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The Concept of Technological Entrepreneurship: The Example of Business Implementation

Ewa Badzińska

ABSTRACT

Objective: The objective of this paper is to identify the role of factors influencing the development of technological entrepreneurship using as example a company with academic origin in the IT sector. The scientific purpose of the study is to compile the views of scholars on technological entrepreneurship.

Research Design & Methods: The first part of the study is of descriptive character and based on literature review, while the second part is empirical. The application of the empirical method of a case study has made it possible to characterize the essence of technological entrepreneurship and illustrate the development of the studied phenomenon in business practice.

Findings: The concept of technological entrepreneurship is based on increasing innovation, new assets and competitiveness through more efficient use of research results leading to development of products and services. The process of creating technological entrepreneurship is conditioned largely by endogenous factors of organizations and also by the business ecosystem.

Implications & Recommendations: It is necessary to further develop current theory of technological entrepreneurship through discussion on the methodological dilemmas associated with conducting research in this area.

Contribution & Value Added: The article is an attempted synthesis of the concept of technological entrepreneurship as a process that combines the elements of academic and intellectual entrepreneurship with the entrepreneurship of commercial organizations implementing new technologies and innovative business solutions in the market environment.

Article type: research paper

Keywords: academic entrepreneurship; ICT solutions; technological entrepreneurship; technological innovation; technology start-up

JEL codes: O31, O32, O33

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INTRODUCTION

An important problem in the process of developing and increasing competitiveness of young companies is the level of technological innovativeness and uniqueness of products and services. In pursuing these objectives an important role can be played by the concept of technological entrepreneurship understood as a process involving greater practical usefulness of scientific research findings on modern technologies. An essential element of this process is effective cooperation between research institutions, research and development centres, capital market institutions, business-related sphere and enterprises in order to diffuse knowledge and scientific potential into commercial solutions regarding technological innovations (Badzińska, 2015). The basis for the development of technological entrepreneurship is formed, therefore, through interactions between science, technology and business (Poznańska, 2010). This is a creative and innovative ability of knowledge-based companies and an adaptation response to the real business environment (Nacu & Avasilcăi, 2014). All the activities of this phenomenon relate to "the identification of potential entrepreneurial opportunities arising from technological developments, and the exploitation of these opportunities through the successful commercialization of innovative products" (Petti, 2012, p. xi).

The process of creating technological entrepreneurship is conditioned largely by endogenous factors of organizations, including primarily the qualifications and expertise of employees and their ability to implement innovative solutions into business practice. A significant impact on the development of technological entrepreneurship is also made by the business ecosystem covering a wide spectrum of cooperation with business environment institutions and by "external factors that influence the formation of technology firms" (Bailetti, 2012, p. 6). The history of technological entrepreneurship is strewn with solutions in search of problems (Venkataraman & Sarasvathy, 2001).

The scientific purpose of the study is to compile and synthesize the views of scholars on technological entrepreneurship. Attention was paid to a widely accepted conceptual apparatus and the multidimensionality of the phenomenon. In this part the paper refers to both Polish and foreign literature concerning the notion of technological entrepreneurship. The author presents also its own interpretation of the concept. The empirical part of the paper is an attempt to indicate the role of endogenous factors influencing the development of technological entrepreneurship using a case-study of a knowledge-based small company with academic origins from the IT industry. Particular attention was paid to the potential of human resources and organizational culture based on knowledge. The next part of the paper provides examples of how to use the potential of the company's external environment and its co-operation with the institutions of business environment, which determine the development of technological entrepreneurship. This paper may provide a starting point for an in-depth empirical research and contribution to the discussion on the methodological dilemmas associated with conducting research in this area.

LITERATURE REVIEW

The Multidimensionality of Entrepreneurship

The starting point in defining the notion of technological entrepreneurship and proposing the operationalization of this term is to present the interpretation of the concept of entrepreneurship. The multidimensionality of this phenomenon raises a number of difficulties in assessing its size and effects, hence literature and business practice have both adopted different criteria and measures for entrepreneurship (Dyduch, 2008). This is also evidenced by widely described kinds, types and models of entrepreneurship. Entrepreneurship is manifested in innovative actions, in introducing new products and technologies and in unconventional problem solving. One useful way of thinking about entrepreneurship is that it is concerned with understanding how, in the absence of markets for future goods and services, these goods and services manage to come into existence (Venkataraman, 1997). The term is also used to determine people's attitude towards the surrounding world and other individuals. This is expressed in creative and active improvement of existing states of affairs and readiness to take up new activities. Entrepreneurship consists in matching up the products of human imagination with human aspirations to create markets for goods and services that did not exist before the entrepreneurial act (Venkataraman & Sarasvathy, 2001).

