Innovative approaches in forest management – the application of a business model to designing a small-scale forestry strategy

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Abstract

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The strong market competition forces forest owners to find innovative approaches to forest management, and business models are becoming integral parts of successful innovations and business strategies. This paper deals with the applicability of a business model (as an innovation tool) for small forest owners. The main objectives were to design a business model applicable in the forestry sector and to find the innovative business alternatives for the small-scale forest owner reflecting the local situation (in a case study in the Czech Republic). The extended business model CANVAS was used. The embedded data was evaluated on the software developed at the Savonia University in Finland where business opportunity and competitive advantage were the main evaluation criteria. As a result, a proposed strategy was advised to be followed. The biggest added value of the extended CANVAS model is giving an objective and unbiased evaluation of the situation of small forest owners. The business model design proved a usable and applicable tool to be used in forest management, for the research has shown that the quantitative data should be complemented by qualitative research in order to get the complex view.

Keywords: resources; innovation; rural economy; competitive advantage; business opportunities; extended business model CANVAS

Although there are different definitions of innovation (Anderson 2006), the consensus is that innovation in general denotes the successful introduction of novelties. We used the definition according to OECD (2005) – innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations.

The issue of innovation has been given increased attention in the past 15 years in the forestry sector, mainly on the scholarly research level. The issue is, however, very broad, it could be distinguished between innovation research from the business perspective (Hansen et al. 2011; Nybakk 2012; Ludvig et al. 2016; Živojinović et al. 2017) and the system perspective level (Rametsteiner, Weiss 2006; Buttoud et al. 2011; Weiss et al. 2011). Only a few authors have devoted time to the issue of innovations in forestry in our environment (the Czech Republic and Slovakia). Jarský et al. (2010) pointed out the small incidence of innovations in forestry in the Czech Republic and selected Euro-

pean countries. Šálka (2004) emphasized that high initial investment costs, lack of own/foreign sources of capital, unfavourable financial condition of forest owners and their lack of information about innovation possibilities and financial support for innovations are the crucial factors hampering innovation processes. Šišák (2007) specified the barriers to the realisation of innovation; as a cause of inefficiency, misapprehension, slow response and slow implementation of changes, they are seen not only in the traditional approach, but also in the economic situation (such as low labour costs) and the legal environment. Another frequently discussed variable within the innovation issue is the size of the forest land and ownership category. Šálka et al. (2006) stated that the main factor of innovation frequency in the forestry of Central European countries is the size of forest land that allows the owner to build on the basis of financial resources, low initial costs, management and reflects the level of management interest to maintain its reputation. Also Eggers et al. (2014) claimed that the property size is the most important factor in determining the choice of management strategy, with owners of larger properties more frequently choosing a more production-oriented management strategy compared to owners of small properties. Dobšinská et al. (2010) and Sarvašová et al. (2014) stated that innovation correlated positively with the holding size and therefore came with a recommendation for the small forest owners to cooperate with each other. According to Jarský (2014, 2015), who evaluated the forestry innovation system (IS) in the Czech Republic based on the fulfilment of the main system functions, the cooperation function (and with it strongly interconnected information function) of the IS is significantly emphasised, as the cooperation and appropriate flow of information are substantial for implementation of innovation on the one hand and for conflict management on the other.

As Kajanus et al. (2014) claimed, depending on the ongoing multidimensional global changes occurring in the external environment, which is inevitable in the near future for forest owners, one must either adapt or create a new business model. Thus, the conceived business model creates a new dimension for innovation, where the innovation is understood to be not only as a new product and service development, but also as a change in some business model components. This extension of the concept of innovation has proved to be very useful and will be used in the application of the extended business model in the next section. This business model is then both the basis for the creation of the innovation and the basis for the development of a new business strat-

egy. This concept of the business model was used by Pateli and Giaglis (2003), who explained what the business model meant and came up with the comprehensive summary of the business model framework. In a similar way, Stähler (2002) understood the business model to be the simplification of a complex reality, a tool for identifying the basics of the business plan and to further develop planning. The long-term business strategy based on a high-quality business model design is an important foundation for a successful business.

