

# An Entrepreneurial Opportunity Recognition Model: Dubin's Theory-Building Framework

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### 1. Introduction

This research aims to propose a model of entrepreneurial opportunity recognition on existing theoretical studies (Moreno 2008; Ardichvili, Cardozo, and Ray 2003; Ardichvili and Cardozo 2000) by using Dubin's theory-building framework (Elwood and Janis 2007; Lynham 2002; Dubin 1978).

The importance of entrepreneurship generates from the process of recognizing opportunity and addressing it through the business organizations in order to foster the economic growth. Timmons and Spinelli (2004) find that problem facing individuals considering entrepreneurship is a concern for identifying the right set of circumstances and the right entrepreneurial activities required for success. It is important for entrepreneurs to identify and select the right opportunities for new businesses. The necessary choice to clarify the opportunity recognition is to build a theoretical model. Recently, a number of models of opportunity recognition have been developed (Ardichvili and Cardozo 2000; Ardichvili, Cardozo, and Ray 2003; Baron and Ensley 2006; Moreno 2008; Townsend and Harkins 2005; Teach, Schwartz, and Tarpley 1989). Those models are based on different assumptions borrowed from a broad range of disciplines from cognitive psychology to Spanish cases. The study of Ardichvili and Cardozo (2000) bases on the analysis of available literatures and in-depth cases of opportunity recognition that

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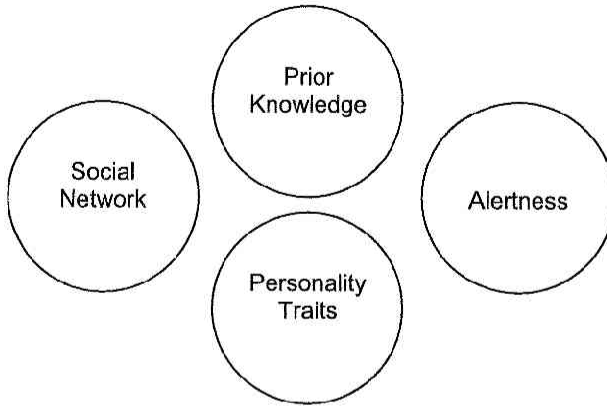
resulted in successful ventures. They found three components are important determinants in opportunity identification, prior knowledge, entrepreneurial alertness, and networks. Ardichvili, Cardozo, and Ray (2003) build on existing theoretical and empirical studies in the area of entrepreneurial opportunity identification and development. They found that prior knowledge and personality traits are associated with social networks and entrepreneurial alertness that result in opportunity development. By clarifying and developing the limitation of these studies, Moreno(2008) conducted an empirical analysis of entrepreneurial opportunity identification and development from new Spanish firms. However, their studies still have limitation and further researches within other methodologies and cases.

Entrepreneurial process is an interactive combination of four components, which ultimately result in opportunity recognition. Four main components of the opportunity recognition studied to-date are outlined in Figure 1. These four key variables are widely recognized in the literature as common and important components of the opportunity recognition process.

The first variable is prior knowledge of entrepreneur about market, ways to serve the market, and customer problems. The second variable is social network of entrepreneur focusing on relationship and ties of entrepreneurs in businesses. The third variable is personality traits of entrepreneur. The final variable is entrepreneurial alertness about the business opportunities. This component may be regarded as hub within the three variables for the opportunity recognition (see Figure 1).

However, few researchers have studied the relationship of these components. That is why this study focuses on the collective and interactive contribution of these four variables.

**Figure 1: The Four Components of the Opportunity Recognition**



This paper argues that assumptions and conclusions drawn from the studies of single components in isolation are really flawed. Those studies fail to consider important relationships that may have been the key contributors of the opportunity recognition. For instance, Ardichvili and Cardozo (2000) proposed just three factors (prior knowledge of markets and customer problems, entrepreneurial alertness, and networks) in their model. Ucbasaran et al. (2003), Ucbasaran, Westhead, and Wright(2009), and Baron and Ensley (2006) studied the association between personality traits, i.e. entrepreneur experiences, and opportunity recognition. The relationship between entrepreneurial alertness and discovery and opportunity recognition was studied by Kirzner (1997). Shepherd and DeTienne (2005) focused on prior knowledge, financial reward, and opportunity identification. Shane (2000) based entirely on prior knowledge and discovery of entrepreneurial opportunity. However, in the line with Moreno(2008) and Ardichvili, Cardozo, and Ray (2003), this paper utilizes different methodology with an additional variable, the personality traits, which is necessary for the author's opportunity recognition and development model.

The contribution of this study is to synthesize the existing literatures into a more complete model of opportunity recognition theory, which is a function of truly entrepreneurial environment. The four components are the main functions of the opportunity recognition model: the alertness, prior knowledge, social network, and personality traits of entrepreneurs. Also the contribution has been to review the literature and uncover the specific contributions of these four model components as well as identifying gaps in the current state of opportunity recognition theory and suggestions on