A look at entrepreneurship from the angle of entrepreneurs allows one to capture its capacity for creative action, building businesses, selecting the right people to work with, as well as acquiring and properly allocating resources and taking personal risks. Drucker (2008) sees in an entrepreneur not only a person who creates organizations but, above all, someone who always searches for change, responds to it and turns it into an opportunity. Shane (2003, p. 9) proposes “the nexus between enterprising individuals and valuable opportunities” as the general framework to understand entrepreneurship. The entrepreneurship literature describes an entrepreneur as an innovative individual who introduces “new combinations” of ideas and resources and “dynamically shakes up the economy out of its previous equilibrium state” (Schumpeter, 1934, pp. 74-75). Historically, opportunities have been supposed to exist and the entrepreneur either is alert to them (Kirzner, 1979) or discovers them (Schumpeter, 1976). “...for Schumpeter the essence of entrepreneurship is the ability to break away from routine, to destroy existing structures, to move the system away from the even, circular flow of equilibrium” (Kirzner, 1973, p. 127). In turn, Shane and Venkataraman (2000; Shane, 2003) argued the entrepreneur is an alert individual who discovers existing opportunities and profits from them while Foss and Klein (2004) describe an entrepreneur as an experienced individual making judgments about an unknowable future. According to von Mises (1949), an entrepreneur “not only bears uncertainty in his judgments about deploying the resources he owns and controls, but is also alert, creative, and leader — and not some abstract, hypothetical discoverer — who is the driving force of the market" (Foss & Klein, 2012, p. 69). In turn, Hood and Young (1993) emphasize that entrepreneur is an individual with certain personality traits and in the opinion of Witt (1998) he is a charismatic leader.

A process approach to entrepreneurship is popular in literature. It involves “identifying and implementing opportunities arising in the environment” (Glinka & Gudkova, 2011, p. 55). “Entrepreneurship is seen as a process of searching for market opportuni-

ties and organizational resources necessary to exploit these opportunities in order to gain results on a long term. (…) It can be distinguished as independent risk taking ability to achieve the biggest gains in the market" (Nacu & Avasilcăi, 2014, p. 229). Entrepreneurial opportunities are extremely context specific. This means that entrepreneurial opportunities do not necessarily lie around waiting to be discovered by the entrepreneurial geniuses. Entrepreneurial opportunities often have to be "created" by using the entrepreneurial imagination to embody human aspirations in concrete products and markets (Venkataraman & Sarasvathy, 2001).

The creativity, capabilities, dynamism, and innovativeness of entrepreneurs in a country are important aspects of the absorptive capacity, which is such a distinctive characteristic of successful development experiences (Szirmai, Naude & Goedhuys, 2011). Moreover, the most important in the entrepreneurial process is "the decision to enter new international markets or to enhance the presence into international markets, which can be considered as innovation" (Wach, 2015, p. 19).

Conceptualisation of Technological Entrepreneurship

Technological entrepreneurship is a complex phenomenon that encompasses not only multiple disciplines and levels of analysis to be investigated using different perspectives, but also a case-by-case approach for the analysis to be meaningful. According to Petti (2009), the concept of technological entrepreneurship incorporates four main sets of activities relating to (i) creating new technologies or identify existing technologies (but previously undeveloped), (ii) the recognition and matching of opportunities arising from the application of these technologies to emerging market needs, (iii) technology development / application and (iv) business creation.

