

Linking Firms in Value Business Ecosystems: Towards a Classification Model

Florian Urmetzer
University of Cambridge

Andy Neely
University of Cambridge

Veronica Martinez
University of Cambridge

ABSTRACT

This paper contributes to the business ecosystem literature by offering a classification model that allows for the differentiation of intercompany connections. The researchers found that the definition of a business ecosystem lacks separation in the types of connection between companies. Business ecosystems were found to differentiate significantly, from loosely coupled to highly regulated and organised company relationships. Work with practitioners has shown that some may even result in newly founded business ventures. The authors are therefore proposing a classification model for business ecosystems that allows further classifications in studies. The outcome of this study has helped practitioners to operationalise product service and service business ecosystems.

Keywords: business ecosystem, classification, business mode

INTRODUCTION

Business ecosystems are structures of multiple firms creating value for one outcome. We are starting to understand more about the structures of firms co-exchanging value. As well we understand more about value exchange between firms. However if we take multiple such value exchanges as they occur in business ecosystems, we know little in how this value exchange gets arranged and orchestrated.

Increasingly, service offerings are intensified by manufacturing companies, with the strategic intent of increasing revenue and extending offerings. In developed countries, two out of three companies, and internationally, one-third of large manufacturing firms, offer services (Bowen et al., 1989; Cusumano et al., 2015; Neely, 2008; Visnjic Kastalli et al., 2013). In addition, some studies indicate that typically one-third of revenue is earned through services offered by manufacturers (Fang et al., 2008). Regardless of the importance of services for manufacturers, many firms indicate problems moving their business model from a product-centred to a service-centric one (Bitner et al., 2008; Chesbrough, 2010; Ng et al., 2013; Reinartz and Ulaga, 2008).

Today, complex services and product service offerings are often delivered through multiple companies, which are referred to as business ecosystems. These business ecosystems are

defined as a network of organisations and individuals that collaborate and evolve roles and capabilities, as well as synchronising their investments to build value and increase efficiency (Moore, 1993; Williamson and De Meyer, 2012). Some authors add that the collective capability should be larger than any of the single organisations could contribute (Urmetzer et al., 2016a).

This paper focuses on contributing to the discussion on business ecosystems. Specifically, we will discuss the business operations involved in establishing and running business ecosystems. The focus here will be on value exchange as a unit of analysis. We have mainly relied on the resource-dependence perspective (Pfeffer and Salancik, 1978) as a theoretical backdrop for this study.

Through the firms with which the authors have partnered in their research, the study has uncovered an interest by practitioners in further understanding and defining business ecosystems operations, especially in connection with a better understanding of value exchange in ecosystems. However, we are answering the call, not just by practitioners, but also by academics, for a deeper understanding of value (e.g. Lepak et al., 2007).

Indeed, the question guiding the research was: “How do companies organise value exchange within ecosystems?”

THEORETICAL BACKGROUND

The resource-dependence perspective (Pfeffer and Salancik, 1978) was used as the theoretical grounding of this study. On this basis, companies are dependent on one another and are in fact not sustainable without external dependencies. The authors argue for a seller–buyer dependency, as well as outcome and behaviour interdependence. These two forms of interdependence are themselves argued to be interdependent, meaning that they can occur either alone or together. If one actor is dependent on another actor, when producing an outcome, these outcomes can only be created by both firms performing correctly, hence creating and capturing value (Adner, 2017; Chesbrough, 2007; Lepak et al., 2007). A practical example would be the provision of flying lessons based on a specific airplane platform, where one firm provides the airplane itself, one provides special equipment for the airplane, one firm provides pilot trainers and another provides future pilots to be trained. If the aforementioned firms do not coordinate their resources, the outcome, in this case a trained pilot, will not be generated. The resources owned by the different actors, however, enable the outcome in the first place.

The case studies detailed in this publication are in line with the above example and will detail similar dependencies.

We rejected stakeholder theory as we found that it rightly acknowledges the existence of stakeholders, but does not focus on the value exchanged between them (Freeman et al., 2010; Freeman and Philips, 2002; Jawahar and McLaughlin, 2001). In more detail, stakeholder theory focuses only on the existence of stakeholders, however not on the exchange and use of their resource to gain a strategic advantage.

