TRENDY EKONOMIKY A MANAGEMENTU
TRENDS ECONOMICS AND MANAGEMENT
ISSN 1802-8527 (Print) / ISSN 2336-6508 (Online)

2020 35(1): 59–71
DOI: http://dx.doi.org/10.13164/trends.2020.35.59

Business Model Adaptation Through Inclusion of Environmental Sustainability Measures

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Abstract

Purpose of the article: The article aims at understanding and description of how and why the business model (BM) of an incumbent manufacturing B2B company adapts, collaboratively with a dominant customer, through measures leading to an improved environmental sustainability performance. The research question was: *How is a business model of an incumbent, business-to-business company adapted through the inclusion of environmental sustainability measures, with the customer's involvement?*
Methodology/Methods: A qualitative research approach, drawing on a descriptive-explanatory, single case study conducted on a Czech manufacturing company active in the field of steel processing was performed. The study draws on the analysis of the focal company's internal and external documents related to sustainability, as well as on semi-structured interviews with the examined company's executives. The analysis also include the externally available sustainability related documents of a dominant customer.
Scientific Aim: Understanding the impact of the environment-related sustainability measures on the adaptation of the extant BM of the focal company, and the role a dominant customer plays in the process.
Findings: The inclusion of environment-related sustainability measures leads to an adaptation of the process and the product, as well as of the focal company's BM and most of its key elements. A value capture by the focal company has been identified as the mainly affected element of a BM through both cost savings and a more business gained. The element value proposition adapts towards a "greener company". The core logic of the BM remains unchanged.
Conclusions: B2B incumbent companies implement environmental sustainability measures into their BMs, aiming to contribute to the preservation of the environment. The economic side continues to be carefully considered. It can even be a trigger of implementation. The large customers get strongly involved in the process, contributing to the adaptation of all four key elements of the BM. The BM's adaptation happens dynamically, in incremental steps.

Keywords: business model, business model adaptation, sustainability, environmental sustainability

JEL Classification: L21, L22, L61, O14, O31, O32, O33

Introduction

Facing the challenges of global warming and limited natural resources and inequalities, industrial companies are taking measures towards inclusion of environmental and social sustainability measures into their BMs, while observing the economic side of business, as well. Doing business in a way aligned with a triple bottom line sustainability approach – people, planet, and profit – further referred to as 3P (Elkington, 1998), is currently considered an underlying assumption for the long-term successful existence of the companies (Benn *et al.*, 2006). Sustainable business is understood as balanced consideration and interlinking of economic, social and environmental performance (Stubbs, Cocklin, 2008), reflected in an overarching concept of a sustainable BM (SBM) (ibid.; Bocken *et al.*, 2014; Lüdeke-Freund *et al.*, 2018). The SBM "is about creating significantly increased positive effects and / or significantly reduced negative effects for the natural environment and society through changes in the way a company and its network create, deliver, and capture value" (Lüdeke-Freund *et al.*, 2018). Such BMs will be considered sustainable, which focuses on and reach a sufficient performance in all three 3P sustainability dimensions, not just one or two (Chuang, 2019; Lüdeke-Freund *et al.*, 2018; Palmer, Flanagan, 2016; Yang, Evans, 2019). Kocmanová, Dočekalová (2011) emphasize the necessity of value creation in all three sustainability dimensions. Kocmanová, Šimberová (2014) suggest that the reduction of environmental impacts will lead to increased competitiveness of industrial companies. Accordingly, the sustainability of the business is supposed to be positively impacted by the implementation of the measures towards the reduction of the environmental impact.

