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## Antecedents of New Venture Creation Decision in Iranian High-Tech Industries: Conceptualizing by a Non-Teleological Approach

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### Abstract

Entrepreneurs' decision-making process is one of the main research topics in entrepreneurship studies. This research aims to conceptualize the antecedents of new venture creation decision in Iranian high tech industries. The research utilizes an innovative non-teleological approach in order to take into account the specific regional context of Iran. Most research into entrepreneurial decision making utilizes teleological approaches; however, these models could not adequately explain the phenomena within the Iranian context. This qualitative study utilized event- based interviews with 20 nascent entrepreneurs. Results from coding, categorizing and validating the research findings, revealed 3 main categories as antecedents of new venture creation decision. Accordingly, concepts of entrepreneurial meta-cognition; primary actions and receiving feedback; and positive attitude toward change, constitute the main antecedents of new venture creation decision in this context. The findings also reveal the non-teleological nature of entrepreneurial decision-making, and adoption of some effectuation logics in the studied decision-making process.

### Keywords

Entrepreneurship, Process, New Venture Creation, Decision-Making, Non-Teleological Approach

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# Antecedents of New Venture Creation Decision in Iranian High-Tech Industries: Conceptualizing by a Non-Teleological Approach

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*Entrepreneurs' decision-making process is one of the main research topics in entrepreneurship studies. This research aims to conceptualize the antecedents of new venture creation decision in Iranian high tech industries. The research utilizes an innovative non-teleological approach in order to take into account the specific regional context of Iran. Most research into entrepreneurial decision making utilizes teleological approaches; however, these models could not adequately explain the phenomena within the Iranian context. This qualitative study utilized event-based interviews with 20 nascent entrepreneurs. Results from coding, categorizing and validating the research findings, revealed 3 main categories as antecedents of new venture creation decision. Accordingly, concepts of entrepreneurial meta-cognition; primary actions and receiving feedback; and positive attitude toward change, constitute the main antecedents of new venture creation decision in this context. The findings also reveal the non-teleological nature of entrepreneurial decision-making, and adoption of some effectuation logics in the studied decision-making process. Keywords: Entrepreneurship, Process, New Venture Creation, Decision-Making, Non-Teleological Approach*

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According to many leading experts in the field of entrepreneurship studies, the “process” of new venture creation, is the central characteristic that distinguishes entrepreneurship from other disciplines such as management and economics (e.g., Shane Locke, & Collins, 2003; Gartner, Carter, & Reynolds, 2010). Authors such as Venkataraman, Sarasvathy, Dew, and Forster (2012), Baron and Shane (2007) and Shane et al. (2003) advocate the importance of using process approaches in entrepreneurship studies and the need to study entrepreneurs in the whole continuum of the entrepreneurial process as a means of achieving a good understanding of entrepreneurial action. Entrepreneurial action is a phenomenon that results in a new venture as one of its main objective outcomes. Ignoring the formation process of these outcomes, results in a defective explanation of this phenomenon, and deviation from the main tenets of entrepreneurship as an academic discipline. In fact, due to the constantly evolving nature of the field of entrepreneurship, research monitoring of the process of new venture creation is constantly required (Gartner et al., 2010).

One of the focal concepts in the process of new venture creation is the decision-making process for new venture creation (Gustafsson, 2006). In general, the decision-making process includes identifying and defining a problem, collecting and analyzing data, building or finding alternative solutions and finally, evaluating alternatives, and selecting one of them (Abelson & Levi, 1985). In the entrepreneurial context, this process takes place under ambiguity or uncertainty (Shepherd McMullen, & Jennings, 2007), hence, entrepreneurs' decision-making is a process that can only be explained by adopting new assumptions (Sarasvathy, 2001, 2008). On this basis, familiar models based on classical and neoclassical rules, decision-making based on bounded-rationality and influenced by ends (March & Simon, 1958; Simon, 1979) and numerous models based on cognitive biases in cognitive psychology cannot reach a proper explanation for entrepreneurs' decision-making as a meta-cognitive process. The major reason

for these inappropriate explanations is the teleological approach of existing models (Buchanan & Vanberg, 1991).

