OVERVIEW OF SUCCESS PREDICTION MODELS FOR NEW VENTURES

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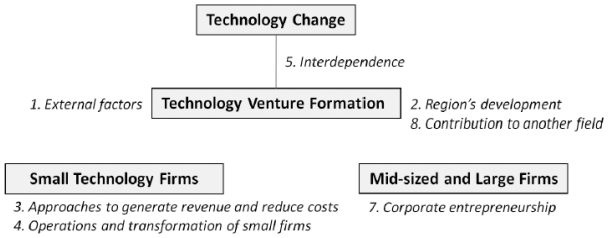
Abstract: An overview of 42 success prediction models for new ventures is presented. Major success factors are identified and a sequence of development of models is analyzed. A successful model pattern is identified containing industry structure, company strategy and interaction of strategy with structure. Alternative success prediction models are presented. A venture creation process and system models are analyzed. A new venture creation process model is proposed and utilized to analyze existing models. Common venture creation barriers and strategies to minimizing their impact on start-up companies are presented. Best practices for designing success prediction models are identified.

Key words: entrepreneurship, venture creation, model, start up companies, company success

INTRODUCTION

Start-up companies are a driver of economic growth, of innovation and a source of new employment opportunities. Technology entrepreneurship [1] was mentioned for the first time at a symposium in 1970 and has become a trendy topic with a growing number of published articles over the years. The technology entrepreneurship studies are dominated by a theme that focuses on identifying the antecedents of technology firm formation. Technology entrepreneurship is the process of creating a new technology venture which involves [2] organization, management, and risk bearing of a technology based business [3] while taking an invention to market. Technology entrepreneurship requires [4] joint efforts to interpret ambiguous data, a joint understanding to sustain technology efforts, and a persistent, coordinated endeavor to accomplish technological change.



Technology entrepreneurship includes several clusters [1], as identified by Tony Bailetti and one of them is new venture formation. New ventures have specific characteristics which distinguish them from more mature ones [5]. These characteristics include novelty, small size, and an inherent uncertainty in business. New venture creation is a risky process consuming the money, time and energy of entrepreneurs, venture capitalists and talented professionals. Unfortunately a large proportion of the new ventures are unsuccessful.

New venture success can be defined in various ways including [6] the internal rate of return realized by all shareholders, [7] fulfillment of goals (income, company growth, personal achievements). The definition of venture success is the important base for building an accurate and practical model. Success prediction for new ventures is an opportunity to increase the efficiency of the new company creation process and to minimize risk and resources spend. This paper contains an overview, insights and suggestions about models for predicting the success of new companies.

SUCCESS PREDICTION MODELS FOR NEW VENTURES

In order to predict the success of new start-up companies, the characteristics of new ventures are presented using a model. A dataset is generated using the model, and is compared to statistical data to predict the success probability for the new company.

Many studies focus on success prediction for new ventures and propose a new venture prediction model. 42 success prediction models have been analyzed from 1974 to 2010. The study is based on a previous models comparison [8,9] by Ensley and Teal in 1998-1999 and extends their findings with data and insights about more recent studies.

It is common for early venture creation models to list individual success factors. Newer models quickly evolved and grouped factors into categories. Early models consider a company as an independent unit, often missing the environment affection. Later models take into account the impact of the context in various forms: market, competition, industry structure or summarized as an environment.

A popular model pattern introduced by Sandberg in 1986 is found in 13 of the analyzed models. He initially includes the variables entrepreneur, strategy and industry structure. McDougall develops a similar model which includes strategy, origin, industry structure and interaction of the company strategy with the industry structure. Later studies also confirm that the interaction of strategy with industry structure is significant and plays an important role for the success of new ventures. Ensley proposes a refined model [8] in 1999 which includes the variables entrepreneurial team, strategy, industry structure and interaction of strategy with structure.

Some of the studies validate the proposed models and come to the conclusion that the human factor in the models (usually referred to as an entrepreneurial team or an entrepreneur) is insignificant according to the statistical validation results. Teal

and Hofer [9] omit the entrepreneurial team in 2003 and propose a model including a new venture strategy, industry structure, interaction of the venture strategy with the industry structure as significant variables.

Other important factors proposed in the venture creation models based on strategy and structure are origin (or location), environment, and management style. A recent model [10], developed for the entrepreneurship specifics of Russia by Shirokova and Shatalov in 2010, substitutes the industry structure variable with the more generic "environment factors". The significant success predictors in the model are environment factors, management style and strategic behavior. The table below is a comparison of prediction models based on Strategy and Structure, showing their similarities and differences.

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 recent venture prediction models are based on Sandberg. Brudel, Preisendorfer, and Zigler [11] define the survival chances of newly founded organizations with the help of a model, which includes three main factors: the human capital resources of the founder, the organizational characteristics and the environmental conditions. The full list of the success factors includes:

- Human Capital Resources of Founder
  - General Human Capital (Years of Schooling, Years of Work Experience)
  - Specific Human Capital (Industry-Specific Experience, Self Employment Experience, Leadership Experience, Self Employment of Father)
- Organizational Characteristics
  - Newness
  - Initial Size
  - Organizational Strategies
- Environmental Conditions
  - Location
  - Branch of Industry
  - Market Conditions

Lussier and Corman, 1995 [12] analyze the success and failure of small firms. They identify four significant factors for successful start-ups. These factors do not formulate a finished new venture success prediction model but can be used as a valuable insight for venture success.

