WHAT EFFECTUATION IS NOT

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Abstract

The theory of effectual reasoning advanced by Sarasvathy (2001) proposes a decision process employed by entrepreneurs that differs substantially from traditional views of decision making used in the management sciences. This paper seeks to clarify this distinctive point of view on entrepreneurial decision-making by pointing to several things that effectuation is not. The paper further explains effectual reasoning and illustrates how effectuation integrates with other theories used in the management sciences.

"Extended systems theorists thus reject the image of the mind as a kind of input-output sandwich with cognition as the filling… Instead we confront an image of the local mechanisms of human cognition quite literally bleeding out into the body and world." (Andy Clark, 2008, *Supersizing the Mind*, page 70).

The objective of this paper is to clarify the distinctive point of view of effectual reasoning, first posited by Sarasvathy (2001a) and then later discussed in a book-length treatment by Sarasvathy (2008). Part of the impetus for this effort comes from the authors' reflections on the many research presentations, seminars, discussions and questions that touch on effectuation, or are centrally concerned with it. Another impetetus comes from the encouraging number of recently published papers and promising working papers on the topic that help develop effectuation conceptually and/or empirically (Chandler et al., 2010; Dew et al., 2009a; Kuepper and Mauer, 2008; Mauer et al., 2010; Read et al., 2009a; Wiltbank et al., 2009 as well as others). In the light of all of these efforts and contributions of many people, this paper is primarily an attempt at making our ideas about effectuation clear. In addition, it focuses on some of the theoretical possibilities spawned by effectuation and strives to show how effectual reasoning integrates with prominent economic and management theories as well as outline where it does not. Although the effectuation lens gives researchers a distinctive point of view on entrepreneurial action, a broader look across the literature suggests that it is one of a number of attempts to really get to grips with entrepreneurial action (Baker and Nelson, 2005; Sarasvathy et al., 2009) and it builds on work of many leading management theorists (particularly March [1982] and the Carnegie school more generally). In March's language (2006) effectuation is a "technology" of decision making. While rooted in entrepreneurship, it may also be possible and useful to see how it works in other domains, such as strategy (Wiltbank et al., 2006), marketing (Read et al., 2009a) and R&D management (Kuepper and Mauer, 2008).

Lastly, perhaps most importantly, this paper also represents an invitation to scholars in areas other than entrepreneurship to embrace the effectual point of view, to contribute to the development of the theory of effectual reasoning, and to contribute empirical evidence to verify the nature of the phenomena of the effectual logic. Science is at its best when constructed by the hands of many. Effectuation is an evolving idea (Sarasvathy, 2007). We probably don't have all the details right, and a lot of areas are badly understood and in need of filling in, or perhaps even developing in different directions. Therefore there are many opportunities to contribute to more fully fleshing out effectual logic and better understanding its relationships with other ideas (or not).

There are at least nine things effectuation is not:

1. Effectuation is not merely a set of heuristic deviations from rational choice – it is a non-overlapping decision technology.
2. Effectuation is not a wholesale replacement for predictive rationality – it exists in parallel to it.
3. Effectuation is not irrational or non-rational – it helps, along with other notions, to pluralize the notion of rationality, not to negate it.
4. Effectuation is not a random process – it is textured and systematic with eminently learnable and teachable principles, and practical prescriptions of its own.
5. Effectuation is not a theory of "anything goes" – it is a theory of constrained creativity.
6. Effectuation is not a resource-based view of individual decision making – it does not assume valuable resources, it inquires into what makes things valuable and how one can acquire and/or create value in resources.
7. Effectuation is not just for small, start-up firms – it can be applied to large firms and economies as well (at least, we think it can).
8. Effectuation is not restricted to the domain of entrepreneurship – it's a theory of action and can probably be applied much more broadly.
9. Effectuation is not an independent theory – it builds on and integrates the work of several well-received theories in economics and management.

In essence, what makes effectuation different is the fact that on the one hand, it *integrates* several existing theories that denote *partial* deviations from rational choice, while on the other,

provides an alternate model with *its own* bounded problem space, viable solution processes, and specific principles with an underlying logic that ties everything together into a *complete* logic.

1. **Effectuation is not merely a set of heuristic deviations from rational choice – it is a non-overlapping decision technology.**

Three aspects of effectuation make the theory stand out as a decision theory distinct from rational choice: first, the kind of decision problem faced by the decision-maker; second, the underlying logic of the theory, and; third, the inversion of the distinctive principles of rational choice. We will deal with each of these in turn.

The decision problem

Effectuation is a method for solving problems in spaces characterized by Knightian uncertainty (Knight, 1921), Marchian goal ambiguity (March, 1982), and Weickian enactment (Weick, 1979). In other words, effectuation steps up to the plate where rational choice bows out of the arena – where predictability, pre-existent goals, and an independent environment are not available to the decision maker. This particular problem space typifies the domain for decision problems faced by most start-up entrepreneurs. As a result, effectuation serves as an apt theoretical framework for empirical studies of entrepreneurial decision making, such as those involving the suicide quadrant in Figure 1.

The suicide quadrant is a clear example for a Knightian-Marchian-Weickian problem space. When entrepreneurs (or even large corporations) seek to commercialize a radical new technology, for example, they cannot rely on predictions about potential demand, because the market does not yet exist. In the absence of markets (i.e., Marchian goal ambiguity), predictions are useless (i.e., Knightian uncertainty rules).

Knight theorized that one could segment "uncertainty" in three ways: first, problems that could be framed in terms of a bet on a known distribution of outcomes (conventionally called "risk"); second, problems that could be framed in terms of an unknown distribution of outcomes that can be approached through Bayesian learning (conventionally known as "uncertainty"); and third, problems that could not be framed at all, because no distribution of outcomes exists (known as "Knightian uncertainty").

Situations of risk and uncertainty are normally made tractable (for modeling purposes) by the attribution of subjective probabilities to future scenarios, upon which some form of calculus (estimation and/or analysis) can be made to operate. Situations of Knightian uncertainty, however, are characterized by the fact that they are intractable under the logic of any form of predictive rationality (rational choice theory being the prime example of predictive rationality). Knightian uncertainty involves the absence of anything that might succumb to known forms of probabilistic calculi, what Shackle (1979) termed a future not only unknown but "unknowable". Substituting a subjective probability to fill the utter void of Knightian surprise assumes away the very heart of the issue. As Shackle emphasized, there is no justifiable rationale for imposing subjective probabilities on the likelihood of the production of novelty, and there is no reason for adjusting the subjective probabilities assigned for foreseeable events owing to the possibility of an additional novel scenario coming to pass (how many novel possibilities ought to be included in the analysis and what probability of occurrence ought to be assigned to them?)

