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AN INSIGHT INTO EFFECTUATION AND ITS USAGE IN PSYCHOSOCIAL ENTREPRENEURIAL RESEARCH

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ABSTRACT

This article gives a detailed insight into the concept of Effectuation which was developed by Dr Saras.D.Sarasvathy and its varied usage in Psychosocial Entrepreneurial Research. Decision making is an inevitable skill for all entrepreneurs. How do they make decisions and is there any universal principle or method behind their decision making ability? The term "Effectuation" answers this question. It is defined as "a logic of thinking that uniquely serves entrepreneurs in starting businesses". It also creates a way to regulate a completely unpredictable and unknown future. Effectuation is a psychosocial dimension, based on heuristics which does the do-able in order to know how to run a business successfully. It offers a new perception to the old domain of entrepreneurship. This paper explores the antecedents to effectuation and also studies the impact of effectuation on new venture performance. The authors of the paper aimed to conceptually explore the mediating role of technology orientation in the relationship between effectuation and new venture performance. The model proposed by the authors incorporate a serial mediation approach and is also found to highlight the undeniable and influential role played by effectuation in entrepreneurial research. This paper can be further explored empirically by researchers and academicians in the field of entrepreneurship.

KEYWORDS

Effectuation; Psychosocial Dimension; Heuristics; Discovery of Opportunity; Innovation Orientation; Technology Orientation; New Venture Performance

I. INTRODUCTION

Decision making skills are very important for entrepreneurs in the dynamic technology driven environment. Entrepreneurial decision making facilitates the new venture to sustain and flourish in a dynamic, immature and uncertain market environment. Various models like causation, effectuation, etc aids in the process of managing a firm. In simple terms causation model means focussing on a predetermined goal and then finding means to achieve this goal. New ventures as said above operate in a dynamic, immature and uncertain environment and the entrepreneurs running these new ventures also suffer from lack of reputation and scarcity of resources. It is impossible to apply the causation approach in these kind of situations (Long *et al*, 2017). In order to overcome the lacunae created by causation many researchers engaged in exploring entrepreneurship, and one such researcher gave a solution to this in the name of effectuation theory (Sarasvathy, 2001). It is defined as "a logic of thinking that uniquely serves entrepreneurs in starting businesses". It also creates a way to regulate a completely unpredictable and unknown future. Effectuation in simple terms is a thinking framework, based on heuristics which does the do-able in order to know how to establish the services and products.

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While studying the importance of effectuation in entrepreneurial research it is mandatory to study the antecedents of effectuation as this type of research is still in its infancy (Long *et al*, 2017). Various researchers found environmental uncertainty and social capital (Meuleman *et al*, 2010), resource flexibility and organization structure (Da Costa, 2010) and entrepreneurial experience (Wiltbank *et al*, 2009) as antecedents to effectuation. There exists a need to study the antecedents of effectuation which is found to create an impact in the effectual decision making process. This paper conceptually explains the impact of discovery of opportunities and innovation orientation on effectuation by taking into account the past research studies. Discovery of opportunity holds two different perspectives namely fortuitous discovery (Kaish & Gilad, 1991) and systematic search (Herron & Sapienza, 1992). Fortuitous discovery is more inclined towards the alertness exhibited by the entrepreneurs, whereas in the systematic search approach the entrepreneurs intentionally search and exploit valuable information. The alertness exhibited in the fortuitous discovery is nothing but a psychological phenomenon of discovering opportunities which helps entrepreneurs to face new events (Gaglio & Katz, 2001). Various researchers have studied the importance of innovation orientation towards effectuation (Gatignon & Xuereb, 1997; Hurley & Hult, 1998 & Calantone *et al*, 2002). They believe that there are two perspectives to measure firm's innovative orientation. They are cultural and behavioural innovativeness. Cultural innovativeness is nothing but the reflection of the firm's capacity to exhibit innovativeness, whereas behavioural innovativeness measures the firm's reaction towards an innovative new challenge. A researcher named Samuelsson in his research work in 2004 indicated the importance of opportunity innovativeness which provides a third perspective to innovative orientation. Opportunity innovativeness is understood as the process responsible for improving the existing means-ends relationships i.e. the methods through which one achieves a goal and produces an output (Eckhardt and Shane, 2003). These antecedents are found to impact effectuation. Further with reference to the past research studies the effectual principles and found to impact technology orientation. Thus the authors of this paper attempts to study the role of technology orientation in the relationship between the effectual principles and new venture performance. Globalization urges the developing countries to pursue technological orientation in their business to gain competitive advantage for sustaining the global competition (Urban & Barreira, 2009). Firms pursue technology orientation i.e they adopt to the advancements in innovations and technology and are also engaged in making investments in disruptive technologies and discontinuous innovations for creating new business entries in the market (Brettel *et al*, 2012; Schindehutte *et al*, 2008). This paper also studies the direct impact of the principles of effectuation on new venture performance. The author delineates the five basic effectuation principles as given by Dr Saras.D.Sarasvathy in 2009. They are Bird-in-hand (starting with the resources at hand), Affordable Loss (focussing on the risk), Lemonade (dealing with leveraging contingencies), Crazy Quilt (forming partnerships) and Pilot-in-the-plane (dealing with the control and predict mechanism). Finally the author of this paper conceptually highlights the mediating role of the effectuation principles on the relationship between discovery of opportunity & new venture performance and innovation orientation & new venture performance. The authors of this paper have also highlighted the mediating role of technology orientation on the relationship between effectuation principles and new venture performance. This paper is an attempt made by the authors to develop a conceptual model with a serial mediation incorporating the principles of effectuation.