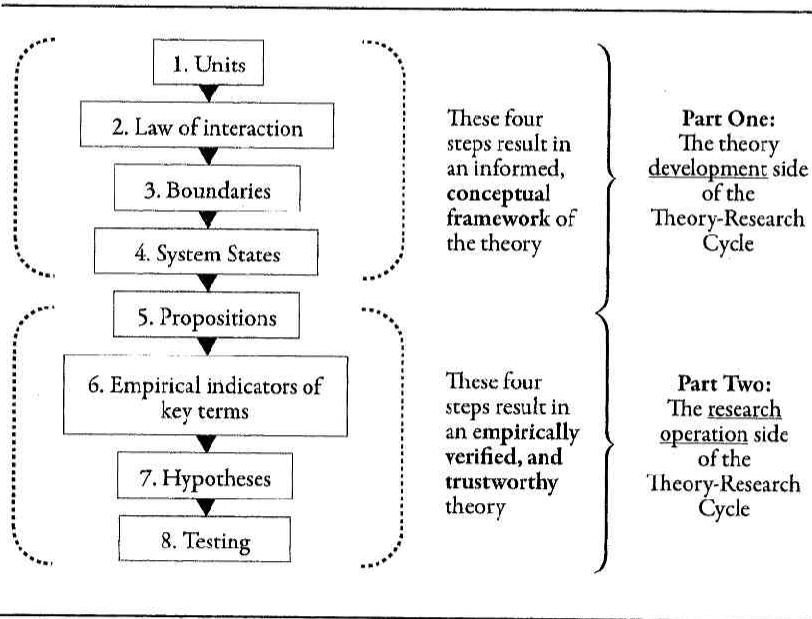
how to further understanding on this important area.

### 1.1. Methodology

Elwood and Janis (2007) and Lynham (2002) have extended the Dubin's (1978) framework on comprehensive methodologies for theory building relevant to applied fields, such as management, marketing, and organization studies. Dubin suggests eight steps on theory building method (Lynham 2002): units of the theory, laws of interaction, boundaries of the theory, system states of the theory, propositions of the theory, empirical indicators, hypotheses, and empirical testing.

This paper conducts the first five steps of Dubin's methodology (see Figure 2).

**Figure 2: Dubin's Theory-Building Method as an Eight-Step Theory-Research Cycle**



Source: Lynham (2002)

### 1.2. Rationale for Choosing Dubin's Methodology

Rationale for choosing Dubin's theory-building methodology is that this paper focuses on theory building, particularly the building of a model of entrepreneurial opportunity recognition. There are a number of strategies and methodologies that theory

builders can use to develop and applied theory; for example the studies of Eisenhardt (1989, 1995) focus on building theories from case study research; Fujimoto et al. (Fujimoto et al. 2009) have focused on field-based research methods; Lynham (2002) and Elwood and Janis (2007) have studied the Dubin's (1978) theory-building methods; and so forth. Each strategy and method is informed by assumptions about what makes for knowledge and in turn good theory, and each is a way of seeing and understanding the phenomenon central to the theory.

A recognized scholar in applied theory building, Dubin advocates a theory-then-research strategy and quantitative hypothetico-deductive approach to applied theory building. That is why, in order to build the model of opportunity recognition, this paper follows entirely on the first five steps of the Dubin's theory that represent the structural components. Although, theorists must consider the entire scope of Dubin's model for effective theory building, theory building and empirical study are often separated, and each of these is conducted as a distinct research effort.

### **1.3. Discussion Framework**

This section introduces the theory building on a model of entrepreneurial opportunity recognition by using the first five steps of method of Dubin: units of the theory, laws of interaction, boundaries of the theory, system states of the theory, and propositions of the theory.

In step 1, this paper presents the relevant theories and affecting variables that lead to opportunity recognition. It, in step 2, introduces the interactions between those four factors and the opportunity recognition. Step 3 and 4 identify the boundaries and system states of the theory with supported arguments. Final step is the propositions of the theory.

This paper is organized into 5 sections. Next section introduces units of the theory. Section 3 discusses laws of interaction. Boundaries, system states, and proposition are in section 4. Section 5 is the conclusion of the paper.

## **2. Units of the Theory**

The concepts from which the theory is constructed are called the units of the theory. In order to determine the concepts to be included in the model, this paper reviews literatures on opportunity identification and other relevant literatures published in several leading academic journals and annual conference proceedings in the following disciplines, entrepreneurship, management, marketing, organization behavior, organization theory,

and economics.

The review of Ardichvili, Cardozo, and Ray (2003) indicates that, “the literature includes several related concepts, which are often confounded with one another: opportunity development, opportunity recognition, and opportunity evaluation. These concepts correspond to the principal activities that take place before a business is formed or restructured. While division into these three processes may facilitate explanation and analysis, in practice these three processes often overlap and interact with each other.”

The units of the theory take into 2 attentions: (1) opportunity and opportunity recognition and (2) related variables of opportunity recognition, such as prior knowledge, social networks, personality traits, and alertness.

## **2.1. Opportunity and Opportunity Recognition**

An opportunity can be the chance to meet a market needs, interest, or want via a creative combination of resources to deliver superior value (Kirzner 1997; Schumpeter 1934, 1961). However, opportunities represent a range of phenomena beginning unformed and becoming more developed via time (Ardichvili, Cardozo, and Ray 2003). Opportunities stem from the perceptions of decision makers are a consequence of making sense of situation. Opportunities have the quality of being attractive, durable, and timely and are anchored in products or service that add value for their buyers or end users (Timmons and Spinelli 2004). The most successful entrepreneurs and private financiers of entrepreneurial ventures are opportunity focused (Lindsay and Craig 2002). They start with what customers and market want and do not lose sight of this (Timmons and Spinelli 2004). Kirzner (1997) states that, “opportunity may appear as an imprecisely-defined market need, or un- or under-employed resources or capabilities.” Later may include basic technologies, inventions which market has not yet been defined, or ideas for products or services. Prospective customers may or may not be able to articulate their needs, interests, or problems (Von Hippel 1988; Park 2005). Prospective customers can still recognize the value to them in something new when they are introduced with it and have its operation and benefits explained, even if they cannot articulate their needs or problems. Value sought is considered as opportunities seen from the perspective of prospective customers (Park 2005).<sup>2</sup>

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<sup>2</sup> Keywords such as “opportunity recognition”, “opportunity evaluation”, and “opportunity development” can be seen in the review of Ardichvili, Cardozo, and Ray (2003) and Lindsay and Craig (2002).

