

3-2015

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### Recommended Citation

Coss, David L.; Dhillon, Gupreet; and Udeh, Ifeoma (2015) "Strategic Planning Objectives for Venture Capitalist Investments in Emerging Information Technologies: A value-focused perspective," *The Journal of Entrepreneurial Finance*: Vol. 17: Iss. 1, pp. 27-64. Available at: <http://digitalcommons.pepperdine.edu/jef/vol17/iss1/2>

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# Strategic Planning Objectives for Venture Capitalist Investments in Emerging Information Technologies: A Value-focused Perspective

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## ABSTRACT

Academic and practitioner literature suggests that Venture Capitalists often have problems with aligning information technology opportunities with investment objectives. To a large extent the alignment process is not formally documented and relies on intuitive instincts. Hence it is important to define Venture Capitalist objectives for investments in emerging information technologies. This paper uses the Value-Focused Thinking approach to identify, define and structure value driven objectives. Based on data collected from a number of Venture Capitalist interviews we identified 130 values, which resulted in 72 objectives. These objectives were organized into 22 clusters, which were bifurcated into fundamental and means categories. In a final synthesis we present a 7 fundamental and 15 means categorical objectives for strategically planning Venture Capitalist investments in emerging information technologies.

Keywords: Strategic planning, Venture Capitalists, emerging information technologies, value-focused thinking.

JEL Codes: G24, O32, M13

## I. Introduction

The creation of a venture is full of uncertainties (Burke and Miller, 1999), especially when it involves emerging information technologies. Entrepreneurs must be willing to assume personal, social, and psychological risks (Lumpkin and Dess, 1996), when considering new investment opportunities. A Venture Capitalist (VC) likes to ensure an entrepreneur is aware of, and committed to, overcoming the risks typical of emerging technology markets. The connection between emerging technologies and VCs can often be a very strong one. Minola and Giorgino (2008) note “small and medium-sized enterprises – especially young and innovative ones – need an adequate context and efficient and effective tools if they are to survive and develop” (pg. 335). The union between an entrepreneur and a VC is often short-lived unless the VC is convinced, based on personal values held for evaluating investments, that the business will provide an acceptable return. Hence, it is important to capture the values of VCs such that their objectives for investing in emerging information technologies are well informed. We posit these values are rooted in the personal, financial, and organizational beliefs that exist within each independent VC.

The remainder of this paper is organized as follows. First, we discuss the relevant literature on VC belief systems and their ability to identify and invest in emergent information technology opportunities, which are congruent to their behavioral, financial and organizational foundations. Second, we present our methodology, which is based on Keeney’s (1999) value-focused thinking. This approach focuses on defining and structuring individual values into fundamental objectives as a means to guide the decision making process. Third, we discuss our identified means objectives and fundamental objectives. These objectives are then reassessed in light of the literature to explore and clarify the associations they have with each other. An illustrative case is also presented. Fourth, we present our proposed theoretical and practical implications, and conclude.

## II. Literature Review

VCS adopt a wide range of criteria for identifying, evaluating and selecting investment opportunities. There are periods of time when the momentum of the market drives inexperienced VCs to invest in the latest fad. At other times, even knowledgeable VCs get influenced by their peer networks to invest aggressively (e.g. see Scharfstein and

Stein, 1990; Gupta, 2000). Research has shown that an individual's decision processes are susceptible to cognitive biases, which lower their perception of risk (Yazdipour, 2008; Palich and Bagby, 1995; Shaver and Scott, 1991; Simon et al., 2000). Cognitive biases are thought and decision making processes that derive erroneous inferences or assumptions, typically based on predisposed opinions (Busenitz and Lau, 1996). Very often, individuals make decisions based on biases, heuristics or take short cuts in their decision making process (Busenitz and Barney, 1997). If venture capitalists make decisions using biased thinking, significant avoidable mistakes may occur. Thus, VCs improve their decision-making processes by using more impartial information and careful analysis. In practice, VCs adopt a broad range of strategies, but academic research has referred to a rather narrow view as discussed below.

An analysis of the VC literature suggests four emergent categories of research. These are: emotional-fit (Zahra et al., 2006; McKnight et al., 2002); behavioral-fit (Bassellier et al., 2001; Bassellier and Benbasat, 2004); organizational-fit (Gruber, 2007; Overby et al., 2006; Galbraith and Schendel, 1983); and financial-fit (Hsu, 2004; Sapienza, 1992; Fiet and Patel, 2006; Curley, 1992). Emotional-fit focuses on human elements such as personalities, characteristics and traits. Behavioral-fit relates to aspects of human nature, behavior and characters such as commitment, competence, dedication, and motivation. Organizational-fit focuses on alignment of structures, processes and resources within an environment, while financial-fit relates to funding, benefits, rewards and risks.

#### *A. Emotional-fit*

Researchers identified various emotional aspects of human behavior that influence VC investment decisions. Past events that are more vivid and evoke emotion are likely to affect VC decision processes (Zacharakis and Shepherd, 2001). Typically, such aspects deal with trust among participants, individual perceptions of abilities, characteristics and traits of key stakeholders. For instance, Zahra et al. (2006) studied relational trust in business creation and noted relational trust can overcome some issues related to social complexity, causal ambiguity, information asymmetry, and political tensions that arise during business creation.

Similarly, Talaulicar, Grundei, and Werder (2005) found trust between top management team members avoids losses in comprehensiveness and yields speedier decisions, because of the perception of being sufficiently supplied with information.

Since the disposition to trust can influence an individual's beliefs and intentions (McKnight et al., 2002; Jarvenpaa et al., 1998), it is arguable that trust between a VC and an entrepreneur may lead to faster investment decisions by the VC, because of the belief of possessing adequate information to make decisions. Sapienza and Korsgaard (1996) whose research emphasizes the importance of entrepreneur engendering investor trust support this assertion. Further, Shepherd and Zacharakis (2001) suggest trust can be built by: signaling commitment and consistency; being fair and just; finding a good fit with a partner; and frequent and open communications.

### *B. Behavioral-fit*

The notion of behavioral fit is based on the belief that individuals will incorporate a qualitative assessment of risk into their financial investment decision-making process. Nelson and Winter (1982) state that an individual's economic behavior is a function of past decisions. Similarly, Hambrick and Mason (1984) argue that it is one's experience that affects one's decision-making. Therefore, the success and failures of previous investment decisions will influence the interpretation of information regarding new investment decisions. Individuals prefer the comfort of familiarity and therefore, tend to focus their attention on aspects of their environment where they have prior knowledge (Levinthal and March, 1993).

Since a venture capitalist's primary goal is to make profitable investment decisions, they tend to focus on deals similar to their past successes as opposed to those in which they failed. This implies VCs will choose a particular investment strategy mainly based on the perceptions of those types of risks that are related to their prior knowledge and competencies. VCs will explore the differences in individual abilities and competencies required for innovation and business management. Such competencies comprise of organization-specific knowledge, interpersonal and management knowledge (Bassellier et al., 2001; Bassellier and Benbasat, 2004). The ability to define good competence for leadership will help in building a competent IT organization (Bassellier et al., 2001); especially since Carswell and Gunaratne (2005) in their study suggest the leadership focus of entrepreneur is on invention rather than the development of the business.

