designed to investigate the transformation of ecosystems in an inductive way and to understand how ecosystem actors describe their approaches to transformation as part of experience. Therefore, we aimed to develop a framework using an interpretative approach where actor perceptions, approaches, and activities are at the core of understanding transformation (Miles & Huberman, 1994).

To address the proposed purpose, we investigated the ecosystem transformation in the retail industry. In particular, we observed that there were several reasons why traditional retail ecosystems centered on physical shops changed in order to place themselves in a better position than their current situation. According to a McKinsey report (2019), the

entire retail ecosystem is now due to go through radical changes. The time would seem opportune to institute the next generation of value creation in retail transformation based on new ecosystem actors and changes to existing ones, involving the incorporation of new technology and digital components. Consequently, we have used this industrial context as a case of ecosystem transformation. However, the idea was to develop a more general model based on the expertise of different actors operating in the ecosystem, which is constantly transforming. The retail sector is known to have high environmental dynamism, high competition, and high heterogeneity of customer preferences. This means that both actors and the entire ecosystem is used to frequent transformation. Thus, it can be considered an ideal case to study ecosystem transformation.

3.2. Data collection procedures

As the method of inquiry, we chose the expert interviews data collection approach. An expert is a person with interpretative and process knowledge in an area of expertise. In this case, it means people with long-standing experience of the retail sector, its changes, and its direction. Experts have more than just systematic organized knowledge, they also have deep knowledge from specific experiences resulting from their actions, obligations, and responsibilities (Bogner, Littig, & Menz, 2009). We therefore interviewed individuals with responsibility for strategy, active in implementation, and with relevant knowledge of strategic decisions, processes, and industry responses but also with a thorough understanding of the retail sector. In interviewing experts, we had a special interest in their experiences as representatives of larger ecosystems. In addition, these experts represented different actor perspectives on retail ecosystem transformation, such as the traditional retail firm, logistic companies, and software and analytics firms.

Purposive sampling was used to identify suitable informants to develop the ecosystem transformation framework. Probability sampling to develop an understanding of a larger and more abstract set of mechanisms is inappropriate in qualitative research because the goal is not to study effects in the larger population and report whether the effects are statistically significant or not. Rather, informants are selected to reflect particular groups within the sampled population (Ritchie, Lewis, Nicholls, & Ormston, 2013). This ensures that a detailed understanding of the mechanisms, the issues being investigated, and important information from specific experiences, roles, and so on is obtained. Here, purposive sampling benefits from the selections made in the early design stages of the research to advance existing knowledge and theories in the field of study.

To ensure precision and rigor, the first step is to define the sample by focusing on those informants that were able to provide relevant information. Therefore, we selected experts that allowed access to insights from transformation projects and real-life experiences of the phenomenon investigated. The method selected allows us to analyze data and to determine differences between expert perspectives (Ragin, 2009). Second, the experts selected are known to have an advanced overview of ecosystem transformation. They come from different types of organization and all have a reputation for having a solid understanding of their firms and their history of partners.

In total, 25 experts were interviewed. This number is consistent with previous recommendations for expert interviews. Glaser and Strauss (1967) suggest at least ten interviews for a representative appreciation of patterns and potential differences across informants. Saldaña (2013) argues for around 20 to 30 informants to achieve a deeper understanding of what is to be analyzed. We initially selected a smaller sample and expanded it using snowball sampling methods. Our enlargement was based on asking people who had been interviewed to identify other experts who fitted the selection criteria. This approach is recommended when analyzing dispersed populations where selection criteria might not be widely available. The expert interviews were conducted face to face or by telephone.

3.3. Data analysis

We used a grounded theory approach to develop a tentative framework of transformation processes in ecosystems (Glaser & Strauss, 1967). Grounded theory examines processes and mechanisms (causes, contingencies, consequences, and conditions) to understand the patterns of relationships between concepts in the data (Glaser & Strauss, 1967). Since the aim of our research was to identify a framework, we started with the data (“the ground”) provided by experts with substantial experience. We defined experience as knowledge about the phenomenon under different conditions. In the coding process, we noticed that the concepts connected to evolutionary ideas and elements of other frameworks on ecosystem transformation.