II. REVIEW OF LITERATURE

Effectuation

The term effectuation was initially proposed by Professor James in 1912 which was later on introduced to the management domain by Professor Sarasvathy in 1998. The theory of effectuation disproves the primary assumption of management studies and economics and engages in proposing novel assumptions which is found to be in coherence with decision – making skills of entrepreneurs (Long *et al*, 2017). Effectuation is nothing but a decision making process encompassing a thinking framework based on heuristics in a dynamic and uncertain environment. Effectual logic also helps the entrepreneurs to overcome obstacles in an immature market. Effectuation is held responsible for idea creation, stakeholder commitment and making decisions. It aids in advancing ideas towards selling products and services and also helps increase the customer base through these effective ideas. It also facilitates the process of finding partners for entrepreneurs for co-creating firms. Finally aids in decision making by providing a set of techniques which serves as a foundation on which decisions are build. The effectuation model has been built on the following three aspects namely, Knightian uncertainty (lack of any measurable knowledge about an event or situation which could probably occur, as opposed to the already present measurable risk), ambiguous nature of the goal and environmental isotropy (explains that which part of the environment is useful for efficient decision making) (Sarasvathy, 2009). Effectuation basically explains specific entrepreneur's behaviour in creating new ventures under uncertainty. In 1998 Sarasvathy has started researching with effectuation. She adopted verbal protocol analysis in which the selected entrepreneurs who are experts in their field are asked to talk continually aloud about the problems they faced and the decisions they made. Based on this experiment she has initially extracted four principles namely strategic partnerships, affordable loss, controlling the unpredictable future and leveraging contingencies. Based on these four principles, five views of effectuation was developed (Sarasvathy, 2009). The five basic views or principles are entrepreneurs

- initiate their actions with the set of means available at hand,
- concentrate more on the affordable losses and then engage in experimenting with the available resources,
- emphasize more on strategic alliances in order to reduce the uncertain nature of the environment,
- leverage the contingency present in the environment &
- seek a control mechanism towards an unpredictable future.

These five principles are named as bird-in hand, affordable loss, crazy-quilt, lemonade and pilot-in-the-plane. Later on various researchers gave different sub constructs for effectuation disguised as principles (Read *et al*, 2009; Garonne *et al*, 2010; Chandler *et al*, 2011 & Gabrielsson & Politis, 2011). The following table summarizes the multidimensional constructs of effectuation.

TABLE 1: List of Constructs of Effectuation

RESEARCHERS	CONSTRUCTS OF EFFECTUATION
Sarasvathy, 2009	- Bird-in-hand - Affordable loss - Crazy-quilt - Lemonade - Pilot-in-the-plane
Read *et al*, 2009	- Available means - Affordable loss

	- Partnerships - Leveraging contingency
Garonne *et al*, 2010	- Affordable Loss - Attitudes towards contingency - Control - Development of partnerships - Use of internal resources
Chandler *et al*, 2011	- Experimentation - Affordable loss - Flexibility - Pre-commitments
Gabrielsson & Politis, 2011	- Market definition - Goal orientation - Attitudes to uncertainty - Stakeholder - Market research

ANTECENDENTS or FACTORS IMPACTING EFFECTUATION

The following section comprises of literature review related to the antecedents or factors impacting effectual principles in entrepreneurial research. It explores the relationship between the dimensions of discovery of opportunity and effectuation and the facets of innovation orientation and effectuation.

Discovery of Opportunity and Effectuation

Entrepreneurial actions help in recognizing opportunities which is a multistage process beginning with innovative ideas and evolving into achievable opportunities (Dimov, 2007). According to Bhave, 1994 there are different types of discovery of opportunity. The two general perspectives are found to be fortuitous discovery (Kaish & Gilad, 1991) and systematic search (Herron & Sapienza, 1992). Austrian school of thought proposed a new pattern of discovery of opportunity namely fortuitous discovery (Kaish & Gilad, 1991). This phenomenon is nothing but "notice without search" i.e. "the alertness" exhibited by the entrepreneur while identifying information for problem solving or decision making. Entrepreneurs who exhibit high levels of alertness have a great sense of information which have not been sufficiently explored and suitable to the market demand (Long *et al*, 2017). Systematic search is found to be one perspective of discovery of opportunity according to the cognitive school (Herron & Sapienza, 1992). According to this perspective entrepreneurs are engaged in through searching of valuable information and identify the same for decision making purposes. This perspective of opportunity discovery requires entrepreneurs to be highly aware of the type of information which they are intended to search (Long *et al*, 2017). Later in 2002 a third perspective to discovery of opportunity was brought into light namely proactive search. This type of search is nothing but searching for information according to the situation in which the entrepreneur is, at the particular time (Chandler *et al*, 2002). Proactive search hasn't gained much research importance with respect to the principles of effectuation and thus the authors of this paper has decided to adopt only the two perspectives of discovery of opportunity i.e. fortuitous discovery and systematic search.

When it comes to available means and discovery of opportunity, systematic search is more inclined towards identifying entrepreneurial opportunities by evaluating new venture creation ideas through known and popular information channels (Fiet, 2007). As mentioned earlier alertness is a trait exhibited by entrepreneurs while identifying entrepreneurial opportunities in the case of fortuitous discovery (Kirzner, 1997). Thus it is found that fortuitous discovery of opportunity is more reliant on alertness. Alertness offers a psychological basis to the discovery of opportunities which aids entrepreneurs to be more attentive about novel events (Gaglio & Katz, 2001). Alert entrepreneurs are highly inclined to counterfactual thinking and also engage in changing the current means-end framework. Thus entrepreneurs engaged in fortuitous discovery always tend to possess high level of alertness while scanning their surroundings for new venture creation ideas. Besides, entrepreneurship is more about immediately seizing opportunities and taking actions. As anticipation cannot be done in the case of discovery of opportunity it is really hard for alert entrepreneurs to effectuate detailed business ideas in advance or prepare solutions for solving problematic situations in advance. Thus they are pressed to expedite actions with the available means and here is where the effectual logic comes into play (Long *et al*, 2017).