Opportunity recognition is “the ability to identify situations in which goods, service, raw materials, markets and organizing methods can be introduced via the formation of new means, needs, or means-end relationship” (Eckhardt and Shane 2003). Researches about opportunity evaluation have been substantially conducted in the academic literature; but, researches about opportunity recognition have gained less attention (Hills 1995; Park 2005). As it is the most important part in the entrepreneurial process, researches are now focusing on opportunity recognition. For understanding opportunity recognition process, Lindsay and Craig (2002) offered an overview of the opportunity formulation process in three phases: opportunity search process, opportunity recognition process, and opportunity evaluation or verification process. With limitation, this paper bases merely on opportunity recognition.

## **2.2. Related Variables**

The major related variables of opportunity recognition should be identified in this literature. Author suggests four following affecting factors: prior knowledge, social network, personality traits, and entrepreneurial alertness. These variables are substantially associated with the opportunity recognition. Later in laws of interaction section, the effectiveness, positive, and/or negative of the relationships will be discussed.

The prior knowledge relies on information asymmetry, and is considered as a trigger of opportunity recognition. The social network studies the networks, ties, and partnership of entrepreneur. The personality traits is about characteristics of entrepreneur in identifying business opportunity. The alertness is a stepping-stone to opportunity recognition and its process.

### **2.2.1. Prior Knowledge**

Through Austrian approach regarding prior knowledge and discovery process, Shane (2000) started the question, “why do people discover some entrepreneurial opportunity and not others?” An answer is that people recognize those opportunities associated with information that they already have. Individuals possess different stock of information because information is generated via individuals’ idiosyncratic life experiences. And because information is delivered via a stochastic process, some individuals have information that others do not have via blind luck (Shane 2000). Ardichvili and Cardozo (2000) offered extensive literatures on entrepreneurial opportunity recognition process. Information asymmetry and prior knowledge were important components of this process. Von Hippel (1988) stated that people tend to notice information related to information

that they already know. Entrepreneurs will discover opportunities because prior knowledge triggers recognition of the value of new information. Entrepreneur exists because of information asymmetry between different actors (Hayek 1945), that any given entrepreneur will discover only those opportunities related to his or her prior knowledge (Shane 2000). Shane (2000) tested three stage study of opportunity recognition processes and confirmed a number of hypothesis as following: “people’s prior knowledge about market will influence their discovery of which markets to enter to exploit a new technology. People’s prior knowledge about how to serve markets will influence their discovery of how to use a new technology to serve a market. People’s prior knowledge of customer problems will influence their discovery of products and services to exploit to a new technology.” Any given entrepreneurial opportunity is not obvious to all potential entrepreneurs (Kirzner 1997).

Idiosyncratic prior knowledge of each person creates a knowledge corridor that allows them to recognize some opportunities, but not others (Hayek 1945). Prior information, whether developed from work experience, education, or other ways, has impacts on the ability of entrepreneur to comprehend, extrapolate, interpret, and apply new information in means that those lacking that prior information cannot replicate (Roberts 1991). So even if information about a technological change is disseminated widely, especially if it is revealed in a patent, presented at a scientific conference, or recognized to several people who might work in the same laboratory, only some subset of the population will have prior information that will trigger the discovery of a particular entrepreneurial opportunity (Shane 2000). Three major dimensions of prior knowledge are important to the process of entrepreneurial opportunity recognition, such as prior knowledge of markets, prior knowledge of ways to serve markets, and prior knowledge of customer problems (Shane 2000). New information about a technology may be complementary with prior information about how certain markets operate, leading the discovery of opportunity to require prior information about those markets. Prior knowledge about the markets might include information about supplier relationships, sales techniques, or capital equipment requirements that differ across markets (Von Hippel 1988). New information about a technology may be complementary with information about ways to serve markets, leading the discovery of the opportunity to require prior information about these processes. An ability of entrepreneur to recognize an opportunity in a new technology might be enhanced by prior knowledge about how the new technology could be used to create a product or service. A new technology might change a production process, allow the creation of a new product, provide a new method



of distribution, permit new materials to be used, generate new sources of supply, or make possible new ways of organizing (Schumpeter 1934). New information about a technology may be complementary with prior information about a customer problem, which discovery of the opportunity may require prior information about customer needs. The locus of innovation always lies with the user of a new technology, because users cannot articulate easily their needs for not-yet-developed solutions to problems (Von Hippel 1988). Entrepreneurs who lack familiarity with the customer problem find it difficult to recognize solutions to those needs when the solutions come along the way (Roberts 1991); and this process leads individuals to start new companies to solve customer problems that they learned from working with users in their previous work (Von Hippel 1988).

Entrepreneurial education and experience play important roles in prior knowledge (Ardichvili and Cardozo 2000). This education has direct impact on the prior knowledge, where individuals are alerted to the knowledge from their previous entrepreneurial education. Both personal and work experiences affect prior knowledge. Business experiences teach entrepreneurs the prior knowledge; particularly experience is a major source of new and other business opportunity recognition. Thus, prior knowledge intermediates between education and experience and the opportunity recognition (Ardichvili and Cardozo 2000). The entrepreneur's human resource has been classified in theory, measured by variables that evaluate professional training, practical studies, university degree, and post-graduate studies, and complemented by evaluating variables that take into account any previous business experience or experience in the business in question (Moreno 2008).