Despite this, in the absence of any other decision model, the logic of rational choice turns to the processes and procedures used to mitigate conventional risk and uncertainty as solutions to Knightian uncertainty. For example, the logic underlying insurance markets and portfolio diversification are posited as appropriate for situations of Knightian uncertainty. And the stock

market and the venture capital business model become exemplars of effective ways to deal with the problem of non-existent distributions (Arrow, 1974). Yet this attribution is only metaphorical and is not a real solution to the problems of Knightian uncertainty, goal ambiguity and enactment (Smircich & Stubbart, 1985).

Furthermore, many ravishing empirical regularities suggest that the way research portrays people thinking under situations of Knightian uncertainty is *not* how they actually conceive of the decision problem and its possible solutions. First, it is rare that entrepreneurs are involved in more than one venture at once, yet by the logic of predictive rationality they ought to diversify. This had led to frequent suggestions that entrepreneurs prefer risk (Khilstrom & Laffont, 1979) but this suggestion does not appear to be supported by the empircal evidence gathered to date (Miner and Raju, 2004). Second, while rational action would prescribe entrepreneurs generate subjective probabilities as the basis for optimal forward-looking choices, data suggests that expert entrepreneurs consciously shirk prediction (Sarasvathy, 2001b). The wisdom of such shirking is attested to by the history of prediction and forecasting which clearly shows that human beings are very poor at this activity (Tetlock, 2006). Some strategy researchers have going as far as claiming, "[M]anagers can always count on one anchor: *Experts' forecasts will always be wrong*." (Christensen, 2000:154, italics in original).

In summary, both theoretical arguments and empirical evidence underline the fact that predictive rationality is not an adequate theoretical lens for the problems posed by Knightian uncertainty. Effectuation presents a new and viable alternative, and is based on a completely different logic (exactly inverse, to be precise) than rational choice.

The logic of effectuation: *control*

Inverting predictive rationality involves inversion of the logic that it is built upon. The logic of prediction states: *To the extent you can predict the future, you can control it.* Inverting it leads to a dramatic new logic for effectuation. That is the logic of control, which states: *To the extent that you can control the future, you do not need to predict it.* In other words, effectual rationality lies in exercising control over what *can* be done with resources at hand, rather than optimizing decisions about what *ought* to be done given a set of predictions about what happens next.

While prediction is tethered to given goals or an assumed telos, control proceeds from open-ended aspirations and given means to the creation of unanticipated, new and often multiple ends. The essential feature of effectuation as a theory is that it is non-teleological. Thus the logic of control unmoors the decision maker from the tyranny of pre-determined ends and sets him or her free to *wield* uncertainty as a powerful tool in the creation of new ends (see Figure 2).

Inversion of the distinctive principles of rational choice

By focusing on those aspects that are under the control of the decision-maker, there are at least three ways that effectuation converts uncertainty into opportunity. Each of these three mechanisms inverts a key principle of rational choice as follows:

1. Affordable loss, rather than expected return – makes uncertainty irrelevant by focusing on controlling downside scenarios and allowing returns to emerge as a residual of a process of stakeholder acquisition. This only sometimes means acquiring financial stakeholders, because new firms probably acquire the bulk of their financial resources from customers and suppliers. In extreme cases entrepreneurs control uncertainty by using a zero-assets-to-market model, which makes uncertainty completely irrelevant to the entrepreneur by laying-off the

entire financial risk of the venture onto other stakeholders. The pattern of acquisition of resources leaves an important stakeholder footprint on the firm, representing a vital role for external influence on the kind of markets the firm eventually converges upon.

2. *Pre-commitments from key stakeholder-partners, rather than competitive analyses* – destroy uncertainty by contracting along certain dimensions for the future – the future that comes to be begins to look very much like the contracts agreed upon. Through pre-commitments entrepreneurs focus on creating new markets in the chosen image of their partners, rather than attempting to guess at structures of exogenous markets through predictive competitive analyses. Control is about choices through an expanding network of stakeholder relationships. This network, as it unfolds, creates the path on which the development trajectory of the firm, and in many cases even the structure of the new market, comes to depend.

3. *Contingent knowledge, rather than pre-existent information* – The decision-maker leverages uncertainty by treating the arrival of contingencies as opportunity to exercise control of the emerging situation. This rule might be looked upon as a meta-rule of "swimming with the tides". The relationship between planning, contingencies and uncertainty is therefore a relationship that is radically rearranged in effectual decision-making. Because effectual decision-making often begins with only a very loose notion of goals, decision-makers can make-up their plan in an incremental fashion, utilizing uncertainty and contingent information as *resources* for constructing their goals (Lindblom, 1959) rather than relying on goals as determining factors of resource acquisition and choice. Decision-makers therefore accumulate and take advantage of path dependencies in the effects they choose. Uncertainty is a resource and a process rather than a disadvantageous state.

Effectuation, therefore, is not a simple heuristic that can be applied to uncertain decision problems, though it does incorporate heuristics and principles observed in other research on entrepreneurship (For example, Baron, 2000). Instead, it integrates a variety of heuristics shown by empirical research to be used by entrepreneurs into a thoroughgoing logic of choice, upon which a theoretical edifice may be built to stand shoulder to shoulder with the classical theory of rational choice (conventionally conceived as predictive rationality).

2. Effectuation is not a wholesale replacement for predictive rationality – it exists in parallel to it.

Although effectuation is a complete and non-overlapping logic to rational choice, we are not advocating abandoning rational choice and replacing it with effectuation. Instead, we think that it is more fruitful to recognize that both types of reasoning are situational and therefore empirically observed as episodes of action and cognition; this also means that there are probably theoretically interesting interactions, intersections, interplay between the two (as well as other) reasoning modes (Harting, 2004; Mauer and Sarasvthy, 2010; Sarasvathy and Kotha, 2001). In fact, both rational choice and effectuation are necessary and valid as guides to decisions and action. Each is useful in a different problem space. This can best be illustrated through the example of entrepreneurial marketing

The classic textbook model of marketing decisions based on predictive rationality suggests proceeding from the definition of a market. In other words, this model begins by defining the universe of all possible customers (people who are willing and able to pay for the product under consideration). The next step is to segment this universe using relevant variables such as income range, education, tastes, etc. Then, based on market research and projections of expected return for each segment, one or two target segments are picked. And, based on what

the market research suggests, marketing strategies to position the product in the chosen segments are to be developed and implemented. This classic analysis is called the Segmentation-Targeting-Positioning process and is represented graphically through the inverted triangle at the top of Figure 3.

