Struggling with conservatism: entrepreneurships’ challenges in business model design

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Abstract: The purpose of this paper is to investigate the conservative business ecosystem and to identify opportunities for new companies to create value. Authors used a design-oriented case study with a start-up concentrating on the commercialisation of the university research. The authors consider a novel business model used by the start-up company. By analysing the model, methods are proposed for accelerating the company and the business ecosystem. The results indicate that cooperation between the product suppliers and opinion leaders plays a key role in supporting the biomedical business ecosystem. The probability of success for a new product depends on the interest of the professional community. The results add to the existing knowledge on business models for start-up companies to succeed without business expertise and extensive business network. The transformation of customers to partners stimulates the emergence of a new business model that takes into account the new role of a ‘customer-partner’.

Keywords: conservative business; business model design; business barriers.
1 Introduction

The popular management literature generally suggests that to succeed, an innovation needs the support of a dedicated business model (Magretta, 2002; Osterwalder et al., 2005; Teece, 2010; Stott et al., 2016). However, too often business model design is looked at from a single company perspective, although people, companies, and ideas create value by interacting with each other. Hence, companies should be considered as parts of a business ecosystem that have different stages of creation, evolution, and death (Moore, 1993; Kandiah and Gossain, 1998; Amit and Zott, 2009). It is necessary to rise above the goals and objectives of a single company and consider the system as a whole. A company may not obtain an adequate return for its innovation due to a lack of market development, existing barriers or bureaucratic obstacles and, therefore, has to approach commercialisation from an ecosystem perspective.

The business model is still a suitable unit of analysis for the study of business structures and the relationships between companies at the onset of the formation and changes of the ecosystems. Due to its fundamentally (but often overlooked) systemic nature (Anggraeni et al., 2007; Zott et al., 2011), the analysis of business models is the key to understanding the shifts in ecosystems and the reasons for these changes. Business
models support the means to finding a way to move from meagre cooperation between companies to a synergy between the whole ecosystem.

To explore the connection of business models and business ecosystems we undertook a design-oriented case study in the biomedical business ecosystem, and veterinary industry in particular. This industry, to our knowledge, has not previously been widely studied before (for an exception, see, e.g., Baguley, 2011). Although considerably smaller than the human market, the veterinary market constitutes an attractive, growing market for start-ups. However, veterinary technologies and products are in general more conservative compared with the human ones and the introduction of new technologies is a cumbersome activity. In turn, the business models of the companies involved in the veterinary business are outdated, the veterinary business ecosystem is conservative. Researchers have not paid sufficient attention to this industry; therefore, it is necessary to study the business ecosystem and key participants with a more detailed approach. Moreover, the findings of this study could be generalised with respect to the biomedical industry.

Our case company was a start-up that focused on the development and commercialisation of scientific innovations. The very purpose of our article was to contemplate the ways in which an innovation and company could establish itself on the conservative market, and how it could identify and exploit opportunities by means of a business model design. It was first necessary to understand how the industry in question currently works. Therefore, we posed the following research question: how does the veterinary device ecosystem currently function? Moreover, in order to further change the systems, it was also necessary to answer the following question: how is it possible to change an existing business ecosystem and overcome the ecosystem’s barriers by means of a business model design? We assessed the reasons for the involvement of the participants in the ecosystem and their contribution to the value creation. The purpose of this paper is to investigate the ecosystem for veterinary devices and to identify opportunities for new companies to create value.

This paper is devoted to the functional analysis of the veterinary ecosystem and the business processes that might help to provide leadership for the existing ecosystems or develop a new system. In addition, the paper features a definition and issues recommendations to all the participants on how to improve the ecosystems in order to increase the value for all the participants.

2 Theoretical background

2.1 Business models and ecosystems

A business model shows how value is created (Amit and Zott, 2001) and captured from an innovation (Chesbrough, 2010). Moreover, it is a widespread unit of analysis in the entrepreneurship and strategic management areas that aids different sides to combine value creation (Amit and Zott, 2009; Zott et al., 2011; Jabłoński, 2019). It proposes that business models are considered as systems of interrelated actions spanning a company’s borders (Hellström et al., 2015).

Value creation explains the advantages that the company creates for its customer. Value for the customer is similar to the customer’s wish to pay for the proposed product. Customers are ready to buy products if their value exceeds their price. If the
manufacturing of the product is below its cost price, the company will make a profit (value capture) (Matzler et al., 2013). An innovative business model leads to the fact that the company offers value to the customer and systematically creates a new model of commercialisation, which allow the company to develop.