In this paper, the authors focus on a B2B or external context rather than a generic dependency, such as, for example, a human resources or business to customer view. It is acknowledged that companies make strategic decisions about their external dependencies, and these decisions are based on how they work with their B2B partners, customers or suppliers. This, in turn, means that other businesses can also be viewed as resources. As a result, a business ecosystem becomes evident, in which multiple companies coexist in a strategic interaction. Some studies argue that business ecosystems evolve in different stages. The

starting point is described as a mix of capital, customer interest and talent base, which is seen as the foundation for the formation of an ecosystem. This is followed by expansion, leadership and, finally, self-renewal or death (Moore, 1993; Ritala and Tidström, 2014). If the companies' value delivery to the customer is considered a success (Ritala and Tidström, 2014), value is created by the company itself or by its partners for the end-customer. Therefore, every actor in the ecosystem creates and also captures value (Urmeter et al., 2016b). Value creation for the customer takes place upstream and/or downstream in the value chain (Adner and Kapoor, 2010). However, it is important that there is a value increase to the value chain by every part of the business ecosystem or supply chain and, hence, minimal value slippage within the system (Lepak et al., 2007). Additionally, we begin to see external organisations as touch points, specifically within firms offering services, as well as the customer satisfaction literature (Baines et al., 2009; Verhoef et al., 2009).

Table 1 - Summary literature review; see research phase one in Table 2

Topic	Summary	Reference (selective)
Definition of business ecosystems	Recently articles started to break open the divide in the literature between the definitions on ecosystems featuring platforms; innovation or structure. (here we focus on business ecosystems as structures)	Platforms (Gawer and Cusumano, 2008; McIntyre and Subramaniam, 2009; McIntyre and Srinivasan, 2017) Innovation context (Adner and Kapoor, 2010; Moore, 1996) Ecosystem as a structure (Adner, 2017; Adner and Kapoor, 2010; Jacobides et al., 2017; Urmeter et al., 2016a, 2016c).
Success factors of ecosystems	Articles are describing the success factors of ecosystems, some address as well the failure or lifecycle.	Success and failure (Den Hartigh et al., 2006; Letaifa, 2014; Ojasalo, 2008; Ritala, 2012; Xiaoren et al., 2014) Lifecycle (Ritala and Tidström, 2014)
Services and business ecosystems	The articles are combining service and business ecosystems. As the presented work is doing as well.	(Holmqvist and Diaz Ruiz, 2017; Zhang and Liang, 2011)
Value exchange between firms	The studies are looking at B2B value exchange, which can be opened into value creation and value capture. Hence a firm is creating value, and the value receiving firm is capturing the value.	Strategy and business model focused (Amit and Zott, 2001; Chesbrough, 2007; Lepak et al., 2007; Olsson and Bosch, 2015; Priem, 2007a; Rai and Tang, 2014; Ritala and Tidström, 2014) Firm touchpoint focused (Baines et al., 2009; Verhoef et al., 2009)

When taking the above and literature assembled in Table 1 together, the organisation and orchestration of resource dependence of firms can be seen as a core part of business ecosystems. This is particularly true if we consider business ecosystems as a structure, delivering value as an outcome (Adner, 2017; Urmeter et al., 2016a). The authors of this

paper argue that there are already different mechanisms chosen by practitioners to express these based on managerial reasoning. However, there is a gap in the literature when it comes to understanding the way in which firms link with one another within ecosystems. There are publications that cover dynamics in ecosystems, with the differentiation between a cooperative and a collaborative approach (Ritala and Tidström, 2014). The literature review found that there is a lack of literature defining the differentiation of value exchange between firms. Indeed, few studies have demonstrated how value exchange in business ecosystems can be operationalised. No details could be found on what relational firm-level strategies may look like.

This paper therefore to contribute to the discussion on the relation between companies and would like to offer a differentiation framework.

DATA COLLECTION

To develop the ecosystem classification model, the data collection was structured according to three phases (see Table 1). In phase one, theory building was established using a literature review. Over seventy papers were chosen to understand the background to the functioning of business ecosystems and studies conducted in the field. The second stage involved exploratory qualitative interviews. Here managers from international cooperation were asked to describe the business ecosystems in which their companies and projects work, and how these cross-business collaborations function. In the final stage, case studies were conducted in the form of two focus interviews.

Table 2 - Research phases and data gathered

Phase	Information gathered	Participants	Methods
Phase one:	Literature review: seventy peer-reviewed papers.	Selection criteria reviewed by three other senior researchers.	(Tranfield et al., 2003)
Phase two:	Exploratory and focused case interviews: qualitative, open-ended interviews, recorded and transcribed.	Managing directors and general managers.	(Bryman and Bell, 2011; Eisenhardt and Graebner, 2007; Yin, 2009)
Phase three:	First focus group interviews of two days, discussing B2B ecosystem collaboration.	Managing directors and general managers from four different multinational cooperations (15 participants).	
Phase four:	Qualitative semi-structured interviews verifying the draft classification model.	Four interviews with managerial staff from multinational cooperations.	
Phase five:	Second focus group interviews of two days, discussing the classification model.	Managing directors and general managers from multinational cooperations (10 participants).	