The dominant theme of studies on technological entrepreneurship focuses on small technology firms and on external factors that influence the formation of technology firms (Bailetti, 2012). Another theme addresses the consequences of technology based business and engineering entrepreneurship (Nicholas & Armstrong, 2003). Another important theme is the interdependence between small-firm initiatives and the external infrastructure that contributes to science and technology advances. This theme describes the systems that support the foundation of new technology firms, establishment of a new technology venture and different types of technical entrepreneurs (Jones-Evans, 1995). Liu, Chu, Hung and Wu (2005) represent ways in which entrepreneurs draw on resources and structures to exploit emerging technology opportunities. Other articles cover topics on: university and business incubators, firm spin-off and technology transfer mechanisms, government programs that support technological entrepreneurship and entrepreneurship education. The results of research conducted by Bailetti suggest that "the number of scholars contributing to the field of technological entrepreneurship is not large" (2012, p. 7). In the literature, the terms: technological entrepreneurship, technology entrepreneurship, technical entrepreneurship and techno-entrepreneurship are used synonymously (Petti, 2012).

Bailetti proposes a definition of technology entrepreneurship, and describes its distinguishing aspects. The author argues that "technology entrepreneurship is an investment in a project that assembles and deploys specialized individuals and heterogeneous assets that are intricately related to advances in scientific and technological knowledge for the purpose of creating and capturing value for a firm" (Bailetti, 2012, p. 9). The pro-

ject exploits or explores scientific and technology knowledge. External and internal individuals and organizations co-produce the project's outputs. "What distinguishes technology entrepreneurship from other entrepreneurship types is the collaborative experimentation and production of new products, assets, and their attributes, which are related to advances in scientific and technological knowledge and the firm's asset ownership rights" (Bailetti, 2012, p. 5).

Technological entrepreneurship is about managing joint exploration and exploitation, where each individual has roles and responsibilities in cooperatively moving forward toward accomplishing shared goals (Lindenberg & Foss, 2011). It focuses on investing in and executing the firms' projects, not just recognizing technology or market opportunities. Technological entrepreneurship is understood therefore, as a joint-production phenomenon that draws from a team of specialized individuals from multiple domains, some or all of whom become embedded in the technology path they try to shape in real time (Garud & Karnøe, 2003). The firm's owners and employees have no way of knowing or predicting the relevant attributes of all the assets. Asset attributes need to be created by the whole team. Technological entrepreneurship identifies, selects, and develops new attributes for the purpose of creating value for the firm and its customers.

The concept of technological entrepreneurship in Polish literature focuses on efforts to connect the scientific potential of universities and research and development centres with capital market institutions and business activities (Flaszewska & Lachiewicz, 2013). It is important to ensure optimal conditions for the commercialization of research results and their usage in enterprises in the form of new products and services through effective collaboration with research centres and the business-related sphere. Poznańska (2010) emphasizes that technological entrepreneurship provides a practical usability of research results through an effective collaboration between science, technology and the commercial world. Inventions, discoveries and new technologies – as a result of the implementation and development of the commercial market – form technological innovations that determine further development of products and processes.

Technological entrepreneurship which must be combined with innovativeness is an ability to allocate resources efficiently. The development and implementation of innovation require cooperation with institutions of business environment, including those that provide funding for such projects. In this respect, "technological entrepreneurship is related to the basic pillars of knowledge-based economy which include the following: the systems of innovativeness, education, information and communication, knowledge management processes at the organization level, regional aspects, as well as institutional and business environment" (Lachiewicz & Matejun, 2010, p. 189).

All approaches to technological entrepreneurship share the same key to its creation, namely the interactions between science and technology and the commercial world. A special role here should be attributed to centres involved in pilot deployments, market analyses, education on new technologies regarding the process of their transfer to the economic sphere. All these segments and types of institutions create a system of activities which compose the process of technological entrepreneurship. A special role is played here by the business ecosystem; a wide range of cooperation ranging from consortia or research centres, through consultancy, organizational, funding and infrastruc-

ture services, to relations with business environment institutions in the field of incubation (Badzińska, 2014).

Technological entrepreneurship formula combines both intellectual entrepreneurship and academic entrepreneurship. This perspective encompasses spin-offs, also known as professorial or academic companies, industrial and technological parks, business incubators and other forms organizing the first phase of technological entrepreneurship. Academic entrepreneurship is an expression of new jobs and opportunities that open up for college community and research and development sector. This is a manifestation of intellectual entrepreneurship coined by Kwiatkowski (2000) as laying the foundations for material wealth of individuals, social groups and nations out of immaterial knowledge. Technology start-ups represent the mainstream of academic entrepreneurship and one of the active mechanisms of the commercialization of research results.