In contrast to the STP process, effectuation (depicted in the bottom triangle in Figure 2), proceeds from a single customer. This first customer may be chosen logically from within the entrepreneur's initial social network (whom he or she knows), or may even be completely contingent upon people he or she happens (given who he or she is and what he or she knows) to think of approaching. Depending upon who happens to become the first customer or partner in the business, the entrepreneur then proceeds to generalize this first customer into a target segment, and then to add segments contingently as an expanding network of partners. Somewhere down the line the segments begin to make sense and hang together as a "market" for the particular product or idea that the entrepreneur ends up building the firm for. Along the way, the product or idea itself might undergo several changes and the firm might end up in a market not anticipated by the original stakeholders or the expanding stakeholder network might end up creating a new market altogether.

All the same, once a market (either new or existing) coalesces for the entrepreneurial firm, i.e., once the effectual process ends up on the base of the triangle at the bottom of Figure 2, it becomes necessary and useful for the firm to institute more predictive processes to obtain and maintain leadership in the market thus defined or created. At this point, the process should move to the top of Figure 2, and the STP procedures can be applied for creating and sustaining market value thereafter. In fact, in many entrepreneurial firms, this is the transition point that puts enormous stress on the efficacy of the founding team and often results in either firm failure or a

change in top management. It may be that many founding entrepreneurs do not make the psychological transition from effectual to causal reasoning very well. The wiser ones either leave to start other entrepreneurial ventures, or step aside to let a COO or other professional management to lead the firm turning their focus on to opening up new strategic frontiers for the firm.

Thus, the key to understanding and applying effectuation is to realize that it co-exists with rational choice and provides an additional set of tools to the decision maker. In fact, one of the most fruitful areas for future empirical work in this regard would consist in carving out the space and bounds for the use of these two very different modes of reasoning, and better understanding how they interact. Under what circumstances what types of reasoning work and why?; how to design and implement decision procedures that work in parallel to tackle the different dimensions of different types of circumstances; whether to develop teams that do both in parallel or to stagger them in iterative cycles? - are all possible questions for future empirical research in effectuation.

Effectuation reinforces the fact that decision-making is situational and episodic – i.e., it depends on the circumstances such as the life cycle of the product, or stage of development of the firm, etc. (Kuepper and Mauer, 2008). In summary, the key question between causation and effectuation is not which is better in an absolute sense, but which is more efficacious under what circumstances (i.e. what are the consequences of framing and reasoning effectually, compared to the consequences of framing and reasoning using predictive rationality).

3. Effectuation is not irrational or non-rational – it helps, along with other notions, to pluralize the notion of rationality, not to negate it.

Effectuation is a rational decision process without goals; it is therefore antithetical to the goal orientation and predictive stance typically assumed by rational choice. However, this does not make effectuation irrational in any sense – precisely the opposite. What effectuation posits is a rational process for acting under situations that are not tractable through the processes of the rational choice model. Instead, effectuation theorizes an alternative process by which rational actors can make rational choices in situations that are characterized by Knightian uncertainty.

Effectuation exhibits the characteristics of rational action described in depth in the work of Hans Joas (1995) and Karl Weick (1979), which builds on the view of action first espoused by American Pragmatist philosophers such as William James (1907) and John Dewey (1917). Joas' work provides the philosophical underpinning for effectuation, while Weick's work exemplifies an organizational level manifestation of effectual action.

Although effectuation takes an action-theoretic view, it does not posit action and imagination as dichotomous or antithetical or even sequential. Imagination and action are tied irrevocably together in the effectual view. Traditionally, scholars working in the Schumpeterian tradition have considered imagination as an important attribute of entrepreneurs (Mintzberg et al 1998). The effectual view reinforces that proposition by positing imagination not only as an important impetus to action, but also recognizing the creativity inherent in all action. New products, new firms, and new markets emerge through the entrepreneur's self-description and re-description of possibilities based on the resources at hand and the continual interaction with sympathetic stakeholders. Whatever beliefs the entrepreneur/s subscribe to about the future, these beliefs also shape the entrepreneurs' conception of what reasonably *can be done* with the resources at hand. However, given Knightian uncertainty, *imagination and beliefs are better*

looked at as resources for action rather than predictors of outcomes, or "intuitions" about eventual states of an uncertain world (Weick, 1995). This is because contingencies arising from action often throw up new situations that overtake imagination and prior beliefs, contingencies created not only by exogenous shocks, but through the negotiations involved in partnerships the entrepreneur forges. Therefore imagination and beliefs are both motivators and residuals of action in effectuation, not predictors of outcomes.

The crux of the issue then is that there are many different kinds of rationality – appropriate in different domains – perhaps many more than we have yet dreamed of. Different philosophers and sociologists would claim different rationalities that are appropriate to their disciplines. For example, procedural versus substantive rationality (Simon, 1978; 1997); ecological rationality (March, 1996); creative rationality (Joas, 1995); and so on. But each of these types of rationality may be causal (tethered to goals) or effectual (non-teleological). For example, one can be very creative with regard to means, while at the same time being tightly tethered to a particular pre-determined goal. Effectuation is bounded, procedural, and creative; but above all, it is non-teleological, i.e., it is not tethered to pre-existent goals.

As the theory of effectuation develops, its prescriptive merit is likely to come from its economizing advantages as much as its psychological advantages. It is likely that effectuation is cheaper than predictive rationality in nurturing new firms since effectuation creates information and utilizes information produced by entrepreneurial action in the process of decision making (Wiltbank et al., 2009). Effectuating entrepreneurs are therefore likely to develop ventures faster and more cheaply than entrepreneurs utilizing predictive rationality at the early stages of new market creation efforts (Mauer and Sarasvathy, 2010; Mauer et al., 2010). At the macro level,

this translates into more attempts and a larger diversity of approaches for creating new markets at a given level of expenditure of resources (Dew et al., 2009b).

4. Effectuation is not a random process – it is textured and systematic with eminently learnable and teachable principles, and practical prescriptions of its own.

