

Wojciech Wodo

Wroclaw University of Technology, University of California, Berkeley
Wroclaw University of Technology, Faculty of Fundamental Problems of Technology,
Wybrzeze Wyspianskiego 27, 50-370 Wroclaw, Poland, wojciech.wodo@pwr.edu.pl

INNOVATION MANAGEMENT IN START-UP OPERATING COMPANIES: LOOKING FOR THE OPPORTUNITIES FOR DEVELOPMENT

Abstract

In this paper I focus on innovation management in a very specific environment – the start-up companies. That means there are many constraints: restricted resources in the sense of money, people and equipment. The aim is to share some approaches towards creating innovative solutions using other people's money. My study is based on detailed observation of opportunities that surround small companies, the power of networking, and ability of benefiting from both of them. I present how to stimulate the growth of an enterprise and prepare it to be a credible partner in the future. It is examined how to start an innovation process within a small company getting the stakeholders involved and supports it from external sources of labor and insights. A few techniques and methodologies of marketing and sales are analyzed and commended on. The large part of the paper elaborates on binding partnerships with universities and through these getting funds or services within a field of research and development. The extended model of open innovation is introduced here, including not only technology, but also other resources. Results are derived from case studies of real operating companies, of which I was a consultant. The key takeaway of the paper may be stated as a clause that the proper innovation management process needs a mix of different techniques and approaches applied at each level of product or service development with a respect to surrounding operating and market conditions. And these above mentioned issues are discussed in the paper as well.

Key words

innovation, entrepreneurship, start-up, management, opportunities, business to academia

Introduction

Understanding innovation and its management is difficult. It seems there is no one set of golden universal principles you can follow and succeed. This is because there are thousands of different flavors and senses of innovation.

We would like to focus in this study on a very restricted area of an innovation, namely the innovation in start-up companies. Motivation for writing this paper comes from many observations of emerging companies from an academic environment, incubators or accelerators of entrepreneurship, and their struggles on the way to mass market. Before we started gathering materials for this paper, we had to investigate the phenomenon of innovation itself and tried to answer two, not so simple, questions: why is the innovation important? And where is innovation born?

In a nutshell, according to a few significant economic and social studies [4], [6], [15], market development based on innovative solutions. There is always a desire to design something better, quicker, more comfortable, and that provides new features. Innovation means an evolution, sometimes it is even radical or disruptive [7], it is a way to meet customer needs (old ones, but also the emerging ones) and align to different life-styles. It is crucial in creating new jobs and new industries. Now that we have the certainty that it is worth talking about innovation, we would like to share our experience and few insights regarding creating and managing it in a start-up company.

The paper is organized as follows, section II describes identifying a need / gap in the market or customer need, and essential matters of sales and marketing are mentioned. Next in the section III we test hypotheses by talking with potential stakeholders. The section IV describes prototyping of our solutions and models based on a case study example. In section V we discuss funding and resources issues and finally sum up our study in a conclusion.

My Sense of Innovation

In this paper we consider the innovation in two modes. The first is about the innovative products and second is about the innovative companies. Let's think for a moment about the innovative product. How should such a product look? What kind of features should it have? As a start-up company we have to get into our customer's shoes. We have to feel and think like a client. This is called an empathy phase and it is one of the steps of *design thinking* methodology [3]. Thanks to that approach we are able to identify an urgent need of a customer (we call it a pain point) that client is eager to solve. He is even ready to pay extra money for the cure for his diseases, because he gains a lot (we call it big gain). This kind of product is called an *aspirin product*.

We could divide products into two categories: *aspirins* and *vitamins*. The former is a product you *must have*, because it removes your pain or solves a serious problem. The latter one is based much more on modes, it is a *nice to have* product, it could be helpful, but in fact you do not need it. It is much harder to convince customers to purchase vitamins, there is a lot of marketing and other psycho-social work involved.

