

# TECHNOLOGICAL ECOPRENEURSHIP: CONCEPTUAL MODEL OF ANALYSING A BUSINESS IDEA'S SUCCESS

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**Abstract**— Developing an innovative business idea and implementing it, along with risk taking, generally defines the concept of entrepreneurship.

Entrepreneurship has a constantly expanding classification, which includes, among others, young entrepreneurship, social entrepreneurship, green entrepreneurship (ecopreneurship) and technological entrepreneurship.

Within this context, the paper aims to present a conceptual model based on the relationships between four classes of influence factors, namely characteristics of the (potential) entrepreneur, the environment, the technology and the involved resources needed for the implementation of the business idea. The business idea comes from an extended domain, namely technological ecopreneurship.

The proposed research methodology is based on a quantitative approach, namely a questionnaire based survey using a non-probabilistic sampling method due to current research limitations. It will be analyzed to what extent, as perceived by the respondents, the success of a business idea depends on each factor.

**Keywords**—Ecopreneurship, technology, environment, performance indicators.

## I. INTRODUCTION

THE success of a business idea is the goal of every entrepreneur, but no one has found the formula for success. Studies show that the main factors influencing the success of business ideas are the personal and professional characteristics of an entrepreneur, the environment inside and outside the business, the technology and also the resources necessary for the implementation of these business ideas.

This research focuses on successful business idea in technological ecopreneurship, using a number of factors. The first class of influence factors used is represented by the personal and professional characteristics of a young (potential) entrepreneur. This category includes the following factors: vision, creativity, industry knowledge, perseverance and determination, charisma and persuasion, positive thinking, passion for your own business, trust in people and attitude. The second class of influence factors that is used in this research is the environment inside and outside the business venture and

is being composed of natural-geographical environment, demographic environment, legal environment, economic environment and political environment. The third class of factors, named technology, consists of the following: the innovativeness of the business idea, the business/technology development potential, the technology globalization and the required public infrastructure. The fourth category of factors that influence the success of a business idea is contains temporal resources, physical resources (ex. machines, equipment, etc.), informational resources, financial resources and human resources. Based on these factors it has been created a conceptual model that aims to determine the success of a business idea of technological ecopreneurship.

The main purpose of this research is realizing a research method which can be used for establishing the success rate of a business idea from the technological ecopreneurial domain.

## II. CONCEPTUALIZATION OF TERMS USED IN RESEARCH

The proposed research methodology in this study is based on a quantitative approach. The latter is based on the survey, using a non-probabilistic method.

A business idea, in its way from this stage to its implementation, depends on a very wide range of factors' influence.

This research focuses on the hypothesis that an idea in technological ecopreneurship is influenced by four classes of factors, namely, the competences of the young (potential) entrepreneur, noted with ' A ', environment, noted with ' M ', technology, noted with ' T ' and resources, noted with ' R '. These kinds of influence factors are outlined in detail in what follows.

### A. From entrepreneurship to technological ecopreneurship

The word 'entrepreneur' derives from French and can be taken to mean 'taking the initiative to bridge'.

The literature gives a variety of definitions for the 'entrepreneurship' concept, but so far, scientists have not reached a consensus regarding a universal recognised

definition of entrepreneurship. By some scientists, the entrepreneurship is defined as addressing uncertainty, exploring opportunities, the creation of organisations, the path from idea to opportunity and success in business [1].

All who tried to define entrepreneurship are having something in common, namely the risk. From this point of view, the development of a new business idea in technological domain, along with risk taking, defines the technological entrepreneurship.

The technological entrepreneurship was also characterized in many ways and at different levels of analysis, such as a system [2], [3], as a policy [4], [5], [6], [7] or as an individual attitude [8], [9].

The term 'ecopreneurship' is a combination of two words, 'green/ecological', ('eco') and entrepreneurship. Ecopreneurship can be defined as 'entrepreneurship through an environmental lens'.

The best explanation of technological ecopreneurship is through an example of a business idea: micro power plants, representing a technological entrepreneurship, which comply with the environmental standards, representing a technological ecopreneurship, by association.