This data-driven procedure was chosen as the means to look for general patterns in the data, and to remain open to all possibilities that emerged without being overly influenced by pre-existing theory and previous empirical research. In our research, we were inspired by the two-phased coding approach of Miles et al. (2013). Specifically, we wanted to understand *how* events in the data occurred by looking deeply into the structure of these events and *why* individual events occurred because of larger theoretical mechanisms. We described our procedure as a “how and why coding approach”:

How coding: In a first cycle of the data analysis, a closed coding approach (Saldaña, 2013) was applied. This allowed us to break down the data into discrete parts. We assigned labels and defined concepts to statements and paragraphs from the interviews that captured important material or provided answers to the research questions. In Fig. 2, this coding is illustrated in how an ecosystem is transformed.

Why coding: In a second cycle, we engaged in why coding in our discussions with the researchers and concluded that the following sub-codes emerged from the data. The sub-codes can be characterized as process codes capturing reasons and conditions under which ecosystem transformation occurs:

- Transformation forces: Why are actors transforming?
- Strategic opportunity formation: Why is transformation evident?
- Ecosystem value alignment: Why are actors transforming?

- Ecosystem capability and process formation: What consequences are evident in ecosystem transformation and why?

We expanded the coding in phase two (e.g., why coding) and applied a broad overview of how the experts talk about each of the codes. Particularly when coding to fit the last codes into the themes above, we placed emphasis on distinguishing between stages and categorizing codes in stages. Initially, as researchers, we derived the meaning of the codes linguistically. We then compared our understanding with defined dictionary terms and ultimately with the existing literature. At this stage of the analysis, we were able to link identified lower-level codes with higher-level codes and to match them to the four transformation states. Ultimately, the coding structure was linked to the overarching concept of ecosystem transformation. Fig. 2 illustrates the full coding scheme and the linkages between the how and why coding.

4. Empirical findings

Overall, our interviews clearly indicated that the current business models in traditional retail are questioned by new companies that compete with online retail, and the ecosystems we mapped and analyzed were undergoing significant transformation.

The results in this section are based on the coding and analysis of the interviews conducted. The findings are organized along the dimensions derived from the coding.

The following coding scheme (Fig. 1) emerges from the coding process. Subsequently, each of the dimensions are discussed.

4.1. Structural transformation forces

The results of the coding scheme consider the reasons for transformation to be based on industry and market changing forces. Most interviewees pointed out that the reason for change comes principally from the external environment where technology advancement and implementation solutions are developing rapidly, but also from the changing needs of customers. We compiled some excerpts that help to understand the structural transformation forces of change.