There is a very bright strategy to provide aspirin-products to the market and be the first in the market – it is a *blue ocean* approach [12]. In simple words it means there are no competitors in certain branch so far. Being a leader is tempting and could bring your company a lot of income and economic growth, but it is dangerous as well. As a pioneer you do not have any source of relevant data or anybody to ask. Every mistake costs you a lot, after the first wave of successes, the competitors joined the race and are chasing you. They are learning from your mistakes and knowing your offer could propose additional value to the customers. Due to these threats it is essential to expand your customer network as quickly as possible and build relationships in which they will become your ambassadors (very loyal customers, we call them *happy prisoners*). It means, they are so satisfied with the product or service that they are not looking for any alternative or change. These clients will be our best salespeople and thanks to *viral marketing* [13] will spread information about our product.

Going from the early-stage market to the mass market is one of the biggest challenges for a company. It is well described in the book *Crossing the Chasm* by Moore [14]. We are not going to talk about this problem here, it is a too complex issue, but we would like to stress that such an expansion strategy must be prepared and executed very carefully. Many enterprises suffered a lot because they did not treat the chasm problem seriously.

We would like to share with you one last remark on delivering innovative products – *mass customization*. It is about the ingenious alignment of the product to the particular customer's needs, even changing over time. You have to consider what kind of work your product must do in many scenarios, and such an approach could increase cost and complexity of your operation [9]. The great story of milk shakes is described in the book *The Innovator's Solution* by Christensen [8].

Flexible Company

The definition of a start-up company varies. We call a company a start-up if it is still searching for a repeatable scalable business model. It means such a company should be ready for switching from its current core business to a side business or even create new business – it is not fixed on one model. Pivoting is a daily routine for a start-up enterprise, it happens for several reasons. First of all in the case of an early stage of development there is usually lack of some resources, we mean here money, infrastructure and human. Driven by these factors the company has to be agile and smart to survive and grow.

One of the approaches is detailed observation of the surrounding market and anticipation of the trends in order to prepare for the short-term future. It could be obtained in two ways, you could be radical and try to create the market (it may be difficult unless you convince the customers that they really need it – e.g. *shadow cost model* [2] or be more conservative and ask your customers – *crowdsourcing* [10]. The wisdom of the crowd is very useful, but has to be acquired by asking the right questions to be valuable. It may be misleading to ask people what they want to change in a product or what kind of product they want to have. You have to identify what they want to achieve with that product, what is their real need and meet this need with your offer.

An interesting form of evaluating a business model in real market conditions is a *preincubation* service. Some institutions (mainly *Business Environment Institutions*) offer a set of support services for emerging business models and allow testing them under its affiliation. In practice this is very convenient for the entrepreneur. This is a chance to limit costs (tax, legal, marketing support is included), build the brand, establishes a network of

clients and partners, and inquire about the market niche. There is certainly a business model beneath that service, they usually charge a monthly fee or commission on the income.

Case Study

We pick one of the real start-ups in order to demonstrate what this company has achieved within 3 years of operating. There were a few hard moments and radical decisions had to be made, but right now the company is still present in the market and even gets prizes for the innovative products.

Let's call that company *360 Degrees*. The whole story began when two founders were wondering how to organize their music collection in a new attractive and accessible way. Their proposal was completely different from the present ones in the market and has additional values. The idea of *Music Board* was simple. Rearrange your collection every time you want in a way you like, and let your music covers be visible and part of your interior design. With this solution the founders established company in the university incubator of entrepreneurship.

Benefiting from assistance of a university patent attorney they filed a national patent application. Simultaneously founders have started a technical cooperation with the university and thanks to that gained access to the certified *Laboratory of Electromagnetic Compatibility*. The company constructed the electronic device based on the invented solution and examined it in that laboratory against *European Union CE* norm (precisely *EMC - ElectroMagnetic Compatibility* assessment). In that moment the company faced obstacles with scaling the business and getting a wider piece of the market. The founders were too invested in their primary invention and would have failed, if not for outside intervention. An external consultant recommended an immediate pivot, switching the core business to a side business and restarting the new main business. From that point the company became a manufacturer of hardware-based devices for medical purposes. Conjunction of the microelectronics and healthcare resulted in new handy products in a telemedicine sector. After few formal rearrangements in the company structure the situation was more or less stable, but the money stream was still narrow.