In detail, the structured literature review revealed that there are different types of contract,

and hence relationships, between firms. Where the contract would mostly resemble the framework under which the value exchange takes place, practitioners stated that these do not always resemble exactly what value is exchanged. The researchers quickly discovered that the unit of analysis of a contract would be too complex to narrow down, as there are too many conditions to be taken into account. Hence, the researchers decided to focus on the differentiation in value exchange (Lepak et al., 2007). This would allow for an easier discussion with practitioners, but would also provide a clearer unit of analysis. This was confirmed in focused case interviews that took place before the focus group meetings, whereby discussions with managers on the basis of contracts proved difficult, whereas discussions on value exchange were much easier. The first focus group interview on the topic of B2B value exchange and its process took place in the UK and was attended by managers from US and UK-based businesses. The represented companies were from different business backgrounds, including heavy-machinery manufacturers, information technology and the defence industry. All firm representatives were invited to give presentations on a B2B relationship. The focus of the presentations was on how the relationship was built and operationalised, including any problems within the relationships. A discussion on the relationships was then encouraged by the researchers, and extended notes were taken by the multiple researchers in attendance.

Analysing the collected data after the first focus group interview, the researchers determined four different value connection types between companies. The researchers were able to describe these in detail, with case examples mentioned by participants during the workshop. After the first workshop, selected focus interviews were conducted to ensure that the four connection types and their visualisation were comprehensible to managers. The second workshop was conducted over two days, focusing on the types of connection between the companies in the ecosystems. The 15 participants were encouraged to contribute to the workshop by providing and presenting case examples. The participants were experienced managers (area managers or programme managers) from four different firms. By the end of the workshop the connection types had been discussed and extended to five connection types that can be found in business ecosystems.

The firms contributing to the research were followed by the researchers over multiple years, and all the material shared was considered in the data analysis. In total, more than a hundred and eighty pages of transcribed interviews were collected and later analysed in order to contribute to this research.

DATA ANALYSIS

The data analysis of interviews conducted in the second phase was conducted through coding of the transcribed material. In the following workshops (phases three and five), notes were taken to contribute information to the phenomenon. Parts of the workshop were recorded and later transcribed. Not all workshops could be recorded for reasons of confidentiality or because of the managers' personal preferences. The participants' presentations were documented in three-page summaries.

The discussions on the draft classification model (phase four) were guided using printouts. Here the changes and differences were recorded on the printouts in the conversations.

In the final workshop (phase five) all participants contributed to, and finally concluded, the five-stage model. Twenty-five pages of a final discussion session were transcribed and analysed, in addition to the notes that were taken during the workshop.

All the material gathered and coded was triangulated, and also in relation to the literature.

THE CLASSIFICATION MODEL

The defined classification model contributes to the ecosystem literature and allows a classification of B2B ecosystem links between participating organisations. During the interviews and workshops that were conducted, the workshop participants found ecosystems to be complex structures. Firms usually have multiple relationships with different business ecosystems. Seeing organisations and their links as being on one level is a limiting view and underestimates the complexity of such structures. Any organisation may have multiple different value exchanges and may be involved in multiple links between companies. This means that, depending on the value delivered to the customer, contract or project, there can be multiple links between companies. Two individual companies may be delivering, for example, one complex service to multiple companies; hence, there are multiple ecosystems. However, this layering of connections again exists in different forms of the value exchange, which are defined within the classification model.

When looking at the value exchange and the linkage between the companies in the value exchange, these connections may be defined or treated differently, depending on their individual condition. Even though the value delivered between the ecosystem firms is similar, the type of connection, its operation and its management may vary.

In brief, a firm will be involved in multiple ecosystems and may be using any of the connection types examined here to express and define the operation of the engagement.

The study presented has uncovered five different types of B2B connection (see Figure 1), which contribute towards a classification model of ecosystem value exchanges. It is acknowledged that one business ecosystem may include multiple classifications. However, the researchers and practitioners found that this does not have an impact on mapping an ecosystem. This can, however, cause confusion when considering business ecosystems and their operation.