One of the most common reactions to the theory of effectuation is that it signifies a random or accidental set of events. Although chance and contingency play key roles in effectuation, effectuation itself is a method to *use* and *exploit* chance and contingency in the creation of novel and unanticipated effects. Effectuation is driven by *agency* and *interaction,* not by chance and contingency.

Effectuation begins with an agent or a decision-maker. Of particular importance are the identity (including value system, beliefs, intentions, and aspirations), knowledge base, and social network of the individual agent. Almost right away, the individual agent begins interacting with others; thereafter, the ensuing reality is a negotiated residual of commitments to particular partners, contingencies, and possibilities. Every such commitment draws and redraws bounds and constraints on who is in and who is out; on which contingencies matter and will be exploited, and which will be ignored or succumbed to unresistingly; and which possibilities will be pursued and which will be abandoned. By actively committing to particular strategies and possibilities, the stakeholders end up creating viable novelties in goals and effects. What drives choice between possible strategies is not predicted outcomes, but negotiated values and aspirations of particular partners matched-up with negotiated perceptions of what each individually and collectively is capable of enacting. Every commitment enables as well as restricts actions in the future.

Agents, whether causal or effectual in their approaches, may vary in their abilities to utilize the tools of effectuation and consequently in the levels of their achievements based upon effectual reasoning. By paying attention to partners and their values and aspirations, as well as carefully testing one's own as well as the group's capabilities on contingencies as they arise, agents can learn to become effectuators and also to improve the outcomes of effectuation over time. For example, just as market research techniques can be taught to students in a course predominantly based on causal reasoning, techniques of taking a product to market with virtually zero resources invested, or to negotiate stakeholder pre-commitments without investing in predictions can and do form part of a course based on effectual reasoning. Case studies on particular strategies and tactics built upon effectuation abound in the history of entrepreneurship. And these cases illustrate that the paths of effectuation, while building upon contingencies, do not depend on them. Contingencies sometimes constrain and often provide opportunities for effectuation, but do not dictate the course or consequences of effectual decision-making.

5. Effectuation is not a theory of "anything goes" – it is a theory of constrained creativity.

If anything, the widely accepted Stevenson and Jarillo (1990) definition of entrepreneurship as -- "A process by which individuals pursue opportunities *without regard* to the resources they currently control" -- ought to be regarded as the entrepreneurial theory par excellence of "anything goes".

Effectuation, by dint of comparison, is a theory of *constrained* creativity. Entrepreneurs are theorized to initiate the entrepreneurial process based on three things: who they are; what they know; and whom they know. Sometimes entrepreneurs bring other resources into their ventures, but at a minimum everyone starts a venture with these three things. The firms and

markets that entrepreneurs create are the residues of the set of transactions with other resource providers that are constructed by the entrepreneur, which in high growth firms normally exhibit nearly decomposable characteristics (Sarasvathy & Simon, 2000). Transaction relationships with these resource providers are subject to the kind of resource dependencies theorized by Pfeffer and Salancik (1977).

The key to the effectual decision process is that the entrepreneur exercises choice over resource constraints (choice over stakeholder relationships and pre-commitments) with the recognition that the manipulation of these forward-looking commitments cuts both ways. In other words, entrepreneurs have resource dependencies but they equally well develop an understanding of opportunities that resource providers seek. At the minimum, information asymmetries exist since the entrepreneur's insights are never entirely shared by the resource providers (Venkataraman, 1997). Thus, the resource dependencies theorized by Pfeffer and Salancik are *mitigated* by uncertainty. As Milliken (1987) put it, there are at least three sources of uncertainty: uncertainty over how the environment is changing (state uncertainty); uncertainty over the impact of environmental changes (effect uncertainty); and uncertainty over the response options (response uncertainty). These uncertainties have the effect of making the present and the future a loosely coupled system: the relationship between means and ends is uncertain. This loose coupling is precisely the factor that creates the opportunity for entrepreneurs to partner with and bargain for resources on favorable terms. *Entrepreneurial action can therefore be seen as taking advantage of uncertainty over the structure of future resource dependencies*. This is especially important in situations in which entrepreneurial firms can leave a footprint on stakeholder relationships because of footprint left by first-mover effects in new markets i.e.

situations in which stakeholder relationships are "enacted" (Weick, 1979) by the entrepreneur in the absence of prior relationships.

In the effectual framework resource interdependencies are seen primarily through the emphasis on stakeholder partnerships and agreements, agreements that make the future look like the agreements made rather than like other futures possible in an uncertain world. Knightian uncertainty engenders a much wider latitude to the precise transaction structures than would be possible under conditions of near certainty, where resource values are relatively transparent to all stakeholders. In this way uncertainty is transparently the essential fuel for the pursuit of entrepreneurial opportunity. This two-way dependency between resource providers and entrepreneur is one of the most important aspects of the effectual model, which might empirically be severely or very loosely constrained depending on the individual project being engaged in and the particular environmental context at the time. Important novel new knowledge has the potential to quickly undo historic constraints – in fact the undoing of these constraints is the essential fact of entrepreneurship – the destructive aspect of Schumpeterian "creative destruction". Re-negotiating resource dependencies is the substance of entrepreneurship and is facilitated by uncertainty (Baker and Nelson, 2005).

6. Effectuation is not a resource-based view of individual decision making – it does not assume valuable resources, it inquires into what makes things valuable and how one can acquire and/or create value in resources and otherwise.

Effectuation is a decision model that explicates *how* value gets created, not a strategy model of the individual that examines performance outcomes as functions of resources available to the decision maker (Read et al., 2009a, 2009b). Resources are a dynamic function of the means (who you are, what you know, whom you know) available to all decision makers. And the particular resources available at any given point of time (both actual and perceived) do

constrain decisions in effectuation, but they do not *dictate* the decisions themselves. Effectuation emphasizes that resources are not static and unchanging quantities – both acquiring and expending a variety of resources in the pursuit of value creation are essential features of the effectuation process.

In other words, (A) how resources are discovered and created, and (B) how choices are made about the application of resources, are both important empirical questions in effectuation that form the core of explanations about value creation.

First, effectual processes in fact get behind the issue of resource creation and provide an explanation of the process of creating resources ex nihilo precisely because effectuation is a creative goal finding (and therefore resource finding) process. This addresses a significant weakness of the resource-based theory of the firm (and any resource-based theory in general), which takes resources as given. Value is inherent in the very notion of "resource", since all resources are defined by their social meanings (Douglas, 1979; Walzer, 1983). The theory of effectuation, by positing a process by which resources may come to be valued therefore provides the primary explanation of why resource-based theories of strategy might make sense. In other words, effectual processes can be theorized to have created the valuable, rare, inimitable, non-substitutable characteristics of resources in the first place (Barney, 1991) that strategy scholars use as the starting point of their explanations.

