

A MODEL FOR PREDICTING THE SUCCESS OF NEW VENTURES

Boyan Yankov

*Department of Software Engineering at Sofia University "St. Kliment Ohridski", Bulgaria,
boian_iankov@abv.bg*

Abstract. After an overview of more than 50 success prediction models for new ventures and identification of success factors and successful model patterns, and analysis of the venture creation process, a model for predicting the success of new ventures is proposed. The success prediction model is extended with measurable variables. Interviews with company owners are conducted to gather initial opinions, to identify possible gaps and to revise the model. Initial results and feedback from the interviews are presented, analyzed and compared to the model to draw conclusions and to make improvements. A survey to statistically validate the success prediction model is currently in progress.

Keywords: technology entrepreneurship, start up companies, business processes, business model, new ventures, success prediction.

Introduction and problem statement

New Venture Success is defined as the return of investment for all stakeholders in a start-up company (Bailetti, T., 2012) and is associated with economics, employment, education, innovations and value generation for society. The economy of Bulgaria needs start-up companies to generate growth, society needs them to create job opportunities and innovations for our daily life. The business needs b2b start-ups which offer innovative services to help different industry sectors develop.

There are a few business incubators, VC funds, business angels and government programs (Avramov, J., 2012) in Bulgaria, operating in the recent years and trying to help entrepreneurs and young companies. The results of this are in small scale as most entrepreneurs start on their own, often without the necessary experience, information and support which sometimes leads to successful ventures but often is a source of ineffectiveness, missed opportunities and failures. Success prediction for new ventures is a technique applied to increase the efficiency of the new venture creation process, to avoid the possible failure, to minimize the risks and resources spend and to increase the returns. Unfortunately there are no success prediction models and software tools developed for Bulgarian start-up companies. Bulgaria is a small ecosystem and its business climate is specific (with its state of development, regulations, location, psychology etc.) and an adapted new venture success prediction model is necessary to help Bulgarian entrepreneurs.

A model to predict the success of young Bulgarian companies would be useful to entrepreneurs, business owners, business incubators, university startup centres, business consultants, venture capitalists and investors. The model is used to present the characteristics of start-up companies. A dataset for the company is created using

the model, and this dataset is compared to statistical data in order to predict the success probability for the new company. The model can also be used to identify possible strengths and weaknesses of the company, to improve the general understanding of the stakeholders about the business, to measure the company's progress over a period of time or to make comparisons.

Requirements for a new venture prediction model

A detailed analysis has been performed by the author of this article in 2012 on 42 success prediction models (Yankov, B., 2012) to identify a model pattern introduced by Sandberg in 1986 and preserved in many models that follow after. Sandberg's model initially includes an entrepreneur, a strategy and an industry structure and can be illustrated with the formula:

$$NVP = f(E, IS, BS) \quad (1)$$

Where NVP is the new venture performance, E is the entrepreneur, IS is the industry structure and BS is the business strategy.

Later studies based on Sandberg include other factors such as the human factor (the entrepreneurial team), the interaction between the company strategy and the industry structure and the available resources. The entrepreneurial team factor is arguably significant and often omitted in the models. Resources (such as assets) are often omitted in models as they are not important if funding is provided (for example in start-up competitions). Table 1 below (Yankov, B., 2012) is a result from a comparison analysis of prediction models – based on the company strategy and the industry structure, showing their similarities and differences:

Table 1. Comparison of NVP models based on Sandberg's model

Study	Strategy	Structure	Interaction	Others
Sandberg, 1986	V	V	X	Entrepreneur
Romanelli, 1987	V	V	X	
McDougall, 1987	V	V	V	Origin
Stuart & Abetti, 1987	V	V	X	Environment, Entrepreneur
Kunkel, 1991	V	V	V	
McDougall, Robinson & DeNisi, 1992	V	V	V	Origin
Bolland, 1993	V	V	X	Origin
Stearns, Carter, Reynolds & Williams, 1995	V	V	V	Location
Robinson, 1995	V	V	V	
Teal, 1998	V	V	X	Entrepreneurial Team
Ensley, 1999	V	V	V	Entrepreneurial Team
Teal & Hofer, 2003	V	V	V	
Shirokova & Shatalov, 2010	V	?	X	Environment Factors, Management Style

