# ENTREPRENEURIAL DISCOVERY IN PROMISING START-UPS: A COGNITIVE ANALYSIS OF PRINCIPLES OF BEHAVIOR

by

**Feng Ju**

MS in Molecular Biology, University of Science & Technology of China, 1996

MBA, International University of Japan, 2000

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KATZ GRADUATE SCHOOL OF BUSINESS

This dissertation was presented

by

Feng Ju

It was defended on

April 26, 2006

and approved by

Jacob G. Birnberg, Robert W. Murphy Jr. Professor of Management Control Systems, Katz Graduate School of Business

John C. Camillus, Donald R. Beall Professor of Strategic Management, Katz Graduate School of Business

Stephen C. Hirtle, Professor, School of Information Sciences

Susan K. McEvily, Associate Professor, Katz Graduate School of Business

Dissertation Advisor: William R. King, University Professor, Katz Graduate School of Business

**ENTREPRENEURIAL DISCOVERY IN PROMISING START-UPS: A COGNITIVE ANALYSIS OF PRINCIPLES OF BEHAVIOR**

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Although entrepreneurs of promising start-ups (Bhide, 2000) usually started their venture without novel ideas, deep experience, high credentials, or ample resources, the companies they eventually built represent the majority of fast-growing, privately held businesses (e.g. *Inc*. 500 companies) in the United States, which have significantly contributed to job creation and the growth of the economy. Instead of conducting extensive prior planning and research, promising start-ups depend on the lead entrepreneurs' capabilities of making good decisions as it goes. Meanwhile, the start-up process and the cognitive studies of entrepreneurial rationality have been increasingly recognized as holding the central place in entrepreneurship research. Despite their clear practical and theoretical importance, current literature does not provide a comprehensive framework of the start-up process of promising start-ups, which can explain the ongoing interactions between entrepreneurs and the market, and the role played by the entrepreneurs' rationality in this process. To pursue this objective, this dissertation proposes that e*ntrepreneurial discovery* is the process of promising start-ups' adaptation and learning, where entrepreneurs through their actions influence how the market will react and what they will learn from it, dynamically shaping the market process. It makes two major methodological improvements on existing research: 1) it uses lead entrepreneurs' close observation of the entirety of actual start-up process as data; 2) it borrows analytical methods from cognitive science to study entrepreneurial discovery as a knowledge-based problem solving process where entrepreneurs' knowledge base becomes the most critical factor in determining their behavioral outputs and influencing their sensory inputs. The results indicate that behavior for effective entrepreneurial discovery is compelled by multiple principles, whose applications converge to a common underlying pattern among promising start-ups. Besides breaking new ground in its methodology, this dissertation contributes to the entrepreneurship literature by being the first to explicate the many facets of the rationality of entrepreneurial discovery as principles of behavior that can not only give the most complete and detailed explanation currently available of the

unfolding of entrepreneurial discovery, but serve as the basis to guide practicing entrepreneurs' behavior and to evaluate and improve entrepreneurship education and learning.

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# 1.0 INTRODUCTION

The recent enthusiasm in economic growth and development has redirected people's interest to entrepreneurship. This is very fortunate, since research attention has been traditionally held in studying established economic activities, neglecting the important question of how new economic activities come into being.

Of all new initiatives, from marginal small businesses undertaken as substitute for low-paying employment to billion dollar research and development projects carried out in giant corporations, promising start-ups (Bhide, 2000) are a distinctive category. Although entrepreneurs of promising start-ups usually started their venture without novel ideas, deep experience, high credentials, or ample resources, the companies they eventually built represent the majority of fast-growing, privately held businesses (e.g. *Inc*. 500 companies) in the United States, which have significantly contributed to job creation and the growth of the economy. Despite the clear importance of promising start-ups, one would search in vain in the current literature to find a comprehensive answer to the question, *How* did they do it?

Meanwhile, we *do* know a lot about promising start-ups (Bhide, 2000): they pursue opportunities with high uncertainty, low initial investment, and low likely profit; they decide on their action as it goes, instead of relying on prior planning and research; they depend on the lead entrepreneurs' capabilities of making good decisions; they are not overnight successes, often taking nearly a decade to succeed.

We *also* know in general that the "start-up process" holds the central place in entrepreneurship research (e.g. Davidsson, 2005). But what *is* missing is a comprehensive framework of the start-up process of promising start-ups, which can explain the ongoing interactions between entrepreneurs and the market, and the role played by the entrepreneurs' rationality in this process. It is missing because methodological frameworks from traditional economic, social, and psychological theories and traditional analytical methods (Davidsson,

2005; Miles & Huberman, 1994), which researchers have long depended on, cannot satisfactorily handle the three critical elements of the problem—process, uncertainty, and rationality—all at the same time.

However, the situation is not hopeless, as artificial intelligence and cognitive psychology in the last fifty years developed methodologies and analytical tools that have turned the scientific study of human problem solving into a reality (Newell & Simon, 1972)—even for complex problem situations where knowledge is essential (Buchanan & Shortliffe, 1984). Through cognitive science's central theme—intelligence through knowledge-based problem solving—process, uncertainty, and rationality can be treated as integral components of problem-solving activities in the start-up process of promising start-ups and therefore nicely taken care of in the analysis. But in entrepreneurship research, even "cognitive" studies have not adopted this powerful approach from cognitive science—they have been mostly using story telling, literary exegesis, and decision-making bias analysis on discrete judgment (e.g. Berlin, 2001; Mitchell, 1997; Busenitz & Barney, 1997).

So, what is needed is the exploration of the potential by embracing appropriate methodologies and analytical tools from cognitive science. That is the purpose of this dissertation. The study conducted to pursue this comprehensive framework of the start-up process of promising start-ups is reported in the next seven chapters.

Chapter 2.0 introduces the phenomena and related major concepts. It describes entrepreneurial phenomena in general and promising start-ups (Bhide, 2000) in particular. After discussing process, uncertainty, and rationality in the start-up process together with opportunity identification and exploitation (e.g. Butler, 2004), it defines entrepreneurial discovery as both the process and goal of the start-up process.

Chapter 3.0 establishes the research objective. It first reviews four studies from the empirical literature that are most closely related to the study of entrepreneurial discovery: Quinn's (1978 & 1985) incrementalism; Bhide's (2000) opportunistic adaptation; McKelvie and Wiklund's (2004) new market knowledge; Sarasvathy's (1998 & 2001) effectuation. It then presents the research agenda of pursuing a comprehensive view of entrepreneurial discovery through making two major improvements on previous research in data acquisition and data analysis.

Chapter 4.0 explains the methodology and analytical methods. It begins with a summary of the cognitive theory of knowledge-based problem solving (Newell & Simon, 1972; Buchanan & Shortliffe, 1984) and knowledge-based systems (Patterson, 1990), which serve as the methodology for this study. Then it introduces the analytical methods of choice: protocol analysis (Ericsson & Simon, 1993) and two-step inference (Anderson, 1987). It ends by illustrating how the methodology and the analytical methods can be combined into an integrative approach for studying entrepreneurial discovery.

Chapter 5.0 illustrates the data acquisition procedure. It first makes a case for the unique advantages of using entrepreneurial autobiographies as data for studying entrepreneurial discovery, and explains the selection criteria necessary for realizing such advantages. Before it ends with explanations on preparing the data for analysis, it presents the four autobiographies selected: Kaplan, Inc., founded by Stanley H. Kaplan (Kaplan & Farris, 2001); ASK Computer Systems Inc., founded by Sandra L. Kurtzig (Kurtzig & Parker, 1991); MAJERS Corp., founded by A.J. Scribante (Scribante, 2005.); Grameen Bank, founded by Dr. Muhammad Yunus (Yunus & Jolis, 2001).

Chapter 6.0 illustrates the data analysis procedure and presents the results from the analysis.

For the data analysis procedure, first, it shows how to convert an autobiography into a sequence of episodes, each with a set of actions and their matching conditions, in preparation for the two-step inference. Then, it explains how decision-making rules can be inferred from the available episode information in the first step of inference, and a testing procedure for ensuring the validity of the rule coding. The inferred rules together with the actions and conditions make up a complete episode. At the end, it illustrates how principles of behavior can be inferred from the rules of “how to” knowledge in the second step of inference, with each rule corresponding to one principle. The inferred principles are called the E-principles, short for the principles of entrepreneurial discovery.

For the results from the analysis, it begins with a brief description of the statistics of the episodes, the coded rules, and the rule applications in the four ventures studied. The rest of the chapter focuses on the E-principles. First, the seventeen inferred E-principles are defined (detailed behavioral examples for each E-principle are available in APPENDIX A): greater leverage, reducing operation cost, seeking commitment, replicating success, responsiveness to

feedback, reducing adoption cost, being prepared, taking control, perseverance, seeking structural solutions, direct approach, reducing "enemy" defense, escaping diminishing returns, continuing improvements, affordable loss, being "one and only", considering both sides. Then, an inter-case comparison of the application frequencies of the seventeen E-principles is made. It is found that 1) the order of the E-principles by their relative application frequency is not independent from the venture; however, 2) the four ventures taken as a whole appear to converge to a common underlying pattern of the relative application frequency between the E-principles. If application frequency is the quantitative view of the E-principles' effect on entrepreneurial discovery, their operation in action as evaluated by comparing the state of the venture before their application and the state of the venture after application is the qualitative view. To provide this qualitative view, fourteen distinct incidents—each consisting of one or multiple adjacent episodes—across all four ventures were selected out of a total of 337 episodes. Synopsis for each incident is presented: the initial state of the incident, the E-principles applied, and the end state of the incident (episode details for each incident are available in APPENDIX B).

Chapter 7.0 provides interpretations of the results.

Section 7.1 explains the meaning of the order between E-principles by their relative application frequency. It argues that the E-principles that are more frequently applied than others in entrepreneurial discovery *are* more important for entrepreneurial discovery. Evidence in this study suggests that such relative importance between the E-principles results from the interaction between the intrinsic characteristic of promising start-ups in general and the intrinsic characteristic of a particular venture.

Section 7.2 explains why the E-principles are important for entrepreneurial discovery, and why the relative importance of a particular E-principle is as it is. It shows that the top four E-principles—greater leverage, reducing operation cost, seeking commitment, replicating success—not only account for nearly 60% of all E-principle applications by themselves, but also seem to be characteristic of promising start-ups by the functions they play or by their high application frequency in entrepreneurial discovery. Thus, these four constitute the "core" E-principles for promising start-ups. "Responsiveness to feedback", an important general problem-solving strategy, ranks fifth by its frequency, but it does not seem to include actions that characterize promising start-ups. Therefore, it suggests that "responsiveness to feedback" leads the second group of more general E-principles, which includes all but the top four.

Section 7.3 compares the E-principles with the results of the four studies reviewed in chapter 3.0 in their abilities to explain the actual venture incidents selected in section 6.6. It demonstrates that the E-principles give more in-depth and complete explanation, which is attributed to the research agenda of this study to pursue a comprehensive view of entrepreneurial discovery (see section 3.2). The rest of this section contrasts the behavior-focused approach of this study with the attitude-focused approach of previous research, showing the superior explanatory power and practicality of the former.

Section 7.4 discusses the practical implications of the E-principles. It explains that the E-principles can help focus entrepreneurs' attention on the right directions during entrepreneurial discovery, acting as an insightful guide of principles that requires the entrepreneurs' thoughtful input at the same time. On teaching and learning side, the E-principles demonstrate that rationality of entrepreneurial discovery is a multi-faceted concept, involving both intellectual and emotional components that are beyond what students normally study nowadays in business schools. The E-principles can be used to pinpoint weaknesses in course materials and in students' individual competence, as well as direct attention to make remedies as needed.

Section 7.5 discusses the theoretical implications of the E-principles. First, results of this study demonstrate that actual entrepreneurial discovery is the outcome of the applications of various combinations of multiple principles of behavior that are beyond the boundaries of rationality as normally conceptualized. Second, this study shows that effort taken to study hard-to-measure and hard-to-obtain-data research subject such as entrepreneurial discovery is richly rewarded. Third, this study demonstrates that, through borrowing appropriate theoretical lens and analytical methods from cognitive science, the previously "untouchable" data of entrepreneurial discovery can be studied rigorously and systematically. Fourth, it advocates more "design" oriented research in studying human purposeful behavior.

Section 7.6 considers three questions that need to be answered to generalize the E-principles to entrepreneurial discovery in venture capital (VC) backed start-ups and corporate initiatives.

Chapter 8.0 discusses limitations of the study and further research.

Section 8.1 presents two major limitations of this study. First, limited number of qualified cases made random sampling infeasible, which renders this study exploratory in nature. Second, entrepreneurial autobiographies, while having clear advantages over other available data sources,

are but dim images of what *actually* went on in the mind of the entrepreneur during entrepreneurial discovery. Both limitations can be alleviated or even cleared if more and better data become available.

Section 8.2 discusses four directions for further research that can directly strengthen or extend the current study.

# 2.0 PHENOMENA

This chapter introduces the phenomena and related major concepts. It describes entrepreneurial phenomena in general and promising start-ups (Bhide, 2000) in particular. After discussing process, uncertainty, and rationality in the start-up process together with opportunity identification and exploitation (e.g. Butler, 2004), it defines entrepreneurial discovery as both the process and goal of the start-up process.

## 2.1 ENTREPRENEURSHIP

### 2.1.1 Overview of entrepreneurial phenomena

By virtue of their grand scale, longevity, and prominence, existing orders of economic activities most easily capture our attention; therefore, it is little wonder that they have been the primary focus of research in economics and in business. However, wisdom reminds us that every existing thing has a beginning—economies, markets, industries, and individual companies we see today all started at one time or another when there was none—and nothing stands still. Not only are new companies being built from scratch, large, well-established companies are themselves increasingly under pressure to grow. Such new economic activities, regardless of their origin, belong to entrepreneurial phenomena, of which scholarly inquiry has only begun in the last several decades; we still know far less than we should given their critical importance in social wealth creation. This study intends to add to this literature.

### 2.1.2 Definitions of key terms

A set of key terms used in this study are defined next:

*New initiatives* refer to "conscious efforts undertaken to generate new sources of profit that may or may not succeed", excluding "accidental discoveries of new technologies, oil deposits, or other such valuable assets" (Bhide, 2000: 26).

*Entrepreneurship* is concerned with new initiatives, regardless of their origin.

*Corporations* refer to large, well-established companies.

*Entrepreneurs* refer only to individuals who start their own businesses (although decision makers in corporations can also serve an entrepreneurial role).

*Initial or up-front investment* refers to "the irreversible commitment of funds, time, reputation, or other resources that the individual or firm undertaking the initiative makes with the expectation of earning a return" (Bhide, 2000: 26).

*Uncertainty* refers to ambiguity due to missing information (Knight, 1921). *Irreducible uncertainty* in a new initiative refers to uncertainty that cannot be resolved by prior testing or research.

*Likely profit* refers to an objective best guess of the net present value (NPV) of an initiative, excluding feasible but unlikely outcomes.

In addition, this study also adopts the following assumption regarding the relationship between a new initiative's likely profit and investment requirement:

> [P]rofitable initiatives (in contrast to lucky discoveries) involve at least some irreducible uncertainty and that large likely profits also require large investments. Bootstrapped entrepreneurs, for instance, cannot objectively expect to make the billions of dollars that flow from a mega-oil field or a blockbuster drug after commensurately large prior outlays, so references to "large" or "small" opportunities include the initial investment as well as the likely profit. (Bhide, 2000: 27)

## 2.2 HETEROGENEITY AND CLASSIFICATION

### 2.2.1 Heterogeneity

Entrepreneurial phenomena come in all shapes and sizes, from mom-and-pop grocery stores to billion-dollar research-and-development (R&D) projects in the semiconductor industry. Such diversity of new initiatives, if not properly taken care of, causes problems in entrepreneurship research. First, if a heterogeneous sample is treated as a homogeneous one, the internal validity of the results is likely to suffer. Second, if results based on one homogeneous sample are generalized to new initiatives of a different nature, a claim of external validity is probably unjustified. Thus, the kind of entrepreneurial phenomena studied in this research needs to be clarified.

### 2.2.2 Classification based on the uncertainty-investment-profit framework

Many classification methods, e.g. high-tech vs. low-tech, family business vs. non-family business, have been developed to give order to the variety of entrepreneurial phenomena. Each serves a distinct purpose. The uncertainty-investment-profit framework (Bhide, 2000) recognizes that entrepreneurs and corporations differ in their endowments (financial and non-financial) and constraints, which differentially enable them to thrive in new initiatives with different initial investment, irreducible uncertainty, and likely profit; consequently, their reliance on adaptation as demanded by the nature of the opportunities they pursue also differs, which requires different traits and skills from them to succeed.

Table 2.1 describes five archetypal initiatives according to this framework—promising start-ups, corporate initiatives, venture capital (VC) backed start-ups, revolutionary ventures, marginal start-ups—in terms of endowments and constraints, nature of opportunities, reliance on adaptation, and differentiating factors.

**Table 2.1.** Archetypal initiatives

(Constructed based on Bhide [2000: 20, 196-201])

| | **Promising start-ups** | **Corporate initiatives** | **VC-backed start-ups** | **Revolutionary ventures** | **Marginal start-ups** |
|---|---|---|---|---|---|
| *Endowments and constraints* | Lack of novel ideas, deep experience, and credentials → severe capital constraints | Ample capital but subject to extensive checks and balances | An innovative concept for making significant profits and valuable human capital but subject to outside monitoring and oversight | A blockbuster idea, significant personal wealth or an exceptional capacity to raise capital, and resources for a visionary scheme | Similar to those of promising start-ups |
| *Nature of opportunities* | Low investment and likely profit; high uncertainty | High investment and likely profit; low uncertainty | The middle ground between promising start-ups and corporate initiatives | High uncertainty, otherwise similar to those of corporate initiatives | Low uncertainty, otherwise similar to those of promising start-ups |
| *Reliance on adaptation* | Extensive adaptation, limited prior planning and research | Extensive prior planning and research, limited adaptation | The middle ground between promising start-ups and corporate initiatives | Extensive research and contingency planning, postlaunch adaptation without altering the core concept in midstream | Limited adaptation, otherwise similar to those of promising start-ups |
| *Differentiating factors* | Entrepreneur's personal capacity to adapt, persuade resource providers | Joint effort of many personnel and functions; soundness of initial concept | The middle ground between promising start-ups and corporate initiatives | The "superhuman" qualities: adaptability, resilience, great foresight, an unusual willingness to take risk, an evangelical ability to inspire others | Limited differentiating potential |

Of the five types of initiative, all but corporate initiatives are concerned with starting up new businesses. But new businesses are not equally significant in social wealth creation:

> Only a small proportion of new business—5 to 10 percent of the total—make much of a contribution to economic growth or job creation or have the potential to provide significant returns to their owners. The great majority comprise "marginal" microenterprises providing routine services in mature fields such as lawn care and beauty salons. Their high rate of appearance and disappearance has limited economic significance. (Bhide, 2000: 360)

### 2.2.3 Three-phase life cycle of a promising business

There are three distinctive phases in starting and building a promising business (as opposed to a marginal business): the start-up phase, the growth phase, and the maturity phase. Through the start-up phase, a promising start-up can develop into a fledgling business, which can further grow into a corporation through the growth phase; the corporation then continues to live, if it lives, in the maturity phase. New initiatives taken in the three phases correspond to the first three archetypes in Table 2.1, where a fledgling business is roughly equivalent to the archetype of a VC-backed start-up (Bhide, 2000). Note that not all promising businesses that eventually reach the status of a corporation follow this life cycle from the beginning. For example, VC-backed start-ups often start right from the growth phase, skipping over entirely the start-up phase or only having a very brief presence in it. Revolutionary ventures deviate even more from this three-phase baseline. This illustration based on the life cycle of a promising business clarifies the position promising start-ups hold relative to other types of economic activities.