Moreover, it is necessary to consider the business models used by all the participants of an ecosystem. Innovative business models that will create value and complement existing ecosystem are required, especially at the initial stage of development (Amit and Zott, 2012). The essence of a business model is the need for change and transformation of the company (Demil and Lecocq, 2010; Davidow, 2018). The basic idea is to create more value for the participants and for the whole ecosystem (Magretta, 2002). Changes made in the business models of companies lead to changes in the whole sector of the economy and industry (Brusoni et al., 2009).

The business model concept is often examined from an individual company’s perspective. However, the concept is systemic by nature (Zott and Amit, 2007). Hence, it lends itself very well to be used as a lens for ecosystem analysis. Business model innovation stimulates the renewal of the business ecosystem by means of the new changes that are used to create new business structures (Boons and Lüdeke-Freund, 2013; Høgevold et al., 2014). This is examined, in this study, through the framework of a veterinary orthopaedics device business ecosystem.

Development of the key participants in the business ecosystem is directly related to the development of the ecosystem and its value creation, the definition of strategic objectives, partnership opportunities, and benchmarking to other related markets (Adner, 2006). Business ecosystems help in the understanding the functional structure of one or several interacting industries (Dalziel, 2007). The purpose of ecosystems is to identify the needs of the participants, to give a vision of the structure and the ways to develop the participants as well the industries in general. The relationship between the participants leads to a strong vibration throughout the structure. When one of the leading participant changes the foundations, a change follows in the value creation for all the participants (Adner, 2006).

A business ecosystem is characterised by its functions (Moore, 2006). The main functions are the exchange and expertise of ideas, the search for investors, commercialisation of innovations, and the creation of structures that will implement these innovations. Different functions at different stages of the ecosystem development are in higher demand than others (Moore, 1993). However, close cooperation between people, ideas, and investments leads to the formation of new values.

The most significant characteristic of the ecosystems is that they create a greater (i.e., leverage) value than the individual members or the group (Graça and Camarinha-Matos, 2016). Initially, ecosystems promote the participation of new major and minor participants at different stages of their development. They allow much more than at an individual level, the creation of the value. This creates the possibilities to support the development and progress of the ecosystem (Amit and Zott, 2009). Moreover, the participants in the system interact with each other, creating more complex schemes of collaboration, which might be difficult to organise in a ‘top-down’ way. There is a dynamic updating of the system and more potential for the future. In addition, participants of the ecosystem collectively develop and maintain a system in order to be protected against failure. Each participant contributes and everyone benefits; thus, the durability of the system increases. The philosophy of ecosystems offers a new structure that fixes a global shift in business and the whole economy (Autio et al., 2000). The
status of networks, collaboration, units, and innovations is not a novelty, but grow rapidly. There is a very attractive opportunity for businesses to use the experience and expertise of the ecosystem participants, which is impossible to control and to provide alone (Graça and Camarinha-Matos, 2016).

3 Methods

The evolution of ecosystems and the role of business models in generating such change require an in-depth understanding of the current and future functions of ecosystems. Moreover, business ecosystems and business models are per definition rather complex entities, and in these complexities, it may be difficult to detect straightforward causal relationships; thus, a deeper understanding of the various contexts and mechanisms may first be necessary. Therefore, a case study seems to be a suitable method to provide rich data (Yin, 2003) and create a roadmap for the new participants in the industry. Current research is based on the design-oriented action research method, as it is the lack of clear variables and relationships, which allows one the testing of various approaches in real-life settings and the exploration of their results (Denscombe, 2014). The researchers contribute to the development of solutions for how the participants of the business ecosystem, and to the creation and capturing of value by adopting a design science approach (Romme, 2003; van Aken, 2004). The main task of this method is to make changes in organisations (i.e., changing their business models) by transferring scientific knowledge to practice (Tsvetkova and Gustafsson, 2012).

A start-up manufacturing company that has an invention in the veterinary orthopaedics device market was selected for the study. The company, TraceRay, and its technology, constitutes a good case, as it is highly dependent on other participants of the ecosystem. Intrinsically, a greater integration of the participants is needed for commercialising the invention and, hence, for leveraging the total value creation of the ecosystem. Moreover, the participants are not competitors as they are focused on a common goal – the synergy of cooperation.