With time a few new team members have joined the startup and they have broadened the portfolio of the offered services and products. That was possible thanks to involving the company in the research and development projects submitted to university *Technology Transfer Office*. There was a small budget in the TTO for promising new technologies and innovative products, in every case a scientific employee was involved in the project and cooperated tightly with a company. Finally the results of the project and *intellectual property* were transferred to the company. Further improvements and additional features were worked out by scientific interns provided to the company for a few months via a special internship programs for the researchers. Such programs allowed the company to have seasoned experts as employees paid by a third party. The board observing the vast scope of new opportunities decided to refresh visual identification of the company. They participated in a program led by the academy of fine art and obtained a professional design audit.

At the end of the third year *360 Degrees* became a stable company with technological experience and know-how, ready to cooperate with bigger players. All these achievements were executed by using external sources of funding.

Opportunities

When money is laying on the street, it makes sense to bend down and grab it. If you look closer at your surrounding environment, you can spot a lot of new, previously unnoticed, possibilities. If you know what to look for, you will find it.

If we consider our previous assumption of restricted resources we find out that it would be better to cover the cost of innovations with the external sources. How it is possible? We could follow best practices, and like *Procter & Gamble*¹, inquire innovations from the market, not from the inner R&D unit, to get rid of *NIH Not Invented Here* syndrome [11]. By this we do not pay for something that does not work and for all those mistakes which had to be made during the innovation process, but just only for the final technology. It is all about the *open innovation* model introduced by Henry Chesbrough [5], we would like to extend that model, considering

¹ P&G has set a stretch goal of having 50 percent of its new project portfolio come from outside its own four walls.

not only innovation in a sense of technology, but also in a sense of other resources like labor, experts or funds. Let us clarify what we mean under that expanded term.

From the perspective of a start-up company it would be great, if work could be outsourced. In that case there is no need to hire people, buy equipment or rent spaces. This significantly decreases costs. We would like to draw your attention to public-private partnerships. There are many governmental and non-governmental programs dedicated to binding collaboration between industry (sometimes especially for SMEs) and academia. Considering scientific grants such a support is available in e.g. *National Center for Research and Development* in Poland, *European Research Council*² in European Union, and *National Science Foundation*³ in the United States of America. In mentioned institutions and similar, there are many calls for proposals, including the commercialization requirement or business partner, it is a perfect place for your company. The research part will be conducted at the university and your part of job will be to sell the technology. We do not claim it is an easy task, but it saves a lot of money and time, simultaneously letting you to focus on marketing, seeking partners and building distribution channels.

We would like to point out other advantages of cooperation with academia. There are programs for scientists to improve their skills during internships in an industry sector (e.g. *Laboratory of Business*⁴ in Poland, *Industry Fellowships Program organized by the Royal Society*⁵ in United Kingdom, *Industrial Research and Development Internship*⁶ in Canada). It is a great opportunity to have an expert working on our technologies or projects who is not paid from our budget. The other idea is to outsource the project to the researcher working at the university. There are calls for proposals, which are financed by third parties (some agencies e.g. *Polish Agency for Enterprise Development*⁷ in Poland, *German Center for Research and Innovation* in Germany⁸, *Small Business Innovation Research*⁹ in¹⁰ United States of America) and results become company's property, including intellectual rights. The simple scheme of such funding mechanism is presented on the Figure 1.

Many, mentioned above, form of support for the companies are *de minimis support*, it means there is some limitation for an overall amount of granted support, e.g. in European Union it is 200 000 EUR within 3 years (it is determined by the European Commission Regulation (EC) No. 1998/2006 of December 15, 2006 on the application of Articles 87 and 88 of the Treaty to *de minimis aid*¹¹).