While dealing with discovery of opportunity and affordable losses, entrepreneurs engaging in systematic search tend to spend considerable amount for searching in order to reap high marginal benefits. These type of entrepreneurs expect that marginal benefits exceed marginal costs and must also concentrate on evaluating the expected risks and returns while engaging in systematic search (Smith *et al*, 2009). Whereas, fortuitous discovery of opportunities is characterised by prior knowledge and alertness which makes the entrepreneurs spend very less time in predicting the estimated returns which may found to be in accordance with the affordable loss principle. According to this principle the entrepreneurs possess a will to lose rather than concentrating on expected returns while thinking about a new venture creation or solving a problematic situation. Thus decision making is found to be dependent on the affordable loss estimate. When an entrepreneur makes his or her decision based on affordable losses the entrepreneur is found to reduce his or her dependence on the predictions (Sarasvathy, 2008).

In the case of discovery of opportunity and partnerships entrepreneurs engaging in systematic search faces an inevitable need for dealing with information related to new venture creation and must engage in searching information channels for elaborating plans. They also exploit opportunities in advance which will make them less inclined towards partnerships. Whereas, entrepreneurs utilizing fortuitous discovery doesn't take initiative for searching information and is also not interested to spend too much time. The entrepreneurs are found to be accidental and lucky when they find opportunities to exploit under fortuitous discovery (Fiet, 2007). Entrepreneurs engaged in fortuitous discovery are found to be unprepared and are more likely to create and build partnerships. These types of entrepreneurs engage in contacting others through social network sites and are also engaged in negotiating with stakeholders in order to reduce uncertainty and obtain actual commitments.

According to Smith *et al*, 2009 *w*hile dealing with discovery of opportunity and leveraging contingency, entrepreneurs adopting systematic search anticipate their behaviours and intentionally seek while searching for opportunities. When it comes to known domains entrepreneurs restrict certain information and would prepare for systematic search. In the case of fortuitous discovery entrepreneurs are not found to prepare in advance. They generally obtain information through alert scanning rather than searching the environment (Kirzner, 1997). Once the entrepreneurs identify the opportunities they must collectively bring the resources together and must exploit the opportunities immediately. Entrepreneurs must leverage contingencies rather than avoiding in order to reduce the opportunity exploitation time.

According to an empirical paper from China the patterns or perspectives of discovery of opportunity is found to have a significant and positive effect on the principles of effectuation. Entrepreneurs engaging fortuitous discovery are found to use available means and leverage contingency than the entrepreneurs adopting systematic search for discovering opportunities (Long *et al*, 2017).

Innovation Orientation and Effectuation

An important issue faced by the researchers in the field of innovation is whether innovation is found to be the capacity to innovate which is nothing but described in a single word as "innovativeness" (Calantone *et al*, 2002; Gatignon & Xuereb, 1997) or is said to be the final outputs of innovation i.e. cultural, behavioural and opportunity innovation) (Story *et al*, 2014). Researchers are faced with multiple questions with respect to the predictors of innovation orientation and are also intrigued by the fact that, whether there is a difference between the innovation orientation between MSMEs and large organizations (Prajogo & McDermott, 2014). MSMEs are found to be different than other organizations irrespective of their lower turnover or smaller size. The governance structure of the smaller firms are often under the domination of the managers or owners, which confuses the innovative orientation of the entrepreneur when compared to larger firms (Varis & Littunen, 2010; North & Smallbone, 2000). MSMEs function interconnectedly with their close networks i.e. suppliers, customers and competitors with respect to innovative orientation.

Several researchers engaged in exploring the various predictors of product innovation in MSMEs, cross industrial comparison and their export orientation approach (Story *et al*, 2014). It is also stated that other characteristics of innovation orientation i.e. behavioural innovation affects the success of product innovation and so a clear understanding of all the aspects of innovation orientation is required. Certain researchers speculate that causational approach i.e systematic search is considered the most superior method as it possesses the potential to identify opportunity innovation, which is another aspect of innovation (Varis & Littunen, 2010). Other researchers proposed that further research must be initiated with respect to ownership structures and incentive types which will enhance the innovation orientation and will also have an acquiescent nature towards the principles of effectuation (Dew *et al*, 2008) for better firm performance.

Research provides only a limited explanation about the relationship between innovation orientation, effectuation and venture performance. On the whole, it is still vague that, how the firm's characteristics affect their innovation orientation (Roach *et al*, 2015).

Innovation and entrepreneurship have a connection which is close, long and overlapping (Schumpeter, 1934). Individuals who provide novel ideas for new businesses assume to play the entrepreneurial role for the entire innovation process. In fact, an individual possessing innovativeness is often construed as the innovative entrepreneur (Varis & Littunen, 2010). Thus entrepreneurs are considered to perform the innovator role in order to be an efficient entrepreneur. Thus, entrepreneurship and innovation go hand in hand, as entrepreneurship enables innovation in order to realize the potential for value creation and innovation also acts as the source of entrepreneurship (Zhao, 2005). This is referred to as the entrepreneurial traditional model which holds economic thinking as its base with an emphasis on the search for opportunities or exploiting areas for innovation (Shane & Venkataraman, 2000). Generally a causation approach is followed while exploiting a known opportunity (Fisher, 2012). This method suits the existing management paradigm involving decision making in a rational way in which

the process begins with specific, well-structured goals. This process of prediction helps in identifying and selecting the potential means on the basis of minimized environmental barriers and maximized returns. The basic logic behind this approach is to manage the uncertainty and ambiguity faced by the environment by applying predictive principles in the process of searching and exploiting opportunities (Roach *et al,*2015).