## 2.3 PROMISING START-UPS

### 2.3.1 Practical importance

Out of all promising new businesses (5 to 10 percent of all new businesses), venture capital backed start-ups are an exception rather than the norm. For example, bootstrappers—entrepreneurs starting their company with little capital—represent the majority of the *Inc.* 500 list of fastest-growing private enterprises in the US: in 2005, 54% of *Inc.* 500 companies had less

than $50,000 start-up capital, and only 9% received funds from formal venture capital. The numbers are 52% and 7% for 2004, 61% and 2% for 2003.

Thus, promising start-ups are the most prevalent means to build fledgling businesses, which measure critically in social wealth creation.

### 2.3.2 Theoretical importance

Not only do promising start-ups have humble beginning, they also evolve differently from other new initiatives—relying mostly on adaptation instead of prior planning—as shown in Table 2.1.

Because promising start-ups go through such a prolonged start-up phase, relying on extensive adaptation to reach their adolescent status (the fledgling businesses), they and corporate initiatives, which rely on extensive prior planning and research, form the two extremes of the adaptation-vs.-planning spectrum of the evolution of new initiatives. Thus promising start-ups provide a fertile ground for studying adaptation.

## 2.4 ENTREPRENEURIAL DISCOVERY

### 2.4.1 Entrepreneurial process

From a system perspective, entrepreneurial phenomena have three major components: antecedents, processes, and consequences. Questions on antecedents (e.g. “Who makes a good entrepreneur?” or “What makes a great entrepreneurial context?”) and on consequences (e.g. “Which ventures perform better?” or “How do ventures impact the economy?”) are no doubt important—indeed they have been the focus of most of the entrepreneurship research done thus far, from either a psychology, sociology, economics, or business perspective. Viewed in light of the three-phase life cycle of a promising business, such research fixes its attention at the time either before the start-up phase begins or after it has finished. But for promising start-ups, the most fascinating and also the least understood is their distinctive reliance on extensive adaptation during the start-up phase.

### 2.4.2 Opportunity identification and exploitation

The economic significance of fledgling businesses and corporations result from their capabilities to profitably exploit market opportunities. The sole reason of existence for promising start-ups as the baby in the life cycle of promising businesses, therefore, is to identify such opportunities during the start-up phase. However, because of high irreducible uncertainty, severe capital constraints, and low likely profit, promising start-ups are usually founded with limited prior planning and research, which entails they depend on extensive adaptation where opportunity identification and exploitation are intermingled:

> The uncertainty of opportunities has two origins. First, the entrepreneur who discovers an opportunity can believe but not know that the opportunity will be profitable. Second, there are several different ways of exploiting the opportunity and the potential profit differs depending on how and when the opportunity is exploited. … as entrepreneurs start exploiting opportunities, uncertainty is reduced. The economic outcomes from the exploitation process informs the entrepreneur about whether or not the opportunity is profitable and, if the opportunity is not sufficiently profitable, the learning from the exploitation process serves to modify and change the opportunity being pursued. Stated differently, opportunities … are not discovered until they are being exploited because it is only then that the entrepreneur knows if new things can be introduced and sold at prices higher than their cost. (McKelvie & Wiklund, 2004: 235)

From their humble initial endowments, entrepreneurs of promising start-ups cannot reach their desired level of opportunity identification and exploitation without learning—such learning is done through interactions with the market, the motherland of all opportunities for new initiatives:

> In aggregate, the attempts by entrepreneurs to create new business models lead to interactions (and unintended consequences of action) that constitute the market process. … Interactions … effectively discover facts about customers, technologies, and firms, forming a discovery procedure. (Mahoney & Michael, 2005: 38)

### 2.4.3 Entrepreneurial discovery and entrepreneurs' judgment and creativity

According to *The American Heritage Dictionary of the English Language (4$^{th}$ ed., 2000),* to *discover* means "to notice or learn, especially by making an effort"—it nicely encompasses the meaning of both adaptation and learning. So, *entrepreneurial discovery* refers to the process of promising start-ups' adaptation and learning during the start-up phase. Because it is closely associated with inquiry (in which the information or knowledge obtained from the seeking is influenced by how the act of seeking is done), *discovery* indicates that entrepreneurs, through

their actions during the start-up phase, influence how the market will react and what they will learn from it, dynamically shaping and sculpturing the market process, i.e. the interactions between the entrepreneurs and the market. Adaptation, on the other hand, has the connotation that the market process is merely the result of entrepreneurs passively adapting to the changing market situation, which is not an accurate description of what is happening between the entrepreneurs and the market in the start-up phase.

Because of the high irreducible uncertainty involved in promising start-ups, there is much room for creativity and autonomy of individual choice to influence the effectiveness of entrepreneurial discovery. To study entrepreneurs' actions means to study entrepreneurs' judgment and creativity—the rationality of which is markedly different from the neo-classical economic rationality.

> [A] theory of entrepreneurship would surely involve a broader definition of rationality than is customary in orthodox neoclassical microeconomic theory, moving beyond simple maximization within a given means-end framework towards identifying new means-ends frameworks. Schumpeter (1934) emphasizes that to assume perfect economic rationality acting on well-defined choice sets is a less than useful fiction when studying the phenomena of entrepreneurship. Schumpeter argues that to cling to the assumption of perfect economic rationality "as the traditional theory does, is to hide an essential thing and to ignore a fact which, in contrast with other deviations of our assumptions from reality, is theoretically important and the source of the explanation of phenomena which would not exist without it" (1934: 80). (Mahoney & Michael, 2005: 37)

Entrepreneurs' judgment and creativity clearly depend on their individual capabilities; this calls for "a richer conception of human capital", which would help explain "economic performance differences among entrepreneurs" just as the resource-based approach (Penrose, 1959) helps explain "economic performance differences among established firms" (Mahoney & Michael, 2005: 46, 49). This emphasis on the capabilities of lead entrepreneurs resonate with many people associated with entrepreneurship:

> A single psychological model of entrepreneurship has not been supported by research. However, behavioral scientists, venture capitalists, investors, and entrepreneurs share the opinion that the eventual success of a new venture will depend a great deal upon the talent and behavior of the lead entrepreneur and of his or her team. (Timmons, 1994: 186)

> [T]hat entrepreneurs—in thought and action—are anchored by certain attitudes and behaviors and by the "chunks" of experience, skills, know-how …. They are thus positioned to see what others do not and seize opportunities and grow higher potential ventures. (Timmons, 1994: 185)

# 3.0 LITERATURE REVIEW AND RESEARCH AGENDA

This chapter establishes the research objective. It first reviews four studies from the empirical literature that are most closely related to the study of entrepreneurial discovery: Quinn's (1978 & 1985) incrementalism; Bhide's (2000) opportunistic adaptation; McKelvie and Wiklund's (2004) new market knowledge; Sarasvathy's (1998 & 2001) effectuation. It then presents the research agenda of pursuing a comprehensive view of entrepreneurial discovery through making two major improvements on previous research in data acquisition and data analysis.

## 3.1 ILLUSTRATIVE STUDIES

In section 2.4, it is shown that the entrepreneurial process, uncertainty, and a focus on entrepreneurs' rationality need to be combined in studying entrepreneurial discovery. The Panel Study of Entrepreneurial Dynamics (PSED) type of research, which Davidsson (2005) in a paper focused on "method issues in the study of venture start-up processes" proposes as the method of choice, will not do. That research studies the event milestones reached by large random samples of nascent entrepreneurs from the general population. But it is clear that such data inevitably include a heterogeneous sample of start-ups—the majority of which are practically and theoretically uninteresting marginal microenterprises. Furthermore, recording event milestones while neglecting the underlying judgment and creativity treats entrepreneurs' responses "statistically, not as outputs of individual decision processes"; therefore, "we do not increase our understanding and potential control over the process under study." (Ackoff & Emery, 1972: 10-11).

Studies that do consider—to varying degrees—the entrepreneurial process, uncertainty, and entrepreneurs' rationality together are few and far between. This section reviews four studies

that use different approaches, which roughly represent the current state of empirical research on this subject.

### 3.1.1 Incrementalism vs. formal planning

In studying successful big companies (e.g. General Motors, Xerox, SONY, and Intel), Quinn (1978 & 1985) finds the "logical incrementalism" approach, characterized by incremental and interactive processes, as opposed to the "formal systems planning" approach, is best for corporations to overcome "process limits" (such as the need for generating political and psychological support, and creating cohesion), as well as "cognitive limits" (missing information due to market or technological uncertainty), they face in making strategic changes and in managing innovations. By innovations, Quinn refers to "programs with at least tens of millions of dollars in initial investment and hundreds of millions of dollars in ultimate annual economic impact" (1985: 77).

With this central message in mind, Quinn (1985), when turning to the topic of what makes start-ups successful, identifies factors that are clearly connected with incrementalism: orientation to the market (interacting with customers, solving their problems), responsiveness (interactive learning, fast response to market feedback); and low early cost.

### 3.1.2 Opportunistic adaptation vs. prior planning and research

Bhide (2000) began his research with the overarching framework of comparing promising start-ups with corporations which are known for their reliance on extensive prior planning and research in taking on new initiatives. Based on interviews that lasted "from one to three hours" (2000: 13) with 100 lead entrepreneurs of *Inc*. 500 companies (most of which have their origin as promising start-ups), Bhide finds that promising start-ups primarily rely on "opportunistic adaptation" in their day-to-day decision making, seeking to enhance short-term cash flow.

Bhide covered a broad sample of promising start-ups (that have become successful fledgling businesses), but his research design inevitably suffered in data richness and comprehensiveness.

### 3.1.3 New market knowledge vs. prior knowledge

McKelvie and Wiklund (2004) started with critiques of the traditional knowledge-based view of the firm which primarily emphasizes the importance of prior knowledge in explaining differences in performance. They followed two VC-backed start-ups for one year and two years respectively (the second venture eventually failed) through using "participant observation, personal interviews (over 25 interviews per case), and written documents" (2004: 224); their data therefore had more richness and comprehensiveness than Bhide's, but were not from promising start-ups. McKelvie and Wiklund conclude that start-ups need to adjust their strategy through reacting to new market information, instead of solely relying on their prior knowledge.

### 3.1.4 Effectuation vs. causation

Sarasvathy (1998 & 2001) began by making a case for the inadequacy of applying traditional marketing approach based on the logic of "causation" to start-ups, which depends on predicting the future and assembling means to achieve a predetermined ends based on this prediction. By studying the pattern of responses of a group of successful entrepreneurs to a set of questions based on building and running a hypothetical start-up, she concludes that entrepreneurial decision making relies on a logic of "effectuation" characterized by working from available means according to the principles of "affordable loss rather than on potential target return" and "growth through expanding stakeholder networks and strategic partnerships."

Sarasvathy (1998) had "expert entrepreneurs" as subjects, who were defined as "a person who, either as an individual or as part of team, has founded a company, remained with the company for several years, and taken it public" (1998: Part Two 28). So, all involved entrepreneurs, at the time of her study, were from public firms with annual sales of $200 million to $6.5 billion as of March 1997; all of them "have been involved in multiple ventures" (1998: Part Two 30). But it is not clear from the reported information whether these companies had their origin as promising start-ups. The circumstances of the hypothetical venture case Sarasvathy used as probe sound similar to a situation of promising start-ups, e.g. "you have very little money of your own to start this company, but you have about five years relevant working experience in

the area" (1998: Part Two 33). But, it being hypothetical, there were no data of *actual* market processes in the study.

## 3.2 RESEARCH AGENDA: IN PURSUIT OF A COMPREHENSIVE VIEW

Each study reviewed in section 3.1 discloses a bit of entrepreneurs' rationality during the entrepreneurial process, but none seems to provide a comprehensive picture of how an entrepreneur with the potential to succeed in entrepreneurial discovery actually thinks and acts. In response, this section proposes a research agenda that entails making two major improvements on these four studies.

First, it aims to collect data from the entirety of actual start-up phase of promising start-ups through relying on the close acquaintance, association, familiarity, and personal information of the lead entrepreneurs.

None of the four studies gathered data from the entirety of the actual start-up phase of promising start-ups. Gathering such data would clearly be a challenge. For achieving a comprehensive view of entrepreneurial discovery, this study takes on this challenge by making use of the observation of entrepreneurial discovery through the eyes of lead entrepreneurs of promising start-ups. Chapter 5.0 explains how exactly this is done.

Second, it aims to reveal the essential and innermost structure and logic of entrepreneurial discovery through using analytical methods from cognitive science for studying human problem solving.

Besides having comprehensive data, to capture the comprehensive image of entrepreneurial discovery also requires analytical methods that are capable of revealing the deep structure and logic embedded in the behavioral data that inevitably dominate a process characterized by interactions and learning where entrepreneurs' cognitive capabilities play a central role. There is no better place to look for than cognitive science (e.g. artificial intelligence and cognitive psychology), which is the only field as we know that provides the theoretical foundation and analytical tools for the scientific study of human problem solving, which have been fruitfully applied in many fields covering a wide variety of problem situations. All four reviewed studies, however, used only traditional methods: case studies related techniques (Miles

& Huberman, 1994) for Quinn, Bhide, and McKelvie and Wiklund; content analysis (Krippendorff, 1980) for Sarasvathy. Their methodological preference, unfortunately, exemplifies the state of the field of entrepreneurship research, which has almost completely overlooked the analytical tools made available by cognitive science. Even a recent article (Hindle, 2004) focused on helping researchers choose qualitative methods for "entrepreneurial cognition research" misses this point completely in its discussion of data analysis techniques. As an integral part of the agenda of pursuing a comprehensive view of entrepreneurial discovery, this study borrows extensively from cognitive science for its methodology and analytical tools whenever appropriate (see chapter 4.0 for details).

# 4.0 METHODS

This chapter explains the methodology and analytical methods. It begins with a summary of the cognitive theory of knowledge-based problem solving (Newell & Simon, 1972; Buchanan & Shortliffe, 1984) and knowledge-based systems (Patterson, 1990), which serve as the methodology for this study. Then it introduces the analytical methods of choice: protocol analysis (Ericsson & Simon, 1993) and two-step inference (Anderson, 1987). It ends by illustrating how the methodology and the analytical methods can be combined into an integrative approach for studying entrepreneurial discovery.

## 4.1 HUMAN PROBLEM SOLVING

### 4.1.1 The cognitive revolution in science

Questions such as “What do we know?” and “How do we know?” have fascinated people since ancient times. This tradition passes down to us through the Greek civilization, the Renaissance, and the Darwinian revolution (Durkin, 2002).

With the advent of digital computing around the middle of the 20th century, an ardent interest in intelligence and thinking resurfaced in computer science, psychology, and linguistics almost simultaneously, which marked the “cognitive revolution” in science (Newell & Simon, 1961; Newell & Simon, 1963; Newell & Simon, 1972; Newell & Simon, 1976; Simon, 1980 & 1995).

### 4.1.2 Cognitive explanations of human behavior

Of all theories about intelligence (human or otherwise) in cognitive science, there are two that are arguably the most substantiated and influential:

> *The Physical Symbol System Hypothesis*. A physical symbol system has the necessary and sufficient means for general intelligent action. (Newell & Simon, 1976: 116)

> *Heuristic Search Hypothesis*. The solutions to problems are represented as symbol structures. A physical symbol system exercises its intelligence in problem solving by search—that is, by generating and progressively modifying symbol structures until it produces a solution structure. (Newell & Simon, 1976: 120)

Computer programs, which process the content of the working memory of the computer and update it and consequently initiate another round of further processing, are difference functions capable of representing process theories when quantitative differential functions are not feasible (Newell & Simon, 1961; Simon, 1998). This approach has led to significant theoretical, experimental, and engineering developments in artificial intelligence and cognitive psychology, to name just two major fields (Boden, 2004; Liebowitz, 1997).

We now understand that humans don't merely respond to external stimuli in mechanical manners—we are, first and foremost, thinking beings (Anderson, 2000). We use symbols to represent the external world and the inner self; we save familiar responses and patterns and strategies as knowledge in long-term memory, indexed and ready for retrieval; we solve problems by using working memory as worksheet and by searching through problem spaces—internal and external—or by evoking stored knowledge through recognition to directly reach the solution (i.e. "intuition" in general discourse).

> This processor operates on an outer environment that has two major components: the "real world," sensed through eye, ear, and touch, and acted upon by leg, hand, and tongue, and a large store of (correct and incorrect) information about that world, held in long-term memory and retrievable by recognition or by association. When the processor is solving puzzlelike problems, the memory plays a limited role. The structure of the problem rather than the organization of memory steers the problem-solving search. When it is solving problems in semantically rich domains, a large part of the problem-solving search takes place in long-term memory and is guided by information discovered in that memory. (Simon, 1996: 87)

Because of the complicated inner cognitive mechanisms at work in our thinking, in order to understand human behavior, it is important to know what is happening between the sensory inputs and behavioral outputs. Computer programs as difference functions provide an appropriate

tool to model human thinking in detail, making possible genuine theories of human cognition that are capable of explaining the moment-to-moment mental state. If the search heuristics and knowledge in use are sufficiently known, the finest explanation intervals achieved so far can be in the seconds (Newell, 1990).

### 4.1.3 Problem solving as directed search through problem space

When we are faced with a problem, our intelligence enables us to represent cognitively the initial state, the goal state, and the environmental conditions using symbol systems; therefore, we try to think through the problem by choosing a course of action that can lead us from the initial state to the goal state. For difficult problems, the possible routes bridging the initial and goal states are too numerous to render any brute force-based search strategies (such as an exhaustive search through the entire problem space) feasible, even given the fastest computing facilities we have or will possibly have. This difficulty is often referred to as combinational explosion and computational complexity (Nilsson, 1971).

As a result, problem solving usually requires using cues from the problem space to guide the search toward the most promising directions (Newell & Simon, 1972). Knowledge, therefore, can be regarded as reusable, behavioral patterns stored under given cues.

If appropriate knowledge can be evoked to guide search, the amount of search required to solve a problem can be greatly reduced. Without existing knowledge or usable cues from the problem space, we have to depend on search to find answer; with perfect knowledge, on the other hand, we can access solution directly through recognition (Newell & Simon, 1972).

Most advanced human problem solving activities require knowledge, especially domain specific knowledge. Expertise is usually proportional to the amount of domain specific knowledge possessed through experience or training. This is the cognitive science's reinterpretation of the adage that "knowledge is power" (Buchanan & Shortliffe, 1984; Lenat & Feigenbaum, 1991).

## 4.2 KNOWLEDGE-BASED SYSTEMS

Because of the critical importance of advanced knowledge in solving problems, how to acquire, represent, organize, and use such knowledge becomes crucial. That is the domain of knowledge engineering (Patterson, 1990; Ignizio, 1991).

As shown in the Figure 4.1, the production system—representing a basic knowledge-based problem-solving system—consists of two main components: the knowledge base (productions, often represented as if-then rules) and the inference engine as the control unit. Such a system works in cycles (Ignizio, 1991). First, the inference engine ranks productions based on the level of match between the left-hand side of the production rule and the content in working memory and sensory inputs. Second, the production with the highest level of match on its left-hand side gets executed; its right-hand side action then takes place and modifies the content of the working memory or carries out actions. Thus a cycle is completed, and the system starts the next cycle, given the altered state of the working memory and sensory inputs. The system stops when it comes to a dead end (no productions can be matched) or after it reaches the goal state.