Not all venture prediction models are based on Sandberg. For example, another success prediction model (Brüderl, J., Preisendöfer, P., Ziegler, R., 1992) defines the survival chances of newly founded organizations using three main factors: the human capital resources of the founder, the organizational characteristics and the environmental conditions. Many different models exist but are usually less popular

The conclusions of the analysis are that venture success prediction models based on Sandberg are a good blueprint for designing a new success prediction model. The model should include the following factors: company strategy, industry structure and interaction of the strategy and the structure. It would be beneficial to include other factors in the model as they could be statistically significant, such as the entrepreneurial team. The importance of the factors can be tested with a model validation and an analysis of statistical data. Every factor from the model must be measurable and defined clearly.

An extended NVP model (Chrisman, Bauerschmidt and Hofer, 1998) is suggested based on Sandberg's model. The model also includes the resources and the organizational structure, processes, and systems developed by the venture to implement its strategy and achieve its objectives. The model is presented with the formula:

$$NVP = f(E, IS, BS, R, OS) \quad (2)$$

In a study of venture prediction and venture creation models (Carland, J.W. and Carland, J.A., 2000), 22 venture success prediction models related to Sandberg's model were analyzed including a few earlier models and 8 venture creation process models. They observed that most studies attempt to link certain variables, such as business level strategy and industry structure, to new venture performance. While there are many studies based on the linear model of new venture performance espoused by Sandberg, the results of the studies differ. They notice that Sandberg is unable to empirically link the characteristics of the entrepreneur to new venture performance. Most new venture research is centered on new venture performance as a function of the entrepreneur and therefore, despite his findings, Sandberg is unwilling to delete the characteristics of the entrepreneur from the model such as management competence and industry experience, because venture capitalists tend to value those characteristics.

JoAnn and James Carland identify the issue that there are few attempts to understand new venture creation. They analyze 8 venture creation process models and propose a process model. Start-up success can be aided by a model of the venture creation as a process. The venture creation process model proposed by the author of this article as presented in fig. 1 (Yankov. B., 2012) is based on the model by JoAnn and James Carland and on a model of technical entrepreneurship (Abbas, 2008). The model shows the process in its stages and context and serves as a starting point for revision of Sandberg's NVP model.