Second, effectuation offers a distinctive logic for how choices are made about the application of resources. This logic shuns predictability, upon which the dominant views of resource-based strategy are based (Barney, 1986). Instead, the logic of effectuation speaks more closely to Penrose's (1995) original conception of entrepreneurship in the growth of the firm, a conception that owes it roots to the *possibilities* that a firm's entrepreneurs see for the company's

pool of resources. Penrose injected an imaginative element in her view of resource optimization that is close to the effectual conception of exploring what *can* be done with resources rather than what *ought* to be done with them given existing markets.

7. Effectuation is not just for small, start-up firms – it can be applied to large firms and economies as well (at least, we think it can).

Since effectuation is a distinctive decision rationality that speaks to a distinctive domain of decision problems, it is just as pertinent to the projects of large entrenched organizations as new start-ups (Kuepper and Mauer, 2008; Dew et al., 2008). The application of effectual reasoning depends on the nature of the project that the firm is undertaking, not on the nature of the firm. In a situation where the firm has to act under Knightian uncertainty, effectuation is likely to provide a rational way of framing problems and acting on them.

An example of the pervasiveness of effectual decision problems beyond the startup firm is the phenomenon known as The Innovator's Dilemma (Christensen, 2000, Christensen & Bower, 1996). Using a case-research methodology, Christensen delineates a decision problem domain characterized by Knightian uncertainty: the development of new disk drives in the computer industry. Christensen shows how the decision-making processes in large firms focus resources on project development not subject to Knightian uncertainty, and shirk investment in projects subject to Knightian uncertainty.

As Christensen & Bower point out, rational resource allocation processes in large firms frame decisions in terms of predictive rationality. Therefore managers backing projects targeted at known users always trump managers backing projects targeted at new markets subject to Knightian uncertainty. Forced into a debate grounded in the logic of prediction, managers backing new markets could only explain their positions in terms of their "hunches". Yet, over

time, new markets do get created and often end up destroying existing ones in which the established firms are leaders, thereby leaving them high and dry.

Effectuation offers a rational way out of this dilemma, suggesting that established firms should invest in predictive as well as effectual decision procedures in parallel. The commercialization of new technologies developed within the large firm should be handled through effectual processes, while predictive systems continue to cater to existing customers. Old products can be phased out and new ones ushered in as effectual processes.

We believe that one of the more fertile areas for research based on the theory of effectuation will involve large corporations and the commercialization of new technologies that they create. Furthermore, theories based on effectuation can also be used to understand developing economies and how they do or do not build entrepreneurial cultures that foster macroeconomic value creation.

8. Effectuation is not restricted to the domain of entrepreneurship – it's a theory of action and can probably be applied much more broadly.

Theories based on rational choice have been used to explore and understand a variety of issues involving human behavior, be it in economics, or psychology, sociology, political science, philosophy or history. Similarly, effectuation may also be used to bolster new theories in any and all of the social sciences, not merely in economics or entrepreneurship. For example, Lindblom's exposition of public policy decisions is based on effectual rather than causal reasoning (Sarasvathy, 2001a).

While effectuation is grounded in how expert entrepreneurs create firms and markets, it can also be observed in day-to-day example of human decision-making. Some mundane examples that contrast causal and effectual reasoning include: cooking a meal starting with a menu and shopping for necessary ingredients (causal) versus imagining possible meals based on

ingredients already available in one's kitchen (effectual); painting the portrait of some particular person (causal) versus starting with available materials such as a canvas and a limited set of paints and painting any one of a variety of possible pictures with them (effectual); etc. These and other mundane examples illustrate that effectual reasoning is a pervasive phenomenon.

Wallace & Gruber's (1988) study of creativity serves up several good examples of effectuation in the creative arts. Artists seek to amplify variance, not reduce it. They consciously work in a decision space that is characterized by possibilism (Hirschman, 1985) rather than "likelihoodism". They are organized around experimental action rather than predictive cognition. An effectual approach to the understanding of the arts, including performing arts, is a promising area for future research.

A vast variety of models of human behavior and action based on predictive rationality have been developed by scholars over the past two centuries and more. We conjecture that there a comparable variety of effectual models may also be discovered to explain endeavors in areas other than entrepreneurship. These models will follow the general principles of effectuation except they will be constrained by the boundaries and requirements of their particular domains. In this sense, entrepreneurial effectuation is but a special case of a more general theory of effectuation that might potentially be developed.

9. Effectuation is not an independent theory – it builds on and integrates the work of many well-received theories in economics and management

While complete as a theory, effectuation also integrates closely with a myriad of important theoretical domains. Some links to the resource-based view of strategy, resource dependency theory, social psychology and action-theory have already been described in our exposition. In this section, we highlight the following additional linkages:

A. The sources on innovation.

Since at least as early as Schumpeter's original work on innovation just after the turn of the century (Schumpeter, 1976), scholars have drawn attention to the processes by which invention and innovation occur. In the Schumpeterian tradition, much attention was given to the role of the solitary and independent "inventor" (Weiner, 1996). More recently von Hippel's (1976) studies of innovation have shown the importance of social processes in innovation; specifically the interface between users – who are, in many industries, the dominant locus of innovation – and producers. The theory of effectuation enhances the explanatory power of this research in two important ways. First, it offers an explanation as to the process of how users innovate: they effectuate. User innovation occurs when users experiment with what *can* be done with existing products and services (effectual) rather than what *ought* to be done with them per the manufacturers' prescriptions (causal/predictive). Users thus take an active and imaginative role in creating new uses from existing artifacts (Bianchi, 1998). Second, the efficacy of strategic pre-commitments to early-stage partners becomes transparent. Because producers often learn of key improvements in products by watching users (von Hippel, 1976) it makes sense for entrepreneurs to partner with early users and let users have a significant hand in producing a final product or service. The underlying logic for this process lies in informational efficiencies, as von Hippel and others have observed (von Hippel, 1994; Arrow, 1983).