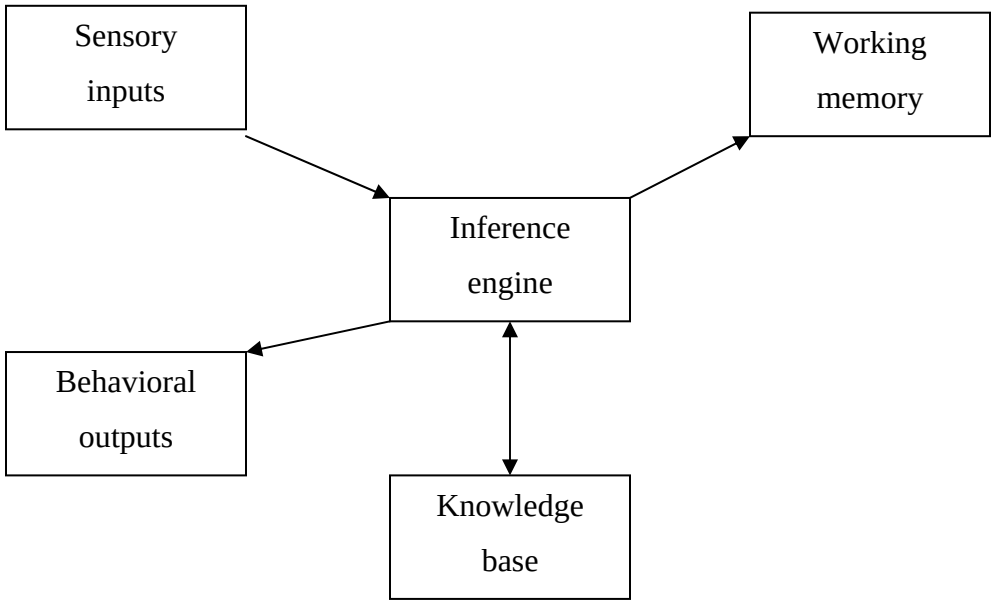


**Figure 4.1.** Basic knowledge-based problem solving system
(Adapted from Figure 15.1 in Patterson [1990, p. 231])

## 4.3 PROTOCOL ANALYSIS

To infer heuristic rules from the texts, the primary tool used here is decision-based procedural analysis (Carley, 1990), often referred to as "protocol analysis" (Ericsson & Simon, 1993). It takes as input the sequence of decisions and actions in the protocol, and generates inferred rules that make such behavior possible as output. Newell and Simon's (1973) landmark work on human problem solving was based entirely on using this technique to study think-aloud protocols.

Due to the inevitable use of inference based on semantic understanding of the protocol, decision-based procedural analysis can only be fruitfully carried out if the analysts have sufficient familiarity and understanding of the task domain under investigation. This is particularly true in semantically rich domains (i.e. domains that can only be adequately described and understood by using large number of concepts and their inter-relationships), to which entrepreneurial discovery obviously belongs. For example, the MYCIN experiments of the Stanford Heuristic Programming Project (Buchanan & Shortliffe, 1984) developed the first artificial intelligence system that could emulate human problem solving in a semantically rich domain, which in this particular case was the diagnosis of blood infections. The programmers responsible for coding the decision-making rules found themselves dependent on the clinical experience and medical knowledge of the physician participants in that project.

## 4.4 TWO-STEP INFERENCE

After heuristic rules are inferred from the sequence of decisions and actions in the protocol, principles that determine the applications of these rules can be further inferred. Such two consecutive inferences constitute the two-step inference procedure, which has been applied to study principles of behavior from behavioral protocols, e.g. in research on human learning in cognitive psychology:

> The first step of induction is to infer from the protocols the rules that define the transitions. The second step is to infer the learning principles that determine the changes in the rules. (Anderson, 1987: 501)

The reason to further infer principles of behavior, rather than stopping at the behavioral level, is because behavior comes and goes and is more dependent on circumstances; principles of behavior, on the other hand, are more reliable indicators of a type of behavior. For example, Kulkarni (1988), in his research on the processes of scientific discovery, finds that the heuristic rules used by scientists in experiments are the specific implementations of a small set of domain-specific and domain-independent experimentation strategies in scientific research, such as magnifying a phenomenon by changing apparatus variables, and looking for relationship between similar phenomena. Those experimentation strategies are principles of behavior; they point out the common underlying logic of various behavioral rules despite their differences in specifics.

## 4.5 AN INTEGRATIVE APPROACH

Viewed through the cognitive theory of human problem solving, entrepreneurial discovery during the start-up phase becomes a knowledge-based problem solving process, with entrepreneurs' initial endowments as the (undesired) initial state, successful fledgling businesses as the (desired) goal state, and the market process as the problem space. The symbol structures that make up the problem space, in the context of entrepreneurship, can be anything from physical entities, cognitive concepts, to behavior, relationships, and organizations, or any combinations of these. As the market process is the aggregate of entrepreneurs' interactions with the market during the start-up phase and such interactions are actively influenced by entrepreneurs' actions, this problem space is not preset at the beginning of the venture. Entrepreneurs, through their actions, dynamically affect what these symbol structures would be, which determine the effectiveness of their entrepreneurial discovery. Such is cognitive science's representation of the conception that entrepreneurial rationality has to move beyond simple maximization within a given means-end framework towards identifying new means-ends frameworks.

Similarly, entrepreneurs during the start-up phase are analogous to knowledge-based systems whose actions (behavioral outputs) are based on what they perceive in the market (sensory inputs) and what they know about the world and themselves (knowledge base). Because

entrepreneurs' interactions with the market are actively influenced by entrepreneurs' actions and such interactions will determine their sensory inputs, namely the market feedback they perceive, entrepreneurs' knowledge base becomes the most important determinant of their behavioral outputs, and consequently the most important determinant of the effectiveness of their entrepreneurial discovery.

Just as in Anderson's (1987) research on the learning principles and Kulkarni's (1988) research on the experimentation strategies, if data of entrepreneurs' sensory inputs and behavioral outputs during the start-up phase are available, we can then use protocol analysis and the two-step inference procedure to infer entrepreneurs' knowledge base—not only its heuristic rules that define entrepreneurs' behavioral outputs, but also its principles of behavior that determine the applications of these rules. Such understanding will be a big step forward towards achieving a comprehensive picture of entrepreneurial discovery.

This approach is called integrative because it, more than any other research approaches in use, better captures the entrepreneurial process, uncertainty, and entrepreneurs' rationality as one cohesive entity in studying entrepreneurial discovery.

# 5.0 DATA ACQUISITION

This chapter illustrates the data acquisition procedure for this study. First, it makes a case for the unique advantages of using entrepreneurial autobiographies as data for studying entrepreneurial discovery, and explains the selection criteria necessary for realizing such advantages. Then it presents the four autobiographies selected: Kaplan, Inc., founded by Stanley H. Kaplan (Kaplan & Farris, 2001); ASK Computer Systems Inc., founded by Sandra L. Kurtzig (Kurtzig & Parker, 1991); MAJERS Corp., founded by A.J. Scribante (Scribante, 2005.); Grameen Bank, founded by Dr. Muhammad Yunus (Yunus & Jolis, 2001). It ends with explanations on preparing the data for analysis,

## 5.1 ENTREPRENEURIAL AUTOBIOGRAPHY AS DATA

Various kinds of behavioral protocols can be analyzed through protocol analysis to infer cognitive rules and principles (Ericsson & Simon, 1993), such as think-aloud protocols, other behavioral outputs (e.g. body movement), focus of attention (e.g. eye movement). A complete collection of these data in real time from the lead entrepreneurs during the start-up phase of promising start-ups would be highly desirable—but unfeasible. In this study, entrepreneurs' autobiographies of their experience in successful promising start-ups were used as research data because they have the following desirable qualities:

1. High Face Validity: It is crucial to use *actual* promising start-ups because entrepreneurial discovery is usually situated in a wide range of complex social interactions, which makes the alternative research tools such as lab experiments and hypothetical case questions inadequate for their lack of face validity. And *successful* cases ensure that entrepreneurial discovery has been effective.

2. High Feasibility: Entrepreneurs' autobiographies on their experience in building successful promising start-ups provide data of entrepreneurial discovery during the actual start-up process. If similar data are to be gathered through field work, due to the reason that successful ventures cannot be known or predicted at the outset, it's necessary to begin with a group of new ventures, and to track equally diligently the development of each of them, hoping that at least one venture will eventually become successful. Even if an endeavor of such scale were implemented, it would still be virtually impossible to obtain concurrent verbal reports from entrepreneurs along the entire venturing process for subsequent protocol analysis, simply because promising start-ups often take nearly a decade to succeed and no entrepreneur would be willing to, or even able to, grant such lengthy cooperation.
3. High Reporting Fidelity: Entrepreneurs, being themselves the actor, have privileged access over an observer to information crucial for understanding the entrepreneurs' cognition—the idiosyncratic meanings they associate with a given observation, their goals, and their memory of past behavior (Nisbett & Ross, 1980).
4. High Information Acceptability: The validity and accuracy of introspection and self reports of mental processes have long been proved suspicious (Ericsson & Simon, 1993). But cognitive psychology tells us that, given sufficient efforts to retrieve information from long-term memory (LTM) and enough motivation to be truthful, we *can* recall considerably accurate accounts of personal historical facts, the external facts we knew, our past decisions and actions, and our plans and goals (Nisbett & Ross, 1980). Autobiographies that have been honestly written can thus serve as credible verbal reports (protocols) of sequences of decisions and actions and the context under which they were made.

Autobiographies have long been used as data in many fields of historical research (e.g. business history) along with traditional analytical methods such as literary exegesis (Miles & Huberman, 1994) and content analysis (Krippendorff, 1980). But none has been studied with protocol analysis (Ericsson & Simon, 1993); the closest things to autobiographies that have been studied using protocol analysis are diaries (Kulkarni, 1988; Kulkarni & Simon, 1988).

## 5.2 SELECTION CRITERIA

In order to realize these four advantages—high face validity, high feasibility, high reporting fidelity, and high information acceptability—the following criteria were used to select entrepreneurial autobiographies:

1. They must be about successful promising start-ups founded by a single entrepreneur that have a substantial start-up phase, in which the entrepreneur's critical decisions can be adequately explicated.
2. There must be no strong evidence to suggest widespread or significant intentional dishonesty, or sloppiness and lack of accuracy with the writing.
3. They must be written in a way that tries to describe decisions and events as they actually happened along the timeline, not mistaking today's interpretation with yesterday's, so to speak.
4. They must be written with enough details so that the underlying knowledge can be reasonably inferred.
5. There must be sufficient information to show that the entrepreneur has been the sole, or at least the principal, content contributor to the finished autobiography, although various levels of literary help may have been received from an experienced or professional writer who acted as a co-author.
6. It is preferable that the autobiographies were written at a time not too distant from the venture's start-up phase.

## 5.3 THE CHOSEN AUTOBIOGRAPHIES

The following sources were searched for autobiographies written by entrepreneurs: University Library System at the University of Pittsburgh, Carnegie Library of Pittsburgh and its affiliated more than 70 public libraries in Allegheny County (Pennsylvania), and the online catalog for books at Amazon.com. Only four autobiographies were found to closely match the selection criteria, thus a random sampling procedure was unfeasible. Although this is not a random sample, it includes a great variety of circumstances as shown in Table 5.1. Moreover, it does not

show any obvious sampling bias that could be suspected to lead the results of this study one way or another.

**Table 5.1.** Overview of the chosen autobiographies

| Entrepreneur | Autobiography | Date of publication | Venture (start-up phase) | Industry | Country |
|---|---|---|---|---|---|
| Kaplan, S. H. (male) | *Test pilot* | 2001 | Kaplan (1940s ~ 1970s) | Test preparation (for-profit) | US |
| Kurtzig, S. L. (female) | *CEO* | 1991 | ASK (1972 ~ 1978) | Software for manufacturers (for-profit) | US |
| Scribante, A.J. (male) | *Shelf life* | 2005 | MAJERS (1963 ~ 1969) | Marketing information and research (for-profit) | US |
| Yunus, M. (male) | *Banker to the poor* | 2001 | Grameen Bank (1974 ~ 1981) | Microloans to the poor (non-profit) | Bangladesh |

## 5.4 PRE-ANALYSIS DATA PROCESSING

The autobiographies in book form were first scanned into electronic texts using an OCR (optical character recognition) program and then proofread. Texts that are out of their natural chronological order when published due to editorial considerations were rearranged to correctly reflect the timeline. Texts describing events outside the start-up phase were trimmed (see Table 5.1 for the start-up phase of each venture): the beginning of the start-up phase was marked by the entrepreneur's initial engagement in the activities that were part of the venture in question or led directly to the venture; the end of the start-up phase was marked by the beginning of the ventures' *systematic* expansion to the national market, at which point the promising start-ups were considered to have transformed into fledgling businesses and thus entered the growth phase of their life cycle.

# 6.0 DATA ANALYSIS AND RESULTS

This chapter illustrates the data analysis procedure and presents the results from the analysis.

The data analysis procedure includes three steps: 1) converting an autobiography into a sequence of episodes, each with a set of actions and their matching conditions, in preparation for the two-step inference; 2) inferring decision-making rules from the available episode information in the first step of inference; 3) inferring principles of behavior from the rules of "how to" knowledge in the second step of inference.

The presentation of the results begins with a brief description of the statistics of the episodes, the coded rules, and the rule applications in the four ventures studied. The rest of the chapter focuses on the E-principles. First, it gives the conceptual definitions for the seventeen inferred E-principles and makes an inter-case comparison of the application frequencies of the E-principles. Second, it demonstrates the E-principles' effect on entrepreneurial discovery using selected episodes from the analysis.

## 6.1 FROM TEXTS TO DECISION-MAKING EPISODES

Since behavioral protocol consists of a sequence of decisions and actions (actions, for brevity) that happen in their respective contexts, the texts ready for analysis need to be reorganized into decision-making episodes, each of which consists of two sets of information: actions and conditions. So, first, entrepreneurs' actions that were relevant to entrepreneurial discovery were selected. To accurately represent the fact that actions normally happen to make a discrete choice or a cluster of closely related choices, and also to make rule inference manageable lest too many rules would be required in one episode, the selected actions were then organized into a sequence of chunks, with each chunk encompassing either a discrete choice or a cluster of closely related

choices. Next, each of these chunks was assigned to one episode, with the original chronological order between chunks preserved. Last, conditions related to each of the action chunks were assigned within the same episode where their corresponding actions were assigned. For example, an episode from the Kaplan case has the following pair of actions and conditions:

**Episode ID:** kap-000-090 **Page:** 28 **Venture:** Kaplan, Inc.

**Time:** early 1940s

**Comment:** kap-03

**Conditions**

***Sequence Condition***

It worked like a charm. After listening to the tape, he remembered and understood almost everything we had covered in the previous lesson.

**Actions**

***Sequence Action***

I encouraged other students to review their lessons before and after our sessions to reinforce concepts. It was as if students were getting two lessons for the price of one.

In an episode, the set of conditions were listed before the actions to reflect the fact that the conditions were the context in which the actions took place. “He” in the condition of this episode refers to Larry, a student of Kaplan in the early 1940s. Since his name had been mentioned in the episode just before this one, it was not repeated here. “I” in the action refers to Kaplan himself, as he wrote his autobiography in first person (which is also the case for the other three autobiographies). The episode ID is a unique identification number that was given to each episode during the analysis. The page number indicates from which page onward in the original autobiography the actions in this episode were described. When multiple actions and multiple conditions were present in the same episode, they were assigned sequence numbers, which indicate either their chronological order in the original autobiography or an arbitrary order for easy reading when their original chronological order was not clear. In this example, there were only one action and one condition, so no sequence number was necessary. (Refer to APPENDIX B for more episode examples.)

## 6.2 FIRST STEP OF INFERENCE: INFERRING RULES

There have been many different knowledge representation schemes (e.g. frames, diagrams, rules) and different methods of organizing even the same knowledge using the same basic representation scheme. These different approaches largely differ only in the ease of coding, storing, retrieving, processing, and communicating the knowledge, not in the essential content of the knowledge represented (Ignizio, 1991).

In this study, the if-then production format was chosen to code the heuristic rules, for its simplicity, intuitiveness, and modularity (i.e. each rule can be created, changed, or deleted as a discrete unit, without affecting the function of other rules). Heuristic rules were then inferred from each of these episodes—rules that would have enabled the entrepreneur to make such actions under the given conditions. The inferred rules together with the corresponding actions and conditions pair within that episode made up a complete decision-making episode. Take the following episode from the Yunus case for example,

**Episode ID:** yun-000-290 **Page:** 88 **Venture:** Grameen Bank

**Time:** 1977

**Comment:** yun-04

**Conditions**

***Sequence Condition***

Since I wanted at least 50 per cent of our experimental projects' borrowers to be women, little by little we had reached a sizeable number of women as our borrowers.

**Actions**

***Sequence Action***

We studied the effects of the loans on the life of the poor we lent to and how our borrowers used their loans,

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* |
|---|---|---|
| 000-344 | you want to learn and improve what you do in a certain subject field, | proactively seek out and study the feedback, which includes any consequence of or response to what you do. |

In this episode, Yunus's action was enabled by a rule, which says "*If* you want to learn and improve what you do in a certain subject field, *then* proactively seek out and study the feedback, which includes any consequence of or response to what you do." (Refer to APPENDIX B for more rule examples along with their respective episodes.) The rule ID is a unique identification number that was given to each rule during the analysis. Because rules are potentially applicable in more than one ventures, their ID, unlike the episode ID, does not include the first three characters from the name of the entrepreneur.

To test the validity of the inferred rules, an experiment can be used where a subject, when given the conditions and the inferred rules of an episode—but not the actual actions—is asked to try to replicate the original actions. If the subject cannot reproduce the actual actions, it is likely that the rules have not been appropriately inferred or coded; corrections can then be made accordingly to remedy this deficiency. This validation procedure through mind simulation (Newell & Simon, 1972) is analogous to verifying a knowledge-based system through computer simulation. A copy of the actual test instruction used in this study is available in APPENDIX C. Actual tests using subjects of doctoral students in business school and a college graduate in English returned a higher than 80% initial agreement rate on average—disagreements were caused by errors of either the coder (the author, in this case) or the subjects, which all could be readily amended through consultations between the coder and the subjects. The test results also did not indicate any advantage for subjects having more business related background—this was to be expected since all the knowledge a subject needed to reproduce the original actions was coded in plain language and given in the test.

Access, a relational database software made by Microsoft, was used to facilitate recording, organizing, and analyzing the data. It offers data entry templates, relationship-based database management, various queuing techniques, and multiple reporting options.

## 6.3 SECOND STEP OF INFERENCE: INFERRING PRINCIPLES

Inferred rules are either "what is" knowledge or "how to" knowledge. "What is" knowledge is about "factual premises" or "factual elements"; "how to" knowledge is about "imperatives" or "ethical propositions"—the distinction as made by Simon (1976) in *Administrative Behavior*:

> Thus, with the mediation of a factual premise…one imperative can be deduced from another. … It should be clear…that most ethical propositions have admixed with them factual elements. (Simon, 1976: 49)

In other words, a rule of "how to" knowledge is a combination of factual information and an imperative, i.e. a principle that compels the specific behavior described by the rule. Inferring such principles from "how to" knowledge is the second step of inference. Take Rule 000-013 in the following episode from the Kurtzig case for example,

**Episode ID:** kur-000-070 **Page:** 36 **Venture:** ASK Computer Systems Inc.

**Time:** working on my first sales call, Pulverizing Machinery, after I was assigned to a newly created GE sales office in West Orange, New Jersey

**Comment:** kur-01

**Conditions**

***Sequence Condition***

Evan Bakke, Pulverizing's R&D manager, gave me a task-by-task rundown of the manufacturing process, and took me from workstation to workstation.

**Actions**

***Sequence Action***

Through the din I fired dozens of questions at Bakke to get a sense of how Pulverizing's manufacturing process worked and what the thinking was behind their operations.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* |
|---|---|---|
| 000-013 | you are approaching a prospective customer, | try to understand his problems first before making your sales pitch. |

The if-section of this rule, "you are approaching a prospective customer", sets up the context for the then-section behavior to happen; however, it does not determine exactly what behavior is going to happen. In other words, given the context that "you are approaching a prospective customer", there can be multiple behavioral options for the then-section—the actual then-section, "try to understand his problems first before making your sales pitch", is but one of them. It is the

principle “greater leverage” that compels the then-section of Rule 000-013. Therefore, to infer principle from “how to” knowledge is to answer the question, *What* principle must be operative to make the behavior described by the rule what it is? (Refer to APPENDIX B for more examples—rules and their principles are listed below the actions, at the end of each episode.)

In this study, “how to” knowledge defines the behavior of entrepreneurial discovery; therefore, the inferred principles were named the principles of entrepreneurial discovery, or E-principles for short. Because this study aims to discover the structure and logic of entrepreneurial discovery directly from data, the E-principle categories were developed iteratively during the actual inference process, instead of being predetermined.