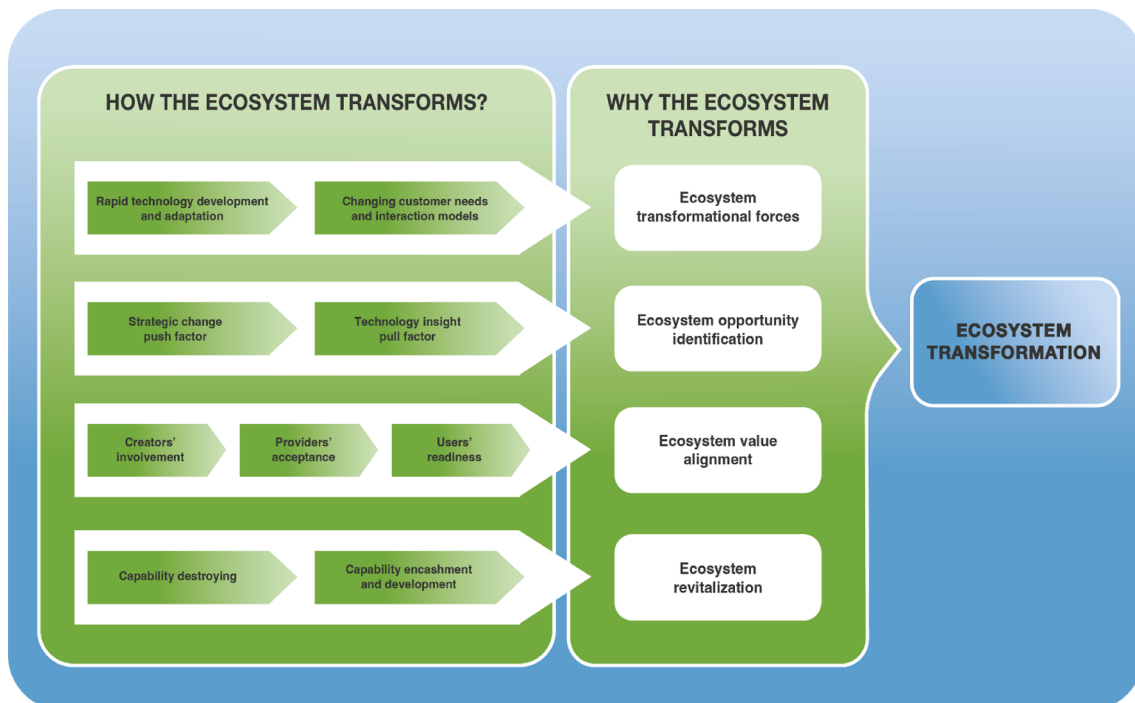


Fig. 2. Data coding and analysis of ecosystem transformation.

4.1.1. Technology developments

It was clear that the underlying force and the core of transformation in the ecosystem was the need to identify new value propositions so that the technology developments related to digitalization could be managed. It was often mentioned that technology and digitalization exert a powerful influence on the existing logics of value creation, and that the business models and traditional ecosystems in traditional retail are losing their competitiveness.

An informant from the traditional retail sector commented:

“This is the constant fight that we all are adjusting to all the time at the moment. Digitalization and online retail are changing the logics for how we need to think of the future.”

The changes in how technology platforms have evolved into their own marketplaces are listed as a main reason.

“Our fear is that global online retailers based in Asia such as Alibaba and in the United States, where players such as Amazon operate, could outcompete the traditional ecosystem around retail stores.”

4.1.2. Customer needs change

The ecosystems in traditional retail were thought to be losing their competitive edge, and levels of customer satisfaction were dropping compared to the online competitors.

Experts commented that pressure comes from more efficient distribution channels, more advanced technology for managing online trade, and more advanced customer interfaces, allowing online companies to maintain and extend their relationships with customers to an increasing degree.

“We see a trend where customers want online purchases. Fast delivery, choice options and the ease has now reached the market. It is a preference that we need to address when we think about our offering and how we can work with our partners around stores.”

These destabilizing forces suggest that the current ecosystem logic for value creation possesses a deep-seated flaw that could dislodge the cornerstone of traditional retail ecosystem and its physical shopping.

“The underlying logic has changed. We all know that. The question is about time and how to address the need for changes that spread gradually. We all need to consider a society in change. This is nothing new for us in retail, but now it is time to think out of the box.”

4.2. Strategic opportunity identification

The interviews highlight different transformation actions, including strategic change push factors and technology insight push factors.

4.2.1. Strategic change push factors

When engaging in strategic change, experts explained how to avoid niche overlaps, differentiate within the ecosystem, pioneer hard-to-imitate innovation, and migrate out of a collapsing ecosystem segment. These are push factors leading to a change in strategy to address, for example, frequency dependence loss and a difficult position within the existing traditional ecosystem.

Avoiding niche overlaps in the ecosystem.

A major area for action concerns niche overlaps. The difficulties in differentiating and finding a niche that had not been overly exploited were mentioned as a reason for strategic change. In discussing these difficulties, experts either referred to the organizational challenges or other pressures coming from stakeholders as the main reasons for finding a niche or a new niche in the existing ecosystem. As one informant commented:

“We are experiencing a significant financial loss right now. This is not only because of technology and market forces as we know them. Our shareholders say we should cut costs and we need to rethink our business set-up to differentiate a niche that is rather overexploited.”

Another expert interviewee concluded:

“You look around you, and you see how people who enters resonate. Do we need yet another store with the same offering? No, in our segment there is no room. It is so crowded. We all think about how to not run into others and to find an own space in here.”

Pioneering with hard-to-imitate innovation.

Another area identified as one of the strategic change push factors is the endeavor to be a pioneer and a front runner with hard-to-imitate innovation offerings, as one representative intimated:

“When looking at the problems we are facing and the changes in our scenery, you start looking into opportunities of the change. Obviously, you realize that you can both replicate what you are exposed to from competing alternatives and think about advantages to combine what you have and what is emerging in terms of technologies and offerings in the digital arena.”