As pointed out by Hansen (2010) and Weiss et al. (2011), for example, the mechanism underlying the competition between forestry companies creates space for expanding business opportunities, creating competitive advantage and improving business performance. The impact of globalisation forces forest owners and forestry entrepreneurs to seek new forms of competitive advantage. According to Porter (1998), there are two basic types of sustainable competitive advantage a firm can possess: low cost or differentiation. Buehlmann and Schuler (2013) illustrated this competition strategy on the example of the domestic furniture sector in the United States, which is significantly losing a market share due to low-cost Chinese production and is forced to fight for its position in the market.

There are about 400 thousand individual (physical persons) forest owners in the Czech Republic (Jarský 2017), most of them obtained their property in the process of restitution. The majority of them (64%) own only less than 0.5 ha of forests and have only little or no knowledge of forests and forest management. A proposal of specific business models could be considered as a significant shift in (economic) activity for such a new forest owner.

The aims of this paper are:
(*i*) To design the extended business model CANVAS (EBMC), as an innovation tool, in the forestry sector;
(*ii*) To identify and clarify the alternative directions for a small-scale forestry owner in a case study in the Czech Republic.

MATERIAL AND METHODS

The main pioneer of the EBMC is M. Kajanus (Kajanus 2000; Kajanus et al. 2014) at the Savonia University of Finland especially on the field of forestry and wood-processing industry. This model is an extension of the model CANVAS that was created and propagated by Osterwalder (2004) in response to changes in management and communication.
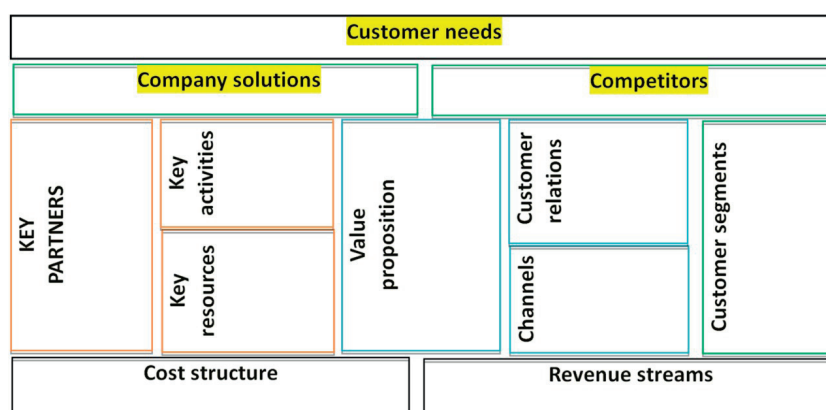
Fig. 1. The extended business model CANVAS

The EBMC is extended by three segments, highlighted in Fig. 1, also see RIEDL (2015):

(i) Which customer do we need to meet? (Which customer problem do we help solve?);

(ii) What do we offer to the customer? (Which products and services, which solutions?);

(iii) The existing or foreseen competition that can meet the customer's needs in a similar way.

The essence of designing the EBMC is, thus, the deconstruction of the examined company processes into twelve segments. These segments reflect the provided value and the logistics of these values to the customer. They are grouped into four basic blocks: (i) customer and competition, (ii) offer and delivery, (iii) resources, (iv) profit formula.

The design of this model includes the following steps: (i) identification of the factors, (ii) qualitative research, (iii) quantitative analysis, (iv) computer processing, (v) results interpretation.

In methodological terms, it is a process of the combination of the qualitative survey and the quantitative analysis.