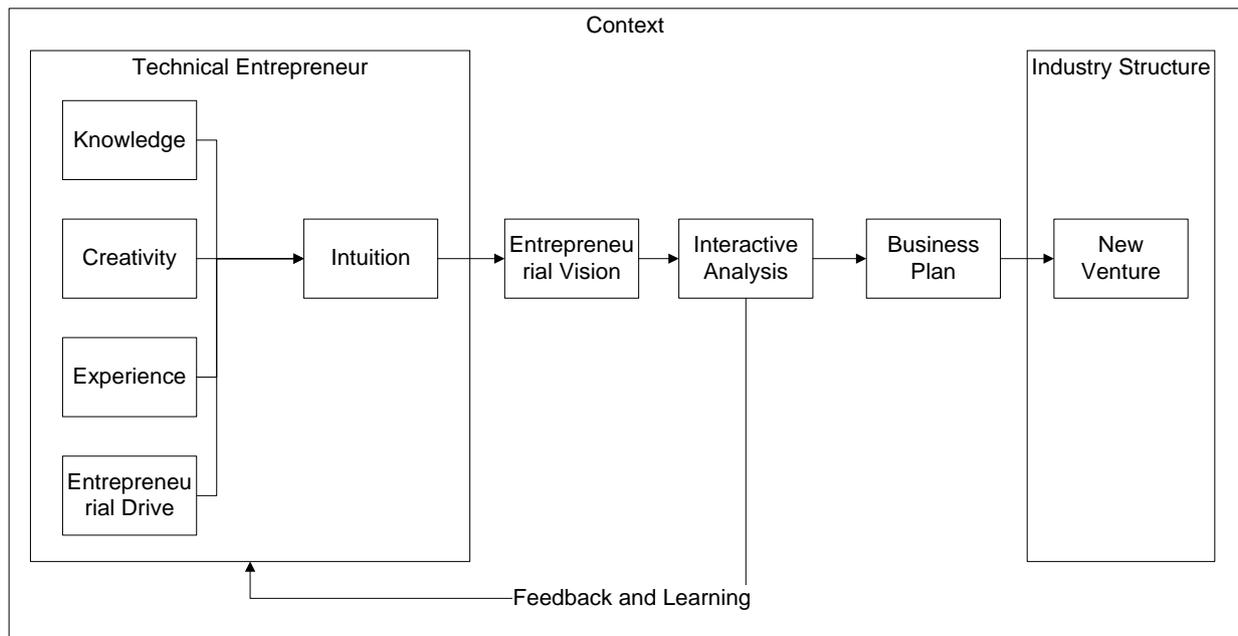


Fig. 1. Venture creation process model

A model to predict the success of new ventures

By analyzing the requirements for a venture prediction model, the current paper proposes an extended new venture success prediction model based on Sandberg. The model is in the form:

$$NVP = f(E, IS, BS, R) \quad (3)$$

Where NVP stands for new venture performance, E is the entrepreneur, IS is the industry structure, BS is the business strategy and R are the resources.

Compared to the model by Chrisman, Bauerschmidt and Hofer the proposed model is lacking the organizational structure which is defined as processes and systems developed by the venture to implement its strategy and achieve its objectives. Developed processes and systems are part of the company's intangible assets and therefore are part of the resources.

Each of the main categories in the company success prediction model is decomposed into subcategories as shown in fig. 2.

The entrepreneurial team category includes the personality and values of the founder (e.g., confidence, locus of control, tolerance to risk), the skills and experiences of the management team (e.g., technical, management, marketing skills, experience in similar position) and the teamwork (e.g., the ability of the team to work together and to generate value).

