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**Paper Title:** Decision-making logic in small firms: Informing the entrepreneurship as method  
debate

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## Decision-making logic in small firms: Informing the entrepreneurship as method debate

### ABSTRACT

Small firms are vital for job creation, innovation and the creation of social value worldwide. Studying the specific method entrepreneurs and small firms use to create entrepreneurial artefacts such as new opportunities, markets, firms and other initiatives present interesting possibilities for research, education and practice. Thus the purpose of this paper is to determine the underlying entrepreneurial mechanism small firm owner/managers to make new venture decisions under uncertain conditions. A think aloud protocol analysis of 13 small firms from the tourism, information technology and retail industry was conducted thematically analysed to identify the underlying mechanisms used when making product, market and startUp decisions in a new venture creation situation. Qualitative, thematic analysis of the data showed three main entrepreneurial mechanisms, namely effectuation, causation and improvisation. Specifically improvisation was used simultaneously when effectual and causal mechanisms were used. This study has pedagogical and practical implications for entrepreneurship as a design science.

### INTRODUCTION

Studying entrepreneurship as a science of the artificial, a science of design, present exciting possibilities for examining how entrepreneurs plie their craft. Entrepreneurship as design is more concerned with what *can be* than what *should be*, thus a focus on entrepreneurial artefacts that can be designed. Entrepreneurial artefacts are regarded as the creation of opportunities, new markets, new ventures, new products among others (Venkataraman, Sarasvathy, Dew & Forster, 2012). Viewing entrepreneurship as a design science, raises questions about the method and mechanics of entrepreneurship. What are the particular mechanisms that entrepreneurs and small firms use to create entrepreneurial artefacts?

The small business sector is significant worldwide in terms of participation (estimated in excess of 80% in most economies) and is also regarded as vital for job creation, innovation and the creation of social value (Stokes & Wilson, 2010). A growing body of literature show that small firms tend to follow emergent, 'entrepreneurial' mechanisms such as effectuation (Sarasvathy, 2001) and improvisation (Hmieleski and Corbett, 2006; Baker, Miner and Eesley, 2003) to exploit opportunities and create value (Lieberman-Yaconi, Hooper and Hutchings, 2010). In fact in the past ten years there has been a significant growth in studies focusing on emergent approaches (Venkataraman et al., 2012). Perry, Chandler and Markova (2012) encourage effectuation research and in contrast view the predominant entrepreneurial decision model taught in many business schools as a goal-driven, deliberate model of causation. This tension between emergent approaches and causation begs the question where causation stands in relation to other entrepreneurial mechanisms such as effectuation and improvisation. Therefore the purpose of this paper is to determine the underlying entrepreneurial mechanism small firm owner/managers to make decisions under uncertain conditions.

Studying entrepreneurship as a method present several interesting possibilities for educators, policy makers and the entrepreneurial community. From an educational perspective a set of teachable and learnable entrepreneurship principles would enable a clearer grasp of problems. Using that knowledge can enable us to pursue the creation of entrepreneurial artefacts such as new ventures, markets, jobs and social and economic wealth, of interest to policy makers and the larger entrepreneurial community. Specifically this paper aims to contribute to theory by

elaborating on the work of Venkataraman et al. (2012) by expanding understanding of the entrepreneurial method used in small firms. While previous studies have focused on measuring causation and effectuation (Chandler, DeTienne, McKelvie & Mumford, 2011) and corporate effectuation (Brettel, Mauer, Engelen & Kupper, 2011), this study focuses on both emergent and predictive approaches used by small business owner/managers under conditions of uncertainty. The paper proceeds in four parts by presenting a theoretical orientation and the central propositions in the literature, then the research procedures are described, subsequently the findings are presented and the concluding section points to further research.

## **THEORETICAL ORIENTATION**

Entrepreneurship, as a science of the artificial, focuses on the design potential of the field. Determining the set of tools and mechanisms which form part of the method of entrepreneurship should allow us to design entrepreneurial artefacts, such as opportunities, new ventures, new markets and new solutions to social problems among other things (Sarasvathy & Venkataraman, 2011). Then entrepreneurship scientists will not only investigate causal relationships to explain how variables are related, but also to how to design and create new outcomes, by examining how the micro, internal processes of the entrepreneur (decision-making logic, cognition, emotions, and actions) interact with elements in the external environment (gaps in the market, institutional misalignment, stakeholders and resources) (Venkataraman et al., 2012). A number of recent studies have identified entrepreneurial strategies, techniques, heuristics and mechanisms commonly employed to create entrepreneurial artefacts. While research into emergent approaches such as bricolage (Baker & Nelson, 2005); the co-creation of markets (Santos & Eisenhardt, 2009), effectuation (Sarasvathy, 2001) and improvisation (Hmieleski & Corbett, 2006) have grown, scholars seem at a lack to explain where purposeful, rational, goal-driven approaches such as causation fits in (Perry et al, 2012). Therefore this paper is primarily interested to determine how emergent, entrepreneurial heuristics interact with causal mechanisms when small business owner/managers make decisions regarding the creation of a new venture. To provide focus, this paper limits its investigation to the emergent, entrepreneurial mechanics of effectuation and improvisation as well as the role of causation in the decision-making logic small firm owner/managers employ.

