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Serbian Journal of Management 5 (1) (2010) 163 - 174

Serbian
Journal
of
Management

Letter to Editor:

UNIVERSITY SUPPORT TO TECHNOSTARTERS' BUSINESS MODELS

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(Received 7 October 2009; accepted 12 January 2010)

Abstract

Entrepreneurs need to develop a business model that gives them a logic framework on how to develop their business idea and make money out of it. Some starters get in touch with academics, searching for their help to prepare and implement their business intentions.

The aim of this article is to outline the collaboration between academic researchers and entrepreneurs, especially in developing the entrepreneur's business model. A review of business models is given and an example of a collaboration of Rousse University's Entrepreneurship Center with a small company that uses biomass for renewable energy production.

Keywords: business model; pellets; university entrepreneurship center; technostarter.

1. INTRODUCTION TO TECHNOSTARTERS AND THEIR UNIVERSITY SUPPORT

Wissema defines technostarters as students or academics, who want to start their own science- or technology-based firm (Wissema, 2006). They own the know-how, which is the fundament of the IPR for the management of their firm. They are usually associated with universities of technology, science and medical faculties of general universities, and agricultural universities. In addition, corporate R&D departments and

governmental or independent research organisations can act as cradles for technostarters, while there are many technostarters who just begin on their own. They can use cutting edge technology or intelligent applications of existing technology.

In the same book (Wissema, 2006) are outlined the main reasons why universities should support technostarters:

The *first* reason is the economic need to create new employment through new, innovation-based, business activities. This employment should offset the loss of mass-

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production-based employment. And universities can deliver. The effect they can have was first brought to light by the now legendary “BankBoston Report”. This study stated that if the companies founded by MIT (Massachusetts Institute of Technology) graduates and faculty were to form an independent nation, the revenues produced by the companies would make that nation the 24th-largest economy in the world. The 4000 MIT-related companies (located world-wide) that existed in 1997 employed 1.1 million people and had annual world sales of \$ 232 billion. That is roughly equal to a gross domestic product of \$ 116 billion, which is comparable to the 1996 GDP of South Africa or Thailand. The study found that MIT “imports” entrepreneurs, as many companies were not spin-outs of the university, but rather company founders who came to Massachusetts to benefit from the presence of MIT.

The *second* reason why universities should support technostarters is to satisfy the needs of students, staff members and alumni, too, who sometimes have considerable work experience and who want to create a new venture in the proximity of the university. Many of them choose self-employment and entrepreneurship as the path to self-fulfilment and we speculated that many will choose this path as the stepping-stone to a career in existing corporations. As educational institutions, universities have a duty to match this trend and satisfy the increasing group of (potential) entrepreneurs. While universities can be significant creators of wealth if they put their minds to it, the benefits to the university itself are largely indirect. There will be income from licences, consulting, contract research and endowments, and although the amounts can be substantial, they maximally

account for only a few percent of the university’s budget (not counting the endowments; Harvard University alone has a fund of \$ 26 billion coming from endowments; Yale has \$ 12 billion). The indirect benefits lie in the attraction the university has for entrepreneurial students, academics and industry – either the industry that it helped create or the industry that it attracted. In this way, a strong regional network of knowledge-based enterprises and institutions can develop, from which the university, being at its centre, can benefit.

The *third* reason why universities should support technostarters concerns the changing power field in which universities operate. Universities cannot escape the trend towards globalisation as students, staff and sponsorship funds rapidly become more international, and in many cases global. This means that universities enter internationally competitive markets for education and research. In order to meet the challenges of this form of globalisation, universities will have to reinvent themselves and become what Wissema has called *Third Generation Universities* or 3GU for short.

The renewable energy sources (RES) are subject of increased scientific interest. According to Antonova & Pavlov (Antonova & Pavlov, 2008), Rouse University has advantages and may join a knowledge cluster as a knowledge supplier to firms that are interested in implementing technologies, based on RES or reduced energy consumption. According to another study (Antonova et al., 2008) “*a knowledge cluster is a system for the creation of strategic alliances between large and small businesses and other interested partners with a view to coordinating the efforts to attract international investors for joint ventures, supply of strategic information about*

possible usage of technological information in specific productions and co-policy of state purchases". It is a good example for Third Generation University, too.