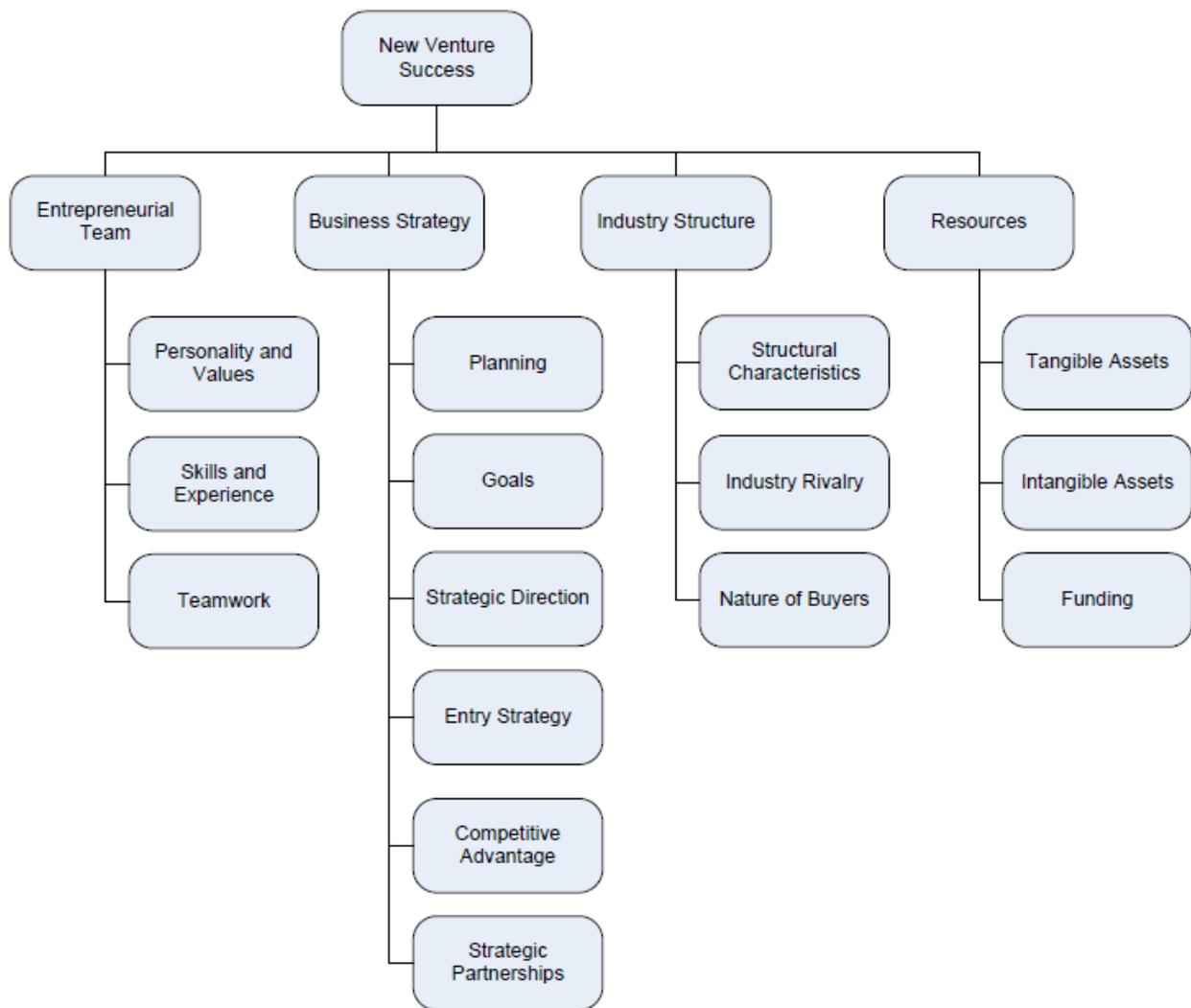


Fig. 2. New venture success prediction model

The business strategy category includes the planning (e.g., depth and breadth of planning efforts), the goals, the strategic direction (e.g., aggressiveness of company strategy), the entry strategy (e.g., pioneer, early or late order of entry), competitive advantage and strategic partnerships (e.g., partnerships with competitors, clients, government).

The industry structure category includes the characteristics of the industry (e.g., barriers, size, and predictability), the industry rivalry (e.g., competition) and the nature of buyers (e.g., concentration, heterogeneity).

The resources category includes the tangible assets (e.g., cash, inventory), the intangible assets (e.g., goodwill, patents, and social networks) and the funding source used (e.g., bootstrapping, venture capital or bank loan).

Qualitative research for the new venture success prediction model

A qualitative research has been performed to discover prevalent trends in opinions and to gain a better understanding of underlying reasons and motivations of

Bulgarian entrepreneurs. The technique used is conducting an in-depth interview on a small number of non-representative cases using the following interview guide:

Interview Guide for Venture Prediction Model

1. What is the main area of operation of your business?
2. What is your position in the business?
3. How long has your business been operating?
4. What do you think about the New Venture Prediction model?
5. Do you find any gaps in the model? What exactly?
6. Do you think the model has unnecessary data? What exactly?
7. Do you think that a software to predict the success of start-ups and young companies would be beneficial for your business and how?
8. What do you think about the criteria from the model: are they understandable, are they measurable, could you estimate them, would you add anything?

The summary of the results from the qualitative research is illustrated in table 2.

Table 2. Summarized results from the qualitative research of opinions about the NVP model

Question №	Qualitative Research Results
1	The areas of operation of the companies are information technologies, medicine and agriculture.
2	All respondents are company owners.
3	The companies were founded 1 to 5 years ago and all of them are currently active.
4	All respondents described the new venture success prediction model as logical and correct.
5	The respondents did not find any gaps in the model but they suggested many improvements and additions regarding the individual criteria.
6	The respondents did not find any unnecessary data in the model.
7	All respondents think that a software to predict the success of start-ups and young companies would be beneficial. Only some of them are ready to pay for the software but all of them would use it if it was free. They would use the software to help their start-ups and initial researches, for assessment of the company, for localization and improvement of weak points. Some of the interviewees will trust the software but other will first need a proof: information about the algorithm and the underlying logic, details and explanations about the model.
8	The respondents described most criteria as logical, clear and measurable. They were able to understand and answer most of the questions without difficulties. However they had uncertainties about many questions regarding the team, the personality and the industry. None of them knew their personality type. All interviewees requested definitions for management or marketing terms that they did not understand or misinterpreted. The respondents suggested many improvements and additions regarding the individual criteria.

The respondents are five Bulgarian entrepreneurs and owners of young companies operating in the field of information technologies, medicine and agriculture. The companies were founded 1 to 5 years ago and all of them are currently active. All companies were founded without any help from business incubators, VC funds,

business angels or the government and used bootstrapping as initial funding source. The duration of each interview was 0:30 to 2:30 hours depending on the responses and the demonstrated interest by the interviewee.