In this study the author proposes the understanding of technological entrepreneurship as a process that combines the elements of academic and intellectual entrepreneurship with the entrepreneurship of commercial organizations – owners, managers and employees implementing new technologies and innovative business solutions in the market environment. Technological entrepreneurship is in its essence based precisely on the cooperation of companies with both the science sector and the business environment.

MATERIAL AND METHODS

Research Design and Data Collection

For the scientific purpose of this paper, a review of Polish and foreign literature has been conducted along with the analysis of secondary research results on the nature and importance of technological entrepreneurship in the modern economy. Much attention has been drawn to the concept and the characteristics of this phenomenon. The author presented also her own interpretation of the concept. The following methods were used: defining, comparing, attribute analysis, inference. The wide problem area of entrepreneurship requires the acceptance of the limitations of the study area.

The empirical part of the paper is an attempt to indicate the role of endogenous factors and external environment influencing the development of technological entrepreneurship using a case-study method on the example of a small technology company. The subject of the research is a technology Start-up – GLIP Ltd. The exploratory research was designed to identify the problem of technological entrepreneurship in business practice and the direction of further in-depth research.

Primary data acted as a basis to identify the factors influencing the development of the studied process. The necessity to confront a variety of data sources forced the application of the principle of triangulation (a multimethod research approach). Triangulation involves a conscious combination of quantitative and qualitative methods as a powerful solution to strengthen the research design. The logic is based on the fact that a single method can never adequately solve the problem of rival causal factors (Denzin, 1978; Jick, 1979; Patton, 1990).

Qualitative data was obtained from direct (in-depth) interviews conducted with the owner of the analyzed enterprise, who is responsible for innovation management. An interview questionnaire was prepared. Semi-structured interview guide contained the

following: (i) general questions about the company and its organizational structure; (ii) questions about all innovation products and projects; (iii) questions about idea generation, idea selection and project development; (iv) questions about events before its formalization and commercialization; (v) questions about the sources of financing innovative projects and the cooperation with business environment institutions and different enterprises.

In order to verify the gathered information, further telephone conversations with the manager of the company were conducted and materials were sent in an electronic form. To expand the database on the company an analysis of materials from the available secondary sources research was also conducted. This included the analysis of websites, publications and customers' opinions on opineo.pl website. An important source of data was the information obtained from Poznan Science and Technology Park of Adam Mickiewicz University Foundation, which is a strategic shareholder of the company.

Case Study

The empirical method makes use of a case study involving the analysis of processes implemented in the selected enterprise (Dyer & Nobeoka, 2000). The rationale for the use of the case study is its usefulness related to the timeliness of technological entrepreneurship phenomenon and the dynamism of its effects. There is a need to conduct a practice-oriented empirical research for better understanding of reality and to help managers choose their own path (Czakon, 2011). The applied case study should help recognize the analyzed phenomenon under real conditions (Yin, 1984), and its purpose has been the practical orientation (executive research) of the concept of technological entrepreneurship. Both descriptive and explanatory techniques were used in the presented case study. The procedure for the case study consisted of the following sequence of steps:

- Research question;

  To exemplify the concept of technological entrepreneurship in business practice, the following driving research question was erected: What endogenous factors and what external environment potential determine the development of technological innovations in the analyzed company?
- The selection of case;

  The case study should be a clear example to illustrate the studied correctness (Flyvberg, 2004). The example of business implementation of technological entrepreneurship was selected with a purposeful sampling technique (Merriam, 1998; Maxwell, 2005; Patton, 1990). The purposeful selection of Glip technology Start-up resulted from the following (i) the pragmatic criterion of availability of data, (ii) clarity of the explained phenomenon of technological entrepreneurship, (iii) the observed influencing factors of technological innovation. The above criteria lead to the conclusion that a single case study would help to attain the objectives of the research.
- The development of data gathering tools;

  The author adopted an iterative procedure, in which the stage of verification of data gathering tools is repeated because of the information obtained or problems encountered. Data from secondary sources do not provide sufficient saturation of information for the research objectives. The need to obtain primary data on the subject

determined the carrying out of field studies (in the premises of Glip Ltd.). The confrontation of multiple data sources justifies the cyclical nature of data collection procedures in the case under examination.