Aiming for an enhanced contribution to the challenges of sustainable development, in line with the United Nations sustainable development goals[1], novel BMs have been identified under the umbrella concept of SBMs. Particularly, the concepts of BM for sustainability (BMfS) (Roome, Louche, 2016; Schaltegger *et al.*, 2016), BMs for sustainable innovation (Boons, Lüdeke-Freund, 2013), and BMs for sustainable development (Boons, Laasch, 2019) have been proposed. These can be understood as sub-categories in the overarching concept of the SBM. Particularly, the BMfS focuses primarily on addressing specific environmental or social challenges, while the economic profit generated by the core activity inherent in these BMs might not be the first intended target (Boons, Laasch, 2019; Freudenreich *et al.*, 2019; Roome, Louche, 2016; Schaltegger *et al.*, 2016). Schaltegger *et al.* (2012) propose integrated business cases for sustainability, aiming for economic profit creation through social or environmental activities.

Manufacturing companies and industries in Europe, affected by the resource scarcity and regulations, spent efforts towards an improvement of their environmental footprint through investing into environmentally oriented product and process innovations. The innovations lead ideally not only to the improvement of the environmental footprint, but also to some cost savings and risk reductions at the focal company's side, as well as in the entire supply chain. These innovations impact the extant BMs, leading to their adaptation into a more sustainable BMs. Such SBMs may involve principles of maximization of material and energy efficiency, closing resource loops or substitution of renewables and natural resources (Bocken *et al.*, 2019; De Angelis, Feola, 2020).

The customers of the focal company play an important role in the adaptation of the BMs towards SBMs. They may be explicitly requiring the focal company to adapt their BMs towards more sustainable ones. Or, on the contrary, the customers maybe explicitly

[1] https://www.un.org/sustainabledevelopment/sustainable-development-goals/

or implicitly addressed with the value embedded in the adapted SBMs, particularly through benefiting from the created value (Abdelkafi, Täuscher, 2016; de Los Reyes, Scholz, 2019). Finally, the BMs' adaptation can also happen in a way of direct close collaboration between both the focal company and the customer. The way how this happens, how to institutionalize the change in the value system requires further research (Rajala *et al.*, 2016).

Drawing on the case study conducted on a metal processing company, the paper contributes to an understanding of how and why an extant BM of a manufacturing company adapts towards SBM. The study examines the single elements of BM being affected through the implementation of environmental sustainability measures, partially driven by customers' expectations and targets, while aiming for a continuous economic viability of the focal company.

Finally, the case study results indicate the need for and the study calls for a balancing the environmental sustainability measures and the economically viable company sustainability into a holistic concept of a *truly sustainable SBM*.

1. Literature review

The term BM is defined and understood differently within the academic community. In our research, we look at the BM through the lens proposed by Gassmann *et al.* (2014, p. 2): *"A BM provides a holistic picture of how a company creates and captures value by defining the elements WHO, the WHAT, the HOW and the WHY of a business."* The WHO says who is the customer, the WHAT says what is the value proposition, the HOW explains the value chain, namely the value creation and delivery. Finally, the WHY covers the value capture, the profit mechanism, cost structures and revenues.

The BM needs to be seen both from its static and from it dynamic perspective. Particularly, the dynamic perspective reflects changes in the environment (Gassmann *et al.*, 2014). The BM dynamics means a temporal change of the BM itself and its single elements WHO, WHAT, HOW, WHY. Wirtz (2016) sees the BM and its elements dynamically changing with different intensity starting with stabilization, going through adaptation, extension, migration and finally radical innovation. Particularly lower extent of changes – stabilization and adaptation – is more typical for incumbent firms and large industries with less competitors (ibid).

Schaltegger *et al.* (2016) confirm interlinkage of economic, social and environmental aspects in sustainable management, targeting an organizational transformation. Drawing on Boons, Lüdeke-Freund (2013), they propose the BMfS and define it as one containing the sustainable value proposition for all stakeholders, as a way of value creation and delivery, as well as value capture, while assuring resource recovery beyond organizational boundaries. Abdelkafi, Täuscher (2016, p. 77) conceptualize the BMfS as a one enabling "the firm to reinforce the mutual interdependencies between the value created for its customers and the natural environment as well as the value captured for itself."