Our experts described a series of responses that belong to this striving to be a first mover. Even if the pace is only incremental, the pressure to not lag behind stimulates many of the strategic changes in the ecosystem.

Migrating from a collapsing ecosystem segment.

Although to a lesser extent, interviewees commented on the carrying capacity of the niche in the ecosystem where they were positioned.

“Of course, it is a problem when you see stores are closing or changing direction. We live in symbiosis, and we are dependent upon the survival of others. For example, if I lose 50% of the neighbors around me, less are visiting our store. The same could be said about our segment. If no one rents movies, it goes out of the mind of consumers, and you get hit by a trend. This is the same for all other areas when you think about store content. It is good to have enough of a mass to keep awareness among customers.”

Consequently, when ecosystem segments were collapsing, strategic change was set in motion.

4.2.2. Technology insight push factors

When engaging in strategic change or being driven towards change, technology push factors, such as technological risk taking and customer demand-technology development, match.

4.2.3. Pushes towards technological risk taking

The interviewees described how technology advancements increased risk taking in the ecosystem.

“We see how technologies can be used and lead to somewhere else. Both costs are going down with internet models, and the technological systems for wiring the offline shop online are much more developed. This leads us out to explore the option.”

Another interviewee stated:

“The technology and the systems have changed so much, so there is now an imagination of how the shop could look like tomorrow for us. You never know where technology is going, but it is developed enough for us to try taking some new explorations with it. There will be investments, but at least we know enough alternatives are developing to understand where we are going.”

4.2.4. Customer demand-technology development match

Other areas that push strategy changes from technology insights

relate to customer demands and technology matching.

“The trend of our customers having an online life and that they are ready to share it with us seems clear. They have been members; they shop at our website. However, technology is now there to integrate what they do online to the store. Sure, we push them to the store with the online platform and by emails. This is trivial to how you can do it tomorrow. Technology seem to go into the area of even better integrating what they want with what we can do for them.”

It was also evident in numerous other statements that a fit between customer demands and how the technology is developing is important for strategies to change based on the insights gleaned.

“You get exposed to new technologies all the time these days, and you start to realize how a customer journey could be both physical in store and digital on the internet or in our app. This is now intellectually interesting to discuss and think about. You realize that what we see in retail will be very different in the future, and this is the time for new strategies to win the next step.”

4.3. Ecosystem value (BM) alignment

Our actors highlighted different types of formation for new value principles, including internal processes, the organization’s use of technology, and workflows or procedures derived from the creators, providers, and users of new technology. In our analysis, we distinguish three roles associated with the development and the execution of ecosystem formation, which aims to align value using interdependent business models.

4.3.1. Creators’ involvement

How to create new value? Content creators are responsible for the creation of the innovative content of the ecosystem. Our experts reported on several “business theories” deployed by ecosystem actors seeking to define new value propositions. Often, these were previously independent or unknown ecosystem actors – sometimes they were the stores, or sometimes actors who were already partners with retail stores. The concept of win–win solutions and differentiation to find a “mutation” that survived in the ecosystem was considered the core mission.

Examples of ideas presented by content creators as future stores in the ecosystem together with new and existing partners were the following:

“We see there is a change of internal processes, change that is necessary for retail. It will not be about products when visiting stores – it is about creating value with production. This means we are moving toward customer made and custom made to increase value. Creating value with in-store production will be the next thing.”

Other advanced ideas were put forward to develop new business models and to create new value streams. Actors in the ecosystem purposely had a role in helping the ecosystem survive, transform to the prevailing environment, and repulse “attacks” from other niches in the ecosystem.

“Our mission is to help our clients to be creative and lead the development. We are certain that we will win the recent losses in customers to purely digital purchases.”

4.3.2. Providers’ acceptance

Providers have positioned themselves as intermediary actors who are central players in the distribution of offerings (e.g., content) in the ecosystem. Sometimes the content creators generated technology and related elements as value propositions for the providers, and sometimes the actors developed solutions together.