### *C. Organizational-Fit*

Organizational-fit requires awareness of current strategic options. Galbraith and Schendel (1983) argued that strategy is a complex system or network of intertwined relationships between various management decision variables such as marketing, pricing, production and research. Similarly, other strategy studies such as segmentation and differentiation research by Clemons and Weber (1994), and branding study by Krake (2005) address the importance of a strategic fit between the internal operations and external stakeholders, which has implications for VC investment opportunities. Leavitt (1964) studied the structural and technical aspects of organizations, and suggests structures, processes and strategies should be in perfect alignment for successful change. Further, Henderson and Venkataram (1993) brought the importance of aligning business and IT strategies to the fore. They suggested a focus on organizational and IT infrastructures is important to ensuring alignment and determining organizational fit.

With respect to the internal environment, it is essential to understand the internal operations of an organization, and how these internal operations interact with the psychological components of individuals and the technological infrastructures, within the organization (Griffith et al., 2003). Opportunities for new technology exist when there is a gap between organizational and IT infrastructures. This assertion is particularly relevant in terms of VCs identifying emerging technologies to fill a gap in the marketplace. A key factor for organizational fit is engaging in change management to ensure enterprise agility (see Hoogervorst, 2004). Overby et al. (2006) studied the need for firms to possess “enterprise agility,” which they described as the ability of firms to sense changes in the environment and to respond accordingly. Similarly, Clark et al. (1997) described enterprise agility as “change-readiness.” These changes may relate to emerging technologies and “market pioneering” (Covin et al., 2000) or “a launch of a next generation product” as stated by Nault and Vandenbosch (2000).

### *D. Financial-Fit*

VCS investment decisions are a function of the financial-fit between the emerging technology idea and their own personal resources. The more funding available for an emerging technology, the more valuable the emerging technology is perceived to be. According to Hsu (2004), entrepreneurs in a bid to gain access to VCs of high caliber

are willing to discount their start-up. By offering discounted investments to VCs with high reputation, these VCs may be willing to convince members of their networks to invest (Shane and Cable, 2002; Zhang et al., 2008)

The performance of a venture is of great importance to the entrepreneur, but also to VCs that have resources invested therein. There is the desire to know beforehand how much of a return can be obtained from an investment (Fiet and Patel, 2006; Curley, 1992; Cooper and Carleton, 1979). Sapienza (1992) found the performance of a venture is related to VC involvement. This suggests VC funding is important to the development of a venture, but also, VC involvement impacts the success of a venture. This is significant since it has implications for the expected investment return, risk (Amit, 1990; Iversen et al., 2004) and exit strategy of VCs (Cumming, 2008; Huyghebaert and Van de Gucht, 2004). As identified by Curley (1992), three cardinal principles of venture capital investment are: (1) the VC is willing to take the heavy risks involved in new ventures, but also expects to be rewarded accordingly; (2) the VC would normally invest for a medium term (no less than 3 nor more than 7 years); and (3) the VC will want to exit the project with cash at the end of the period.

### III. Theory and Methodology

Literature suggests VCs tend to internalize their decision process based on beliefs beyond these levels of emotional, behavioral, organizational and financial considerations to assess where they should invest or what their priorities should be. Such considerations have been termed as "values" that people might hold (Keeney, 1992). The notion of values is nothing new, and the importance of values is well recognized (Orlikowski and Gash, 1994; Tan and Hunter, 2002). Various terms have been used to describe values including cognitive maps, schemas, mental models, and technological frames. In the context of VC research, the importance of individual values has been recognized. However, research has fallen short of articulating how these values inform decision-making. It is important to establish the link between values and decision making, since VCs essentially want to decide whether they should investment in a certain enterprise or not. How VC values collectively form objectives for VC investment decisions is what this paper addresses. While this aspect is new in the VC investment decision-making domain, values have been well articulated to define objectives in many other domains (see Keeney, 1999; Torkzadeh and Dhillon, 2002).

This study focuses on the examination of VCs' investment decisions in emerging information technologies, and how they are shaped by their value perception of the individuals within an organization. Approaching the concept of VCs values from this viewpoint, it can be argued that their investment objectives are shaped by underlying social and organizational factors, which impact the consciousness of VCs decision-making processes. Tan and Hunter (2002) argue that sense-making begins with the personal perspectives that individuals use to understand and interpret events that occur around them. In this paper, we argue that the personal perspectives framed by a VC's values ultimately determine whether or not a VC invests in an emerging information technology.

Catton's (1959) theory of value suggests individuals are conceived to be at the center of a vortex of multiple decision options. One decision is preferred over the other based on various sociological and psychological values and beliefs that they personally identify with, as being closely linked to their own. Researchers have argued that understanding the assumptions, expectations, values, and beliefs of stakeholders can lead to more successful outcomes (Orlikowski and Gash, 1994; Tan and Hunter, 2002). Understanding the cognitive processing of these assumptions, expectations, values and beliefs is becoming increasingly important for a number of areas of management research including strategic management (Walsh 1995). In this paper, we adopt Keeney's (1992; 1994) approach to understanding an individual's decision-making process, which is based on Catton's theory of value. We examine individuals' actions to invest in emerging technology by understanding individuals' value and belief systems.

Value-focused thinking does not limit individuals to narrowly defined rules. Instead, it focuses on the items people care about, which by definition does not constrain individuals to a limited set of rules. Since this concept relates to perceptions, opinions, and unobservable characteristics of individuals, the major obstacle is identifying a comprehensive list of VC investing objectives, which prevail in emerging technology ventures. Hence, the decision to start the process of identifying key VC values from scratch. Keeney (1999) suggests values can be identified by asking relevant individuals within an organization about their values. While no consensus exists as to the appropriate number of individuals to interview, we interviewed twelve VCs from geographically diverse backgrounds to gain a broad perspective of generally held VC investment values. The interviewees in this study all had a minimum of 10 years of relevant experience investing in emerging technology ventures. Multiple interviews were conducted. In total,

about 52 hours of interview time was spent collecting largely qualitative data. The values identified by the subjects were organized using a 3-step process:

1. Each individual was asked to think beyond the bounds of what they were currently doing and identify their wishes - things they wished could be done while investing in new information technology venture. Interviews were designed to obtain implicit values, and interviewees were asked to list values they considered important, as well as the investment shortcomings they perceived within emerging technology ventures.
2. Each value statement was restated in a common form, and then converted into an objective by adding a directional preference. These sub-objectives were then grouped into 22 clusters, which represented the main objectives.
3. Each cluster of sub-objectives was classified as means or fundamental to the decision context. This was done by applying the WITI test (Why Is This Important) proposed by Keeney (1992). Keeney argues, "Two types of answers seem possible. One answer is that the objective is one of the essential reasons for interest in the situation. Such an objective is a candidate for a fundamental objective. The other response is that the objective is important because of its implications for some other objective. In this case, it is a means objective" (pg. 66). This process resulted in 15 means and 7 fundamental objectives.