To test the replicability of the inference, a second coder repeated the second step of inference using the E-principle categories developed by the author, the primary coder. Initial agreement rate was higher than 80% on average, and all disagreements were readily resolved through consultations between the two coders.

## 6.4 EPISODES AND RULES

This section presents a general overview of the results regarding episodes and rules (as inferred in section 6.2). “Kap” is the identification in short for Kaplan; “kur” for Kurtzig; “scr” for Scribante, “yun” for Yunus.

In the four cases, there are a total of 337 episodes, 304 coded rules (21.4% shared by multiple cases), and 672 applications of all rules. The inter-case difference of the number of episodes (see Table 6.1) reflects the extent of details entrepreneurs have included in their description of the start-up process of their respective ventures. As a result, there are also differences in the numbers of rules and rule applications.

**Table 6.1.** Episodes, rules, and rule applications

| | **kap** | **kur** | **scr** | **yun** |
|---|---|---|---|---|
| *Episodes* | 50 | 170 | 50 | 67 |
| *Rules* | 60 | 201 | 57 | 79 |
| *Rule applications* | 117 | 314 | 93 | 148 |

Although, as a whole, the number of applications per rule is about 2.2 (672/304), the majority of rules were used only once (see Table 6.2). But, on the far right side of the distribution, there are some rules being applied more than 10 times.

**Table 6.2.** Rule application frequency

| *Application frequency* | 1 | 2 | 3 | 4 | 5 | 6~10 | >10 |
|---|---|---|---|---|---|---|---|
| *Rules* | 182 | 49 | 23 | 18 | 9 | 11 | 9 |

As shown in Table 6.3, rules of "how to" knowledge were more likely being used in multiple cases (25.1%) than rules of "what is" knowledge. General "what is" knowledge is defined as factual information that is potentially relevant to all businesses; on the other hand, local "what is" knowledge is factual information associated with only specific time, location, or line of business, which is why it was the least shared due to the variety of the ventures studied here.

**Table 6.3.** Rules

| Rules | Used in one | Used in two | Used in three | Used in four | Total |
|---|---|---|---|---|---|
| "How to" knowledge | 194 | 43 | 15 | 7 | 259 |
| "What is" knowledge (general) | 19 | 1 | 0 | 0 | 20 |
| "What is" knowledge (local) | 25 | 0 | 0 | 0 | 25 |

## 6.5 PRINCIPLES OF ENTREPRENEURIAL DISCOVERY

This section presents the results from the second step of inference (see section 6.3), where E-principles, i.e. principles of entrepreneurial discovery, were inferred from the rules of "how to" knowledge, with each rule corresponding to one principle.

In total, seventeen distinct E-principles were developed iteratively through the inference process. A complete list of actions described by the rules in this study ordered according to their E-principle category is available in APPENDIX A. The conceptual definition and a few behavioral examples for each E-principle are as follows:

1. *greater leverage*: find ways to make bigger impact than what's normally possible for the resource you have (e.g. focus on strength, make use of others' resources)
2. *reducing operation cost*: reduce operation cost, making the operation cheaper to run (e.g. reduce employment expenses, reduce overhead)

3. *seeking commitment*: bond people—socially, economically, emotionally, intellectually, etc.—to you, your company, your business, or your preferred course of action (e.g. make use of self-interest, pursue motivation)
4. *replicating success*: applying previous successful approaches to solving similar problems (e.g. replicate successful solutions on similar problems, use similarity with your existing customers to find new customers)
5. *responsiveness to feedback*: seek out feedback—others' responses to your action or inaction—and adjust your behavior accordingly (e.g. develop new product/service based on customers' unsolved problems, improve your solution based on feedback)
6. *reducing adoption cost*: make it easier for people to accept/adopt your message, your product, your offer, etc. (e.g. make "risk-free" offers, educate for better acceptance of new things)
7. *being prepared*: make or get ready for what is to come or what is to be required (e.g. hire managers in expectation of future business growth, provide necessary training in advance)
8. *taking control*: take yourself, the situation you are faced with, etc., under your own control instead of the control of circumstances or others (e.g. do what you think is right, keep control of the ownership)
9. *perseverance*: don't be discouraged by setbacks, difficulties, rejections, failures; keep going (e.g. keep going when the going gets tough, take "no" as the journey not the finale)
10. *seeking structural solutions*: prefer to deal with systematic problems first; make institutional arrangements for the actions or solutions for their continuity, stability and sustainability (e.g. institutionalize a beneficial one-time happening, pursue institutional solutions for long-lasting or widely spread problems)
11. *direct approach*: prefer the shortest connection between you and the things or people you want to deal with (e.g. get as near to the source of a situation as possible to understand it, prefer to use first-hand experience in evaluating people)
12. *reducing "enemy" defense*: reduce resistance to or difficulty with what you want to do (e.g. divide and conquer, put people at ease in conversation)
13. *escaping diminishing returns*: don't waste your resources on things or courses of action that have little or even negative payback (e.g. seek quality but avoid perfectionism, avoid displaying emotions that do not help achieving your objective)

14. *continuing improvements*: find ways for yourself, your people, and your business, etc., to do better (e.g. keep improving your own practice, learn from what you admire)
15. *affordable loss*: try not to face a risk or give up something that you cannot afford to lose (e.g. take baby steps to reduce cost and risk exposure when doing new things, take opportunities to explore at little or none of your own expense)
16. *being "one and only"*: crush your competition, or at least make their life difficult (e.g. deny others the chance to compete successfully with you in your choice of strategy, register your trademarks)
17. *considering both sides*: consider comprehensively in situations where a subject has both pros and cons, direct effect and indirect effect, or short-term and long-term consequence, etc. (e.g. consider both pros and cons of a hard choice, consider publicity together with an action's direct payoff)

As this study focuses on how entrepreneurial discovery is influenced by entrepreneurial actions, which are themselves determined by the applications of rules in the entrepreneur's knowledge base, the effect of the rules on entrepreneurial discovery depends on the frequency of their application rather than the number of rules available. As each rule has a corresponding E-principle, the effect of the E-principles on entrepreneurial discovery also depends on the frequency of their application rather than the number of rules they represent. Table 6.4 below shows the application frequency of the E-principles within each case and in four cases as a whole.

**Table 6.4.** Application frequency of E-principles

| E-Principles | kap | kur | scr | yun | Total | Percentage (equal weight) |
|---|---|---|---|---|---|---|
| *greater leverage* | 27 | 137 | 29 | 29 | 222 | 32.0% |
| *reducing operation cost* | 13 | 21 | 13 | 3 | 50 | 9.3% |
| *seeking commitment* | 10 | 19 | 6 | 15 | 50 | 8.6% |
| *replicating success* | 13 | 14 | 9 | 4 | 40 | 7.7% |
| *responsiveness to feedback* | 11 | 12 | 5 | 12 | 40 | 7.3% |
| *reducing adoption cost* | 6 | 19 | 1 | 13 | 39 | 5.8% |
| *being prepared* | 4 | 12 | 8 | 4 | 28 | 5.1% |
| *taking control* | 8 | 5 | 3 | 6 | 22 | 4.3% |
| *perseverance* | 2 | 13 | 3 | 8 | 26 | 4.0% |
| *seeking structural solutions* | 4 | 4 | 1 | 10 | 19 | 3.5% |
| *direct approach* | 3 | 6 | 1 | 9 | 19 | 3.2% |
| *reducing "enemy" defense* | 1 | 7 | 0 | 11 | 19 | 2.9% |
| *escaping diminishing returns* | 0 | 14 | 1 | 3 | 18 | 2.1% |
| *continuing improvements* | 3 | 2 | 3 | 0 | 8 | 1.8% |
| *affordable loss* | 2 | 4 | 0 | 4 | 10 | 1.6% |
| *being "one and only"* | 0 | 3 | 1 | 0 | 4 | 0.6% |
| *considering both sides* | 0 | 3 | 0 | 1 | 4 | 0.4% |
| **Sum** | 107 | 295 | 84 | 132 | 618 | 100.0% |

It is obvious from Table 6.4 that the four cases share most of the E-principles with one another; however, Table 6.3 in section 6.4 shows that only 27.7% rules were applied in more than one cases. This means that, although there is much inter-case difference at the behavioral level, the great similarities among the cases can be clearly demonstrated at the principle level. This observation serves as another example that principles of behavior are more reliable indicators of a type of behavior as discussed in section 4.4.

Since Table 6.4 seems to indicate that the four cases show similar patterns in the application frequency of the E-principles, a chi-square test of independence (a nonparametric test) was conducted to explore the relationship between the ventures and the E-principles. If the four cases—kap, kur, scr, and yun—are viewed as the 4 categories of the nominal variable “venture”, and the seventeen E-principles are viewed as the 17 categories of the nominal variable “E-principle”, then the four columns of within-case frequency (excluding the last “Sum” row) constitute the contingency table of the two variables, namely the cross-tabulation of the frequencies for the combinations of categories of variables “venture” and “E-principle”. As more than 20% of the cells within this contingency table have expected frequencies less than 5, the requirement for the standard calculation of the chi-square statistic is not satisfied. Thus Fisher

exact calculation using Monte Carlo simulation was used instead, which returned a $\chi^2$ statistic with $p < .05$, which means variables "venture" and "E-principle" are not independent, i.e. the expected frequencies for each E-principle are influenced by the specific venture pursued.

The differences in application frequency between the E-principles as shown in Table 6.4 seem to imply some kind of relative significance. To compare the E-principles in this relative significance entails ranking them by their application frequency. However, as explained in section 6.1, the four cases have different number of episodes and different number of rule applications and, consequently, different number of E-principle applications; therefore, ranking the E-principles by their total across-case frequency would favor cases with more E-principle applications. To avoid this, the within-case percentage of each E-principle application frequency was first calculated and then the across-case average, which is the percentage reported in Table 6.4, giving equal weight to the four cases regardless of their size. E-principles are ordered descendingly by this equal-weight percentage in both Table 6.4 and the list of conceptual definitions given before.

It is interesting to note that only in two pairs of adjacent E-principles—"taking control" and "perseverance", "continuing improvements" and "affordable loss"—is the order by the total frequency in reverse with the order by the equal-weight percentage. The Spearman rank correlation coefficient between these two orders is .99 ($p < .05$). This seems to show that, taken as a whole, the four cases converge to a common underlying pattern of the relative application frequency between the E-principles (see Figure 6.1), which is roughly independent of the relative size between the cases.

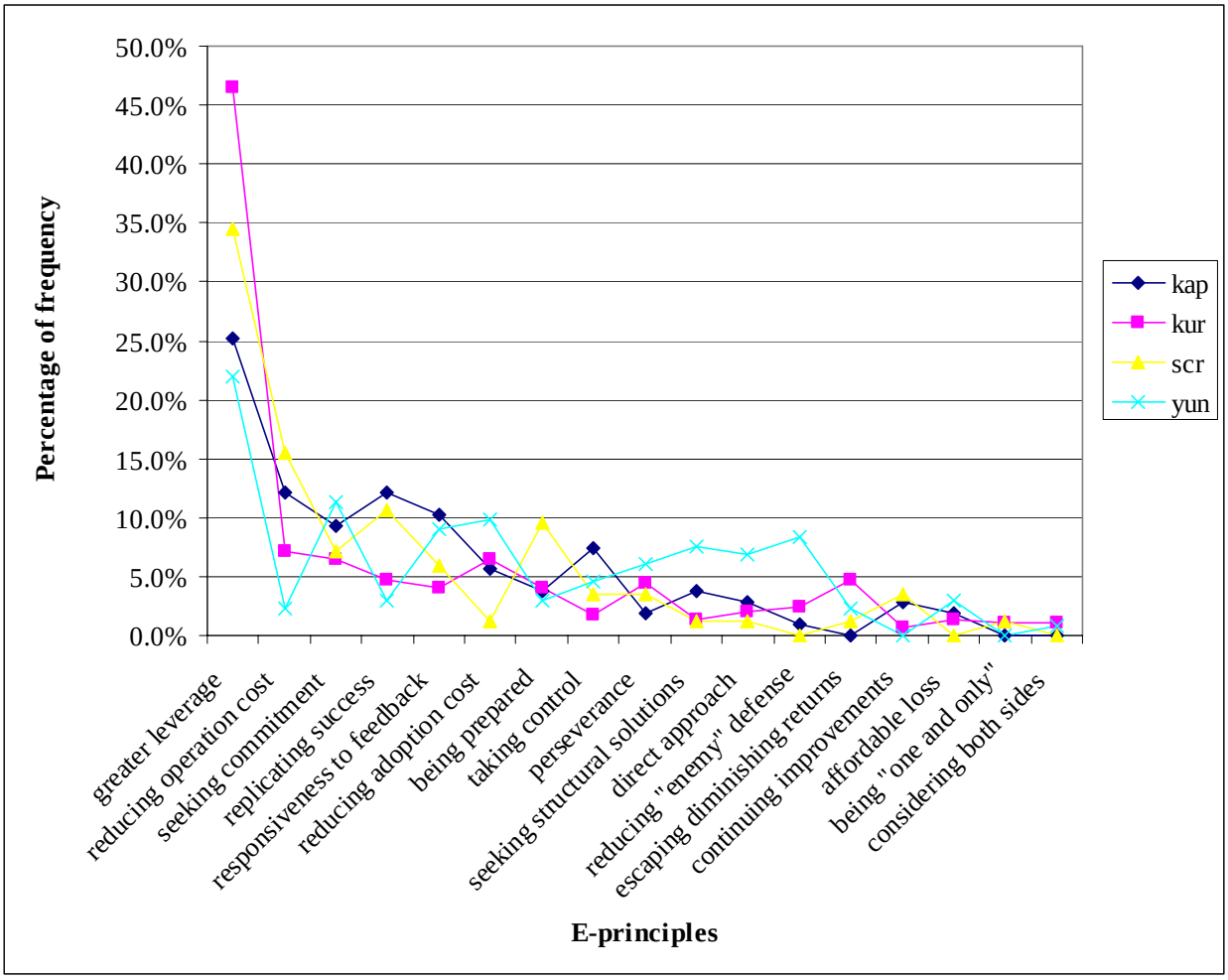


**Figure 6.1.** Percentage of frequency of E-principles

The Spearman rank correlation coefficients between cases, as well as between cases and the rank by the equal-weight percentage, are shown in Table 6.5 (all but the correlation between the Yunus case and the Scribante case have $p < .05$). The mean correlation coefficient among the four cases is 0.55, which indicates the (expected) reliability of any single case to be consistent with the common underlying pattern. This is different from the aggregate reliability of all four cases, as calculated by the Spearman-Brown effective reliability formula (Rosenthal & Rosnow, 1991):

$$R = \frac{nr}{1 + (n-1)r}$$

where $R$ is the effective reliability coefficient, $n$ is the number of cases, and $r$ is the mean correlation among cases. The effective reliability coefficient here is .83, which indicates the composite internal consistency of all four cases.

**Table 6.5.** Spearman rank correlation coefficients

| | **kap** | **kur** | **scr** | **yun** |
|---|---|---|---|---|
| *kap* | x | 0.62 | 0.82 | 0.51 |
| *kur* | x | x | 0.62 | 0.54 |
| *scr* | x | x | x | 0.20 |
| *Percentage (equal weight)* | 0.92 | 0.84 | 0.84 | 0.61 |

Furthermore, it is clear from this table that each of the four cases correlates more with the rank by the equal-weight percentage, which represents one manifestation of the common underlying pattern, than with other cases. All of these point to the existence of a common underlying pattern of E-principle application frequency.

Table 6.5 also shows that the Yunus case has the lowest correlations with other three cases. Its unique venturing circumstances probably provide some explanation: Grameen Bank, different from the other three cases, operated as a non-profit organization (as opposed to for-profit) in Bangladesh (as opposed to the US); during its start-up phase, Grameen Bank, being non-profit and humanistic in its business model, received substantial financial and other means of support from governmental and international sources (Yunus & Jolis, 2001). If the Yunus case is excluded from the analysis shown in Table 6.4, the top five E-principles remain the same, with only a reversal of position between “seeking commitment” and “replicating success”. In fact, the dominance of the top four E-principles (the significance of which is interpreted in section 7.1 and section 7.2) only gets strengthened by excluding the Yunus case: the top four E-principles as a group would account for 63.8% of all E-principle applications, up from 57.5%.

## 6.6 E-PRINCIPLES IN ACTION

The previous section defines the E-principles, looks at the frequency of their application, and demonstrates potentially a converging pattern of such frequency across ventures. Besides application frequency, other information associated with the E-principles is the manner in which they affect entrepreneurial discovery, namely how they influence the market process toward directions that are congruent with transferring a promising start-up into a successful fledgling business. If application frequency is the quantitative view of the E-principles’ effect on

entrepreneurial discovery, their operation in action as evaluated by comparing the state of the venture before their application and the state of the venture after application is the qualitative view. The analysis procedure used in this study—to first break down the start-up phase of a venture into consecutive episodes ordered chronologically and then infer rules and principles to explain the entrepreneurial actions that took place in each episode—reveals the E-principles in action in a resolution as high as a single discrete action and facilitates achieving a qualitative view of the E-principles' effect on entrepreneurial discovery.

Out of the 337 episodes, fourteen distinct incidents—each consisting of one or multiple adjacent episodes—across all four ventures were selected to provide this qualitative view. The selection was made so that different combinations of multiple E-principles can be seen in action together in a small sample of episodes—just like the way they work together in the entire pool of episodes. Table 6.5 shows the fourteen incidents and the E-principles applied in them. (Check sign in Table 6.5 does not include application frequency information in it.)

**Table 6.6.** Selected entrepreneurial discovery incidents

| **E-Principles** | **kap-03** | **kap-07** | **kap-08** | **kap-10** | **kur-01** | **kur-05** | **kur-10** | **kur-14** | **kur-16** | **scr-01** | **scr-02** | **scr-04** | **yun-03** | **yun-04** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *greater leverage* | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| *reducing operation cost* | | ✓ | | ✓ | | | | | ✓ | | | | | |
| *seeking commitment* | | | | ✓ | | | ✓ | | | | | | | ✓ |
| *replicating success* | | ✓ | ✓ | ✓ | | | | ✓ | | ✓ | | | ✓ | ✓ |
| *responsiveness to feedback* | ✓ | ✓ | | | ✓ | ✓ | | ✓ | | | ✓ | ✓ | ✓ | ✓ |
| *reducing adoption cost* | | | ✓ | ✓ | | ✓ | | | | | | | | ✓ |
| *being prepared* | | ✓ | | | | | ✓ | | | ✓ | | | | |
| *taking control* | ✓ | | | ✓ | | | | | ✓ | ✓ | | | | ✓ |
| *perseverance* | | | | | | | ✓ | | ✓ | | | | | ✓ |
| *seeking structural solutions* | ✓ | | ✓ | | | | | | | | | ✓ | ✓ | ✓ |
| *direct approach* | | | | | | | | | | | ✓ | | ✓ | |
| *reducing "enemy" defense* | | | | | | | ✓ | | | | | | ✓ | ✓ |
| *escaping diminishing returns* | | | | | ✓ | ✓ | ✓ | | | | | | | |
| *continuing improvements* | | | | | | | | | | ✓ | ✓ | | | |
| *affordable loss* | | | | | | ✓ | ✓ | | | | | | | |
| *being "one and only"* | | | | | | | ✓ | | | | | | | |
| *considering both sides* | | | | | | | | | | | | | | |
| **Episodes involved** | 2 | 2 | 2 | 2 | 4 | 5 | 10 | 2 | 4 | 7 | 3 | 1 | 8 | 8 |

Four incidents were chosen from the start-up phase of the Kaplan case. Their synopses are shown in Table 6.6; detailed information for involved episodes is available in section B.1 of APPENDIX B.