On the contrary, the main goal of effectual approach is to show what makes an entrepreneur "entrepreneurial". Effectuation focusses on an alternative approach where the opportunities are not only found (causation approach) but are created (effectuation). Effectuation theory states that theory of causation is dependent on the prediction logic, whereas the theory of effectuation is dependent on the control logic (Saravathy, 2001). This aids in creating a new perspective in which the entrepreneur acts as an innovator and his or her stakeholders are engaged in conducting a co-creation process. Effectual logic possesses a belief that individuals are responsible for the future which is in contradiction to the causation approach. This logic is built on the argument that individuals are responsible for the shaping and creation of products, firms, services, ideas and markets and so there happens to be a very less need for predicting the future.

According to an empirical study conducted in small and medium sized enterprises the innovation orientation were characterized into two constructs namely cultural and behavioural innovation (Calantone *et al,* 2002 & Gatignon & Xuereb, 1997). The following effectuation principles such as leveraging contingencies and available means showed a positive mediation towards the relationship between innovation orientation (cultural and behavioural orientation) and product or service innovation (Roach *et al,* 2015).

Opportunity innovation is considered to be another aspect of innovation orientation and is of great importance in entrepreneurial research (Samuelsson, 2004). In general, reproduction and innovation are the two types of opportunities (Aldrich & Martinez, 2001). Mostly the common type of opportunities is reproduction as the entrepreneur engages in exploiting the opportunity by merely changing or imitating the current products and services which are profitable and also organize the entrepreneurial activity in the similar manner in accordance with their predecessors. On the contrary, very few opportunities fall under the innovation type i.e. the entrepreneurs are found to be engaged in exploiting it by significantly diverging from the existing services and products. In general, higher the level of opportunity innovation for a particular opportunity, that opportunity is considered to be more valuable. Even though opportunity innovation is proportional to surplus commercial value, it brings huge risk as there are no predecessors to reproduce or copy.

Innovative opportunities are found to have ambiguous and uncertain means-ends relationship which might overturn the conventional means-ends relationship (Sarasvathy *et al*, 2003). When entrepreneurs aspire to create a great business in the world, they look for innovative opportunities. Hence, entrepreneurs are unable to take actions on the basis of established ends in the context of innovative opportunity. Entrepreneurs are more likely to utilize available means for reducing the time of opportunity exploitation. Thus, entrepreneurs can become more informative and resourceful if they reconstitute the available means and then work on making clear ends through available resources.

With respect to affordable losses, entrepreneurs engaging in exploiting innovative opportunities must be more vigil and open as there are no customer feedback and precursors (Danneels & Kleinschmidtb, 2001). It is clearly evident that innovative opportunity exploitation is an experimental and explorative process. It is difficult for entrepreneurs engaging in exploiting these types of opportunities to estimate the expected return in the uncertain future if they possess very little information about the market. Moreover, lots of risks are associated in this

exploitation process. Most entrepreneurs engaging in exploiting innovative opportunities are open with affordable losses and does not gamble on all the available resources.

While dealing with the relationship between innovative opportunities and partnerships entrepreneurs are prone to lots of risks. In the earlier stage of exploitation of innovative opportunities, entrepreneurs are not completely aware of the means for achieving entrepreneurial goals. Only through exploration for a longer time they tend to reduce the risks and propose solutions. Hence, entrepreneurs must build partnerships with others through social networks (Fields *et al*, 1983). The partnerships built by them will provide support to them in order to find the most feasible means for exploring. Moreover, this type of opportunities engage in embracing valuable knowledge. Thus making it difficult for entrepreneurs to comprehend and utilize it. Indeed, entrepreneurs will spend most of their time in exploiting and exploring this type of opportunities (Long *et al*, 2017).

The attitude of entrepreneurs with respect to leveraging contingencies are found to be influenced by opportunity innovation. When opportunity innovation is found to be low, opportunities demand concentrated and complete information which will help the entrepreneur in predicting the future and avoiding contingencies. When opportunity innovation is found to be high, opportunities necessitate incomplete information which will enable the entrepreneur in predicting the future under ambiguity and uncertainty. Despite future prediction, entrepreneurs intend to take actions in order to create future under ambiguity and uncertainty. Entrepreneurs will never avoid contingencies, whereas engage in transforming them into opportunities by applying subjective initiative (Sarasvathy, 2009).

An empirical research study conducted in China stated that with lower chance of opportunity innovation, entrepreneurs are most likely to use the principles of effectuation such as leveraging contingencies and affordable losses rather than the other principles (Long *et al*, 2017).

Effectuation and Technology Orientation

According to the creative destruction theory of Schumpeter, entrepreneurs alter the market equilibrium through introduction of new innovations or new products in the market (Schumpeter, 1934). A type of innovation i.e. radical innovation is found to play a major role in long term wealth creation and developing new businesses (Wang *et* al, 2013; Schindehutte *et al*, 2008). Technological innovativeness comprises of creating new technologically innovative ideas and applying them in the businesses. The importance of developing new technology for introducing a product in the market and the need for creativity and technical expertise, validate the crucial role played by the technology-oriented ventures for selecting strategies through which the businesses can be executed successfully (Steyn & Buys, 2011; Schindehutte *et al*, 2008).

The firm's technological choices are based on the technology strategy of the firm. The technology strategy helps in accumulating and deploying the technological capabilities and resources of the firm (Zahra, 1996). When the firm's strategy and technological choices go hand in hand, the venture can use its technological capabilities and investments for creating competitive advantage which helps in supporting the firm's strategic objectives and posture (Binneman & Steyn, 2014; Kuratko & Audretsch, 2009; Galbraith *et al*, 2008).