The decision-making process of entrepreneurs in any society is influenced by the context and business environment (North, 1990; Fuduric, 2008). According to the Global Entrepreneurship Monitor (GEM) report (Singer, Amorós, & Arreola, 2015), Iran has a factor-driven economy which is also in transition to the efficiency-driven economy. The results of GEM (2014) show that in terms of perceived capabilities (whether individuals feel they have the knowledge and skills to start up), and early-stage entrepreneurial activity, Iran exceeds the average of its neighbours in the Asian and Oceania region. Government programmes and policies promote entrepreneurship with remarkable initiatives in Iran's "Fifth Development Plan." Access to physical and service infrastructures is a key enabler of entrepreneurship in Iran; roads, utilities, communications, water, waste disposal and generally favourable environments such as free trade zones, and industrial districts, all deliver proper supports for new and growing businesses.

Iran's physical infrastructure has been improving in recent years, however, bureaucracy and multiple tax burdens limits sustainable business activities (GEM, 2014). Furthermore, based on GEM report (Singer et al., 2015), business environment of Iran has specific conditions which is grappling with different problems. So that Entrepreneurship Framework Conditions (Finance, National General Policy, National Regulation, Government Programs, Education, Commercial Infrastructure, Internal Market Openness, Cultural and Social Norms, etc.) in Iran, have an average of 72 to 73 among 73 countries, and indexes related to Cultural and Social Norms, and National Regulation are rated low at 66 and 69, respectively. In reciprocity, relative high ranks of 21 in both Entrepreneurial Intention and Total Early-stage Entrepreneurial Activities (TEA) indexes show the percentages of people who are seeking to set up business in such an environment (25 percent), or have recently set up their businesses (16 percent) are noteworthy (Singer et al., 2015). This can be a serious challenge for these groups of people during the process of new venture creation in the context and business environment of Iran.

In this regard, there is a paucity of research exploring the process and distinguishing concepts related to the formation of entrepreneurs' decisions to create new ventures in the regional context and environmental conditions of Iran, and uncertainties arising from the environment. In this view, this research aims to conceptualize the antecedents of new venture creation decision in Iranian high-tech industries. These antecedents are a set of entrepreneur's behavioral and mental activities that have preceded the decision to create a new venture. In fact, these antecedents are the most significant factors influencing the problem identification, and evaluation stage of decision-making process, and form entrepreneurs' decisions to create new ventures. Zahra (2007) and Zahra, Wright, and Abdelgawad (2014) point to the need for contextualization in future orientations and theory building in the entrepreneurship discipline. Therefore, building propositions and concepts with regard to the context, including the dynamics, distinctive features, and limitations could contribute to a strategy for creative theorizing in the field of entrepreneurship.

### **Theoretical Background**

In entrepreneurship literature, especially in recent years, doubts have been raised about the potential of the teleological approach in explaining entrepreneurial action (Venkataraman et al., 2012), due to its origin being related to constructs and theories such as Knight's human action (Knight, 1935), human action of von Mises (1949), radical subjectivism (Lachmann, 1976) and creative market of Buchanan and Vanberg (1991). The teleological approach has caused a neglect of the process of entrepreneurial decision-making and its changes and evolutions, emergence of new ends and means, context and uncertainty.

Teleological and non-teleological approaches are used by entrepreneurs during decision-making processes. The teleological approach is based on the deterministic principles of the positivist paradigm and general equilibrium models. In this approach, objectives are predefined and available and entrepreneurial decisions are an attempt to achieve a given end through given routes and with given means. In the teleological approach, creativity of decision-making and human actions are not considered (Saravathy, Dew, Velamuri, & Venkataraman, 2003). The teleological approach is divided into two approaches, one that views the market as an allocative process and the other that sees the market as a discovery process (Buchanan & Vanberg, 1991).