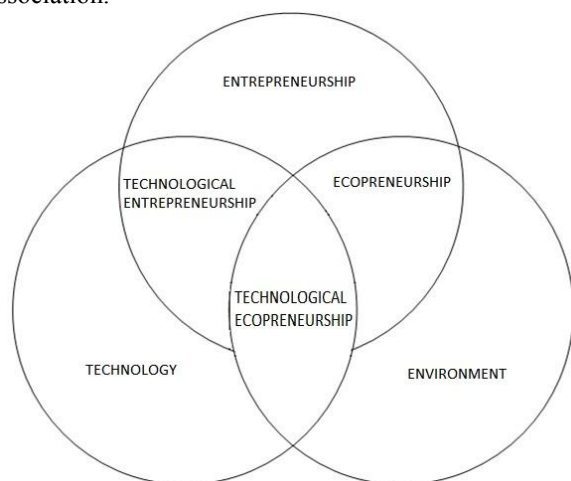


Fig. 1. Technological ecopreneurship

### *B. The competences of a young (potential) entrepreneur*

An entrepreneur is someone who organizes a business venture and assumes the risk for it.

For this study it has been used a number of nine entrepreneurial competences (TABLE I) of an entrepreneur. These competences are considered the most important and those with the most pronounced mark on the success of a business idea [1].

Factor found in the literature as one of the most important qualities of the entrepreneur's vision (A1). It is very difficult to define, because in essence represents to see what others do not see, at least not yet. Entrepreneurs need to develop a vision and determine ways to combine previously unidentified component to take advantage of perceived business opportunity [10], [11].

TABLE I  
 FIRST CLASS OF INFLUENCE FACTORS (A): COMPETENCES OF A YOUNG (POTENTIAL) ENTREPRENEUR

Notation	Influence factors
A1	Vision
A2	Creativity
A3	Industry knowledge
A4	Perseverance and determination
A5	Charisma and persuasion
A6	Positive thinking
A7	Passion for your own business
A8	Trust in people
A9	Attitude

Another factor considered to be as important as the vision is creativity (A3). Creativity and innovation are very closely related; in some cases, in the business environment, innovation may be regarded as an applied creativity. Thus, technological strategy involves a commitment of the company to acquire, develop and launch technology [12].

It is said that it is paramount for an entrepreneur to know the field of activity in which wishes to open a business. And this knowledge of the industry refers both to the knowledge, the know-how and the experience in the respective field of activity.

To be successful the idea of an entrepreneur, it must have the competence (A4), namely perseverance and determination. Giving up is much easier than risking and to try out, so to create something requires a combination of many traits, including the discipline and perseverance to transform new ideas into product" [13]. Entrepreneurs by definition are going to be some people very motivated and with a very good self-control. Thus, motivation, desire and determination play a very important role in achieving success [14].

Influence factor noted (A5), that influence the success of an idea is represented by the charisma and persuasion. Having a great business idea or being a charismatic visionary leader is "telling time"; building a company that can prosper is "clock building" [15]. Also, one of the ten most important entrepreneurial competences is persuasion – "Entrepreneurs influence other people to follow them or do something for them" [16].

Positive thinking (A6) is a factor with a special influence over the decisions that adopts an entrepreneur in the process of developing an idea. The beliefs of a young (potential) entrepreneur and the energies flowing around are having a prominent effect on the evolution of business ideas to its success.

Another factor of influence on the ideas of business success is the passion for their own business (A7).

This passion is beneficial first and foremost those who are at the first start-up and they want to implement the first idea, because passion is a pretty good motivation to have the courage to begin the adventure. Passion was identified as a key factor influencing venture capitalists investment decisions [17].

Trust in people (A8) is also a factor that puts mark on the success of a business idea of technological environment. "You can't achieve a sustainable entrepreneurship and scalable without you was based on a very simple and clear concept, called the delegation" [1].

Attitude (A9) is the latest, but not the latter factor of the new list of category of personal and professional characteristics of a young (potential) entrepreneur. A person is suitable if he has the right attitude and takes action.