– The formulation of conclusions and implications for research and practice;

The application of these research methods has made it possible to characterize the essence of technological entrepreneurship and illustrate the progress and development of the studied phenomenon in practice. The presented case study may act as a starting point for an in-depth empirical research on endogenous and exogenous factors influencing the development of technological entrepreneurship in academic start-ups. Despite the fact that the research is based on a single case study, there are some interesting implications for business practice, as described in the conclusions section.

RESULTS AND DISCUSSION

The Technology Start-up Glip Ltd

The subject of the study – Glip Ltd – is a young Polish company manufacturing multimedia touch platforms (Glip Multitouch Solutions, 2015). The founders (two men) of the technology Start-up are graduates of the Poznan University of Technology, who, on the basis of interdisciplinary knowledge and experience related to the IT industry, marketing, finance and economics, have created a modern business model. "We share passion and desire to create innovative ICT solutions for business" – declare the entrepreneurs from Glip. The company has been on the market since 2013 and currently employs 8 full-time employees, but the first multimedia devices were presented by these young entrepreneurs in 2012. ICT tools created by Glip facilitate clear and engaging communication, both within the company and around it, taking into account the realities of the fast-growing B2B and B2C markets. In its solutions the company uses modern tools of interactive communication and focuses on the customization of services dedicated to individual customer needs.

The company offers equipment based on the technology of touch, motion detection and holographic projection. The offer includes touch tables, totems and screens, as well as interactive floors and holographic pyramids. This equipment is available in a wide range of sizes and types tailored to individual projects. Glip also offers copyright software created per requests of different groups of consumers, freely customized and designed in accordance with company logo. The products are dedicated for business customers, cultural and educational institutions and local government units. Transforming the concept into a coherent and valuable application, service or device, created on the basis of professional consulting and support for the project in this phase of its implementation is a challenge faced by the young entrepreneurs of Glip.

The Influencing Factors of Technological Entrepreneurship in the Studied Company

In order to obtain an answer to the driving research question: "What endogenous factors and what external environment potential determine the development of technological innovations in the analyzed company?" – an attempt has been made to diagnose these factors. The influencing factors of technological entrepreneurship in the studied company include a set of endogenous components.

Company managers have pointed to the human factors and more precisely – the potential of staff members and organizational culture based on knowledge. The pillars of technologically entrepreneurial culture of organization should include an ability to implement technology (innovation) and take actions towards technology development (Disselkamp, 2005). The company Glip emphasizes both the individual characteristics of employees (providing them with a wide range of creative freedom) and the creativity of the team. Emphasis is laid upon the ability to generate new ideas and solutions and to improve adaptation to the changing environment. Managers attach great importance to building their own developmental base (both physical and intellectual) and to the commercialization of solutions and applications designed by employees. Responsible leadership, commitment and great determination of employees to reach objectives constitute the challenges posed by young entrepreneurs from Glip.

The concept of technological entrepreneurship is permanently inscribed in the strategy of the company. The main purpose of the team of young entrepreneurs is to create and promote innovative projects that will explore new opportunities and offer unique business solutions with the support of ICT. The mission of the team is to break standards, avoid boilerplate solutions and undertake interesting challenges. "Glip wants to stay ahead of the needs of the users and even create such needs" – says the manager of the company. A clearly defined purpose, aims and priorities allow the company to point towards development and fulfill its mission. A common vision of development strategy concerns the creation of new ICT solutions tailored to the specific needs of clients. In the analyzed company the basis for the creation of the management style is to build a climate of dialogue, partnership relations and free flow of information. The organizational structure and motivation procedures are tailored to the needs of the implemented ICT solutions. An important role in the development of technological entrepreneurship is played by the management through objectives and the delegation of powers for self-learning and acquiring new skills.

Organizational culture constitutes a common system of meanings, which is the basis of communication and mutual understanding. On the one hand, the culture of organization shapes its style and atmosphere, governs the approach to work and attitudes of people on how to perform tasks. On the other hand, it determines the effectiveness of the organization and carries significant implications for the motivation of employees. By building an entrepreneurial organizational culture the analyzed company creates its own patterns of behaviour and patterns of action, thus gaining unique expertise and the ability to cope with the changing environment. The basis of organizational culture at Glip is the awareness of the importance of knowledge, commitment to shared values and the creation of an attitude of cooperation and not rivalry. These are the necessary conditions to create a culture of creative thinking to support the development of technological entrepreneurship. An important aspect is also the consistency of operations and customer-oriented employees with high attention to the quality of services. Creating a culture based on knowledge, identifying employees with the company and the continuous technological development are key values of the analyzed organization. Knowledge management supports both innovative processes and technological entrepreneurship in order to effectively implement and commercialize the designed solutions and applications.