Roome, Louche (2016) study the BM transformation towards sustainability. In their findings, the BMfS is an outcome, not the beginning of the transition process to sustainability. Their findings were confirmed by D'Amato *et al.* (2020) who studied how companies re-shaped their BMs and BMs' elements towards reaching more sustainability. They found that sustainability was not the trigger, as it was a tool or even an outcome of the efforts for reaching an improved company performance.

Typically, the companies run a combination of the SBM archetypes (Bocken *et al.*, 2014). The most applied ones are "maximizing material and energy efficiency" and

"substituting with renewables and natural processes". For substitute with renewable and natural resources, they admit a risk of low economic viability, at least for a temporary period. The value is captured mainly through cost reductions, higher prices for branded products or specific product features.

Hall, Wagner (2012) find in their research a positive correlation of the integration of strategic issues and environmental management with the economic and environmental performance of firms. Schaltegger *et al.* (2012) identify business cases for sustainability, creating economic value through engagement in environmental and social activities. The engagement, however, has to be voluntary, has to create a positive measurable or arguable business effect and has to show actively managed contribution leading to success. In terms of a strategic approach, they see defensive (limited integration), accommodative (integration) and proactive (full integration) attitudes, when reflecting social and environmental aspects into the core business logic of the company.

In order to assess the implemented sustainability measures, Kocmanová, Šimberová (2014) emphasize a need for measuring of sustainable performance of the corporations, reflecting environmental, social and corporate governance indicators. While focusing on improving sustainability performance, the companies are reporting their key performance indicators, which contribute to the proper decision-making process (Kocmanová, Šimberová, 2014). These indicators – both general as well as specific sector-based – are an important support in setting the priorities for the future (Kocmanová, Dočekalová, 2011).

SBMs are designed to generate extra value for numerous stakeholders, the customers being one of the key ones. According to the stakeholder theory, customers actively participate in BM. The value can be created not only for them but also with them (Freudenreich *et al.*, 2019).

Despite the topic of BM transformation towards sustainability is very relevant for meeting the expectations of various stakeholders, the specific ways how this is operationalized in practice require more research (Rajala *et al.*, 2016).

2. Research method

Drawing on the literature review, call for more research in the topic and a practical problem at hand, we have defined the research question as follows: *How is a BM of an incumbent, business-to-business company modified through the implementation of sustainability measures, with the customer's involvement?*

Our question is primarily targeted at the interlinkage of environmental (ecological) and economic dimensions of the 3P approach and the BM, while we are deliberately leaving the social dimension aside from the core attention of this research paper. Particularly for the reason that European companies, based in the Member States of the European Union, usually fulfil numerous rather strict standards related to employment, equality, inclusion or similar, while these topics can be much more an issue outside the EU. This was also stated by the respondents of our case study.

Our research aim is to understand how and why the BM (the unit of analysis) of the research subject (a focal firm) has evolved under the impact of the implementation of measures which are considered by the research subject and its customers, as leading to improved environmental sustainability.

For the purpose of studying an ongoing BM dynamic adaptation of a B2B incumbent company towards the SBM, a qualitative research strategy, applying a case study approach, has been chosen as the most appropriate one for studying a contemporary phenomenon in a real-life environment (Yin, 2018). Our research combines a descriptive

(what we see) and explanatory (why things are happening) method (ibid). We conducted a single company case study, examining a particular, embedded phenomenon of a BM adaptation, in a diachronic (over time) manner, combining the analysis of documents, and conducting semi-structured interviews. The triangulation of the findings is supported by the fact that one of the researchers has a longer-term practitioner's experience with the BM adaptation applied in other manufacturing industries. By combining the various research techniques and knowledge, we aimed for a better validity of the construct. A similar research approach has been applied, for example, by Bocken *et al.* (2019), who studied two companies. Unlike them, the drawback of our single case study approach is positively offset by both the unique access to the research subject and the specific experience of the researcher (Yin, 2018).

