The final version has been printed and copyright by Springer in: BIR 2018, LNBIP V. 330, 2018

Defining Transformational Patterns for Business Model Innovation

Ilia Bider & Erik Perjons

DSV, Stockholm University, Stockholm
{ilia|perjons}@dsv.su.se

Abstract. The pace of changes in the business environment in which a modern enterprise operates requires the enterprise to constantly review its business models in order to survive and prosper in the dynamic world. This exploratory study investigates how to help the enterprise to innovate their business models based on the concepts of fractal enterprise model and transformational patterns. The paper suggests an approach to Business Model Innovation (BMI) where the focus is on transformational patterns. It discusses the structure of such patterns, and based on examples, it presents an approach on how such patterns can be derived from cases of completed business transformations.

Keywords: business model, innovation, strategy, business transformation, pattern, enterprise modelling, fractals.

1 Motivation

In the dynamic world of today, enterprises need to be innovative not only in the line of products and services they offer, but also in who they are and what they do, i.e. under which Business Models they operate. This is needed in order to survive in the turbulent, technology driven business environment and/or exploit the opportunities for growth, emerging due to the changes in the environment. For example, in the future, a traditional manufacturing company may not be able to continue its business as usual, i.e. designing and manufacturing their own products, due to the emergence of mature 3-D printing. Instead, the company may need to change its business model, for example, becoming a designer while letting the customer 'print' the design in the place convenient for the customer, or becoming a manufacturer, providing the customer with a service to 'print' somebody else's design (having both alternative could do as well). This change could be more radical than adding a new product or service to the company's offerings.

In light of the increasing pace of changes in the business environment, it is not a surprise that the topic of Business Model Innovation (BMI) got attention from both practitioners and researchers. This interest is visible in numerous research publications, including books [1] and special issues of journals. [2]. According to the classification suggested in [3], there are three ways of innovating a Business Model (BM):

1. *Industry model* innovation - which amounts to change the position in value change, entering new markets, and/or other type of radical changes.

2. *Revenue model innovation* - which results in changes in how a company generates revenues, e.g. reconfiguring offerings and/or introducing new pricing models.
3. *Enterprise model* innovation – which involves innovating the structure of an enterprise, such as enterprise goals, business processes, products and/or services

In this paper, we focus exclusively on the first type of BMI, i.e. industry model innovation. Note, however, the three types are not independent, but can interweave. This especially concerns the industry model innovation, as, for example, entering a new market may require changes in the existing revenue model as well as the enterprise model. From the strategic perspective, the industry model innovation corresponds to changing the doctrine [4], i.e. who we are, which is the highest level of strategic decision making.

From the field of engineering invention [5], it is well known that over 90% of inventions do not propose anything new, but suggest new combinations of known ideas, or exploiting known ideas in new domains. Based on this fact, Altshuller created a method called TRIZ [5] that "industrializes" invention in the field of engineering by making use of recurrent problems and solutions across industries. In the same way, an enterprise that needs or wants to change its BM does not need to invent a new model but can follow a proven example invented by somebody else.

A number of research papers is devoted to designing tools that could help the decision makers to successfully innovate their BMs. Some of these works suggest standardized procedures for innovation, for example, [6] suggest a procedure to use analogies when innovating a business model. Other works [7,8] suggest using patterns as help in designing a new business model. Patterns can be on the highest level as in [7], or on the level of elements of the business model, as in [8].

When designing a new business model for an already existing enterprise, it makes sense to take into account and to utilize already existing enterprise structures and elements. Designing a new BM completely unconnected to the existing enterprise does not make sense, as it might be easier to create a new company in this case instead of transforming the old one.

An enterprise has several strategic layers [4]; any of them or a combination can be used as a starting point for innovating a business model. According to [4], the highest strategic layer is the doctrine, i.e. who we are (mentioned above), followed by the layer of *capability/infrastructure*. The other two strategic layers are *grand strategy*, e.g. choice of a sector or strategic alliances, and *strategy as such*, which is defined as a structural coupling to the elements of environment, e.g. competitors, partners, customers, markets, etc. In this paper, we will mostly consider the layer of capability/infrastructure as a starting point for innovating a business model of an existing enterprise. In this case, the innovation consists of reconfiguring capabilities, including the infrastructure, for a new strategic direction. This corresponds to the idea of destruction (of an old model) and creation (of a new one) by reconfiguring the existing elements, as suggested in [9].

The research reported in this paper aims at creating a procedure that facilitates business model innovation based on transformational patterns. The usage of concept of pattern in our approach is different from other works that exploit patterns in BMI, e.g. [7,8]. In the latter works, patterns are used to design a new business model. Our patterns are used to find a way to transform an existing business model. As it has been mentioned

above, we mostly consider transformations that are based on existing capabilities and infrastructure. This type of transformation requires depicting existing capabilities/ infrastructure in some form.