The origins of the market as an allocative process are provided by positivist rules of classical and neoclassical schools. There isn't any theory or model raised related to entrepreneurial decision-making in these economic schools. Casson (1982) specified this issue to the assumptions relating to access to information. Classical and neoclassical models assume that all market actors have access to all the relevant information needed for decision-making. This assumption degrades decision-making processes as far as the use of mechanical and mathematical rules for optimization and downplays the importance of knowledge dispersion and uncertainty, making it impossible to analyse special decisions and actions of entrepreneurs. Models such as the model of strategic decision-making based on attributes removal (Tversky, 1972) and the conceptual framework of the decision-making process (Mintzberg, Raisinghani, & Theoret, 1976) are attempts to contrast with the assumptions of perfect information and homogenous market actors in schools of classical and neoclassical economics. But since these patterns are largely dependent on rational assumptions, they are not extendable to all entrepreneurs, because of differences in cognition and decision making logics.

Foundations of development of the market as a discovery process are the principles of modern Austrians- in particular Kirzner (1997). A model based on this approach, is the decision-making model based on the theory of bounded-rationality. The core concept of the current model is the concept of cognitive limitations of decision-maker. Decision-making based on bounded-rationality has an appropriate conformity with numerous models influenced by the concepts of cognitive biases and decision heuristics of entrepreneurs. Simon (1979) states that it is not possible to achieve a high degree of rationality in decision-making. As the number of alternatives and information needed for them are very broad, therefore individual's decisions take place in an environment full of givens. The individual uses these givens as the basis of decision making. In fact, goals provide limitations and givens of the decision framework. This concept is referred to as bounded-rationality (March & Simon, 1958). Similarly, in cognitive psychology, heuristics are confirmed as tools for responding to uncertain and complex environments. In these studies, some types of particular biases in most of decision-making processes are explored (Kahneman, Slovic, & Tversky, 1982).

In the process of decision-making with teleological approach, the concept of future is a predictable, knowable and given end. It is worth noting that knowing of future in allocative process is made based on the assumption of exploiting a perfect knowledge of future, and in the process of discovery, by exploiting information asymmetry, conjectures, and tacit dispersed knowledge related to expectations and errors of other market actors (Kirzner, 1997).<sup>1</sup>

On the other hand, the non-teleological approach is based on the prevailing principles of radical subjectivism paradigm. Assumptions of this paradigm are derived from the intellectual foundations of thinkers such as Lachmann (1976). In the non-teleological approach, a substantial role can be considered for potentially creative decision-making of entrepreneurs in establishing new businesses and markets. In entrepreneurship literature, especially in recent

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<sup>1</sup> According to Buchanan and Vanberg (1991), subjectivism of new Austrians including Kirzner (1997), has outstanding and significant differences from scrutinized "radical" subjectivism of non-teleological approach.

years, more debates about the non-teleological nature of entrepreneurial decision-making process have been proposed (e.g., McMullen, 2015; Venkataraman et al., 2012). Mentioned propositions during these discussions put assumptions of entrepreneurial decision-making in contrast to the assumptions of rational decision-making and decision-making models based on bounded-rationality. In rational models of decision-making and decision-making based on bounded-rationality, decisions are influenced by available means and ends (March & Simon, 1958; Simon, 1979). However, based on the theory of effectuation, in the entrepreneurial decision-making process, these are decisions that affect ends and create opportunities, information, directions and new institutions (Sarasvathy, 2008; Sarasvathy & Dew, 2008). The non-teleological approach corresponds to the particular case of market as the creative process (Buchanan & Vanberg, 1991). In this approach, future is considered as an evolutionary phenomenon. More precisely, passing of time is necessarily along with creating new knowledge and changing the body of knowledge. This attitude to the relationship between time and knowledge is consistent with the view of Gartner et al. (2010), which specify entrepreneurial behavior (a process evolving over time) as the core characteristic of entrepreneurship phenomenon.

In non-teleological approach to the process of decision-making, since man as the central factor of future creation, has a creative nature, future at the point of decision is non-existent and clearly, non-existent future cannot be predicted rationally (Buchanan & Vanberg, 1991). There is no perfect knowable future and hence, prediction of the future is not possible based on the positivist principles of natural sciences which are inspirational to the classical and neoclassical schools of economics. In fact, in the process of entrepreneur's decision-making, ends are not precise and perfect, whether they are not pre-defined or pre-determined as they emerge within the process. In other words, there is no tacit or perfect knowledge presumption regarding objective realities and pre-determined directions in order to achieve pre-determined ends. With such a viewpoint, entrepreneurs' actions are based on the will and freedom in their choices. Thus, decisions of these special individuals are made in an open-ended path (McMullen & Dimov, 2013). These are entrepreneurs who as designers of future and by their effective actions create new means-ends and their decisions are not based on defined paths in history but are basis of change and creating history. Therefore, the decision of entrepreneurs to create new ventures has a potentially creative and effective nature, and by following changes and evolutions causes the emergence of new ends, paths and means (McMullen, 2015).