The CEO, CTO of the manufacturing company, a private investor, practicing veterinarian-consultants, and other participants of the ecosystem were interviewed. The main points of discussion were to determine the potential of the veterinary orthopaedics device ecosystem, discuss challenges and opportunities, and identify the role of participants in the design of a new logic for the business ecosystem. All interviews were conducted in English and lasted 35–65 minutes. For more information about the interview participants, key topics, date, and duration, see Appendix. Most of the individual interviews were done in a narrative format (Riessman, 1993), while the group interviews were more likely done in the form of a discussion with an exchange of expert opinions (McLafferty, 2004). After the interview, the received information was transcribed verbatim and sent for verification to the interview participants. The collected information was discussed at the research team’s weekly meetings, with the involvement of an additional researcher who did not participate in the interviews. This approach made it possible to obtain an independent assessment of the interviews and increase the reliability of the analysis. During these meetings, we also had an opportunity to modify questions for the interview based on the data received, and we prepared a list of comments for clarification by phone or e-mail.
As a method of analysis, we used content analysis (Mayring, 2004). Researchers independently processed the information, identified patterns and proposed topics for discussion. If at least two of the three researchers agreed with the pattern, then it was later verified by the CEO of the studied company. Verification occurred monthly by e-mail.

We used independent sources of information to complement existing ones. First, we conducted additional interviews with the incubation program manager and senior adviser of the accelerator program where TraceRay participated. The unbiased opinions of experienced participants in the local life science market allowed us to take a new look at the state of the business ecosystem, the relationship of TraceRay with other companies and the development prospects of the company. Second, Finland considers the development of the biomedicine and biotechnology industry to be a priority for economy. There are many industry reports that have clarified and triangulated the results of our study. In addition, we used the websites of TraceRay’s competitors, which allowed us to compare the companies’ business models. We decided to finalise the interviews and search for data after we stopped receiving information from new sources.

The physical limitations were based on product development capabilities as the products consist of advanced materials and their combinations. Social issues also had an impact on this case study, which added to the complexity to the ecosystem.

4 The case analysis

4.1 A new business model for the veterinary orthopaedics device ecosystem

The manufacturing and supply company changed usual business models. The company offered to develop a new product, using its knowledge in the field of materials. With the support of opinion leaders, the company offered a new approach to cooperation in this ecosystem. At the initial stage of product development, the company collaborated with opinion leaders, as consultants, in order to discover the problem, and then offered knowledge of materials and R&D processes. Further, the focal company continued collaboration with opinion leaders as consultants, but in the capacity of the first testers of the prototypes (Morgado, 2018). After that, opinion leaders were the first customers when the product became available on the market. This new approach towards the business model in the veterinary orthopaedics device ecosystem considered novel interconnections between the opinion leaders, the ‘customer-partner’ scheme, and the impact of significant changes to the whole ecosystem (Teece et al., 1997). Collaboration with opinion leaders and transformation of customers to partners at different stages of development of the supplying company created a new framework for insight into this area.

Regular veterinarians work with suppliers on a commercial basis. Such cooperation may include the purchase of goods or the provision of advisory services. In turn, the opinion leader becomes a partner in the project when providing free services but receives a reward depending on the case. This may include, for example, obtaining shares of the company, joint publications in peer-reviewed journals or moral compensation to solve important industrial problems. In this view, cooperation with an opinion leader is more beneficial for accompany than cooperation with a big network clinic, as the former option increases the chances of cooperation with small clinics. Substantially this is due to conservatism in the field of medicine for human and veterinary applications.
4.2 TraceRay Oy case analysis

The participants in the veterinary orthopaedics device business ecosystem are highly interdependent and interact with each other to create and capture value. The current situation of the ecosystem in this case is shown in Figure 1. Motivated by professional development, the veterinarians play a key role in the survival of the ecosystem. Most are members of professional communities led by leaders in terms of veterinary opinions; the opinions and expertise of these leaders regarding new products and services are critical to the supplying companies. The focal company involves veterinarians as consultants in the R&D process. Moreover, TraceRay Oy attracts key partners, inviting them to become shareholders of the company. These opinion leaders play an active role in product development, access to the distribution channels and networks might increase the speed of regional development.