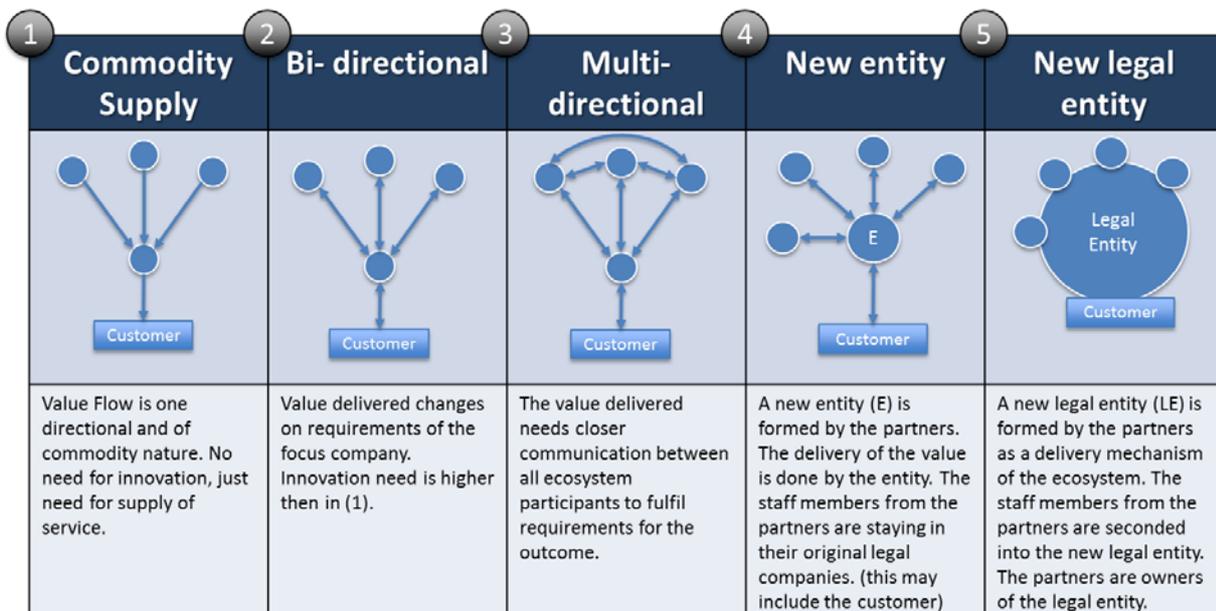


Figure 1 - Different types of connection in ecosystems

The next section details the five different B2B connections in ecosystems. The authors, first, describe each type and, second, indicate the reasons why it would be attractive to

practitioners. A case example is given for each type in order to illustrate their benefits, as pointed out by the practitioners.

Commodity supply

In this category company connection is on a commodity supply basis, often described by practitioners as the nuts-and-bolts supply. The distinction for the next type of connection (bi-directional classification) is that with these connections there is a standardised type of communication upfront and usually no need, or even expectation, for feedback – similar to buying nuts and bolts from a supplier. When purchasing standard items like nuts and bolts or office supplies, there is really no need for exchange of communication before or after the purchase is made. In other words, the communication before the purchase is expected to be standardised and requiring little effort from either party. After the purchase and delivery of the task or product, there is no expected need for additional communication by the parties involved. Contractually these structures can be organised in different ways, starting from a single purchase order to a performance-based contract securing delivery for several years for a specific price and condition.

Practitioners choose these links for non-complex participation in a business ecosystem. No – or minimal – communication is needed between partners, even though the complexity of the task may vary.

An example described by the practitioners is the supply of a convenience store in a complex service contract organising an entire defence harbour. While the harbour is a highly complex service delivery ecosystem, the harbour is contracted by the government to a privately held firm, which organises all that is needed for the upkeep of the harbour, in addition to the management of all operations. This includes the provision of security while enabling swift access to the harbour for maintenance personnel, as well as orchestrating the firms involved in the harbour's wider ecosystem. A further responsibility is the upkeep of roads and docks used for the maintenance of ships. This particular example involves one large governmental contract. A sub-contract, and hence the value delivery, is the provision of a convenience store within the harbour structure. This is taken on by a store brand, which is generally available nationwide. The contract with the store brand is reviewed every other year and, as a consequence, the store brand undergoes occasional changes. However, it was described that the store personnel, as well as the interior, stay the same, which is interesting and indicates that it is a transaction business. No innovation or communication with other businesses is needed within the business ecosystem. The shop supplies essential goods for people working in the harbour, starting from convenience food and drinks (hot and cold) to work clothes and shoes. However, as mentioned before, this process does not change when the brand of the store changes.

Another example of such value exchange was mentioned by an interviewee from a barber's shop in the aforementioned harbour. Similar to the convenience store, the barber does not need to exchange value with any other business, but does receive a licence and housing and continues its business of cutting hair and charging customers for the service.

Both of these examples are integrated in a wider value business ecosystem. While it may be disputable whether the example businesses are vital to the overall operation of the harbour, it can be seen that the operation would at least be incomplete if the firms were missing.