### **Methodology**

The principles of non-teleological approach are derived from fundamental principles of radical subjectivism paradigm. In this paradigm, Reality is subjective and multiple, as seen by participants in the study. Besides, with an epistemological viewpoint, the nature of knowledge in this paradigm is subjective. Therefore, in this research, knowledge about the entrepreneurial decision-making processes has been considered to be subjective. Likewise, from methodological aspect, accessing subjective knowledge requires taking advantage of the methods of knowledge acquisition from images of reality in mind. In practice, research is conducted in the context which is important for understanding what the participants are saying. Since the purpose of this research is exploration with a non-teleological approach in conceptualizing the antecedents of venture creation decision, its aims are achievable through exploratory and qualitative research designs. For this reason, the research was conducted by using an explorative and qualitative (multiple case study) design. However, as Creswell (2013) notes, process of the research is inductive, emerging, and continuously should be revised from experiences in collecting and analyzing the data in the field.

Population frame of the research were nascent entrepreneurs (owners and founding managers) of high-tech industry SMEs<sup>2</sup> located in Tehran city. Also, consistent with the definition of Total Early stage Entrepreneurial Activity (TEA) by Global Entrepreneurship Monitor (Singer et al., 2015), at the time of research field study, less than 42 months had been elapsed from the date that their firms started trading. The data related to the research population frame are prepared and available each year by the Iran Vice-Presidency for Science and Technology; Iran Ministry of Industry, Mine and Trade; and Industrial Development and Renovation Organization of Iran. Besides, the required permits for recruiting the participants (based on the research theoretical sampling process) were provided by the above-mentioned organizations.<sup>3</sup> The criterion for determining sample size was theoretical adequacy or reaching saturation in research. This means that new sampling and interviews were continued until no new data or information were obtained regarding the development of the categories. Also, purposive theoretical sampling was implemented as a sampling method in a manner that required an integrated simultaneous gathering and analysis of data. Thus, sampling was non-probability and was continued until the theoretical adequacy. This was obtained during interviews with the 18<sup>th</sup> to the 20<sup>th</sup> samples.

All of the participants were Persian Muslim nascent entrepreneurs with a wide range of age from 32 to 73, among them five were female. Whereas, the most outstanding demographic characteristic of the sample of entrepreneurs was the high level of their education. So that 2 participants with B.Sc. degrees, 7 with M.Sc. degrees, and 11 participants holding Ph.D. degrees comprised the theoretical sample of current research. The other feature was a direct connection between entrepreneurs' education and their businesses fields of operation. This point reveals the substantial role of higher academic education in allowing these entrepreneurs to enter the high-tech industries.

In order to gather data for the research, a data collection protocol was initially developed. Moreover, the interview protocol was developed during the revisions made after primary interviews. Data gathering was done via numerous qualitative event-based interviews with 20 nascent entrepreneurs of the research theoretical sample (at least three interviews were done with each participant at different times during the integrated process of data gathering and analysis). To provide ethical research practices, during the interviews, the participants have been assured to their safety and privacy and confidentiality of their opinions and answers to the questions. Subject of the interviews was the event of venture creation decision, and in terms of time, the open-ended questions of the interviews concerned periods, conditions, activities, beliefs and states before that core event. The core logic of the interviews was based on Dale's zero-based information logic (Dale, 1991). In the zero-based information logic, blankness of the researcher's mind of any judgment or foregone conclusion during a field study is emphasized. Based on this logic, the researcher should minimize biases and incomplete information interferences in favor of discovering the truth in research process. Insisting on this logic, makes the researcher gather and analyze information that would help in increasing the actual knowledge within the framework of the research process.