Figure 1 The ecosystem of an orthopaedics veterinary device start-up ecosystem (see online version for colours)

The focal company’s new ‘customer-partner’ business model of collaboration with veterinarians allowed it to be highlighted as innovative on the market. The changes allowed the existing barriers to be overcome more effectively, increasing the chances of survival, as well as accelerating development. Shifting the status of veterinarians from customers to partners at different stages of development provided a critical advantage in the market. Poor links between the participants of a business ecosystem do not allow further development and generates a relatively negative impact on sustainability.

The key value that the opinion leader brings to the project is their level of expertise. The opinion leader is not a regular veterinarian, but rather a specialist with a position in the professional community of the largest European and US markets. Such a person could
be on the board of a professional association, have a significant number of peer-reviewed publications, and most importantly, and have a wide network. As a rule, these persons are not looking for additional income, but they are interested in solving global problems in the industry. For example, they want to reduce animal suffering or see a paradigm shift in treatment, etc. In addition to confidence in the expertise, TraceRay received extra value.

First, the company reduced R&D costs. The partners of the opinion leader agreed to lower the cost of animal testing. Moreover, the opinion leader covered the costs of the medical workers involved in the operations. Second, TraceRay received access to the leading distributor of veterinary products in the home market of the opinion leader, which helps support future sales growth in this and the neighbouring markets. Third, regular veterinarians who were not previously interested in cooperation began to provide free consultancy services, and they began buying TraceRay products. The key trigger for the start of cooperation was the opinion leader’s presentation at the chief European veterinary exhibitions and joint publications in journals. Thus, the opinion leader influences the business development of the focal company due to its authority in the professional environment.

Table 1  Evaluation of the TraceRay business model by design themes

<table>
<thead>
<tr>
<th>TraceRay Oy representative</th>
<th>Veterinarians</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lock-in</strong></td>
<td>No lock-in.</td>
</tr>
<tr>
<td><strong>Novelty</strong></td>
<td>International conferences organised by the key European societies (ESVOT and BSAVA) showed that the leading manufacturers in the European market do not intend to offer a significant change in the product for a long time. All manufacturers use metal.</td>
</tr>
<tr>
<td><strong>Complementarity</strong></td>
<td>No complementarity.</td>
</tr>
<tr>
<td><strong>Efficiency</strong></td>
<td>The shareholders hope that the healing process will increase by using this product and the risk of re-operation or amputation will fall by ×10 when compared to the basic implant.</td>
</tr>
</tbody>
</table>

Selected statements from Table 1 confirm the perspective of TraceRays’ business model. The main differences between this novel and other typical product are the reduced recovery period and the lower probability of complications. The traditional and the new process of treating animal bone fractures are compared in Figure 2.
One of the issues that TraceRay Oy faced was related to the need to create much more value compared to their competitors. To succeed and to develop their own ecosystem, TraceRay had to redesign its business model. The current ecosystem does not create value after the animal’s recovery. However, on the human market various services in relation to the recovery are more common. Such services could also be offered by the veterinary market. For example, the combination of implants with sensors for personalised medicine is a hot topic (Campbell et al., 2012; Palo and Tähtinen, 2011). The use of modern sensors with the software application might change the regular interactions between the participants. As seen in Figure 2, there are no further activities after the animal’s recovery. Supplementary post-operative care products by the focal company are a step in this direction. In addition to the generation of extra revenues, these types of care products could extend the loyalty of customers towards the company. Moreover, in the future a smart implant loaded with sensors might help the ecosystem create more value and unit participants through remote health control, see Figure 3. A smart implant with remote health control can be used by all the participants of the ecosystem. The added value creation is shown in Table 2.

Significant changes to the existing ecosystem and development of the focal company might be achieved through restructuring the traditional collaboration (Hsu, 2016). However, this new development is impossible without significant changes in the business model and without additional investments. A comparison of the current and updated business models of the focal company is presented in Table 3.
Table 2  Advantages to the users if a plate with sensors is used

