Lean Startup in Croatia - Does the Croatian Startup Scene Develop Effective Enterprises?

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Abstract **- In times of general business uncertainty, when the companies face challenges upon which their further existence depends, one of the reactions of the management board is influencing the processes which lead to a relatively quick decrease of expenses and general rationalization of the company's business. The method, or what many refer to as a management philosophy, which is recommended to be used in crisis periods, is the lean method. Having in mind the extremely volatile business environment, lean startup approach has raised to surface recently since it takes the basic principles from the lean production. Although it was primarily developed for technical domain, the lean startup approach to management is flexible, and can therefore be applied in every industry. It uses the experimental way of approaching the innovation cycle, as well as a continuously evaluated process of learning about the organization with the goal of rigorous and measurable validation of the development hypotheses for the new products and services. The lean startup approach tires to systematically and very precisely lead the entrepreneur in discovering the valuable parts of a business vision, and in rejecting the parts which are not realistically founded. This paper analyses the Croatian startup companies by using a customized questionnaire. Besides an overview of the companies' founding profiles, financing sources, the development phases of startup companies, business areas and metrics used by startup companies, as well as information sources, the research showed that the Croatian startup scene is familiar with the principles of lean startup methodology and it is successfully implementing it in business.**

Keywords **- *Lean* Startup, BML Cycle, Croatian Startup Scene.**

1. Introduction

Lean startup approach aims to systematically and precisely lead the entrepreneur in discovering the valuable parts of his/her product and business vision, as well as discarding the parts which are not realistically founded.

In relation to other European states, especially in relation to Silicon Valley, one of the economically most developed parts of the world and an area with the highest concentration of IT industry, the Republic of Croatia (RC) is a small country, and its startup scene is in its beginnings. However, the domestic market is showing an increasing number of entrepreneurs who are developing startup companies focused on solving the concrete customer problems, and for which the world investors are starting to show more and more investment interest. One of Croatian problems is the non-existence of a startup company's registry containing the data on their founders, investments made so far, and so on.

1.1. The goal and research hypothesis

The goal was to design a Croatian startup companies database by doing independent search and, with support of the leaders from the Croatian Business Angels Network (CRANE) and Netokracija, a regional internet magazine dedicated to internet business, marketing, culture and media, discover whether the startup companies in Croatia are *lean* (flexible, adjustable) and whether they are familiar with the *lean* startup method and *lean* startup principles.

Based on the gathered and analyzed research up to date, defined problem and determined research goals, a research hypothesis was set. Besides the hypothesis, the paper also poses some research questions.

H1. Croatian startup scene is familiar with the principles of lean startup methodology.

Research questions for the Croatian startup scene:

1. The profile of the Croatian startup company founder?
2. Financing sources of the Croatian startup companies when being founded?
3. Current development phase of the Croatian startup companies?
4. Familiarity of the startup companies in Croatia with the *lean* startup methodology?

5. The most important *lean* startup principles for Croatian startup companies, and which ones are the most difficult to implement?
6. Business areas for which the startup companies conduct documenting of the assumptions on product market viability?
7. Metrics used by the Croatian startup companies when determining the level of customer satisfaction?
8. The sources of useful data and advice for the Croatian startup companies?

1.2. Research methodology and expected scientific contribution

While implementing and confirming/rejecting the set scientific hypotheses, several different scientific methods were used: content analysis method, data gathering method and statistical analysis, descriptive statistical analysis and description method, generalization method, compilation method, deduction method, correlation method, Chi square test and t-test which all helped process the gathered data and determine the basic characteristics of the sample. Data analysis was conducted using the Excel program as well as the statistical program package SPSS 19.0. As a measurement instrument for the implementation of the research, an online questionnaire was created using Google Docs tools. Gathering of primary data was conducted by the method of mailing the questionnaires to the email addresses of Croatian startup companies.