“Now we are rethinking what to provide and deliver to our customers. Perhaps it is not so much to think about products or people as the contact point. We set technology in the front line. Placing technology in the front line in terms of screens, interactive technology, customers logs or connection to online behavior are important. We start to think that perhaps you next log in with your membership card when entering the store and you get customized messages”.

Other providers in the ecosystem reasoned:

“The interaction with customers is changing. It is not much staff, but very different staff. We need to think about competence and reputation. Branding. High paid professionals and brand ambassadors. Less space and more exclusive.”

4.3.3. Users’ readiness

Users are actors that consume or interact with the value offerings in the ecosystem. When aligning value and when exploring new business models, such access is crucial.

“We have been a pain for others in the ecosystem. We set the bar. We know what we want.”

In the process of aligning value propositions in the ecosystem, lead users are central. Sometimes the content providers develop solutions on their own and sometimes in collaboration with the providers. However, the model where creators, providers, and users work closely together is increasingly important as the ecosystem becomes more exposed to changes, competition, and dynamism.

“We know our triad model and we have geared it carefully. Right now, we are working on in-store entertainment. I cannot envision doing this without creators, providers, and users in the same team. We need to listen, experiment, and develop together.”

4.4. Ecosystem capabilities and process formation

Ecosystem transitions are truly evolutionary. The battle between actors in the ecosystems and new entrants is at its core. The evolutionary idea of hanging in, stepping up, and stepping out are shown in the data to be central in driving the change process in the ecosystem. We identified capability enhancing and capability destroying among the actors.

4.4.1. Capability enhancement and development

Incumbents in the ecosystem consistently monitored when to execute and how to compete with new value propositions.

“We are investing into technology and a strategy to re-do the whole customer journey. We decided to hold the trigger to save money and to see if we are right with the idea. We reason that it is not about asking for information for completing a purchase when being in a store. It is about intimacy for a future purchase. This is a radical shift for us, and we do not know if this is the right step. We monitor small incremental changes in the ecosystem to see if we are right or wrong.”

The obvious costs are related to a new set of capabilities.

“The investments are large, and it is about taking responsibility. Talking about hard decisions. Well, you may take on such right decisions, and you can live in several years from it. If wrong, you are ruined.”

4.4.2. Capability destroying

New actors or those coming from other places into the ecosystem sometimes aimed to implement new value propositions with capability destroying strategies.

“We are reasoning that our value proposition will shake up and deviate from others, instead of replicating and to rely upon the “standard” design. We set our mark in the ecosystem through creativity.”

Once this is implemented, new motions, technologies, and customer needs change. This again initiates a new cycle of change in the ecosystem.

4.5. A process framework for ecosystem transformation

Based on the above findings about different phases of ecosystem transformation, we have developed Fig. 3, which depicts a process framework of ecosystem transformation. This framework serves as a basis for a set of propositions on the processes involved in ecosystem transformation.

Consistent with our previous definition of ecosystem transformation as a process causing changes in the mutually aligned value proposition among a set of partners that are directly and indirectly linked with a purpose to stay competitive and differentiate themselves to other value propositions offered by other actors, we have determined that the spark of transformation comes from technology and customer preferences.

The idea is that ecosystem transformation is a process of change in mutually aligned value propositions, sparked by structural transformation forces in terms of technology transformation and changes in customer needs. There are four interlinked and cyclical overarching

phases that can explain the constant transformation in ecosystems. These are transformational forces, strategic opportunity identification, ecosystem value alignment of actors, and ecosystem capabilities and process formation. At the lower level, our framework suggests that is strategic change push factors are at the core where actors in the ecosystem seek to avoid niche overlaps in the ecosystem. This is caused by problems related to differentiating and finding a niche that has not been over-exploited. Another reason is the collapse of a segment of the ecosystem and, with it, the carrying capacity of specific niches in the ecosystem.

An important observation from previous research is that value proposition transformation driven by three types of actor is at the very fundament of change. Migration into new value propositions is led by content creators, content providers, and content users. In symbiosis, they develop, offer, and implement technology innovation, take risks, and identify solutions that create new customer demand that help actors to migrate into new niches and transform the ecosystem. These actors are at the core of the evolution and transformation of the ecosystem. The implications of the new value propositions are that actors in the ecosystem need to face capability enhancing and capability destroying forces, which ultimately spark new cycles of structural transformation in the technology and change in customer needs.