**Table 6.7.** Kaplan of Kaplan: Synopses

| Incident ID | Initial state of the incident | E-principles applied | End state of the incident |
|---|---|---|---|
| *kap-03* | Larry, one of Kaplan's students, had problems remembering algebra lessons from one week to the next. | greater leverage; responsiveness to feedback; taking control; seeking structural solutions | Larry learned well and became a satisfied client. Kaplan found a good teaching method that saved his own effort and benefited all his students. |
| *kap-07* | Kaplan was asked by some students to help them prepare the Medical College Admission Test (MCAT), which was a difficult test and he had never seen. | greater leverage; reducing operation cost; replicating success; responsiveness to feedback; being prepared | Within six months, Kaplan was ready for his first MCAT preparation class. |
| *kap-08* | One of Kaplan's employees, Lucille San Giorgio, decided herself to make a soft sell to Catholic schools. This was when the staff at many private schools were reticent toward test preparation. | greater leverage; replicating success; reducing adoption cost; seeking structural solutions | Kaplan adopted a new marketing approach through forging new relationships with school administrators, teachers, and counselors. |
| *kap-10* | Kaplan got requests from some students in Philadelphia for taking the MCAT class locally instead of in Brooklyn, where Kaplan was located. | greater leverage; reducing operation cost; seeking commitment; replicating success; reducing adoption cost; taking control | Kaplan developed a method of growth through hiring local center administrators. |

Five incidents were chosen from the start-up phase of the ASK case. Their synopses are shown in Table 6.7; detailed information for involved episodes is available in section B.2 of APPENDIX B.

**Table 6.8.** Kurtzig of ASK: Synopses

| Incident ID | Initial state of the incident | E-principles applied | End state of the incident |
|---|---|---|---|
| *kur-01* | Kurtzig was on her first sales call, Pulverizing Machinery, to sell GE's time-sharing programs. | greater leverage; responsiveness to feedback; escaping diminishing returns | Kurtzig got the client and did her very first custom programming, which marked the beginning of her own venture later in software. |
| *kur-05* | Kurtzig was asked to write a manufacturing program for the Tymshare network; she refused for not wanting to lose independence. A few weeks later, Tymshare called her again. | greater leverage; responsiveness to feedback; reducing adoption cost; escaping diminishing returns; affordable loss | Kurtzig began a fruitful cooperation with Tymshare. |
| *kur-10* | ASK was stretched very thin with rewriting its software for a new computer system and several other custom programming jobs for big and famous clients. | greater leverage; seeking commitment; being prepared; reducing "enemy" defense; perseverance; escaping diminishing returns; affordable loss; being "one and only" | Kurtzig got ASK out of trouble and put it on a promising course for future success. |
| *kur-14* | During a sales call, one client told Kurtzig that they would not buy ASK's software unless it got an integrated accounting software—something ASK had never done. | greater leverage; replicating success; responsiveness to feedback | ASK developed the required financial management program, which later became a profitable part of ASK’s bundle of software. |
| *kur-16* | During ASK's joint sales effort with HP, Kurtzig noticed that ASK was doing most of the work involved in selling HP's computer. | greater leverage; reducing operation cost; taking control; perseverance | ASK became the first software company that got the status as HP's original equipment manufacturer (OEM). |

Three incidents were chosen from the start-up phase of the MAJERS case. Their synopses are shown in Table 6.8; detailed information for involved episodes is available in section B.3 of APPENDIX B.

**Table 6.9.** Scribante of MAJERS: Synopses

| Incident ID | Initial state of the incident | E-principles applied | End state of the incident |
|---|---|---|---|
| *scr-01* | In 1963, Scribante wanted to sell his bleach beyond the local market areas to other cities. | greater leverage; replicating success; being prepared; taking control; continuing improvements | Within a month, Scribante started a new market information and research business, got $10,500 in revenue, and more than 60 big companies as clients. |
| *scr-02* | MAJERS was providing clients with compiled newspaper grocery ads together with market share information. | greater leverage; responsiveness to feedback; direct approach; continuing improvements | Scribante developed a promotional index help clients make intelligent decision of where to spend their trade promotion dollars. |
| *scr-04* | The president of one client told Scribante that he was wrong in focusing on MAJERS's own margins. | greater leverage; responsiveness to feedback; seeking structural solutions | Scribante improved MAJERS's sales approach. |

Two incidents were chosen from the start-up phase of the Yunus case. Their synopses are shown in Table 6.9; detailed information for involved episodes is available in section B.4 of APPENDIX B.

**Table 6.10.** Yunus of Grameen Bank: Synopses

| Incident ID | Initial state of the incident | E-principles applied | End state of the incident |
|---|---|---|---|
| *yun-03* | The success of his three-share experiment for the farmers highlighted a problem Yunus had not focused on before: the landless poor needed more help than farmers. | greater leverage; replicating success; responsiveness to feedback; reducing "enemy" defense; seeking structural solutions; direct approach | Yunus discovered the concept of microloans to the poor and was on his way to discover the need for a bank to the poor. |
| *yun-04* | Traditional banks in Bangladesh are gender-biased and do not want to lend money to women, who constituted less than 1 per cent of all the borrowers in Bangladesh put together. Yunus always thought such situation was downright discrimination against women. | greater leverage; seeking commitment; replicating success; responsiveness to feedback; reducing "enemy" defense; taking control; perseverance; reducing adoption cost; seeking structural solutions | Grameen Bank successfully changed its client base to focus almost exclusively on lending to women, which was a critical factor in Grameen’s success. |

# 7.0 INTERPRETATION OF RESULTS

This chapter provides interpretations of the results. Section 7.1 explains the meaning of the order between E-principles by their relative application frequency. Section 7.2 explains why the E-principles are important for entrepreneurial discovery, and why the relative importance of a particular E-principle is as it is. Section 7.3 compares the E-principles with the results of the four studies reviewed in chapter 3.0 in their abilities to explain the actual venture incidents selected in section 6.6. Section 7.4 discusses the practical implications of the E-principles. Section 7.5 discusses the theoretical implications of the E-principles. Section 7.6 considers three questions that need to be answered to generalize the E-principles to entrepreneurial discovery in VC-backed start-ups and corporate initiatives.

## 7.1 APPLICATION FREQUENCY BETWEEN E-PRINCIPLES

This first section tries to answer two questions raised by the results presented in section 6.5: 1) What do the application frequency differences between the E-principles mean? 2) Can the converging pattern of application frequency of the E-principles across cases shown in this study be generalized to the start-up phase of other promising start-ups? Answers to these two questions could influence how to make sense of the E-principles in the context of entrepreneurial discovery, the topic of the next section.

The ranking of the E-principles by their application frequency clearly implies some kind of relative significance, but the meaning of this significance needs to be carefully explored. As section 6.6 shows, there are two possible views of the E-principles' effect on entrepreneurial discovery: quantitative and qualitative. Since application frequency represents only the

quantitative view, how it correlates with the importance of an E-principle to entrepreneurial discovery is affected by how well the qualitative view fairs in the same sense.

From the demonstration of detailed scenes of the E-principles in action (see section 6.6), it is clear that the E-principles influence the market process through working together with each other in entrepreneurial discovery. Take the following incident from the Scribante case for example (see APPENDIX B for details),

| Incident ID | Initial state of the incident | E-principles applied | End state of the incident |
|---|---|---|---|
| *scr-01* | In 1963, Scribante wanted to sell his bleach beyond the local market areas to other cities. | greater leverage; replicating success; being prepared; taking control; continuing improvements | Within a month, Scribante started a new market information and research business, got $10,500 in revenue, and more than 60 big companies as clients. |

To transform the state of the venture from the initial state of the incident to the end state of the incident, five E-principles—greater leverage, replicating success, being prepared, taking control, continuing improvements—were applied alongside one another. If any one of the five had been missing, the transformation would not have been so.

Because of this integrative way they work, evaluating the importance of one E-principle relative to another cannot be meaningfully done given the qualitative view of the E-principles' effect on entrepreneurial discovery. Thus, it is up to the quantitative view, i.e. the relative application frequency between the E-principles, to determine the relative importance between the E-principles: the E-principles that are more frequently applied than others in entrepreneurial discovery *are* more important E-principles for entrepreneurial discovery.

Such relative importance between the E-principles can be the result of either the intrinsic characteristic of promising start-ups in general, or the intrinsic characteristic of any venture in particular, or the interaction between the two. Results in section 6.5 indicate that the four cases, despite their different sizes and greatly different circumstances, converge to the same pattern of E-principle application, and yet "venture" and "E-principle" as two nominal variables are not independent. Thus, evidence in this study favors an interaction between the intrinsic characteristic of promising start-ups in general and the intrinsic characteristic of a particular venture, suggesting that there exists a basic similarity of E-principle application among promising start-ups as a group but, at the same time, there is also contingency-based flexibility to be determined in individual cases.

## 7.2 MAKING SENSE OF E-PRINCIPLES

This section intends to answer the question: If the relative application frequency between the E-principles indicates their relative importance to entrepreneurial discovery and, as the data imply, the pattern of such application frequency is an intrinsic characteristic of promising start-ups as a distinctive category of new businesses, why are these E-principles important for entrepreneurial discovery, and why is the relative importance of a particular E-principle as it is?

1. *greater leverage*: find ways to make bigger impact than what's normally possible for the resource you have

Since opportunities with high likely profit have high level resource requirement, entrepreneurs of promising start-ups, beginning with meager endowments, need to magnify the impact of their action when interacting with the market in order to become capable of exploring and discovering increasingly more attractive opportunities. It is perhaps not surprising that "greater leverage" accounts for one third of all E-principle applications in the start-up phase when resource is the most constrained but learning and growth is imperative.

The four main categories of achieving greater leverage shown by the data in this study are straightforward enough: focusing on strength, focusing on what is important, making use of others' resources, and using the right leverage points. However, a look at the detailed behavioral examples of "greater leverage" (see APPENDIX A) indicates that entrepreneurs of promising start-ups, although without deep experience and credentials (i.e. verifiable human resources), seem to possess high levels of technical sophistication (e.g. negotiate from a position of strength or others' weakness), discipline (e.g. focus on your chosen strategy), managerial maturity (e.g. hire "giant" to become "giant"), strategic acuteness (e.g. focus on solving universal problems), and salesmanship (e.g. sell yourself by focusing on helping others). Such advanced competence in "greater leverage" clearly sets them apart from entrepreneurs of marginal start-ups.

2. *reducing operation cost*: reduce operation cost, making the operation cheaper to run

If "greater leverage" is concerned with making the most out of what resources entrepreneurs do have and striving to increase the value of their promising start-ups, "reducing operation cost" is about conserving those resources and trying to stay in the game.

Although, from time to time, "reducing operation cost" requires some creativity (e.g. overcome lack of cash through bartering or seeking credit from suppliers) and "street smarts"

(e.g. make salespeople your first hires in opening a new office, reduce unnecessary transactions before the final sale), mostly what entrepreneurs of promising start-ups do to reduce operation cost, as shown by data in this study, seems mundane and not to differ much from what ordinary small businesses do, e.g. have family members and relatives work for you, hire from marginal groups, rent cheap, and work multiple tasks and work long hours (see APPENDIX A for more examples). Clearly, reducing operation cost does not have much glamour to it, and no promising start-ups can become successful solely by being an expert in doing it. But judged by its second highest application frequency, it is undoubtedly a critically important chore that cannot afford to be neglected.

3. *seeking commitment*: bond people—socially, economically, emotionally, intellectually, etc.—to you, your company, your business, or your preferred course of action

Behind each promising start-up and behind every step of the market process, there is the entrepreneur interacting with a multitude of people in various circumstances: with employees, with potential customers, with existing customers, with cooperators, with suppliers, etc. The start-up company and the relationships it has with the other entities of the market are all organizational forms made up of people in pursuing either their personal interest, the collective interest, or both. The significance this fact holds for the probability of success of promising start-ups can be indicated by the following quote from Robert Quinn, a seasoned researcher and consultant in organizational behavior.

> I believe that everything I have learned about the problems of organizations can be stated in a single sentence: In organizations, individuals often choose personal good over the collective good. … When faced with the choice between organizational and personal good, it is natural to choose personal good. This natural pattern is the root cause of a vast number of collective failures. (Quinn, 2000: 124)

The evidence from this study indicates that entrepreneurs of promising start-ups seem to have highly developed intuition about the dynamic that Quinn points out; they are very adept at aligning the behavior of the people they interact with with the interest of their promising start-up. The techniques of “seeking commitment” they use include demonstrating commitment (e.g. lead through personal example), making use of self-interest (e.g. share pieces of the action to enlist others' help), pursuing better interpersonal relationship (e.g. embrace candor in difficult situations with others), and pursuing motivation (e.g. let people choose for themselves instead of imposing decisions on them).

Interestingly, a look at the behavioral examples of "seeking commitment" (see APPENDIX A) shows that it contains a majority of "soft" skills, which are traditionally not much emphasized, or even focused on, in most business school courses that feature predominantly "hard" analytical skills. Its occupying the third position of all the E-principles is, therefore, both natural and surprising—depending on how it is looked at.

4. *replicating success*: applying previous successful approaches to solving similar problems

Since entrepreneurs of promising start-ups begin with little strategic planning and market research, how do they manage to go from a single successful transaction to a choice of strategy, and from a single client to an entire customer base? Results from this study suggest that the E-principle of "replicating success", judged by its fourth position, is entrepreneurs' favorite choice. By replicating their prior successful solution on similar problems, entrepreneurs focus on and build up a resource base that solves a particular category of problems, which gradually evolves into a strategy for their promising start-up. On the other hand, by using similarity with their existing customer to find new customers, entrepreneurs connect to a larger group of customers who they can readily serve, which gradually evolves into the target customer population for their venture.

This style of building a strategy from the ground up has clear advantages: 1) little resources are needed as compared with extensive prior research and planning; 2) the potential pitfall of building a conceptually sound yet practically untenable strategy is mostly avoided since it is based on practical results instead of conceptual research and planning. But the source of its strength is also potentially the source of its weakness: the eventual impact of "replicating success" on entrepreneurial discovery depends on the soundness of the first successful transactions and the first clients the promising start-up has—it is, therefore, a myopic process by itself that could lead down a path with limited promise. However, its weakness can be counterbalanced, as the data suggest, by the application of "greater leverage", e.g. focus on solving universal problems and target the more promising customers. This probably explains why it has been used so frequently despite its potential limitation.

5. *responsiveness to feedback*: seek out feedback—others' responses to your action or inaction—and adjust your behavior accordingly

Learning and improving performance through feedback has been arguably the most fundamental general problem-solving strategy of all. It's not surprising, therefore, "responsiveness to

feedback" has an important role to play in entrepreneurial discovery where discovering opportunities (i.e. learning) and exploiting opportunities (i.e. improving performance) are paramount.

On the contrary, what may be a little surprising is that "responsiveness to feedback" does not rank *first*—it is below, although only by a small amount in some cases, four other E-principles: "greater leverage", "reducing operation cost", "seeking commitment", and "replicating success". The reason may be that these four E-principles need to be there first to set up the stage, so to speak, for "responsiveness to feedback" to really matter in entrepreneurial discovery. Moreover, a look at the behavioral examples of "responsiveness to feedback" (see APPENDIX A) although shows a great deal of sophistication, e.g. develop new product and service based on customers' unsolved problems, it does not seem to involve any behavior that distinctively represents promising start-ups. So, it is probable that the four E-principles ranking above it—"greater leverage", "reducing operation cost", "seeking commitment", "replicating success"—together as a group, distinguish promising start-ups from other types of new businesses. These four combined account for nearly 60% of all E-principle applications in this study. If this is true, then "responsiveness to feedback" can be regarded as a watershed that separates the four characteristic E-principles of promising start-ups from the other group of more general E-principles to which it itself belongs. When "responsiveness to feedback", as the leader of the second group, is added to the top four, they as a whole make up a whopping 65% of all E-principle applications.

It is also to be noted that some actions within "responsiveness to feedback" can be myopic, too, because the nature of the feedback may not point entrepreneurs to a promising direction. For example, developing new product/service based on customers' unsolved problems needs to be balanced, as the data suggest, by considerations such as focusing on solving universal problems and focusing on your chosen strategy, both belonging to the E-principle of "greater leverage".

The rest of the E-principles account for 35% of all E-principle applications. Similar to "responsiveness to feedback", none of them seems to involve any behavior that distinctively represents promising start-ups (see APPENDIX A for a complete list of behavioral examples from the results of this study).

6. *reducing adoption cost*: make it easier for people to accept/adopt your message, your product, your offer, etc.

The other person's willingness to accept and adopt what you have to offer is critical, whether it is to attract a potential partner or to convince a potential client. Since promising start-ups, as well as entrepreneurship and business in general, involve a lot of both, it is not surprising that "reducing adoption cost" holds a high position among the group of more general E-principles. In this study, making "risk-free" offers stands out as the most prominent behavioral example of "reducing adoption cost"—it is not difficult to find many applications of this behavior around us in everyday life.

7. *being prepared*: make or get ready for what is to come or what is to be required

The motto of the Boy Scouts is a general wisdom that finds its use in a broad variety of situations far beyond promising start-ups. In this study alone, behavioral examples for "being prepared" range from common sense (e.g. get to know the people you need to deal with), financial savvy (e.g. establish loan credit before you need it), to sound management principles (e.g. provide necessary training in advance, hire managers in expectation of future business growth).

8. *taking control*: take yourself, the situation you are faced with, etc., under your own control instead of the control of circumstances or others

"Taking control" is also a general principle. Its applications in promising start-ups range from equity management (e.g. keep control of the ownership), customer relationship (e.g. pursue customer satisfaction down to each and every encounter), to self mastery (e.g. do what you think is right).

9. *perseverance*: don't be discouraged by setbacks, difficulties, rejections, failures; keep going

Even folk psychology dictates "perseverance" to be a necessary condition for success in almost any field imaginable—entrepreneurship included. Two behavioral examples from this study should be particularly recognizable to anyone who has ever faced a difficult situation in life: keep going when the going gets tough, take "no" as the journey not the finale.

10. *seeking structural solutions*: prefer to deal with systematic problems first; make institutional arrangements for the actions or solutions for their continuity, stability and sustainability

"Seeking structural solutions" is a general principle that usually involves making good use of the power of institutions to supplement ad hoc or individual actions. Even casual observation of our everyday life can testify the prevalence of this principle. Behavioral examples from this study

closely match the conceptual definition, e.g. institutionalize a beneficial one-time happening, pursue institutional solutions for long-lasting or widely spread problems.

Unlike “replicating success” which is a bottom-up approach, “seeking structural solutions” is more of a top-down approach. The results here show that the bottom-up approach is clearly more preferred in promising start-ups.

11. *direct approach*: prefer the shortest connection between you and the things or people you want to deal with

The most prominent behavioral example of “direct approach” in this study—get as near to the source of a situation as possible to understand it—shows a great deal of problem-solving savvy of the entrepreneurs of promising start-ups, as many perennial business problems have been attributed to decision makers being distanced from where the real issue lies.

12. *reducing "enemy" defense*: reduce resistance to or difficulty with what you want to do

“Reducing ‘enemy’ defense” is also a general strategy, whose applications in this study range from relationship management (e.g. put people at ease in conversation) to general problem solving (e.g. divide and conquer).

13. *escaping diminishing returns*: don’t waste your resources on things or courses of action that have little or even negative payback

The flip side of knowing what to do for one’s own interest is knowing what *not* to do—this is the domain of the general principle “escaping diminishing returns”. In this study, it has been applied in product development (e.g. seek quality but avoid perfectionism), management (e.g. don't meddle where you are not needed), personal mastery (e.g. deflect personal offenses without becoming offensive), etc.

14. *continuing improvements*: find ways for yourself, your people, and your business, etc., to do better

It is hard to find a more ordinary principle for effective action than “continuing improvements”. Its relatively low application frequency in this study does not mean that the entrepreneurs of promising start-ups do not care about improving their own practice—it only indicates that they most likely have already accomplished most of it through following other more important principles, such as “greater leverage”, “responsiveness to feedback”.

15. *affordable loss*: try not to face a risk or give up something that you cannot afford to lose

Behavioral examples of this general principle are surely sound: concede only what is affordable, take baby steps to reduce cost and risk exposure when doing new things, etc. But its low position relative to most other E-principles shows that "affordable loss" does not contribute as much to effective entrepreneurial discovery as most other E-principles. Clearly, to avoid risk is not as important as to better take advantage of opportunities (through applying principles such as "greater leverage" and "seeking commitment") for promising start-ups.