The Czech company NVK (a pseudo-anonymised name for confidentiality reasons), active in the field of metal processing, has been chosen for the single case study. The reasons for selecting NVK lie in NVK seemingly being a typical case in the industry, a medium-sized company, privately owned, and having strong cooperation with a large, dominant customer. At the same time, the case is unique through NVK's enormous dependency on a large global company AEIOU (pseudo-anonymized name), who has over time co-adapted NVK's BM towards including numerous sustainability-related measures.

Conducting our research, we started with a secondary source of information, analysing the company documents, available about NVK from externally available sources, as well as only internally available documents obtained from NVK. We analysed particularly the documents related to sustainability, a transition to sustainability and cooperation with customers in the field of sustainability.

Aiming for obtaining the view from the other side, an analysis of externally available documents about AEIOU was conducted. After thorough considerations, we have decided that secondary sources of information about AEIOU will be sufficiently supporting the research scope.

In the primary research stage, we conducted three semi-structured interviews with NVK executives, particularly: the CEO, Commercial Proxy / Production Director (PD), as well as the EHS (environment, health & safety) Manager. Prior to the interviews, they were provided with a set of open-ended questions and discussion topics related to the BM, its change over time, the impact of the main customer on the change, impact of the changes in terms of financial or other measurable metrics. Finally, the interviews, which lasted between 60 and 120 minutes, were recorded and analysed.

The data were collected in the period of 12/2019 – 01/2020. Due to confidentiality, the names of the organizations were de-personalized and pseudo-anonymized. The study was, before publishing, presented to the respondents for check of the content and plausibility of conclusions.

3. NVK and its initial BM

NVK is a Czech company with more than 100 years of manufacturing tradition, focusing mainly on tailored, bulk manufacturing of steel-based goods. The 2018 revenues reached EUR 95 million, with the company having 850 employees. The company processes steel and manufactures steel-based consumer goods that can be described as steel furniture and house furnishings. The company also manufactures rolled steel profiles for the construction industry. The main raw materials used are steel based coils. The significant portion of NVK products nowadays is OEM (original equipment manufacturer) for the main customer AEIOU, selling the products through its worldwide retail network. AEIOU is by far the largest customer

of NVK with currently approx. 80 % share on the entire NVK's business.

At the beginning of the 21st century, new owners took over the part of the company's assets with an idea to combine the existing know-how, technology, and assets needed for steel processing with a business idea of producing steel-based mass furniture. At that time, what we call the *original BM* of NVK in the new era was implemented, based on manufacturing and sales of steel products particularly destined for the furniture and home appliances retailers, yet under the brand name of NVK.

Original BM's elements of the customer and value proposition (the WHO and WHAT elements): A decent quality standardized, NVK's branded steel "me too" products at a highly competitive price, produced in decent volumes in line with specifications, with a relatively low number of product modifications. On the contrary, also fully tailored products (the WHAT element). The customers (element WHO) were both retail "do-it-yourself" shops, as well as individual B2B industrial companies (construction, automotive).

Original BM's element of the value creation and delivery (the HOW element): The value was created for customers by producing goods in line with the specification at highly competitive prices. The value was mainly created and delivered by on-time shipments of goods according to specification at the right place and competitive price, therefore NVK was included in the list of approved suppliers and partners by numerous companies (element WHY). Needless to say, next to numerous other non-differentiated suppliers. NVK was a good "me too" supplier.

Original BM's element of the value capture (the WHY element): The value was captured by NVK through optimized efficient production flow, fix cost reduction supported by reasonable utilization of the installed capacities, and overall low-cost structure. The sales price was market-driven, there was a permanent threat of being replaced by lower price offers from non-European, particularly Asian producers. The products were sold to the downstream retail customers in large volumes with optimized costs. The revenue streams were based on sales of physical products.