### ***Causation***

Causation is a systematic, goal-directed process, where firms consider which resources are needed to achieve specific goals (Chandler et al, 2011). This decision-making logic is underpinned by the assumption that environmental events and actions are predetermined (De Rond & Thietart, 2007; Sarasvathy, 2001) and can therefore be predicted. Causation fits well with the rational decision-making process where firms follow an analytical process of environmental scanning and integrative planning to address a problem or achieve specific goals (Wiltbank et al, 2006; Hill & Jones, 2008). Several empirical studies show that firms which follow rational planning processes outperform those who do not (Brews & Hunt, 1999; Priem, Rasheed & Kotulic, 1995). Despite criticism against the rational school that the process is inappropriate in uncertain situations, proponents argue that this method is superior to others, since firstly heuristics, and other mental short cuts reveal individual and group prejudices and using analytical approaches can help identify these biases to overcome them. Secondly using a rational approach helps a firm to align itself with opportunities and threats in the environment and finally while prediction strategies might not be implemented as planned when environmental conditions change, it provides a basis from which a firm can develop emergent strategies (Wiltbank et al, 2006). However while some authors have suggested that small firms use rational processes (Brouthers, Andreissen and Nicolaes, 1998),

most find minimal evidence of rational decision-making models, objectivity and goal maximization (Lieberman-Yaconi, Hooper & Hutchings, 2010).

Small firms are more likely to use *bounded-rational* processes, where rationality is limited (bounded) by time, resource and information constraints, resulting in decision-makers coming to 'good enough' or 'satisficing' solutions (Hmieleski & Corbett, 2006). Both rationality and bounded-rationality are aligned with causation reflecting a predictive approach to the future. In principle small firms who are able to predict the future environment should be in an advantageous position in the market, in order to produce propitious outcomes. Thus a small firm would need to predict competitor actions, future market trends and demand, and factors influencing the cost of resources. Strategies and tactics can then be formulated on the basis of these predictions (Wiltbank et al, 2006).

However, predictive approaches depend on the ability to project the future to a certain degree of certainty, and environmental uncertainty is an inevitable reality small firms deal with on a daily basis (McKelvie, Haynie & Gustavsson, 2011). Uncertain environments create both opportunities for innovation as well as threats for the way firms currently do business, therefore small firm owner/managers often utilise other decision-making approaches when developing strategy and managing operations in such conditions (Freel, 2005). Increasingly scholars have used terms such as effectuation (Sarasvathy, 2001) and improvisation (Hmieleski & Corbett, 2006; Baker et al, 2003) to describe the actual decision-making logic used in small and entrepreneurial firms.

### **Effectuation**

Effectual reasoning acknowledges the future as changeable and shaped by human action; the environment created by decision-making and actions; and goals developed through cooperation agreements between stakeholders, rather than prior existing alternatives (Sarasvathy 2001). This type of decision-making logic is especially suited to uncertain situations and preferred by 'expert entrepreneurs' in contrast to causation (Dew, Read, Sarasvathy & Wiltbank 2008; Chandler et al, 2011). The effectual process begins with the effectuator drawing from three categories of resources (means) namely: identity of the entrepreneur and/or team (who I am?), knowledge and idiosyncratic experience (What I know?) and networks (Whom I know?). Based on these resources the effectuator then decides which actions are possible to get things going; subsequently reaches out to others to obtain input on how to proceed; these are often people in their network or other stakeholders, friends and family. As the idea grows from the input of others, they move and obtain commitments from interested stakeholders, which then expand the resource base of the potential venture and may also change the direction of the venture. Stakeholder commitments drive the process, based on several principles (Wiltbank et al, 2006: 992). The cycle reflects an emphasis on future events that the effectuator can control, rather than focus on prediction.

Chandler et al (2011) recommends that the differences between effectuation and causation should be organised around four principles. Firstly they contend that effectuators experiment in the short-term to find attractive business opportunities under conditions of uncertainty, whereas causation will first define the primary end goal. Secondly during effectuation there is a focus on limiting losses when embarking on new projects, meaning stakeholders only invest what they are prepared to lose termed affordable loss, since they are not able to predict the final 'size of the pie' using measures such as the expected return on investment, which is used during the causation process. Thirdly, as mentioned in the previous principle, effectuators focus on obtaining pre-commitments from interested stakeholders and are prepared to adapt and change the venture to co-create new products, ventures or markets, while the focus in the

causation process is on business planning and competitive analyses to predict the future. Finally actors in the effectuation process also need to remain flexible, as unforeseen events will inevitably be part of the development path of the venture. Thus effectuation seeks to capitalise on these occurrences and use unexpected surprises to their advantage, such as creating new opportunities; in contrast the causation approach will aim to avoid or hedge against contingencies and plan for them, which may result in inertia when unplanned contingencies arise.

The effectuation approach has attracted much attention from academics and practitioners in recent years and has been assessed with 'expert' entrepreneurs (Dew et al., 2009), business angels (Wiltbank, Read, Dew & Sarasvathy, 2009), new product development (Brettel, Mauer, Engelen & Kupper, 2011), but not to our knowledge in a small firm context, hence another reason for the purpose of this paper. Like effectuation, improvisation and heuristics acknowledge that small business owners follow non-predictive approaches to develop their ventures.

### ***Improvisation and Heuristics***

Improvisation can be broadly defined as the conception of action as it unfolds, drawing on available cognitive, affective, social and material resources (Minor, Basoff & Moorman, 2001). Improvisation has been observed during the founding process of new venture, when the 'design and execution of novel action' occur simultaneously (Baker et al, 2003), that is the conception and creation of a new organisational entity, which seldom unfolds according to a plan. The improvisation process therefore implies a degree of novelty and intentionality, of both design and execution.