16. *being "one and only"*: crush your competition, or at least make their life difficult

"Being 'one and only'" is the central theme in strategic management. Behavioral examples in this study (e.g. deny others the chance to compete successfully with you in your choice of strategy) are associated with the effort to win the direct competition game. However, judged by its low position relative to nearly all other E-principles, "Being 'one and only'" does not contribute nearly as much to effective entrepreneurial discovery as most other E-principles. But that is *not* saying that the strategic principle does not apply—it merely means that, for promising start-ups to differentiate themselves (i.e. become the "one and only"), the best approach is *not* to base their actions on the principle of "being 'one and only'", but on other more important E-principles that help build value for promising start-ups.

17. *considering both sides*: consider comprehensively in situations where a subject has both pros and cons, direct effect and indirect effect, or short-term and long-term consequence, etc.

"Considering both sides" is the least applied general principle in this study. It could be useful in some circumstances (e.g. consider both pros and cons of a hard choice), but it does not seem to make any special contribution to effective entrepreneurial discovery.

## 7.3 COMPARISON WITH OTHER "ENTREPRENEURIAL MINDS"

This study and the four illustrative studies reviewed in section 3.1 can be seen as providing alternative models of the "entrepreneurial mind" that compels entrepreneurs' actions during entrepreneurial discovery. Section 6.6 shows a sample of fourteen incidents from the start-up phase of the four ventures studied. As demonstrated with detailed information of the involved decision-making episodes (see APPENDIX B), the model developed here—using various combinations of the E-principles—not only provides the best explanatory details (down to a

single discrete action) but, more importantly, gives the most complete explanation of the unfolding of these incidents.

For example, in incident scr-01 from the MAJERS case (see its synopsis in Table 6.8 and details in section B.3 of APPENDIX B), Scribante was not merely striking out in directions where he could afford (as the logic of Sarasvathy's [1998 & 2001] "affordable loss" would dictate). Instead, through applying a combination of five E-principles ("greater leverage", "replicating success", "being prepared", "taking control", "continuing improvements") in a sequence, his behavior was much more purposeful and thoughtful—he developed a reasonable expectation of a considerable reward for his endeavor; he focused on magnifying the impact of his actions directed toward the market, rather than pondering which action he could *afford* to carry out; he also completed the first step of reaching out to significant other parties in the process, on which the success of his venture would depend. Sarasvathy's (1998 & 2001) "growth through expanding stakeholder networks and strategic partnerships" also recognizes the importance for a start-up to reach out, but it begs the question of how to identify and attract such stakeholders and strategic partners.

Since Scribante's actions did not start due to any extensive planning or search, Bhide's (2000) "opportunistic adaptation" certainly rings true; however, as he sacrificed the depth of each case for the breadth in his sample, Bhide's research cannot illustrate the in-depth nature of being "opportunistic". Seeking to enhance short-term cash flow clearly does not provide an adequate explanation for what Scribante did in incident scr-01.

McKelvie and Wiklund's (2004) result of the importance of making use of new market knowledge when the market is changing is clearly a sound one: Each action Scribante took in incident scr-01—if not a result of reasoning based purely on his prior knowledge—was a result of his taking into account new information from the market. However, lacking conceptual details, their model is unable to illuminate Scribante's actions in any other way besides making that general comment.

Quinn's (1978 & 1985) emphasis on using incrementalism to overcome missing information due to market or technological uncertainty complements well the heavy use of planning and research by corporations; however, Scribante, as an entrepreneur starting a promising start-up, did not face the same situation as big companies in managing innovation. As

shown clearly in scr-01, he needs more than incremental and interactive learning to get his venture off the ground.

The E-principles being able to give more in-depth and more complete explanation for entrepreneurial actions in actual entrepreneurial discovery incidents is the result of this study taking a comprehensive view of entrepreneurial discovery, which previous research has failed to do (see section 3.2).

A basic premise of the cognitive analysis of problem-solving behavior is that decisions and actions are what ultimately matter in realizing intelligence. If an attitude, a "state of mind", or a "state of being", does not have clear connection to options of behavior, its ability in giving explicitly precise explanations of behavior happened and in providing actionable advice to practice is limited. For example, among Timmons's (1989) "entrepreneurial attributes" contributing to venture success, "drive to achieve and grow", "opportunity and goal oriented", "veridical awareness", "internal locus of control", "tolerance for ambiguity", and "low need for status and power" all lack clear connections to behavior, making it problematic in explaining what should be learned from good practice and what could be done for greater effectiveness. The same problem exists in Bhide's (2000) "traits" of entrepreneurs for building successful promising start-ups: "tolerance for ambiguity", "open-mindedness", "managing internal conflict", and "perceptiveness". Rather than being attitude-focused, this study, thanks to its fundamental methodological orientation from cognitive science, is thoroughly behavior-focused. Not only have E-principles themselves been inferred directly from concrete behaviors, they also make it clear *how* (see section 6.6) and *why* (see section 7.2) certain behaviors contribute to the effectiveness of entrepreneurial discovery.

## 7.4 PRACTICAL IMPLICATIONS

Showing the E-principles in actions (see section 6.6) demonstrates how entrepreneurs, through applying combinations of the E-principles, influence the unfolding of the market process to their own advantage.

These E-principles, however, will not transform into a no-brainer, step-by-step instruction manual that can tell any prospective entrepreneurs exactly what to do in building their promising start-up. The specific actions of appropriate E-principles that ought to be taken depend on the circumstances of a particular venture which no manual can foresee; on the other hand, possible actions within each E-principle are potentially endless—they are only limited by our grasp of the facts of the world (science) and by our imagination of how to make associations and connections between those facts (design)—so that no manual can contain it all.

Because the E-principles do make clear the many facets of the rationality of entrepreneurial discovery, they can focus entrepreneurs' attention on the right directions when they are deciding which actions to take given the specific circumstances they face. So, a no-brainer manual—no; an insightful guide of principles that requires thoughtful input from the entrepreneurs—yes!

On teaching and learning entrepreneurship, the E-principles demonstrate that rationality of entrepreneurial discovery is a multi-faceted concept, involving both intellectual and emotional components that are beyond merely writing a business plan, which has increasingly become the centerpiece of teaching and other activities in entrepreneurship education. For a successful preparation in building significant entrepreneurial businesses, students would need far more than the training they normally receive nowadays in business schools.

The E-principles can be used to pinpoint weaknesses in course materials (e.g. see "seeking commitment" in section 7.2) and in students' individual competence. As attention of research, teaching, and learning is directed to making remedies as needed, behaviors that constitute the E-principles can be taught and learned to enhance competence (e.g. see "greater leverage" in section 7.2), and practices can be designed and carried out to make people more proficient in applying the E-principles in unfamiliar situations.

## 7.5 THEORETICAL IMPLICATIONS

Several aspects of this study, such as theoretical foundation, data acquisition and analysis, and results, break new ground for research on entrepreneurial discovery. There are four major implications.

First, the results of this study demonstrate that actual entrepreneurial discovery is the outcome of the applications of various combinations of multiple principles of behavior that are beyond the boundaries of rationality as conceptualized in the neo-classical economic theories or other organizational and management theories that have similar origins. The multi-faceted nature of entrepreneurial rationality as shown by the E-principles indicates that, in studying the formation process of how established economic activities came to be what they are, it is usually not appropriate to borrow social, economic, and management theories that have been developed through studying the established orders. Instead, a theoretical foundation that *can* represent such formative dynamics, such as the E-principles in this study, needs to be discovered directly from the data of such formation.

Second, entrepreneurship research needs to direct more attention to hard-to-measure phenomena in the entrepreneurial process. Arnold Cooper, a leading entrepreneurship scholar and a pioneer in strategic management as well, observes (as quoted in Landstrom [2005]):

> "In many cases researchers have focused upon things that can be measured easily, on things on which we have data. For example, look at the research on managerial teams, work has been done which examines the relative size of the team or background of team members, but no research has really looked at the processes by which these teams interact. There has not been very much work that really looks in a detailed and fine grained way … e.g. work involving psychological measures or management style, or more specific and detailed measures of the skills and capabilities of the people. All of that remains to be done." (Landstrom, 2005: 286)

Entrepreneurial discovery fits almost perfectly with the prototype profile of a hard-to-measure and hard-to-obtain-data research subject Cooper has in mind. This probably explains why there has been such scant research on it. However, results of this study demonstrate that effort taken to blaze a trail into the wilderness of entrepreneurial discovery that has long been shrouded in darkness and mystery due to its inaccessible terrain is richly rewarded. This is heartening, yet there is still so much out there that we hardly know anything about. The current study will have served an important purpose if, for nothing else, it can entice more researchers to follow its path or to blaze better trails of their own.

Third, entrepreneurship research needs to learn from cognitive science, such as artificial intelligence and cognitive psychology, which provides theoretical foundation and analytical tools for studying human cognition. One primary reason that entrepreneurial discovery is so hard to measure for entrepreneurship researchers is because the theories in traditional economics, sociology, and psychology which they are so used to using do not provide adequate tools for

handling the rich process and cognition data that are prevalent in this context. To use the classical hammer-nail fable to illustrate: It is true that if a person only has a hammer, everything tends to be viewed first as a nail; at the same time, it is equally true that for this person anything that does not first look like a nail is readily dumped into a heap marked “undesirable” and “unimportant”. This study demonstrates that, through borrowing appropriate theoretical lens and analytical methods from cognitive science, the previously “untouchable” data of entrepreneurial discovery can be studied rigorously and systematically.

Fourth, entrepreneurship research needs to lean more toward the “design” side of entrepreneurship. Entrepreneurial discovery is not a naturally occurring phenomenon governed by physical laws alone; it is an artificially created entity by human purposeful behavior in the domain of the sciences of the artificial (Simon, 1996). To study it means to study the principles of good “design”—i.e. the rationality of purposeful behavior—involved in entrepreneurial discovery. This current study is an example of research focused on “design” (so are the four studies reviewed in chapter 2.0); its results illustrate that there is much such research can contribute to entrepreneurial practice. However, studies like ours are few and far between in the current literature, which, taken as a whole, is mostly populated with studies that inappropriately treat entrepreneurial behavior as mere statistics.

## 7.6 GENERALIZATION BEYOND PROMISING START-UPS

This study focuses on entrepreneurial discovery in promising start-ups, where there is little prior planning and research; therefore, it does not provide any direct insight on how initiatives that heavily depend on prior planning and research, such as VC-backed start-ups and corporate initiatives, could improve their practice in planning and research.

But, as to resource requirement, there seems to be no reason why those types of ventures could not adopt the E-principles to complement their own approach. After all, compared with their rich endowments, promising start-ups often started with next to nothing. However, as Bhide (2000) argues convincingly that, while the superior endowments of VC-backed start-ups and corporate initiatives (see Table 2.1) enable them to take on initiatives that are out of reach for promising start-ups, their organizational constrains, which are an intrinsic part of their capability,

may at the same time impede their adoption of certain activities that come natural to promising start-ups.

Two questions, therefore, need to be asked regarding generalizing the E-principles beyond promising start-ups. First, could VC-backed start-ups and corporate initiatives somehow adopt these E-principles, or some of them, to complement their own approach? Second, what adjustments on the E-principles and what adjustments on those other ventures need to be made for the adoption to be successful? These two questions are based on the assumption that the E-principles or some variations of them are the best for entrepreneurial discovery in the other types of initiatives, too—if entrepreneurial discovery is ever needed there. Whether this assumption is true is the third question.

The scope of this study does not encompass developing the answers to the three questions. Quinn's research (see review in section 3.1.1) seems to suggest that the answers would be positive: "the successful big innovators I studied have developed techniques that emulate or improve on their smaller counterparts' practices" (1985: 77). More complete answers await further research that targets specifically on entrepreneurial discovery in VC-backed start-ups and corporate initiatives.

# 8.0 LIMITATIONS AND FUTURE RESEARCH

This chapter discusses two major limitations of this study as well as four directions for further research that can directly strengthen or extend the results obtained here.

## 8.1 LIMITATIONS

To overcome long-standing hurdles in data acquisition and analytical methods in research on entrepreneurial discovery, this study originates a research design that combines the rich information of entrepreneurial autobiographies with the analytical strength of protocol analysis and two-step inference. While enabling it to achieve the research objective of generating a comprehensive view of entrepreneurial discovery, this research design also results in a few limitations that prevent this study from providing a definitive answer on the subject.

First, due to its complete reliance on case histories already in print that meet certain qualities (see section 5.2), this study has been from the beginning at the mercy of the availability of quality autobiographies written by entrepreneurs of promising start-ups. As it turned out, such autobiographies were rare exceptions (see section 5.3), which made random sampling from a large population out of the question. Although, eventually, four qualified cases covering a wide variety of venturing circumstances were located (which also consequently produced fruitful results), this study remains exploratory in nature.

Second, entrepreneurial autobiographies, while having clear advantages over other available data sources (see section 5.1), are still but dim images of what *actually* went on in the mind of the entrepreneur during entrepreneurial discovery.

Although, philosophically, all human knowledge, at the end of the day, is but a dim image of *the* reality out there, more data and better data in this case would have definitely enhanced the sharpness and resolution of the results.

## 8.2 FURTHER RESEARCH

Beyond the E-principles, there are undoubtedly other important "parameters" of entrepreneurial discovery, e.g. How important a role do entrepreneurs' values and personal goals play in building promising start-ups? However, to improve the return of the effort already spent in studying the E-principles, this section only focuses on further search that can directly strengthen or extend the current study.

First, more effort is needed to search for qualified entrepreneurial autobiographies on promising start-ups—after all, the four cases in this study represent the effort of only one person searching recent publications written in English only. If resources allow and privileged access is granted, data of entrepreneurial discovery that are even better in all accounts than quality entrepreneurial autobiographies can be potentially collected. When more and better data become available through either way mentioned here, or better ways, they can be analyzed to see if more E-principles or better E-principles, as well as better interrelationships between the E-principles, can be discovered. For example, all four entrepreneurs included in this study were by and large nascent entrepreneurs when they started their venture; if quality cases on veteran entrepreneurs building promising start-ups—instead of getting involved in other kinds of initiatives—become available, it will be interesting to see if they use different and better principles due to their presumably improved entrepreneurial capability. Of course, the four cases used here can be and should be reanalyzed by other researchers to see if better and more insightful inferences can be made.

Second, this study intentionally avoids cases where more than one lead entrepreneurs have been involved (see section 5.2) on the assumption that the eventual autobiography, which is usually written by just one entrepreneur (even if there has been a partnership), may not be able to adequately and accurately capture the details of the entrepreneurial process that has been primarily influenced by what was in the mind of the other entrepreneur(s). Considering that the

high reporting fidelity of firsthand view of the lead entrepreneur is the predominant reason why autobiographies, instead of journalistic accounts of the same ventures, are used in the first place, this assumption is a critical safeguard for data quality. Be that as it may, this single-entrepreneur criterion greatly reduces the number of potential cases that can be used for study:

> Partnerships are common in new ventures—they represent 70 percent of the *Inc*. start-ups I studied. *Inc.*'s survey of the companies on its 1992 500 list also showed that about two-thirds were started as partnerships. (Bhide, 2000: 303)

Therefore, in further research, it may be worthwhile to explore possible consequences of loosening up this criterion. If data quality is not unduly affected, not only will more cases likely become available, interesting patterns or new principles may be discovered because of the added complexity of managing and taking advantage of the partnership of lead entrepreneurs.

Third, for each E-principle, effort needs to be made to try to *dis*-confirm it by devising convincing underlying mechanisms, showing *why* this particular E-principle is 1) *not* good at all, or 2) *not* good under certain circumstances (e.g. Christensen's [1997] research shows that being close to customers may not be good for incumbents when disruptive technology exists), or 3) something *else* is better. Only this way can the E-principles be seriously challenged. Because all of them share extensive connections with a large body of other concepts and theories that we believe to be true, one or two counter examples, or the conventional research strategy of having controls (e.g. studying successful and unsuccessful cases side by side) will *not* amount to challenges serious enough to displace them. An example of such futile effort of using controls can be found in McKelvie and Wiklund (2004), which is reviewed in section 3.1.3. In their research, McKelvie and Wiklund's studied two ventures in changing market conditions side by side: one failed and one succeeded—the failed one did not respond to market feedback as well as the successful one. However, this seemingly legitimate control is actually a "pseudo-control" because the validity of being responsive to market feedback when the market is changing was *not* established in their study by the counter example of the failed venture—on the contrary, the attribution of why the failed venture failed *was* established by their prior conviction (a very sound one indeed, as most people would agree) that such responsiveness is good in changing market!

Fourth, there are important questions need to be answered through further research before we can say anything definitive about how the E-principles can benefit initiatives that heavily rely

on prior planning and research, such as VC-backed start-ups and corporate initiatives. As detailed discussion on this topic was already given in section 7.6, it will not be repeated here.

## APPENDIX A

## E-PRINCIPLES IN DETAIL

1. *greater leverage*: find ways to make bigger impact than what's normally possible for the resource you have
   - ✓ *focusing on strength*
   - act from a position of strength when in doubt
   - exploit the resources that give you competitive advantage
   - focus on advantages and downplay disadvantages (2)
   - focus on people's strengths and downplay their weaknesses
   - focus on what you can influence and downplay what you cannot
   - make use of your strength in negotiation (5)
   - negotiate from a position of strength or others' weakness (6)
   - ✓ *focusing on what is important*
   - choose mission/value over occasional bottom line
   - clarify question first (4)
   - focus on key business issues--product, customers, competition, and financials
   - focus on solving the important problem or part of problem
   - focus on what's more important (2)
   - focus on your chosen strategy (6)
   - target the more important audience (2)
   - target the more promising customers (2)
   - understand customers' problems first (3)
   - ✓ *making use of others' resources*

- delegate the work in which your involvement is not essential (12)
- delegate the work that no longer offers any challenge and learning opportunity
- encourage grass-roots level initiatives
- have customers help themselves
- have people help themselves
- have people with experience and expertise on your board of advisors (2)
- hire "giant" to become "giant" (8)
- make use of customers' experience and knowledge (5)
- make use of others' knowledge and assistance (5)
- make use of the brain of your board of advisors/directors (2)
- make use of your customers' credit worthiness
- make use of your partners' superior resources--tangible or intangible (10)
- use others' expertise (13)
- use others' legitimacy (2)
- use others' resources and capability to represent you (3)
- use peer groups to enhance learning and support (4)

✓ *using the right leverage point*

- assess performance in critical conditions
- assume positions of influence
- become the perceived expert (2)
- choose for diversity for your board of advisors/directors
- choose outsiders over insiders for your board of advisors/directors
- choose the most suitable legal form for your business
- computerize tasks that require substantial human efforts (5)
- create direct communication for multiple involved parties (5)
- create supportive insiders through mutual assistance (5)
- encourage fruitful group interactions
- enhance performance through building self-confidence
- focus on decision makers (7)
- focus on solving universal problems (12)
- help someone who can help you (2)

- help your own business through taking care of the complementary
- hire independent thinkers instead of yes-men
- hire people for their likeability as well as their technical proficiency
- hire people with a healthy dose of sense of humor
- keep the morale high (2)
- lead through goal setting (4)
- make use of all the PR opportunities around you (4)
- make use of positive word of mouth of existing customers (2)
- match capability with assignment (5)
- match performance style--individual vs. team--with work
- match personal style--e.g. aggressive vs. laid-back--with work
- match pricing scheme with the characteristics of the product (2)
- prefer PR over advertising (2)
- sell yourself by focusing on helping others (19)
- set well-defined specific performance goals
- share customer success stories
- take care of early adopters of your product
- take care of opinion leaders
- take care of your people with sufficient recreational activities and recognition
- treat existing customers as valuable resources
- use classified ads in newspapers
- use direct mail in attracting potential customers (3)
- use existing customers to help launch new products
- use multiple suppliers, avoid being dependent on any particular supplier (5)
- use public image to project your intended identity
- use technology to duplicate personal effort
- use training to duplicate personal effort (2)
- write business plan to think through your choice of focus

