Abstract

There are several attempts to investigate partnerships between software vendors and its stakeholders. The term ecosystem is used to emphasize the aspect of interdependence between the businesses operating in the value chain of the software industry. Messerschmidt and Szyperski introduced an abstract model of the ecosystem’s lifecycle in this industry. Using the model as a basis, a survey among 28 enterprise system providers (ERP providers) was conducted to determine specific formations of ecosystems among real world businesses. We investigate the relationships between the actors of the ecosystems and analyze how the different types of ecosystems are operating. The study reveals that several different models occur in relation to specific aspects, such as the size of the ERP provider or additional services provided. The main different models that were figured out as a result of the survey could encourage new approaches to researching value co-creation, including the evaluation of the different software ecosystems.

Keywords: Ecosystems, ERP provider, business models, classification scheme.

1. Introduction

The term ‘ecosystem’ has been used frequently in the literature to describe the relations of different businesses operating in the value chain of the software industry. It is adapted from the natural ecosystem, which consists of a complex of relations between species among themselves and to their biotope [18]. Over a period of time, input is transformed to output which requires specific actors in the ecosystem who are responsible for specific tasks.

The ecosystem is protected against diseases through diversification which is regulated by environmental conditions. Within an ecosystem a co-evolution of the species occurs, which supports the optimization of the ecosystem [16].

Messerschmidt and Szyperski draw an analogy between the natural ecosystem and the software ecosystem presenting an archetype model which shows the lifecycle of the ecosystem including the different tasks and functions within the value chain [12]. We go a step further and investigate the correlations between the actors of different software ecosystems. The aim is to identify different practiced ecosystems that have to be distinguishable by specific characteristics, such as the participants in the ecosystem and their relations among each other.

Using the model of the software ecosystem by Messerschmidt and Szyperski as a basis for our research, a survey was designed to identify specific relationships in the constitution of software ecosystems. Our field of research relates to business-to-business (B2B) relationships, hence, providers of enterprise software (ERP provider) were surveyed. Using ERP software as an example to demonstrate the B2B relationships in a software ecosystem appears to be appropriate, since it is a packaged software product used by companies [13]. Moreover, it is an integrated set of programs [1] and a configurable information system [10], which indicates that ERP systems have to be designed, implemented, configured and distributed [20]. These are important aspects for the constitution of the software ecosystems, since different businesses could provide one or more of the above-mentioned services, such as design, implementation, configuration and distribution and therefore influence the numbers of relationships in the ecosystem as well as its complexity.

The term ecosystem is also used in the context of value co-creation [8]. Sarkar, Sarker, Sahaym and Bjorn-Andersen discuss the relationships between an ERP vendor and its partners using a case study of a SME providing ERP software for SME [17]. They analyze the partnerships of a specific ERP vendor
with other organizations and demonstrate how this network creates value for all of the partners.

This case study is a description of how a distinct software ecosystem could work. The next step could be, to investigate the value co-creation of other formations or the evaluation of specific ecosystems in relation to their value co-creation.

Andresen, Bockmann and Roztocki point out that ERP providers often focus on one large revenue that they gain by selling a new ERP package and the suitable maintenance and consultant services for this package [3]. This business model is stated obsolete, since many users of ERP systems became educated in potential problems. They use their knowledge to play providers against others which leads to a lower purchase price [3]. This trend encourages ERP providers to rethink their business model, which has to be more customized to potential users of the ERP system [4].

The aim of the research is to investigate the practiced business models and deduce different models of ecosystems that are distinguished by specific aspects, such as the size of the ERP provider or the different sources of revenue, for example developing, implementation, configuration and distribution of the software.

First, ecosystems of ERP providers are explained further, which includes the model by Messerschmidt and Szyperski and our own model, which is a modified version. Afterwards, the methodology of the research and the results are explained. Finally, the different types of ecosystems that we figured out are presented.

2. Ecosystems of enterprise system providers

Since it depends on the motivation of the researchers where they set the boundaries of an ecosystem [16] we first have to define our assumptions relating to the constitution of a software ecosystem. Organizations are regarded as open systems, which indicates that they affect and are affected by their external environment [2].