Hmieleski and Corbett (2006:46-47) argue that novel or uncertain situations and resource constraints influence the decision-making logic entrepreneurs use; specifically they highlight the relevance of improvisation and heuristics in the entrepreneurial process. They maintain that when the environment is stable and resources are abundant, entrepreneurs will tend to use strategic planning to develop their ventures, yet when uncertainty increases; while resources remain abundant a 'trial-and-error' approach is more likely. In reality though, small business owners and entrepreneurs are often faced with highly uncertain or novel environments, together with severe resource constraints; under conditions such as these improvisation is more likely.

Hmieleski and Corbett (2006) describe how the improvisation process occurs when an entrepreneur or small firm owner/manager is presented with an entrepreneurial problem. The individual examines their previous experience to ascertain whether the problem bears any similarity to problems previously experienced, and a *referent* is selected. A referent represents a strategy or plan to respond to an external trigger. The referent may be formal, such as a published procedure, or an informal cognitive bias or heuristic (Busenitz and Barney, 1997), also described as intuitive thinking (Lieberman-Yaconi et al, 2010). There-after isolating a reference point, the decision-maker considers if this would be sufficient, considering the boundaries of the problem space. Should it be sufficient and practical, that referent is usually chosen as a solution, if not the referent can be improvised, by broadening or reconstructing the referent to generate a creative response. This entire process occurs *impromptu*, so that the individual is assessing probabilities and formulating strategy while acting out the solution. The unrehearsed nature of the processes suggests that cognitive heuristics and biases are likely to be the most commonly employed referents (Baker et al, 2003). Hmieleski and Corbett (2006) point out that few studies have investigated the role of improvisation in entrepreneurship, despite the value it could offer, since firstly small firms operate under high

levels of uncertainty where improvisation is a particularly useful behavioural strategy and secondly how improvisational activities can be integrated into work level processes.

## METHODS

This paper uses thematic analysis of data from the protocol analysis conducted with 13 small firms from the tourism, information technology (IT) and retail industries. Owner/managers from small firms were asked to think aloud when making a series of decisions regarding the product, market, launch and start-up in a new venture creation situation, characterised by uncertainty. The use of qualitative procedures was appropriate for three reasons. First decision-making logic as an internal micro human process is complex and difficult to observe; also and the causal dynamics are not immediately apparent and the motivations of small firm owner/managers are obscure (Elsbach & Kramer, 2003). Second a primary motivation for this study was “theory elaboration” (Lee, Mitchell, & Sabyliniski, 1999), a process where pre-existing understandings is contrasted with observed events in an effort to extend existing theory. Finally think aloud protocols is appropriate in entrepreneurship research to extract common cognitive processes (Dew et al, 2009), offering benefits above retrospective recall or stimulus-response methods such as questionnaires. Think aloud protocols allow researchers a glimpse into the *short-term memory processes* of the human brain, due to the short interval between the occurrence of thoughts and their verbalisation, overcoming retrospection and introspection biases associated with interviews and questionnaires (Nguyen and Shanks, 2006). The small firm context was seen as particularly appropriate for this type of inquiry.

### *Small firm decision-making context*

The context of the small firm makes it particularly noteworthy to examine for four reasons. Firstly small firms are an economically significant group to study, since 89 percent of Australian firms employ less than 20 people and can be considered small firms (ABS, 2010). Yet these firms are typically underrepresented in strategy, management and entrepreneurship research (Johnson, Melin and Whittington, 2003). Secondly the owner/manager plays a substantial role in the decision-making logic used in this firm and inevitably draws from their previous experience, knowledge, as well as network members (Smith, Gannon, Grimm & Mitchell, 1988). Since there are few peers in the firm to share ideas with small firm owner/managers need to balance short-term operational issues with longer-term managerial ambitions (Atuahene-Gima and Li 2004), the owner-manager is often under pressure and resorts to drawing from their own cognitive biases, previous experience, knowledge and personality traits (Liberman-Yaconi et al, 2010). These heuristics have a much stronger influence on decision-making, compared to the process followed in a larger firm, where teams make decisions and justifications are required for decisions made. Thirdly small firms operate with major resource constraints in terms of time poverty, knowledge (human capital) and organisational capabilities (low employee numbers) (Graeme & Staines, 1994). Despite owner-managers engaging in network bricolage to seek resources and making do with what they have (Baker et al., 2003); resources may still be very limited (Stokes & Wilson, 2010). Finally small firms face significant uncertainties in terms of an ambiguous environment (Freel, 2005), where they are vulnerable to changes in customer tastes, competitor strategies and economic and social trends.

These challenges of small firms significantly influence the decision-making logic used by the owner-manager in creating entrepreneurial artefacts. Two main sources of data were drawn from in this study, namely data gathered from the small firm-owner managers through the protocol analysis and researcher notes on non-verbal behaviour as well as triangulating ‘verifiable’ data with their web sites.

### **Data sources**

Protocols were collected from 13 small business owners and managers. All the answers from the think-aloud protocols were transcribed. Interview notes were also recorded in observing subjects' non-verbal behaviour. Verifiable information was triangulated with the small firms' websites. The small firm owner managers operated in three diverse industries, namely information technology and online businesses (IT), retail and tourism industries. These industries were selected, since a number of technological, economic and social trends are compelling firms in these industries to adapt to changing circumstances and design new business models; or face business failure. In choosing firms from these industries a heterogeneous mix of small business owners formed part of the study, representing different levels of IT skills and business experience. Diversity was valued in subject selection, since it was expected that 'richer' research data would be uncovered to understand decision-making logic and entrepreneurial mechanisms in small firms.