4. NVK's adapted BM impacted by AEIOU

Soon after the new start at the beginning of 21st century, however, NVK got into a business discussion with AEIOU, a large global company searching for a new supplier of the so-called private label furniture product, *i.e.* a product that could be particularly designed in a manner to meet its specific expectations in numerous aspects, being sold under the AEIOU's name in its shops. Namely required were uniqueness, a quality (but not luxury) product, sufficient volume, and a highly competitive price.

Initially, the changes were mainly on the product side, by having included semi-tailored products, developed together and for AEIOU, however with a large contribution of product and process development activities from NVK (BM elements value proposition and value creation). In order to cope with the challenges, additional resources for product and process development have been employed on NVK's side (initially negative element value capture). Accordingly, NVK has extended its activities particularly in the field of development, both product and process-related. Thus, the value proposition (tailored products), as well as value creation and delivery (targeted tailored development with and for the customer) were modified. Value capture was negatively impacted by increased development costs.

As the business was evolving and while aiming for raw materials stock reductions, improvement of flexibility and availability,

as well as cost reductions, NVK acquired a steel coil slitting technology, which was a form of backward integration. Thus, the BM of NVK continued to adapt by modifying both the value proposition (semi-tailored products in mass volumes), value creation (supported by vertical integration), and value capture (better cost structure, savings, and economies of scale).

Although it was not explicitly said by AEIOU, if NVK wanted to become and stay a major supplier of AEIOU, it had to comply with the AEIOU's sustainability-related suggestions. However, the internal decisions of NVK played a key role in the implementation of the activities leading to the adaptation of the BM. Through investments into projects related to energy savings and energy utilization, NVK recognized a potential to capture more value and maintain or even increase the profit margin.

Over time, due to the continuously increased pressure from AEIOU, the sustainability-related activities became an inherent dynamic part of NVK's BM. The initial core logic of the BM remained unchanged. But the adaptation affected all elements of the original BM: value proposition, value creation, value delivery, and value capture. The BM of NVK, now including sustainability measures, has modified into the adapted one as follows:

The *adapted BM* of NVK continues to be based on manufacturing and sales of the goods to the large furniture and home appliances retailers. The BM has been expanded with dimensions of sustainability, particularly through increased use of renewable raw materials, reduction of the use of plastic, increasing the percentage of the recycled content, as well as applying measures leading to costs savings through energy savings and recovery activities.

The BM elements of *customer and value proposition in the adapted version (the WHO and WHAT elements):* A good quality steel based furniture, at attractive price continues to be the key value proposition. However, due to the inclusion of some proportion of renewable raw materials, recycling initiatives, as well as energy projects, NVK supports AEIOU in reaching AEIOU's own goal, particularly in "… Planet Positive". By being a supplier who reduced the waste, NVK helps AEIOU to become less "sinful". By being a supplier who reduced the energy consumption, NVK helps AEIOU to reduce the impact of its business on climate change.

The WHO, the customer element, has changed slightly, while impacting the entire BM a lot. NVK is now a supplier of mainly private label, tailored products (WHAT) for one large customer (80 % of the revenues), instead of mainly branded products for numerous retailers. By giving up part of its identity, NVK has been able to expand its business to current by approx. 50 times up compared to 20 years ago.

The BM element of the *adapted value creation and delivery (the HOW element):* The adapted value creation with sustainability measures is reflected in more efficient production, less energy consumption and accordingly lower manufacturing costs. AEIOU has actively supported NVK in the inclusion of sustainability measures by sharing know-how, exchanging best examples and experience from other sustainability-related projects, and with adjusting product specifications. A joint action plan for the activities has been created, and it is being regularly followed-up, reviewed and the performance assessed. The value is created for AEIOU by getting "more for less", *i.e.* "greener" products at an overall lower price. Thus, AEIOU has more incentive to continue working with NVK also in the future.