An organization interacts with its ecosystem, which consists of a set of actors that functions as a group and interacts with a shared market for software and services [7]. We assume that ecosystems form around ERP providers comparable to the assumption of Popp and Meyer [15]. Distinct formations of relationships between the ERP provider and other organizations of its ecosystem are called business models. This means that the business model of the ERP provider resembles its ecosystem. Models can be created referring to different hierarchic levels. Osterwalder, Pigneur and Tucci introduce three levels of creating business models:

The first level is the overarching concept of a business model that can describe all real world businesses. The second level is a classification scheme of different business models which means that each business model can be described as a specific configuration of elements [9]. The third level is the conceptualization of a particular real world business model [14]. In this contribution, we investigate the second level of business models with the intention to create a classification scheme of different business models.

In order to distinguish different types of business models, the specific elements and relationships that describe the business of a company have to be identified. This description relates to the first level of creating business models, which is the definition of the overarching concept. It guarantees that the business models are comparable and can be understood by different persons in the same way [14]. Therefore, a description of the different business actors, their functions and the sources of revenue is necessary [21].

Our overarching concept of business models presented in this work refers to the reference framework of business models presented by Brockmann and Gronau [6]. The four main components of their model are the development of the software, the distribution of the software, the market and target group of the ERP provider and its value generation, which are additional services provided such as the implementation of the software [6]. We add two further components: The size of the ERP provider (micro-, small, medium and large enterprises), in order to detect correlations between the size of a provider and its pursued business model, and partnerships with other organizations of the software industry, since these are affecting the constitution of the ecosystems as well.

The software ecosystem consists of businesses that operate in the value chain of the software industry [12]. This is shown in Figure 1, which illustrates the model of the ecosystem lifecycle of the software industry adapted from Messerschmidt and Szyperski and modified by the authors. After the analysis of the needs and requirements of the end-users by the business consultant, concrete approaches for realizing these specific needs and requirements are designed. The results of the analysis and design stage are realized during implementation by the software supplier. Provisioning includes the installation, integration and testing of the software in the organizational environment of the end-user. This
includes the integration of application software and infrastructure software, such as operational systems or databases [12]. The function of the operation stage is to keep the application running reliably and securely, including the support of end-users if problems, such as defects or changing needs, are arising. In the use stage, the software product provides direct value to the end-user organization [12].

Figure 1. Ecosystem lifecycle of the software industry including businesses participating.

The model introduced by Messerschmidt and Szyperski shows the elements of the software ecosystem: business consultant, software supplier, provider of infrastructure software, system integrator, service provider and end-user (customer). The different stages cannot be separated precisely since they overlap each other [12].

It is important to note that one organization can serve more than one of the above-mentioned businesses, which means that ecosystems can vary in their number of involved participants, which is also shown in the results of the survey. This means that the ecosystem-lifecycle works as shown in figure 1, but it does not represent the potential relationships among the actors of the ecosystem. These are presented in figure 2, which shows the potential actors and their relationships within the ecosystem.

Figure 2. Overarching concept of software ecosystem including possible actors within the system.

Every type of ecosystem presented later on investigates a specific type of ERP provider (ERP provider A). Depending on the business model of ERP provider A, the ecosystem can consist of more or less actors and relationships. The main objective remains the same, which is to bring the software to the customer organization within the process described above.

3. Methodology

The main objective is to detect specific different business models practiced by ERP providers. As stated above, there is a trend to customize the business model, since older standardized models are obsolete due to the increased know-how and education of customers of ERP providers.

Since the required information is very specific, a survey with a questionnaire that includes all of the necessary questions seemed to be most suitable to get the required information. The components presented in chapter 2 are the foundation of the survey among ERP providers done by the authors of this work with the intention to create a classification scheme of different business models. First, a questionnaire, which includes all of the aforementioned elements of a software ecosystem and the relationships among them, had to be designed. The questionnaire consists of closed questions only. In addition, the interviewee has the possibility to list further answers, if the given list does not include appropriate options, for example a given list of sources of revenue of the ERP provider.

The questionnaire includes the size of the ERP provider, the development and distribution of the ERP system, the customer organizations, the services provided, the sources of revenue and partnerships with other organisations, such as retailers, system integrators, service providers and others.

The survey took place in July 2011. 28 of the 62 ERP providers that were contacted responded to the survey. The number of participants might be too short for a statistical evaluation, but nevertheless, the results are analyzed and definitely show tendencies.