Seven males, five females and one husband and wife team (co-preneurs) participated in the study. Their ages ranged between 24 years of age to over fifty years of age, with the majority of subjects being between 40 to 49 years of age. Six of the businesses were active in the IT industry, while four were in retail and three were in the tourism sector. Most of the owner-managers operated established businesses, older than four years, and had been managing the business for longer than four years. Interestingly, only five of the subjects started their own businesses, while three bought their businesses and two were involved with family businesses, while three managers also participated. Most of the owner/managers had university degrees. More than half of the subjects had experience both of being involved in a business from an employee and owner/manager perspective. All owners interviewed actively participated in the management of their firms. Five of the subjects had owned and operated at least two other firms, prior to the one they were involved with at the time of data collection.

### **Data analysis**

Subjects were interviewed by firstly asking them a series of open-ended question related to their business, experience and entrepreneurial artefacts created. There-after they were presented with a decision scenario, describing a hypothetical product called *Venturing*, adapted from Dew et al (2009). The decision problem used in the study was kept understandable to all subjects, from different industries in order not to bias some subjects against others. The scenario focused on a business start-up situation, where subjects had to identify and describe the market they considered attractive, competitors and the launch strategy to follow. Subjects were requested to 'think aloud' while they were considering the course(s) of action they would take. Protocols were recorded electronically and transcribed for coding and analysis. Interviews ranged in duration from one to two hours.

Thematic analysis was used to investigate the mechanisms small firm owner/managers used to arrive at decisions. This is an accepted methodology used by Dew et al (2009) previously. In keeping with other qualitative research (Locke, 2001) the analysis moved iteratively between the data, emerging themes and existing theory in several phases. In the first phase of the analysis we used Nvivo, a computer-based qualitative research package to identify the main themes; these were aligned with the questions asked around the market, product, competitors and launch of the new venture. These themes had to be further refined to look at the justifications or underlying reasons provided for these choices. To capture the small firm owner/managers experiences and 'minimize violence' (Pratt, 2008:499) to the data, both in-line quotations and summary tables present rich accounts of subjects think-aloud decisions. This second round of selective coding focused on the first-level constructs (experimentation, affordable loss, partnerships, flexibility, planning tendencies and so forth) Following Maitlis

and Lawrence (2007) the first level-constructs and representative quotes are presented in Table 1.

**Table 1: Data Exemplars for First-Order Constructs**

First-order construct	Exemplars from the data
Experimentation	<p>“I will try it out and see what words... try and talk to the Education Department and see what happens.”</p> <p>“I’d have design interface via the iPhone [and other...] that’s how teenagers interact with technology.”</p> <p>“There’s quite a number of different ways to market the product, like internet promotions, to universities, to develop other educational materials, articles and blogs to support the product.”</p> <p>“There’s quite a number of product design possibilities, but this will depend on the party that buys into the idea... will negotiate the deal.”</p> <p>“We’ve tried different things [in our current business]... for example we tried a web shop once, but it didn’t work [customers didn’t use it], so we left it.”</p> <p>“We realise that customers are changing and prefer online, so we’ve found new ways to build relationships with them, such as a loyalty club and referrals.”</p>
Affordable Loss	<p>“...suppose we could use television advertising, but we’d have to limit our expenses at the start.”</p> <p>“need to work on a shoestring budget.... limit costs”</p> <p>“using an iPhone app lowers the set-up costs, overheads and advertising, I’ve just done all my research on this recently, I’m aware of the costs.”</p> <p>“We’d have to be careful and control our costs.”</p> <p>“I would not move ahead with this project if there wasn’t a major partner on board with us who would also be part of the marketing effort.”</p>
Other financial measures	<p>“... we’d have to earn some reasonable profit margins on a project such as this to move ahead.”</p> <p>“... have to make sure what the industry return on investment is and this would be part of the package as we move forward with this project.”</p> <p>“I’d like to make the maximum sales from this to ensure we earn maximum returns.”</p>
Stakeholders/ Partnerships	<p>“...if I get started with this, I’d first target the Education Department and get them to back it”</p> <p>“... it would be best to link with a state government agency responsible for economic development to encourage this as part training.... This could be like a free stuff package for new business, you know and also if they provided to tax incentive to do the course, it would boost sales.”</p> <p>“I plan to be an Apple distributor and would launch this as part of other gaming apps.”</p> <p>“The first thing to do is to pitch this idea to USC (local university) and later on other uni’s or colleges and schools could be offered the opportunity. But USC must commit to developing the project with us, if they don’t; it’s too risky to go ahead.”</p> <p>“I would seriously consider getting a partner involved, as part of the business who has the gaming and IT expertise to make this work.”</p>
Flexibility and dealing with unexpected events	<p>“...will adapt and change the product as my customers require, after all I need to make sales.”</p> <p>“We’d have to develop multiple versions of the simulation for all the different customer groups we plan to target.”</p> <p>“Multiple versions of the game should be downloadable and changes made based on customer feedback.”</p> <p>“Cloud computing provides us with immense flexibility [in IT terms]”</p> <p>“Being flexible is part of my personality.”</p> <p>“We’d have to adapt and change the product and then charge a higher price.”</p> <p>The first year will be a learning curve – we could do several “unique” things</p>
Structured plan	<p>“... it would be better to draw up a business plan to direct the marketing research and find out more about customers and competitors.”</p> <p>“I’d prefer to go at the problem in a more structured fashion and first work out different options and then see what is the best one to go for.”</p> <p>“... depends on my strategy... market research is vital, I’d start by looking at the ABS data.”</p> <p>“The plan ahead depends on who gets on board with us to take the project further.”</p> <p>“It’s best to first decide on the target markets, by segmenting the market... determine what they want and adapt the product accordingly and then decide on the marketing mix.”</p>
Use of information provided in the case/ decision experiment	<p>Uses information to justify decisions made, especially pricing decisions</p> <p>Mentions numbers in decision-making, seems to use it mostly as justification for decisions</p> <p>Uses it as a basis, but keeps on thinking of new possibilities and “make it up as I go along.”</p> <p>Studies information in ‘detail’, asks questions and uses information when making decisions as reasons for decisions</p> <p>Studies information in detail asks questions and uses it when making decisions as reasons for decisions. Responds relatively quickly.</p>
Use insights from previous experience	<p>Talks about experience in another management simulation in the education environment</p> <p>Talks about Facebook interactions “use online surveys to generate continuous feedback: and knows cost implications of suggestions</p>