2. *reducing operation cost*: reduce operation cost, making the operation cheaper to run
   - ✓ *reducing cost of capital*
   - borrow from personal relationships

- get paid early and pay late (4)
- overcome lack of cash through bartering or seeking credit from suppliers (2)

✓ *reducing employment expenses*

- have family members and relatives work for you (4)
- hire from marginal groups (8)
- hire on part-time until business grows (4)
- pay yourself last and less
- work long hours (use sweat capital) (3)
- work multiple tasks (5)

✓ *reducing overhead*

- keep overhead expenses low (6)
- make salespeople your first hires in opening a new office (2)
- use independent sales reps as opposed to internal sales reps

✓ *others*

- make use of free information available (2)
- reduce unnecessary transactions before the final sale
- seek help first from your social network (6)

3. *seeking commitment*: bond people—socially, economically, emotionally, intellectually, etc.—to you, your company, your business, or your preferred course of action

✓ *demonstrating commitment*

- put others' best interest over your own
- lead through personal example (3)
- spend generously your personal resources (3)

✓ *making use of self-interest*

- align interests
- assign unambiguous responsibility
- match compensation or reward with business objectives
- share ownership
- share pieces of the action to enlist others' help
- use performance-based compensation

✓ *pursuing better interpersonal relationship*

- address people by their names in a friendly manner
- build higher levels of relationship for long-term cooperation through personnel continuity
- embrace candor in difficult situations with others (3)
- know your students, care for them, and earn their trust, respect and confidence (2)
- know those who work for you, care for them, and earn their trust, respect and confidence
- nurture candor, fairness, and trust (3)
- nurture ease, closeness, openness, candor in client relationship (3)
- nurture equality, directness, and openness (2)
- nurture friendliness with people you rely on
- share joyous collective activities with a unique identity (2)
- substitute trust for legal sanction
- value trust as much as competence (2)
- value trust in building partnership (2)

✓ *pursuing motivation*

- choose people with high commitment to face tasks with high uncertainty
- focus people's attention on the moral values behind and beyond everyday operation (2)
- hire people with inner-motivation (2)
- value motivation as much as competence (3)
- let people choose for themselves instead of imposing decisions on them (3)
- make people buy into your decision instead of imposing it on them (2)

4. *replicating success*: applying previous successful approaches to solving similar problems
   - apply your skills in one field to similar fields
   - learn from what you like and apply it in your own work (4)
   - replicate successful solutions on similar problems (18)
   - replicate your success with customers on a larger customer population (3)
   - reuse the PR strategy that has worked
   - use similarity with your existing customers to find new customers (13)
5. *responsiveness to feedback*: seek out feedback—others' responses to your action or inaction—and adjust your behavior accordingly

- check a project's performance frequently and resolve any issue that needs to be taken care of (6)
- consider the possibility that you may have misunderstood the problem if your persistent effort has failed
- develop new product/service based on customers' unsolved problems (11)
- follow up frequent performance evaluation with appropriate rewards or punishments (5)
- give serious thought to cooperation opportunity brought to you (2)
- improve your solution based on feedback (8)
- seek out and study the feedback to what you do (3)
- study what went wrong and avoid the same mistakes (3)

6. *reducing adoption cost*: make it easier for people to accept/adopt your message, your product, your offer, etc.
   - attract attention (10)
   - communicate to your potential customers the "miss-proof" way
   - create a loud and clear image by identifying what you do with symbols of your company (3)
   - educate for better acceptance of new things (3)
   - keep in mind that even good products don't sell themselves (2)
   - make customers' entire experience with your product/service trouble-free (2)
   - make "risk-free" offers (8)
   - make thing easier to use for customers (2)
   - make written communication direct and precise
   - match name with the nature of the organization
   - mingle with your target customers
   - provide better value than alternative products
   - use enticement rather than punishment to get what you want
   - use humor in presenting your company and product (2)
   - use Q&A format to present information
7. *being prepared*: make or get ready for what is to come or what is to be required
   - establish loan credit before you need it
   - find out and learn what you need to know to do what you intend to do (2)

- gather evidence before make accusation
- gather market intelligence about your competitors (4)
- get to know the people you need to deal with
- have a backup plan for your computer presentation
- hire managers in expectation of future business growth
- learn about others through watching their body language
- take legitimate fear seriously
- practice, practice, and practice in as similar a situation as possible (3)
- prepare for managerial challenges that come with growth
- prepare your counter argument based on the original argument
- provide necessary training in advance (4)
- set aside contingency funds
- sign a legal document only after you understand it (3)
- strive for quality market information (2)

8. *taking control*: take yourself, the situation you are faced with, etc., under your own control instead of the control of circumstances or others
    - build your image at each and every encounter
    - create satisfied customers through after sale service
    - do what you think is right (11)
    - keep control of the ownership (3)
    - pursue customer satisfaction down to each and every encounter (4)
    - uphold service quality through uniform training
    - use your own personnel
9. *perseverance*: don’t be discouraged by setbacks, difficulties, rejections, failures; keep going
    - insist on getting what you want when the other party is trying to tire you out in a negotiation
    - keep going when the going gets tough (9)
    - keep trying if you didn't succeed (4)
    - stay in the game even if you have failed for the time being (2)
    - take "no" as the journey not the finale (10)

10. *seeking structural solutions*: prefer to deal with systematic problems first; make institutional arrangements for the actions or solutions for their continuity, stability and sustainability
    - institutionalize a beneficial one-time happening (6)
    - pursue institutional arrangements for continuity, stability and sustainability of an activity (6)
    - pursue institutional solutions for financing
    - pursue institutional solutions for long-lasting or widely spread problems (4)
    - pursue systemic and structural amendments
    - substitute robust management processes for ad hoc measures
11. *direct approach*: prefer the shortest connection between you and the things or people you want to deal with
    - assess competence through case interview (2)
    - check personal references for evaluating candidates
    - conquer fear by directly facing it
    - evaluate people based on recommendations from people having first-hand experience (2)
    - get as near to the source of a situation as possible to understand it (11)
    - interview a law firm before hiring it
    - prefer to use first-hand experience in evaluating people
12. *reducing "enemy" defense*: reduce resistance to or difficulty with what you want to do
    - avoid attention through informal procedures
    - call during afterhours to avoid caller screening
    - divide and conquer (6)
    - invite people out on your expense to create conversational opportunities
    - play a helpless victim when facing a 800-pound gorilla
    - put people at ease in conversation (4)
    - talk business during off-hours
    - use humor to defuse tension
    - use similarities with your audience to improve communication (2)
    - use third-party mediation to reduce tension in dispute

13. *escaping diminishing returns*: don’t waste your resources on things or courses of action that have little or even negative payback
    - avoid analysis paralysis
    - avoid displaying emotions that do not help achieving your objective
    - avoid fighting a war you are likely to be overwhelmed
    - avoid taking a stand when faced with chauvinist or sexist remarks (2)
    - deflect personal offenses without becoming offensive
    - don't "fight" against the market
    - don't linger on a losing cause (2)
    - don't meddle where you are not needed (3)
    - ignore anxiety
    - seek quality but avoid perfectionism (3)
    - stick to the standard if you want to use standard pricing (2)
14. *continuing improvements*: find ways for yourself, your people, and your business, etc., to do better
    - keep improving your own practice (7)
    - learn from what you admire
15. *affordable loss*: try not to face a risk or give up something that you cannot afford to lose
    - concede only what is affordable (2)
    - take baby steps to reduce cost and risk exposure when doing new things (4)
    - take opportunities to explore at little or none of your own expense (4)
16. *being "one and only"*: crush your competition, or at least make their life difficult
    - build product/service clearly superior to the competitor's
    - deny others the chance to compete successfully with you in your choice of strategy (2)
    - register your trademarks
17. *considering both sides*: consider comprehensively in situations where a subject has both pros and cons, direct effect and indirect effect, or short-term and long-term consequence, etc.
    - consider both pros and cons of a hard choice (2)
    - consider both worst-case and best-case scenarios of your option
    - consider publicity together with an action's direct payoff

# APPENDIX B

# E-PRINCIPLES IN ACTION: DETAILS

## B.1 KAPLAN OF KAPLAN

### B.1.1 kap-03

**Episode ID:** kap-000-080 **Page:** 28 **Venture:** Kaplan, Inc.

**Time:** early 1940s

**Comment:** kap-03

**Conditions**

***Sequence Condition***

Larry, one of my students at that time, had problems remembering our algebra lessons from one week to the next.

**Actions**

***Sequence Action***

I told him, "I'm going to record today's lesson. Come an hour early next week and listen to it."

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-007 | what you do does not fully achieve your objective, | try to make adjustments to what you do based on the feedback. | responsiveness to feedback |
| 000-418 | your product/service is currently | try to use technology to duplicate what | greater leverage |

| | | | |
|---|---|---|---|
| | offered in person, | you can offer in person (because once the duplication is done, it can be reused over and over by many people without taking any more of your personal time). | |
| 000-425 | customer satisfaction is critical, | you should treat each of your worthy customers as if your entire customer base depended on it. | taking control |

**Episode ID:** kap-000-090 **Page:** 28 **Venture:** Kaplan, Inc.

**Time:** early 1940s

**Comment:** kap-03

**Conditions**

***Sequence Condition***

It worked like a charm. After listening to the tape, he remembered and understood almost everything we had covered in the previous lesson.

**Actions**

***Sequence Action***

I encouraged other students to review their lessons before and after our sessions to reinforce concepts. It was as if students were getting two lessons for the price of one.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-176 | a chance or one-time happening benefits you, | you may find it a good idea to systematize or institutionalize it if feasible. | seeking structural solutions |

### B.1.2 kap-07

**Episode ID:** kap-000-310 **Page:** 64 **Venture:** Kaplan, Inc.

**Time:** 1960s

**Comment:** kap-07

**Conditions**

### *Sequence Condition*

01 But the largest number of new requests for test preparation came from former SAT students who were now in college and wanted help with graduate and professional school admissions exams.

02 One of the most popular requests was preparation for the Medical College Admission Test (MCAT).

03 MCAT was a very difficult exam; it tested students on basic sciences, including biology, organic and inorganic chemistry, and physics. I had never seen the MCAT.

**Actions**

### *Sequence Action*

So I began talking to my former SAT and Regents students who were now in medical school and had taken the MCAT. I also studied the MCAT instruction booklet all students received before taking the test.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-054 | it's about the focus of the business, | prefer solving universal problems instead of idiosyncratic problems (even if those universal problems cost more and take longer to solve). | greater leverage |
| 000-323 | you are trying to solve a problem, | you need to find out first the true situation of the problem. | greater leverage |
| 000-328 | you are not able to do what you intend to do because you lack certain knowledge or information, | find it out and learn it. | being prepared |
| 000-433 | you need help, | try to see if someone in your social network can help you, especially those who you trust, before looking for others. | reducing operation cost |

**Episode ID:** kap-000-320 **Page:** 64 **Venture:** Kaplan, Inc.

**Time:** 1960s

**Comment:** kap-07

**Conditions**

***Sequence Condition***

All of this gave me a fair idea of what the MCAT was like.

**Actions**

***Sequence Action***

I decided to help my students prepare for the MCAT. I hired medical students to help me write study materials and sample tests as practice tool.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-036 | you don't have the required expertise to do a task well AND that task is mission-critical, | seek help from qualified others. | greater leverage |
| 000-046 | a customer has important problems that your current product/service cannot help solve, | try to develop the new product/service that can help. | responsiveness to feedback |
| 000-272 | you have successfully solved a problem, | apply your solution to similar problems. | replicating success |
| 000-422 | people with low employment opportunity cost such as housewives and students can get your job done, | hire them instead of people with high employment opportunity cost. | reducing operation cost |

## B.1.3 kap-08

**Episode ID:** kap-000-360 **Page:** 68 **Venture:** Kaplan, Inc.

**Time:** 1960s

**Comment:** kap-08

**Conditions**

***Sequence Condition***

01 One of my enterprising employees, Lucille San Giorgio, was a Kaplan booster who believed in our product and decided to make a soft sell to Catholic schools even though the staff at many

private schools were reticent toward preparation.

02 Some private schools were so anti-test prep that they forbade test preparation outside school. They felt it undermined the reputation of their teachers, who led small classes and emphasized math and verbal skills.

**Actions**

***Sequence Action***

I encouraged Lucille's effort. And we focused on showing them that our classes supplemented, not replaced, their own classroom instruction,

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-329 | you are trying to convince people of your offer, | try to structure the offer in a way that incurs them little to no risk but provides them with attractive benefits or upward potentials. | reducing adoption cost |
| 000-434 | it's about encouraging innovation in an organization, | grass-roots level initiatives should be encouraged. | greater leverage |

**Episode ID:** kap-000-370 **Page:** 68 **Venture:** Kaplan, Inc.

**Time:** 1960s

**Comment:** kap-08

**Conditions**

***Sequence Condition***

Many of these schools invited us to teach test preparation classes in their schools.

**Actions**

***Sequence Action***

That became a new marketing approach for us. It also marked the beginning of our effort to forge new relationships with school administrators, teachers, and counselors. We also reached out to the neighborhood yeshivas [Jewish schools].

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-272 | you have successfully solved a problem, | apply your solution to similar problems. | replicating success |
| 000-384 | you want to achieve continuity, stability and sustainability of an activity, | prefer institutional arrangements as opposed to ad hoc arrangements (such as those dependent on personal initiatives). | seeking structural solutions |

### B.1.4 kap-10

**Episode ID:** kap-000-440 **Page:** 77 **Venture:** Kaplan, Inc.

**Time:** 1970

**Comment:** kap-10

**Conditions**

***Sequence Condition***

| | |
|---|---|
| 01 | I was getting more and more calls from University of Pennsylvania students who want to take an MCAT class in Philadelphia rather than travel to Brooklyn. |
| 02 | Carol Weinbaum, who had worked for me in Brooklyn for twelve years before moving to Philadelphia with her husband, who had a Ph.D. in biochemistry. |

**Actions**

***Sequence Action***

| | |
|---|---|
| 01 | I phoned Carol Weinbaum, suggesting that she and her husband teach classes at their home just one time on a trial basis for those perspective students in Philadelphia. |
| 02 | I told Carol I would send all the MCAT study materials, lesson plans, practice tests, and review tapes we used in Brooklyn--all at my expenses. |

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-019 | you have successfully solved one person's problem, | try to locate others in similar situation who you can potentially help too. | replicating success |
| 000-062 | you have more work than you can do yourself, in which your involvement is | try to delegate such work to others. | greater leverage |

| | | | |
|---|---|---|---|
| | not essential. | | |
| 000-201 | when it comes to hiring (or promoting) people, | you should try to hire (or promote) competent and high-quality people for the job. | greater leverage |
| 000-329 | you are trying to convince people of your offer, | try to structure the offer in a way that incurs them little to no risk but provides them with attractive benefits or upward potentials. | reducing adoption cost |
| 000-433 | you need help, | try to see if someone in your social network can help you, especially those who you trust, before looking for others. | reducing operation cost |

**Episode ID:** kap-000-450 **Page:** 87 **Venture:** Kaplan, Inc.

**Time:** 1970

**Comment:** kap-10

**Conditions**

***Sequence Condition***

Carol's trail classes were very successful. She was convinced of signing on with Kaplan.

**Actions**

***Sequence Action***

01 I made Carol the first Kaplan administrator to open a center outside Brooklyn.

02 I paid the opening costs, overhead, and teachers' salaries. I also sent volumes of materials designed specifically for each course. Instead, center administrators were independent contractors who earned a 25 percent commission on the center's revenues.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-478 | you need to share part of the action of your business with others to enlist their help, | prefer to revenue (or profit) sharing instead of ownership sharing. | taking control |
| 000-177 | there are other people around who are capable of helping you do what you are | it may be advisable to enlist their help by promising them part of the action that | seeking commitment |

| | | | |
|---|---|---|---|
| | doing, | they think fair or even generous of you.. | |
| 000-329 | you are trying to convince people of your offer, | try to structure the offer in a way that incurs them little to no risk but provides them with attractive benefits or upward potentials. | reducing adoption cost |

## B.2 KURTZIG OF ASK

### B.2.1 kur-01

**Episode ID:** kur-000-070 **Page:** 36 **Venture:** ASK Computer Systems Inc.

**Time:** working on my first sales call, Pulverizing Machinery, after I was assigned to a newly created GE sales office in West Orange, New Jersey

**Comment:** kur-01

**Conditions**

***Sequence Condition***

Evan Bakke, Pulverizing's R&D manager, gave me a task-by-task rundown of the manufacturing process, and took me from workstation to workstation.

**Actions**

***Sequence Action***

Through the din I fired dozens of questions at Bakke to get a sense of how Pulverizing's manufacturing process worked and what the thinking was behind their operations.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-013 | you are approaching a prospective customer, | try to understand his problems first before making your sales pitch. | greater leverage |

**Episode ID:** kur-000-080 **Page:** 36 **Venture:** ASK Computer Systems Inc.

**Time:** working on my first sales call, Pulverizing Machinery, after I was assigned to a newly created GE sales office in West Orange, New Jersey

**Comment:** kur-01

**Conditions**

***Sequence Condition***

01 During my tour I saw time-wasting, labor-intensive manufacturing operations at Pulverizing.

02 GE's canned time-sharing programs could help Pulverizing in many ways, but were of little use to improving Pulverizing's operation efficiency.

**Actions**

***Sequence Action***

Back in Bakke's office, when I should have been hauling out GE's catalog of programs, I told him I was struck by what seemed to be a lot of wasted production time and talked with him in detail about possible solutions.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-018 | you are working on solving a customer's problem, | try to elicit and make good use of the customer's cooperation. | greater leverage |
| 000-046 | a customer has important problems that your current product/service cannot help solve, | try to develop the new product/service that can help. | responsiveness to feedback |

**Episode ID:** kur-000-090 **Page:** 37 **Venture:** ASK Computer Systems Inc.

**Time:** working on my first sales call, Pulverizing Machinery, after I was assigned to a newly created GE sales office in West Orange, New Jersey

**Comment:** kur-01

**Conditions**

***Sequence Condition***

01 To achieve a good balance between the need for inventory control and production efficiency at Pulverizing, scheduling needs to be done.

02 To schedule a custom shop like Pulverizing--one where a different product or part of a product

was manufactured every day--around labor time involved too many variables to be calculated efficiently by hand.

03 Each custom job would require a completely new calculation, if done by hand, any labor time saved would most likely be offset by the time it took to recalculate the schedule.

**Actions**

***Sequence Action***

So I said to Bakke, "It seems to me we could write a program that could schedule your operations and keep your machines and your people working at top efficiency."

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-015 | a calculation that involves many variables or needs constant recalculating cannot be done efficiently and accurately by hand, | you should have a computer program to automate this calculation. | greater leverage |

**Episode ID:** kur-000-100 **Page:** 38 **Venture:** ASK Computer Systems Inc.

**Time:** working on my first sales call, Pulverizing Machinery, after I was assigned to a newly created GE sales office in West Orange, New Jersey

**Comment:** kur-01

**Conditions**

***Sequence Condition***

When I told Bakke, "It seems to me we could write a program that could schedule your operations and keep your machines and your people working at top efficiency." He heard me out.

**Actions**

***Sequence Action***

I arrived at Pulverizing the next day with dozens of lines of program code on a sheet of paper to show Bakke. "It's not perfect," I said, "but it's a beginning. Let's start with this."

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-017 | you are solving a problem, | try to come up with a quality solution, even if it is imperfect or partial, instead of trying to make the solution perfect. | escaping diminishing returns |
| 000-018 | you are working on solving a customer's problem, | try to elicit and make good use of the customer's cooperation. | greater leverage |

### B.2.2 kur-05

**Episode ID:** kur-000-400 **Page:** 58 **Venture:** ASK Computer Systems Inc.

**Time:** chugging along in my second year in business, in mid-1973

**Comment:** kur-05

**Conditions**

***Sequence Condition***

01 Gary Kettleson called from Tymshare, the small, aggressive time-sharing company that was outselling GE on the West Coast. He wanted me to write a manufacturing program for the Tymshare network--a canned, one-size-fits-all program.