Currently, a business model is depicted using some kind of a canvas, e.g. as suggested in [7]. Such a model may not reveal all capabilities existing in the enterprise, and thus it is not very useful for the sake of transformation. Therefore, we are not using a canvas type of enterprise model, but a more powerful enterprise model that can reveal, if not all, but the essential capabilities of the enterprise in question.

The enterprise model we use for transformational purpose is called a Fractal Enterprise Model (FEM). It was first introduced at PoEM 2012 [10], and then extended and improved in [11]. FEM has a form of a directed graph with two types of nodes *Processes* and *Assets*, where the arrows (edges) from assets to processes show which assets are utilized by which processes and arrows from processes to assets show which processes help to have specific assets in healthy and working order. The arrows are labeled with meta-tags that show in what way a given asset is utilized, e.g. as *workforce*, *reputation*, *infrastructure*, etc., or in what way a given process helps to have the given assets "in order", i.e. *acquire*, *maintain* or *retire* the assets.

A FEM model is built recursively by using a so called unfolding procedure and two types of archetypes: *process-assets archetypes* that show which kind of assets might be needed for running a process, and an *asset-processes* archetype that shows which processes are needed to maintain an asset in order. Unfolding starts with a primary process, a process that delivers value to a customer/beneficiary, by applying process-assets archetypes and alternating them with the asset-processes archetype.

Both assets and processes represent capabilities that exists in the enterprise and can be used as a basis for a transformation. A major organizational change would result in changing FEM. A change that corresponds to an industry model innovation would result in appearing nodes for new primary processes that substitute or complement the old ones. A part of a FEM graph that corresponds to a new primary process would use assets and processes that already exist in the old FEM, though some modification can be made in them. This reuse of nodes from the old FEM in a new one represents employment of the existing capabilities during industrial business model innovation.

The idea of using FEM for business model transformation was first presented in [12], but without any technical details on the transformational procedure and transformational patterns. A more recent publication [13] sets a research agenda for converting the idea from [12] into a practically useful procedure. The agenda consists of several items, including defining transformational patterns (archetypes), and providing computerized tools support. The current paper aims at making a step in fulfilling the research agenda by defining a possible structure of a transformation pattern, and presenting examples of such patterns.

The rest of the paper follows the following structure. In Section 2, we give an overview of the related literature. In Section 3, we present a short description of FEM. In Section 4, we discuss our research approach. In Section 5, we demonstrate a way for analysis of examples of BMI. In Section 6, we discuss the structure of transformational patterns. In Section 7, we present another transformational pattern, also built based on a BMI example. Section 8 contains concluding remarks and plans for the future.

2 An additional literature overview

There is a sizable body of literature devoted to BMI in addition to what has already been reviewed in Section 1. The book by [1] provides a systematic review of this literature. The works that are related to the current research belong to the area *Tools and Processes for BPI*. According to [1], "overall, research on the BMI process is still in its infancy and more work is needed in all respects". Still, there are a number of researchers working in this area. Below, we review some works related to our research that represent the main directions in the area of tool and processes for BMI.

The idea of experimentation starting from the existing BM and trying to reconfigure it is expressed in [14]. This work proposes using the business model canvas [7] as an enterprise model to start experimentation. Moreover, it does not suggest any systematic way for experimentation, therefore, the experimentation remains on the ad-hoc level. We are also promoting the idea of experimentation. However, we suggest the use of a richer enterprise model as well as a more systematic way for experimentation by applying transformational patters to the existing model.

The ideas of using the experience of others, so-called best practices, is promoted by a number of researchers. For example, [6] suggest a procedure (process) called *BMI by analogy* that consists of finding cases of BMI and reinterpreting them so that the ideas can be applied in a certain business. In our work, we exploit the idea of analogy implicitly; namely, we suggest (1) having a library of cases instead of scanning the environment for them each time, (2) pre-interpreting the cases by increasing the level of abstraction in the case description, thus converting them into transformational patterns.

Another way of using best practices is by using a library of patterns to be used in the BMI process. Two directions of using patterns can be found in the literature. The first direction is having a pattern of overall composition of a business model, as in [7] where five general BM patterns are defined. The second direction is introducing patterns for individual components of a BM, as suggested in [8]. In both directions, patterns are used for designing a new BM. Our aim of using patterns is different, we suggest using transformational patterns to get an idea for changing/complementing an existing BM. After the new idea has been chosen, the non-transformational patterns can be applied.

Summarizing the short literature overview above, we can conclude:

- The research area of tools and processes for BMI is a relatively new field which requires attention from the researchers.
- Our approach uses some of the already known ideas, like experimentation, analogy and patterns. However, it implements and combines these ideas in a different way, i.e. use a richer business model as well as transformational patterns.