All respondents described the model as logical and did not find any significant gaps. I.M. – owner of a web design company said: "The model is logical and does not have any substantial gaps. It has improved by adding additional categories to the traditional model". V.V., owner of internet trading company thinks that "The model covers the main areas". They identified all categories as important for company success and did not find any unnecessary data. L.M. owner of a bio agriculture company said, "There is nothing to remove".

All interviewees demonstrated interest in the study and shared that a software to predict the success of start-ups and young companies would be useful to them. However some of them remain reserved about the practical implication, the usefulness and the logic. I.M. – owner of a web design company thinks that, "The results will not be taken seriously unless there is a logical explanation and a list of weak points. I need the weak points to make improvements in the business." P.P. - owner of a specialized medical devices distribution company said that the software "would be useful. It will focus the attention of the entrepreneur on details such as the team and the strategy." P.M – owner of a software development company said that "It's good to have such a product on the market and I will use it, if it is free, but if it is paid, I would rather make my own research".

The respondents were shown the individual criteria representing the subcategories in the model diagram and the draft of a survey. They were able to understand and answer most of the questions without difficulties. However they had uncertainties about many questions regarding the team, the personality and the industry. I.M. reported that the team is unimportant for company success and only the management (core) team is important and suggested that a definition of "entrepreneurial team" is provided. The interviewees did not have information about their personality type (Myers-Briggs classification). Some of them did not understand or misinterpreted general management and marketing terms such as "product portfolio". The respondents requested that definitions of all terms are provided in order to interpret the questions correctly. The interviewees identified the human resources (the entrepreneurial team), the clients, the unique product and the competitors (and also the competition analysis) as the most important factors for the success of the young company. They suggested many improvements and additions to the survey draft which will be taken into account in the quantitative research.

Conclusion

The interviewees expressed a clear interest in the research and a need for a software for predicting the success of young companies and for suggesting possibilities for improvements. This is a proof that Bulgarian entrepreneurs need such tool to help them develop their businesses. Business owners have a positive attitude and are

proactive because they see potential benefits for their businesses. They like sharing their experience and are willing to help improving the business climate in Bulgaria.

The qualitative research confirms that the proposed model for predicting the success of new ventures is accepted by the Bulgarian entrepreneurs as logical and complete. They identified the proposed category “Resources” as an integral and important part of the model. The model and the generated ideas can be further tested with a later quantitative research.

References

1. Bailetti, T. (2012), Technology Entrepreneurship: Overview, Definition, and Distinctive Aspects, *Technology Innovation Management Review*.
2. Avramov, J. (2012), Some Problems in the Operation of the Management of Mis Funding for Modernization and Innovation for Industry Under OP "Competitiveness", IV International Science Conference „E-governance”, pp 227-238
3. Yankov, B. (2012), Overview of Success Prediction Models for New Ventures, *International Conference Automatics and Informatics'12*, ISSN 1313-1850, pp 13-16.
4. Carland, J.W. and Carland, J.A. (2000), *A New Venture Creation Model*, Western Carolina University.
5. Abbas, A.A. (2008), *An Assessment Methodology for Predicting the Success of Technological Enterprises*
6. Brüderl, J., Preisendöfer, P., Ziegler, R. (1992), Survival Chances of Newly Founded Organizations, *American Sociological Review*, Vol. 57, No. 2, pages 227 – 242.
7. Ruskov, P., Haralampiev, K. and Georgiev, L. (2012), Online Investigation of SMEs Competitive Advantage
8. Ensley, M.D. (1999), *Entrepreneurial teams as determinants of new venture performance*, New York: Garland Publishing Inc.
9. Teal, E.J. and Hofer, C. (2003), The determinants of new venture success: strategy, industry structure, and the founding entrepreneurial team, *The Journal of Private Equity*, Vol. 6 No. 4, pp. 38-51.
10. Chrisman, J., Bauerschmidt, A. and Hofer, C. (1998), *The Determinants of New Venture Performance: An Extended Model*,
11. Tanev S., Ruskov, P. and Georgiev, L. (2011), *A Business intelligence tool for studying value co-creation and innovation*, forskningsbasen.deff.dk
12. Guion, L., Diehl, D. and McDonald, D. (2006), *Conducting an In-depth Interview*, <http://edis.ifas.ufl.edu/fy393>

This work was supported by the European Social Fund through the Human Resource Development Operational Programme under contract BG051PO001-3.3.06-0052 (2012/2014).