The expected scientific contribution supplements the development of the scientific thought on *lean* startup method which takes its basic principles from *lean* production, and which according to many is a management philosophy recommended to be used in times of crisis. Its contribution can be seen in the fact that there is a relatively small amount of papers, especially in domestic literature, which would research the mentioned issues. Therefore, the conducted research can contribute to a better understanding of *lean* method which facilitates bringing rational business decisions. The presented and interpreted results could provide a useful basis as well as encouragement for further research in this or similar topics related to a startup scene in Croatia. All this would show whether Croatian startup companies are developing effective enterprises.

2. Overview of Papers Containing Up To Date Theoretical and Empirical Research

The term *lean* designating flexible, vital or adjustable organization is applicable today in every business process. *Lean* principles were firstly defined by Toyota managers in the 30ies of the last century in order to optimize the production and set up an ideal flow of materials throughout the supply chain, so that they could achieve competitive advantage on the market over the strong American companies such as Ford and General Motors [1]. This is how the idea on decreasing expenses and the effort of the workforce came to existence, as well as an idea on how to shorten the time needed to develop a product. This led to the creation of *Just- In- Time* philosophy and Toyota Production System whose principles as well as the entire methodology was explained in detail by the inventor himself - Taiichi Ōno (1988) [2], in his book *Toyota Production System: Beyond Large-Scale Production,* which was later updated by James M. Morgan and Jeffrey K. Liker (2006) [3], in the book *The Toyota Product Development System: Integrating People, Process and Technology*.

In the scientific article *Startup, six sigma and startup sigma: fads or real process improvement methods* by Dag Näslund (2008) [4], the author explains that in many respects *lean* is in fact an updated version of JIT system, and that these methods are highly interconnected and dependable, and therefore one method cannot be implemented without the other. The *lean* system process, being the one which aims to eliminate loses in order to create added values, is explained by Earll M. Murman (2002) [5], in his book *Lean Enterprise Value: Insights from MIT's Lean Aerospace Initiative.* On the other hand the *lean* system and *lean* process philosophy were described in the book *The Machine That Changed the World* by James P. Womack, Daniel Roos and Daniel T. Jones (1991) [6]. The principles of the *lean* system were explained by P. Womack and Daniel T. Jones (2003) [7], in the book called *Startup Thinking: Banish Waste and Create Wealth in Your Corporation.* Startup company concept was explained in a paper by Carmen Nobel (2011) [8], *Teaching a 'Lean Startup' Strategy*, while Jerry Kaplan (1995) [9], defined it among the first in his book *Startup: A Silicon Valley Adventure*. Ash Maury (2012) [10], wrote on the topic of startups and development phases of a startup in his

book *Running Startup: Iterate from Plan A to a Plan That Works.*

Finally, the term *lean* startup appears, and it takes the basic principles from *lean* production, with the aim to decrease the activities in the entrepreneurial world which do not yield value, so that a startup company would be helped to achieve its business vision more promptly. Mindaugas Kiškis (2011) [11], argues that the whole concept of *lean* system within a startup company was enabled by the so-called cybernetic space, i.e. the space of virtual reality and technologies. Thomas R. Eisenmann (2012) [12], describes *lean* startup companies as being the ones that follow the approach based on certain assumptions or hypotheses while evaluating market entrepreneurial opportunities. However, Eric Ries (2011) [13], is considered to be the real founder of *lean* startup method. Ries is also the author of the book *The Lean Startup: How Today´s Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses* in which he defines startup companies as organizations or institutions of people formed in order to create something new in the conditions of extreme uncertainty; he also describes in detail his own experience in the startup world.

Among the empirical researches, it is worth to mention the *Startup Genome Report* [14], which included an analysis of more than 650 web startup companies in the USA, as well as a research by EBAN [15], which presents a detailed structure of business angels from Europe and the USA and does a comparison of these two startup scenes. It is worthwile mentioning a reasearch contribution by Christian Kähliga (2011) [16], entitled "*Facilitating Opportunity Development: Increasing Understanding of the Startup Startup Approach in Early Stage High-Tech Entrepreneurship*" during which a research on startup scene in Germany was conducted.