Technological orientation is conceptualised as the combination of organizational decisions dealing with technological posture which is aggressive in nature, process innovation and automation and new product development (Zahra & Covin, 1993). Technological orientation can be operationalized by using the dimensions such as pioneering posture (here the firm decides whether to introduce a new product based on new technology to the market or not), internal and external sources of research and development (internal sources refer to the

resources obtained through firm level research and development activities, whereas external sources refer to licensing or purchasing of technology from other ventures or through strategic alliances for acquiring the most needed innovative technology), basic vs applied research (basic research deals with advances in the field of science, whereas applied research deals with research and development activities related to new technologies and product) and the firm's use of patented products or services gained from its research and development activities for protecting its competitive advantage (Zahra, 1996a).

Furthermore, most research on strategy related to technological fit hypothesize that external factors are found to drive the process of research and development. Human actions and the organization are found to be the core elements of the research and development process, thereby claiming that the elements of effectuation has an active role in the process of research and development. Research reveals that resources or means-driven approach is found to have a positive impact on the outputs obtained from the research and development activities, especially in those activities which exhibited a higher level of innovation (Brettel *et al*, 2012). Innovativeness and technology work towards developing new organizational competencies through creativity and trial and error method, which is similar to that of the effectual principles (Alegre *et al*, 2012).

An empirical study conducted in the renewable energy sector has found that the various effectual principles have a positive relationship with technological orientation and is also found to influence the performance of a firm (Urban & Heydenrych, 2015).

Technological Orientation and New Venture Performance

The relationship between technological orientation and new venture performance is found to be controlled by business strategy. This finding is based on the fact that different configurations of business strategies affect the level of strength between the technological orientation and new venture performance relationship. It is also found that a business strategy which is designed to be more technologically oriented is directly associated with high performance of new ventures. Therefore, the strategic technological fit is considered to be of great importance while predicting the new venture performance. Thus, there exists a need to show the importance of aligning business strategy with technology as technological orientation acts as a precondition towards superior new venture performance (Zahra & Covin, 1993).

The studies from the past literature reveals that there is an association between business strategy and technological orientation in homogenous, low intensity marketing and middle-of-the-road concerns when these concerns use advanced process innovation and automation. When firms follow aggressive technological exposure for developing new products there is found to exist a fit between the business strategy and technological orientation which ultimately lead towards better performance of the companies. The firms must also not put too much of emphasis on process innovation and automation, whereas they must use their technological orientation for gaining competitive advantage. According to an empirical research study conducted by Zahra & Covin, 1993 reveal that all the technological orientation variables have a positive relationship with the firm performance irrespective of the profile of the firms.

There is also a risk named "technological myopia" faced by the firms reflecting in low performance of firms. Technological myopia is nothing but, the entrepreneurs of the firms only concentrate on the investments related to technological orientation as they believe that competitive advantage can be achieved only through technological orientation, which in turn results in the neglect of other equally important competencies required for businesses to perform well. As technology is found to be a core determinant of success, mere investment in technology must

not be carried out, instead technological investments can be made when the business strategy favours technological orientation for the successful running of businesses (Zahra & Covin, 1993).

According to an empirical study conducted among 73 firms in South Africa revealed that there exists a positive and significant relationship between technological orientation and business performance (Urban & Heydenrych, 2015).

Effectuation and New Venture Performance

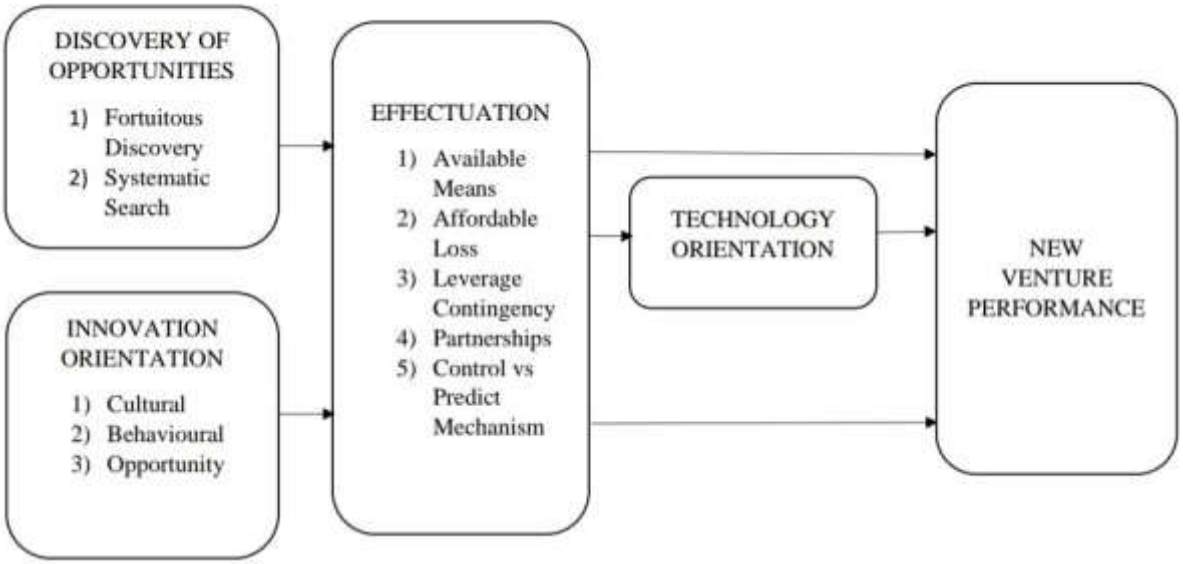
According to various researchers, effectuation is nothing but a type of expertise of entrepreneurship, which helps entrepreneurs while making decisions in uncertain environment or situation (Sarasvathy, 2001; Knight, 1921). Effectuation is found to be a set of heuristics which enables decision making in ambiguous and uncertain situations or environment. The effectual reasoning comprises of strategies which combine the available means or resources with contingencies that are unanticipated in order to build stakeholder commitment. Effectuation gathers huge amount of interest in theoretical discussions in the field of economics (Dew *et al*, 2004), psychology (Sarasvathy, 2003) and management (Augier & Sarasvathy, 2004; Sarasvathy, 2001). The concept of effectuation was developed in order to support the new venture creation and its also now extending its attention towards problems dealing with innovation (Dew & Sarasvathy, 2001) and finance (Sarasvathy & Wiltbank, 2002).