3 Fractal Enterprise Model

The Fractal Enterprise Model (FEM) includes three types of elements: business processes (more exactly, business process types), assets, and relationships between them, see Fig. 1 in which a fragment of a model is presented. The fragment is related to a

hypothetic company that sells books over the Internet. Graphically, a process is represented by an oval, an asset is represented by a rectangle (box), while a relationship between a process and an asset is represented by an arrow. We differentiate two types of relationships in the fractal model. One type represents a relationship of a process "using" an asset; in this case, the arrow points from the asset to the process and has a solid line. The other type represents a relationship of a process changing the asset; in this case, the arrow points from the process to the asset and has a dashed line. These two types of relationships allow tying up processes and assets in a directed graph.

In FEM, a label inside an oval names the given process, and a label inside a rectangle names the given asset. Arrows are also labeled to show the type of relationships between the processes and assets. A label on an arrow pointing from an asset to a process identifies the role the given asset plays in the process, for example, *workforce*, *infrastructure*, etc. A label on an arrow pointing from a process to an asset identifies the way in which the process affects (i.e. changes) the asset. In FEM, an asset is considered as a pool of entities capable of playing a given roles in a given processes. Labels leading into assets from supporting processes reflect the way the pool is affected, for example, a label *acquire* identifies that the process can/should increase the pool size.

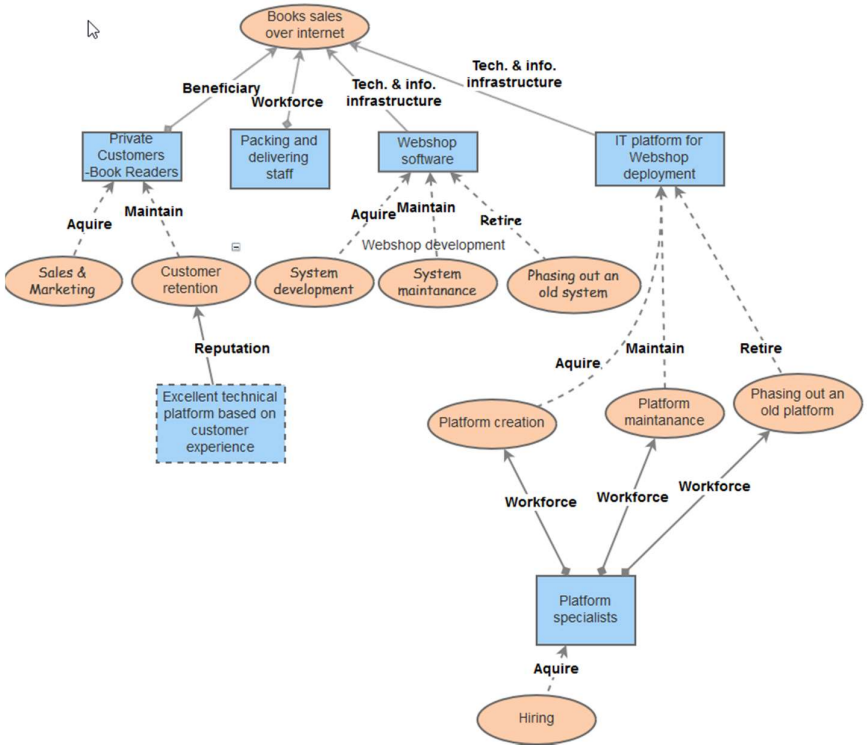

Fig. 1. A fragment of a FEM from [13]

Note that the same asset can be used in two different processes playing the same or different roles in them, which is reflected by labels on the corresponding arrows. It is also possible that the same asset can be used for more than one role in the same process; in this case, there can be more than one arrow between the asset and the process, but with different labels. Similarly, the same process could affect different assets, each in the same or in different ways, which is represented by the corresponding labels on the arrows. Moreover, it is possible that the same process affects the same asset in different ways, which is represented by having two or more arrows from the process to the asset, each with its own label.

In FEM, different styles can be used for shapes to group together different kinds of processes, assets, and/or relationships between them. Such styles can include using dashed or double lines, or lines of different thickness, or colored lines and/or shapes. For example, a dashed border of an asset (see the asset "Excellent technical platform based on customer experience" in Fig. 1) points to the asset being intangible opinion of stakeholders. A diamond start of an arrow from an asset to a process means that the asset is a stakeholder of the process (see the arrows "Workforce" in Fig. 1).

Labels inside ovals, which represent processes, and rectangles, which represent assets, are not standardized. They can be set according to the terminology accepted in the given domain, or be specific for a given organization. Labels on arrows, which represent the relationships between processes and assets, however, can be standardized. This is done by using a relatively abstract set of relationships, like, *workforce*, *acquire*, etc., which are clarified by the domain- and context-specific labels inside ovals and rectangles. Standardization improves the understandability of the models.