The BM element *of adapted value capture (the WHY element):* With a very few exceptions, AEIOU does not pay any extra for the fact that NVK produces its goods with the inclusion of sustainability measures. This

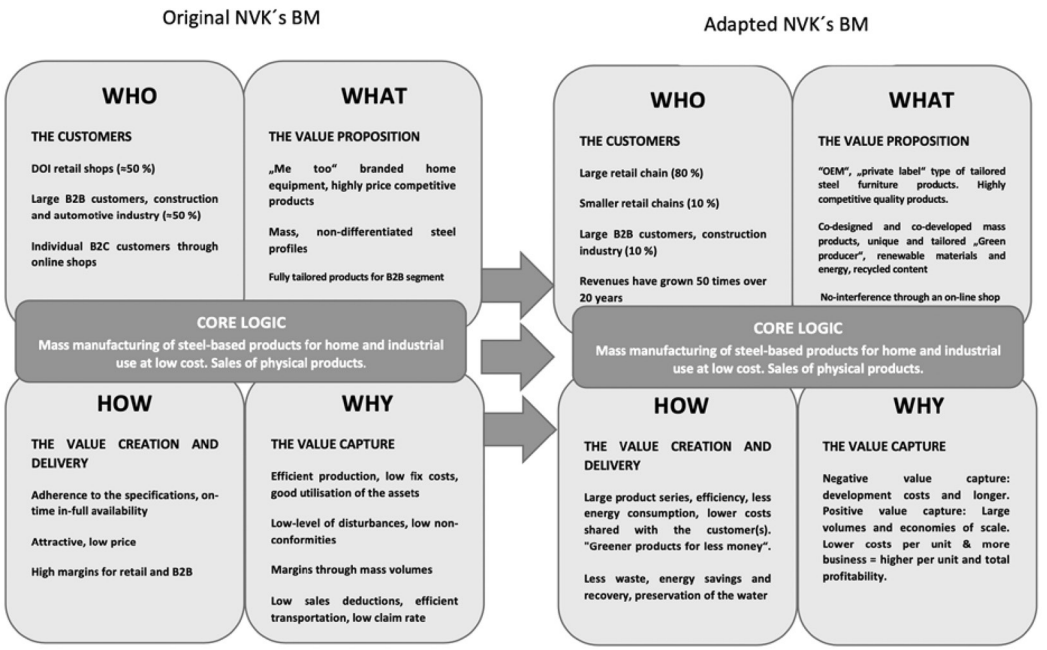

Figure 1. The evolution of NVK BM's adaptation. Source: Authors' own study, drawing on Gassmann et al. (2014).

has been declared as an ultimate target from the very beginning. An extra value is thus being captured by NVK in the form of reduced variable costs per unit produced and a higher turnover.

The process of NVK BM's adaptation is depicted in Figure 1.

While AEIOU was the main advocate and the main trigger among the customers, driving the extension of NVK's BM, AEIOU is by far not the only beneficiary. The value proposition (WHAT) of a green supplier clearly benefits also other, albeit smaller retailers. The value creation (HOW) in the form of lower product costs, improved know-how and sharing experience are beneficial for the others, as well. In the end, NVK cannot and will not differentiate in its offerings between "green" and "non-green". Thus, the WHY is benefiting by having not only AEIOU, but various other customers ready to buy from more environmentally friendly supplier.

5. How does the main customer of NVK – a company AEIOU – understand sustainability and particularly the environmental sustainability performance?

AEIOU is a globally active retail company focusing on food and home equipment. In 2018, it has reached a turnover of EUR 34.8 billion. AEIOU employs 158.400 employees and operates 367 department stores in 30 countries.