The opportunities for the creation of the Entrepreneurship Center at Rouse University have been studied in 2006 (Penchev & Pavlov, 2006) and 2008 (Pavlov, 2008). Both studies find the opportunities limited, mostly because of financial issues. In preparing for fund searching, Rouse University developed in 2008 all official documents that create the institutional infrastructure required for a well-functioning the Entrepreneurship Centre. Other elements exist – Career Centre (since 2004) and Technology Transfer Centre (since 2007) – both establishments having been funded by external sources.

2. BUSINESS MODEL REVIEW

The Rouse University Entrepreneurship Center was established in 2008 and has chosen as its mission to supply adequate guidance to the starters, mainly helping them to develop their business models. This statement is based on the activity of the EC in 2008 in contribution to the students and academics who asked the EC for help. This part of the paper will give an overview of current business models.

After having had a new idea for a business activity, every entrepreneur has to prepare a business model, which, according to Lang (Lang at al., 2002), is "...a polite way of saying How are you going to make money out of this...". There are many *business model* definitions. Some of them are grouped by Leung (Leung, 2007):

– Afuah: "... the set of which activities a firm performs how it performs them, when

it performs them as it uses its resources to perform activities, given its industry, to create superior customer value... and put itself in a position to appropriate value".

– Amit & Zott: "A business model depicts the content, structure, and governance of transactions designed as to create value through the exploitation of business opportunities."

– Christensen: "The way a company captures value from its innovations. This includes the structure of its costs, how it prices its product or service, whom it attempts to sell that product or service, how it sells it (one time sale, licensing agreement, and so on), what value proposition it purports to offer, how it delivers its product or service, how it offers post sales support and so on."

– Seddon & Lewis: "A business model is an abstract representation of some aspects of a firm's strategy; it outlines the essential details one needs to know to understand how a firm can successfully deliver value to its customers."

– Timmers: "An architecture for the product, service and information flows, including a description of the various business actors and their roles; and a description of the potential benefits for the various business actors; and a description of the sources of revenues."

– Tucker: "A business model is a description of how your company creates value for customers that in turn generated revenue and profits for your company."

According to Osterwalder (Osterwalder, 2004), the simple understanding of a business model is *a representation of how a company buys and sells goods and services and earns money*. He gives a more complicated definition that illustrates in a very successful way the nature of business

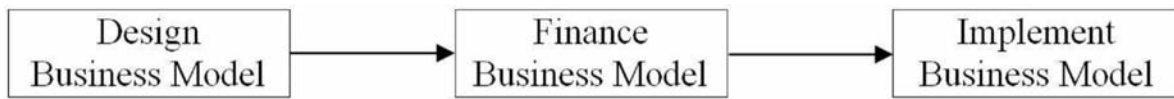


Figure 1. Business Model steps, according to Osterwalder (Osterwalder, 2004)

model: a business model is a conceptual tool that contains a set of elements and their relationships and allows expressing a company's logic of earning money. It is a description of the value a company offers to one or several segments of customers and the architecture of the firm and its network of partners for creating, marketing and delivering this value and relationship capital, in order to generate profitable and sustainable revenue streams.

Osterwalder splits the four pillars of the business model ontology (Product, Customer Interface, Infrastructure Management, Financial Aspects) into nine interrelated business model building blocks: value proposition, targeted customer, distribution channel, relationship, value configuration, capability, partnership, cost structure and revenue model. He also describes the business model process as going from design to implementation, illustrated in Figure 1. The process starts with the business model **design** which translates a strategy into a business model blueprint. Then the business model has to be **financed** through internal or external funding (e.g. venture capital, cash flow, etc.). And finally, it has to be **implemented** into an actual business enterprise.

Although the linkages in Figure 1 are only in one direction, our experience at Rouse University Entrepreneurship Center has shown that **there are feedback loops, too**, illustrated in Figure 2. That experience has been gained during our efforts to support an entrepreneur to start production of pellets and bio-briquettes. At a certain moment, we faced problems with the implementation of our business models and we have developed an alternative implementation plan, which has required alternative funding, as well. We were faced with different funding systems and therefore we had to start at the beginning, leading to the design of some alternative business models for the pellet production (see last paragraph). One of our implementation plans (the so-called 3 step plan) was so different from the original plan, that we had to go back directly to step 1 and develop an alternative business model, keeping the same funding system.