Bi-directional

In bi-directional relationships, the ecosystem participants are in need of more exchange of

information, communication or another external value. Changing requirements or consistent feedback may be exchanged between ecosystem members. It should be noted that in this case value exchange has to take place between two partners within the ecosystem, but not between more than two parties. For example, the requirements are given by one partner and fulfilled by the other. Practitioners described this category as a research and development (R&D) link between ecosystem members. Therefore, the need for innovation (or communication) is higher than in the category *commodity supply*. This may be a result of changing requirements or the need to exchange information constantly. Overall, this category is chosen by companies to foster collaboration and closer proximity between the two businesses. One of the ecosystem members may have multiple value exchange links such as this and orchestrate them to deliver to a customer. In order for this model to be successful, the management on both sides needs to be aware of the exchange and design or manage the exchange actively. There is an expectation that there is value capture and value creation for both parties. Hence, the first partner creates and the second partner captures; in return, the second partner creates and the first captures. Indeed, the internal processes then manage the value created and captured (Priem, 2007b; Urmetzer et al., 2016b)

An example of this is the relationship between a heavy-machinery company and a sensor supplier, which was mentioned by a practitioner whose firm was building a new engine to sell to its customer. The company was collaborating with a sensor firm, which was delivering to a high quality and in time for production. Therefore, when it comes to requesting sensors with new requirements, such as reacting to changing factors in the environment (e.g. temperature or pressure), the sensor must work under these changing conditions. To achieve this, the firm producing the engine works in close collaboration with the sensor firm's R&D department to develop new sensors. While the sensor supplier may fall into the *commodity supplier* category, the relationship changes when it begins R&D activities. The engine manufacturer and the supplier move closer and together specify new sensors that work with different requirements and conditions, such as high temperature or durability.

Another example is the provision of airplanes for training exercises. This means that the training operator does not buy the airplanes, but instead hires them for individual training exercises. Every training exercise differs in scope and requires different types of airplane, for example, night flight versus day flight and short versus long distance. The training operator coordinates all the information needed and delivers the training staff in order to prepare the trainees for the exercises. The airplane is then supplied by the providing firm to meet the necessary requirements. The airplanes are maintained and serviced outside the training schedules and there are multiple training flights every day. There is a stream of communication exchanged throughout the operation, and without this close proximity the firms would not be successful in their endeavours. The location for the communication, as well as delivery, may or may not be the same.

Overall, there is no consistency in requirements, but a quickly changing base set of demands that results in a high quantity of communications or service exchange.

Multi-directional

In the category *multi-directional value exchange*, companies are coupled together loosely, albeit within close proximity or with high exchange of value in-between. The difference between this and the bi-directional value exchange is that here the value exchange is between all the parties involved and is multilateral. The exchange may be a strategic approach to how the companies work together, and an alliance or ecosystem contract may be in place. However,

the importance stated by practitioners is the characteristic that if the multiple partners do not communicate with one another and exchange value, then the delivery of value to the end-customer cannot be ensured.

Practitioners would use such an approach for a value delivery whereby multiple work processes must be completed, which require inter-organisation communication. This may be multiple companies joining their workforces and capabilities to deliver an airplane or the servicing of an airplane. The individual tasks fulfilled by the companies are complex and specialised; however, inter-communication between multiple partners is needed to guarantee success. For example, when it comes to the defence industry, and the training of pilots on jet engine aircrafts is required, extension of the service provision of training aircrafts is profitable and advantageous to the companies. The training flights are specified and set by the training regime; however, the aircraft is owned, serviced and provided by different service companies. In addition, a number of expert firms are involved in providing certain aspects of the training. This may include specialist radar, night-vision systems or weapon systems. Accordingly, if, for example, a night-vision flight is requested, all the equipment required must be provided, tested and prepared for the training flight by this specialist provider. The same applies for simulations of defence cases, where specialist test weapon systems may be used. The above example necessitates the coordination of requirements, the scheduling of work to be realised on the ground, as well as communication about the availability of both manpower and technical equipment. This task falls to the firms and is not the responsibility of the contract-holder. Exceptions need to be taken into account; for example, night-vision equipment might not be required every time. As a result, sometimes there is no specialist available onsite. Once the task has been completed through joint efforts, the specialists disperse. Gaps in availability may also occur if a specialist radar is not needed for three weeks, in which case the firm will not be onsite either.

Another example would be the running of an availability contract for a mining operation. The conglomerate of firms could involve several parties such as a data analysis firm, a firm that conducts all the maintenance on the machines and a firm looking after road conditions onsite. All actors are collocated; however, they have to come together to allow the site to work in the first place. The firm undertaking the data analysis of the mine is working on one part of the site, running its communications in the form of daily reports, as well as through direct communication with, for example, the maintaining firm in case there is an issue. On a second level the firm has to uphold communications with the mine in case there are production issues or the mining operator communicates increases or decreases in production to the participants. In conclusion, the complete operations will not work if the partners neglect communications and overlook central orchestration of the parallel operations. In conclusion, without a higher level of value exchange, the operation will not succeed and will fail to create the ideal value for the customer. The communication channels may or may not be defined in the form of a contract.