To make the work of building a fractal model more systematic, we introduced archetypes (or patterns) for fragments from which a particular model can be built. An archetype is a template defined as a fragment of a model where labels inside ovals (processes) and rectangles (assets) are omitted, but arrows are marked. Instantiating an archetype, means putting the fragment inside the model and labeling ovals and rectangles; it is also possible to add elements absent in the archetype, or omit some elements that are present in the archetype.

We introduce two types of archetypes, process-assets archetypes and asset-processes archetypes. A process-assets archetype represents which kind of assets that can be used in a given category of processes. An asset-processes archetype shows which kinds of processes are aimed at changing the given category of assets.

Note that the fractal model does not represent direct relationships between business processes, such as generalization or composition. On the level of abstraction accepted for FEM, a process with all its possible sub-processes is considered as one process.

4 The research approach

The research presented in this paper belongs to the Design Science (DS) paradigm, [15,16,17], while we use an approach suggested in [18]. Using DS is natural for this research, as the objective is to develop a way of depicting and using transformational patterns for BMI, as well as creating a library of such patterns. The problem the research

addresses is that, currently, BMI (at least, industry model innovation) is done in an ad-hoc manner based on experience and intuition, which may result in a new BM that is too costly, difficult, or impossible to implement. The proposed solution, or artifact in terminology of [15], is transformational patterns that could be applied to a FEM-based enterprise model.

The development of a solution for the problem defined above requires both (a) defining a structure of a transformational pattern, and (b) creating a sizable library of such patterns. An appropriate approach for both tasks is analyzing examples/cases of transformations of the industry model innovation type, successful and unsuccessful, from the international enterprise practice. Information of such transformations can be found in different sources, like books, Internet, and our own practice. The analysis and building of a pattern are envisioned as consisting of the following steps:

1. Build a relevant fragment of FEM before the transformation
2. Build a relevant fragment of FEM after the transformation
3. Relate elements of these two models showing which elements of the original model have been used in the transformed model and how they have been change during the transformation
4. Abstract from the details of the given case creating a transformational pattern
5. Finding other examples of transformation that fit the constructed pattern

The analysis of a specific transformational example/case can be done in different ways, dependent on the amount of information available about the example. In the best case, information can be available on the rationale behind the transformation, and details on how it has been decided upon and completed. This will help to better understand the logic of transformation to be presented in a transformational pattern. In a less favorable case, only the business activities before and after transformation are known, but not how the decision has been made. In such a case, we can just make logical analysis when comparing FEM before and after transformation, deriving the rationale behind the transformation based on the analysis and imagination. Whether this rationale corresponds to the decision making in the case or not is less important, as long as our analysis can result in defining a transformation pattern and finding other examples of its application. In the following sections, we will analyze both types of transformation cases.

5 Reverse engineering of a transformational case

In this section we will use an example from [13] to demonstrate our approach for analyzing examples/cases. The example corresponds to the transformation completed by Amazon when it created a new business – Amazon Web Services (AWS) - in 2006. The new business was created [19] to complement the main business of selling books over Internet. As we do not know the exact rationale behind this transformation, we just create the relevant fragments of FEM before and after transformation and analyze the relationships between the elements of these two FEMs.

The two FEMs and the relationships are presented in Fig. 2. The FEM fragment that corresponds to book sells over the Internet is represented on the left-hand side of Fig.

2; actually, it repeats the fragment depicted in Fig. 1. The right-hand site of Fig. 2 depicts a FEM fragment related to the new business – AWS. The (green) dashed arrows between the elements of these two FEM's show the relationship between these elements, the labels on the arrows indicating the difference between these elements.

The main idea of the transformation is to lease the internal IT platform to external customers. Thus, the cornerstone of the transformation is the asset *IT platform for workshop deployment*. This asset represents also a capability of maintaining such a platform, including updates, scaling up the power, etc.; this capability is represented by the whole graph that "hangs" on this asset, see Fig. 2. This asset plays a role of *Technical & informational infrastructur*e in the *Books sales* process, which is indicated by the label on the arrow going from this asset to the process. In the new FEM it also plays the role of infrastructure, but the nature of the main process is completely different – platform as a service. Though we do not know the actual rationale of the transformation, we can imagine one as follows:

> *We are maintaining a powerful IT platform for our own needs, and the market for IT platform as a service is growing. We could use our platform capability to enter this market.*

The FEM on the right hand side of Fig. 2 is built based on this rationale. To ensure that the transformation is feasible, we need to compare the new FEM with the old one to see what assets and capabilities from the old business could be employed in the new one. The analysis follows below:

- *Beneficiary* (customers). Customers for the new business are different from the old one. However, the decision makers of the new kind of customers, can be assumed to be book readers (at least some of them), which increases the chance that they have used the original main process for buying books. In this case, they have the firsthand experience of using Webshop software and the IT platform behind it. Therefore, a reputation of having software that is reliable and efficient can be used for acquiring new customers. This thinking is depicted in Fig. 2 by using the reputation asset from the left-hand side of Fig. 2 to underpin the sales process in the new business.
- *Technical & informational infrastructure - the platform itself*. For the book sales business, the infrastructure needs to contain only the components, e.g. database engines, webservers, etc., that are used by the Workshop software. For the AWS business the platform should be more general, e.g. include different database engines. This is depicted as a label that connects the infrastructure assets from two FEMs in Fig. 2.
- *Managing processes for IT platform*. The processes for maintaining the *IT platform* asset - *Acquire*, *Maintain* and *Retire* - also have different characteristics. For the internal use, acquiring a new platform and dismantling the old one can be planned in advanced and performed at regular speed. For the new business, this should be done quickly, i.e. as soon as the customer defines what platform is needed, it should be immediately created. When the customer no longer needs the platform, it should be dismantled to free the resources. This is depicted in labels that connect the managing processes in two FEMs.

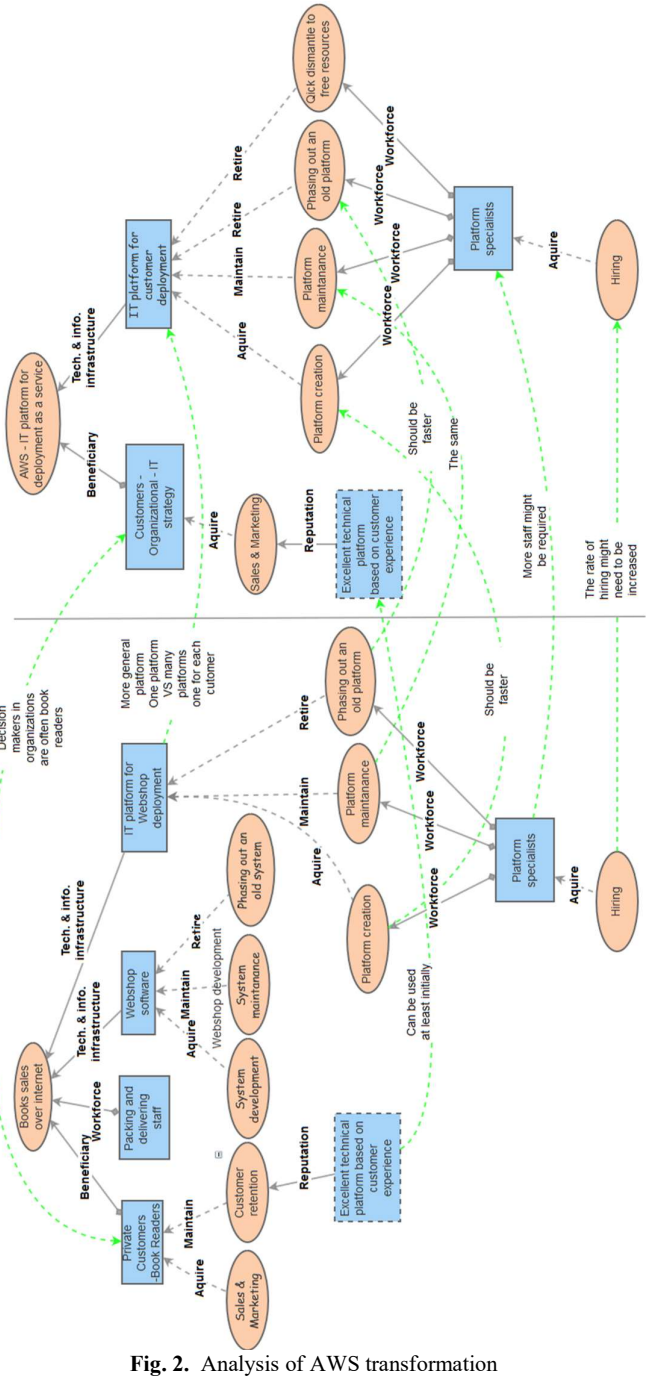

Fig. 2. Analysis of AWS transformation

- *Assets needed for managing platform* – workforce. The discussion on the differences between two FEMs could continue further by unfolding the FEMs downwards. For example, at the next level the capacities of hiring platform specialists could be evaluated with the result that this capacity might need to be increased for the new FEM, which is depicted in Fig. 2.