#### C. Environment – influence class of factors

The success of a business idea is influenced by the environment, inside the business, as much as outside the business. So there is a new category of factors of influence (M) which includes a series of five factors. This category of factors is represented in TABLE II.

TABLE II  
 SECOND CLASS OF INFLUENCE FACTORS (M): ENVIRONMENTS

Notation	Influence factors
M1	Natural-geographical environment
M2	Demographic environment
M3	Economic environment
M4	Regulatory environment
M5	Political environment

Natural-geographical environment (M1) influences the success of a business idea based on the scope of the idea. This environment includes factors such as geographic location positioning implementation of the business idea (ex. for operation of a micro-hydroelectric plant we need running water or to build wind power plants we need the hillside with windy conditions). But also, regardless of the scope of the business (of the field of activity of a business), even when it's about an idea of technological entrepreneurship it must be complied with environmental protection standards, emission limits, European and national standards in force, so as not to pollute the natural environment.

Demographic environment (M2) is the macro-variable with numerous influences on the success of a business idea in technology. Population is in a position beneficiary of the results of successful idea, being one of the components of demand, but also as the creation of these results, as a source of labour.

Economic environment (M3) is an essential element both nationally and internationally, with a significant impact on the success of a business idea. This environment is focused on the domestic market, the external one and the financial and economic levels through production, distribution, exchange and consumption of goods services.

Regulatory environment (M4), which is called the legal framework, is represented by the system of economic - geographic area in which operates the company resulted from the implementation of the business idea. This environment has a significant

influence on the success of a business idea because it is regulating the business conduct.

Political environment (M5) always affects domestic and international success of a business idea, because it has implications both-direct and indirect, manifested by organization and state government, economic policy that promotes it, economic and community membership and political groups.

#### D. Technology – the source of innovation

TABLE III  
 THIRD CLASS OF INFLUENCE FACTORS (T): TECHNOLOGIES

Notation	Influence factors
T1	The innovativeness of the business idea
T2	The business/technology development potential
T3	The technology globalization
T4	The required public infrastructure

Technology is the current notion that is needed in implementing any business idea. There are four technologies used in this research (TABLE III).

The first influence factor from this class of factors is noted with 'T1' and represents the innovativeness of the business idea. The innovativeness is very important for the success of a business idea. It is defined by Hurt as a 'willingness to change' [18] and for Midgley and Dowling, innovativeness is a form of 'innate personality trait' [19].

The factor 'T2', the business/technology development potential, has its own proportion of influence on the success of a business venture.

The technology globalization is noted in the questionnaire with 'T3'. There is so much ideology surrounding this notion, and its implications, that it is essential to characterize globalization precisely, and then determine its extent and evolution in empirical terms [20].

For the implementation of every business idea it is needed one or more kinds of infrastructures, like the Internet infrastructure, or roads and highways. These are included in the influence factor named 'the required public infrastructure', noted with T4.

#### E. Resources – the business engine

Directly deriving from the above definition of entrepreneurship, a specific skill would appear to be particularly important: that of making use of resources (TABLE IV) that are outside the entrepreneur's control [21], [22], since entrepreneurial behaviour implies pursuing opportunities regardless of the resources under control.

Temporal resources (R1) involve the planning and evolution of the idea of success. Always, your time is precious, so precious that "time is money". This is fair enough, because if it appears disturbances in a technological process, they would have repercussions on profit in the end.

TABLE IV  
 FOURTH CLASS OF INFLUENCE FACTORS (R): RESOURCES NECESSARY FOR THE IMPLEMENTATION OF THE BUSINESS IDEA

Notation	Influence factors
<i>R1</i>	Temporal resources
<i>R2</i>	Natural resources
<i>R3</i>	Informational resources
<i>R4</i>	Financial resources
<i>R5</i>	Human resources

Physical resources (R2) represent resources that materialize a business idea. So, for a technology business idea to reach to be successful, you need resources such as machinery, equipment, and more.

Information resources (R3) are very precious, especially if they contribute and lead to a successful business idea.

Financial resources (R4) are those that often make the difference between an idea and a successful idea.