<table>
<thead>
<tr>
<th>The focal company</th>
<th>The possibility to collect information about end-users and their owners (animals following, database of the pet owners).</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Additional cash flow from the application use or advertisement.</td>
</tr>
<tr>
<td></td>
<td>Sale of the knowledge to vendors.</td>
</tr>
<tr>
<td></td>
<td>Sale of the access to the database for marketing purposes (manufactures of food and accessories).</td>
</tr>
<tr>
<td>Veterinarians</td>
<td>The ability for remote control of the animal condition (especially inflammatory process after the operation).</td>
</tr>
<tr>
<td></td>
<td>Reminders to the owners about the annual visits to the clinic (increase cash flow).</td>
</tr>
<tr>
<td>Investors</td>
<td>Creation of a new cash flow, which might be even higher than in the case of the sale of the original product (small constant monthly fee and a large one-time sale).</td>
</tr>
<tr>
<td>Owners</td>
<td>Tracking animals without extra clinic visits. Visits to the veterinarian only when needed (cost reduction).</td>
</tr>
<tr>
<td></td>
<td>Marketing bonuses that might cover a monthly subscription fee.</td>
</tr>
<tr>
<td></td>
<td>Fun (joint jogging, animal’s parameters control, communicate with other owners, word of mouth to promote products).</td>
</tr>
</tbody>
</table>

Table 3  Used and proposed business models by the focal company

<table>
<thead>
<tr>
<th></th>
<th>The current situation (without sensor)</th>
<th>The updated version (with sensor)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content of transactions</td>
<td>The product is developed using the knowledge of experts in biomaterials and veterinarians.</td>
<td>The product is developed using the knowledge of experts in biosensors, biomaterials and veterinarians.</td>
</tr>
<tr>
<td>Structure of transactions</td>
<td>The new approach collaboration with veterinarians ‘customer-partner’.</td>
<td>The new approach collaboration with veterinarians ‘customer-partner’ + collaboration with experts in biosensors.</td>
</tr>
<tr>
<td>Governance of transactions</td>
<td>No changes.</td>
<td>Communication with the pet owners, feedback, extra revenues.</td>
</tr>
</tbody>
</table>

The new value creation is formed by the advanced collaboration between the participants. Similarly, the business model of the focal company demonstrates only a part of the ecosystem value creation and cannot be studied independently. As demonstrated in Table 2 and Table 3, the benefit from involvement in the updated business ecosystem for the existing and new participants depends on the business model used and the desire to renovate. The focal company might eventually reach a leading position in the business ecosystem, and, due to their close cooperation, other companies in the ecosystem may benefit from this scenario. The analysis of the key factors that defined the development of these collaborators could, in turn, aid the focal company in stimulating them to reach a qualitatively new condition in the ecosystem.
5 Discussion

5.1 How does the veterinary device market function?

A key role in creation, development and support of the veterinary orthopaedics device market is played by cooperation between the product supplier and the veterinary community. Veterinarians are interested in collaboration, if they see opportunities and solutions to existing problems. New technologies in business and science and their combination provide an opportunity to look at this conservative ecosystem in a new way. The impact of other participants as investors and animal owners is important, but provide little understanding of the business ecosystem.

In order to see and capture the opportunities for the improvement of a business model and the chances for joint value creation in the ecosystem, it is insufficient to consider each participant of the ecosystem as individuals (Adner, 2006; Amit and Zott, 2009). Moreover, extensive resources should be attracted to achieve a significant shift in the ecosystem without a breakthrough innovation (Chesbrough, 2006; Amit and Zott, 2012; Chesbrough, 2007). Therefore, to achieve sustainability of the ecosystem, increased cooperation between the participants is required; in particular, cooperation with the company in possession of the innovation is compulsory.

The focal case varies from the conservative veterinary orthopaedics device suppliers, because different participants create and capture value through the close collaboration. Moreover, traditional collaboration is characterised by the high level of dissociation between the key participants of the business ecosystem. However, the focal company is now searching for new opportunities at the ecosystem in system-level of goals by interconnection both inside the business ecosystem and at the intersection with others. Improved interdependence is associated with increased sustainability (Boons and Lüdeke-Freund, 2013) and value creation as a key element of the business ecosystem and the business model (Amit and Zott, 2001).

5.2 Changing the veterinary device ecosystem by means of business model design

To answer our second research question, how to change an existing business ecosystem and overcome ecosystem barriers, we used CIMO-logic (Denyer et al., 2008) for explicating our arguments. CIMO (context, intervention, mechanism, and outcome) is a logic specifically developed for writing out theories developed through a design science approach (Romme, 2003; van Aken, 2004; Denyer et al., 2008). This CIMO-logic defines the mechanisms for creating, sharing and capturing value used in system transitions.