We suggest that the four interlinked processes serve as a basis for understanding ecosystem transformation – characteristics that we merge under the label, ecosystem transformation. The idea of ecosystem

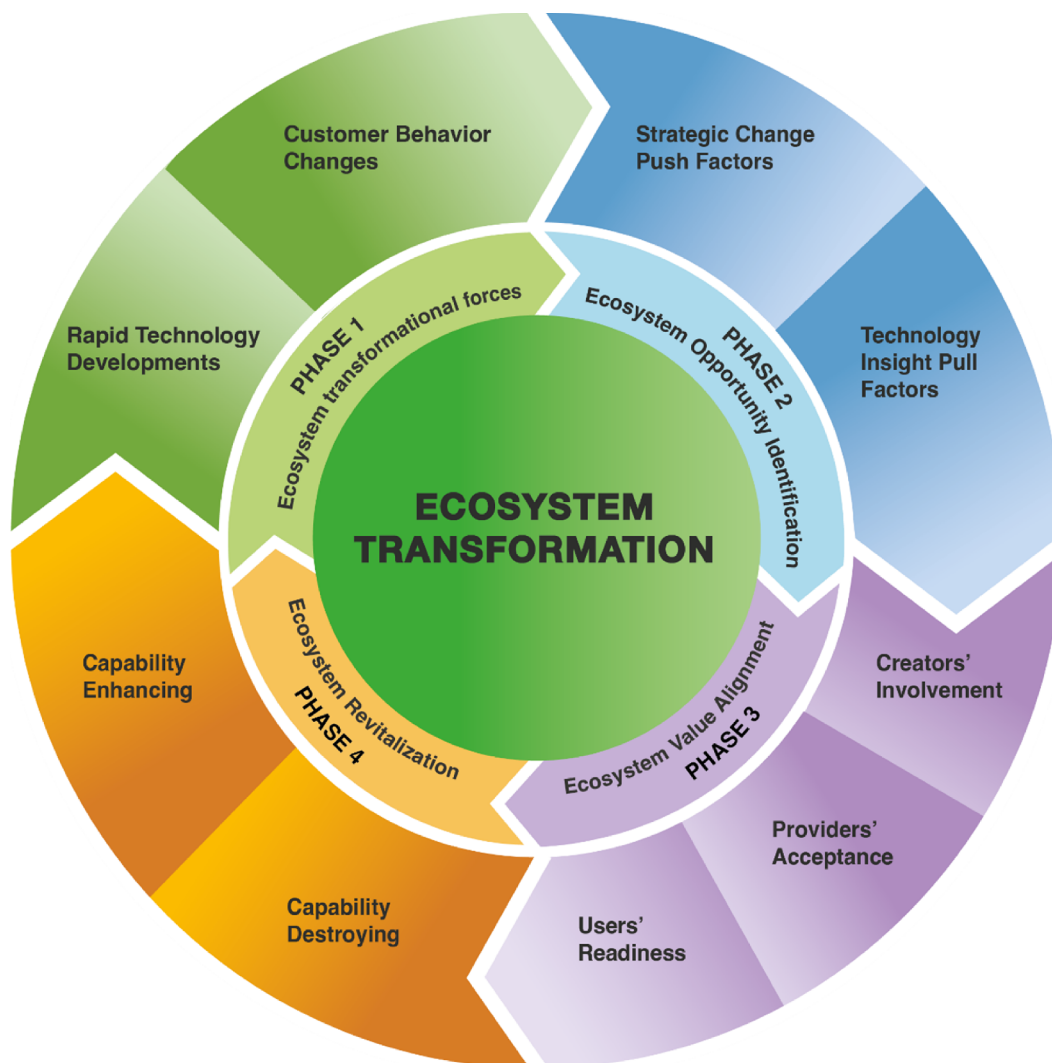


Fig. 3. Framework of ecosystem transformation.

transformation is not new, but it has not been explored scientifically. We have set our point of departure by focusing on the value propositions of firms and how they fit with and adjust to the ecosystem (Adner, 2017). At the core, disruptive innovation in various forms sets the basis for how these ecosystems change and evolve in cycles.