6 The structure of transformational patterns

In this section we will use the example from the previous section to show how a transformational pattern can be derived from a business case of BMI, and discuss the structure of transformational patterns. The basic idea behind BMI in Fig. 2 is based on the following reasoning:

- We have an *infrastructure* that supports our main process that could be of use for other processes if made more general
- Part of our current customers might be interesting to use our infrastructure if the latter is generalized
- These customers have positive experience of our infrastructure, though indirect

A transformation pattern that corresponds to this thinking could be presented as Fig 3. It consists of two FEM fragments, (green) labeled arrows between the elements of these fragments, and green hexagons with label inside that are connected to the elements of the left-hand FEM fragment. We can differentiate two parts in a pattern - formal and informal:

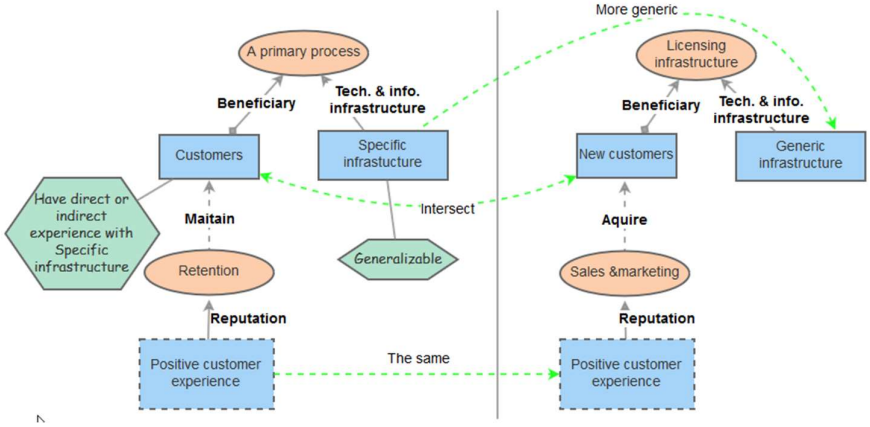

Fig. 3. An example of transformational pattern

- The *formal* part is a part that can be applied by an algorithm to an existing FEM without any human participation. It includes (1) shapes for processes and assets in both FEM fragments, but not the labels in them, (2) links between these shapes,

including labels, inside each fragment, and (3) green links between the elements of the two FEMs, but not their labels.
- The *informal* part is a part that needs human beings for interpretation. It includes: (1) hexagons connected to the elements of the left-hand FEM that express some conditions on these elements (2) labels inside elements of FEMs that express the semantics of the assets, and (3) labels on the (green) arrows that connects the elements of two FEMs that express the difference between the corresponding elements.

Application of a transformation pattern to an existing FEM is as follows:

1. A place in a FEM graph is found which matches the formal part of the left-hand FEM fragment of the pattern (labels inside shapes excluding)
2. The informal conditions expressed by (green) hexagons and semantic labels inside the pattern's shapes are checked by experts
3. If the conditions are considered as being satisfied, a new FEM is generated and attached to the old one with (green) arrows
4. Conditions included in the labels on the (green) arrows between the new and old FEMs are checked by experts
5. If conditions considered as being satisfied, the process of adding details to the new FEM continues

Fig. 2 can be used as an example of application of this procedure to the FEM in Fig. 1. Note that the pattern from Fig. 3 can be applied not only to the place where *IT-platform* matches *Specific infrastructure*, but also to the place where *Webshop software* matches *Specific infrastructure*. In this case, the new FEM would represent licensing the Webshop to other book sellers. In fact this transformation has also been completed by Amazon.

7 Another example of a transformation pattern

The example of transformational pattern presented in Section 6 is more or less straightforward, as the idea behind it is simple – having excellent infrastructure that supports a main processes, the company can decide on leasing this infrastructure to others. This is why the pattern could be constructed based only on facts, without knowledge on the details of decision making. In this section, we present another example, which is not that straightforward and which has been built based on the information on the decision making process of the company that has completed this type of transformation.

The company in question is an American consulting company called Prolifics, for which the first author worked for a short period of time in the middle of 1990th. At this time, the company was a vendor of a high-level software development tool, also called Prolifics, which could be counted as a kind of 4GL tools. The main business was selling licenses of the tool and providing product support. Beside this, there was a consulting business providing experts in Prolifics for various software development projects that used this tool. By the end of 1990th the market for 4GL went down due to the switch to the web and low-level programming (e.g. Java), and in the beginning of 2000th, the company needed to radically change its business in order to survive.

Such a change was successfully completed, and the company reemerged as a consulting business providing expertise in IBM's Websphere. Understanding the rationale behind such a transformation requires some insights in the internal decision making. These were provided by Prolifics' CEO, who explained that the internal changes were minimal. The sales and marketing of the new consulting service was done according to the same routines that were established for consulting arranged around the company's tool (Prolifics). The consulting service itself also used the already established routines. The main difference was that instead of expertise related to the tool Prolifics, the company started to provide expertise related to Websphere. At the same time, activities related to the tool Prolifics where drastically cut off. The support for the tool, and some consulting related to it, remained, but without any marketing and sales activities. The product development went down to bug fixing and releases connected to changing operational environment. The developers where redirected to be Websphere consultants.