Human resources (R5) are not more important than free others factors in category of resources. These resources are irreplaceable and at the same time the most unpredictable and risky.

### III. PROPOSED RESEARCH METHODOLOGY

To measure the successes rate of a business idea it is necessary a quantitative research, based on questionnaire based survey, to establish the influence percentage of every factor and class of factors. This would be the

existing business ventures and as a result, the calibration of the model and retesting it.

The third step of the implementation of the research method is represented by a mathematical model that aims to determine the success of a business idea of technological ecopreneurship.

$$f(x) = A * X^3 + M * X^2 + T * X + R \quad (1)$$

The above equation, (1), is a polynomial one, where 'f(x)' represents the success of a business idea.

'A' represents the mean of the grades, given by the potential entrepreneurs for the influence factors noted 'A1' to 'A9' – the personal and professional competences of an entrepreneur.

'M' represents the mean of the grades, obtained through the questionnaire survey, grades given for the environments, noted 'M1' to 'M5', that are influencing the implementation of a business idea.

'T' represents the mean of the grades obtained for the appreciation of the technology's importance for the business success.

The equation factor noted with 'R' represents the mean of the grades given by the potential entrepreneurs for the importance of the resources in the implementation of a business idea.

The order of the equation factors, namely 'A', 'M', 'T' and 'R', is not random. It is determined according to the percentage given to the importance of each class of influence factors.

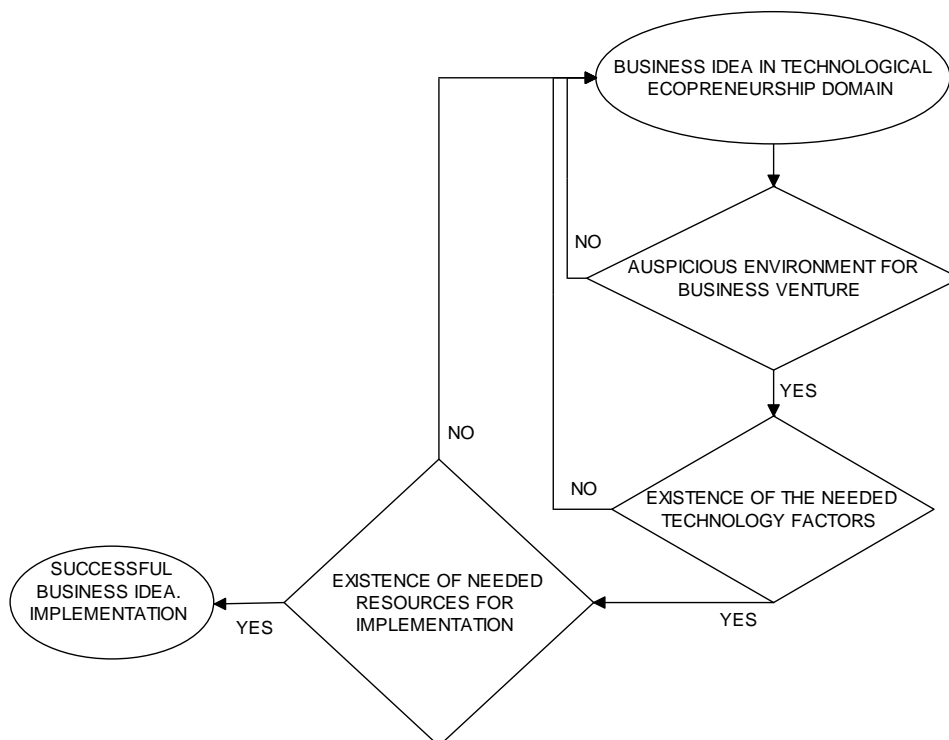


Fig. 2. Logical scheme of the conceptual model

content of the first step in the application of this research. The second step is applying the conceptual model for

The equation factor named 'X' represent a composite factor, a key factor, which shows if a business idea is

successful or not. After the implementation of this research methodology it will be established a range for the 'X' factor. If a result will be part of this range, than the initial business idea will be successful.

In Fig. 2 it is presented the logical scheme of the research methodology. It starts from the business idea that crosses a number of decisions until it has all it's necessary for the business idea to grow up into a business venture.