- Staffing inadequacy: Businesses that select product/service that is too new or too old have a greater chance of failure than firms that select products/services that are in the growth stages.
- Planning: Businesses that do not develop specific business plans have a greater chance of failure than firms that do.
- Availability of advisors: Businesses that do not use professional advisors have a greater success chance than firms using professional advisors (at first sight this looks wrong but advisors may be necessary due to lack of skills).
- Level of education: People without any college education who start a business have a greater chance of failure than people with one or more years of college education.

An interesting model proposed by Shepherd, 1999 [13] argues that new venture's survival chances depend on the following variables:

- Stability
- Timing of Entry
- Lead Time
- Competitive Rivalry
- Educational Capability
- Industry Related Competence

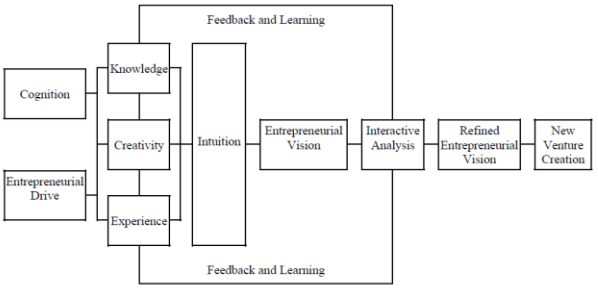
Abbas, 2008 [14] proposes a model in the context of business plan competitions. Logically, resources and environment are unimportant because all student companies start in the same environment without any capital and compete for a prize and/or financing. The factors in the model are the technological innovation, the business concept and the technical entrepreneur.

A good model which deserves attention [15] is proposed by Davis and Zweig in 2005. The factors that influence start-up success are the market, an appropriate product or service, financial resources and a solid management team. This is one of the few models that include the financial resources as an important factor.

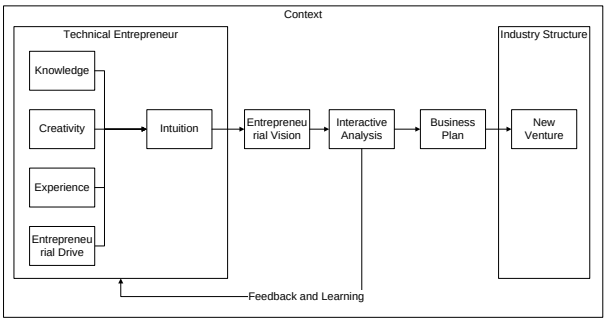
Another interesting [16] model for success prediction is presented by Åstebro in 2004. The model features the success factors: expected profitability, technological opportunity, development risk, appropriate conditions. The inclusion of the profitability and risk factors suggests that the model would serve venture capitalists well as they usually assess them. The conditions variable means that the effects of the context on the company are important for Åstebro.

VENTURE CREATION MODELS

JoAnn and James Carland [17] argue that new venture success can be predicted if we first model the venture creation as a process. In their model the entrepreneur develops a vision of the business venture based on their cognition, entrepreneurial drive, knowledge, creativity, experience and intuition. This early vision is further refined and may either be abandoned or result in a new venture creation.



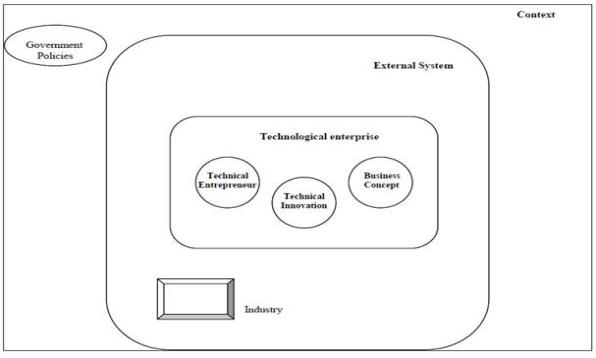
I have revised the new venture creation process model by adding a context corresponding to the strategy and structure model and substituting the refined entrepreneurial vision with the more formal business plan. The whole process takes place in and depends on the context. The initial part of the process – the formation of the entrepreneurial vision takes place in the mind of the technical entrepreneur. After analysis, changes and reconsideration, the vision may develop into a (either written or informal) business plan. The new venture then forms in the framework of the industry structure.



When the strategy and industry structure model is analyzed in the context of the venture creation process model, some valuable insights are discovered:

1. The strategy and industry structure models analyze a particular timeframe from the process model – usually the refined entrepreneurial vision or business plan stage.
2. The industry structure variable is not included in the original process model, but it serves as an environment.
3. The human factor in the strategy and industry structure models (the entrepreneur or the entrepreneurial team) partially duplicates the strategy factor. The business plan already contains the strategy which is an outcome of the entrepreneurial abilities: cognition, entrepreneurial drive, knowledge, creativity, experience and intuition.