It is worth mentioning that our framework differs from some of the previous ideas advanced on ecosystem transformation. Obviously, regulation and political forces, among other factors, set the context. However, these are endogenous and are always at the core of real ecosystem transformation. Thus, our conceptualization is that ecosystem actors identify opportunities through a process of reacting to these challenges by conceiving strategic change and nurturing insights into technology development. Following the development and alignment of new value propositions in the ecosystem by different actors central to innovation in the ecosystem, ecosystem capabilities and process formation are actualized. Actors engaged in capability enhancing or capability disruption set new agendas for technology development and/or changed customer needs.

5. Discussion, Outline, and future research

This study sets out to develop a definition and framework for the transformation of ecosystems. The framework suggests a circular model where four main mechanisms or stages can be used to understand the transformation process. Previous literature has not presented a clear definition of ecosystem transformation. Research on ecosystem transformation has also lacked a comprehensive framework to conceptualize the change process in ecosystems. Consequently, our contribution is to offer an alternative approach to understanding ecosystem development. We used interview data from experts to develop our core framework, integrating new value propositions and value proposition alignment among actors into the ecosystem.

The framework is based on an acknowledgment of evolutionary mechanisms. An emphasis on firm-specific technology developments sets in motion strategic and technological engagements by other firms in the ecosystem. Firms take responsibility for change, and actors define new ecosystem roles, driving the entire ecosystem towards transformation based on new value propositions. This means that disruptive innovation and technological advancement, along with market needs, are driving ecosystem transformation through new value creation. Our comprehensive framework provides an outline for further research in the domain of ecosystem transformation.

We are aware that potential alternative explanations exist for how ecosystems transform. We are also aware that the retail context constitutes one context out of many. The goal of our analysis is not to provide definitive answers. It is to develop a foundation for future research and debate.

5.1. Theoretical implications

This study offers three contributions to the innovation and business ecosystem literature. First, ecosystem-level transformational changes have not been investigated previously. By taking a multi-actor preceptive, we are able to show how retail ecosystems are transformed. This provides an alternative stance to the firm-centric view of the innovation ecosystem literature (Adner, 2017). The conceptual framework we developed can be considered a main contribution to the theme of ecosystem transformation. While we are not the first to argue for a more abstract treatment of the concept of ecosystem transformation, comprehensive attempts are still lacking. What we present is an effort to explain that ecosystem transformation is a concept that exists at a higher level of analysis. By understanding the more abstract evolutionary changes and evolutions in the network of surrounding firms, additional meaningful insights can be garnered on ecosystem transformation processes and transformation activities. Our model illustrates the larger evolutionary forces that a firm must navigate, well beyond what is

commented on in the firm-centric view, which proffers specific knowledge on how to navigate changing business landscapes. Obviously, only in cases where one firm owns or controls the entire ecosystem is the reality different to that presented in this paper. Otherwise, it is a cyclical process of adaptation and change.

Second, a detailed account of how the ecosystem is transformed is based on a four-phased evolution process. We identify specific stages and the associated activities. The model can be considered a closed-loop cyclical model where innovation and pioneering are central to an understanding of ecosystem transformation. We demonstrate the complexity in determining how an ecosystem will transform in the future. It centers on value capture in the future and the temporality of value. We believe our observations are closely linked to evolutionary theory and the concept of Schumpeterian competition. Whilst elaborating on the transformation of value propositions, we have also drawn on previous frameworks to offer a broader perspective, focusing on the strategic value creation activity of individual firms that drives evolution at the ecosystem level (Van der Borgh, Cloodt and Romme, 2012). The four phases of our model capture the essence of transformation forces, strategic opportunity identification, ecosystem value alignment, and ecosystem capabilities and process formation, which combine two discrete economies: the research economy driven by technology advancement, and the commercial economy driven by customers (Oh, Phillips, Park, & Lee, 2016).

Third, we also recognize the importance of value alignment by creating a multi-actor business model. This phase is the most complex and challenging, where we provide examples and coping strategies. In short, we introduce three types of actor – the content creator, the content provider, and the content user – to drive a linear process on how ecosystems transform. Linking and establishing awareness of where to find these actors in an ecosystem will be central in developing the next generation of value propositions. Previous research has afforded scant attention to where agents are positioned and activity is located in order to help actors migrate to the ecosystem and to prevent the collapse of ecosystem niches.