3. *Lean* startup concept and its meaning

The *lean* production concept is based on a continuous improvement of the system in small steps, and on focusing on removing loses and eliminating harmful actions in any form in order to achieve market competitiveness. Therefore, *lean* startup takes its basic principles from *lean* production, and it tries to decrease the activities which do not add value and do not help a new enterprise to achieve its business vision. *Lean* startup represents a new managerial approach (theleanstartup.com) which facilitates bringing rational business decisions and strives to encourage the entrepreneurs to continue doing big and good quality projects.

The concept *lean* startup [16], was created in Silicon Valley, which is the accelerator of startup scene, investors and mentors in the area of entrepreneurship, while today the concept has spread through the entire world.

Lean startups [12], are the companies which follow the approach based on certain assumptions or hypotheses while evaluating the entrepreneurial opportunities on the market. In *lean* startup companies, the entrepreneurs implement their own vision in business models, after which they test their primary hypotheses. After that, based on users' feedback, the entrepreneurs must bring a decision whether they will continue with the initial business model or whether they will change it (pivot).

One of the most important principles of the *lean* startup methodology is a closed circle or loop symbolizing the validated (confirmed) learning [10], The goal of BML (Build-Measure- Learn) cycle is making the entrepreneur realize which of his hypotheses has a real basis, which is market justification. The real object that goes through the BML cycle is an experiment testing whether an instance of the product or its part has functionality, control, and whether it will be accepted on the market (market justification).

The process of validated learning starts from an idea, followed by programming (coding), connecting of modules, testing, and so on, in order to come to the actual product, service or application, i.e. to the implementation of the initial idea.

4. Empirical research

The goal of researching the Croatian startup scene was to find out whether the startup companies in Croatia are *lean*, and the extent to which they are familiar with the *lean* startup methodology.

Startup companies [17], are defined as high technology scalable projects (the existence of a standardized product) that are not limited to the region, but instead develop their solutions for the world. Therefore, with the help of CRANE, Netokracija (regional internet magazine), and through independent search, a list of Croatian

startups was made corresponding to the previously mentioned definition. Afterwards, 42 questionnaires were sent to the email addresses of the Croatian startup companies. The questionnaire was answered by 23 Croatian startup companies that are 54.76% of the participants which was evaluated as satisfactory for the needs of this research. A sample of 23 startup companies is representative, and it is assumed to represent the features of the entire population, i.e. of all the startup companies in Croatia.

4.1. Results of the empirical research on the Croatian startup scene

Descriptive statistics determined certain statistical population features, after which the statistical connections, gained by correlations, were shown between the variables.

- **First research question:** The results of the analysis showed that a typical Croatian startup company founder is male (96%), with a university degree (35%), between the age of 25 to 34, comes from Zagreb (57%), has so far participated in 3 startup projects (82%), and has more than 11 years (52%) of professional experience in the entrepreneurial world.
- **Second research question:** The biggest number of Croatian startup companies was financed independently (74%), the so-called *bootstrapping*, i.e. they had no external investments, and afterwards were helped by friends and family (30%), so-called 3Fs – Friends, Family and Fools. Besides that, many were helped by the Croatian Business Angels Network (CRANE), as well as business angels from other countries (43%).
- **Third research question:** Most startup companies on the Croatian startup scene were founded in 2011 (48%), and almost half of the questioned companies are in a phase in which the accent is put on the increase of sales of the already existing products, service or services (43%). Five Croatian startup companies (22%) are only at their beginning, i.e. they have an idea they are trying to develop into a complete product, service or services. In doing so, the main challenges that the new companies are facing at their beginning are related to creating a need for the product, service or services on the market offered by the company itself, as well as visibility, lack of courage and knowledge on lean startup principles, finding the right mentors, and so on.
- **Fourth research question:** Most Croatian startup companies are well familiar with the *lean* startup methodology and principles (52%), and 44% of the participants have used their knowledge and familiarity with the *lean* startup principles in at least one project (startup). Almost 70 % of participants said they were included in implementing *lean* startup activities in their own startup company. In doing so, some of them had a very small role, however many were involved to a great extent and were tightly connected and involved in almost all the startup activities within their own startups.
- **Fifth research question:** The most important *lean* startup principles are *Talk to your customers (78%),* and *Build minimum viable product or product with the least possible set of functionalities which yields some value to the customers (57%).* The *lean* startups which are most difficult to implement, according to the opinion of the Croatian startup entrepreneurs, are *Build minimum viable product (32 %)* and *Quick iterative repetition (26%).*
- **Sixth research question:** Croatian startups document their assumptions related to all important business areas, in which most put emphasis on documenting those hypotheses relating to their customers, business partners, and business offers (50%). However, 23% of the participants stated to not document their business related assumptions at all.
- **Seventh research question:** Most Croatian startup companies (91%) use, as the basic metrics for determining the satisfaction level of their customers, the customer feedback, as well as the market feedback, the number of newly registered customers, return on investment, and the number of followers on social networks. Some use the agile methods, some measure the number of visits on their web sites, the number of received *emails,* some are familiar with the sales data, and so on. However, the Croatian startup companies use measurements, and they implement the customer feedback for further