	Draws from IT experience, retail and management experience. Draws extensively on IT industry experience; claims he's been in industry so long he can "predict the trajectory" of the future of the information technology industry Suggests a competition be held to promote the game which is linked to his past experience of having children in school, participating in an Investment Challenge Draws on previous [tourism] industry experience where recommendations can be supported
Use insights from case studies and/or classes	Draws insight from strategic management cases Strategic management tools and World of Warcraft Uses Siemens as a case study for innovation 'rules of thumb' "Get kids to play, like Microsoft....." "I have role models in business, for example Boost Juice and Sumo Salad, I have met these guys personally ~ they are inspiring!"
Goal setting	Sets clear goals, talks about a "phased implementation and project is needed" Sets target for certain level of revenue and "minimum number of downloads" Targets are set and goals will evolve
Theorising about entrepreneurship	Mentions entrepreneurial characteristics The simulation allows for creation of numerous scenarios, so business owners can adapt Recommends that real business figures should be included in the simulation Comments about management and strategic management Mentions models, diagrams and other rules of thumb to guide decision-making Talks about different types of opportunities for example in 'buying a business or buying a job'

In reviewing the first-order constructs and relating it to prior research we concluded that three main entrepreneurial mechanisms were at work simultaneously underpinning decisions made. Therefore the first-level constructs were aggregated to three second-level constructs, which this paper theorises form part of the entrepreneurial method used by small firm owner managers to create entrepreneurial artefacts. Modelled on other qualitative research (Maitlis and Lawrence, 2007) Figure 1 provides a visual representation of the analysis, showing the move from data presented in Table 1 to first-order and second order theoretical constructs. A coding scheme was used to identify the type of statements related to first-order constructs and two other coders used this coding scheme (available on request). Interrater reliability of 89% was achieved through this process, within acceptable standards (James et al, 1993).

## FINDINGS

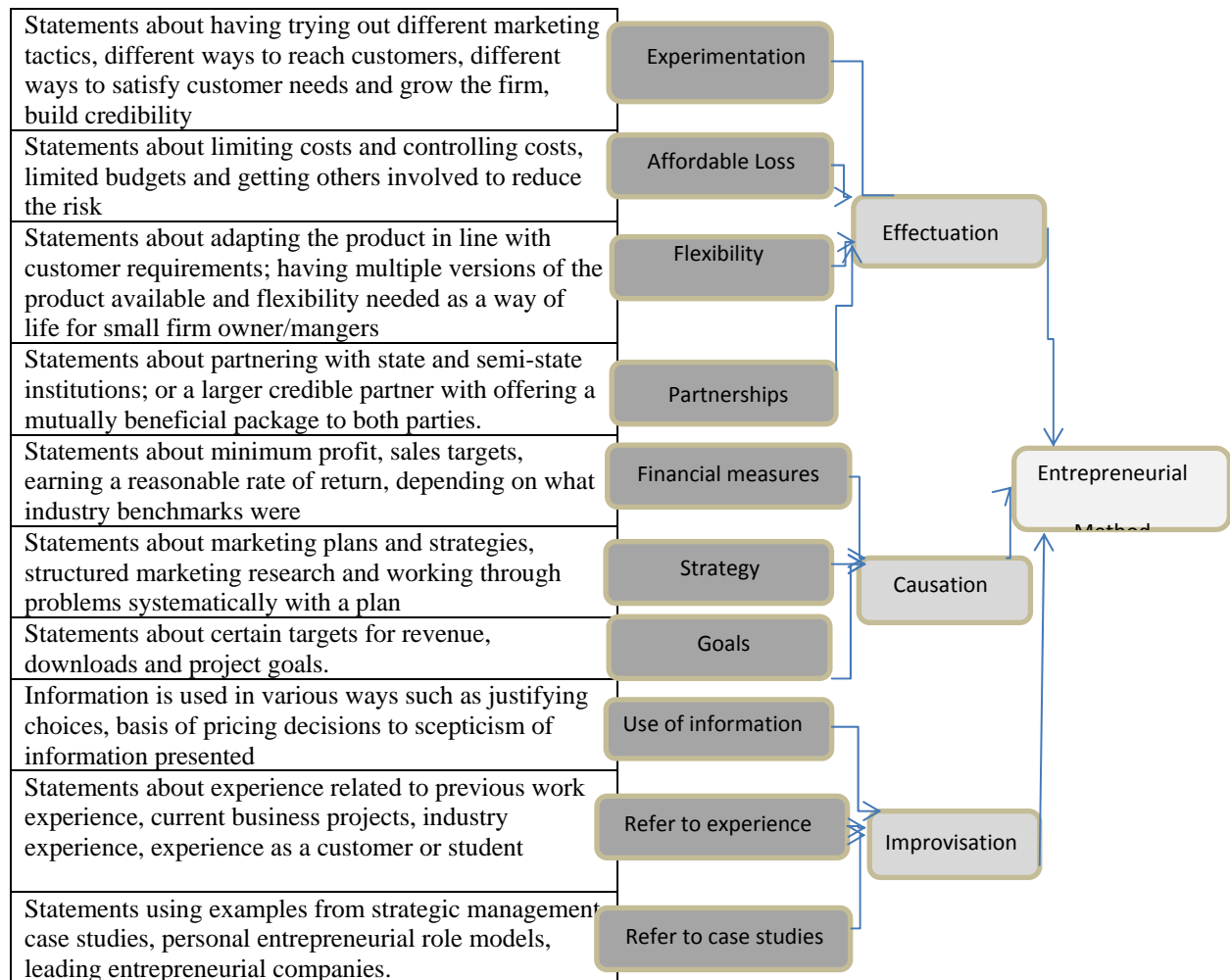
The analysis in Figure 1 suggests that small firm owner managers used a variety of entrepreneurial mechanisms simultaneously to determine a suitable course of action, drawing from emergent approaches such as effectuation and improvisation as well as a more predictive, causal approach. The entrepreneurial method is therefore not exclusively made up out of emergent approaches; rather small firm owner/managers use a combination of linear, predictive as well as non-predictive, non-linear approaches. This section proceeds by first discussing the mechanisms related to effectuation, second to causation and finally to improvisation.