The trustworthiness of research that has been suggested by Guba and Lincoln (1989) as a criterion for joint assessment of reliability and validity in qualitative research, was assessed using elements of credibility, transferability, dependability and conformability. Besides, some structured processes to write, record and interpret data (such as qualitative data analysis software), and also parallel analysis and comparison of findings were employed for further improvement of reliability.

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<sup>2</sup> Small and Medium-sized Enterprises

<sup>3</sup> This study was conducted and approved by the reviewers board of the Faculty of Entrepreneurship of University of Tehran.

Analysis process of gathered data began simultaneously and integrated to data gathering. The process initially was done via coding and detailed line by line or part by part analysis of verbal cues hidden in memos, field notes or short pieces of data. This stage of coding continued until the initial emerging of categories. During this stage, a kind of conceptual control over the data was obtained. For data categorization, inductive process of constant comparative method (Glaser & Strauss, 1967) was applied which is a useful method to identify patterns in the data and to organize large amounts of data so as to abstract categories in qualitative researches (Fram, 2013). By using this method, incidents to incidents, concepts emerging from further incidents in new data, and concepts to concepts were compared. These constant comparative analyses demonstrated analytical discriminations and was continued until theoretical saturation was reached. Theoretical saturation is obtained when no more new code related to a specific category, is recognized in final stages of data gathering. In other words, the categories are well developed. Therefore, during this process, categories were developed and their sub-categories, properties and dimensions became apparent. Various methods of reducing biases and improving theoretical sensitivity were employed in all these steps. Examples of such methods include the use of questions, near and far comparisons and the use of the partners in research process. The above mentioned methods are solutions to observe the actual meaning of data and crossing from description to achieve a level of theoretical analysis. Validating of findings was conducted through strategies such as triangulation, member checking, experts' opinions regarding the results, and comparisons with the criteria contained in the original literature.

### Research Findings and Discussion

The results of coding process, categorizing and validating of findings, has determined 3 main categories as antecedents of new venture creation decision. Accordingly, the concepts of entrepreneurial meta-cognition (i.e., a dynamic process of monitoring, evaluating and selecting among available cognitive mechanisms in response to an entrepreneurial task), primary actions and receiving feedback; and positive attitude toward change, constitute the antecedents set of new venture creation decision in the sample of entrepreneurs.

In Table 1, a summary regarding the results of analysis on gathered data and validating of research findings is provided. Codes in the right column of Table 1 refer to the codes of research participants, or in other words, entrepreneurs of the theoretical sample. On this basis, verbal cues derived from gathered data through interviews with the referred entrepreneurs, have significant effects on the coding process and formation of corresponding main categories and sub-categories. In the middle column of the table, sub-categories associated with each of the main categories are considerable, and finally, the left column of Table 1 belongs to the main categories.

Table 1: Results of analysis on gathered data and validating of research findings

Main Category	Sub-category	Participant code
<b>Entrepreneurial Meta-cognition</b>	Entrepreneurial Intention	1 – 2 – 3 – ... - 20
	Opportunity Intention	1 – 2 – 3 – ... - 20
	Cognitive Biases	1 – 2 – 3 – ... - 20
	Realistic control belief	1 – 2 – 3 – ... - 20
	Trust in God	1 – 2 – 3 – ... - 20
	Communicating with supporting governmental organizations	1 – 2 – 3 – ... - 20



<b>Primary actions and receiving feedback</b>	Feasibility studies	2-3-4-5-6-8-9-10-11-12-13-14-15-17-18-19-20
	Primary income-generating actions for financing	1-2-3-4-5-6-7-8-11-12-13-14-15-16-17-18-19-20
	Work-team forming	1 – 2 – 3 – ... - 20
	Starting lab. and semi-industrial project, prototyping and initial testing	1-2-3-4-5-6-7-8-9-13-14-15-16-17-18-19-20
	Actions for receiving official certificates and licenses	1 – 2 – 3 – ... - 20
	Actions for resource acquisition and mobilization	1 – 2 – 3 – ... - 20
	Interacting with potential business customers	1 – 2 – 3 – ... - 20
<b>Positive attitude toward change</b>	Need to change	1-2-3-4-8-9-10-12-17-19-20
	Commitment to change	1 – 2 – 3 – ... - 20
	Motivation for change	1 – 2 – 3 – ... - 20

In the rest of this section, to illustrate the grounded nature of the developed categories in the data originated from the field, some vignettes or verbal cues related to each category are presented correspondingly. Moreover, external support based on valid literature is provided in the appropriate cases.