New entity

A new entity may be formed as a structure by multiple collaborators. This may include anything from the creation of a physical space to branding the collaboration or integrating several activities, such as, for example, sales or R&D. This approach differs from the *multi-directional* classifications in that the proximity is increased between the partners involved. In multi-directional partnerships the location may be shared on a short-term basis, but not throughout a regular period of time or for a longer-term engagement. Here the solution may be

a physically shared space or shared infrastructure, such as IT integration, as well as a shared governance structure, work culture and marketing. Even more detailed may be a shared and integrated CRM system for a sales and business development team, which works co-located in order to design and sell new business.

Practitioners described that they would opt for this form of collaboration if there were a significant need to define an exchange focused on collaboration around speedy delivery. Specifically, this would be the case if there were value in the combination of capability and if there were a need to control for trust, risk or the alignment of objectives. Furthermore, there may be a need to respond quickly to, for example, sales opportunities. Hence, systems to combine not just people but also infrastructure, such as finance or CRM systems, should be in place. In this structure, where there is a physical mixed space, people work under one roof. Members of staff are still separated by the firms they belong to and therefore on the payroll too. Even if the basis is such that companies still have a significant amount of non-shared infrastructure that does not belong to the business ecosystem, part of the delivery, or the complete delivery, of value through the business ecosystem is ultimately achieved through a formed entity.

An example of such a multi-directional model is provided by the collaboration between two IT companies. One specialises in software integration for large industrial companies and the other in producing mobile front-ends for end-customers of, for example, small mobile applications. Both companies are distinctly different in both their internal culture and their customer base. The two companies have decided to join forces in their wider ecosystems to interface more productively and to raise the quality of software products for industrial companies. Both firms' capabilities are located at opposite ends of the spectrum, which creates a significant need for information exchange between the workforces involved in the process. This not only concerns information exchange, but also includes trust and speed of information exchange. The firms have therefore decided to build or form an entity. This means that, while all members of staff remain working in their company, and market access is defined through one of the firms, they have chosen to have one physical location in which to conduct their work. The two companies have started sharing one office space to run the service interaction. The advantage described includes that the people working on the ground learn from one another and integrate the operation in a more flexible way. This, in addition to the speed of operations and outcome focus, can be shaped more easily by the managers involved. Overall, this model further indicates that there is more trust, more speed in the scale-up of operations, but also a stronger commitment involved in building the partnership. Yet, there is the risk of intellectual property rights infringement, depending on the work done within the set-up.

It can be argued that the above-mentioned defence harbour, which is contracted to one firm, has a similar set-up. While all firms remain separate entities, they all work towards one goal, shared office space or at least a close proximity in location (on the harbour site). Even if the harbour is seen as one business ecosystem consisting of an entity set-up, the *commodity supply*, for example, of a barber's shop and other shops within this structure, is not dependent on other actors. This means that these types of actor still do not need communications between the harbour authority and the different firms. However, the harbour is seen as a new entity, and there is one communications office, which looks after an overall "ecosystem culture" and drives communications such as newsletters and magazines. There are also branding and cultural campaigns organised across the firms, which demonstrates that the harbour operates as one entity.

From the above we can see that, by definition, there are entities where multiple firms share

one location, with the goal of delivering value to one or multiple customers.

New legal entity

There are cases in which B2B companies, acting in the form of ecosystems, choose to form a new legal entity. The partners then build a new company overnight. The ecosystem partners involved in the value delivery then transfer all the risks, processes and company functions, as well as members of staff, to the new legal entity. The legal entity ownership is consequently shared by the different firms that have invested monetarily, but also in terms of intellectual property.

Practitioners have stated a preference for building a new legal entity when there is a strong need to have long-term collaboration and performance focus. This may have to do with the length of asset use or contract runtime. There may also be larger financial risks involved, which, in the case of a separate legal entity, would not be held within the different owner companies, but could be carried separately.