Effectuation was made up out of four entrepreneurial mechanisms, namely experimentation, affordable loss, flexibility and dealing with unexpected events and partnering and gaining commitments from stakeholders.

Table 1 shows exemplars of small firm owner/managers' responses related to *experimentation*. Responses ranged from tactics a trial approach to find another institution to partner with, for example: "*I will try and talk to Education Department and see what happens*"; an experimental delivery method of the product in the scenario "*I'd have a design interface via the iPhone (and other) app's, that's how teenagers interact with technology*;" as well as providing examples of how experimentation is already used in their current business, for example "*we tried a web shop, but it didn't work, so we left it*." This comment indicates how the trial of an idea and outcomes could be judged in an experimental nature. Small

business owner/managers with multiple businesses owned experience, tended to be more willing to experiment, than those who lacked such experience.

**Figure 1: Structure of entrepreneurial mechanics guiding entrepreneurial decision-making logic**



The notion of *affordable loss* or limiting the downside loss of the expenditure and/or investment was evidenced by references to “*limiting costs*” and/or “*controlling costs*” in the given problem scenario. Small firm owners also indicated that they could keep costs down through their knowledge and experience gained in other projects, for example from research already completed one owner remarked that to distribute the product (game) “...*using an iPhone app lowers the set-up costs, overheads and advertising costs.*” The concept of limiting loss or risk was even taken further by an experienced small business owner, who had owned and sold multiple businesses before, who stated: “*I would not move ahead with the project if USC [the major university partner he was targeting] did not get on board,*” showing how the principles of affordable loss and pre-commitments from stakeholders worked together in his mind to limit loss and minimise risk.

Only a limited number of small business owner/managers considered obtaining resources or input from *networks and partners*, a prominent part of effectuation. While some of the small business owners talked about partnerships and getting either an internal or external partner, only three went so far as to say they wanted a commitment from an external stakeholder. Two of these owners talked about it in terms of trying to launch the new venture and expand its potential, for example getting the Department of Education involved or the State Government as part of a business start-up package. Both these two owners were still prepared to look at

other avenues and go ahead with the start-up, while only the experienced multiple business owner said that he would not consider going ahead with the project, unless he could interest the stakeholder he had in mind (a local university), or another similar stakeholder. This finding is of particular interest and may help explain why many small businesses, in spite of being aware of the benefits of networks and involved with networks, may not realise the full benefits networks can offer and prefer to work independently, thereby sealing their own fate to stay small and vulnerable.

The final effectual principle considered was *flexibility* and openness to contingencies. All owner/managers were willing to adapt and change the product in response to market changes and requests from customers, with comments such as: “*I will adapt and change the product*”; “*multiple versions of the game will be downloadable and changes will be made based on customer feedback*” showing the realisation that unexpected events are part of the small business landscape and a willingness to be flexible and make changes. One owner went so far as to say “*being flexible is part of my personality*,” in other words part of his identity. This principle seems to be crucial to small business survival and should be part of small firm owner/managers set of competencies.

Causation as structured, goal-directed behaviour manifested in themes of financial evaluative measures for a project, strategies and plans as well as goals set for project outcomes.

Theoretically opposed to affordable loss used in the effectuation literature, stands the concept of *return on investment (ROI)* as a financial ratio that can be calculated in causation, however it is unlikely that this calculation would be performed in the short-term talk aloud protocols used in this study, therefore other financial measure used as a guideline to decide to launch the venture seems suitable. Only a small number of owner/managers talked about such measures, for example “*set price to earn reasonable profit margins*,” ensuring “*maximum sales for maximum returns*” and consider “*industry return on investment*” as an industry guideline to judge the feasibility and attractiveness of the proposed venture. The owner/managers who mentioned financial measures were trained in management and had extensive experience in new projects.

Other evidence of causal thinking was sought through mentions of strategy and a structured, goal-directed approach. Evidence was found of some owner/managers preferring a structured approach, using strategic management terminology to describe the process to follow; also “*learning is constant, and the market evolves*” therefore a firm’s strategy should be adapted. While another owner talked about achieving future goals in terms of a negotiated results with other stakeholders. Evidence was also found in the form of owners talking about setting clear goals, in line with a project plan and ‘*phased*’ implementation of the project, as well as targets for a “*minimum number of downloads*” which was then related to a certain level of revenue. Despite the fact that this type of goal setting was not common for all owner/managers, a significant group did use the tactic.