Therefore, prior knowledge is an important determinant of entrepreneurial opportunity recognition. Three major dimensions of the prior knowledge, prior knowledge of markets, prior knowledge of ways to serve markets, and prior knowledge of customer problems, are important to the entrepreneurial opportunity recognition and discovery. The experience and education of entrepreneurs play major roles in the prior knowledge leading to the opportunity recognition. As personal or entrepreneurial characteristics concern personality traits variable, this paper assumes that prior knowledge is also associated with personality traits.

### **2.2.2. Social Networks**

Previous studies suggest that social network may play an important role in facilitating the process of opportunity recognition (Hills 1995; Iansiti and Levien 2004;

Ardichvili, Cardozo, and Ray 2003; Hoang and Antoncic 2003; Arenius and De Clercq 2005), especially the importance of network structure to the opportunity recognition (Hoang and Antoncic 2003). Granovetter (1973) first introduced the concept of tie strength to describe network structure. The finding on the strength of weak ties by Granovetter (1973) showed that weak ties are bridges to information sources not necessarily contained in a strong-tie network of an individual. Weak ties include casual acquaintance, and strong ties include friends and family. The casual acquaintance is more likely to provide unique information than are close friends, because most people have more weak ties than strong ties (Granovetter 1973). On the other hand, strong tie contacts have frequent interaction and tend to offer reciprocal favors to each other based on friendship. In contrast, weak tie does not interact with each other as frequently, so lacking affecting content. Therefore, strong and weak tie function differently in transmitting information. While strong tie tend to transfer redundant information, individuals are inclined to use weak ties for the diffusion of novel information (Nelson 1989). However, weak ties are found to facilitate opportunity recognition via providing novel information (Singh et al. 1999).

In his survey study, Hills (1995) hypothesized that entrepreneurs who have extended networks identify significantly more opportunities than do entrepreneurs who lack such networks. The quality of network contacts can impact other components, including alertness and creativity that lead to increases in opportunity identification. Successful entrepreneurs discover opportunities that others do not see due to creativity (Schumpeter 1934). Creativity plays a central role in entrepreneurial decision making (Ardichvili and Cardozo 2000). 90 percents of the survey by Hills (1995) found that creativity is very important for opportunity identification process. Ray and Cardozo (1996) defined that “entrepreneurial creativity is an ability to rapidly recognize the association between problems and their supported solutions by identification of non-obvious associations and/or by reshaping or reforming available resources in a non-obvious way.”

However, solo entrepreneurs are those who lack networks (Ardichvili and Cardozo 2000). Solo entrepreneurs found creativity more important than did the networked entrepreneurs. Entrepreneurs without strong networks viewed themselves as being more creative, and were more likely to set aside time specifically to be creative. Entrepreneurs who are networked to opportunity resources may not need to be as creative as those who are not well networked (Hills 1995). Moreover, social networks (partnerships, inner circle, and action set) are important determinants for the entrepreneurial alertness and

opportunity recognition (Ardichvili, Cardozo, and Ray 2003). Therefore, higher level of social networks is related to the opportunity recognition.

Arenius and De Clercq (2005) studied network-based approach on opportunity recognition. They argue that individuals differ in terms of their perception of opportunities because of the differences between the networks they are embedded in. They focus on two perspectives of embeddedness of individuals networks: (1) individuals' belonging to residential areas that are more or less likely to be characterized by network cohesion, and (2) individuals' differential access to network contacts based on the level of human capital they hold. Their analyses show that the nature of an individual's residential area influences the perception of entrepreneurial opportunities. Furthermore, there is a positive effect for education, i.e., "people with a higher educational level are more likely to perceive entrepreneurial opportunities compared to those with a lower educational level."

A socio-cognitive framework of opportunity recognition proposed by de Koning and Daniel (1999) shows that, via extensive networks, entrepreneurs develop opportunities by pursuing three cognitive activities, including information gathering, thinking through talking, and resource assessing. The networks include inner circle of entrepreneurs, action set, partnerships, and a network of weak ties. Inner circle of entrepreneurs refers to the set of people with whom an entrepreneur has long-term and stable relationships; they are not partners in the venture. Action set refers to people recruited by the entrepreneur to provide necessary resources for the opportunity. Partners are start-up team members, and weak ties network is a network used to gather general information that could lead to identifying an opportunity or to answering a general question (de Koning and Daniel 1999).

Vandekerckhove and Dentchev (2005) focused on a network perspective on stakeholder management, facilitating entrepreneurs in the discovery of opportunities. They argued that the problem of opportunity discovery is at the heart of entrepreneurial activity. Cognitive limitations determine the search for and the analysis of information, and as a consequence, constrain the opportunities identification. Typical personal characteristic, locus of control, need for independence, and need for achievement, moreover suggest that individuals will tend to take a central position in their stakeholder environments and thus fail to adapt to the complexity of the stakeholder relationships in their entrepreneurial activity. Vandekerckhove and Dentchev (2005) approach this problem by adopting a network perspective on stakeholder management. They propose a heuristic approach of stakeholder analysis that requires two mappings of the entrepreneurial constituents: (1) the first mapping focuses on current interactions

between entrepreneur and their stakeholders, (2) the second focuses on a specific issue and the stakeholders that constitute. As the result, such a stakeholder analysis requires individuals to use the complexity of stakeholder relationships or partnership in order to go beyond their cognitive limitations and thus facilitate the discovery of new entrepreneurial opportunities.