Another study (Malone et al., 2006) defines four basic business models based on which asset rights are being sold (the Creators, Distributors, Landlords and Brokers). Adding four variations of each model according to the type of assets involved (Financial, Physical, Intangible, and Human) results in 16 different business

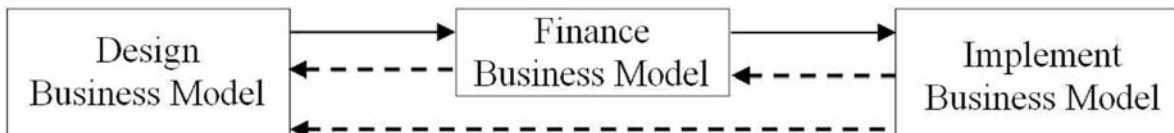


Figure 2. Business Model forward and backward steps

Table 1. The Sixteen Business Models

Involved Assets Sold Rights	Financial	Physical	Intangible	Human
Creator	Entrepreneur	Manufacturer	Inventor	Human Creator
Distributor	Financial Trader	Wholesale/ Retailer	IP Trader	Human Distributor
Landlord	Financial Landlord	Physical Landlord	Intellectual Landlord	Contractor
Broker	Financial Broker	Physical Broker	IP Broker	HR Broker

models, illustrated in Table 1.

We consider that the term of “entrepreneur” should have a broader meaning than that of Table 1. In the case of Rouse University we consider that the business model of the Entrepreneurship Center itself involves mainly intangible assets, because of the nature of the consultant activity. But should the Entrepreneurship Center act mainly as an “Inventor” in supporting the starters or “IP Trader”, too? We need a broad experience to answer this question.

Leung (Leung, 2007) uses some defined symbols (**I** is Idea, **T** – Technology, **BM** – Business model, **M** – Market) and depicts the business model, illustrated in Figure 3. Replacing “1” with “many” he describes seven other extreme business models giving examples of their application.

He also adopts the Chesbrough closed and open business models, based on closed and open innovation paradigms (Leung, 2007):

- Closed innovation companies commercialise ideas and technologies that are generated and developed within the internal organisation; the visualisation of



Figure 3. Business model “1-to-1-to-1”

closed innovation; the birth of the corresponding business models is illustrated in Figure 4.

- Open innovation companies create ideas and technologies from both internal and external sources and capture value through internal and external channels to markets; the visualisation of the development of open innovation business models is illustrated in Figure 5.

The clients of Entrepreneurship Centers can be expected to be starters with an understanding of “open companies” because students/academics go beyond the boundaries of their firms in search of all kinds of extra assets. In the case of Rouse University, we presume that the Entrepreneurship Center should have the role of an external supplier of information, in relation to the commercialisation of the innovations, helping the efforts of the starters to develop their business models. A key element is the trust that has to exist between the Entrepreneurship Center and the students/academics, who take the risk to share their business ideas and reveal them entirely. It is only realistic to accept that many entrepreneurs will not take that risk and they will never visit the Entrepreneurship Center.

The Entrepreneurship Center itself should also act as an “open company”, receiving mainly new ideas on how to facilitate the