improvements, learning, *bug* correction, and development of products/services/applications.

- **Eight research question:** The Croatian startup entrepreneurs try to find the numerous useful information and advice related to the startup and entrepreneurial world in general by following blogs of the renowned experts in this area, such as Eric Ries (42%), Dave McClure (53%) or Steve Blank (21%). Besides that, they use social networking (Twitter, LinkedIn), they try to participate at a number of international conferences, talk and share their experiences with the other startup companies, investors, read books, forums, and so on.

4.2. Statistical correlations between the correlation-derived variables

In order to come to a conclusion, correlations were conducted on several most interesting variables. The first correlation was conducted between the level of theoretical knowledge on *lean* startup methodology, and practical knowledge implementation and experience in *lean* startup methodology. The results showed a strong correlation among these three variables (Table 1).

Correlations

		Practical knowledge implementation	Practical experience implementation	Theoretical knowledge level
Practical knowledge implementation	Pearson Correlation	1	.732**	.718**
	Sig. (2-tailed)		.000	.000
	N	23	23	23
Practical experience implementation	Pearson Correlation	.732**	1	.715**
	Sig. (2-tailed)	.000		.000
	N	23	23	23
Theoretical knowledge level	Pearson Correlation	.718**	.715**	1
	Sig. (2-tailed)	.000	.000	
	N	23	23	23

**. Correlation is significant at the 0.01 level (2-tailed).

Table 1. Correlation between familiarity, knowledge and experience of the questioned startup company founders on lean startup methodology

As Table 1 shows, the overall number of participants is 23, the data is statistically relevant since the significance coefficient is less than 0.05, while Pearson correlation coefficient is in the range from 0.715 to 0.732, depending on which of the three analyzed variables is taken into account. The correlation results indicated a high level of theoretical knowledge on *lean* startup methodology among the Croatian startup companies, and also the implementation of that knowledge in actual startup projects, as well as involvement in the implementation of *lean* startup principles and all other activities related to *lean* startup methodology.

The second correlation was conducted between the level of familiarity with the *lean* startup methodology, and the participation at conferences and other programs in order to network and meet other business people from the world of startup companies (Table 2).

Correlations

		Conferences	Familiarity with the *lean* method
Conferences	Pearson Correlation	1	.062
	Sig. (2-tailed)		.778
	N	23	23
Familiarity with the *lean* method	Pearson Correlation	.062	1
	Sig. (2-tailed)	.778	
	N	23	23

Table 2. Correlation between the familiarity with the lean method and networking

The correlation results shown in Table 2 indicate that there is no statistically relevant correlation between the ones familiar with the *lean* method and those who participate at conferences and different other programs in order to do better at networking; the importance of this was emphasized by Eric Reis in his book.

The following correlation was conducted between the level of practical knowledge implementation on *lean* startup methodology and the participants who have so far either begun a startup company, or were one of the first 5 employees of a new startup company (Table 3).