Moreno (2008) tests on a model of opportunity recognition and development theory (Ardichvili, Cardozo, and Ray 2003) through empirical study, and finds that two more important variables should also be tested in the model: industry and region. Industry's argument is determined by firm size effect (number of employees) and sector effect (controlled by means of a dummy variable that incorporates six sectors of activity: the industrial sector, commerce and hotel and catering, financial institutions, health and education services, construction and energy services, transport and water). In region effect, he studies three important regions that include 21 municipal districts of Madrid. The cluster has been applied in ward method, including population density, income level and unemployment rate for each district. Moreno (2008) finds that these two variables (industry and region) are important factors in social networks and environment that alert entrepreneurs to recognize and develop the business opportunities.

To sum up, social network is an important determinant of entrepreneurial opportunity recognition. The more networks, the more opportunities entrepreneur may recognize. The key factors of social networks range from strong and weak ties, action set, and inner circle, to stakeholder relationships or partnership. Industry and region are also necessary in determining the social networks. Therefore, these factors (inner circle, action set, partnership, weak ties, industry, and region)<sup>3</sup> facilitate the process of the opportunity recognition through social networks and alertness.

### **2.2.3. Personality Traits**

A number of cognitive studies have focused on personality traits of entrepreneurs and their contribution to the success of entrepreneurial ventures (Ardichvili, Cardozo, and Ray 2003). However, psychometric test searching for distinctive entrepreneurial traits have been unable to find differences in most personality traits between entrepreneurs and other groups, such as manager or general public (Shaver and Scott 1991). Ardichvili, Cardozo, and Ray (2003) point out that there are two components in personality traits have been shown to be associated with successful opportunity recognition. First

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<sup>3</sup> These factors are later considered the sub-components of the social networks.

personality traits is the relationship between optimism and higher opportunity recognition (Krueger Jr and Dickson 1994; Krueger Jr and Brazeal 1994; Neck and Manz 1992; Neck and Manz 1996). Second personality trait is creativity (Hills 1995; Schumpeter 1934). Some studies show that entrepreneurial optimism is associated with self-efficacy beliefs. Ardichvili, Cardozo, and Ray (2003) point out that optimism about one's ability to achieve specific, difficult goals (self-efficacy) is not related to optimism in the sense of higher risk taking (Krueger Jr and Dickson 1994; Krueger Jr and Brazeal 1994). Optimism of entrepreneurs was an inside view of the potential success of the venture based on their evaluations about their abilities and knowledge. While forced to take an outside view, entrepreneurs were much more realistic in judging probable outcomes (Neck and Manz 1992; Neck and Manz 1996). Creativity is very important for opportunity identification (Schumpeter 1961). Creative factors play significant role in entrepreneurial decision-making (Ardichvili, Cardozo, and Ray 2003). According to surveys by Hills (1995), creativity very important for opportunity identification evidenced by 90% of those surveys. In the social networks literature, however, solo entrepreneurs find creativity more important than do the networked entrepreneurs. "They also viewed themselves as being more creative, and were more likely to set aside time specifically to be creative" (Ardichvili, Cardozo, and Ray 2003). Entrepreneurs who are networked to opportunity sources may not need to be as creative as those who are not networked (Hills 1995).

Moreover, in similar line with Ardichvili, Cardozo, and Ray (2003), Moreno (2008) has measured two factors of personality traits: motivation (reward intrinsic and extrinsic) and personality characteristics (sex and age) in his empirical test. His assumption on motivation theories was that individuals act to satisfy their needs and that before undertaking any action they consider what the remunerations or compensation will be (Moreno 2008). Through this reasoning, he used reward as an important effect on behavior, and finally classify entrepreneurs in accordance with the type of that reward that guides their behavior. There are two rewards: intrinsic and extrinsic rewards. Intrinsic rewards are those that individuals receive for themselves in great measure the result of the individuals' satisfaction with their work. Extrinsic rewards include direct and indirect compensation and non economic bounuses. Another measurement, in the line of prior knowledge variable, is the personal characteristics: gender, age, education and experience (Moreno 2008). The entrepreneur's human resource has been classified in theory, measured by variables that evaluate professional training, practical studies, university degree, and post-graduate studies, and complemented by evaluating variables that take

into account any previous business experience or experience in the business in question (Moreno 2008).

Therefore, creativity, optimism, motivation, and personal characteristics are important determinants of personality traits that affect the entrepreneurial opportunity recognition. The high level of personality traits is related to the opportunity recognition. As personal or entrepreneurial characteristics concern personality traits variable, this paper assumes that prior knowledge is also associated with personality traits.

#### **2.2.4. Entrepreneurial Alertness**

The term “alertness” was first used by Kirzner to explain the entrepreneurial opportunity recognition. Kirzner (1973) pointed out that entrepreneurs have or gain specialized knowledge and could use it to create or exploit opportunities. This is reinforced in later studies where entrepreneurs are shown to be more active in seeking opportunity than corporate managers (Busenitz 1996; Kaish and Gilad 1991). They also found that the successful entrepreneurs had high levels of entrepreneurial alertness. Timmons and Spinelli (2004) proposed that successful entrepreneurs possess capacity to see opportunity that others do not. They cite two scientists, Edison and Einstein, who between them wrongly predicted that the nickel battery would replace gasoline and that nuclear energy would never be obtainable. This reinforces the proposition that even the most brilliant scientific minds are not always fully tuned to business opportunity.