Remarks of interviewed entrepreneurs showed that these people have taken advantage of Entrepreneurial Meta-cognition as an influential mental activity on their decisions. This concept is a dynamic process of evaluating and selecting among available cognitive mechanisms based on motivations, givens, strengths and weaknesses of the individual entrepreneur. In this process, the Individual takes advantage of an overall awareness and monitoring on his/her perception of specified entrepreneurial task. Entrepreneurial Meta-cognition facilitates the evaluation of multiple solutions (such as the choice between causal and effectuation logics) in response to an entrepreneurial task. In this regard, Haynie, Shepherd, Mosakowski, and Earley (2010) specify that meta-cognitive processes are directly related to the desired output of entrepreneurial tasks. On the other hand, conducted analysis on gathered data shows that entrepreneurial orientation, entrepreneurial alertness and entrepreneurial self-efficacy have been the most significant factors in development of the entrepreneurial, and the opportunity intentions of the research participants. Entrepreneurial intention is a process in which an individual chooses entrepreneurship as a career choice among other various options for employment. This intention is formed when entrepreneurship has been considered as a career alternative and its feasibility perception is in such a way that the individual believes that success will be achieved by choosing entrepreneurship. Opportunity intention is a process in which a third-person opportunity becomes a first-person opportunity. In other words, through this process, a belief in the possibility of exploiting opportunities is shaped in a nascent entrepreneur's mind (Dimov, 2007). It is worth noting that in the decision-making process of some entrepreneurs participating in this research, entrepreneurial intention was prior to opportunity intention, and on the contrary, in other participants opportunity intention was prior to entrepreneurial intention. In this case, current research findings correspond to the findings of Bhawe (1994).

On the other hand, as mentioned by the participant with code 12, cognitive biases and heuristics along with realist control beliefs have been involved in decision-making process of interviewed entrepreneurs:

So in this particular case, an individual who wants to enter this special field has to take risks and also be a hardworking man. He should be optimistic. In general, I am risk-taking. Then, in a sense, I was courageous, but at the same time, this optimism and risk-taking behavior for me, was quite different from the ignorance, disorganization and lack of research and effort. I had to try and investigate and also I had to be alert. One who is more successful in this field is the one who investigates more and is more careful too. In total, considering a roadmap, identifying opportunities and threats could help to a great extent. This task required attention, preparation and lots of investigation.

As De Carolis and Saparito (2006) have also affirmed, entrepreneurs make use of several kinds of cognitive biases and heuristics frequently during their decision-making process for exploiting entrepreneurial opportunities and creating new ventures. Aforementioned biases cause entrepreneurs to have a lower level estimation of real risks associated with entrepreneurial tasks. Research findings show that the self-efficacy characteristic of the entrepreneurs has been a determinant factor in utilizing these heuristics. In addition, besides the cognitive biases, analysis of extracted verbal cues reveals the realist control belief of the Interviewees. This belief - which has been arisen from the regulatory focus of these Individuals - makes them have a realistic perception of the risks associated with their venture creation process. This proposition has been acknowledged by Hayek (2012) about the relationship between realistic control beliefs and risk perception. These findings correspond to the findings of Tumasjan and Braun (2012) as well, which describe self-regulation as a combination of self-efficacy and regulatory focus. Tumasjan and Braun (2012) recognize self-regulation as a necessary factor in progress of venture creation process.