Our final synthesis presented two sets of objectives, and Keeney (1992) recommends that the objectives are a good basis for defining decision models. Keeney (1992) does not suggest further validation of the objectives. However, Torkzadeh and Dhillon (2002) set up a panel of experts to validate the objectives in their value focused study. Following Torkzadeh and Dhillon (2002), we set up a panel of 3 VCs. We presented our objectives to the panel and sought comments pertaining to internal consistency of the means and fundamental objectives. The panel of experts felt our objectives were well-formed and represented the domain well. We also asked the panelists to comment on the division between means and fundamental objectives. The panelists felt the WITI test adequately helped in deriving the means and fundamental objectives. However, the panelists felt the wording for some of the objectives were off the mark, and had to be expressed differently. Based on the input from the panelists, adjustments were

made and the panelists were asked to review the revised list. Overall, the validation process helped ensure that the list of objectives developed was both reliable and complete.

#### IV. VC Objectives for Emerging Technology Investments

Definitions of VC objectives for emerging technology investments are developed systematically in a number of steps. In the first step, we identified all the values from our interviews. For instance, we identified the following values:

- "I wish I knew the person that wants me to invest in an emerging technology company."
- "I wish I knew the entrepreneur's ethics."
- "I wish I had an assurance about the entrepreneur's values."
- "I wish I could trust the person asking me to invest in an emerging technology."

Next, we converted each of these raw values into sub-objectives. In this case, the following sub-objectives emerged:

- Maximize confidence in entrepreneur.
- Develop an understanding of entrepreneur's ethics.
- Ensure VC-entrepreneur value alignment.
- Ensure trust in entrepreneur.

In defining the sub-objectives, there is a many-to-one relationship, that is, many values lead to one sub-objective. Our careful consideration of the four sub-objectives further suggests they could be collectively described as "Maximize VC-Entrepreneur Trust Relationships." In our study, the common descriptors for all the sub-objectives are termed objectives. We had 22 such objectives in this study.

Another illustrative example of raw values being molded into sub-objectives and subsequently merging to form a main objective is shown here. "Maximize entrepreneur's team congruence" emerged from the following values and sub-objectives:

- Values such as, "I wish I were enculturated with the management team's thinking process," and "I wish I knew if everyone in the company is working together"

come together to form the sub-objective, "Ensure Venture's ability to work in teams."

- The values, "I wish the management team had a history of success," and "I wish the management team had experience in creating new ventures" come together to form the sub-objective, "Ensure venture management team's success record."
- "I wish I am familiar with all competencies for new leadership," and "I wish I had faith in the competence level of the management team" come together to form the sub-objective, "Understand competencies of leadership team."

In forming objectives for emerging technology investments, we went through all the values using the process illustrated above and further classified them into fundamental and means objectives (as discussed in section 3 above). Significance of each objective is discussed below and a summary list of the fundamental and means objectives appears in Tables 1 and 2.

#### *A. Fundamental Objectives*

##### *Maximize VC-Entrepreneur trust relationships*

This objective, focused on the trust relationship between a VC and an entrepreneur is necessary for the VC to invest in a new venture. Building trusting relationships temper a VC's fears, while building VC's confidence in the entrepreneur, and relational trust can be a powerful ingredient for fostering activities needed for successful new business creation (Zahra et al., 2006). A key component to establishing trust between a VC and an entrepreneur is tied to the level of confidence the VC has in the entrepreneur. Additionally, an understanding of the entrepreneur's ethics plays an important role in the VC's ability to ensure trust in the entrepreneur. An alignment of VC and entrepreneur's core values and beliefs is a forceful driver in building the trust foundations that exist in the fundamental objective of "Maximize VC-Entrepreneur trust relationships."

As noted by one of our VC respondents, *"I usually do not invest in any venture unless I trust the other party."* This suggests that a good relationship between a VC and an entrepreneur is important. Sabherwal (1999), while discussing trusting relationships

notes that in inter-organizational relationships, there are usually two types of contracts - formal (written) and psychological. While the formal/written contract is rather easy to understand and implement, the psychological contract is typically loaded with obligations and each other's prerogatives. When dealing with new emergent technologies, the VCs and entrepreneurs need to be conscious of factors that lead to successful relationships.

### *Maximize understanding of market-making mechanisms*

To make investment decisions, VCs need the ability to forecast emerging technology markets. To develop this ability, VCs need to know how to maximize price by understanding inelasticity for emerging technologies. With this knowledge, VCs and entrepreneurs will ensure a positive revenue stream for the technology venture. However, unlike an entrepreneur, who often does not have much to lose from erroneous forecasts (Gruber, 2007), the VC must be able to correctly forecast changes in the market for an emerging technology to ensure a continuing revenue stream and minimize price elasticity for the emerging technology. The need to understand market-making mechanisms cannot be overstated, because market-making mechanisms are designed to assure liquidity, and the market maker has to maintain a wide spread to cover the cost of capital and generate a profit. This was clearly illustrated by a VC working in the medical field. The VC stated, "*In our field, market-making is a tricky business. There is a small gap in the cost associated with physicians billing and collection process and the fixed cost being charged by the service providers.*"

### *Maximize understanding of the emerging technology market*

This objective emphasizes awareness of the trend in emerging information technology market. VCs need to understand niche market characteristics for an emerging technology, to make successful investment decisions. To gain this understanding, the product or service mix offered should be well defined and documented. Also, understanding current threats and opportunities will help in identifying future threats

Table 1: Fundamental Objectives for VC Investment Decisions

<b>Fundamental Objectives</b>	
<p><b>Maximize Venture Capitalist-Entrepreneur trust relationships</b></p> <p>Maximize confidence in entrepreneur. Ensure trust in entrepreneur. Develop an understanding of entrepreneur's ethics. Ensure venture capitalist-entrepreneur value alignment.</p>	<p><b>Maximize confidence in entrepreneur's individual abilities</b></p> <p>Maximize understanding of entrepreneur's challenges. Maximize understanding of entrepreneur's personal traits.</p>
<p><b>Maximize understanding of market-making mechanisms</b></p> <p>Define ability to forecast emerging technology markets. Ensure revenue stream. Maximize price inelasticity for emerging technologies.</p>	<p><b>Maximize understanding of marketing strategy</b></p> <p>Maximize ability to differentiate. Define marketability of emerging technologies.</p>
<p><b>Maximize understanding of the emerging technology market</b></p> <p>Maximize understanding of niche market characteristics. Ensure well-defined product/service mix. Maximize optimization of emerging technologies products and services. Define an understanding of threats and opportunities for emerging technologies.</p>	<p><b>Maximize understanding of entrepreneur's competence</b></p> <p>Maximize understanding of entrepreneur's technical abilities. Maximize understanding of entrepreneur's strategic abilities. Define competence for leading emerging technology ventures. Ensure experiential knowledge in venture domain.</p>
<p><b>Maximize entrepreneur's financial commitment</b></p> <p>Ensure entrepreneur's financial status. Ensure entrepreneur's financial commitment to the emerging technology.</p>	

and opportunities for an emerging technology. To invest in an emerging technology, VCs want to believe that the optimization of emerging technology products and services are maximized for prospective consumers. This ensures barriers to entry for potential competitors.