The process of upgrading work of civil infrastructure that involves multiple companies is a good example of the formation of a new legal entity. Infrastructure projects are always complex and transaction costs between companies are high. Hence, having a highly integrated approach in the form of a new legal entity enables a common performance to be driven and ensures the success of the single project by focusing on outcomes rather than transactions. In this example the market demands a high level of customer satisfaction on the basis of a governmental questionnaire. When customer satisfaction is low, the firms providing the infrastructure are penalised in some countries. Therefore, a performance-measurement system can be designed to indicate the most satisfaction-focused involvement of the firm. This information enables the firm to concentrate on the most vital parts of infrastructure renewal and change. Indeed, this information exchange involves not only the infrastructure provider but also data analysis firms, customer satisfaction specialist organisations and infrastructure planning and building firms. As described by practitioners in the workshop, they have all come together as one firm and created a single entity, their linkage being defined on the grounds of a performance-based contract. In fact, an integrated sales infrastructure and reporting structure, as well as a highly integrated performance-measurement system and the backing of the higher levels of management, are vital to making this system work effectively.

Overall, this is seen as the most complex way of expressing value exchange in an ecosystem. In particular, the definition of the contract before the entity has been built is seen as complicated. Points of consideration for drawing up such contracts, as mentioned by practitioners, include exit strategies, performance measurement and, specifically, risk shares. Furthermore, among the problems mentioned was that staff are normally seconded into the new firm. However, often this brings risks to the pension funds of individual members of staff, damages to the brand and reputation issues for the contracting firm. To an individual who has started to work for a large, well-known brand, joining a spin-off company may feel like a high-risk move.

In any case, when realised in a successful way, practitioners reported that there are advantages to building highly effective new entities, with a streamlined focus on performance and outcomes.

DISCUSSION

The differentiation in classifications detailed in Figure 1 is important for practitioners, as well as researchers investigating business ecosystems. The classification allows for differentiation

between the B2B connections and enables a more nuanced description of the phenomenon of business-to-business relationships in such ecosystems.

The classification chosen for the design of a connection between firms has an impact on the ability of the two firms to perform together. The literature review conducted for this study has not supplied in-depth studies looking at a wider business ecosystem value-exchange classification. However, even though managers do not always seem to be fully aware of it, they make a distinction between the five classifications in their value exchange design (Urmetzer et al., 2017). Furthermore, practitioners, as well as researchers, agree that the classification is not a staircase model, indicating that the B2B relationship should aim for the highest level in order to be ideal. It is rather a model that shows that there is the right fit for the right type of relationship.

The cases discussed with practitioners on the basis of this classification model facilitated the outlining and differentiation of the following areas: performance, proximity, standardisation, risk, costs and people factors.

When a linkage across firms was designed for *performance* (Bocquet and Mothe, 2013), the model enabled practitioners to differentiate. For example, there was a statement that high performance might mean that a commodity supply could be designed through the fully automated order integration between firms. One organisation would request an order and the other would execute it accordingly. There would be no separate contract or supplier selection processes needed. As another example, practitioners pointed out that performance could be defined in the form of communication overheads. The sales team of a *multidirectional* firm collaboration may facilitate closer communication (or proximity); hence, the transaction overheads for communication can be significantly reduced and the performance increased by collocating a part of the *new entity* firm. This means that there may not always be a clear-cut distinction between classification and entities.

Increasing *proximity* has already been discussed to a certain extent. However, as mentioned by the practitioners, there is a need to manage the proximity between firms (Letaifa, 2014; MacBryde et al., 2013). This happens on a competitive basis, where two or multiple firms may be collaborating on one contract. Yet, on other contracts the firms may find themselves in fierce competition. Here the example of a sales team being collocated was mentioned by firms as a possible solution. This proximity allows a fast turnaround time on tender-built processes, which applies to the multidirectional cooperation of firms, as well as to the new entities that are built. However, firms stay separate and the proximity may have to be unpacked at a later stage in the case of one of the companies exiting.

Depending on the chosen classification, the *standardisation* (Probst and Bohn, 2013; Ramirez, 1999) of some of the processes needs to be discussed. This concerns managerial processes, as well as the use of electronic means. Achieving standardisation should involve lean management of the interaction with as few overheads as possible. For example, the practitioners mentioned that when creating a new entity with shared processes, such as billing and/or sales processes, it is also essential to prevent communication errors and wrong expectations. On the other hand, when wanting to sell nuts and bolts to business ecosystems, it may be advantageous to define a standard process for ordering, which may be fully enacted electronically. In conclusion, when deciding on an interaction classification, practitioners need to determine which interactions should be strongly standardised.

Practitioners also mentioned the problem of *risk*, which ideally needs to be pooled between the entities involved. Risk involves all forms of risk in this case, and stretches from possible damages to the brand reputation to the accountability for work done five years after finishing

the partnership or participation in the ecosystem. Unpacking the risk aspect, practitioners will want to control the brand's reputation risk. In an extreme case, there may be the case for both entities to build a *new legal entity*, and hence a new brand, to carry the risk. The decision to build a *new legal entity* may therefore only be guided by internal firm drivers rather than drivers from the collaboration or external drivers. Another example would be ensuring that customers actually want value created for them (Osterwalder et al., 2015). This may mean including the customer within an entity or letting them partake in the proximity to the business ecosystem.