B. ***First-mover advantages and consumer preference formation.***

Marketing scholarship has for many years keenly researched the question of why some market pioneers develop long-lasting advantages over brands that enter markets later (Wind & Mahajan, 1997). In their highly innovative theoretical account of preference formation, Carpenter & Nakamoto (1989) argued that, "[P]ioneering advantage can arise from the process

by which consumers learn about brands and form their preferences. This process can produce a preference structure that favors the pioneer." (1989:1). The crux of this explanation is that enduring consumer preferences for the structure and weight of various product attributes are *constructed* by pioneering producers, rather than being "discovered". This is especially true when the importance of attributes is ambiguous (as it often is in the early stages of the development of new markets). It also suggests that many different preference structures (i.e., many different markets) are possible given a particular technology and that entrepreneurs sometimes achieve success in markets by influencing preferences rather than simply responding to them. The theory of effectuation integrates with Carpenter and Nakamoto's explanation of consumer preference formation by providing the underlying logic for the process of consumer choice. In short, in cases where preferences (ends) do not pre-exist, consumers choose effectually based on the materials at hand (means) -- hence the pioneering economic artifact. Consumers attribute the success-in-use of a product to its combination of attributes (Carpenter & Nakamoto, 1989:287) thus effectuating their way towards a preference structure by choosing the ends (preferences) that matter to them. Effectual processes therefore can be seen as a promising underlying logic that informs the vexing problem of how, in the absence of goals, people acquire goals. It partly answers March's (1982) call for a "technology of foolishness" – for a goal-finding process that explains how individuals construct new values and preferences.

C. *Marchian exploration-exploitation (March, 1991).*

Stylizing effectual processes as the exploration aspect of the exploration-exploitation is possible (Sarasvathy, 2001a) and serves to locate effectual reasoning within a framework that is very well accepted in entrepreneurship research. The crux of March's argument is that, "Both exploration and exploitation are essential for organizations, but they compete for scarce

resources. As a result, organizations make explicit and implicit choices between the two." (1991:71). Consistent with streams of literature previous to it (for example Arrow, 1962), March's essential point is that organizations are good at adaptive processes that result in efficient exploitation of existing opportunities, but are poor at exploring for new opportunities owing to the uncertainties involved. The theory of effectuation explains the process by which some individuals are able, nevertheless, to conquer the seemingly paralyzing uncertainties of economic change by applying the logic of control rather than the logic of prediction in the exploration process. Whereas the logic of prediction underpins the exploitation process, the logic of control (effectuation) underpins the exploration process, making uncertainty irrelevant through the affordable loss principle, destroying uncertainty through pre-commitments from key stakeholders, and leveraging uncertainty in its key processes. The contrast between effectual reasoning and predictive rationality therefore provides the underlying machinery for March's exploration-exploitation dichotomy; in fact, without the alternative of effectuation, the dichotomy hangs unsupported on the exploration side. As a result existing literature alludes to mystical sounding processes such as intuition, and/or incomplete characterizations of creativity such as bricolage and improvization as the only alternatives. The theory of effectuation, however, begins to point to some fresh interpretations, and more rigorous and complete solutions to this age-old problem. Effectual logic can equally well be used to undergird other models that feature exploration (search) mechanisms, such as Nelson & Winter's (1982) characterization of evolutionary mechanisms in economics.

DISCUSSION

There are at least three major implications of the distinctiveness of effectuation as a model for building theories of entrepreneurship. First, effectuation helps frame a substantial part

of entrepreneurship as a distinct domain of scholarship; second, effectuation largely unseats luck and intuition as explanations for entrepreneurship; and third, effectuation helps explicate the role of entrepreneurship not only in the creation of for-profit firms but in the systematic creation of new institutions in general.

Entrepreneurship as a distinct domain of scholarship

Scholars in economics and management have long argued that entrepreneurship lacks a distinct intellectual domain with its own central driving issues and challenges. For example, entrepreneurship is either portrayed as the economics of the small firm, or the management of early-stage organizations. Recently, however, Shane & Venkataraman (2000) have argued for a distinctive domain of scholarship for entrepreneurship, without denying its overlap with other areas. This distinctive domain consists of the creation, exploitation and *destruction* of opportunities for value creation in the absence of current markets for them. The theory of effectuation offers a unique perspective on the very central issues concerning opportunities that form the distinctive domain for entrepreneurship.

This is not to say that anyone should endeavor to define the field of entrepreneurship by a decision model or logic, only to say that all fields are characterized by their key theoretical assertions, and that the same is true of entrepreneurship. A genuinely entrepreneurial decision theory is one mark of a coming-to-age of this scholarly field. Effectuation is at once empirically grounded in the decisions of real-world entrepreneurs as well as theoretically well-funded through the intellectual lineage of pragmatist philosophers, heuristics-based decision theorists, and economists and social scientists tired of the restrictive paradigm of rational choice.

This enables us to sharply delineate entrepreneurship, both in terms of its theoretical role in the social sciences and its empirical efficacy in the practice of entrepreneurship. The

theoretical importance of the phenomena of entrepreneurship stems from its role in the creation of new markets (ends). This alters the relevance of resources (means) – both in terms of their relative value and in absolute terms of what is considered a resource (Barney, 1991). Focusing on entrepreneurial phenomena through the lens of effectuation locates a theoretical role for entrepreneurship at the heart of economics, highlighting economics truly as a science of the artificial (Simon, 1996). It also locates the practical task and challenge of entrepreneurship in the finding and/or building of new markets, and is particularly apt to an understanding of the commercialization of new technologies (Christensen, 2000:191).

Dethroning the efficacy of luck and intuition as explanations of entrepreneurship

To date, some of the major explanations for entrepreneurship are based on luck and intuition (Demsetz, 1982). The luck-and-intuition perspective assumes that entrepreneurial action exists within the framework of predictive rationality. Also, given that luck and intuition are probably correctly modeled stochastically, the luck-and-intuition perspective raises the specter of the null hypothesis that there is nothing intellectually interesting or even plausible in the scholarly domain of entrepreneurship. All that is left to do is to model entrepreneurship the same way some finance theorists model the stock market: as a "monkeys and dartboards" phenomenon. In our view, theories based on entrepreneurial judgment also come perilously close to the luck-intuition fallacy (Sarasvathy and Dew, 2009).

Effectuation is the first theory of entrepreneurship that suggests that the very conception of action used in the "intuition" rationale is wrong. It is irrational for an individual to use predictive decision-making processes, intuitive or otherwise, under conditions of Knightian uncertainty. In fact, doing so prescribes the entrepreneur to view him/herself as a portfolio of attempts at firm creation. The realization of the structure, bounds and dimensions of the

entrepreneurial decision space induces us to seek a new view of rationality or at the very least a more plural notion of it. Otherwise the resultant confusions over the nature of rational action (conventionally understood) in the Knightian-Marchian-Weickian decision space lead our scholarship only to an absurd opaqueness rather than any luminous clarity to inform research, pedagogy, or practice.