At first it is needed a business idea from the technological entrepreneurship domain. After it has been chosen the idea, it is necessary to search for environments that can be prosper for the idea to be implemented. For example, if we chose to build a micro power plant we need a stream, so the natural environment is very important for the implementation of this business idea.

If it is found at least one environment, the idea goes to the next decision. Here it is studied what technologies are necessary for the implementation of the business idea and also for smooth running of the business.

If there are the necessary technologies, the business idea goes to the next decision, the final one.

This is where it is made the final decision, if the business idea it can be put into application or not.

At this stage are searched the necessary resources for the implementation of the business idea. For example, if it is a business idea that uses the Internet, than for its implementation, it will be necessary an Internet infrastructure, but also has to be calculated the number of the employees, the capital and others necessary for the born of a business environment.

If these resources exist and if there are enough of them, then the business idea can be implemented.

Realizing a scale of success for a business idea is the final goal of the application of the proposed conceptual model.

#### IV. CASE STUDY

For the case study it was used a sample of 100 students, from five faculties, from "Gheorghe Asachi" Technical University of Iasi, Romania. These students are considered potential entrepreneurs. The respondents' age is between 21 and 29 years. Also, the sample is composed of 49 percent female and 51 percent male.

From the students' point of view, every influence factor from every class of factors is appreciate with a grade from 1 to 5, where grade 1 means the least important factor, and, respectively, grade 5 means the most important factor in the success of a business idea from the technological domain.

Step 1: It is been created the data base with the grades and it is calculated the grades' mean for every factor.

Step 2: Then are calculated the values for 'A', 'M', 'T' and 'R', from (1), by calculating the mean of all factors from the same class of factors. The obtained value for 'A' is 3.82; for 'M' is 3.21; for 'T' is 3.70; for 'R' is 4,28.

Step 3: The resulted equation, by replacing the obtained values, is (2).

$$f(x) = 3.28 * X^3 + 3.21 * X^2 + 3.70 * X + 4.28 \quad (2)$$

Step 4: Making the substitution (3) in (1), of which is obtained (4),

$$x = \frac{y - M}{3 * A} \quad (3)$$

$$y^3 + p * y + q = 0 \quad (4)$$

$$p = \frac{T}{A} - \frac{M^2}{3 * A^2} \quad (5)$$

$$q = \frac{2 * M^3}{27 * A^3} - \frac{M * T}{3 * A^2} + \frac{R}{A} \quad (6)$$

Step 5: Replacing values for 'A', 'M', 'T' and 'R' in (5) and (6), there are obtained the values for 'p' is -48.96 and for 'q' is 0.89.

Step 6: Using (7) and (8), the values for 'P' is 2.51 and for 'Q' is -2.54.

$$P = \sqrt[3]{-\frac{q}{2} + 2\sqrt{\left(\frac{p}{3}\right)^2 + \left(\frac{q}{2}\right)^2}} \quad (7)$$

$$Q = \sqrt[3]{-\frac{q}{2} - 2\sqrt{\left(\frac{p}{3}\right)^2 + \left(\frac{q}{2}\right)^2}} \quad (8)$$

Step 7: Solving the initial equation, we obtain three roots of this equation, which are noted with 'y1', calculated by (9), 'y2' by (10) and 'y3' by (11).

$$y_1 = P + Q = -0.0358 \quad (9)$$

$$y_2 = -\frac{P+Q}{2} + i * \frac{P-Q}{2} * \sqrt[3]{3} = -0.01 + i * (-40.19) \quad (10)$$

$$y_3 = -\frac{P+Q}{2} - i * \frac{P-Q}{2} * \sqrt[3]{3} = -0.01 - i * 4.38 \quad (11)$$

In the case that all the grades given by potential entrepreneurs were 1, then the roots of the initial equation would have been (12), (13) and (14).

$$y_1 = -0.37 \quad (12)$$

$$y_2 = -0.18 + i * 1.24 \quad (13)$$

$$y_3 = -0.18 - i * 1.008 \quad (14)$$