Opportunity recognition is a skill highly related to the field of technology where some huge product innovations have largely involved the transfer of a low-value technology from one business sector to another where it becomes high value (Christensen 1997). Any recognition of opportunity by a prospective entrepreneur is preceded by a state of heightened awareness of information (Ray and Cardozo 1996). Ray and Cardozo (1996) stated as entrepreneurial awareness (EA)<sup>4</sup>. They define EA as a propensity to notice and be sensitive to information about objects, incidents, and patterns of behavior in the environment with special sensitivity to maker and user of problem, unmet needs and interests, and novel combinations of resources. Personality characteristics and then environment interact to create conditions that foster higher EA (Ray and Cardozo 1996). Others argue that notion that higher entrepreneurial alertness increases the likelihood of an opportunity being recognized. For example, Kaish and Gilad (1991) proposed that

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<sup>4</sup> For simplicity, the distinction between “awareness” and “alertness” will not be made; hence “alertness” is used to narrate both concepts.

entrepreneurs are more alert to new opportunities and use information differently than managers do.

Understanding how successful entrepreneurs manage the opportunity recognition successfully is even more related to today with so much in the way of new technology either readily available or actively sought (Park 2005). Park (2005) offers an example of the form of large technology firms showcasing proprietary technologies through technology licensing websites (e.g. [www.yet2.com](http://www.yet2.com)) with the corporate objective to seek external license partners who will recognize the potential value in new markets. The other side of the equation is technology acquisition, which is also used by large corporations to recruit external scientists to solve business problems that have defeated their internal research and development organizations (e.g. [www.innocentive.com](http://www.innocentive.com)). Nevertheless, having available technology or even opportunity on show and available is just one part of the equation (Park 2005). It also requires an individual to be alerted to its potential reapplication opportunity and willing to take the risk of starting a business to exploit it. On the other hand, it requires a Schumpeterian champion (Schumpeter 1934) to engage in creative destruction of an existing market (Park 2005).

Therefore, there is impact between entrepreneurial alertness on opportunity recognition. A high level of entrepreneurial alertness is related to opportunity recognition (Ardichvili and Cardozo 2000; Kirzner 1997; Ardichvili, Cardozo, and Ray 2003; Busenitz 1996; Shane 2000).

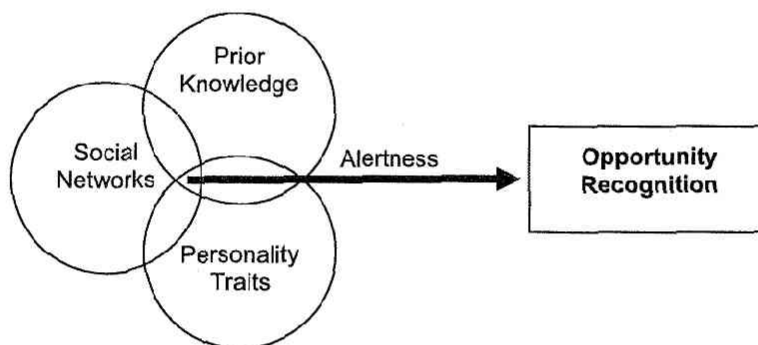
From the above reviews, three components (prior knowledge, social network, and personality traits) are highly associated with the entrepreneurial alertness, which is the prior source of the opportunity recognition. To understand the theory of opportunity recognition, this paper discovers in Figure 3, the conceptual model of the opportunity recognition consisting four components: prior knowledge, social network, personality traits, and alertness.

Prior knowledge refers to the knowledge of entrepreneurs prior recognizing any business opportunities. Social network is the network of entrepreneur in business settings. Personality traits is the characteristics and traits of the entrepreneur identifying business opportunity. Alertness refers to the alertness of entrepreneurial and business opportunities by individuals. A study of Shane (2000) shows that prior knowledge is associated with personality traits. Entrepreneurs, as a part of personality traits, could gain prior knowledge through social networks (Arenius and De Clercq 2005; Granovetter 1973; Hoang and Antoncic 2003). Thus social network is associated with prior knowledge and personality traits. The alertness (Kirzner 1997) of business opportunities may gain from

these three components (see Figure 3).

Therefore, the assumption of this paper is that alertness is the joint correlations between prior knowledge, social network, and personality traits. As the alertness to the business opportunities is recognized by individuals, the entrepreneurial opportunity recognition is associated with the prior knowledge, social network, personality traits, and alertness. This means that the four components are main sources of the entrepreneurial opportunity recognition (see Figure 3 and Figure 4). These two figures have quite similar scheme, however, Figure 4 possesses more details in terms of sub-associated components and interactions, for example, prior knowledge of market, prior knowledge about the ways to serve the market, and prior knowledge of customer problems (Shane 2000), and so forth.

**Figure 3: The Conceptual Model of the Opportunity Recognition**



### **3. Laws of Interaction**

Elwood and Janis (2007) and Lynham (2002) have studied the theory of Dubin (1978) and extend that the relationships among the units or concepts of theory are presented in the laws of interaction. How changes in one or more units of the theory influence the other units are presented in the laws of interaction. This paper generates the relationships outlined in Figure 4 extended from Figure 3 above. This research is interested in the outcome defined as a series of successful businesses created by entrepreneurs. The successful business creation results from a successful opportunity development process that includes opportunity recognition, evaluation, and development. It is assumed that opportunity recognition is a core stepping stone for this success.

Laws of interaction study the contribution and interactions of the model



components. Four components are discussed in their relationships: prior knowledge, social networks, personality traits, and alertness. Figure 4 illustrates the relationships between affecting factors, variables, or units of theory, particularly the four major variables of the model of entrepreneurial opportunity recognition. The proposed model may be summarized and suggested as follows. Entrepreneurial alertness is considered to be a core process of the model. The alertness level is likely to be heightened when there is a joint of several components: prior knowledge, social network, and personality traits. As mentioned above, any recognition of opportunity by a prospective entrepreneur is preceded by a state of heightened awareness of information. This means that higher alertness increases the likelihood of an opportunity being recognized by the individuals, who are more alerted to new opportunities and use information differently than managers or other corporate publics. Therefore, a high level of alertness is related to opportunity recognition.