Improvisation is used as owner/managers draw from available information and decide on the relevance; as well as using referents from their previous experience or other examples to inform their decision-making logic.

The information presented to owner/managers was treated quite differently by the owner/managers. Four main approaches prevailed. While one group barely considered the information and only referred back to it when making pricing decisions, another group used it retrospectively to justify decisions already made. A third group studied the information intently and asked for more information, suggesting that they would only like to proceed if

proper research was done, while a final group was sceptical of the information and used it as a basis, but imagined new possibilities and trends not addressed in the scenario.

Many owner/managers mentioned their *previous experience* as a basis for decision-making or to generate ideas; therefore it was also included as a theme and seems to be strongly related to improvisation. Examples of these insights gained from previous experience include references to experience of being part of a management simulation, useful tools for the venture scenario presented “*use online surveys to generate continuous feedback;*” holding “*... a competition to promote the game*”, referring to previous experience of an investment simulation where the competitive nature worked very well. The rest of the owner/managers drew from their industry experience to help them make decisions. They also referred to other examples such as *case studies and entrepreneurial role models* to provide a basis for their decisions. One manager talked about ‘*World of Warcraft*’ as an example of a global simulation game; the experienced entrepreneur mentioned Siemens and their approach to innovation as a guideline to decision-making, an owner in the retail sector talked about Microsoft’s early involvement with educational institutions as a business model to follow, while an owner, mentioned he had entrepreneurial role models in businesses such as Boost Juice and Sumo Salad.

Therefore entrepreneurial mechanisms of effectuation, causation and improvisation were all used in the entrepreneurial decision-making process of small firm owner/managers.

## DISCUSSION

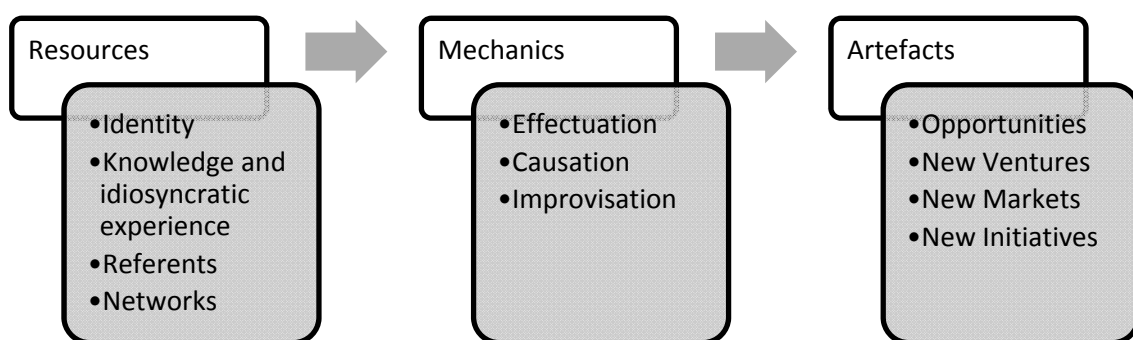
In summing up the findings of this study small firm owner/managers use entrepreneurial mechanisms of effectuation, causation and improvisation to guide their decision-making and subsequent actions.

Effectuation manifested through experimentation, affordable loss, partnering and stakeholder pre-commitments sought as well as remaining flexible in the light of unforeseen stages. Firstly experimentation is an effectual principle and small firm owner/managers generally drew ideas from previous experiences and knowledge they possessed to propose ideas and shape the type of trial approaches they would use. It therefore seems that improvisation, conceptualising action as it unfolds and drawing from a variety of resources, often from a referent in an individual’s realm of experience is much more closely related to this effectual principle, than current literature points out. Secondly affordable loss, which generally took the form of limiting or controlling costs in relation to the proposed new venture, also seems to be related to owner/managers experiences, again underlying the relevance of improvisation for affordable loss. The third construct of partnering and obtaining pre-commitments from stakeholders was also linked to risk reduction, in that one owner pointed out that unless he was able to secure a pre-commitment to develop the product from a stakeholder who would also end up being the first client of the business, he would not proceed. Getting stakeholders involved is also a way to increase the legitimacy of the new venture. Despite the fact that all owner/managers acknowledged the importance of networks, the majority did not make use of these to increase the proposed venture’s market entry potential. This finding suggests that many small businesses may not realise the full benefits of networking and strategic alliances, preferring to work independently and thereby increasing the survival risk of their businesses. Finally flexibility and welcoming contingencies, as an effectual principle, was a value all small business owner/managers embraced. In particular this flexibility was shown in response to customer needs. Lieberman-Yaconi et al (2010) emphasises flexibility and proximity to customers as key advantages of small firms. From these findings, it seems that improvisation is closely linked to effectuation.

Although causation was not used widely by all owner/managers, those with management education preferred to use a structured approach and even used this type of thinking as a heuristic to approach the decision-making problem. Evidence of the causation was found in the strategies planned, goals set and financial measures to judge the attractiveness of the opportunity. It should be borne in mind that the type of protocol analysis used in this study, does not lend itself to a comprehensive analytical approach, but rather a ‘thinking on your feet’ approach. Despite this limitation the current study indicates that causation should form part of the entrepreneurial mechanisms inherent in an entrepreneurial method.