The effectual principles is nothing but a decision making approach which relies on the assumption of the impact of individual creation rather than prediction (Sarasvathy & Dew, 2005). Effectuation provides a normative approach towards problem solving which are designed in such a way that they got to be functional under uncertain and ambiguous situations. The effectual principles with respect to new venture performance are explained as follows: means are sources which provides an entrepreneur, a basis for identifying and utilizing certain opportunities emerging from the contacts, available resources and knowledge. Partnerships are found to be new opportunities which are created by additional means offered by new stakeholders of a venture. Affordable losses deal with the possible downside while evaluating alternatives, which will help the entrepreneur understand that an opportunity failure does not lead towards a great personal or venture failure. Whenever an entrepreneur is stuck in a situation where the future seems to be unpredictable, he or she must be ready to leverage the contingencies i.e. they must find new opportunities from surprises – even though they are negative (Read *et al*, 2009).

A meta analytical research study incorporating past research studies in the field of entrepreneurship and effectuation reveal that the available means are measured under three aspects namely "What I Know, Who I am and Whom I Know" and its relationship with venture performance has been studied (Ericsson *et al*, 2006; Ensley *et al*, 2006; Lu & Beamish, 2006; Durand & Coeurduroy, 2001; Anna *et al*, 2000). All these three aspects of the available means was found to have a significant and positive relationship with venture performance. Partnership, another principle of effectuation was measured under two aspects namely endogenous (employee partnership) and exogenous (Customers, other firms, standard bodies partnership) (Jones *et al*, 2001). Affordable loss was categorized into two measures namely the degree to which the entrepreneurs take risks (Miller & Friesen, 1983) and how entrepreneurs distribute or mitigate risk. Leveraging contingencies were coded as the degree to which an entrepreneur is willing to modify a product as well as customize it according to the openness, organicity and transformational leadership style. This meta analytical research study also found that the other two principles of effectuation such as partnership and leveraging contingency were found to have a positive and significant relationship with venture performance, whereas affordable loss was found to have an insignificant relationship with the venture performance (Read *et al*, 2009).

III. PROPOSED FRAMEWORK

Based on the past research studies the authors of this research study has proposed this model which incorporates a serial mediation approach.



The basic purpose of this research study is to encourage research in the field of effectual entrepreneurial research. The authors of this paper explored the antecedents of effectuation and the relationship between the discovery of opportunity & new venture performance and innovation orientation & new venture performance with a mediating role of the principles of effectuation. Through this paper the authors developed a serial mediation model highlighting the serial mediation role of the variables namely effectuation and technology orientation. This paper is a comprehensive study of all the major variables related to the study of effectual principles. The model developed in this study might be used by future researchers for validating it empirically.

A through and deep understanding of the factors impacting effectuation, the relationship between the effectuation and new venture performance and the relationship between effectuation and new venture performance with a mediated role of technology orientation is considered to be of great importance to policy makers and practitioners as well as academicians. Thus the authors state that opportunity must be identified through proper means in an innovative way by applying effectual principles with the incorporation of latest technology for the successful functioning of the firm.

REFERENCES

1) Aldrich, H.E. and Martinez, M.A. (2001), “Many are called, but few are chosen: an evolutionary perspective for the study of entrepreneurship”, Entrepreneurship Theory and Practice, Vol. 25 No. 4, pp. 41-56.

2) Alegre, J.,Pla-Barber, J. Chiva, R. and Villar, C. 2012. Organisational learning capability, product innovation performance and export intensity, Technology Analysis and Strategic Management, Vol. 24, pp. 511-526.
3) Anna, A.L., Chandler, G.N., Jansen, E., Mero, N.P., 2000. Women business owners in traditional and non-traditional industries. Journal of Business Venturing 15 (3), 279–303.
4) Augier, M.S., Sarasvathy, S.D., 2004. Integrating cognition, evolution, and design: extending Simonian perspectives to strategic organization. Strategic Organization 2 (2), 169–204.
5) Bhave, M.P. (1994), "A process model of entrepreneurial venture creation", Journal of Business Venturing, Vol. 9 No. 3, pp. 223-242.
6) Binneman, B. and Steyn, H. 2014.Criteria for selection and gate reviews of technology innovation projects. South African Journal of Industrial Engineering, Vol.25,pp. 117-130.
7) Brettel, M., Oswald, M. and Flatten, T. 2012. Alignment of market orientation and innovation as a success factor: A five-country study, Technology Analysis and Strategic Management, Vol. 24, pp. 151-165.
8) Calantone, R.J., Cavusgil, S. and Zhaob, Y. (2002), "Learning orientation, firm innovation capability, and firm performance", Industrial Marketing Management, Vol. 31 No. 6, pp. 515-524.
9) Chandler, G.N., Dahlqvist, J. and Davidsson, P. (2002), "Opportunity recognition processes: a taxonomy and outcome implications", The Twenty-Second Annual Babson College Entrepreneurship Research Conference, Babson College.
10) Chandler, G.N., DeTienne, D.R., McKelvie, A. and Mumford, T.V. (2011), "Causation and effectuation processes: a validation study", Journal ofBusiness Venturing, Vol. 26 No. 3, pp. 375-390.
11) Da Costa, A.F. (2010), "Effectual cells: fostering innovation-based corporate entrepreneurship through conditions for effectual process (interactive paper)", Frontiers ofEntrepreneurship Research,Vol. 30 No. 17, pp. 10
12) Danneels, E. and Kleinschmidtb, E.J. (2001), "Product innovativeness from the firm's perspective: its dimensions and their relation with project selection and performance", Journal of Product Innovation Management, Vol. 18 No. 6, pp. 357-373.
13) Dew, N., Sarasvathy, S.D., 2001. Of immortal firms and mortal markets: dissolving "the innovator's dilemma.". Second Annual Research Policy Technology Entrepreneurship Conference, University of Maryland, p. 26.
14) Dew, N., Sarasvathy, S.D., Venkataraman, S., 2004. The economic implications of exaptation. Journal of Evolutionary Economics 14 (1), 69–84.
15) Dew, N., Read, S., Sarasvathy, S.D. and Wiltbank, R. 2008. Outlines of a behavioural theory of the entrepreneurial firm, Journal of Economic Behavior and Organization, Vol. 66, pp. 37–59.
16) Dimov, D. (2007), "Beyond the single-person, single-insight attribution in understanding entrepreneurial opportunities", Entrepreneurship Theory and Practice, Vol. 31 No. 5, pp. 713-731.
17) Durand, R., Coeurderoy, R., 2001. Age, order of entry, strategic orientation, and organizational performance. Journal of Business Venturing 16 (5), 471–494.
18) Eckhardt, J.T. and Shane, S.A. (2003), "Opportunities and entrepreneurship", Journal ofManagement, Vol. 29 No. 3, pp. 333-349.