Later from this point, sub-components are replaced by determining factors. That is this study divides two factors determining the prior knowledge: (1) prior knowledge about market, prior knowledge about ways to serve the market, and prior knowledge about customer problems, and (2) education and experience of entrepreneur. Entrepreneur discovers opportunities because prior knowledge triggers recognition of the value of new information. Entrepreneur exists because of information asymmetry between different actors that any given entrepreneur will discover only those opportunities related to his or her prior knowledge. Shane (2000) confirmed a number of hypothesis: "people's prior knowledge about market will influence their discovery of which markets to enter to exploit a new technology. People's prior knowledge about how to serve markets will influence their discovery of how to use a new technology to serve a market. People's prior knowledge of customer problems will influence their discovery of products and services to exploit to a new technology." Roberts (1991) puts that prior information, whether developed from work experience, education, or other ways, has impacts on the ability of entrepreneur to comprehend, extrapolate, interpret, and apply new information in means that those lacking that prior information cannot replicate. Therefore, prior knowledge is the source of the alertness that allows individuals identify successful business opportunities.

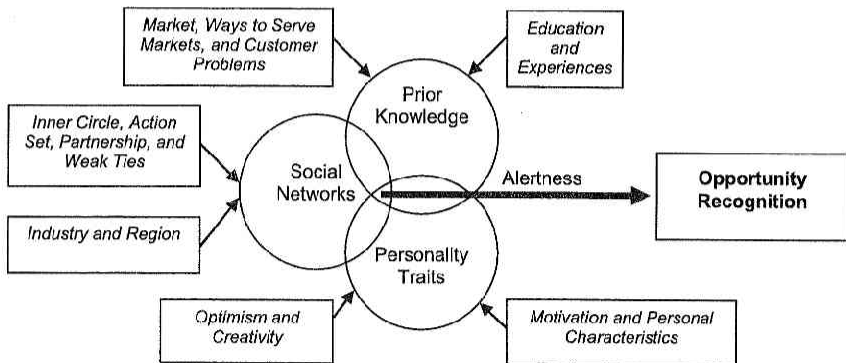
Factors determining the social networks include, (1) inner circle of entrepreneurs, action set, partnerships, and a network of weak ties and (2) industry and region. Inner circle of entrepreneurs refers to the set of people with whom an entrepreneur has long-term and stable relationships; they are not partners in the venture. Action set refers to

people recruited by the entrepreneur to provide necessary resources for the opportunity. Partners are start-up team members, and weak ties network is a network used to gather general information that could lead to identifying an opportunity or to answering a general question (de Koning and Daniel 1999). Network structure is important in opportunity recognition. The concepts of weak and strong tie describe the network structure of individuals. Weak ties are bridges to information sources not necessarily contained in a strong-tie network of an individual. Weak ties ties include casual acquaintance, and strong ties include friends and family. The casual acquaintance is more likely to provide unique information than are close friends, because most people have more weak ties than strong ties (Granovetter 1973). On the other hand, strong tie contacts have frequent interaction and tend to offer reciprocal favors to each other based on friendship. In contrast, weak tie does not interact with each other as frequently, so lacking affecting content. Therefore, strong and weak tie function differently in transmitting information. While strong tie tend to transfer redundant information, individuals are inclined to use weak ties for the diffusion of novel information (Nelson 1989). However, weak ties are found to facilitate opportunity recognition via providing novel information (Singh et al. 1999). Furthermore, several studies found that the less networks, the more creative entrepreneur is. As the result, inner circle, action set, partnerships, and weak ties are important determinants of social networks. As reviewed earlier, Moreno (2008) tests on a model of opportunity recognition and development theory (Ardichvili, Cardozo, and Ray 2003) through empirical study, and finds that two more variables related to the social networks should also be tested in the model: industry and region. These two variables are important factors in social networks and environment that alert entrepreneurs to recognize and develop the business opportunities. To sum up, social network is an important determinant of entrepreneurial opportunity recognition. The more networks, the more opportunities entrepreneur may recognize. The key factors of social networks range from strong and weak ties, action set, and inner circle, to stakeholder relationships or partnership. Industry and region are also necessary in determining the social networks. Therefore, these factors (inner circle, action set, partnership, weak ties, industry, and region) facilitate the process of the opportunity recognition through social networks and alertness. Those determining factors are the main sources of the entrepreneurial alertness to business opportunities by entrepreneurs.

Personality traits component consists of two determining factors: (1) optimism and creativity, and (2) motivation (reward intrinsic and extrinsic) and personal characteristics (gender, sex, education, and experience). Entrepreneurial optimism is associated with self-

efficacy beliefs. Optimism about one's ability to achieve specific or different goals (self-efficacy) is not associated to optimism in the sense of higher risk taking. Optimism of entrepreneur is an inside view of the potential success of the venture based on their evaluations about their abilities and knowledge. Creativity factor plays important roles in entrepreneurial decision-making and opportunity recognition. In social networks literature, however, solo entrepreneurs find creativity more important than do the networked entrepreneurs (Ardichvili, Cardozo, and Ray 2003). In motivation, there are two rewards: intrinsic and extrinsic. Intrinsic rewards are those that individuals receive for themselves in great measure the result of the individuals' satisfaction with their work. Extrinsic rewards include direct and indirect compensation and non economic bonuses. Another measurement, in the line of prior knowledge variable, is the personal characteristics: gender, age, education and experience (Moreno 2008). The entrepreneur's human resource has been classified in theory, measured by variables that evaluate professional training, practical studies, university degree, and post-graduate studies, and complemented by evaluating variables that take into account any previous business experience or experience in the business in question (Moreno 2008). Those four factors (optimism, creativity, motivation, and personal characteristics) are important determinants of personality traits. From the literature, therefore, personality traits variable is associated with the alertness of the recognition of business opportunities.