An important aspect in the development of technological entrepreneurship is to create an attitude of openness among employees regarding knowledge, study the environment in terms of demand for new ICT solutions and look for external sources of information to fill gaps in intellectual resources. In this context, the important role is played by cooperation with selected research institutions and organizations supporting technology transfer. The external environment potentially determines the development of technological innovations in the analyzed company. Building a network for the exchange of information and the diffusion of knowledge between employees and cooperators takes place through the implementation of joint projects. Company managers attach great importance to creating an attitude of openness to new solutions and to the dissemination of information and communication technologies. The pro-innovation attitude is something more than just a search for new solutions in a changing environment. The external knowledge search plays a key role in achieving variety through the identification and acquisition of new information and ideas that, in combination with their internal knowledge base, lead firms to generate solutions for emerging problems and new opportunities (Cruz-Gonzalez, Lopez-Saez, Navas-Lopez & Delgado-Verde, 2015).

Among the activities undertaken by the company in the field of cooperation with the business ecosystem and in creating favorable institutional environment to support the transfer of technology, it is necessary to mention strict scientific and research cooperation between Glip and Poznan Science and Technology Park of Adam Mickiewicz University Foundation. The project called InQbator Seed co-financed by the European Union under the Innovative Economy Operational Programme aided the company in 2013 with the amount of 500 000 PLN (Mam Startup, 2013). It was an important financial aid determining the development of the young technology start-up. The funds have enabled further research and progress on the construction of large-format touch surfaces and specialized software.

Another example of the co-operation with the institutions of business environment is taking part in the prestigious competition called Poznan Leader of Entrepreneurship 2014 in the category Start-up 2014. The competition is aimed at young, innovative companies based on knowledge and new technologies. It is organized jointly by Poznan City Hall and County Office and designed to support outstanding enterprises from the SME sector which have been building their strong market position (Poznan Leader of Entrepreneurship, 2014). Technological innovations and the entrepreneurship of young people employed by Glip were fundamental for the company to win the first place in the Poznan Leader of Entrepreneurship 2014 competition (Winner in the category Start-up, 2015). In 2014, Glip also won the VII edition of the Award of the Marshal of Greater Poland "i-Greater Poland – The Innovative for Greater Poland". This is a special award for entrepreneurs who, through their creativity and openness to new scientific thought, bring innovative solutions to the market.

The cooperation of the company with business institutions in the field of science and culture supports the transfer of knowledge into commercial solutions in the field of technological innovations. Glip's technology has been used in the Mobile Museum of the Greater Poland Uprising. It is an example of cooperation with the Foundation of Greater Poland Brand – the main organizer of the project. With Glip's technological support some private family heirlooms of people associated with this historic event were scanned.

During the show, Glip unveiled nearly 30 square meters of interactive space – touch tables, floors, screens and holograms. The collected documents, dates, places and characters are presented using technology based on motion detection and touch.

The cooperation with the institutions of business environment in consulting, organizing and financing innovative ICT solutions constitute the condition for development for this company. These examples confirm that the environment and the conditions conducive to the process of technological entrepreneurship can be found on various grounds of companies and institutions as well as surrounding entities. The conducted exploratory research aimed at problem identification and determination of the direction of further research. The data analysis connecting with the examined phenomenon suggests that the concept of technological entrepreneurship is based on increasing innovation, new assets and competitiveness through more efficient use of research results leading to development of products and services. Both endogenous factors and external environment undoubtedly play an important role in the process of technological entrepreneurship associated with the basic pillars of knowledge economy. However, there is a need for conducting a broader quantitative research confirming the importance of the listed endogenous and exogenous factors.

CONCLUSIONS

The process of creating technological entrepreneurship is a joint achievement of the team from the studied company Glip, which offers support with knowledge and expertise. Employees in this process show a tendency to take actions aimed at continuous development and risk taking, while managers manifest the characteristics of leaders who are open to innovativeness. It is worth keeping in mind that people are the basis for the functioning of every company. Their attitude, creativity, invention and courage impact the overall innovativeness. However, this requires full acceptance of goals, motivation and commitment to tasks.

