

# Business Ecosystems: Towards a Classification Model

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## Why this paper might be of interest to Alliance Partners:

Partners and practitioners will find paper contributes to understanding B2B relationships in business ecosystems by offering a classification model. The model allows the differentiation of B2B intercompany connections. The problem arose for the researchers that the definition of a business ecosystem lacks separation in the types of connection between companies. Business ecosystems are found to differentiate significantly in their intercompany relationships, starting from loosely coupled to highly regulated and organised company relationships. Some may even result in newly founded business ventures. The authors are proposing a classification model for business ecosystems to allow further classifications in studies.

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# **Business Ecosystems: Towards a Classification Model**

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This paper contributes to the business ecosystem literature by offering a classification model, allowing the differentiation of intercompany connections. The problem arose for the researchers that the definition of a business ecosystem lacks separation in the types of connection between companies. Business ecosystems are found to differentiate significantly, starting from loosely coupled to highly regulated and organised company relationships. Some may even result in newly founded business ventures. The authors are proposing a classification model for business ecosystems to allow further classifications in studies.

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 made through services offered by manufacturers (Fang et al., 2008). Regardless of the importance of services for manufacturers, many firms indicate problems going from a product-centred business to a service-centric one (Bitner et al., 2008; Chesbrough, 2010; Ng et al., 2013; Reinartz and Ulaga, 2008).

Today, complex services are often delivered through multiple companies, which are often 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 the single organisation could add (Urmetzer et al., 2016a).

This paper focuses on adding to the discussion on business ecosystems. Specifically, we will discuss the business operations behind establishing and running ecosystems. The focus here will be on value exchange as a unit of analysis.

Through partner companies, the study has found an interest by practitioners in understanding business ecosystems, especially in connection with better understanding 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).

The research question is: “How do companies organise value exchange within ecosystems?”

## **Theoretical background**

The resource-dependence perspective (Pfeffer and Salancik, 1978) has been used as the theoretical grounding of this study. The basis of this is that companies are dependent on one another and are in fact not sustainable without external dependencies. In this paper the authors focus on a B2B context rather than a generic dependency, such as, for example, a human

resources' view. Companies make strategic decisions on their external dependencies. 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 can be seen, 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 starting point 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 (Urmetzer et al., 2016b). Value creation for the customer takes place upstream and/or downstream 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, as little as possible value slippage within the system (Lepak et al., 2007).

There is a gap in the literature when it comes to understanding the way in which companies link with one another within ecosystems. There are publications that cover dynamics in ecosystems, with the differentiation of a cooperative approach or a collaborative approach (Ritala and Tidström, 2014). However, no details are being shared on what relational firm-level strategies may look like.

This paper aims 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 into three parts. First, theory building was done 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 cooperations were asked to describe business ecosystems in which their companies and projects worked, and how these cross-business collaborations function. In the final stage case studies were conducted in the form of two workshops. The workshops took place in the UK and were attended by managers from US and UK-based businesses. The companies were from different business backgrounds, including heavy-machinery manufacturers, information technology and the defence industry.

*Table 1: Research phases and data gathered*

<b>Phase</b>	<b>Information gathered</b>	<b>Participants</b>
a) Literature review	Seventy peer-reviewed papers.	Selection criteria reviewed by three other senior researchers.
b) Focused interviews	Qualitative, open-ended interviews, recorded and transcribed.	Managing directors and general managers.
c) First workshop	Workshop of two days, discussing B2B ecosystem collaboration.	Managing directors and general managers from four different multinational cooperations (fifteen participants).
d) Verification interviews	Qualitative interviews verifying the draft classification model.	Four interviews with managerial staff from multinational cooperations.
e) Second workshop	Workshop of two days, discussing the classification model.	Managing directors and general managers from multinational cooperations (ten participants).

In total over a hundred and eighty pages of transcribed interviews were collected and later analysed to contribute to this research.

After the literature review and the first focused interviews, a draft classification model was developed with examples of company interactions. The information gathering was extended in the first workshop, where the topic on partnering and partnering types in ecosystems was discussed. After the workshop four different connection types between companies were identified and the researchers were able to describe these in detail, with case examples mentioned by participants during the workshop. After the first workshop some selected focus interviews were conducted to ensure that the four connection types and their visualisation were comprehensible by managers. The second workshop was conducted over two days, focusing only on the connection types of companies in ecosystems. The 15 participants were encouraged to contribute to the workshop by providing and presenting case examples. By the end of the workshop the connection types were discussed and extended to five connection types that can be found in business ecosystems.

### **Data analysis**

The data analysis of the phase b interviews was conducted through coding of the transcribed material. In the following workshops (phases c and e), notes were taken to contribute information to the phenomenon. Parts of the workshop were recorded and later transcribed. Not all workshops could be recorded because of confidentiality or managers' personal preferences. Case presentations from the participants during the workshops were written up in three-page summaries.