Identification of the factors. In order to compile the questionnaire for the quantitative analysis, there was a need to generate the most important factors (ideas) that can have an influence on the small-scale forestry, for each of the 12 segments of the model above (Fig. 2); 68 factors in our particular example have come up as the most significant influences from the following methods. The methods used to generate the factors were as follows:

(i) A brainstorming method with forestry students (50 randomly chosen students as a sufficient representative sample). Students of authors were impulsively coming up with factors that could be recognized as having an influence on the small--scale forestry. After the irrelevant factors were dismissed by the controlled discussion, the most important factors were left;

(ii) A phone survey of forest owners up to 5 ha (25 randomly chosen respondents as a sufficient representative sample);

(iii) 5 experts on the issue (mentioned below in the "qualitative research" subsection).

Fig. 2. Savonia robust portfolio modelling – extended business model CANVAS

The first of the three figure numbers shows its affiliation to one of the main 4 blocks, while the other two are a sequence in which the factors were added. The final output evaluation of Fig. 2 is discussed in chapter Results and Discussion where the detailed examination of each block is provided

The acquired factors were entered as inputs to the Savonia University software (2011) which carried out further evaluation and treatment (https://apps.savonia.fi/idea).

Qualitative research. The qualitative research was conducted in the administrative district of Králíky as a case study with the forest owner (hereinafter the "Subject"). To get the most important factors the questionnaire was used and complemented with a managed structured interview in order to get secondary qualitative data relevant for the purpose of research. A category of "small" forest owners up to 5 ha was chosen. The respondent was chosen by recommendation (of the above-mentioned forestry students), or the so called "snowball sampling" method (Goodman 1961) generating the most important factors. The respondent was a woman, 57 years old, who owns the forest area of 37,812 m^2 and the adjacent land in the area. The property was received as a gift from her mother.

Qualitative analysis. Each of the 68 obtained factors was evaluated by 5 experts on a scale from 1 to 7 (1 for slight, 7 for significant) in terms of competitive advantage (how big is the advantage the forest owner has over his competitors in the frame of chosen factor) and business opportunity (how big is the opportunity for the forest owner to run a business in the frame of chosen factor):

(*i*) A manager of the Forests of the Czech Republic;
(*ii*) A specialist at the Faculty of Forestry and Wood Sciences, Czech University of Life Sciences in Prague;
(*iii*) A marketing expert;
(*iv*) Two owners of a forest up to the area of 5 ha – the Subject and another forest owner (randomly recommended by one of the above-mentioned forestry students, having the forest in a different location from that of the Subject) for the purpose of the interview.

This evaluation has been done by the experts independently of the computer as additional inputs into the software mentioned above (https://apps.savonia.fi/idea/Evaluator/EvaluateIdeas).

Computer processing. The subsequent processing of all relevant factors and the entered score, also known as the core value analysis, provides the calculation of the key factors based on the predefined criteria evaluation (competitive advantage and business opportunity in this paper). The software works on a multiple criteria decision support basis (Kajanus et al. 2014) using the principles of robust portfolio modelling – RPM (Salo et al. 2006; Liesiö et al. 2007). Therefore, the core value calculation is fast (no sensitivity analysis is needed)

and ensures the identification of all of the relevant factors. The key factors that are recorded in four predefined categories (Fig. 2) are used in the software output to calculate the RPM.

Results interpretation. The use of the software's graphical output to evaluate the business model (BM) see below.

RESULTS AND DISCUSSION

The graphical output of the RPM is recorded in Fig. 2. These are the key factors within the internal and external evaluation frame. You can see the analogy to the critical factors of success (Škrtić et al. 2006).

Customer and competition

The residents living in the surroundings of the forest where the research took place are the most important customer segment. The Subject is not only a part of the local community and might establish business relationships as a daily routine, but also she is able (she resides in the area) to meet the demand in terms of flexibility and speed of delivery related to the saved transportation costs. The locals mostly use solid fuel to make fire in their households and they have the need for raw wood for construction, repairs, or production. As a matter of fact, the Subject is not the only forest owner in the area that might take advantage of the opportunity for cooperation with others, to reduce the forest activity costs and could, thus, offer customers the wood at a lower price.