The number of participants might be too short for a statistical evaluation, but nevertheless, the results are analyzed and definitely show tendencies. Basically, we analyzed differences between large and small ERP providers in general and we compared ERP providers developing their own ERP system with providers not developing their own system and providers developing additional modules for other ERP systems. The comparison mainly considers the types and total number of partnerships an ERP provider has and the specific additional services it is providing. We assume that these two facts combined with the size of the regarded provider and the
development of the system are most important for the complexity of the software ecosystem.

The surveyed organizations have a headquarter located in Germany. The participants were acquired through online exhibitions (ERP expo, CeBIT) and the search engine google. The organizations were contacted via phone, mail and contact forms. The questionnaire was filled in by a responsible employee of the IT department or another responsible person, who has the required know-how to answer the questions.

4. Empirical results

The results will be presented referring to the six components introduced in chapter 2: The size of the organization, the services provided by the organization, development and distribution of the ERP system, market and target group and partnerships with other organizations of the software industry.

4.1. Size of the ERP provider

Small (28.6%) and medium sized (32.1%) enterprises have the highest percentages and make up two thirds together. Large enterprises make up a fifth (21.4%) and micro enterprises make up just under a fifth (17.9%). The sizes of the organizations are defined as follows: Micro enterprises have 10 or less employees, small enterprises have more than 10 and up to 50 employees, medium enterprises have more than 50 and up to 250 employees and large enterprises have more than 250 employees. The classification based on the numbers of employees conforms to the definition of the Federal Statistical Office in Germany and to Brecht [5].

Micro enterprises are given an extra category instead of adding them to the category of small enterprises, because the percentage is relatively high. A classification based on the size of the organizations makes sense, because it can be assumed, that large enterprises that have much more resources than small or micro organizations will pursue a different business model and vice versa.

4.2. Development of the ERP system

Over two thirds of the surveyed organizations develop the ERP software by themselves (64.3%). Less than 15% of the organizations provide externally developed software (14.3%) and a fifth shares the development (21.4%). There is a difference between micro, small and medium and large providers: Whereas 60% of the micro providers, 75% of the small providers and 78% of the medium providers develop the software completely on their own, only 33% of the large providers are found to develop the software completely on their own. The reason for the lower percentage of the large enterprises might be found in the two kinds of sharing the development of the software:

1. The main part of the ERP system is developed by an external organization and the ERP provider develops industry-sector-specific or customer-specific components;
2. the main part of the ERP system is developed internally and other organizations can be granted rights to develop further specific components of the software.

The results of the survey show, that the developer of the main part of the ERP system is in all cases a large enterprise, whereas the developer of specific components is mostly a small to medium sized enterprise. This explains the low percentage of large ERP providers developing the software completely on their own.

4.3. Distribution of the ERP system

In general, an approximate half of the providers distribute the system on their own (53.5%) and nearly the other half shares the distribution with other organizations (42.8%). Only one of the surveyed providers does not take part in the distribution of its ERP software, which main parts are in this case developed externally. This organization is specialized in implementing and adapting the software to its customers.

The results of the survey show, that providers, which develop and distribute the ERP system on their own interact much less with other organizations than providers, which share the development and/or distribution.

Surveyed providers that share the distribution of the ERP system often declare that the software is distributed via solution partners. These solution partners can be granted rights to develop customer-specific solutions (which is not obligatory) and distribute the expanded software.

4.4. Market and target group

Most of the ERP systems regarded in the survey can be used all over the world (71.4%), but have to be adapted to the foreign country which can be done by the ERP provider itself or by an extern
organization. A quarter of the systems can be used in Germany, Austria and Switzerland (25.0%) and only one provider selected Europe as the area of usage, thus, this category is to be disregarded. None of the surveyed providers selected the first category: The software is only used in the country of the headquarters of the ERP system provider.

The area of usage is to a certain extent linked to the size of the ERP provider. Micro and small enterprises tend to limit the area of usage of the software, whereas all of the large enterprises surveyed provide an ERP system that can be used worldwide. Only 35% of the micro and small enterprises provide their systems worldwide although their absolute percentage among all surveyed organizations makes up nearly 50%, but 71.4% of the providers that limited their area of usage are micro and small enterprises.