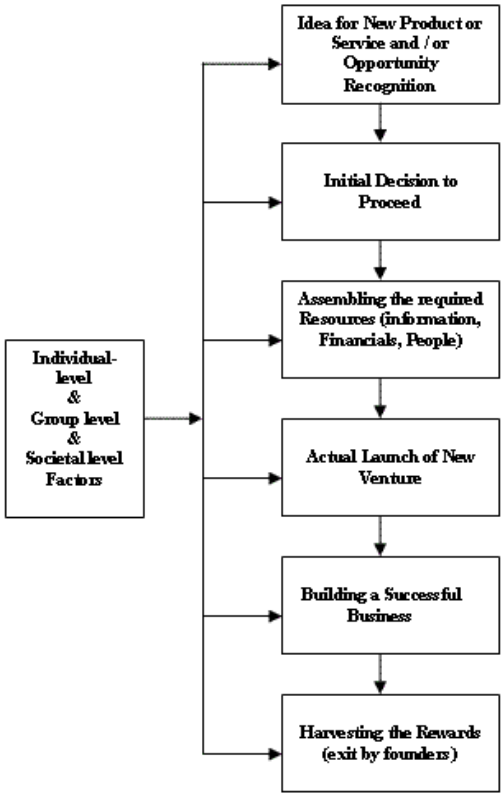
The revised venture creation process model I propose is based on [14] a model of technical entrepreneurship by Abbas, 2008. This model, together with the strategy and structure models, served as a basis for adding the impact of the environment in the process model.



Another interesting model is [18] the entrepreneurial process model by Baron and Shane, 2005.The process steps are:

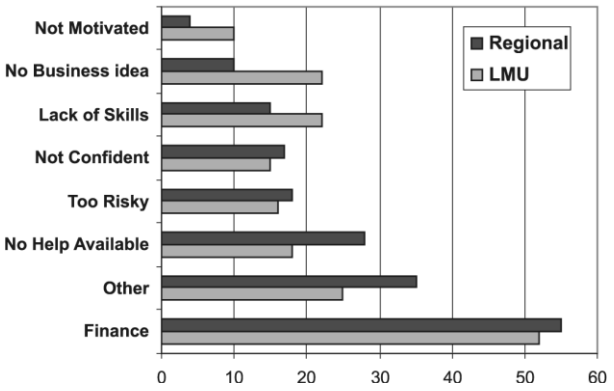
1. Idea for a new product or service and/or opportunity recognition
2. Initial decision to proceed
3. Assembling the required resources (information, financials, people)
4. Actual launch of the new venture
5. Building a successful business
6. Harvesting the rewards

The entrepreneurial process is affected by variables in three groups: individual, group, and societal. The process by Baron and Shane has a different focus than the process by JoAnn and James Carland. The first step – the idea is the equivalent of the entrepreneurial vision. The analytical stages are skipped and the focus is on the gathering of resources before the launch of the new venture. There are two post-launch stages – building the business and harvesting the rewards.



VENTURE CREATION BARRIERS

The identification of [19] barriers and the strategies for minimizing their impact on start-up companies is a key factor for success and stimulation of new businesses. The psychological barrier suggests that individuals who have certain personality traits are more likely to take a decision to start a new business. These traits are the need for achievement, the internal locus of control, the risk taking ability, the ambivalence to authority. Sociological barriers are the gender, the ethnic origin, the education, the culture. The external environment also shapes the attitudes and forms the intensions of entrepreneurs. The typical entrepreneur [20] in the UK is white, male, aged 36 years old and possesses a higher education qualification. Over 60% of entrepreneurs are at the age of 25 to 44. A large percentage of them have an expressed fear of debt and fear of failure. A large part of the population has a negative attitude to entrepreneurship which forms a significant barrier to start-ups. The next graphic shows the common reasons of UK students for not starting up a business.



CONCLUSION

Venture success prediction models based on strategy and structure are a good blueprint for designing a new success prediction model. Such a model would include the factors:

- ✓ New Venture Strategy
- ✓ Industry Structure
- ✓ Interaction of Strategy & Structure

A good practice is to include other factors in the model which may be statistically significant, such as the entrepreneurial team. Their importance can be tested with model validation and analysis of the statistical data. The abstract model will require further development for validation and practical applications. Each of the main abstract factors must have a clear and measurable definition.

When designing a success prediction model for new ventures, we must carefully focus on the state of interest from the venture creation process. The proposed venture creation process model will help to identify the factors at each step of the process. Our venture success definition (which may be growth, return of investment, venture survival, getting funded, success on competition, maintaining personal welfare etc.) is also important when designing the model. It serves as a basis, a goal and it may also constrain, complicate or simplify our task. The perspective (VC, entrepreneur, teacher, etc.) from which we look at the start-up company is closely related to our success definition and goals. The context is what makes an idea successful at a particular time and place and unprofitable at another. Context is of vital importance for new venture success and must be included in every success prediction model in some form. It summarizes many variables such as place, timing of entry, regulations, market specifics, consumer specifics.

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