Offer and delivery

The local region – the administrative district of Králíky – is characterised by the lowest population density in the region and has an unemployment rate of around 7.5% (Czech Statistical Office 2015). The local residents stay together, not only because of these indicators. There is a concentration of farmsteads which entails the need for mutual cooperation and trade. According to Galobardes et al. (2006), the socioeconomic status (SES) plays an important role in communication in such areas. In our case, a good landowner (in terms of natural production) and a diligent businessman are highly recognised by the local community. The attributes of these statuses are based not only on good farming (homestead management), but also in relation

with other inhabitants of the region. From the information mentioned above, another significant factor follows: a reliable and honorary member of the community. This factor was evaluated by the system as the most significant. The demand for the cheap firewood was raised as another significant factor, which is closely connected to the customer segment (see Customer and competition above). The close distance (of about 500 m) of the transportation of the material also plays its major role. Given that the Subject is a worthy person and respected businesswoman in the local region, she is expected to respect the attributes of a diligent businesswoman as well. Therefore, it is important to be concerned about a healthy landscape-forming forest, personal communication (building customer and business partners' relationships), knowledge of the customer needs, experience and knowledge in the field of activity. The composition of the stands in the region is mostly represented by coniferous species and taking into account the management set of stands HS57, there is a possibility of growing deciduous trees to satisfy the local demand for hardwood, mainly beech wood as a building material.

Resources

Because the Subject grew up in the country and cares about forestry, she has got the necessary lumberjack knowledge and knowledge in other activities in the forest and is able to do most of the activities on her own. Given the size of the property she does not deal with any issues with professionalism, manages the forest with "common sense" (based on her experience) and leaves the specialised affairs up to the forest manager. The licensed forest manager of the forest that we have been investigating is also a resident of the region and has a good relationship with the Subject. Thanks to this, there is a possibility of getting the necessary contacts and services relatively quickly. Knowing the forest manager's qualities personally allows the Subject to entrust him not only with the innovations, but also it gives new possibilities of how to manage the forest, from the possibilities of achieving grants for planting the long-term specialisation in the composition of the forest species.

Profit formula

The Subject is willing to invest in her forest land only to the necessary level (investment only into maintaining). She is not profit motivated, nor does she have a successor who would be willing to expand the forest management. She considers working in her own forest as her own way of relaxation. Thanks to this, she has no fixed costs and the variable costs are low. However, if she offsets the cost of her work, she would lose a competitive advantage. She strives for natural regeneration or occasionally transplants a natural thicket within her property. Taking into consideration the size of the land and the way of management, most of the revenue is realised in the firewood price and state support is ineffective; the revenue does not equal the time costs.

The business model is, by scientific nature, partly unique because as Osterwalder (2004) claimed, the main mission of the BM is not the understanding of the phenomenon, but finding ways to solve the problem. It is the search for concepts and relationships that allow the expression of the business logic of the company, so as to be able to formally embrace this business logic. For, as many authors (Stähler 2002; Gordijn, Akkermans 2003; Pateli, Giaglis 2003) present, the business model design is considered as the optimal solution serving as the basis for creating a business strategy.

According to Keeney (1994), the least amounts of time, effort and resources are crucial in searching for the best possible alternative. Designing the EBMC proved to be a very fast method thanks to computerising the processed data. A random-word method (brainstorming) showed to be effective on generating the quantum of ideas in a short time, but an expert was needed to remove the irrelevant terms. There are also some ways in which the model could be improved. A lot of time was devoted to generating the ideas, as it was highly important to get the most valuable data from the qualitative methods. A significant amount of cost would have been reflected in experts' time cost, in case that they had not cooperated voluntarily like in our case.