Trust in God is also a concept which found a sub-category place, based on the entrepreneurs' statements and after the research analysis. Findings indicate that these entrepreneurs had trust in God as a spiritual strategy in their minds to deal with various uncertainties of high-tech institutional context and ambiguities facing their entrepreneurial tasks. According to the participants, divine will is a super natural force beyond all forces which depends on human actions. Therefore, if their actions in the market get real positive outcomes for themselves and their society, they will be directed to praiseworthy ends reliant on God's protection. This issue can be related to the regional culture, religious and national values of the research sample of entrepreneurs as a sample of Persian Muslim entrepreneurs. Furthermore, this concept could have a significant relationship with the particular context of Iran. Thus, because of carrying out research in other different contexts, few valid studies could be found pertaining to conceptualization or explanation of the mentioned factor impacts on decision-making process of entrepreneurs.

During the interviews, it became clear that a set of primary actions and feedbacks received during the proceedings have made a prominent effect on forming the entrepreneurs' decisions. For example, the participant with code 2 noted:

At first we communicated with a foreign company and got an agency from it. After examining strength and weakness points of the product, whether in technical aspects or in the field of local market needs and customer requirements, we produced our own product and registered our company. In fact, our primary activities were in a way that we had bought the product from

foreign company, and we implemented some assessments on it during a number of projects. Along with these measures, our technical team examined obtained information from our executive branch, including customers' feedbacks and delivered them to the research and development branch. During this period of about two years, we examined efficiency and structure of the product so that its features, strengths and weaknesses became clear to us. Finally, after solving the problems of foreign product, we produced our own product.

A complete list of these measures is provided in sub-category column of Table 1. The important point to be noted in this section is the contextualized property of some of these sub-categories due to contextual conditions of Iran business environment. Communicating with supporting governmental organizations and primary income-generating actions (such as participating in sales agency activities and businesses with short return periods) are some examples of these actions. Besides, during these primary actions, entrepreneurs have established useful interactions with customers and stakeholders, prior to making the decision of venture creation. Information and feedbacks that entrepreneurs have acquired in this way concerning market demands and customers' needs have played a distinguishable impact on their decisions to create new ventures. This is consistent with the non-teleological nature of entrepreneurial decision-making in the market as a creative process (Buchana & Vanberg, 1991), and entrepreneurs' empowerment cycle in effectuation logic (Sarasvathy, 2001, 2008). In this cycle, feedbacks from the initial actions of entrepreneurs act as inputs for making their subsequent decisions. Furthermore, part of the findings in this section is similar to the findings of Maine et al. (2015), which demonstrate that entrepreneurs of high-tech industries can apply a mixture of causal and effectuation logics in response to the changing environment conditions and according to the different environmental variables. In other words, they can apply causal logic in one particular part of an entrepreneurial task, and in other part of the task, make decisions consistent with the principles of effectuation logic.

Positive attitude toward change is another concept that became clear after the research analysis process. As mentioned by the participant with code 12, need to change as a major issue, along with a commitment to make change in both personal life and the market are two factors playing important roles in making the decision to create new ventures by the participant entrepreneurs.

..., but an unexpected change adopted in the regulations, and my salary was halved. On the other hand, after a while, my contract with ... was expired. All of a sudden, I was faced with a very special revenue decline. At the same time, a hospital which was located in a foreign country, invited me to work. As my salary was too close to one-third and I could not do anything in Iran, so I accepted that offer and went abroad. Since my family had a hard time there, after a while, I decided to return to Iran, but in a way that I would no longer become dependent on government salaries.

Need to change has been a major problem facing entrepreneurs, and venture creation has been seen as the solution to that problem. The behavioral resilience characteristic of the entrepreneurs had a significant impact in unfolding of commitment to change sub-category regarding to these entrepreneurs. This characteristic is a kind of positive psychological capital that provides entrepreneurs with determination and perseverance required for dealing with obstacles (Hayek, 2012; Luthans, 2002). According to the interviewed entrepreneurs, awareness about this characteristic could have played a significant role in making their decisions to face numerous hardships and obstacles facing their way of creating new ventures.

In this regard, several obstacles were recognized by the research participants derived from micro business environment of high-tech industries, and also national macro business environment.