Another helpful tool when it comes to choosing the appropriate classification for a firm is defining the *costs investment* (Astley, 1985; Stadler et al., 2013). Here the practitioners stated that investing in B2B relationships is expensive and does not always lead to the desired outcome. Therefore, participants in business ecosystems may choose a specific classification type and define another classification type as a strategic goal with the partner. Firms may agree that they will be working on defining and building an entity. This may be done while working together and building the market and interacting with the customers. This may already include the selling of value to the customer. The time and effort that goes into building the entity must be based on an investment, and hence on the budget spent. The question here is how much needs to be spent and how the budgeted costs between the firms are distributed. One participant in the workshop mentioned that it can take years for lawyers to agree on wording and text when building a legal entity. This time may simply be considered an investment, rather than time where revenue is generated from the value created.

Finally, *people factors* were also mentioned and discussed in detail. Central questions in the workshops focused on how one ensures that personnel working in close collaboration with other firms maintain their firm's culture and bond with their own company. Some practitioners referred to this as "going native". This means that employees started to work more for the customer or partner firm than for their mother organisation (the one whose payroll they are on), by, for example, offering the partner firm too many "favours" without charging for their time and effort. Possible measurements to avoid such migration could be the implementation of a rotation system for workers. Other options mentioned were hosting internal work events, which are exclusively offered to staff of the mother firm in order to strengthen a common identity and not designed as a cross-firm event. However, there was definitely a feeling that there is a risk of losing or changing values and culture in an organisation by doing so. The other extreme occurs when firms actively seek to have one entity, as in the case of the classification types, *new entity* and *new legal entity*. Here, considerable effort needs to be made to define a new entity culture and communication strategy.

There was agreement that when the right level of integration within firms was chosen there was an opportunity to improve competitiveness and disrupt the market through the generation of new business models and advanced value-generation models.

The classification model has been developed to help structure conversations with practitioners and academics alike. The practitioners demonstrated that they clearly make a distinction between the different types of value exchange and also differentiate why a particular classification is used; however, although it may appear to be the case, there is no differentiation in the form of a staircase model, in which one model is by definition more advanced than the one below. There are, however, distinctly recognised effects between the different classifications for the ecosystem partners, depending on the delivery model they are aiming to adopt.

In the discussions with the interviewees as a baseline we found a need for collaboration,

which leads to the alignment and delivery of inter-firm operations. One option that was mentioned was innovation processes, a lack of capacity or the need for capacity and delivery collaboration (such as market access, specialist capability, for example, technology or operations specialism such as transport and logistics).

Finally, and most importantly, the practitioner workshop agreed that multiple types of connection can occur in one business ecosystem. Hence, working with one company in a commodity supply relationship does not prevent the wider ecosystem from working with another company, or even with the same company in a bi-directional setting or forming a legal entity. However, there are factors of ecosystem typology decisions that are made and result in the associated cost benefits.

CONCLUSION AND RELEVANCE

In this study, we have investigated the following research question: “How do companies organise the value exchange within ecosystems?” The unit of analysis focused on the dependencies and the ecosystems’ operational connections in B2B relationships. The resource-dependence perspective was used and has established that companies are not sustainable without external dependencies (Pfeffer and Salancik, 1978).

A categorisation model was identified that splits into five parts, namely, commodity supply, bi-directional, multi-directional, new entity and new legal entity. It can be observed as well that multiple of these relationships may occur in one business ecosystem; hence the categorisation model is not aiming to limit the business ecosystem, but support the description of the link between one and multiple firms.

The relevance and contribution of this study applies to two areas of interest: first, the work extends the academic literature on ecosystems and contributes to the ongoing discussion on ecosystems, as well as value exchange (Lepak et al., 2007). Specifically, it defines that there are different types of ecosystem value connection, which need to be studied separately and which imply distinct business and managerial requirements for the implementing firms. The differentiation and recognition of the defined types have an impact on performance, proximity, standardisation, risk, costs and people factors. There is a need to further study the single classification types in more detail, as well as their implications and impact.

Second, this study has enabled a better practical understanding of business ecosystems and their operations. One practitioner stated that the classification has given him a clear structural vision of the value interrelations, which has led him to make more strategically informed decisions based on the options provided.

The authors would like to call for a greater understanding of value exchange in ecosystems between companies and wider actors. What constitutes a successful relationship, and which set-up is used for which purpose and towards which achievement? Moreover, how do business models work across companies, and how can they be organised?

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