Correlations

		Practical knowledge implementation	Number of founded startups
Practical knowledge implementation	Pearson Correlation	1	.563**
	Sig. (2-tailed)		.005
	N	23	23
Number of founded startups	Pearson Correlation	.563**	1
	Sig. (2-tailed)	.005	
	N	23	23

**. Correlation is significant at the 0.01 level (2-tailed).

Table 3. Correlation between the practical knowledge implementation on lean method and the number of founded startup companies

Correlation results shown in Table 3 indicated the existence of a moderate statistically significant correlation between the two previously described variables. The moderate statistically significant correlation was also gained in the correlation between the level of practical experience on *lean* startup method and the overall number of founded startup companies (Table 4).

Correlations

		Number of founded startups	Practical experience level
Number of founded startups	Pearson Correlation	1	.541**
	Sig. (2-tailed)		.008
	N	23	23
Practical experience level	Pearson Correlation	.541**	1
	Sig. (2-tailed)	.008	
	N	23	23

**. Correlation is significant at the 0.01 level (2-tailed).

Table 4. Correlation between the practical experience of lean method and the number of founded startup companies

Correlation was conducted between the variable relating to the fact that the participants prior to starting their own startup company conducted testing on their potential customers, and on the other hand relating to the overall number of the newly founded startup companies. Table 5 shows a moderate statistically relevant correlation between the previously mentioned variables.

Correlations

		Number of founded startups	Tested ideas
Number of founded startups	Pearson Correlation	1	-.562**
	Sig. (2-tailed)		.005
	N	23	23
Tested ideas	Pearson Correlation	-.562**	1
	Sig. (2-tailed)	.005	
	N	23	23

**. Correlation is significant at the 0.01 level (2-tailed).

Table 5. Correlation between the tested ideas and the number of the newly founded startups

The following correlation was conducted between the variable which implies the customers should be given the product to use in the earliest possible phase of development, and the other variable which implies correction of *bugs* while the customers were already given the product to use. Table 6. shows the result of implemented correlation which indicates moderate significant correlation between these two variables.

Correlations

		Open-alpha version	Correction of bugs
Open-alpha version	Pearson Correlation	1	.515*
	Sig. (2-tailed)		.012
	N	23	23
Correction of bugs	Pearson Correlation	.515*	1
	Sig. (2-tailed)	.012	
	N	23	23

*. Correlation is significant at the 0.05 level (2-tailed).

Table 6. Correlation between the customers who use the product in open-alpha version and correction of bugs

4.3. The Hypothesis Conclusions and Research Limitations

The hypothesis comprised of verifying whether the Croatian startup companies are familiar with the *lean* startup methodology. Through research based on qualitative and quantitative analysis, descriptive statistical analysis, method of generalization, compilation, deduction, correlation analysis, as well as analysis of research questions through the description method, the hypothesis was confirmed.

The Croatian startup companies are familiar with all the principles of *lean* startup methodology. Besides that, startup companies mentioned which are, according to them, the most important key *lean* startup principles, as well as those *lean* startup principles which are the most difficult to implement in a certain startup company. The results have shown that even in that case (depending on whether these are the key, i.e. *lean* startup principles most difficult to implement), there is a difference between the founders of startup companies with more professional experience in entrepreneurship, and those who have so far participated in more than three startup projects.

While researching the Croatian startup scene, the basic limitation is the size of sample, since it is impossible to know with great certainty what the percentage of included startup companies in this research is. The data on the number of startup companies are based exclusively on information gathered by our own resources, and by the leaders of CRANE association, as well as Netokracija portal. The limitation is related to a lack of previously

conducted research in the area of the Republic of Croatia against which the results of the conducted research could be compared.

5. Conclusion

It is generally known that a very small number of startup companies succeeds, and after the launch of their products or services manages to further develop their products (services) and earn profit. Startup companies, which are mostly defined as just founded companies, and are most frequently linked to high-technology projects, get very often lost on their way from being founded as startups to achieving business success.

In order for a startup company to face more effectively the uncertainty of the market and the problems which arise when founding a new company, a lean startup method was founded with the aim to lead the entrepreneur during the development process of those products and services which the customers really want. However, there is no secret to success, and the success itself is a result of work, preparation and learning by doing mistakes. Neither does the lean startup method indicate any magic activities which should lead a startup company to success.