The discussions on the draft classification model (d) were done over print-outs. Here the changes and differences were recorded on the paper in the interviews.

In the final workshop (e) all participants contributed to, and finally concluded, the five-stage model. Twenty-five pages of a final discussion were transcribed and analysed, as well as notes being taken during the workshop.

### **The classification model**

The defined classification model will contribute to the ecosystem literature and will allow a classification of B2B ecosystem links between participating organisations. During the interviews and workshops that were conducted, it was determined by workshop participants that ecosystems are complex structures. They may have multiple levels of engagement, and seeing organisations and their links as one level may be underestimating the complexity. This means that any company may have multiple different value exchanges and may involve 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. Hence, two individual companies may be delivering, for example, one complex service to multiple companies. When looking at the value exchange and the linkage between the companies in the complex value exchange, these connections may be defined differently, as the situation demands different treatment. Even though the value delivered to customers is similar, the type of connection, its organisation and its management may be distinctly different in its organisation.

The study presented has uncovered five different types of ecosystem B2B connection, which contribute towards a classification model of ecosystems. It is acknowledged that one business ecosystem may include multiple classifications. However, the researchers and practitioners found that this doesn't have an impact on mapping an ecosystem, but does cause confusion when

conversing about business ecosystems and their operation.

The next section will detail five different B2B connections in ecosystems. The authors will describe, first, the type and, second, why it would be chosen by practitioners, and, finally, a case example will be given, as stated by the practitioners.

#### *Commodity supply*

In this category company connection is on a commodity supply basis. This was often described by practitioners as nuts and bolts supply. The distinction to the bi-directional classification is that in these connections there is a minimum of communications or even only electronic communications – hence, buying nuts and bolts from a supplier. 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.

Practitioners choose these links for non-complex participation in a business ecosystem. No or hardly any 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 very complex service delivery ecosystem, and in the stated example it is one large governmental contract, the provision of a convenience store within the harbour structure is a transaction business and no innovation or communication is needed with other businesses within the business ecosystem. Another example could be the aforementioned nuts and bolts supplier. Indeed, this isn't to say that the above member of the ecosystem is less or more important than the others.

#### *Bi-directional*

In bi-directional relationships the ecosystem participants are in need of more exchange, communication or another value. Changing requirements or 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, however not more of the partners. For example, the requirements are given by one partner and fulfilled by the other. Practitioners have described this category as a typical research and development (R&D) link between ecosystem members. Therefore, the need for innovation (or communication) is higher than in the category *commodity supply*. Overall, this category is chosen by companies to foster collaboration and closer proximity, potentially bound through a B2B contract.

As an example one of the practitioners mentioned the relationship between a heavy-machinery company and a sensor supplier. While the sensor supplier may fall into the commodity supplier category, it may be bound by R&D activities. Hence, the heavy-machinery supplier can ask for specified deliveries such as sensors that work at a high temperature or have high durability.

#### *Multi-directional*

In the category *multi-directional value exchange* companies are coupled together both loosely and separately, albeit within close proximity or with high exchange of value in-between. The difference to 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 on how the companies work together and an alliances or ecosystem contract may be in place. However, the

importance stated 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 will not work.

Practitioners would be using such an approach for a value delivery whereby multiple work tasks have to be conducted, which require inter-company communication. This may be multiple companies working 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.

One example is the service provision of training aircrafts. The training flights are specified and set by the training organiser; however, the aircraft is owned, serviced and provided by different service companies. This means that if, for example, a night-vision flight is requested, all the equipment must be provided, tested and ready for the training flight. This necessitates the coordination of requirements, scheduling of work to be done on the ground, as well as coordination of availability of both man and material.

#### *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. The differentiation between the multi-directional classifications is that the proximity is increased between the partners involved. Here the aid may be a physical shared place or a shared infrastructure, such as IT integration, as well as a shared governance structure, culture and marketing.

Practitioners have described choosing this form of collaboration if there is a large need to have delivery collaboration, if there is value in the combination of capability and if there is a need to control for trust, risk or the alignment of objectives. Furthermore, there may be a need to respond quickly to sales and, hence, combine not only people but also infrastructure such as finance or CRM systems. In this structure, where there is a physical mixed space where people work under one roof, members of staff are still separated into their own companies and the companies still have significant non-shared infrastructure.

The example used here is two IT companies. One specialises in software integration for large industrial companies and the other in producing mobile front-ends for the end customer. 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 better and to raise the quality of software products for industrial companies. Both capabilities are very different and there is a high need for information exchange between the workforce. The partners have therefore decided to found an entity. While all members of staff remain working in the same company and market access is defined through one of the companies, the companies have chosen to have one physical location to conduct their work. Hence, the two companies have begun sharing one office space to run the project and this part of the wider ecosystem.