Schoemaker (1990) saw innovations as one of the main sources of sustainable competitive advantages. According to the definition of the innovation mentioned above, the BM is a typical innovation tool because its designing helps us implement a significantly improved process and method in business practice. There are several researches in Central and Eastern Europe using BM as an innovation tool (Kajanus 2000; Richter 2013; Souto 2015; Vrahnakis et al. 2016), although they are not settled in the forestry segment.

Based on the BM evaluation, it is therefore possible to propose the following strategy.

Selling cheap firewood to the residents of the region should be the main focus of the business plan

(business strategy). It is a low-cost strategy which relies on the Subject's status in society. Based on the output data, it is obvious that most of the Subject's activities correlate strongly with the need of working on her SES within the local community. It is highly desirable that the Subject strengthens her position as a supplier through her social network interaction. In order to reduce costs (use of grants, neighbours' help with material, information, transportation etc.), the local population as well as the relationship and communication with the forest manager and the surrounding forest owners fall under this social network interaction. It is very difficult to create one's own market in such a traditional branch as forestry, but it is not impossible in such a small region and with the help of the connections. By concentrating on firewood, it would be possible to establish a strong position against larger competitors, purely on the basis of market sentiment, more precisely the creation of added value through the building of a strong social position in the locality.

Due to the volume of harvested timber, she cannot compete with larger forest owners, however, there is a potential in the reforestation of the surrounding land.

The research results have shown that the possibility of reforestation of the surrounding land is not undesirable in the local community and, therefore, has the potential of future expansion opportunities. However, we still encounter the fundamental pillar of the BM merit and that is the willingness and motivation of the Subject to proactively be innovative in forest management, which, in this case, is minimal – no efforts to innovate.

As Jarský et al. (2010) described, the main innovation barriers for the owners of forest lands are their financial possibilities and the administrative complexity with regard to the willingness to undertake innovative activities. As in our case, the Subject's profit motivation is quite low compared to barriers she has to deal with. As an added motivation, the strengthening of the social position comes up, nevertheless, we cannot speak about the significant resonance with business planning. There is a solution found in Štěrbová (2016), who saw the cause of the level of innovative activity in the financial situation (disposition) of the forest owner (supplier). While in similar research, Štěrbová et al. (2016) offered a way to reduce these barriers – if the small forest owners in the neighbourhood cooperate, they will reduce the disadvantage of financial resources and take the advantage of the opportunities of financial loans, support programmes, availability of skilled labour, etc.

The status of the Subject's attitude to innovation that occurred can be somewhat expected, since it is in line with the research of Pudivítrová and Jarský (2011), in which a dependence of the willingness for innovation on the size of own land has been proved. The research showed the willingness to be innovative in only 20% of the landowners up to 500 ha of those surveyed, while 51% of the innovative owners were noticed with land owners over 500 ha. Given the size of the Subject's property, we can specify this correspondence with the output of the research and, thus, provide material of this paper as a basis for further research to develop the potential of innovative approaches in forestry.

CONCLUSIONS

In the context of this paper, a designed business model of a particular forest owner has been proved, because the BM can very clearly combine and quantify socioeconomic variables and inputs.

In our particular case, given the size of the forest, it is important to realise that the Subject does not have the opportunity of meeting the specific demands of the customers for quality processed wood, hence she is unable to compete on price with bigger forest landowners. High barriers to enter the competitive market and the willingness of the Subject basically determine the need to find one's own market.

Using the BM proved to be a very helpful methodology, whose main asset is a concise evaluation of quantitative and qualitative data. The extended BM allows for the methodical approach opening the way to innovations in forestry. Its main contribution was the sophisticated capture of the complex range of variables that have an impact on forest management. The RPM software helped to graphically evaluate the resulting data not only for clarity, but also for importance. When evaluating and designing strategies, it was important that the Subject lives near the forest land.

The versatility of the extended BM makes it suitable for use regardless of the size or type of forest owner. For example, there is a possibility to compare the state and private forest owners of the same land size in future research.

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