The main factor that allowed to successfully complete the transformation above was that Prolifics had interface (API) to a number of third parties products, including Websphere. Therefore, some of their consultants and product developers already had expertise in Websphere. Moreover, a number of their customers had both Prolifics and IBM products working together, as well as some of the consultants providing expertise in both. In addition, the company had a partnership agreement with IBM.

Based on the analysis of the information provided by CEO, we created a transformational pattern in Fig. 4 by abstracting from details specific for Prolifics. In several places in Fig. 4, a connection between an asset and a process labelled ExT is used. ExT stays for Executable Template, and it is used for linking to the process any asset that affects the behavior of process instances that belong to this process. In the first place, ExTs have a form of description of working routines, process maps, policy documents, etc. However, an EXT can be any other asset that affects how the process is executed. In particular, the asset *Own software product* is used as ExT in both main processes in the left-hand FEM in Fig. 4. In *Product Licensing* an installation package is used for copying and sending to the customer, or downloading. In *Consulting*, the product affects the area of the customer project that engages the consultants.

Note also that the two main process in the left-hand FEM are not independent, the consulting process serves for retention of customers that license the product; also the set of customers for consulting is a subset of the customers who have bought a license.

On the whole, the pattern in Fig. 4 represents the main idea of Prolifics's transformation – amending the consulting business by substituting its own product to a third party product. The pattern expresses also the conditions when such transformation is feasible. For example, to have a solid customer base for this kind of transformations, a substantial part of the existing customer base should not only have the company's own product installed, but also the third party product. Moreover, a substantial part of their consultants needs to be experts in both products, and their expertise in the third party products should be revealed to the customers that have both products.

Note that Prolifics, as a company, still exists, but at the end of 2000th, it was sold to an Indian concern, and might have changed the line of its business. The example of the transformation refers to the events of the early 2000th. The authors are grateful to Robert Ismach, its President at the time, for providing the internal insights.

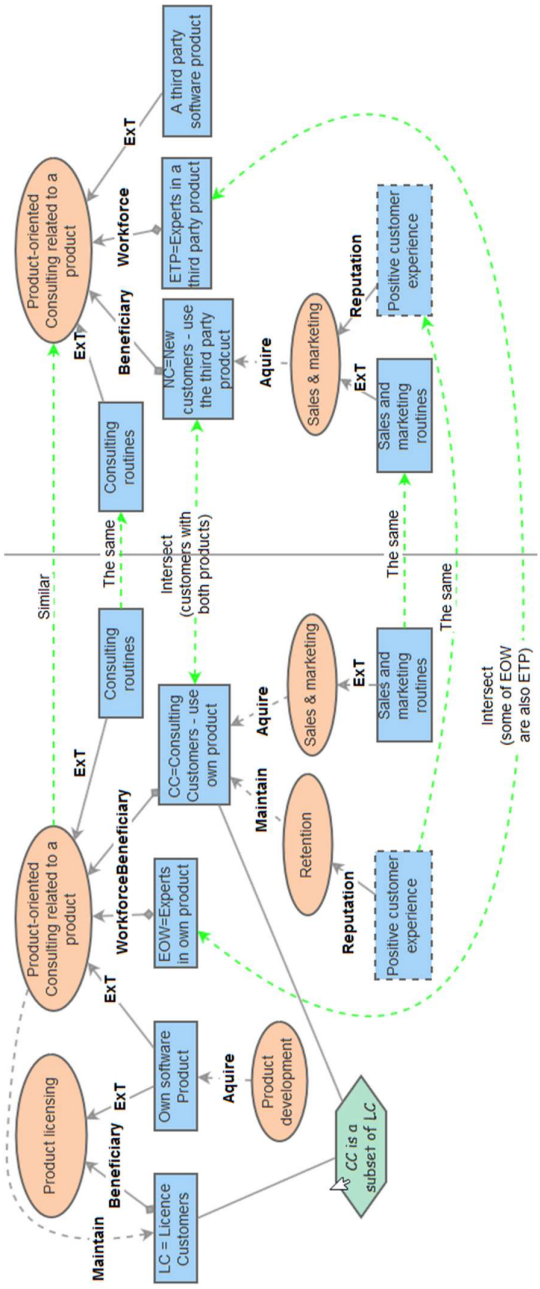

Fig. 4. From a tool vendor to providing expertise in a third party product

8 Concluding remarks

According to the literature reviewed in Section 1 and 2, the needs for the enterprises to innovate their business models is expected to grow, particularly in connection to advances in technology, and especially in regards to digital transformation. In particular, in this environment, the needs for industrial model innovation is expected to grow, as the companies might be forced to rethink their line of business. As the same literature shows, there is no systematic way for an existing business to conduct this kind of BMI. Currently, it is being done on the intuitive, tacit level with running a risk of failure or great costs, or missing a better opportunity. Management consultants, with whom we discussed our ideas, also confirmed the lack of tools for systematic industrial model innovation.