#### *New legal entity*

There are cases where B2B companies acting in the form of ecosystems choose to found a new legal entity. The partners then build a new company overnight. The ecosystem partners involved in the value delivery are then transferring all risks, processes and company functions, as well as members of staff, to the new legal entity. The legal entity ownership is then shared by the different companies.

Practitioners have stated to choose to build a new legal entity when there is a strong need to have long-term collaboration. This may have to do with length of asset use or length of contract. 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.

An example of this is multiple companies involved in upgrading work of civil infrastructure. Infrastructure projects are always complex and transaction costs between companies high. Hence, having a highly integrated approach in the form of a legal entity will enable common performance to be driven and ensure the success of the single project. Integrated sales structures and reporting structures are indeed included.

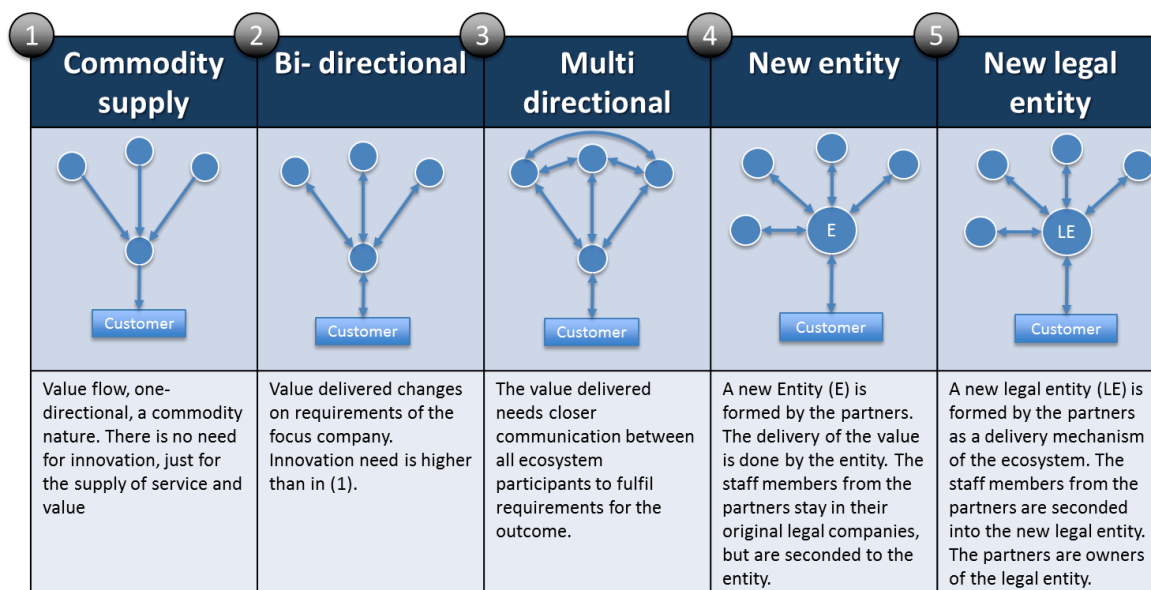


Figure 1: Different types of connection in ecosystems

### Discussion

Indeed, the differentiation in classifications above is important as it has an impact on the level of integration of the ecosystem and, hence, the proximity between the organisations involved. Indeed, there are also impacts on the firms operating and the business model, as well as commercial dependency.

The classification model has been developed to help structure conversations with practitioners and to facilitate an understanding of the differences in their use. There are differences in why a particular classification is used; however, there is no differentiation in the form of a staircase model, where one is always better than the other. There is only a good fit for the situation of the ecosystem partners and the delivery in general.

One example would be a service delivery that is based on capability and technical expertise. These tasks are clearly defined. For example, if the engine of a machine is broken, then one company will do the repair; if there is something else wrong, another firm will conduct the repair. There is no need for this task to build an entity or a new legal entity.

Another finding from the practitioner workshops was that multiple types of connection can occur

in one business ecosystem. Hence, working with one company in a commodity supply relationship does not prevent them from working in the same ecosystem with another company, or even with the same company in a bi-directional setting.

### **Conclusion and relevance**

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

A categorisation that has been split into five parts was determined, namely, commodity supply, bi-directional, multi-directional, new entity and new legal entity.

Relevance and contribution are split into two: first, the work extends the academic literature on ecosystems and contributes to the ongoing discussion on ecosystems. Specifically, it defines that there are different types of ecosystem connection, which can be studied separately and have separate business needs. The difference in the definable types has an impact on the proximity of the companies involved in the ecosystem and also on the components needed for the implementation of a functioning ecosystem. Second, the work will help practitioners to better understand business ecosystems and their operations.

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

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