We recommend, if it is possible, to approach a particular researcher and convince him to get involved in your project. If you succeed he will advocate for your proposal from the inside of the institution. It is much easier to finalize such a project with an agreement, than by contacting an institution from the outside (it is very probable that we are going to get stuck in a bureaucratic swamp). In such a case there is often a possibility to use certified laboratories at the university (e.g. *Laboratory of Electromagnetic Compatibility*¹² at Wroclaw University of Technology in Poland, *Nottingham Nanotechnology and Nanoscience Centre*¹³ at University of Nottingham in United Kingdom, *Computer Science and Artificial Intelligence Laboratory*¹⁴ at Massachusetts Institute of Technology in United States of America) to examine samples or perform some research.

At the end of this section I would like to mention relatively new idea of *crowdfunding* [1], which is a great source of money for covering small projects. A short overview of a few popular crowdfunding websites is presented in the Table 1¹⁵.

² <http://www.ncbir.gov.pl/en/>

³ <http://erc.europa.eu/>

⁴ <http://www.nsf.gov/>

⁵ <http://www.laboratoriumbiznesu.pl/>

⁶ <http://royalsociety.org/>

⁷ <http://www.nce-rce.gc.ca/>

⁸ <http://en.parp.gov.pl/>

⁹ <http://www.germaninnovation.org/>

¹⁰ <http://www.sbir.gov/>

¹¹ <http://eur-lex.europa.eu/>

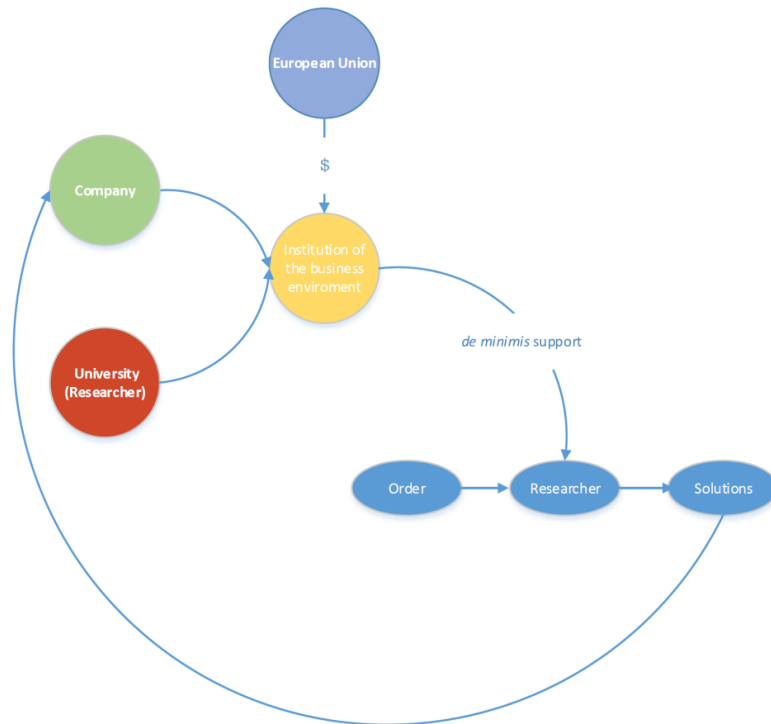
¹² <http://www.ktt.pwr.wroc.pl/lke/?en>

¹³ <http://www.nottingham.ac.uk/nnc/>

¹⁴ <https://www.csail.mit.edu/>

¹⁵ Interesting comparison of two the biggest crowdfunding portals is available here:

<http://www.theverge.com/2013/8/7/4594824/less-than-10-percent-of-projects-on-indiegogo-get-fully-funded>