As shown in the case analysis, business ecosystem changes should be evaluated at the system level. Previous collaboration between the conservative and closed business models of participants requires significant revision and modification to more functioning analogues. A common characteristic in these two analyses is the need to revise the business models of partners to make a joint proposal. This redesign could be achieved through in-depth cooperation between partners, specifically with in the creation of a complementary service that was not previously available. This approach is the key in creating a lock-in with a customer.
Complementarity creates environment conditions of value creation. The demand to change the business ecosystem creates the basis for lock-in, novelty and efficiency. For example, the issue of novelty stimulation in a conservative market could be solved by integrating the key veterinarians into the development, testing and sharing of profit. In the sensor case, value was not created earlier. If the sensor appears in the implant, it will contribute to the pet owner’s cost efficiency. In addition, extra revenues and lock-in will be created for the veterinary clinic and veterinarian.

Thus, the total value for the focal ecosystem is created in operational and non-operational relationships between the participants. Therefore, consideration of the isolated business model provides little understanding of the way in which value creation can be achieved within the veterinary orthopaedics device ecosystem. However, this study provides an understanding of the place of participants in the industrial chain of the creation and capture of value. Moreover, it is an incentive to strengthen collaboration.

New interactions between customers and suppliers, and the transformation from customer to the partner provided the key for the changes in the business model of the focal company (Amit and Zott, 2009, 2012). Adaptation of the relationships and reactive changes in the ways of achieving cooperation between the key participants in the veterinary orthopaedics device ecosystem are of great importance. Each participant in the ecosystem benefits from closer cooperation (Chesbrough, 2006; Teece, 2010; Jaakson et al., 2011; Chesbrough, 2007). In order to improve collaboration, the concept of value creation should be changed and a system-level interaction should commence (Amit and Zott, 2001; Palaima and Skarzauskiene, 2010; Amit and Zott, 2012). Identification of factors that create value in every circumstance is the basis for changes in the ecosystem. However, existing barriers limit the market. These barriers include, i.e., the immaturity of the product and ethical issues related to its application. In this study, we envisaged that a combination of implants with sensors might create business opportunities beyond the simple implantation device. Consequently, collaboration mechanisms should lead to the cooperation and revision of the existing business models not only in a single company but also in the whole ecosystem (Tsvetkova and Gustafsson, 2012).

In the above case, there are key factors that had an influence on the creation of new value in the ecosystem (Osterwalder et al., 2005; Boons and Lüdeke-Freund, 2013). These factors include the elimination of cooperation obstacles and an understanding of the reasons for transformations in the business models (Adner, 2006; Chesbrough, 2010). Knowledge of these factors helps companies realise the benefits of cooperation in the development and use of a product. In our case, the conservatism of a participant, e.g., a veterinary surgeon, might be overcome by the involvement of an opinion leader in the development of a breakthrough technology. As a result, reputational risks might be reduced when the opinion leader has a deeper involvement in the R&D process. This involvement should assume beneficiary interest, rather than the opinion leader taking a mere consultant role.

6 Implications for theory and practice

Our study offers three main theoretical inputs to the existing literature:

First, using the veterinary industry as a case study, we consider how innovations enable the development of a conservative business ecosystem through business model innovation (Chesbrough, 2010) and product innovation (Danneels, 2002). The focal
company uses business model innovation to enter the market and distinguish itself from competitors through collaboration with an opinion leader. After that, the possibility of using new technologies forms a new niche in the veterinary market (Kemp et al., 1998). Our case is in tune with the principles of open innovation, but it goes further to demonstrate development using new technologies. On the one hand, there is a joint approach to value formation, which includes a new type of cooperation between industry participants and participation in public entrepreneurial programs in the form of a business incubator and accelerator. On the other hand, a new value is being formed at the intersection of knowledge in the field of veterinary medicine and engineering.

Second, we use CIMO-logic, which allows us to demonstrate how a business model innovation creates value for various participants of the collaboration (Denyer et al., 2008). Participants can commercialise innovations in different ways, offer value to the end user, or form a unique value proposition in the framework of a similar context. We also implement knowledge that business ecosystems generate more value than individual participants (Adner, 2006) due to:

1. accelerating market promotion
2. expanding market services
3. forming value at the junction of several industries.