5.2. Managerial implications

This has important practical implications. Firstly, without such strong relationships, it is implicitly assumed that a company will not be able to survive over the long run. Secondly, unless technology development and changes in customer needs are placed at the core of the transformation process and unless business competence is developed as a necessary skill to adjust strategies and convert technology into new value propositions with others in the ecosystem, companies will be outcompeted or will not be viewed as potential survivors. These matters should be addressed as a major concern. The fact that we draw this conclusion in retail is interesting. The concept of evolutionary theory and its importance for companies in relation to R&D have often been discussed in knowledge-intensive industries (Nelson & Winter, 1973). However, this is perhaps more important than we think when looking at evolution from an ecosystem rather than an industry perspective.

5.3. Avenue for future research

A central tenet of this study thus far is that practitioners and researchers have increasingly been grasping the occurrence of disruption and that this progression has reached the stage of theory development in the ecosystem literature. Increasing research in the pertinent areas has produced many useful insights. Nonetheless, several prospects for further research remain uncharted. As we move further through the integrated theoretical base that has surfaced from the study in hand, we have recognized new areas in the field that hold out the prospect of developing and spreading ecosystem transformation as a feature of innovation theory – specific strategies, performance trails, and some useful insights with regard to ecosystems. Table 2 illustrates some new

Table 2
Outline of future research for ecosystem transformation.

Theme	Potential Future Research Questions
Ecosystem transformational forces/changes	RQ1: How are diverse technologies, such as AI and block chain, transforming industries? RQ2: How is lasting changes introduced to the buying behavior for customers? RQ3: How is change of R&D capabilities introducing change in ecosystems? How are R&D investments lead to capabilities to develop in ecosystems?
Ecosystem opportunity identification	RQ1: How does the change in ecosystem actors' role and position triggering new opportunities for ecosystem transformation? RQ2: How is new strategies and the use of substitutes cause actors to engage in new opportunities? What can be path-dependent strategic changes in ecosystems? RQ3: How is disruptive technologies change the nature and character of opportunities?
Ecosystem value alignment	RQ1: Who takes the orchestrator role in an ecosystem and how do they ensure value alignment between diverse actors? What theory can explain why orchestrators occur? RQ2: What is the role and critical mass of creator involvement for an ecosystem to find enough value to attract new players and help survival of existing actors in the system? RQ3: What influence and triggers user readiness levels for new value propositions to be implemented in an ecosystem?
Ecosystem revitalization	RQ1: What can a dynamic capability lens provide from a theoretical point of view to understand new capability needs for ecosystem revitalization? RQ2: What is the destruction rate of capabilities in an ecosystem? RQ3: How fast is new capabilities forming?

research questions and potential avenues of future research.

The view presented here opens a relatively understudied area of management and organizational behavior. By acknowledging the implications of technology developments and changes in customer needs on interdependence relationships in an ecosystem, it is possible to take an alternative view of strategy. It is rather common that research does not address the importance of the collaboration of multiple firms in this ecosystem concert, nor the replacement or upgrading of members. The approach of aligning and adjusting value propositions to meet technology development and changes in customer demand will be central. Always thinking about interdependence may be the key concern of future strategists in a world where ecosystems are in a state of constant change.

In closing, this issue is larger than what we have thus far investigated in this initial attempt to spark research activity. Our approach is a tentative start, and we encourage future researchers to develop, refine, and question the ideas presented in this paper. We anticipate that scholars will want to study ecosystem transformation in other contexts. We also hope future studies will focus on strategies that companies can use, given that processes can change over time and strategies can be manifested in alternative ways. Nevertheless, this paper suggests that interesting insights on future ways of competing can be learnt from studying ecosystem transformation.

CRediT authorship contribution statement

Pejvak Oghazi: Writing – review & editing, Writing – original draft, Supervision, Project administration, Methodology, Funding acquisition, Conceptualization. **Vinit Parida:** Writing – review & editing, Writing – original draft, Methodology, Data curation, Conceptualization. **Joakim Wincent:** Writing – original draft, Methodology, Data curation. **Rana Mostaghel:** Writing – review & editing, Writing – original draft.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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