Finally, motivation for change is another notable sub-category which has an imperative role in forming the venture creation decisions of the sample of entrepreneurs. Shepherd et al. (2007) specify motivation as a factor which is determinant in forming both entrepreneurial and opportunity intentions which lead entrepreneurs toward making venture creation decisions. Motivation provides the willingness for making the decision and pushing the entrepreneurial process forward (Shane et al., 2003). In other words, entrepreneurial and opportunity intentions, along with motivation would turn into venture creation decision (Shepherd et al., 2007). According to the findings, in addition to entrepreneurs characteristics and background such as given means, some contextual conditions like current situation dissatisfaction, dynamic scientific environment and possibility of accessing governmental incentives, have been some incentives in motivating the interviewed entrepreneurs to make venture creation decisions.

### **Conclusions, Limitations and Implications**

In the entrepreneurship literature, few studies have been done based on the principles and assumptions of a non-teleological approach to the process of entrepreneurial new venture creation. Consequently, it is essential to carry out more research designs based on epistemological and methodological elements of non-teleological approach to the decision-making process of entrepreneurs. Accordingly, current research aimed to conceptualize the antecedents of decision to create new ventures by adopting a non-teleological approach. The process of coding, categorizing and validating the research findings determined three categories of entrepreneurial meta-cognition, primary actions and receiving feedback and positive attitude toward change as the antecedents of new venture creation decision in a sample of nascent entrepreneurs in Iranian high-tech industries. This conceptualization became possible and practicable by choosing and utilizing the philosophical assumptions of non-teleological approach for exploring the process under study. Consistently, based on the research results, the final decision of new venture creation in this context, is not an instantaneous made decision, but as an output of the process, is a consequence of a sequence of empowerment cycles. Entrepreneur's mental images of end have been changed several times during the process. This corresponds to non-teleological nature of the market as a creative process of Buchanan and Vanberg (1991). This also reveals the non-linear evolutionary essence of the future which points to the emergence of end during the process of decision-making (McMullen, 2015). In such a process, passing of time is necessarily inseparable from creation of new and radical knowledge (Lachmann, 1976). Therefore, future is uncertain, undetermined and unpredictable at the opening point of decision-making process. Similarly, ends are not predefined perfectly. As a result, substantial role of the interviewed entrepreneurs as creative designers of new means-ends in emergence of new ends within an open-ended process is significant.

According to the research findings and results, governmental incentives and supports as some contextual conditions have been fundamental motivators in leading the sample of entrepreneurs to make decisions for creating ventures in high-tech industries. It seems that this factor in practice could play a key strategic role in providing motivation for making these entrepreneurial decisions. Correspondingly, pursuing former policies of support and supplying new facilitators may be a key focus point in policy-makings intended for future development of businesses in these strategic industries. Results also indicate that the dynamics of scientific environment in high-tech fields, and the recent increasing rate of knowledge creation related to these fields in Iran are some other context specific dimensions. These factors have also

played a significant role in stimulating entrepreneurs of the research sample to make decisions for creating ventures related to these fields. Similarly, supporting scientific and research activities may provide an enabling environment for future creation of new businesses and knowledge commercialization.

It is recommended to potential and nascent entrepreneurs to improve their heuristics and entrepreneurial decision-making skills, as well as relying on their entrepreneurial competencies. This can be achieved through counseling and connecting to competent consulting organizations, especially in areas such as providing business plans, product design, business environment, and market studies. Besides, due to the utilization of outstanding effectuation logics in the studied decision-making process, providing relevant information and helpful feedbacks by relevant stakeholders for involved nascent entrepreneurs, may aid these entrepreneurs in their decision-making process.

The developed concepts are context specific, so that the decision antecedents are specific to the context which provides the environment and conditions of forming the decision-making process for new venture creation in Iranian high-tech industries. Therefore, due to the qualitative design of the study, the research has its limitations, so that its conclusions and implications may not be generalized or appropriate in other contexts. A suggestion stemming from this limitation is that future studies may replicate the non-teleological approach employed here to explore the process of new venture creation decision-making in different contexts. Additionally, it would be interesting for future researchers to examine the validity of the results of this research within other discrete or larger samples. It is promising for empirical researchers to test out the generalizability of current results to other statistical population frames using quantitative techniques, especially other areas of high-tech industries. In this way, it may be possible to draw broader conclusions about the process of new venture creation decision-making.

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