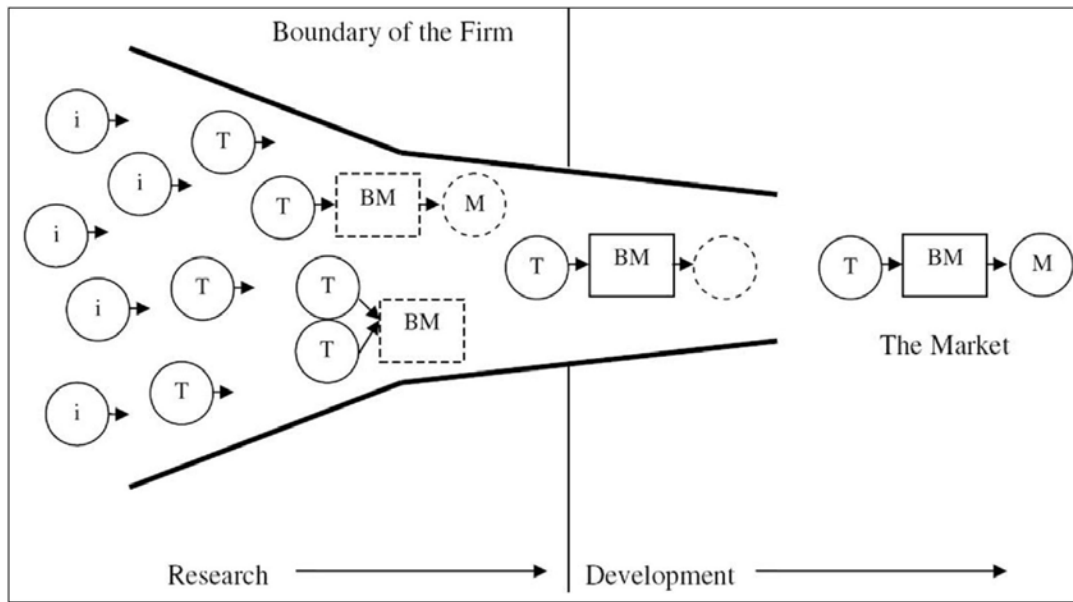


Figure 4. Closed Innovation and Business Models

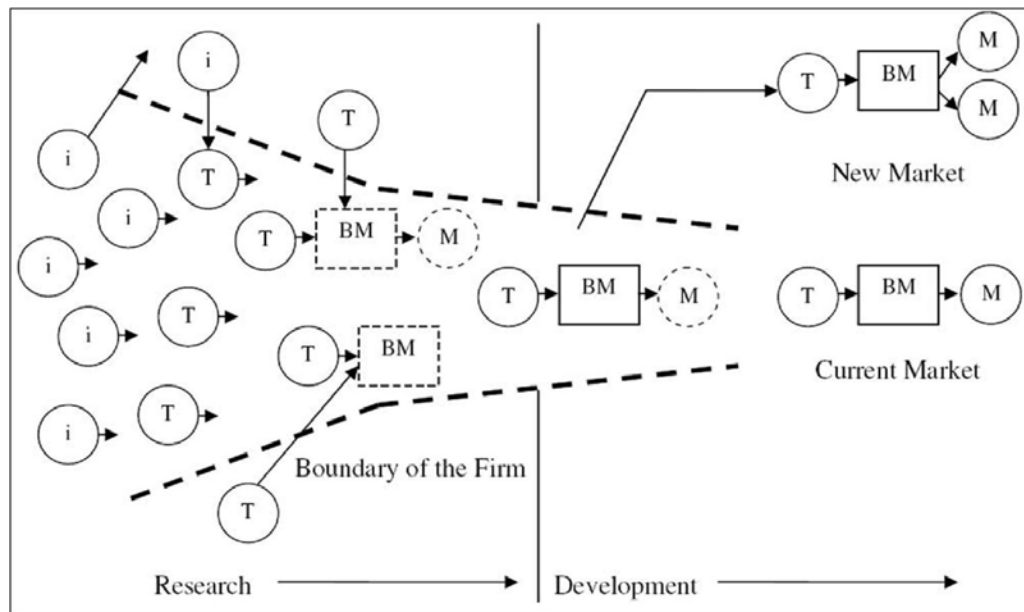


Figure 5. Open Innovation and Business Models

commercialisation, instead of being a closed system, with only a few participating academics (consultants). Therefore one of our main tasks is to develop an open net with other business model researchers, consultant units, business angles, successful entrepreneurs, etc.

Another study (Seppanen & Makinen,

2004) conclude that the central concept in utilising technologies is the guidance of the business model in the value creation and the crafting of some competitive advantages. Their study contributes to the understanding of business model concepts while they point out that the “confusion between R&D / technology management” creates

technological opportunities and a perception in the company's environment on how to utilise opportunities and create economic value. According to these authors, the research on business models should be targeted towards the analysis of the concept of the models and their characteristics and towards the development of further unequivocal models that are commonly shared in both the academic and business community.