19) Ensley, M.D., Pearson, A.W., Amason, A.C., 2002. Understanding the dynamics of new venture top management teams: cohesion, conflict, and new venture performance. Journal of Business Venturing 17 (4), 365–386.
20) Ericsson, K.A., Charness, N., Feltovich, P., Hoffman, R., 2006. The Cambridge Handbook ofExpertise and Expert Performance. Cambridge University Press, NewYork, NY.
21) Fields, C.R.I.O., Dimaggio, P.J. and Powell, W.W. (1983), "The iron cage revisited: institutional isomorphism and collective rationality in organizational fields", American Sociological Review, Vol. 48 No. 2, pp. 147-160.
22) Fiet, J.O. (2007), "A prescriptive analysis of search and discovery", Journal of Management Studies, Vol. 44 No. 4, pp. 592-611.
23) Fisher, G. (2012), "Effectuation, causation, and bricolage: a behavioural comparison of emerging theories of entrepreneurship research", Entrepreneurship Theory and Practice, Vol. 36 No. 5, pp. 1019-1051.
24) Gabrielsson, J. and Politis, D. (2011), "Career motives and entrepreneurial decision-making: examining preferences for causal and effectual logics in the early stage of new ventures", Small Business Economics, Vol. 36 No. 3, pp. 281-298.
25) Gaglio, C.M. and Katz, J.A. (2001), "The psychological basis of opportunity identification: entrepreneurial alertness", Small Business Economics, Vol. 16 No. 2, pp. 95-111.
26) Galbraith, C.S., Rodriquez, C.L.and De Noble,A.F. 2008. SME competitive strategy and location behaviour: An exploratory study of high-technology manufacturing,Journal of Small Business Management, Vol. 46, pp. 183-202.
27) Garonne, C., Davidsson, P., and Steffens, P.R. (2010), "Do strategy choices matter for nascent firms? A study on effectuation and causation impacts on new ventures outcomes", Proceedings ofthe 7th AGSEInternational Entrepreneurship Research Exchange.
28) Gatignon, H. and Xuereb, J. (1997), "Strategic orientation of the firm and new product performance", Journal of Marketing Research, Vol. 34 No. 1, Special Issue on Innovation and New Products, pp. 77-90.
29) Herron, L. and Sapienza, H.J. (1992), "The entrepreneur and the initiation of new venture launch activities", Entrepreneurship: Theory and Practice, Vol. 17 No. 1, pp. 49-55.
30) Hurley, R. and Hult, G. (1998), "Innovation, market orientation, and organizational learning: an integration and empirical examination", Journal of Marketing, Vol. 62 No. 3, pp. 42-54.
31) James, W. (1912), "The experience of activity", Essays in Radical Empiricism, University ofNebraska Press, Lincoln, pp. 155-189.
32) Jones, G.K., Lanctot Jr., A., Teegen, H.J., 2001. Determinants and performance longimpacts of external technology acquisition. Journal of Business Venturing 16 (3), 255–283.
33) Kaish, S., Gilad, B., (1991). Characteristics of opportunities search of entrepreneurs versus executives: sources, interests, general alertness. Journal of Business Venturing 6 (1), 45–61.
34) Kirzner, I.M. (1997), "Entrepreneurial discovery and the competitive market process: an austrian approach", Journal ofEconomic Literature, Vol. 35 No. 1, pp. 60-85.
35) Knight, F.H., 1921. Risk, uncertainty and profit. Houghton Mifflin Company, Boston, New York.