As stated by Nault and Vandenbosch (2000), an incumbent in a market is fully aware of potential market developments, and is willing to preempt potential entrants in order to maintain market leadership. VCs also want to be aware of the trend, especially since they are funding the investment. As such, VCs may want to work with entrepreneurs to understand the emerging technology market, and help the venture management identify where it has resource and capability advantages over its rivals (Nault and Vandenbosch, 2000). A respondent reaffirmed the importance of having an ability to scan an emergent technology marketplace, which is usually done by having a multidisciplinary team in the VC group. As noted by the respondent, *"The strength is in the team with broad industry knowledge and diverse skill sets. This helps us to understand the market trends and quickly analyze the potential."*

#### *Maximize entrepreneur's financial commitment*

Just as the entrepreneur must have the technical and business acumen necessary to build the new venture into a successful venture, the entrepreneur must also prove financial commitment to both the new venture and the emerging technology to the VC. The VC invests only when the entrepreneur proves capable of sustained financial commitment. When VCs are considering investing with individuals that they do not have previous business relations with, they need to evaluate the entrepreneur's financial status. This evaluation of the entrepreneur's net worth will allow the VC to judge the entrepreneur's financial commitment to the emerging technology. As one VC expressed, *"Personally, I like to see that the entrepreneur has mortgaged everything he has into the venture."* If the entrepreneur's financial commitment to the emerging technology is high then, the VC is more willing to invest in the emerging technology as well.

#### *Maximize confidence of entrepreneur's individual abilities*

Before VCs make investment decisions, they form an understanding of entrepreneurs' challenges, to assess their ability to lead new ventures through the trials

and tribulations of developing successful business organizations. This understanding is not restricted to entrepreneurs' business acumen, but also includes an understanding of entrepreneurs' personal traits, since the relationships that are formed between VCs and entrepreneurs are social in nature. Questions that VCs may want answered include – is the entrepreneur suited to building a venture to a successful one, or is the entrepreneur suited to developing ideas and innovations? As one respondent commented, *"it is not just the business aspects that we are looking at. We want to be certain that there is good communication between an entrepreneur and us. It is important for us to know if we can call upon them for consultation."*

Carswell and Gunaratne (2005) found many entrepreneurs' characteristics and abilities were suited to inventing, rather than developing the business. VCs also want to know if the entrepreneur is new at venture building, or if the entrepreneur has mature experience (Thorpe et al., 2006). Hsu (2007) noted "Prior founding experience (especially financially successful experience) increases both the likelihood of VC funding via a direct tie and venture valuation; and that founders' ability to recruit executives via their own social network (as opposed to the VC's network) is positively associated with venture valuation" (pg. 772).

### *Maximize understanding of marketing strategy*

Embedded in this objective is a VC's desire to know if the entrepreneur has a marketing strategy, and if the entrepreneur is able to address different segments of the market. The VC tends to favor entrepreneur ventures that have the ability to differentiate market segments for their emerging information technologies. One respondent said, *"We want to have relationships with entrepreneurs who are knowledgeable of the market, but may not have the actual ability to market. Or, they may have a wonderful product that fits the need, but don't know how to sell."* This knowledge is required for "developing flexible pricing strategies and tailored offerings for individual customers" (Clemens and Weber, 1994). This objective is achieved by understanding the market boundaries of the emerging technology. The goal is to be aware that the new venture team can provide services that are accurately targeted at the needs of specific customer segments, especially in today's global market with heterogeneous customers and costs that vary widely across customers (Clemens and Weber, 1994).

### *Maximize understanding of entrepreneur's competence*

In building an emerging information technology venture, there are few pre-defined tasks, and a VC expects the entrepreneur to have the technical abilities to understand the technology requirements, as well as the business acumen to successfully build the business. Entrepreneurs must not only possess the skills to do both jobs, but also the competence to develop and nurture human capital to acquire the required individual skill sets, as well. A VC needs to verify the entrepreneur's ability to develop and deliver specific strategic goals. To do this, the VC needs to be able to define competence requirements for leading emerging technology ventures. Additionally, the VC needs to have a high level of confidence in the entrepreneur's experiential knowledge in the venture domain.

The notion of competence is well researched. Dhillon (2008) present competencies for harnessing information technology, and suggests how these abilities can be used to ensure success of an enterprise. It has also been argued that competence gaps emerge, not just because of the cognitive failures of a few top people in a company, but also because of a lack of embedded customer and market related competencies (see Henderson, 2006). Interestingly, one of the respondents for this research made the exact same observation. The respondent stated, *"Even though the CEO was competent in developing a great product, he lacked the ability to sell his own product, therefore key stakeholders need to evaluate the people involved in the venture and their ability to understand the market and customer perspectives."*

#### *B. Mean Objectives*

### *Maximize the entrepreneur's team congruence*

The start-up team plays a key role in VCs' evaluations of venture proposals. VCs consider not only individual team members' characteristics, shortcomings, and qualities, but also the team's characteristics. VCs desire assurance that the team is coherent, cohesive, and share the same goals and passion for success. Franke et al. (2008) found "Novice VCs tend to focus on the qualifications of individual team members, while experienced VCs focus more on team cohesion." One interviewee noted, *"I have often come across various venture projects that even though they have a good innovative product*

*they are unable to be successful and turn a profit. When I dig deep into these organizations I will usually find one or two key stakeholders, who are not completely on board with some aspect of the venture for some personal point or what not and they become the road block to success. In those cases I will only invest if I know for certain that those road blocks are either removed or on board with the overall team goals."*

Further, VCs desire to know if the venture leaders can allow their entrepreneurial capabilities to flow freely among team members, thus transmitting their entrepreneurial spirit to the team and, subsequently driving the collective entrepreneurship in the firm (Soriano and Martínez, 2007). VCs also need to understand the competencies of the leadership team and verify that they have the ability to gain synergistic benefits from the venture's team. The higher the level of success of the venture management team's previous projects, the more likely the VC will be willing to invest in the venture project.

### ***Maximize business continuity for emerging technology ventures***

As emerging technology ventures succeed and become dominant players in the market segment, "the very factors that created and defended the strength of the dominant players may have become weaknesses" (Clemons et al., 1996). As such, a new venture must have contingency plans and processes to ensure it does not become the ousted incumbent. VCs like to review business plans with well-defined clarity of business processes before they are willing to commit their personal resources to the venture. One respondent commented, "*The business plan needs to include a well thought out business model as well and include a contingency plan that is complete and comprehensive.*" This ensures certain revenue goals or technology milestones are met within the forecasted time period. VCs also require contractual rights granting them the ability to ensure continued alignment of the venture with their investment portfolio objectives.

### ***Maximize confidence in emerging technology market***

In emerging technology markets, the race to launch the next generation product before competitors, often drives new ventures to develop an alternative to current generation products, or "disruptive technology" (Christensen, 1997). Disruptive technologies are prime targets for VCs who invest in emerging technology ventures.

