

Summary of the doctoral thesis
written under the scientific guidance of
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“The introduction of eco-innovations and business model change in enterprises”
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The research problem addressed in this doctoral thesis is the identification of relationships existing between the introduction of eco-innovations and business model change in enterprises, as well as their influence on value for the customer, enterprise and society.

The population of our planet is currently approaching seven billion and is expected to reach 9.3 billion by 2013 [UN 2010]. At the same time, the expectations of the world's population related to prosperity, the quality of life or availability of goods are becoming higher. According to research conducted by more than 1,300 experts from 95 countries as part of the Millennium Ecosystem Assessment report [MEA 2005], it is a reason for dramatic changes in the structure and functioning of the world's ecosystems—changes whose scope was larger in the second half of the twentieth century than it has ever been in human history.

Awareness of this problem became impetus for the World Commission for Environment and Development to begin works, the results of which were contained in the report “Our Common Future” [Brundtland 1991]. This report presented the concept of sustainable development, which became one of the premises of the process of market greening [Andersen 2010], on the one hand revealed in the increased ecological awareness of the demand side of the market, and on the other hand presented by enterprises discerning the possibility of gaining competitive advantage based on the key component of this process, eco-innovation.

The concept of eco-innovation is part of the currently developing broader concepts of sustainable businesses, or sustainable innovation, based on the paradigm of sustainable development. This term may be defined as production, assimilation or exploitation of a product, production process, service or management or business method that is novel to the organisation (developing or adopting it) and which results, throughout its life cycle, in a reduction of environmental risk, pollution and other negative impacts of resources use (including energy use) compared to relevant alternatives [Kemp and Pearson 2007].

At present, taking eco-innovation into account as a significant premise of change in the processes of adaptation and development of business models becomes a condition of creating

above-average value for the enterprise, customers, and other stakeholders, especially value for the environment, or, more broadly, society.

The issue of the business model of enterprises has been addressed in the reference literature for several years, gaining more and more popularity resulting in a large amount of empirical research devoted to this concept [Chesbrough, Rosenbloom 2002; Osterwalder, Pigneur, Tucci 2005; Christensen, Johnson and Kagermann 2008; Sabatier, Mangematin, Rousselle 2010; Lambert and Davidson 2013]. The researchers indicate that the business model is instrumental in nature [Rokita 2005], and that its role is to create values for the customer and to ensure the enterprise's position allowing it to capture the created value [Afuah 2004]. In the literature, fairly well-recognized is the structure of a business model (static approach) consisting of nine components within two modules: Architecture and Clients [Osterwalder, Pigneur, Clark 2010]. The modular nature of the business model enables its change occurring in reaction to changes in the environment as well as for the purpose of implementing the actions planned by the company. In contrast to the structure, the process of changing the business model (dynamic approach) has not been well described nor examined yet [Bucherer, Eisert and Gassmann 2012; Schneider and Spieth 2012]. It is indicated that one of the factors of change in the business model of enterprises is innovation that can be the company's answer to changes in the environment, or that can generate such change by itself. However, there is scarce research linking eco-innovation to change in the business model of enterprises [Boons and Lüdeke-Freund 2013; Stubbs, Cocklin 2008; Bocken 2014].

The specificity of eco-innovation, compared to innovation itself, consists in the fact that its introduction assumes, first and foremost, the creation of value for the enterprise's external stakeholders—the environment, or, more broadly, society as a whole. Eco-value (or more broadly sustainable value) can be interpreted as a concept of value containing elements of economic, social, and environmental values [Van Osch, Bohnsack and Avital 2010]. However, eco-value, as opposed to value for the customer and the company, is not considered part of the business model of enterprises. One may assume that eco-innovation creates value for the customer and the enterprise only directly, that is by creating eco-value, although its relationship with change in the business models of enterprises is poorly recognized.

The conducted critical analysis of the reference literature has allowed the author to identify the boundaries of current knowledge, at the same time defining cognitive gaps in the field of issues including business models, eco-innovation, and business model change under the influence of eco-innovation.

The basic cognitive gap in the area of business models can be considered the notion of the process of their change and the methodological gap consisting in a lack of specialist tools for the analysis of business models in a dynamic approach. In case of the issue related to the concept of eco-innovation, one can consider the cognitive gap to be a small reference of this concept to the microeconomic level, as well as a weak recognition of the influence of various eco-innovations and their mutual relationships and external factors influencing their implementation. The most poorly described in the literature and unexplored area should be considered recognition of the influence of eco-innovation on business model change in terms of its components and the rate of the change process. Unrecognized remains also the research area related to the dimensions of the created value under the influence of eco-innovation and the issue of its perception by the enterprise and its stakeholders, with special attention to the customers and society.

The basic cognitive objective of the undertaken empirical research is the identification of relationships between the introduction of eco-innovations and change in the business model of an enterprise. Detailed research objectives are focused on the issue of changing the business model depending on the types of the introduced eco-innovations, the premises and the process of their introduction, as well as links between them. They should allow us to recognize the influence of a specific type of eco-innovation on business model change in the context of the scope and course of the change process, its rate and complexity, as well as to determine the way in which eco-innovations influence the created and captured value for the company, customer, and society.