The specialization in distinct industry-sectors is also part of the market and target group. It emerges, that most of the surveyed ERP providers do not specify in distinct industry sectors (67.9%). A third provides industry-sector-specific solutions for several sectors (28.6%). Only one of the providers specializes in one sector, which was in that case specified by the provider as "high-tech".

The providers also had the possibility to enumerate industry sectors that they are specialized in. The specificity of the results was very unequal. It ranges from very specific sectors as the production of photovoltaics, rolling technology or medical technology to more generic sectors as the service sector in general, the machine building industry or the wholesale trade.

4.5. Providing additional services

The results of the survey show that the providers tend to either provide most services around the ERP system by themselves (42.9%) or share most services with intermediaries (42.9%). A balanced mix of both is practiced less frequently (14.3%).

It is also noticeable, that there are no specific trends regarding each of the services. That means, none of the services (except for renting the system and updating the system), has a tendency of being shared or offered solely by the provider. In fact, it can be observed, that both possibilities tend to be evenly spread referring to each single service, which is demonstrated in figure 3.

The services updating the system and especially renting the system are exceptions to the assumption stated above. The renting of the system is the only service that is not provided by all of the surveyed organizations. Most of the organizations that provide this service do it solely on their own, which is also the case with updating the system.

Further additional services or sources of revenue were specified by an approximate third of the surveyed providers. Common additional services among these are advisory services (40%) and project management (20%). Other services mentioned were very different: development of other software, development of hardware, maintenance of hardware, printing technology and financing.

4.6. Partnerships among organizations

Most of the surveyed organizations have between three and four different types of partnerships. There was only one provider participating in the survey that has no partnerships with any other organization. This provider is a micro organization that concentrates on its core competencies, since time- and resource-intensive services, as the service of implementing the ERP system and the IT support service, are being outsourced.

Figure 4 shows the distribution of the six different general types of partnerships that were included in the questionnaire. It can be seen, that most of the ERP providers have distribution partners (71.4%) and most of these stated having more than one distribution partner. One of the surveyed providers even has more than 20 distribution partners and another provider refers to the distribution partners as a partner network.

Often the ERP providers call the distribution partners solution partners. It emerges, that these solution partners are other organizations, for example system integrators that are granted rights to resell the
ERP software and other additional services relating to this software.

Partnerships with other ERP providers (21.4%) and other organizations in general (14.3%) are not very common among the surveyed ERP providers. The results of the survey show, that if an ERP provider has a partnership with another ERP provider, this partner mostly develops the main software and both exchange additional modules of the software. A three-quarter of the partnerships ERP providers have with other organizations in general are providers of other related software. Providers of database management software, for instance, were mentioned by several surveyed organizations.

Development cooperation, turnover sharing via recommendation and partnerships with system integrators that resell the software are important aspects within the topic of partnerships between organizations as well. These three particular types occur relatively often (at least about 43%). Although these different partnerships require very unequal intensities of interaction, the spread is relatively equal.

Note, that there are also three different types of development cooperation. 85.7% of the providers, which cooperate in development, work together on an interface, 42.8% exchange additional modules of the ERP system and 35.7% do both. Most ERP providers, which exchange modules, also cooperate in developing interfaces. This result is coherent, since the different modules have to fit in the corresponding ERP system.

5. Different types of ecosystems of ERP providers

The following table presents the different types of ecosystems of enterprise system providers that could be figured out through the results of the survey. The different business models are categorized through ten different components: the size of the provider organization, the size of the customer organization, the market, the development of the system, the distribution of the system, how the services are provided (exclusive, externally or shared with another organization), the implementation of the system, the maintenance service, further additional services / sources of revenue and the number of partnerships.

The values as a whole of all the components form the different business models, but not every component does always have a specific value. These components are marked with the value “not specified”. The different models are being named after their main characteristic(s).

The following sections describe each of the different business models in detail. The model of each ecosystem only shows the relevant relationships of the main ERP provider regarded. There are of course actors in each ecosystem that are participating in other ecosystems as well. The actors that do not appear in this ecosystem are market grey in order to ease the comparison with the overarching concept presented in figure 2.
Table 1. Five different types of ecosystems that resulted from the research.