We consider the statement of Seppanen & Makinen (Seppanen & Makinen, 2004) of a great importance for the successful operation of University Entrepreneurship Centers, because the Center is the place where invention and commercialisation get together. The successful "marriage" of invention and commercialisation (by a business model) is fundamental to the Third Generation University concept.

3. ROUSSE UNIVERSITY SUPPORT TO ENTREPRENEURS IN PELLET PRODUCTION

Biomass is one of the Renewable Energy Sources (RES) and it is widely produced in the rural areas. According to the Agro statistics of the Bulgarian Ministry of Agriculture and Food (2007), the Bulgarian crop growing fields cover about 28 % of the total territory of the country with wheat, barley, corn and sunflower being the main crops. If all biomass could be harvested and processed, the annual energy equivalent would be at least 24 million GWh or some 3 000 MWh per hour, which is almost equal to the capacity of the Bulgarian Nuclear Power Plant at Kozlodui. According to the European Commission (2008), this plant

supplies 42 % of the electricity in Bulgaria.

These numbers describe the most optimistic use of biomass for intelligent energy as the collection of the biomass also consumes energy and not all biomass can be collected anyway. But even if a smaller portion of this renewable source is used for energy production, it is still of high importance to develop biomass for energy usage. This gives starters who take the opportunity to produce pellets and briquettes an important, national, role.

In 2007 Mr Nikola Zmeev was a student at Rousse University owning NIK-05 Ltd, a small firm in the woodcutting sector of Bulgaria's rural areas. Although pellets are not familiar to Bulgarian consumers, he realised that the future belongs to intelligent energy suppliers. Mr Zmeev analysed the opportunities to start producing pellets, realising that this initiative would need the implementation of an invention and a business model, both of which were beyond his personal capacities. He therefore contacted Rousse University's scientists for support and expertise, especially those from Departments "Business and Management" and "Agricultural Techniques". This makes NIK-05 an *open innovation company*.

In 2008 Rousse University developed a project with Mr Zmeev in environmental protection through the use of efficient energy (Rousse University, 2008), attracting in the project's management board other participants such as Rousse University Pilot Plant (for the development of technological production lines) and ECORYS, a consulting agency in Sofia, Bulgaria. This project is one of the first steps of Rousse University towards the commercialisation of inventions by both *technology transfer activities* and *stimulation of entrepreneurship*.

The 3GU collaboration with NIK-05 Ltd

becomes facilitated by the Entrepreneurship Center when NIK-05 applies in 2008 for a government grant according to the *Voucher system*. This system was initiated in 2008 by the Enterprise Directorate of the Bulgarian Ministry of Economics and Energy (BSMEPA, 2008) with a goal to provide a financial mechanism to support knowledge transfer from Universities to firms.

In the summer of 2008, the manager of NIK-05 Ltd enlarges its cooperation with the Entrepreneurship Center in making a common study of the opportunities to apply to RES supporting funds. The efforts are focused on the *Bulgarian Rural Areas Development Programme* (2007-2013) and the exploitation of the advantages of the public-private partnership with municipality authorities; it can benefit from the opportunities of the Operational Programme Regional Development (2007-2013).

NIK-05 uses the Rouse University academics as knowledge suppliers for research and the implementation of research, related to:

- legal environment, with direct influence on pellets (eco-briquettes) production;
- creating business models and developing a management structures for the production of pellets and eco-briquettes, according to a specific technological approach;
- structuring of sources about firm resources (financial, human, intangible and physical), that are necessary in pellets (eco-briquettes) production.

The Entrepreneurship Center develops three basic business models in order to meet the requirements of the two public funds: the Financial Mechanism of the European Economic Area (FM EEA) and the Bulgarian Rural Areas Development Program

(BRADP). These business models are named “the big production line”, “the smaller machine” and “the mobile decision”, described bellow:

1. *Business model in answer to FM EEA requirements – “The big production line”*

NIK-05 will be able to get a production line for pellet production with an annual capacity of over 6 000 tones. At one hand, it requires a bigger store (working premises) and open spaces, on another hand the firm needs direct clients for the production. The Entrepreneurship Center develops 11 different variants for integration searching for the best case to NIK-05.