The reconstitution of rationality into causal as well as effectual allows us to get off the old hobby-horses of luck (Demsetz, 1982); intuition (Christensen, 2000); alertness (Kirzner, 1973); insight (Rumelt, 1988); prescience (Melville, 1987); *or any other explanation for entrepreneurial action that suggests entrepreneurs have knowledge of things before they exist or happen*. These myths, usually fuelled by post-hoc rationalization by entrepreneurs themselves, are well overdue for debunking.

It is perhaps the single most important immediate contribution of effectuation that it offers an alternative narrative to the "discovery" view that suggests that the role of entrepreneurship is to "discover" new means-end relationships through their "intuition" or equivalent psychic talents. The notion of Knightian uncertainty – which is clearly well understood in the mainstream literature (Langlois 1984, Christensen, 2000) – is not amenable to the language of discovery, since clearly there is nothing "there" to be discovered. This conception of Knightian uncertainty is only amenable to the language of creation, construction and effectuation, particularly non-teleological narratives (Buchanan & Vanberg, 1991).

In situations of Knightian uncertainty, we would argue that forecasts based on predictive rationality really are better thought of as monkeys throwing darts at dartboards. Any predictions that are revealed post hoc to be "accurate" are only accurate to the extent that effectual action *constructed* the relevant outcomes. In other words, effectuation denies the usefulness of

prediction under situations of Knightian uncertainty, and instead advocates constructing the future by creative action based on the logic of control. Thus from an effectual standpoint, Knightian uncertainty turns out to be the least "risky" of the three-fold typology of uncertainty – viz. risk, uncertainty and Knightian uncertainty.

Entrepreneurship in the creation of new institutions

Despite the powerful insights of the new institutionalism in the social sciences (March & Olson, 1984), the converging strains of institutionalism have had problems explaining sources of change (Leblebici et al, 1995). Effectuation poses one answer to the outstanding issue of*, Who is creating new institutions and by what process?* We can look at entrepreneurship as the process of forming new stakeholder routines and conventions, of providing the raw material for the processes of institutionalization. This applies both to the construction of new means (firms and operating routines) and new goals (markets and preferences). The role of entrepreneurship is the role of initiating, experimenting with and organizing these new institutions.

What is striking about much of the research on institutions is the emphasis it places on the ignorance of decision-makers (vis-à-vis future desirable institutions) and the power of institutional processes (for instance, path dependencies) compared to the power of individual decision-makers (for a good summary, see Nelson & Sampat, 2001). Of course, both these aspects of institutional thought are brought into sharper focus when seen through the lens of effectual reasoning instead of through predictive rationality. Rather than looking absurd as it does through the predictive lens, institutional construction under the effectual lens looks perfectly rational. This is because, the logic in the latter case is one of constructing the institutions that *can* be constructed rather than a paralyzing focus on what *ought* to be constructed, given the absurdity of presuming one can calculate an actual best strategy in a

Knightian uncertain world. As Hernando de Soto's (2001) empirical study of the historical development of property rights elegantly illustrates, our forefathers certainly did not envision the institution of property rights shaping the world in the profound way it currently does. They simply did what they could, what was possible – in other words they chose a *local* effect. The institution of property rights thus grew bottom-up, with layer upon layer of chosen *local* effects, into a *global* institutional structure that we now, with the benefit of hindsight, examine in terms of its rationality and effectiveness (North, 1981). Like most institutions, just because we can always look back post hoc and impose a telos (say, efficiency) on the process, it does not mean that that is how institutions come to be. A close examination of the historical events brings out in sharp relief the fact that institutions are the contingent product of effectual "cans" rather than predictive "oughts".

In sum, the prime benefit of the effectual lens is to bring about a balance between the two extremes of (a) a certain sneering at the perpetual ignorance of institutional actors, and (b) a veneration of their vision. Effectuation replaces these two virulent extremes with a more measured conception of the entrepreneurial imagination. It provides a role for individual actors *within* an expanding network of stakeholders. Together they drive the effectual construction of new ends out of the means available to them, sometimes succumbing to contingencies, and at other times transforming them into new value.

CONCLUSION

At the eve of the American Revolution in 1776, Thomas Paine wrote: "The long habit of not thinking a thing wrong gives it a superficial appearance of being right, ..." (Paine, 1976). In introducing the theory of effectuation as an alternative to rational choice, we would like to re-phrase Paine to make the point that, *the long habit of thinking a thing right often makes all other*

alternatives appear false or at least improbable. Also, as Kuhn points out, paradigm shifts lay not so much in the invention/discovery of new knowledge as in new ways of looking at the things we *already* think we know. It is the very essence of human cognition to absorb new information into familiar and well-understood patterns. Yet, the history of ideas progresses often through Kuhnian revolutions that change our routines of seeing. In this paper we have attempted to show why effectuation is not yet another form of rational choice, but a distinct and irreconcilable alternative to it.

We are all heirs to a number of revolutions and paradigm shifts in a variety of disciplines. And perhaps the most precious of our intellectual heritage is the hard won notion of rational choice with its promise of "optimal" decisions and "predictable" futures. Yet such psychological comforts can only protect us from the reality of the blooming buzzing confusion of human decisions (James 1908), not enable us to overcome them and recreate our world in new ways. While even so astute a thinker as Kant could conceive of no other approach to Space and Time than the classical, 'absolute' Time and Euclidean Space of Newtonian Mechanics, recent developments in the sciences have successfully established otherwise. These developments tell us something valuable about how monolithic paradigms such as rational choice get pluralized through effective replacement of fundamental assumptions (Davis & Hersh, 1981: 217-236). For example, denying the parallel postulate in Euclidean geometry led to the development of two non-Euclidean geometries: (1) Riemannian or elliptic geometry where the sum of the angles of a triangle > 180 degrees; and (2) Lobachevskian or hyperbolic geometry where the sum of the angles of a triangle < 180 degrees. Analogously, falsifying the Axiom of Choice and the Continuum Hypothesis in different ways led to the development of non-Cantorian set theories (one by Kurt Godel and another by P. J. Cohen) in the twentieth century. Similar developments

such as Grassmann's relaxation of the commutative law, for example, have led to the pluralization of algebra.