<table>
<thead>
<tr>
<th>Size of the provider</th>
<th>1. Micro enterprise system provider</th>
<th>2. Large organization with extensive partner network</th>
<th>3. Main part of ERP system is developed externally</th>
<th>4. Complementary software partner</th>
<th>5. Service oriented ERP system provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size of the customer</td>
<td>Micro enterprise</td>
<td>Large enterprise</td>
<td>No specific size</td>
<td>Midsized enterprise</td>
<td>Small to midsized enterprise</td>
</tr>
<tr>
<td>Market</td>
<td>Small and midsized</td>
<td>Not specified</td>
<td>Same as developer of the main components</td>
<td>Midsized enterprise</td>
<td>Same as developer of the ERP system</td>
</tr>
<tr>
<td>Development of the system</td>
<td>Germany, Switzerland, Austria</td>
<td>Worldwide</td>
<td>Same as developer of the main components</td>
<td>Germany, Switzerland, Austria</td>
<td>Same as developer of ERP system</td>
</tr>
<tr>
<td>Distribution</td>
<td>Exclusive development</td>
<td>Core components developed by provider, additional modules externally</td>
<td>Core components developed externally, additional modules by provider</td>
<td>Exclusive</td>
<td>Developed externally</td>
</tr>
<tr>
<td>Services provided</td>
<td>Exclusive distribution</td>
<td>By provider and through several distribution and solution partners</td>
<td>Exclusive distribution</td>
<td>Exclusive</td>
<td>If provider is granted rights to resell</td>
</tr>
<tr>
<td>Implementation</td>
<td>IT support and implementation most likely to be outsourced</td>
<td>Not specified</td>
<td>Not specified</td>
<td>All services are provided exclusively</td>
<td>Most services are provided exclusively</td>
</tr>
<tr>
<td>Maintenance services</td>
<td>Shared or outsourced</td>
<td>Shared</td>
<td>Exclusive</td>
<td>Exclusive</td>
<td>Exclusive</td>
</tr>
<tr>
<td>Further additional services / sources of revenue</td>
<td>None</td>
<td>Advisory service, development of other software</td>
<td>There are mostly no additional services provided</td>
<td>Project business, advisory service</td>
<td>Advisory services</td>
</tr>
<tr>
<td>Number of partnerships</td>
<td>Few</td>
<td>Numerous</td>
<td>Numerous, especially in developing interfaces and exchanging modules</td>
<td>Partnerships with large organization that develop complementary software as product data management systems (PDM) and computer-aided quality (CAQ)</td>
<td>No specific quantity</td>
</tr>
</tbody>
</table>
5.1. Micro enterprise system provider

The key value of the micro enterprise business model is evidently the size of the ERP provider, which is a micro organization. The results of the survey show, that the micro sized ERP providers limit their markets and concentrate on their core competencies. This is demonstrated in figure 4, which illustrates the ecosystem of micro ERP providers.

It can be seen that the customer of the ERP provider is the only source of revenue for the provider, if there is no partnership with a retailer that resells the software, which is indicated by the dashed arrows. The partnerships with the system integrator and the service provider for IT support demonstrate that resource intensive parts of the business are outsourced.

The authors assume that the relation between the provider and its customers are relatively close, because of the extensive interaction between the two organizations. This causes a detailed and immediate knowledge of the ERP provider of problems with the software, which might occur. This might also be the reason, why micro ERP providers do not have partnerships with business consultants, which analyze customer satisfaction and problems.

5.2. Large enterprise with extensive partner network

The main aspect of this business model is that the core components of the ERP system are developed by a large enterprise (ERP provider A) and additional modules are developed by another ERP provider (ERP provider B) that is granted rights to use the ERP system as a basis for new additional modules. This provider can also be granted rights for the development and distribution of software which extends or modifies the enterprise system [19].

Around the large ERP provider forms an extensive network, which can be seen in figure 6. The ERP provider has several sources of revenue:

- The ERP provider, which is granted rights to develop additional modules, pays for using the software. This fee is called certification fee [15].
- The customer of the large ERP provider pays for using the ERP system and for all services purchased and
- the distribution partner or partners pay a license fee.

Since most large ERP providers have capacities to offer additional services as IT projects (not only relating to the implementation of ERP software) or advisory service, there is an additional income through further customers.

All of the large ERP providers surveyed had partnerships with a business consultant. The authors assume that the complexity of the network and relationships leads to a need of a business consulting firm that analyzes the customer satisfaction for the large ERP provider. Compared to the ecosystems of micro organizations, the large enterprise is engaged in a variety of interactions with a multitude of different organizations, which might prevent the ERP
provider from recognizing specific needs or deficits relating to the satisfaction of its customers.