NIK-05 and the Entrepreneurship Centre try to attract strategic partners such as biomass producers who own stores and open spaces, and firms that could change the ovens in their heating systems with pellet-fired ovens. NIK-05 and the Entrepreneurship Center conduct many appointments offering this vertical integration to executives. Unfortunately, pellets are unfamiliar in Bulgaria and businessmen and biomass producers still do not show the necessary level of collaboration, even though Mr Zmeev offered them shares in his firm NIK-05.

The principle of the model, is that NIK-05 will sell pellets to large clients, which at the same time will be able to control the pellet prices. The sustainability is enforced by the fact that there is a long-term integration with agrofirms, which are expected to supply biomass to NIK-05 and thus to guarantee the pellet production. Some Bulgarian pellet producers in the Rouse region, who export their pellets, have met serious problems with the biomass supply and they had to close their firms.

2. *Business model in answer to BRADP – “The smaller machine”*

In case NIK-05 is not able to meet the FM EEA requirements, Mr Zmeev prefers to have an alternative business model, because he is convinced that the future belongs to the use of pellets and briquettes rather than wood for heating. He faces alternative funding through the Bulgarian Rural Areas Development Program (BRADP).

According to the financial requirements of BRADP, NIK-05 is able to get a much smaller pelletising machine and supporting equipment with an annual production capacity of about 600 tones. He is obligated to develop his activity in a rural area. Because of the smaller machine and equipment the working premises can be much smaller and more importantly, he is able to rent a store instead of buying it. The clients could be large firms, but also households. The success of this model entirely depends on finding a proper store, which to be used as working premises. Mr Zmeev is not looking for financial partners.

3. Business model in answer to BRADP – “The mobile decision”

In case Mr Zmeev is not able to find a

proper store, he should make some changes in his business model. The Entrepreneurship Center suggests him to apply to BRADP for a small pelletising machine and supporting equipment of an annual capacity of about 500 tones. The new issue is that this machine has to be mobile and he doesn't need a store as working premises. Every unit can be on a separate trailer and be used where and when it is necessary. In this case, he will be able to supply a new business activity – “pelletising”. His clients could be agricultural firms that use pellets for heating, but that do not have a pelletising machine for variety of reasons. Being mobile, NIK-05 could be able to visit at a certain time these agrofirms and to pelletise their biomass. The same service could be offered to households that own biomass. He is able to work alone, with no trouble-making shareholders or other partners. There are disadvantages, too.

The Entrepreneurship Center and NIK-05 discussed these ideas in all three business models using Osterwalder's nine business model elements. These three business models are illustrated in Figure 6.

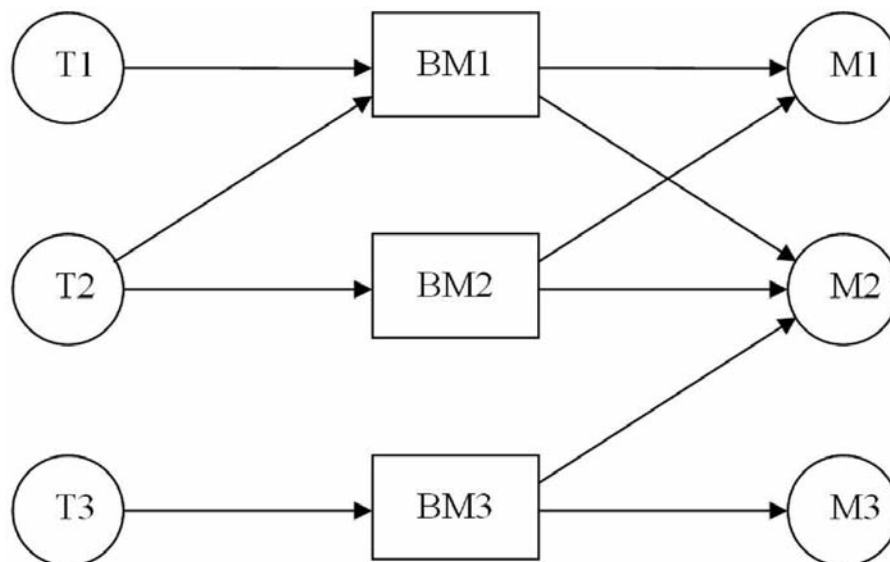


Figure 6. Possible business models of NIK-05, developed by Rouse University Entrepreneurship Center in 2008