36) Kuratko, D.F. and Audretsch, D.B. 2009. Strategic entrepreneurship: Exploring different perspectives of an emerging concept, Entrepreneurship Theory and Practice, Vol. 25, pp. 1-17.
37) Long, D., Xia, Z., & Hu, W. (2017). How does entrepreneurial opportunity a ff ect the decision- making process of effectuation ? Evidence from China, *46*(6), 980–999. https://doi.org/10.1108/K-11-2016-0322
38) Lu, J., Beamish, P.W., 2006. Partnering strategies and performance of SMEs' international joint ventures. Journal of Business Venturing 21 (4), 461–486.
39) Meuleman, M., Lepoutre, J. and Tilleuil, O. (2010), "On the use of effectuation versus causation in the new venture creation process: the role of resources versus the environment (summary)", Frontiers ofEntrepreneurship Research, Vol. 30 No. 6, p. 11.
40) Miller, D., Friesen, P.H., 1983. Strategy-making and environment: the third link. Strategic Management Journal 4 (3), 221–235.
41) North, D. and Smallbone, D. (2000), "Innovative activity in SMEs and rural economic development: some evidence from England", European Planning Studies, Vol. 8 No. 1, pp. 87-106.
42) Prajogo, D. and McDermott, C.M. (2014), "Antecedents of service innovation in SMEs: comparing the effects of external and internal factors", Journal ofSmall Business Management, Vol. 52 No. 3, pp. 521-540.
43) Read, S., Song, M. and Smit, W. (2009), "A meta-analytic review of effectuation and venture performance", Journal ofBusiness Venturing, Vol. 24 No. 6, pp. 573-587.
44) Roach, D. C., & Ryman, J. A. (2016). Effectuation , innovation and performance in SMEs : an empirical study, (1934). https://doi.org/10.1108/EJIM-12-2014-0119
45) Samuelsson, M. (2004), Creating New Ventures: A Longitudinal Investigation ofthe Nascent Venturing Process, Internationella Handelshögskolan.
46) Sarasvathy, S., Dew, N., 2005. Entrepreneurial logics for a technology of foolishness. Scandinavian Journal of Management 21, 385–406.
47) Sarasvathy, S.D., Wiltbank, R., 2002. Selection and return in angel investment. Babson Kauffman Entrepreneurship Research Conference, Denver, CO, p. 18.
48) Sarasvathy, S.D., Dew, N., Velamuri, S.R. and Venkataraman, S. (2003), "Three views of entrepreneurial opportunity", Handbook ofEntrepreneurship Research, Springer, pp. 141-160.
49) Sarasvathy, S.D. (1998), "How do firms come to be? Towards a theory of the prefirm", Unpublished Doctoral Dissertation, Carnegie Mellon University.
50) Sarasvathy, S.D. (2001), "Causation and effectuation: toward a theoretical shift from economic inevitability to entrepreneurial contingency", Academy of Management Review,Vol.26 No. 2, pp.243-263.
51) Sarasvathy, S.D., 2003. Entrepreneurship as a science of the artificial. Journal of Economic Psychology 24 (2), 203–220.
52) Sarasvathy, S.D. (2008), Effectuation: Elements of Entrepreneurial Expertise, Edward Elgar, Cheltenham, Glos.
53) Sarasvathy, S.D. (2009), Effectuation: Elements of Entrepreneurial Expertise, Edward Elgar Publishing.
54) Schindehutte, M., Morris, M.H. and Kocak, A. 2008. Understanding market-driving behaviour: The role of entrepreneurship, Journal of Small Business Management, Vol. 46, pp. 4-26.

55) Schumpeter, J.A., 1934. The theory of economic development: an inquiry into profits, capital, credit, interest, and the business cycle. Harvard University Press, Cambridge, MA.
56) Shane, S. and Venkataraman, S. (2000), "The promise of entrepreneurship as a field of research", Academy ofManagement Review, Vol. 25 No. 1, pp. 217-226.
57) Smith, B.R., Matthews, C.H. and Schenkel, M.T. (2009), "Differences in entrepreneurial opportunities: the role of tacitness and codification in opportunity identification", Journal of Small Business Management, Vol. 47 No. 1, pp. 38-57.
58) Steyn, J.L. and Buys, A.J. 2011. Creativity and 'eureka' in science and engineering.South African Journal of Industrial Engineering, Vol.22,pp. 1-17.
59) Story, V.M., Boso, N. and Cadogan, J.W. (2014), "The form of relationship between firm level product innovativeness and new product performance in developed and emerging markets", Journal of Product Innovation Management, Vol. 32 No. 1, pp. 45-64.
60) Urban, B. and Barreira, J. 2009. Empirical investigations into firm technology orientation and entrepreneurial orientation, International Journal of Innovation and Technology Management, Vol. 7, pp. 1-23.
61) Urban, B., & Heydenrych, J. (2015). Technology Orientation And Effectuation – Links To Firm Performance In The Renewable Energy Sector Of South Africa. *Journal of Industrial Engineering*, *26*(November 2015), 125–136.
62) Varis, M. and Littunen, H. (2010), "Types of innovation, sources of information and performance in entrepreneurial SMEs", European Journal of Innovation Management, Vol. 13 No. 2, pp. 128-154.
63) Wang, X., Lu, Y., Zhao, Y., Gong, S. and Li, B. 2013. Organisational unlearning, organisational flexibility and innovation capability: An empirical study of SMEs in China, International Journal of Technology Management, Vol. 61, pp. 132-155.
64) Wiltbank, R., Sudek, R. and Read, S. (2009), "The role of prediction in new venture investing", Frontiers ofEntrepreneurship Research, Vol. 29 No. 2, p. 3.
65) Zahra, S. A. and Covin, J. G. 1993 'Business strategy, technology policy and firm performance', Strategic Management Journal, Vol. 14, pp. 451-478.
66) Zahra, S.A. 1996. Technology strategy and financial performance: examining the moderating role of the firm's competitive environment. Journal of Business Venturing, 11(3): 189–219.
67) Zahra, S.A., 1996a. Technology strategy and new venture performance: a study of corporate-sponsored and independent biotechnology ventures. Journal of Business Venturing 11 (4), 289–321.
68) Zhao, F. (2005), "Exploring the synergy between entrepreneurship and innovation", International Journal of Entrepreneurial Behavior and Research, Vol. 11 No. 1, pp. 25-41.