AEIOU presents on its www pages its sustainability strategy till 2030 that was published in June 2018 under the headline "People & Planet Positive". AEIOU declares that the strategy aims not only at transformation of the AEIOU business itself, but also at the cooperating industries in the value chain, and further at the living of the people all around the world. The strategy is linked to the UN sustainable development goals. AEIOU declares its intention to "inspire, activate and

lead", while admitting that cooperation with numerous stakeholders as well as transparency are important in order to reach the sustainability targets. AEIOU has to not only critically review its own business, but also engage customers, collaborators, and partners. Therefore, it intends to focus on three areas: healthy and sustainable life, circular and climatic positive, fair and equal. AEIOU declares the intention of using its "strength, size and business set-up" for advocating and promotion of the changes.

The main principles and expectations towards improving the environmental sustainability of the supply chain are reflected in the supplier sustainability index tool. The tool also serves as a mean to measure performance. The activities and targets are categorized into three main sections, being the Strategy and Management, Sourcing and Procurement, as well as Manufacturing and Resource Use. Specifically, for NVK, in total 236 focus areas are listed, defined, reported and followed up in a mix of qualitative and quantitative data.

6. Discussion

The original NVK's BM has been with the time adapted to one we call "Adapted SBM" (Cavalcante *et al.*, 2010; Dai *et al.*, 2011; Ning *et al.*, 2011), which includes numerous environmental sustainability targeting principles and measures. The "Adapted SBM" of NVK has evolved dynamically from the original BM towards meeting the environment related targets of both the focal company and its various stakeholders, particularly AEIOU. Its adapted purpose is to address environmental sustainability-related challenges, while the original logic of the business remains unchanged. The economic viability reflected in costs reductions or at least costs neutrality, return of investment and payback time, when available also supported through external subsidies is still a key consideration for implementation of the single environment oriented activities. Therefore, the "Adapted SBM" can also be called "Sustainably Adapted SBM". It addresses extensively environmental challenges, while generating sufficient economic profits (Lüdeke-Freund *et al.*, 2018). Accordingly, the environmental and the economic dimensions in the BM are well balanced, thus, at least from current point of view, the "Adapted SBM" can be considered sustainable. It is adapted, not entirely changed, while the core logic remains unchanged and the adaptation happens gradually, dynamically (Gassmann *et al.*, 2014). It corresponds to the call of Stubbs, Cocklin (2008, p. 121) for a need that "sustainable organizations making profit to exist but don´t just exist to make a profit."

The outcome of the case study of NVK indicates a temporal adaptation and extension of the original BM with numerous activities related to environmental sustainability. Within the 20 years of NVK's existence, its BM has undergone a dynamic adaptation. Although the core logic of the BM has remained unchanged, all the single BM's elements were adapted and affected through addition of new environment-related features. Therefore, the changes can be considered as causing an adaptation of NVK's entire BM, not only being a pure product or process change (Gassmann *et al.*, 2014).

NVK believes that their BM adapted through the incorporation of numerous environment preserving activities into their operations and products. NVK was permanently carefully making sure that contribution to the environment does not negatively impact its overall economic performance. It became obvious that NVK followed the logic of improved environmental performance combined with a positive impact on the cost side. In parallel, it maintained or even improved its economic performance. A return on investment was carefully considered, before implementation of every single sustainability-related measure. Exceptionally, NVK was

willing to accept longer than typical payback time. The desired one would be 4–6 years, whereas numerous of the projects needed 8–10 (*e.g.* solar panels).

At the same time, NVK also admits that it can sometimes hardly both measure and predict the full impact of the applied measures. Financially, payback time is a good indicator. NVK does its evaluation for every single project. In terms of environmental performance, cooperation with AEIOU helped NVK to identify, understand and measure the impact of numerous activities through the provided and mutually evaluated sustainability index tool and thus helped NVK to understand and measure how they perform (Kocmanová, Dočekalová, 2011; Kocmanová, Šimberová, 2014).

At the same time, NVK also believes that the product costs is and remains a key factor for any decision related to sustainability, with only rare exceptions. If an implementation of a particular sustainability measure would lead to a risk of worsening the supply-demand situation to the disfavour of AEIOU or to a risk of non-conformities, such a measure is unlikely to be applied.