In Fig.6:

- T1 stands for the large technological line and large working premises;
- T2 – the small technological line and small working premises;
- T3 – the mobile technological line;
- M1 – the clients, who are shareholders in NIK-05 Ltd and buy its production (pellets, bio-briquettes);
- M2 – the clients, who buy the pellets (bio-briquettes) of NIK-05 Ltd because of their free marketing will;
- M3 – the clients, who buy from NIK-05 Ltd the service of pelletisation/briquetisation, not the biomass itself.

Table 2 describes the rank of priority of the Osterwalder's nine building blocks (elements) of the business model in each of the three business models of NIK-05 Ltd.

In Table 2 we have underlined the elements which are mandatory for the successful development and that have special importance to NIK-05 for its choice of the best business model. We consider that the other elements are already achievable by NIK-05.

The activity of NIK-05 involves mainly physical assets and according to the Sixteen Business Models (Malone et al., 2006) we define this firm as a "Manufacturer".

4. CONCLUSION

It is of fundamental importance to understand whether the existing business model ontology is able to support entrepreneurs who use biomass for the production of intelligent energy. The experience of Rouse University's Entrepreneurship Center gives rise to optimism, but it would be of great support to have the statements of other researches, who study and create business models.

The Entrepreneurship Center is not funded by Rouse University's budget. This Center is financially independent and therefore it has to develop a business model for its own activity too. During its first years, the Center did not plan to generate income from successful technostarters, because it expected to attract some public funds. For the future it is however necessary to develop a scheme that allows the Entrepreneurship Center to benefit from its successful results and creates an income out of it. We see this issue as an opportunity to collaborate with business model researchers elsewhere in finding a proper business model for a starting Entrepreneurship Center at a private or state university.

Table 2. Time Sequence of the Design of the Osterwalder's Building Blocks in the Business Models of NIK-05 Ltd in 2008. (1 stands for the first one in the time, 9 is the last one in the time)

BM1	BM2	BM3
1. Value proposition	1. <u>Value proposition</u>	1. Cost structure
2. <u>Value configuration</u>	2. <u>Value configuration</u>	2. Capability
3. <u>Cost structure</u>	3. Capability	3. <u>Value proposition</u>
4. <u>Capability</u>	4. Cost structure	4. <u>Value configuration</u>
5. <u>Partnership</u>	5. <u>Partnership</u>	5. Target customer
6. <u>Revenue model</u>	6. Target customer	6. Relationship
7. <u>Relationship</u>	7. <u>Revenue model</u>	7. Revenue model
8. <u>Target customer</u>	8. Relationship	8. Distribution channel
9. <u>Distribution channel</u>	9. Distribution channel	9. Partnership

Developing expertise in business model theory and having its adequate application to the entrepreneurs are two fundamental phases in the commercialisation of academic know-how. We consider these phases would be able to show the progress of universities in their transition to this part of the Third Generation model and give the necessary support to the technostarters through their Entrepreneurship Centers.

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ПОДРШКА УНИВЕРЗИТЕТА РАЗВОЈУ ПОСЛОВНОХ МОДЕЛА НОВИХ ТЕХНОЛОШКИХ ПРЕДУЗЕЋА

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Извод

Предузетници морају да развију бизнис модел који им даје логички оквир како да развијају своју бизнис идеју и на тај начин зараде. Неки будући предузетници контактирају академске структуре, у потрази за помоћи код припреме и примене сопствених пословних планова. Циљ овог рада је да подвуче колаборацију између научних истраживача и предузетника, посебно при развоју предузетничких пословних модела. Дат је преглед пословних модела као и пример сарадње Универзитета Русе (Бугарска) и једне мале компаније која користи биомасу као извор за производњу обновљиве енергије.

Кључне речи: Бизнис модел, универзитетски предузетнички центар, техностартер.

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