**Table 2: Means Objectives for VC Investment Decisions**

<b>Means Objectives</b>	
<p><b>Maximize entrepreneur’s team congruence</b>                      Ensure venture’s ability to work in teams.                      Ensure venture management team’s success record.                      Understand competencies of leadership team.</p>	<p><b>Maximize understanding of venture’s technological innovations</b>                      Understand impediments to technology innovations.                      Define understanding of sustainable technological innovations.                      Maximize understanding of path dependency.</p>
<p><b>Maximize business continuity for emerging technology ventures</b>                      Define clarity of business processes.                      Define clarity of business model.                      Ensure contingency planning is complete and comprehensive.                      Ensure continued alignment of venture with investment portfolio objectives.</p>	<p><b>Ensure the emerging technology venture is well-designed</b>                      Maximize validity of entrepreneur’s emerging technology ideas.                      Ensure well-formed organizational structure for new venture.                      Develop understanding of organization’s culture for new venture.                      Define reporting feedback mechanisms for new venture.</p>
<p><b>Maximize confidence in emerging technology market</b>                      Maximize understanding of nuances of emerging technologies.                      Develop understanding of alternative technological innovations.                      Define clarity of entrepreneur’s technological investment objectives.</p>	<p><b>Maximize venture capitalist’s investment return in emerging technologies</b>                      Minimize financial risk.                      Maximize understanding of opportunity costs.                      Ensure entrepreneur’s accountability for return of venture capitalist’s investment.                      Maximize return on investment.                      Ensure clarity of break-even point in emerging technology venture.</p>

<p><b>Maximize entrepreneurial dedication</b>          Ensure entrepreneur's commitment for the duration of the venture.          Understand entrepreneur's management team's level of commitment.          Ensure entrepreneur's motivation to complete the project.          Maximize dedication of employees.</p>	<p><b>Maximize stakeholder involvement in emerging technology venture</b>          Identify stakeholders who are detrimental to venture.          Identify reasons stakeholders are investing in this emerging technology.          Identify reasons for displeased stakeholders.</p>
<p><b>Maximize benefits realization from emerging technologies</b>          Maximize understanding of alternative emerging technologies.          Ensure validity of the emerging technology.          Ensure emerging technology provides benefits.</p>	<p><b>Maximize clarity of entrepreneur's decision-making</b>          Maximize understanding of decision-making processes.          Develop understanding of patterns of decisions made by entrepreneur's management.</p>
<p><b>Maximize socialized network investments</b>          Maximize investments from socialized network.          Extend investment to socialized network.          Maximize opportunities for future networking.</p>	<p><b>Minimize risks for emerging technology</b>          Identify detriments to emerging technology.          Develop understanding of inertia needed for launching emerging technology venture.          Develop deeper understanding of key operational issues.</p>
<p><b>Maximize understanding of venture's operational climate</b>          Maximize understanding of supply chain.          Maximize understanding of distribution channels.          Ensure a well-defined timeline for venture's progress.          Define understanding of weaknesses and strengths in venture's operations.</p>	<p><b>Maximize due diligence</b>          Ensure the emerging technology is socially responsible.          Ensure emerging technology meet regulatory and legal requirements.          Ensure intellectual property is protected.          Ensure emerging technology is deliverable, doable, achievable and workable.</p>

<p>Ensure access to financial data at any time.</p>	
<p><b>Define venture capitalist’s exit strategy</b>                  Ensure entrepreneur has a well-defined exit strategy.                  Maximize opportunities for continued investment.</p>	

Additionally, VCs tend to look for an emerging technology within a “market that offers unconstrained opportunities for rapid growth” (Rea, 1989). However, “markets that do not exist cannot be analyzed” (Dhillon et al., 2001). The disruptive technologies literature argues that often, a market is unable to absorb the progress that a given emerging technology may offer. For this reason, it is important to go beyond just the technology or the customers to understand various facets of a technology market.

One respondent noted, “*We need to understand the nuances of emerging information technologies before entrepreneurs are able to make investment decisions about investing in the technology.*” Additionally, an understanding of alternative technological innovations will help VCs in the vetting process of determining whether to invest or not. In order to make this assessment, entrepreneurs need to communicate to VCs a clearly defined vision of the entrepreneur’s technological investment objectives.

*Maximize entrepreneurial dedication*

To ensure an entrepreneur’s management team is committed to the success of the new venture, VCs need to be able to effectively assess their dedication and commitment. For example, the capacity for sustained and intense effort is particularly important for ventures operating in established markets, where competition is strong and there are few possibilities to protect the products through patents (Dubini, 1989). Equally important is the dedication of the employees and their motivation to complete projects necessary for success. Erikson (2002) found commitment tends to decrease with age, and those who are younger often may be strong on commitment. As such, an entrepreneur’s team must be properly balanced to include younger team members.

One respondent noted, *"We must be sure of the entrepreneur's commitment to sustain the duration of the venture before they are willing to invest the money and time into the project."* This understanding of commitment is not exclusive to the entrepreneur's level of dedication, but includes the entrepreneur's management team's level of commitment as well. Also, the VC needs to be able to identify how to ensure dedication of employees. This includes being confident the entrepreneur's motivation to complete the project is highly significant.

### *Maximize benefits realization from emerging technologies*

VCs wish to fully understand the emerging technology in which they intend to invest and the potential alternative technologies. They need to ensure there are socio-environmental benefits as well as financial benefits for the emerging information technology. Additionally, the emerging technology may need enabling government regulations in order for the benefits to be realized (Fisher and Harindranath, 2004). At least one of the respondents believed, *"in order to be able to achieve maximum return on benefits realization the VCs need to fully understand the risks from alternative emerging technologies."* Furthermore, the VC needs to perform a verification and validation of the emerging technology to ensure that the technology is capable of providing the expected benefits.

### *Maximize socialized network investments*

Often VCs prefer to rely on their social networks to find an emerging technology firm in which to invest. Shane and Cable (2002) found "social ties provide a mechanism by which investors obtain information." Sharing investment opportunities within socialized networks generate future investment opportunities, allows VCs more latitude in choosing which opportunities to invest in, which investment options to forego, and it helps VCs to maximize opportunities for future networking.

Individuals prefer to share information with peers, as this helps in identifying investments from socialized networks. Also, there is typically a greater level of trust between individuals in the same social circles, which leads to lower transaction cost for VCs during the validation process. Therefore, VCs are more likely to investment within their own socialized network, which also leads to future opportunities. One interviewee

claimed, *"I very rarely have to look outside my own peer group for opportunities because deals are always being brought to me by my friends."*

### ***Maximize understanding of venture's operational climate***

VCs seek to understand a new venture's supply chain and distribution channels, since they affect enterprise's growth and success. Covin et al. (2000) found certain distribution channel decisions (e.g. relative control over distribution channel members and relative number of distribution channels employed) are differentially related to firm growth. Additionally, understanding the weaknesses and strengths of an operation makes an investment decision easier. Also, a venture's business plan needs to have a well-defined timeline, so VCs can determine if the venture's timeline matches their own investment goals.