Improvisation was prevalent among all small firm owner/managers. Most of the owner/managers drew ideas from their own previous experience and knowledge as well as other entrepreneurial cases. These then served as a referent as Hmieleski and Corbett (2006) describe. The improvisation process seems very plausible in small business situations where contingencies require small business owner/managers to assess probabilities, formulate strategy and act out the solution in a tight time-frame and unrehearsed manner. Although Baker et al (2003) and Hmieleski and Corbett (2006) discuss role of improvisation in entrepreneurship, they tend to concentrate on the founding process and nascent stages, not the everyday decision-making in the business, or the continued operation or growth of the business. As such this study contributes to our understanding of improvisation as an entrepreneurial mechanism.

Figure 2 shows how entrepreneurs and small firm owner/managers would use resources at hand in the design process. This study adds to the current model proposed by Sarasvathy (2001) by showing that not only the identity, knowledge and idiosyncratic experience and networks as resources at hand, but also referents in the mind of the actor. These resources are drawn from in the mechanics of the entrepreneurial design process, where the actor would use a combination of causation, effectuation and improvisational tactics to solve a problem. This study contributes to the existing literature by showing that effectuation and causation are not theoretical dichotomies but complementary mechanics. This finding is supported by Groves, Vance and Choi (2011) who find that entrepreneurs balance linear and nonlinear thinking style in the cognitive processing of information to facilitate decision-making. These mechanics are then employed to design entrepreneurial artefacts such as new opportunities, ventures, markets and initiatives.



**Figure 2: Entrepreneurial mechanics used by small firms to create entrepreneurial artefacts**

This paper makes several contributions to the entrepreneurship literature by firstly showing how closely the improvisational decision-making style is linked to effectuation and causation. Most small business owners draw from reference points, based on their experience to generate new ideas and solutions, during situations of uncertainty. Secondly small business owners use a variety of mechanisms, such as causation, effectuation and improvisation, when considering

which course of action to take. A balance of both linear and non-linear approaches is used in the entrepreneurial design process.

The findings of this study have practical implications for small business owners and educators. Small business owners should take note that making use of both predictive, linear approaches as well as non-predictive, nonlinear decision-making processes is the norm in this sector. While planning approaches have value and can possibly lead to efficient and profitable outcomes during stable conditions, non-predictive approaches are useful when creative, innovative solutions are required, under conditions of uncertainty. Furthermore, making use of effectual principles would also help build resilience for small business owners. Flexibility and looking for opportunities amidst contingencies seem to be strengths most small business owners acknowledge, however the principles of experimentation, affordable loss and pre-commitments from stakeholders could be used more. Frequent small scale experiments enable small business owners to test innovations on a small scale to improve their current business, while focusing on affordable loss, to limit the downside risks of these initiatives. Although most small business owners are involved in networking the findings of this study suggests that they are not making full use of the opportunities to expand and grow their businesses through strategic alliances and pre-commitments of stakeholders, which could help lessen the risk of growth, while also building the credibility of the smaller firm.

The findings also have implications for entrepreneurship and management educators and the courses they teach. Presenting entrepreneurship in the form of teachable, learnable design method and principles should enable entrepreneurship and management students to design entrepreneurial artefacts. The concepts of improvisation and effectuation should also be incorporated into courses.

## CONCLUSION

In conclusion this study set out to determine the particular mechanisms entrepreneurs and small firm owner/managers use to create entrepreneurial artefacts. More specifically the interaction of effectuation, improvisation and causation as entrepreneurial mechanisms were studied using a new venture decision-making experiment. The findings confirm that all three these mechanisms are useful for small firm owner/managers to create new artefacts, contributing to the work of Venkataraman et al (2012).

Much remains to be done. The thesis of this study should be tested in other contexts and industries. The specific actions and interactions between actors (entrepreneurs) and their stakeholder partners in the creation of entrepreneurial artefacts would yield further interesting findings to advance entrepreneurship as a science of the artificial. Perry et al (2012) calls for advancing research to an intermediate state with contributions focusing on the development and testing of more rigorous models. With respect to limitations of this study, given the research method, it is not possible to generalise these findings to all small businesses, nor was it the intention of this study. This study does provide a starting point and shows the relevance of improvisation for both effectuation and causation as entrepreneurial mechanisms.

## APPENDIX: Coding Scheme used for selective coding

### 1. Notes on overall process

Record the time of each interview and makes notes on: Did this person believe the numbers? ; Did this person worry about how much money he or she has and what the costs of executing his or her marketing decisions will be?; Did they beyond making marketing decisions to talk about building the business as a whole? (Quotes) [For second round of coding look for theorizing about entrepreneurial decisions/actions; insights from previous experience; insights from case studies/classes]

**2. Partnerships/affiliations/relationships:** Did this person visualize partnering or building a relationship with someone? If yes, provide quotes and details

3. **Use of information provided** Record how the person dealt with the information presented in the case e.g. studied in detail, used information when making decisions, looked at information when making pricing decisions or questioned information.
4. **Set goals:** Observe in notes whether the person sets clear goals; or targets; is the impression created that goals will evolve or no goals are set.
5. **Decision-making process:** Look for to what extent small business owner/managers use phrases related to experimentation, affordable loss, flexibility, partnering or stakeholder commitments, financial measures such as minimum return on investment, structured steps and planning or managerial language.
6. **Segment decision:** Did this person decide on one or more segments?; Did this person decide to sell to all three segments?; If this person chose more than one segment, was it simultaneous or prioritized?
7. **Number of new markets:** Who were identified as the potential customers for this product?; What did the person think of the growth opportunities for this company?; Did this person visualize new segments other than the ones suggested?
8. **Channel decision:** What channels did they decide to use internet, retail, mail order catalog and/or direct sales

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