Third, we apply a social theory in the veterinary industry and demonstrate value creation and capturing at various stages of business development (Nahapiet and Ghoshal, 1998). According to the ‘customer-partner’ scheme, the transformation of the interaction between the company and the opinion leader corresponds to the general concept about the role of social ties in business. However, our case is one of the few to use it in a conservative market.

In addition, we also demonstrate that it is not only the business ecosystem but also its participants that can change their functions over time (Adner, 2006). The main functions of the business ecosystem are the exchange of expertise, assistance finding investments, and the commercialisation of innovations. In turn, the role of participants may vary depending on the conditions of cooperation, time, or participants in the collaboration. The formation of long-term and mutually beneficial ties is important for stability and the gradual development of the business ecosystem.

Our study also offers a number of practical implications:

First, we demonstrate a new opportunity for start-ups facing a lack of resources for business development. The proposed approach demonstrates that a lack of funding may not be so problematic for entrepreneurs with innovative solutions. On the one hand, key market participants may be interested in various conditions of cooperation. On the other hand, start-ups get the necessary expertise and network, which could substitute financing in certain cases. We emphasise that cooperation with opinion leaders provides additional motivation for business development at various stages of the company’s growth. Initially, this happens at the planning stage due to the correct identification of a niche in the market. Then, it happens at the R&D stage, when the company is sure of the expert’s professionalism, thereby reducing the likelihood of external factors affecting product testing. Moreover, use of the opinion leader’s personal relationships helps to reduce direct costs. After that, opinion leaders may assist in market promotion. Companies gain
access to an established partnership network with distributors and other clinics, and they use the opinion leader as a speaker at professional conferences.

Second, we demonstrate how companies could increase their competitive advantage in a conservative market. The use of new technologies allows us to expand the traditional market limitations. We demonstrate how a company could benefit from the formation of a new offer that was not previously available to the customer. Using the veterinary market as an example, we show the novelty, lock-in, efficiency, and complementarity of two conditions that can be formed in the market.

7 Limitations

This study is one of the few that is devoted to issues of business ecosystems for the veterinary market. We look forward to continuing with further studies of the veterinary and human markets. Such studies could overcome the existing limitations of our work. Primarily, the increased number of companies that create breakthrough products and technologies should be analysed. This analysis will allow researchers to consider trends in the business ecosystem. In addition, research in the field of the human orthopaedics could consider the experience obtained from different countries. A natural extension of this study would be to evaluate companies in various stages of development and consider changes in their business models over time.

8 Conclusions

In this study, we examined how companies from the veterinary orthopaedic device market collaborate with each other in a business ecosystem. In general, the participants of the business ecosystem are continuing to make significant changes through close interaction with each other. We have shown that the business ecosystem provides the possibilities for the formation of new participants even with a lack of key resources. We investigated business processes and business models that contribute to the shift from a conservative business ecosystem towards a new ecosystem.

The transformation of veterinarians from customers to partners, gives a significant contribution to the development of the business model of the supply company. This merger stimulates the emergence of a new business model, which takes into account the new role of a ‘customer-partner’. This transformation leads to a change in the business ecosystem, which creates more value for the market.

References


Appendix

**Table A1** The key meetings regarding to the TraceRay case

<table>
<thead>
<tr>
<th>Representative</th>
<th>Time</th>
<th>Major discussed topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEO of TraceRay Oy</td>
<td>September 2018, 90 minutes</td>
<td>• Commercialisation of research</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Background of the founders</td>
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<td>• Negotiations with investors</td>
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<td>• Competition</td>
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<td>• Plans for future</td>
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<tr>
<td>CTO of TraceRay Oy</td>
<td>September 2018, 70 minutes</td>
<td>• Pros and cons of a product</td>
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<td>• Collaboration with universities and companies</td>
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<td>• Plans for future</td>
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<tr>
<td>Private investor</td>
<td>September 2018, 60 minutes</td>
<td>• Reasons for collaboration</td>
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<td>• Plans for future</td>
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<tr>
<td>CEO, CTO and veterinarians</td>
<td>October 2018, 125 minutes</td>
<td>• R&amp;D of the plate</td>
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<td>• Post-operative collars</td>
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<td>CTO</td>
<td>October 2018, 50 minutes</td>
<td>• Collecting data with sensors</td>
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<td>• Use of data</td>
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<tr>
<td>CEO, CTO, and R&amp;D director</td>
<td>November 2018, 45 minutes</td>
<td>• Prototyping of post-operative collars</td>
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