**Figure 4: The Contribution and Interaction of the Model Components**



In short, prior knowledge, social networks, personality traits, and alertness are four important factors determining the opportunity recognition by entrepreneurs.

The development process of this opportunity recognition may differ across

individuals, entrepreneurial teams, and organizations. Certain individuals are good at invention, and others at creating business models. But very few may excel both. Team and individuals have different personalities, which means that no two organizations conduct exactly the same venture development procedures. Ardichvili, Cardozo, and Ray (2003) concluded that, “inventors may develop their inventions into full business concepts, or entrepreneurs who have not participated in the invention process may attempt to expand invention into full business concepts if their economic processes are promising. For inventions to become business, either the inventor or entrepreneur must recognize the opportunity and evaluate it positively.”<sup>5</sup>

#### **4. Boundaries, System States, and Propositions**

In this section, Dubin’s theory is described from step 3 to 5. Step 3 is the boundaries of the theory, step 4 is the system states of the theory, and step 5 is the propositions of the theory. These phases are necessary on the theory building methodology framework of this paper.

##### **4.1. Boundaries of the Theory**

Boundaries of the theory refer to the boundaries within which theory is expected to apply (Dubin 1978). The boundaries of a theory differentiate its theoretical domain from aspects of the world not addressed by the theory. Ardichvili, Cardozo, and Ray (2003) point out opportunity identification and development, and others (Eckhardt and Shane 2003; Hills 1995; Kirzner 1973, 1997; Park 2005; Shane 2000; Singh et al. 1999; Timmons and Spinelli 2004; Ucbasaran et al. 2003) have addressed that, “significant commonalities exist between the business creation processes of independent start-ups and internal corporate ventures.”

However, the boundary, which this paper’s theory expected to hold, is the boundary of pre-development of entrepreneurial opportunity, the opportunity recognition.

##### **4.2. System States of the Theory**

System states of the theory refer to condition under which the theory is operative. Dubin (1978) defines “a system state as a state in which all the units of the system take on characteristic values that have persistence through time, regardless of the length of the

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<sup>5</sup> Later paper author will discuss more by focusing on opportunity recognition and development theory.

timeinterval.” Meaning that all units of the system have values that are determinant, measurable, and distinctive for that state of the system. A system state that accurately represents a condition of the system being modeled has three features: (1) inclusiveness, all the units of the system are included in the system state, (2) persistence, the relationship between units persists long enough to allow the goodness of fit between them to be determined, and (3) distinctiveness, all units take on unique values for that system state.

This study’s model fulfills all the three requirements, because (1) it includes all the important units of the system, meaning all the units that have been identified as important in previous research on opportunity recognition, (2) the relationships between all the units in Figure 4 are long-lasting relationships, and (3) there is no overlap in values between any of the units, meaning that each unit has its own unique value.

### **4.3. Propositions of the Theory**

Proposition of the theory refers to logical deduction about the theory in operation. Dubin (1978) mentions that propositions can be subjected to empirical testing because they are statements that are logically derived from the theory. In order to extend to further empirical testing, five required propositions are proposed from the model of opportunity recognition theory. These propositions illustrate those that may be derived from the proposed theory, but do not exhaust. Each may have its own breakthrough proposition.

*Proposition 1: A high level of entrepreneurial alertness is related to successful opportunity recognition.*

*Proposition 2: Entrepreneurial alertness is the core joint relationship between prior knowledge, social networks, and personality traits.*

*Proposition 3: Prior knowledge, regarding market, the ways to serve market, customer problems, education, and experience, is related to the alertness of opportunity recognition.*

*Proposition 4: Social networks, regarding inner circle, action set, partnership, weak ties, industry, and region, is related to the alertness of opportunity recognition.*

*Proposition 5: Personality traits, regarding optimism, creativity, motivation, and*

*personal characteristics, is related to the alertness of opportunity recognition.*

Theory building is not without proposition. Proposition of the theory should also be conducted conforming to the Dubin's method, because they are regarded as stepping-stones to the future empirical researches. In each proposition, relationships of the affecting variables are stated and considered important that may have been the key contributors of the opportunity recognition.

## **5. Conclusion**

This research studied the methodology of theory building from the framework of Dubin, which finally built a model of the entrepreneurial opportunity recognition. This model suggested four major variables: prior knowledge, social networks, personality traits, and entrepreneurial alertness, which can result in recognizing the successful entrepreneurial opportunity. Five propositions of the theory have finally been made on relevant variables. This paper proposes that these four variables are related to opportunity recognition.

However, it is required that further studies on entrepreneurial opportunity recognition and development have to be conducted utilizing complete steps of the Dubin's theory, i.e. in addition to the last three steps: empirical indicators, hypotheses, and empirical testing. This means that further empirical research should be conducted to test the proposed model on larger samples with structural equation modeling (SEM). As the model outlines in Figure 4, it is likely that the factor analysis of empirical study could be tested. For example, it is not easy to measure prior knowledge variable directly with the opportunity recognition. In this case, we normally measure the prior knowledge by utilizing its related factors like education and experience. Education maybe interpreted by educational level from elemental or professional grads to the postgraduate. Previous working experiences and experiences of successful business start-up may be interpreted in the experience factor of the prior knowledge variable, etc. Finally, it is suggested that mixed methodology and longitudinal research may also be applied.

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