Figure 1. Scheme of *de minimis* support

Source: Author's

Conclusions

Through this study I analyzed and considered many different techniques and approaches towards managing innovation on different stage of its development. I tried to align those ones with the more appropriate for start-up companies. I based on dozen surveys performed within management teams and my own experience. Every single venture needs to be treated individually, it means you need to perform careful analysis of strengths and weaknesses of your company first (there is no one universal receipt for success) and upon its outcome choose set of tools and methods for applying. It is crucial to get familiar with your local and global competitors (e.g. scope of offer, customer service or pricing strategy) and operating conditions (e.g. characteristic of customer orders or public auctions schedule). You need all this data to find differentiators, which allow you becoming unique compared to others. Now you are familiar with an overview of potential tools for creating innovative solutions and its advantages as well as drawbacks that might be useful in your case. It is up to enterprise's management which path they decide to follow, but it is worth to consider a few of them and always has a *B-plan*. By an alternative way of acting I mean having in mind a defense strategy to decrease losses or even completely different sort of products or services to offer in case of failure (*pivoting*).

As a closing remark I would like to leave you with a thought that things change with a tick of every second. That is the reason as an *opportunity finder* you have to constantly look around you and grab the chance in an appropriate moment. But how to know if it is a right time to act? Firstly, keep eye on your rivals, observe what they do and react instantly. Sometimes well designed customer survey may be helpful in discovery of new market niche, then run quick and build value for consumers simultaneously creating association with your brand as a leader in this field.

Collecting and filtering information is a painstaking job, but it is worth it. A good habit is to sign up to some aggregators of business news. One opportunity passes away, but a new one is born, all you need to recognize it, is to be updated.

Table 1. Crowdfunding portals overview. Data from fourth quarter of 2013.

	KickStarter¹⁶	IndieGoGo¹⁷	Polak Potrafi¹⁸
Funding	Projects must reach goal in order for project creator to receive funds.	You can choose to get the funds earned for projects, regardless of whether the project reaches its goal.	Projects must reach goal in order for project creator to receive funds.
Categories	Art, Comics, Dance, Design, Fashion, Film, Food, Games, Music, Photography, Publishing, Technology, and Theatre.	Animals, Art, Comic, Community, Dance, Design, Education, Environment, Fashion, Film, Food, Gaming, Health, Music, Photography, Politics, Religion, Small Business, Sports, Technology, Theatre, Transmedia, Video, and Writing.	Art, Comics, Dance, Events, Fashion, Film, Food, Games, Music, Photography, Publishing, Technology, Theatre, Travel, Video, Writing.
The Biggest Project	Oculus Rift, Coolest Cooler, Pebble Smartwatch.	Ubuntu Edge, Solar Roadways, Scanadu Scout.	Secret Service, Space is More, Cohabitat Gathering Festival.
Average Funding	\$ 6 791	\$ 4 337	\$ 1 226
Succes rate	44%	33%	43%
Total succesful dollars	\$ 660 M	\$ 99 M	\$ 1,5 M
The biggest funding for a project	\$ 13 285 226 / coolest cooler	\$ 10 267 352 / ubuntu edge	\$ 88 784 / Secret Service

Source: www.kickstarter.com/help/stats, www.medium.com/on-startups/2a48bc6ffd57 and author's survey

Acknowledgements

I would like to express my great appreciation to Ms. Karolina Zborowska from Faculty of Computer Science and Management at Wroclaw University of Technology for writing assistance and constructive suggestions during the planning and development of this research work. Moreover I would like to thank Ms. Whitney Hischier from Haas School of Business, UC Berkeley for constructive review and her valuable comments and remarks to improve the quality of the paper. Many thanks for Mr. Ted Stock from University of Wroclaw for editing the paper and correcting the spelling and grammar. This research was partially supported by European Union as part of the European Social Fund within program SKILLS (competition IMPULS) of Foundation for Polish Science – agreement no. 44/UD/SKILLS/2014.

¹⁶ Source: <https://www.kickstarter.com/help/stats>

¹⁷ Source: <https://www.medium.com/on-startups/2a48bc6ffd57>

¹⁸ Source: data obtained by personal contact with people running the portal.