The conducted review of the results of research undertaken by other authors indicates a lack of established methods and tools of business model analysis in the dynamic approach, especially their change occurring as a result of innovations introduced by the company. Therefore, the thesis aims to accomplish a methodological objective expressed in the quest for the development of a methodological approach and a research tool allowing the researcher to examine business model change occurring under the influence of eco-innovation.

The utilitarian objective of the thesis is to present recommendations in the field of eco-innovation implementation management in enterprises.

Extensive literature and empirical studies have been conducted in order to solve the presented research problem and to answer the research question asked. The literature studies proceeded largely in accordance with the rigidity of a systematic review. Due to the low level of knowledge and empirical recognition in the field of the addressed research problems, it was decided that the empirical research should be qualitative in nature and aim to accomplish

explorative and explanatory cognitive objectives. The adopted basic research method consisted in multiple case studies conducted with the use of several data sources for the purpose of meeting the requirements related to ensuring the reliability of data and conclusions based on them. The research was conducted in two ways—as desk research and field research.

The subjects of the conducted research were three companies purposely selected from among enterprises awarded commendations under the Minister of the Environment's GreenEvo project. In the research their owners, presidents and vice presidents, members of the boards, and managers of the research and development departments participated. The research was conducted during the period from January to March 2016 and focused on companies located in southern Poland.

The conducted literature and empirical studies allowed the author to accomplish the cognitive, methodological, and utilitarian objectives of the thesis. Above all, the cognitive objective of the thesis was accomplished, consisting in recognizing the current state of theoretical knowledge and the results of empirical research in three research areas being the basis for formulating the research problem of the thesis. It helped determine research gaps and recommended directions of research, as well as develop the assumptions of the research project. The research has helped accomplish detailed cognitive objectives emerging on the basis of the conducted literature studies concerning the business model and its change, eco-innovation, and, especially, the relationship between eco-innovation and the business models of enterprises. These answer the question what the premises for the implementation are and what different types of eco-innovation are implemented by the examined enterprises, including the links that exist between them. The research also answers the question how the process of implementing eco-innovations occurs, in what way eco-innovations are related to business model change—whether only selected components of the model, particular modules, or the whole model are subject to change—and how the process of change occurs under the influence of eco-innovation, depending on the type of the introduced eco-innovation, including the rate of change, the course of the process, and its complexity. It is also recognized how eco-innovations influence the created and captured value for the enterprise, customer, and society.

The methodological objective was accomplished through the development of a specific methodological approach and research tool designed for its implementation, which helped examine business model change taking place under the influence of eco-innovation.

Conclusions of the research may be utilized in economic practice, in this way accomplishing the utilitarian objectives of the thesis. By means of identifying the influence of

different types of eco-innovation on business model change (including both particular components of models as well as the models in their entirety), these may help improve management of the implementation of eco-innovations in enterprises; by means of identifying the influence of eco-innovations on value for the customer and the enterprise, they can increase the profitability of funds spent by the company on investments in eco-innovations. Presenting the factors of implementing eco-innovation and the influence on value for the company, customer, and society may also intensify and facilitate the design of legislative solutions stimulating the creation of real value for the stakeholders of enterprises. The results of the conducted research may also contribute to an increase in the competitiveness of Polish companies in the international market, as the environmental aspect of business is becoming one of the basic elements of competitiveness in this market.

The research approach adopted in the thesis is reflected in its structure. The first chapter focuses on the problem of the concept of business models, presenting its genesis and evolution, its basic approaches, and the definitions and roles of business models in enterprises. The second part of the chapter is devoted to presenting the concept of business models in the context of corporate strategy, as well as against the background of other theoretical concepts, including ones providing its theoretical basis.

Chapter two focuses on the problem of innovation and change in the business model of enterprises, beginning with a description of the concept of innovation and innovativeness. Then, presented are the factors of change in the business model, and business model change is associated with the concept of the life cycle of value, as well as the process of business model change is described. The other part of the chapter discusses the issues of business model innovations and business model change mechanisms. The chapter is completed by a review of empirical research in the field of innovation and business model change.

The third chapter is devoted to the issue of eco-innovation and business model change related to eco-innovation. In its first part, the theoretical basis of eco-innovation and factors stimulating the implementation of eco-innovations in enterprises are presented. Then, the chapter focuses on the presentation of the role of eco-innovation in enterprises and its relationship with the business model, the issue of the influence of eco-innovation on business model change, as well as the influence of eco-innovation on broader structures approached in the category of the value chain of a company. The theoretical considerations are supplemented by a review of the results of research on eco-innovation and its relationship with business model change.

The last, fourth chapter begins with the identification of cognitive gaps indicating the unrecognized research area in which the thesis is located. Then, the concept of the research is discussed, focusing on the definition of the problem and the research questions. The selected research method is justified, the principles of selecting the cases are presented, and the organization and course of the empirical research is described. The second part of this chapter is devoted to a descriptive analysis of the collected data conducted in order to identify relationships between the implemented eco-innovations and the process of business model change in the studied enterprises. The chapter ends with conclusions from the conducted research contrasted with the results of empirical research by other scholars.

The doctoral thesis ends with Conclusions containing an account of the accomplishment of the research objectives and an indication of directions for further research in the field of eco-innovation and business model change in enterprises, in their search for competitive advantage based on delivering values in the environmental dimension.

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