Results of research showed not only that the Croatian startup entrepreneurs are familiar with the lean startup principles, but they also implement them, since most of the questioned companies tested their products/applications before they presented them on the market. Most supported the claims that it is very useful and above all necessary to give the product/application to the customers for use as soon as possible, i.e. in the earliest possible development phase, and the bugs which appear can be dealt with „on the go". On the other side, the results of the research showed that most Croatian startup companies have not been changing their business model, i.e. have not been applying pivoting.

It is important to conclude that the Croatian startup scene, although young and small, in terms of knowledge on and familiarity with the startup world, lean startup principles and in general the level of awareness, is no different than most bigger and older European startup scenes or USA startups.

References

[1]. Stefanic N., Tosanovic N. (2010), *Upravljanje znanjem i promjenama* – Lean proizvodnja. ftp://161.53.116.242/Predavanja_vjezbe_programi_rokovi/Upravljanje%20znanjem%20i%20promjenama/20_04_2011__12766_Startup_proizvodnja.pdf , 20.02.2012.

[2]. Ōno T. *Toyota Production System: Beyond Large – Scale Production,* Productivity Press; 1St Edition, 1988.

[3]. Morgan J.M., Liker J.K. , *The Toyota Product Development System: Integrating People, Process and Technology*, Productivity Press, 2006.

[4]. Näslund D. ,*Lean, six sigma and lean sigma: fads or real process improvement methods?* , Business Process Management Journal. Vol. 14 Iss: 3, pp.269 – 287 , 2008.

[5]. Murman E.M. , *Lean Enterprise Value: Insights from MIT's Lean Aerospace Initiative,* Palgrave, 2002.

[6]. Womack J.P., Jones D. T., Roos D. , *The Machine That Changed the World: The Story of Lean Production,* Harper Perennial, 1991.

[7]. Womack J.P., Jones D.T. ,*Startup Thinking: Banish Waste and Create Wealth in Your Corporation*, Free Press, New York, 2003.

[8]. Nobel C. (2011), *Teaching a 'Lean Startup' Strategy*. http://hbswk.hbs.edu/pdf/item/6659.pdf, 20.04.2012.

[9]. Kaplan J. , *Startup: A Silicon Valley Adventure*, Houghton Mifflin,1995.

[10]. Maurya A. *Running Lean: Iterate from Plan A to a Plan That Works,* O'Reilly Media; Second Edition, 2012.

[11]. Kiskis M. , *Entrepreneurship in cyberspace: What do we know?*, ISSN 2029-7564 (online), SOCIAL TECHNOLOGIES, 1(1), pp. 37–48. 2011.

[12]. Eisenmann T.R., Ries E., Dillard S. (2012) *Hypothesis-Driven Entrepreneurship: The Lean Startup.* Harvard Business School. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2037237, 20.04.2012.

[13]. Ries E., *The Lean Startup: How Today´s Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses*, Crown business, New York, 2011.

[14]. Marmer M., Hermrmann B.L., Berman R. (2011.) *Startup Genome Report 01, A new framework for understanding why startups succeed,* http://www.wamda.com/web/uploads/resources/Startup_Genome_Report.pdf, 20.04.2012.

[15]. EBAN Secretariat (2010) *Statistics compendium 2010*, http://www.eban.org/components/com_virtuemart/shop_image/product/EBAN_StatisticsCompendium_Full_060111.pdf, 20.04.2012.

[16]. Kähling C. (2011) *The Lean Startup Research Project*, Results of the Lean Startup Approach survey, http://www.slideshare.net/ckny/110515-2228-embamasterthesischristiankaehliglsapproachsurveyresultsnopcmn, 10.04.2012.

[17]. Brezak Brkan I. (2012) *Sto je startup (na 'Balkanu'): Vodič kroz osnovne pojmove i rušenje nekoliko učestalih mitova.* http://www.netokracija.com/startup-vodic-27580, 15.04.2012.

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