A clear understanding of the operational aspects cannot be underestimated. While venture capital for existing technologies and businesses certainly presents the opportunity to engage in a careful review, in situations where an entrepreneur or a VC is entering into a totally new field, such evaluation is difficult. In regards to this, one respondent noted, *"We proactively seek specialists who have the ability to help not only with the technology development and implementation, but also the operational needs there might be."*

### ***Define Venture Capitalist's Exit Strategy***

The VC's exit strategy is designed to provide an optimal return on investment and provide opportunities for continued investment. It is necessary to invest in emerging technology ventures whose leaders have similar exit strategies. To ensure exit strategies are aligned, VCs often prefer to have effective contractual control rights (Cumming, 2008), and as a result of exercising these rights, the VCs increase the probability of their preferred exit strategy. This also allows VCs to consider future opportunities for continued investment and keep their investment pipeline filled with potential opportunities.

### *Maximize understanding of venture's technological innovations*

VCs wish to understand the technological innovations entrepreneurs have developed before committing any investments into a venture. Of particular interest is when an innovative technology has the capability of becoming a “disruptive technology” and can possibly displace an incumbent technology. In order to assess the opportunities available to new emerging technologies, an understanding of possible impediments to the technological innovations is required before a VC can make a fair prediction of a specific technology's potential impact on the existing market.

Additionally, to measure this impact on the existing market, VCs need to have a well-defined understanding of whether the emerging technology is a disruptive or sustaining technology innovation. An analysis of path dependency will allow the VC to understand the critical chokeholds that might exist within the new venture's operations, and be able to decide if an entrepreneur is capable of controlling these critical points effectively to ensure success of the venture. During the interview one of the VCs referred to a salt shaker and said, *"I am willing to invest in almost any product even this shaker, if I know there is a market for it. I however prefer to invest in a new technology that is lacking in the current market place and particularly, a product that displaces an existing product by approaching the business problem from a new and fresh angle."*

### *Ensure the emerging technology venture is well-designed*

VCs should also understand a new venture's organizational structure. Having specifically defined reporting and feedback mechanisms in place, which are aligned with the proposed organization structure, helps create positive and innovative cultures within an organization, and allows for a successful new venture. A venture's governance or culture may restrict a response to a threat (Clemons et al., 1996). Understanding a venture's structure, governance, and culture allows VCs to validate the entrepreneur's emerging technology ideas. An interviewee stated, *"one of the first things that I require of my team during our vetting process is that they need to read every internal document available to them where there is communication between internal stakeholders, as well communication to outside stakeholders, and create a story line and communicate that to me. From this, I am able to fully understand their organization culture and identify strengths and opportunities for improvement."*

### *Maximize Venture Capitalist's investment return in emerging technologies*

Maximizing return on investment ("ROI") while minimizing risk is the goal of venture capitalism. Even so, a "VC expects to take the heavy risks involved in new ventures, but also expects to be rewarded accordingly" (Curley, 1992). To evaluate and understand the opportunity costs associated with a specific project, there is need to compare ROIs of different projects and the risks associated with each project. Understanding the emerging information technology venture's break-even point further clarifies the return on investment potential of the venture.

Additionally, increasing an entrepreneur's accountability for return of VC's investment will positively affect the likelihood of the VC investing in the venture. One interviewee mentioned, *"depending on the type of venture project, i.e. phase one new technology venture, phase two technology venture with an existing operations or a phase three with reorganization requirements, I am expecting a different return, because each requires a different amount of my time in addition to my financial input."*

### *Maximize stakeholder involvement in emerging technology venture*

In this objective is embedded the knowledge that multiple stakeholders are affected and influenced by emerging technology in different ways. Multiple constituencies are diverse stakeholders (Voss et al., 2005). As such, VCs need to understand how an entrepreneurial team manages dissimilar stakeholders, which stakeholders influence the entrepreneur, the most, and in what ways. It is possible for individual stakeholders to have alternative interests, which could be detrimental to a venture. It is important to identify reasons stakeholders are investing in an emerging technology, in order to ensure the common investment goals align with each other. Additionally, by identifying reasons for displeased stakeholders, issues could be resolved prior to VC's resource investment. Such activities encourage increased stakeholder involvement throughout the venture. During the vetting process, one VC stated, *"We once identified a stakeholder who put a deposit down for the product and was waiting for 18 months for delivery of the technology. This stakeholder was easily converted to a positive spokesperson for us and referred several additional clients."*

### *Maximize clarity of entrepreneur's decision-making*

This objective addresses the need for VCs to gain an understanding of the decision-making process of an entrepreneur, as it relates to a venture. "Given the social and economic relevance of creating new businesses, it is important to understand how market entry decisions are made, what factors influence individuals who make these decisions, and what kinds of errors these individuals are likely to make" (Koellinger et al., 2007). When VCs understand the patterns in an entrepreneur's decision-making process, there is more confidence in the entrepreneur and fewer surprises for VCs. This point is validated by a VC who stated, *"When my team is going through the communication documents, they are identifying what type of decisions are being made and who is making them. This helps up in identifying who is really running the venture's operations."*

### *Minimize risks for emerging technology*

While the entrepreneur is marketing the emerging information technology for its innovative characteristics, it is important to understand the possible disadvantages of an emerging technology. A full comprehension of the emerging technology will allow VCs to understand what is necessary to launch a successful emerging technology venture, sustain the venture for at least the term required to receive return on investment, and potential alternative technologies that may compete in the same market. In order to perform a risk assessment, VCs need to first identify detriments of the emerging technology. This includes developing a deep understanding of key operational issues along the lines of market threats and operational weaknesses. A good understanding of the required inertia needed for launching emerging technology venture will help VCs make investment decisions. During one interview a VC referred to the inertia of starting a new venture through a silent message of lifting a huge weight up into the air and stated, *"The more risk involved, the harder it is to build momentum behind the venture which is required for a successful technology launch."*

### *Maximize due diligence*

Due diligence is required to ensure all aspects of a business are considered before any investment decision is made (Swanson 1989). Due diligence also helps VCs ensure

the emerging technology is not only profitable and feasible, but meets regulatory and legal requirements. This provides a level of comfort to VCs by helping them realize the venture is attainable. Additionally, VCs want the intellectual property to be properly protected, as it assures future benefits to a large extent. This point was brought to light in a discussion with an interviewee who narrated the following: *"During the due diligence process we identified a short term note that required immediate action, this allowed us the ability to secure access to their intellectual property rights by loaning them the money and using their patents as collateral."*

## V. Illustrative Case

The following case outlines how a regional VC group utilized these objectives to assist them in structuring their investment in a small electronic medical records ("EMR") company.

### A. *Blutech Case*

#### *VC Background*

Alpenglow Capital, LLC, is a firm that specializes in pharmaceutical/medical, financial services, multifamily real estate, and professional services industries. Alpenglow Capital consisted primarily of two principle partners who joined forces to invest in startups who needed seasoned leadership to guide them through the early stages of developing a new profitable company. They primarily invest in select technology growth companies, start-ups, and turnarounds where they can have a significant impact on the organization such as: stabilizing operations, ramping up revenue and improving employee performance. Charles is the financial expert within the group and has served as a CFO for several public companies and has had the experience of taking a healthcare organization through the strenuous process of going public. Paul is an expert in sales and marketing. He served as the Executive VP of Sales for a \$1.5 billion NYSE traded company, which managed 24,000 apartments, and was recently acquired by one of the largest private equity real estate investors in the world. Alpenglow Capital's goal is to

utilize their strategic expertise to improve the value of the ventures they invest in and achieve a profitable exit.