Needless to say, that nothing of the above provides, at least in the case of AEIOU and NVK, any continuous business guarantee. In the end, NVK is left alone in its decisions about sustainability oriented investments. AEIOU provides a perspective without being bound. AEIOU provides inspiration, as well as direct and indirect motivation. NVK continues to be in this way motivated to seek continuous improvements everywhere, including a clear focus on high competitiveness expressed in appealing enough product pricing. Therefore, it is a good business perspective, a potential of a large and long-term business, where NVK sees value from cooperation and is willing to go the extra mile in searching for and implementing novel solutions with a touch of environmental sustainability. This is where the main contribution and the role of the large customer is and that is why it contributes to the better world.

The "Sustainably Adapted SBM" of NVK incorporates attributes of two SBM archetypes as defined by Bocken *et al.* (2014): "*Maximize material and energy efficiency*" (low carbon manufacturing/solutions, lean manufacturing, additive manufacturing, de-materialization, and increased functionality) and "*Substitute with renewable and natural processes*" (move from non-renewable to renewable energy sources, solar and wind-power based energy innovations, and zero-emissions initiative). Based on a framework proposed by Bocken *et al.* (2014; 2019), these correspond to the environmental archetype or the technologically driven SBM. This is in line with the claim that companies focusing on sustainability typically run a combination of various SBM archetypes (D'Amato *et al.*, 2020).

7. Conclusion

Large customers have the power to change the industry or even change the world towards "a better one". Their impact on the BM of their suppliers is potentially huge. They are nowadays ready to reduce or cease cooperation with suppliers or other cooperation partners, if these are suspected of acting against 3P principles, specifically in environmental and social terms. They use their market power in order to push the suppliers to adapt to their needs and expectations, including environmental performance (Rajala *et al.*, 2016). So did AEIOU in our case and so adapted BM of NVK towards a more SBM.

The cooperation across the value chain, essential for a successful transformation to a more sustainable BM (Rajala *et al.*, 2016), has in the case of NVK and AEIOU proven to be essential and beneficial.

On the other hand, the suppliers of the large companies, while implementing the

environmental measures, either alone or in cooperation with their customers, have to carefully assess the economic side. If any of the activities, modifications or processes that are to be implemented, are potentially not economically viable, it is unlikely they will be implemented. Otherwise, the logic of the holistic sustainability of the BM of the specific firm is not maintained. The NVK's case confirms that clearly. Cooperation, co-creation, support, knowledge sharing, direct or indirect working in networks, and a reasonable business perspective are very essential and helpful in the proliferation and the more efficient implementation of the activities. A 3P sustainability principle requires a careful balance between the social, environmental and economic side of a business. We focused mainly on environmental and economic sides and found a clear link and dependency between them in the sustainable adapted BM. In truly responsible and sustainable industries, companies and business relations, they will go hand in hand.

A contribution of the conducted research to the current knowledge consists in in linking the BM and its dynamics being fuelled by the inclusion of the environmental sustainability measures with the external force being the large customer of the focal firm. The results indicate an impact mainly on the BM elements of value capture and value proposition.

Practitioners will benefit from an improved understanding of what needs to be considered when designing future SBMs in the manufacturing industries in a way enabling reaching a higher level of sustainability and thus viability for the benefit of numerous stakeholders. It is emphasized that a truly sustainable SBM, as the viable one, remains an ultimate, long term target for (not-only) the metal processing industry.

Research limitations, avenues for further research

Our single-case-study-based research, despite its in-depth access, has some limitations through its focus on one company, one industry and the B2C sector. Further empirical research conducted on other manufacturing industries and business sectors would support in expanding both the theoretical and the practical knowledge on how and why the proliferation of the sustainability thinking into the business practice happens in a real-life environment.

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Received: 31. 1. 2020
Reviewed: 4. 5. 2020
Accepted: 30. 6. 2020

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