To the extent that effectuation seeks to replace the logic of prediction in the paradigm of rational choice with the logic of control, it walks a well-trodden path in the history of ideas. Also, the fact that it embodies a non-teleological approach grounded in how entrepreneurs actually create firms and markets gives us hope that our decision to start on that path is not entirely misguided. However, only time and the prolonged attempts of scholars at verification and falsification will tell us if a journey on such a path might actually be even feasible or worthwhile. It is as the poet Roethke says, "I learn by going where I have to go" (Gensler, 1987: 279).

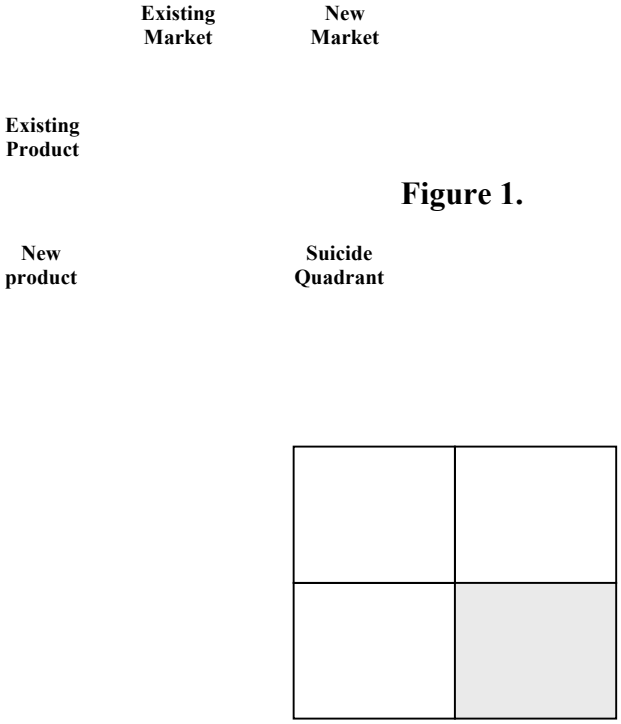

Existing Market
New Market
Existing Product
New product
Suicide Quadrant

Figure 1.

Managerial Thinking -- Causal Reasoning

Distinguishing Characteristic:
Selecting between given means to achieve a pre-determined goal

M_1

M_2

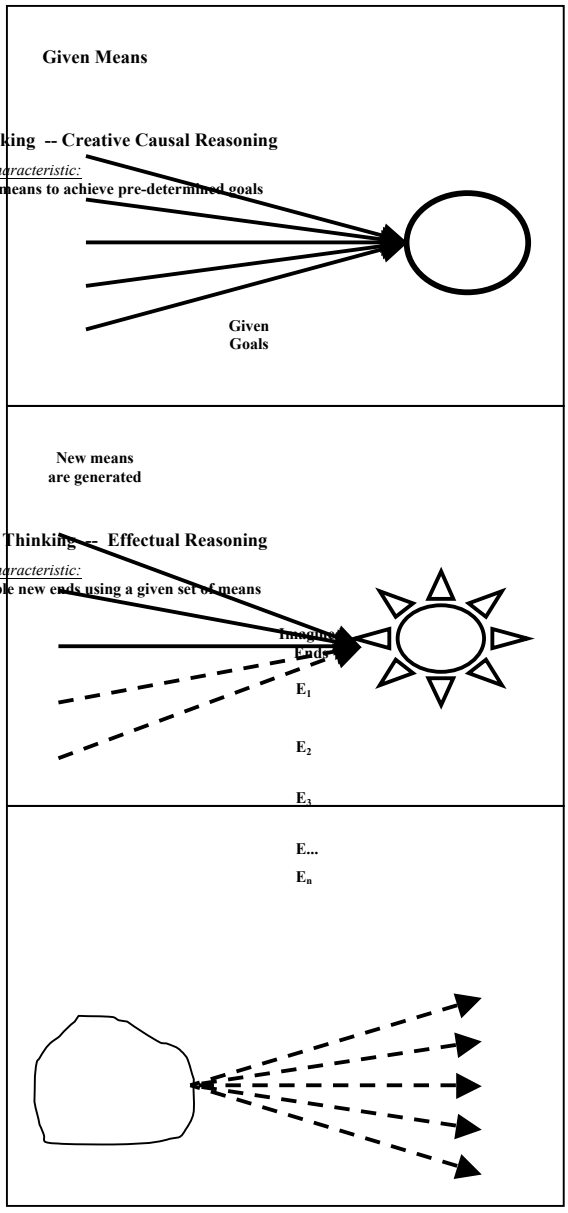
M_3

M_4

M_5

Given
Goal

Figure 2.



Classic Causation Model from Marketing Textbooks

Market Definition

Segmentation

(using relevant variables such as age, income, etc.)

Targeting

(based on evaluation criteria such as expected return)

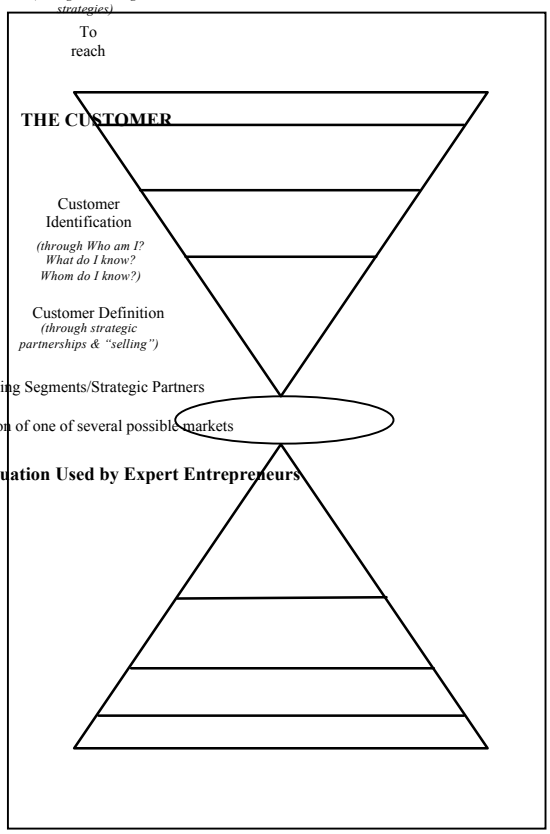
Positioning

(through marketing strategies)

To reach

THE CUSTOMER

Figure 3.



Process of Effectuation Used by Expert Entrepreneurs

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