The empirical findings are reflected in the light of development of technological entrepreneurship with regard to Glip technology Start-up. The paper finds that both the potential of human resources and the potential of the company's external environment contribute to firms' recognition of entrepreneurial opportunities as well as to development of technological entrepreneurship. Young, technology start-ups are able to create and use intellectual potential. It is necessary, however, to support them in the process of technology transfer. It is also worth pointing out the interactive nature of this process, in which various feedback loops take place between the senders and receivers of knowledge and new technological and organizational solutions (Matusiak, 2011). Supporting the development of innovative technology start-ups and accelerating the process of intellectual property commercialization may significantly contribute to further integration of academics and practitioners in the implementation of the concept of technological entrepreneurship.

The study confirms that case studies in the field of technological entrepreneurship should develop the existing theory and provide explanations of the hitherto unrecognized phenomena. However, the rationale for conduct of a practice-oriented empirical research is its usefulness for managers and business reality. In addition, they will allow for a better understand and development of the analyzed processes, taking into account

the economic, social and cultural characteristics of the region. The wide problem area of entrepreneurship requires the acceptance of the limitations of the study area. The empirical method makes use of a case study which has helped to recognize the analyzed phenomenon under real conditions (Yin, 1984), however, there is a need for conducting a broader research. The presented case study can be a starting point for an in-depth empirical theory-creating research (for instance the multiple-case studies approach as suggested by Eisenhardt (1989), Yin (1984), Voss, Tsikriktsis and Frohlich (2002) and Eisenhardt and Graebner (2007) recommendations), providing hypotheses for quantitative research, or making room for exploration that was previously perceived differently or simply overlooked. The findings of case studies can help practitioners in designing processes more adapted to the characteristics of their projects and contingencies, which may lead to a better allocation of resources and better efficiency in general (Salerno *et al.*, 2015). Furthermore, a quantitative research confirming the importance of factors influencing the development of technological entrepreneurship would have a greater cognitive value and impact on the business practice.

It is necessary to develop the current theory of technological entrepreneurship and provide the discussion on the methodological dilemmas associated with conducting research in this area. The contribution of the author to the research theme is both an attempted synthesis of the views of scholars on technological entrepreneurship and own interpretation of the concept. The author proposes the understanding of technological entrepreneurship as a process that combines the elements of academic and intellectual entrepreneurship with the entrepreneurship of commercial organizations implementing new technologies and innovative business solutions in the market environment. Technological entrepreneurship is in its essence based precisely on the cooperation of companies from both the science sector and the business environment.

Despite the fact that the research is based on a single case study, there are some implications and recommendations for business practice. The creation by Glip of innovative ICT solutions and multimedia devices may allow the company the early internationalization of its business activity (Oviatt & McDougall, 2005; Cavusgil & Knight, 2009) and become a key tool in generating wealth in international business environment. Opportunity recognition is an important aspect on entrepreneurship, especially for technology-based ventures. However, to successfully compete on the global market entrepreneurs have to break standards, avoid boilerplate solutions and undertake interesting challenges.

Furthermore, the author emphasizes that important stimuli for the process of creating technological entrepreneurship are both the local climate and the commitment of local government and business institutions. The lack of any formulated innovation strategy for the region undoubtedly inhibits the development of entrepreneurial activities and pro-innovation structures of the region itself. It is vital, therefore, to create an effective system of support from financial institutions, non-profit organizations and EU programs for entrepreneurship infrastructure development and technology transfer. The formation of regional innovation policy and the assurance of international cooperation in terms of technology transfer from research centres to technology start-ups both constitute essential conditions for effective implementation of the concept of technological entrepreneurship into economic practice.

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Author

Ewa Badzińska

Assistant Professor in Faculty of Engineering Management of the Poznan University of Technology (Poland), PhD in management sciences, author of 4 books and over 60 scientific articles. Scientific research issues: technological entrepreneurship, technology Start-ups, innovative ICT solutions, academic entrepreneurship, the process of building competitive position of companies, innovative forms of business communication, foresight of companies.

Correspondence to: Dr inż. Ewa Badzińska; Poznan University of Technology; Faculty of Engineering Management; ul. Strzelecka 11, 60-965 Poznań, Poland; e-mail: ewa.badzinska@put.poznan.pl

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