References

- [1] Belleflamme, P., Lambert, T., Schwienbacher, A. (2014). Crowdfunding: Tapping the right crowd . Journal of Business Venturing , Vol. 29, No 5.
- [2] Bockel, L., Tallec, F. (2005). Commodity Chain Analysis: Impact Analysis Using Shadow Prices, EASYPol Module 046, <http://www.fao.org>
- [3] Brown, T. (2009). Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation. Harper Business
- [4] Burns, T. (1994). The Management of Innovation. Oxford University Press
- [5] Chesbrough, H. (2006) Open Innovation: The New Imperative for Creating And Profiting from Technology. USA : Harvard Business School Publishing Corporation
- [6] Chesbrough, H. (2007). Why Companies Should Have Open Business Models. MITSloan Management Review, Vol.48, No 2.
- [7] Christensen, C. M. (1997). Innovator's Dilemma. When New Technologies Cause Great Firms to Fail. USA : Harvard Business School Press
- [8] Christensen, C. M. (2003). The Innovator's Solution: Creating and Sustaining Successful Growth. USA : Harvard Business School Press
- [9] Gilmore, J. H. II and Pine, B. J. (1997). The four faces of mass customization. Harvard Business Review, Vol. 75, No 1, Jan-Feb 1997.
- [10] Howe, J. (2008). Crowdsourcing: Why the Power of the Crowd is Driving the Future of Business (1 ed.). Crown Publishing Group, New York, NY, USA.
- [11] Huston, L. and Sakkab, N. (2006). Connect and Develop: Inside Procter & Gamble's New Model for Innovation. Harvard Business Review, Vol. 84, No 3.
- [12] Kim, W.C., Mauborgne, R. (2005). Blue Ocean Strategy: How to Create Uncontested Market Space and Make the Competition Irrelevant. Boston: Harvard Business School Press.
- [13] Leskovec, J. Adamic, L. A., and Huberman, B. A. (2007). The dynamics of viral marketing. ACM Trans. Web, Vol.1, No 1, Article 5 (May 2007).
- [14] Moore, G. (2002). Crossing the Chasm: Marketing and Selling Disruptive Products to Mainstream Customers. USA : Harper Business
- [15] Trott, P. (2008). Innovation Management and New Product Development. Pearson Education Limited

ZARZĄDZANIE INNOWACJĄ W DZIAŁAJĄCYCH FIRMACH TYPU START-UP: POSZUKIWANIE MOŻLIWOŚCI ROZWOJU

Streszczenie

W niniejszym artykule skupiono się na zarządzaniu innowacjami w bardzo specyficznym środowisku – działających firmach typu start-up. Oznacza to szereg narzuconych ograniczeń, takich jak limitowane zasoby pieniężne, ludzkie i sprzętowe. Celem badań jest podzielenie się różnymi podejściami do tworzenia innowacyjnych rozwiązań z wykorzystaniem zewnętrznych źródeł finansowania. Badania dotyczą wyszukiwania możliwości rozwoju dla małych firm oraz wykorzystania sieci kontaktów i umiejętnego korzystania z efektu synergii tych dwóch pól aktywności. W pracy przedstawione są metody stymulacji wzrostu przedsiębiorstw i budowy wizerunku rzetelnego partnera na rzecz przyszłych współpracy. Zbadano jak zainicjować proces innowacyjny w małym przedsiębiorstwie angażując w niego interesariuszy i wspomagając go zewnętrznymi źródłami finansowymi oraz ludzkimi. Przedstawiono również kilka technik i metodyk marketingowych oraz sprzedażowych, poddano je analizie i opatrzone komentarzem na ile skutecznie sprawdzają się w przypadku badanego rodzaju firm.

Słowa kluczowe

innowacja, przedsiębiorczość, start-up, zarządzanie, możliwości, biznes i nauka