### *New Venture Offer*

During the spring of 2008, Alpenglow Capital was contacted by John Kline who owns and operates a midsized medical billing company in the Virginia and DC market. John recently started an information technology company, Blutech Solutions, LLC (“Blutech”), which provides solutions for small to medium sized medical practices. Blutech is a healthcare revenue cycle management company that uses proprietary software and service solutions to optimize the revenue and flow of information within physician practices. Blutech enables practices to reduce paper-based errors, increase speed and accuracy of collections, and make operational decisions resulting in improved financial performance. John identified an opportunity for a strategic acquisition of an EMR software company, Crux Inc. (“Crux”), which would leverage his contacts and expertise in the healthcare practice management segment. He wanted to raise capital to finance the expansion into EMR market. Since John’s existing business had significant cash flow and 15 years history with positive reputation, the partners at Alpenglow Capital were willing to consider investing in Blutech.

### *Venture Analysis*

Alpenglow Capital wanted to do their due diligence on both Blutech and Crux before they are willing to commit a significant amount of cash into the deal. During the due diligence process, they found John’s original medical billing company generated positive free cash flow of about \$2 million each year. However, Blutech was relatively new and had not made a profit. Crux Inc., which has been in the health informatics domain since 1999 had about \$160,000 negative cash flow each month. From a strictly financial position, Charles and Paul were not interested in the deal. However, the due diligence included a review of all communications between the companies and their stakeholders.

During the review of communication documents between Crux Inc. and a few of their investors, who were also physicians, Alpenglow Capital’s research team discovered that Crux had a great EMR product, but were unable to adequately deliver

the product on time to the customers. Further investigation into Crux revealed the president and CEO, Randy, who is somewhat of a perfectionist, was constantly upgrading and improving the EMR system, such that they were unable to successfully rollout a stable version. This also increased implementation, installation and product development cost since they were forced to customize the product for each customer. Charles and Paul recognized the fact that while Crux had an innovative product, Randy did not possess the skills to effectively bring it to market. However, they believed a recent hire of Crux named James had the ability to do so, if he was given adequate support from top management. James, the new director of sales had joined Crux just 3 months earlier after holding key sales positions in several leading technology companies.

From their analysis of the EMR market, they understood a key provision of the American Recovery and Reinvestment Act of 2009 was about to go into effect, and healthcare providers across the country were preparing to comply. As of January 1, 2014, all public and private healthcare providers and other eligible professionals (EP) must adopt and demonstrate “meaningful use” of EMR, to maintain their existing Medicaid and Medicare reimbursement levels. This information validated the need for an innovative EMR to support the needs of the small and medium medical practices. Charles and Paul believed if they structured the acquisition deal properly, they could significantly contribute to Blutech’s success. They also believed a key component of the deal was to limit Randy’s control in the operations of Crux. Given John’s previous success, they believed he possessed the necessary skills to successfully manage Blutech, once key positions were filled to assist with the development of qualified sales team, technology services and support group to ensure EMR systems sold were delivered and installed properly. To ensure a successful transition, they required that John provide them with two seats on the board of directors along with temporary management control until a quality leadership team was in place. Based on their understanding of the medical/healthcare technology market, their existing relationship with national health companies with the means to acquire targeted EMR companies, and their understanding of the strengths and weaknesses of the entrepreneurs involved, Charles and Paul agreed to invest in Blutech and provide management assistance during the acquisition transition.

*B. Consideration of strategic planning objectives with respect to case study*

A VC's decision to invest in an emerging technology is influenced by their views, perceptions, beliefs, and realities. In other words, VCs tend not to make investment decisions that are contrary to their psychological "make-up." As such, most VCs will not invest in emerging technologies that are outside the bounds of their "comfort zone," where the comfort zone includes, but is not limited to issues like level of risk tolerance and predisposition to trust. The fundamental and means objectives derived from this study can strategically assist VCs in how they consider their investment opportunities.

In the Blutech case, Charles and Paul had some levels of concern as to whether or not to invest in Blutech. From their perspective, they had to consider not only an investment in Blutech, but also how Crux Inc. could potentially be rolled into Blutech as a strategic acquisition. Several of the strategic planning objects for VC investments raise concerns about going forward with the deal. In several cases, one entrepreneur/company met their investment objective and the other did not. For instance, while John owned a large investment in Blutech, it was not a significant portion of his net worth, and they questioned his own financial commitment to his new company. Randy, on the other hand, was almost all-in with his investment in Crux Inc. Further, Charles and Paul had more confidence in John's ability and his competence to successfully lead Blutech going forward, than in Randy's ability and competence to lead Crux Inc. or even just the EMR project. Important to their decision to invest was their confidence in their own understanding of the healthcare market, and its demand for quality driven EMRs, which are capable of being integrated with other technologies being used in the healthcare industry.

## VI. Discussion

Most research in IT related VC activities can be classified as efforts in defining the investment criteria or success factors in the management of VC funds. Tyebjee and Bruno (1984) present a model of investment criteria. In their study of 41 VCs and 90 deals, they identified five underlying dimensions. These are: 1) Market attractiveness (size, growth and access to customers); 2) Product differentiation (uniqueness, patents, technical edge, profit margin); 3) Managerial capabilities (skills in marketing, management, finance and the references of an entrepreneur); 4) Environmental threat

resistance (technology life cycle, barriers to competitive entry, insensitivity to business cycles and down-side risk protection); and 5) Cash-out potential (opportunities to realize capital gains by merger, acquisition or public offering). Fried and Hisrich (1994) provided a different focus relative to Tyebjee and Bruno (1984). They present a process oriented framework that identifies generic investment criteria. The key difference between the two models relates to when price negotiation takes place. The evaluation criteria, however, are more or less the same. Both studies provide a basis for strategically understanding how a VC investment decision should be structured. The success factor oriented and the process configuration streams of research essentially focus on criteria used in evaluating potential investments. Though other studies have presented similar criteria (see MacMillan et al., 1985), most studies on investment criteria and success factors tend to incorporate all factors (emotional, behavioral, organizational, and financial).