In comparison to the ecosystem cycle presented in figure 1 the ERP provider A is software supplier, system integrator and service provider that works together with another software supplier (ERP provider B), a business consultant, a system integrator and a service provider.

**5.3. Main part of ERP is system developed externally**

This model is the complementary part of the one presented in chapter 5.2. The main characteristic of this model is that the core components of the ERP system are developed externally and additional modules by the ERP provider regarded in this section (ERP provider A in figure 7). Both ERP providers have a development cooperation in programming interfaces and exchanging modules of the ERP system. In some cases, the ERP provider of the core components buys the additional modules programmed by the other ERP provider instead of exchanging the modules.

The services presented in previous chapters are shared by the ERP provider, which means that the provider works together with other organizations in providing these services (e.g. integrating the system at the customer's organization).

The results of the survey indicate that the involvement of business consulting firms and distribution partners as described in the previous section is very common in this business model as well.

**Figure 7. Ecosystem of ERP providers that develop additional modules**

Referring to the ecosystem cycle presented in figure 1 the ERP provider A is software supplier, system integrator and service provider that works together with another software supplier (ERP provider B), a business consultant, a system integrator and a service provider, which is the same case as described in the previous chapter.

**5.4. Complementary software partner**

The main characteristic of this business model is the partnership between the ERP provider and a provider of complementary software (e.g. data management system (DMS), computer aided quality (CAQ) and customer relationship management (CRM)), presented in figure 8.

**Figure 8. Ecosystem with complementary software partners.**

The ERP provider is granted rights by the provider of complementary software to use this software and provide an integrated software solution of the own ERP software and the extern complementary software. The services required for the implementation and maintenance of the software are offered by the ERP provider. The organization surveyed that pursues this business model also provides additional services as IT projects and advisory services.

Referring to the ecosystem cycle presented in figure 1 the ERP provider is software supplier, system integrator and service provider and works together with a software supplier of other software which enables the ERP provider to develop an integrated IT solution.

**5.5. Service oriented ERP system provider**

The key value of this model is the externally developed ERP software. This indicates a partnership with another ERP provider that develops the software and grants usage rights to the ERP provider regarded in this section. This provider is specialized in
providing the main and additional services relating to ERP software, which can be seen in figure 9.

![Figure 9. Ecosystem of service oriented ERP providers (ERP system developed externally).](image)

Since the provider is specialized in services, there are no partnerships with other service providers apart from business consulting firms that analyze customer satisfaction. The results of the survey indicate that this partnership is common in this type of business model.

In addition to the services relating to ERP software, the providers mostly offer advisory services, which are further sources of revenue for the ERP provider A.

Referring to the ecosystem cycle presented in figure 1 the ERP provider is service provider and system integrator that is dependant on a software supplier (ERP provider B in figure 9).

6. Summary and further research

The aim of this work was to create an overview of different business models of ERP providers in reference to their software ecosystem. For that purpose, the general idea of the constitution of a software ecosystem had to be identified and defined. This includes the actors, their tasks and relationships within the ecosystem. Since this work focuses on business models of ERP providers, the ecosystems presented pursue a provider-centered view.

The questionnaire of the survey was designed to cover the main components of a software ecosystem of an ERP provider. These components were presented in chapter 3.

The results of the survey also reflect the assumption of Jansen, Finkelstein and Brinkkemper, who stated that ERP provider became networked, which means that they are often depending on service and software suppliers, resellers and others [11].

Further research could include other actors of the ecosystem as well, for example, acquisition targets, standards bodies or open source communities [15]. In addition, the specific characteristics of the partnerships between organizations could have been included in more detail. In some cases it is not absolutely certain if there is a flow of goods, knowledge and / or funds or just a collaboration, which represents this partnership.

Other important aspects regarding to the results of the survey are the conditions of the survey. A higher number of participants might have improved the basis for the analysis and therefore facilitate the generation of different business models and the correlating ecosystems.

Moreover, there is a need to verify the assumptions of the author of this work made in chapter 5 (e.g. regarding the partnerships between ERP providers and business consultants). Another aspect for further research could include the evaluation of the different ecosystems, for example by investigating the co-creation of value within the network.

7. References