This exploratory study represents a major step on the way of filling the above gap in theory and practice by providing an innovative approach for BMI that takes into consideration existing capabilities of the enterprise (in form of both processes and assets). Though this approach is based on the known principles - experimentation, analogy (best practices) and patterns - it combines these principles in a new way. The contributions of this paper include:

- Clearly identifying the gap in practice and research that needs filling
- Suggesting an approach to fill the gap by a library of FEM-based transformational patterns
- Suggesting a structure for transformational patterns
- Suggesting and demonstrating an approach for creating new patterns

Our immediate plans regarding transformational patterns are related to creating and disseminating a library of patterns. Creating a transformational pattern includes finding a good example, abstracting from details and creating a transformational pattern based on this example, and finding other examples that correspond to the constructed pattern. Dissemination can be arrange by creating a website where such patterns are published, giving access to it to any researcher or practitioner who wants to add a new pattern, thus making the library a collaborative work.

More long-term plans include creating a computerized tool that facilitate experimentation by automatically finding places in a FEM model which can serve as a basis for a pattern-based BMI. We also plan to extend our framework so that it can help not only in finding a promising transformation using the pattern library, but also in planning the completion of such a transformation. This requires the development of a set of qualitative and quantitative properties that could be assigned to the nodes of FEM [13]. Planning then can be done based on comparing characteristics of elements of the FEM before transformation with the corresponding elements of the FEM after transformation. We are also planning to investigate attaching other frameworks and method for developing a more detailed plan. Here in the first place, we are looking at pattern of strategy suggested in [4] trying to find a synergy between two types of patterns. The connection between them seems to exist when considering specific examples, e.g. Prolifics´ pattern of strategy was changed from coupling to a market to coupling to a bigger partner.

References

1. Andreini, A., Bettinelli, C.: Business Model Innovation. From Systematic Literature Review to Future Research Directions. Springer (2017)
2. Mangematin, V., Ravarini, A., Sharkey Scott, P.: Special Issue: Business Model Innovation. Journal of Business Strategy 38(2) (2017)
3. Giesen, E., Berman, S. J., Bell, R., Blitz, A.: Three ways to successfully innovate your business model. Strategy & Leadership, Vol. 35 Issue: 6, pp. 35(6), 27-33 (2007)
4. Hoverstadt, P., Loh, L.: Patterns of Strategy. Taylor & Francis (2017)
5. Altshuller, G.: The innovation algorithm: TRIZ, systematic innovation and technical creativity. Technical Innovation Center (1999)
6. Rumble, R., Niall Anthony Minto, A.: How to use analogies for creative business modelling. Journal of Business Strategy, 38(2), 76-82 (2017)
7. Osterwalder, A., Pigneur, Y.: Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers. Wiley, Hoboken, NJ,US (2014)
8. Echterfeld, J. ., Gausemeier, J.: How to use business model patterns for exploiting disruptive technologies. In : 24th International Conference on Management of Technology, pp.2294-2313 (2015)
9. Boyd, J. R.: Destruction and creation. Lecture presented to the U.S. Army Command and General Staff College (1976)
10. Bider, I., Perjons, E., Elias, M.: Untangling the Dynamic Structure of an Enterprise by Applying a Fractal Approach to Business Processes. In : Proceedings of PoEM 2012, Springer, LNBIP 134, pp.61-76 (2012)
11. Bider, I., Perjons, E., Elias, M., Johannesson, P.: A fractal enterprise model and its application for business development. Software & Systems Modeling (2016)
12. Henkel, M., Bider, I., Perjons, E.: Capability-based Business Model Transformation. In : Advanced Information Systems Engineering Workshops, Sprnger, LNBIP 178, pp.88-99 (2014)
13. Bider, I., Perjons, E.: Using a Fractal Enterprise Model for Business Model Innovation. In : BPMDS 2017 RADAR, CEUR Vol 1859, pp.20-29 (2017)
14. Chesbrough, H.: Business model innovation: opportunities and barriers. Long range planning 43(2), 354-363 (2010)
15. Hevner, A., March, S. T., and, P.: Design Science in Information Systems Research. MIS Quarterly 28(1), 75-105 (2004)
16. Peffers, K., Tuunanen, T., Rothenberger, M. A., Chatterjee, S.: A Design Science Research Methodology for Information Systems Research. Journal of Management Information Systems 24(3), 45-78 (2007)
17. Baskerville, R. L., Pries-Heje, J., Venable, J.: Soft Design Science Methodology. In : DERIST 2009, pp.1-11 (2009)
18. Bider, I., Johannesson, P., Perjons, E.: Design science research as movement between individual and generic situation-problem-solution spaces. In : Organizational Systems. An Interdisciplinary Discourse. Springer (2013) 35-61
19. Amazon: Amazon Web Swevices (AWS). Available at: https://aws.amazon.com/