If one evaluates our fundamental and means objectives, there is significant amount of overlap with the evaluation criteria proposed by Tyebjee and Bruno (1984). However, in our review of literature, we did not find any study that makes a proactive attempt at strategically planning for VC investments. There might be overlaps in our objectives and Tyebjee and Bruno's study, but we began our research primarily to define objectives. It is the objectives that help in strategically planning for an enterprise (Ansoff, 1987). Even Tyebjee and Bruno recognize the importance of defining objectives for an investment. The fact that our value driven objectives present similarities with the evaluation criteria of Tyebjee and Bruno is in effect an external validation of our research findings. Our study indicates VCs do not make decisions about investing in emerging technologies without surveying the current market environment. Also, VCs are constantly presented with numerous investment opportunities. Consequently, it is important for individuals seeking funding or for the VC themselves, to understand the characteristics of investment opportunities which they consider most important. An understanding of the values considered most important to VCs enables us to understand which emerging technology investment opportunities will be considered acceptable and which opportunities are likely to be rejected. In our study, a major VC in the healthcare sector noted:

*“There is a lot of serendipity in how a deal originates. And there is significant uncertainty in how we arrive at a decision to invest or not. All this, I would say, is a function of our values, or feeling and what we wish should have been done - gut feel so to speak. There is no one way of arriving at the decision to*

*invest. It may be as simple as a referral or something more systematic such as constantly monitoring the market to understand what technologies are making a mark in the marketplace. Some of us look specifically at technologies that under-perform in a marketplace. So, it all depends.”*

This observation is substantiated at least by what Tyebjee and Bruno (1984) refer to as "Deal Origination." Other researchers have also argued that the decision to invest in a particular venture – or even to cooperate with the entrepreneur – is intricately linked to individual values (see Cable and Shane, 1997). Other researchers who have established the importance of value congruence as a concept include, Bygrave and Timmons (1991) and Chatman (1989). While individuals manifest themselves in different ways – alignment of VCs with entrepreneurs, goal congruence, and deal orientation – there is a clear link between values and how individuals decide what needs to be done. In this paper, we have articulated this link between values and what people wish to do, as objectives. And formulation of value driven objectives is considered a first step in good strategic planning (Keeney, 1992; 1994; 1999).

Our study suggests that the emerging technologies that go beyond the initial stages to conceptualization and progress to the latter stages of development are not just affected by the presence or absence of funding but also, by the social structures and interactions that are obtainable within the domain where the emerging technology was conceived. These social structures include factors such as the laws and regulations existing within a given country or region, and the level of collaboration and cooperation existing among the group of persons working on the emerging technology. The effect of the influence of the social structure on emerging technology further becomes apparent when there are restrictions on allowable sources of funding for an emerging technology. This, in no little way, may limit some VCs that may be willing to invest in an emerging technology.

Our research has two major theoretical implications. First, we present theoretically and empirically grounded *fundamental objectives* for VC investments in emerging information technologies. Such objectives help in achieving the overall objective to "maximize efficacy of VC investments in emerging technologies." As previously noted, there are numerous other pieces of research that presents stages of VC funding, and success factors for new information technology start-ups. However, in our quest to find other research that presents objectives that would aid decision making for ensuring efficacy of VC investments in emerging technologies, none could be found.

Second, we present *means objectives* for achieving the fundamental objectives. Both sets of objectives are value driven and hence, are grounded in what VCs actually feel, rather than a laundry list of alternatives they could pursue.

The importance of defining *fundamental objectives* cannot be overstated. Keeney (1992) considers fundamental objectives to have two basic properties - essential and controllable. The essential nature of the fundamental objectives indicates, “consequences in terms of the fundamental reasons for interest in the decision situation,” while the controllable aspect “addresses consequences that are influenced only by the choice of alternatives in the decision context” (pg. 82). Consider the fundamental objective "Maximize understanding of entrepreneur's competence." Clearly, the fundamental objective must lie somewhere between the decision context (VCs investment in emerging technologies) and the strategic objective (maximize efficacy of VCs investment). Exactly where the fundamental objective resides is however, a function of the *essential* and *controllable* elements. The need to focus more on the *essential* elements pushes the fundamental objective towards the strategic objective. For instance, in our decision context, given the inherent complexities, "maximize understanding of market making mechanisms" may be *essential* to the strategic objective. The *controllable* element narrows the objective and pushes it towards the alternatives. And hence, "maximize understanding of market making mechanisms" may be *controllable* and hence, closer to the alternatives. The balance between *essential* and *controllable* is illustrated in figure 1 below.

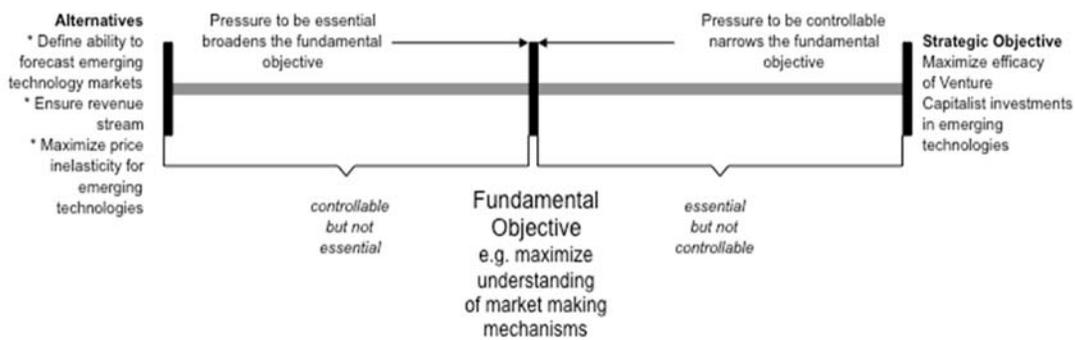


Figure 1. Balancing requirements of a fundamental objective

The second contribution of this research is a systematic presentation of the *means* objectives. While in the literature there is a predominance of a range of alternatives there might be to achieve a fundamental objective, Keeney (1992) critiques such an approach as limiting, since the alternatives are restricted to an existing set. In our study, we present alternatives that are value driven, that is wishes individuals might have in the context of unconstrained thinking. Keeney argues such alternatives to be better. The means objectives provide a dual benefit. While they certainly help in developing insights in identifying decision opportunities and systematically appraising alternatives, their measurement, if that is the intention, helps in quantifying if a certain means objective is being achieved or not. The development of a value model and definition of various attributes are important, but beyond the scope of the current paper and thus, offers an opportunity for further research.

## VII. Conclusion

In this paper, we defined strategic planning objectives for VC investments in emerging information technologies. Our objectives are presented in two sets: *fundamental* and *means*. The fundamental objectives provide insight into the reasoning processes of VCs when making investment decisions. These objectives tend to be aligned with the behavioral, emotional, organizational, and financial values and beliefs held by VCs. While this paper has developed insight on venture capitalist values toward investing in emerging information technologies, these values may or may not vary when considered in other investment context such as investing in pharmaceutical or manufacturing industries. Future research utilizing our approach to identify venture capitalist values towards investments in other industries could lead to the development of a systematic approach for venture capitalists to develop strategic planning objectives for all their investments.

In a future research study, we will examine the relationships that exist between select mean objectives and desired fundamental objectives. Also, there is an opportunity to develop measurement scales for these objectives and analyze the statistical significance among identified relationships. With the newly-gained knowledge on VC values about investing in emerging technologies, we can examine successful emergent technology companies to determine if these objectives increased the likelihood of success for the technology firms. Since emerging information technologies are highly information-asymmetric and are hard to value, having an understanding of which objectives lead to

success, will allow investors to reduce uncertainties in their decision-making process and increase their profit opportunities.

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