02 However I liked being a heroine to individual customers and the satisfaction of customer contact. Besides, the current wisdom was that manufacturing companies needed custom programs tailored to specific operations.

03 Mostly, though, I wanted my independence.

04 I refused him, but he called back a couple of weeks later.

**Actions**

***Sequence Action***

My second thought was that maybe Gary was right I heard him out.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-064 | you are approached for cooperation on a business opportunity new to you, | you should give it some serious thought rather than simply passing it up (because you may be missing a worthy | responsiveness to feedback |

| | | | |
|---|---|---|---|
| | | opportunity). | |
| 000-253 | there are opportunities to get exposed to relevant people, activities, or information and ideas at little or none of your own expense, | you should take the opportunities to explore and see what you can find out. | affordable loss |

**Episode ID:** kur-000-410 **Page:** 59 **Venture:** ASK Computer Systems Inc.

**Time:** chugging along in my second year in business, in mid-1973

**Comment:** kur-05

**Conditions**

***Sequence Condition***

I was giving Gary's proposal for writing a universal program for all manufacturing companies careful consideration.

**Actions**

***Sequence Action***

I decided that his argument for a universal program for manufacturing companies made a great deal of sense. I agreed to write the universal program Tymshare wanted.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-052 | it is about manufacturing companies--however varied their products may be, | their needs for computerized material and operation management were more similar than dissimilar. | local fact |
| 000-054 | it's about the focus of the business, | prefer solving universal problems instead of idiosyncratic problems (even if those universal problems cost more and take longer to solve). | greater leverage |

**Episode ID:** kur-000-430 **Page:** 60 **Venture:** ASK Computer Systems Inc.

**Time:** chugging along in my second year in business, in mid-1973, working with Tymshare

**Comment:** kur-05

**Conditions**

### *Sequence Condition*

I agreed to write the universal program Tymshare wanted.

**Actions**

### *Sequence Action*

After three months' work, the program ASK developed for Tymshare was bare bones, allowing Tymshare's customers to enter their data quickly and be up and running within days.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-070 | the time is early 1970's AND it's about inventory and operation management for manufacturing companies, | the manual cardex system (little file drawers filled with tiny cards corresponding to each part number) was the mostly used inventory control method then. | local fact |
| 000-071 | inventory control method in use for a manufacturer is the manual cardex system ((little file drawers filled with tiny cards corresponding to each part number), | it's painstaking to maintain AND it's difficult to update AND it's slow to use. | local fact |
| 000-072 | a computerized inventory and operation management program can be designed, | compared with the manual cardex system (little file drawers filled with tiny cards corresponding to each part number), even a rudimentary version is likely to be easy to maintain and update, and fast to use. | local fact |
| 000-073 | the product satisfies the demand AND there is an under-served market waiting, | you may want to favor a shorter time to market over delaying it in order to further perfect it. | escaping diminishing returns |

**Episode ID:** kur-000-440 **Page:** 62 **Venture:** ASK Computer Systems Inc.

**Time:** in my second year in business, in mid-1973, working with Tymshare

**Comment:** kur-05

**Conditions**

### *Sequence Condition*

I wrote both the universal manufacturing program and its manual for Tymshare.

**Actions**

### *Sequence Action*

I built the same simplicity into the manual that I'd built into the software, making use of a similar question-and-answer format the user could easily walk through.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-032 | you are designing a product, especially when customers' familiarity with this product is likely to be low, | try to make the product easy for them to use. | reducing adoption cost |
| 000-074 | it's about presenting information, | organize it in a question-and-answer format. | reducing adoption cost |

**Episode ID:** kur-000-450 **Page:** 63 **Venture:** ASK Computer Systems Inc.

**Time:** early 1974, working with Tymshare

**Comment:** kur-05

**Conditions**

### *Sequence Condition*

01 By early 1974, the program I wrote for Tymshare, named MANMAN (short for MANufacturing MANagement) was run on Tymshare's system.

02 ASK made around 20 percent of every dollar that Tymshare billed their customers for using MANMAN.

**Actions**

### *Sequence Action*

I now decided to dedicate much of my time to helping Tymshare's sales reps to learn how to sell it.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|

| | | | |
|---|---|---|---|
| 000-445 | you can do something well but there is more than what you are able to do yourself, | you can train other people how to do it and have them do it. | greater leverage |
| 000-076 | there is someone who can help you, | you should help him. | greater leverage |
| 000-077 | it's about people's acceptance or adoption of a product--no matter how good the product is, | you should pay attention to the sales efforts. | reducing adoption cost |

### B.2.3 kur-10

**Episode ID:** kur-000-710 **Page:** 101 **Venture:** ASK Computer Systems Inc.

**Time:** fall 1975

**Comment:** kur-10

**Conditions**

***Sequence Condition***

01 I'd started as a contract programmer. Seizing opportunities as they arose, ASK soon became a service bureau, then created a universal MANMAN product on Tymshare.

02 Responding to the problem of the skyrocketing on-line costs of timesharing, we turned to minicomputers and took on the Powertec job with the intention of developing a one-size-fits-all program that could be sold over and over.

03 In 1975, We were confronted with writing new programs, Powertec on the HP 2100, Boeing on the HP 3000, Hughes Oceanside on the HP 21MX, and a program for HP to use internally, I was back to being a contract programmer.

04 With the exception of the Hughes Oceanside project, where we were only a few months away from implementing MANMAN on the HP 21 MX, all other projects had us do custom programming on computers unfamiliar to us.

05 Meanwhile, I also knew dearly that me and crew had invested so much time and energy, knocking ourselves out at HP, night after night, to give Boeing what they wanted. And we were already low in morale due to the cancelled Powertec project.

06 HP also had been hoping the Boeing project could open for them the door for more future sales--HP was already not very satisfied with the failure of the Powertec project. And it'd taken months for us to write the contract with Boeing in the first place.

**Actions**

### *Sequence Action*

I felt that I'd lost my direction and ASK had lost its logic of progression. I decided that we should focus our energies on being successful at Hughes and get out from under all the other projects.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-054 | it's about the focus of the business, | prefer solving universal problems instead of idiosyncratic problems (even if those universal problems cost more and take longer to solve). | greater leverage |
| 000-136 | there are opportunities along multiple directions, | you should only pursue those that are along the direction of your choice of focus. | greater leverage |
| 000-140 | you have decided on a course of action that's most consistent with your choice of focus, | you should stick to it however hard emotionally, financially, or socially this decision is. | perseverance |

**Episode ID:** kur-000-730 **Page:** 102 **Venture:** ASK Computer Systems Inc.

**Time:** fall 1975

**Comment:** kur-10

**Conditions**

### *Sequence Condition*

01 Since I had decided the best course for ASK out of my best judgment, next I needed to choose how to break my decision to my ASK employees.

02 As the owner and top manager of ASK, I was paying salaries and the decision and responsibilities were ultimately mine.

**Actions**

### *Sequence Action*

I called the ASK crew together to share my thoughts. I wanted their approval and backing. I

wanted them to feel as part of the decision-making process.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-137 | it's about a difficult decision you want people to take, | try to have them buy into it themselves by sharing your reasoning with them and giving them a chance to have their opinions heard and considered, rather than merely imposing the decision on them. | seeking commitment |

**Episode ID:** kur-000-750 **Page:** 104 **Venture:** ASK Computer Systems Inc.

**Time:** fall 1975

**Comment:** kur-10

**Conditions**

***Sequence Condition***

01 Graeber Jordan, the project manager at Boeing, had been distancing himself from ASK as the project bogged down. He was an up-and-comer in the company, and he now was trying to get his fingerprints off the murder weapon.

02 When I told Graeber over the phone that ASK wanted out, he yelled, "We've put all this time and energy into this system, and you've made a commitment, and you have to fulfill your commitment."

03 A few days later Graeber trooped his team of Boeing lawyers and contracts and procurement people into my office. The air was thick with "We can sue you," "You haven't fulfilled--" And it's obviously they got all the money and the strength.

**Actions**

***Sequence Action***

My strategy was to play the part of the small company in over its head at the mercy of the larger company by pointing out Boeing's repeatedly modifying its requirements and the contract was too open-ended in Boeing's favor to begin with.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-142 | you are in a disagreement with another party with stronger power and a deeper pocket, | try not to get into a lawsuit with them in resolving the issue. | escaping diminishing returns |
| 000-143 | it's not judicious for you to play tough when you are in a disagreement with another party, | play the unwitting victim of bigger or uncontrollable forces and seek mercy. | reducing "enemy" defense |

**Episode ID:** kur-000-760 **Page:** 105 **Venture:** ASK Computer Systems Inc.

**Time:** fall 1975

**Comment:** kur-10

**Conditions**

### *Sequence Condition*

01 Graeber and his legal team heard me out. But instead of responding to my points, they emphasized how much effort Boeing had spent, and they kept stressing again and again the millions ASK could sell the completed program for.

02 I repeated my reservation that the program wouldn't be valuable to anyone but Boeing. "No, no," they insisted. "A lot of companies could use this program."

03 Then Graeber handed me a three-page agreement to sign.

**Actions**

### *Sequence Action*

I read it very, very carefully, glancing at Graeber and the others over the top of the pages as I read.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-144 | you are to sign a document with legal consequences, | you should really read it and understand it before you sign it (even if you've had verbal agreement with the other party about what's to be included in the document). | being prepared |
| 000-145 | you are dealing with someone, | you should pay attention to their non- | being prepared |

verbal communications such as body language besides what they say.

**Episode ID:** kur-000-770 **Page:** 105 **Venture:** ASK Computer Systems Inc.

**Time:** fall 1975

**Comment:** kur-10

**Conditions**

### *Sequence Condition*

01 The document stipulated that ASK surrender to Boeing all its work to date and that Boeing Computer Services had the right to distribute the software in any way they saw fit.

02 Since the original contract was only for Boeing's Electronic Support Division to use the finished program, while ASK got to maintain all other intellectual property rights, I asked "What do you mean, `distribute the software'?

03 Graeber and his cronies fiddled with their ties and looked furtively down at their briefcases. "You know," one of them finally ventured, "if we can salvage what you give us and one of our divisions wants to use it."

04 Our contract with Boeing was signed for $50,400 for the program to be used by Boeing's Electronic Support Division only, with a $10,000 down payment to ASK.

05 Prior to the meeting I'd figured ASK would be doing well if we only had to return the ten-thousand-dollar up-front payment. No lawsuits, case closed.

**Actions**

### *Sequence Action*

01 Now I was fairly positive that I had something Boeing really wanted (even if it wasn't finished).

02 I decided to press my luck. I told them that Boeing could take over the incomplete program for $15,000 (including the paid $10,000) , and could use the program freely within Boeing--but not on the outside.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-147 | in a disagreement, what the other party threatens to hurt you is different from | negotiate around the issue of what you have that would benefit them more, | greater leverage |

| | | | |
|---|---|---|---|
| | what you have that would benefit themselves more, | instead of what the other party threatens to hurt you. | |
| 000-150 | it's about your choice of focus, | deny others the potential to succeed in it. | being "one and only" |
| 000-151 | you find yourself in a position where you have to concede some ground to the other party in order to reach an agreement, | concede only what does not have long-term detrimental effects on your prospect of success. | affordable loss |

**Episode ID:** kur-000-790 **Page:** 105 **Venture:** ASK Computer Systems Inc.

**Time:** fall 1975

**Comment:** kur-10

**Conditions**

***Sequence Condition***

01 Again there were quick looks around the table. Suddenly Graeber announced, "Fair enough!" And I walked out of the room free and clear of Boeing, with nearly $5,000 to boot.

02 A few days later Boeing sent down the paper work for the mutual release.

**Actions**

***Sequence Action***

I read the paper work very carefully.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-144 | you are to sign a document with legal consequences, | you should really read it and understand it before you sign it (even if you've had verbal agreement with the other party about what's to be included in the document). | being prepared |

**Episode ID:** kur-000-800 **Page:** 106 **Venture:** ASK Computer Systems Inc.

**Time:** fall 1975

**Comment:** kur-10

**Conditions**

### *Sequence Condition*

In the paper work Boeing sent to me, everything seemed in order except that in the place where the $15,000 payment was mentioned, the release gave Boeing Computer Services the right to distribute the software in any way they saw fit.

**Actions**

### *Sequence Action*

I called them on it. "Come on, you guys. We specifically agreed you could use the program within Boeing only."

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-153 | you find the other party has manipulated the agreement in the last minute by sneaking in new clauses or changing the existing ones in their favor, | resist the temptation to just give in to save the trouble of going through further round of negotiation, allowing yourself to fall victim to "acceptance by default"; instead, you should be determined to get what you want. | perseverance |

**Episode ID:** kur-000-810 **Page:** 106 **Venture:** ASK Computer Systems Inc.

**Time:** fall 1975

**Comment:** kur-10

**Conditions**

### *Sequence Condition*

Since Boeing seemed to be determined to get the right to sell the program outside of Boeing, we got into further negotiation on this issue.

**Actions**

### *Sequence Action*

We finally decided on a royalty of an additional 5 percent of whatever Boeing could sell the program for to any non-Boeing company over the next five years.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-151 | you find yourself in a position where you have to concede some ground to the other party in order to reach an agreement, | concede only what does not have long-term detrimental effects on your prospect of success. | affordable loss |

**Episode ID:** kur-000-820 **Page:** 108 **Venture:** ASK Computer Systems Inc.

**Time:** 1975

**Comment:** kur-10

**Conditions**

***Sequence Condition***

01 Fortunately, since the 21MX was not an entirely new machine, but a next-generation 2100, we were able to use a lot of what we had done on the aborted Powertec job.

02 We already understood the vagaries of HP's Image data base manager. Roger had developed the terminal polling program to replace HP's Terminal Control System.

03 We knew what we wanted MANMAN to accomplish based on everything we had learned about what it took to run a successful manufacturing operation.

04 Now, all we needed was a few months to put it all together. By 1975, I decided I'd worked too long (4 years) and too hard to throw away what was surely my last chance with HP by writing anything less than a state-of-the-art program for the Hughes project.

**Actions**

***Sequence Action***

So I challenged myself and the others on the ASK team to create the most efficient program possible for Hughes.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-155 | you are the leader AND you are convinced that your organization should pursue a certain goal, | clarify and communicate this goal to your crew. | greater leverage |
| 000-353 | you are advocating a certain behavior or attitude in an organization as the leader, | you should manifest such behavior or attitude yourself. | seeking commitment |

**Episode ID:** kur-000-825 **Page:** 130 **Venture:** ASK Computer Systems Inc.

**Time:** 1976

**Comment:** kur-10

**Conditions**

***Sequence Condition***

01 In 1976, over the next few months after we got out of the Boeing contract, two large divisions of Hughes, as well as Reliance Electric, Bendix Teterboro, and a handful of other prestigious companies approached us.

02 All were big manufacturing companies with complex production systems that required us to customer design based on our existing program, MANMAN, to fit their specific needs.

**Actions**

***Sequence Action***

We turned all them down.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-136 | there are opportunities along multiple directions, | you should only pursue those that are along the direction of your choice of focus. | greater leverage |

## B.2.4 kur-14

**Episode ID:** kur-001-150 **Page:** 134 **Venture:** ASK Computer Systems Inc.

**Time:** sometime around December 1976

**Comment:** kur-14

**Conditions**

***Sequence Condition***

01 I called on a company named Gardco that manufactured outdoor lighting equipment. It had annual sales of about $8 million and was looking for a turnkey manufacturing system--our ideal target customer.

02 Phil Hurlow, their VP of finance, liked MANMAN but thought it too limited. He wanted MANMAN integrated with accounting software to provide him with a bigger picture of Gardco's manufacturing operation. And this integration was the condition for the sale.

**Actions**

***Sequence Action***

I allowed myself to be convinced by Phil, and decided that ASK should expand its goals to include a financial management program for manufacturing companies in MANMAN.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-046 | a customer has important problems that your current product/service cannot help solve, | try to develop the new product/service that can help. | responsiveness to feedback |
| 000-054 | it's about the focus of the business, | prefer solving universal problems instead of idiosyncratic problems (even if those universal problems cost more and take longer to solve). | greater leverage |

**Episode ID:** kur-001-160 **Page:** 134 **Venture:** ASK Computer Systems Inc.

**Time:** sometime around December 1976

**Comment:** kur-14

**Conditions**

***Sequence Condition***

ASK got on developing FINMAN, the financial management program, for MANMAN based on Phil's demand and suggestion.

**Actions**

***Sequence Action***

01 During the development, we had Phil worked closely with us: He spelled out what Gardco needed in an accounts receivable, accounts payable, and general ledger system and how they all should fit together as well as integrate with MANMAN.

02 Besides listening to what Phil wanted, but we also checked other basic accounting packages.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-018 | you are working on solving a customer's problem, | try to elicit and make good use of the customer's cooperation. | greater leverage |
| 000-170 | you find that something others, or even your competitors, do that you like, | take the chance to implement that yourself. | replicating success |

### B.2.5 kur-16

**Episode ID:** kur-001-310 **Page:** 143 **Venture:** ASK Computer Systems Inc.

**Time:** 1977

**Comment:** kur-16

**Conditions**

***Sequence Condition***

01 During ASK's joint sales effort with HP, it soon became clear to us that it took ASK a lot more time and effort to sell MANMAN at $35,000 than it took an HP salesman to sell his $100,000 machine once ASK had laid the groundwork.

02 In other words, ASK was doing most of the work involved in selling the hardware.

**Actions**

***Sequence Action***

I figured that instead of our current joint selling agreement with HP, ASK should become an HP original equipment manufacturer (OEM).

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-222 | party A can generate benefit for party B, | party A often can use this to get compensated somehow accordingly by party B for its effort. | greater leverage |
| 000-223 | party A is an original equipment manufacturer (OEM) of party B, | it usually means that party A can buy things (e.g. hardware) from party B at a certain discount, package it into a new | local fact |

system with its own value-added components, and sell the finished system and enjoy all the profit generated so.

**Episode ID:** kur-001-320 **Page:** 143 **Venture:** ASK Computer Systems Inc.

**Time:** 1977

**Comment:** kur-16

**Conditions**

***Sequence Condition***

01 While OEMs were common in the computer industry in 1977, virtually all were companies that would add hardware to an existing computer to make it perform a specific function.

02 It was a rare software company, on the other hand, that in 1977 enjoyed as cushy a deal. Certainly none did with HP.

**Actions**

***Sequence Action***

I made my request for HP OEM status.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-321 | you believe you are doing the right thing, | don't allow other people's disapproving opinions or how things were done differently before prevent you from doing it. | taking control |

**Episode ID:** kur-001-330 **Page:** 143 **Venture:** ASK Computer Systems Inc.

**Time:** 1977

**Comment:** kur-16

**Conditions**

***Sequence Condition***

01 HP said ASK couldn't be an OEM because we weren't modifying or adding hardware.

02 The definition of an OEM in HP's own contracts: An OEM had to "add value" to the hardware

to qualify for the discount.

**Actions**

### *Sequence Action*

I pointed out that ASK qualified under HP's own definition of an OEM as any HP's hardware OEMs. And not granting us the OEM status would mean that HP discriminated against ASK.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-474 | by not granting what you request, the other party can get into a more unfavorable position themselves, | make this potential detriment crystal clear to them. | greater leverage |
| 000-109 | your request has been rejected, | do not give up if you believe the reasons for your request are still at least as valid as before. | perseverance |
| 000-224 | it's about the US company Hewlett & Packard in the 1970s, | HP was a company that prided itself on playing by the rules and was extremely sensitive to equal opportunity issues in its business conduct. | local fact |

**Episode ID:** kur-001-340 **Page:** 144 **Venture:** ASK Computer Systems Inc.

**Time:** 1977

**Comment:** kur-16

**Conditions**

### *Sequence Condition*

Besides my moral arguments, I also had business arguments for ASK's OEM status with HP.

**Actions**

### *Sequence Action*

01 First, unlike most OEMs at the time, who mixed and matched hardware from various vendors, ASK's system of choice, including the computer, printers, tape drives, and monitors, would be 100 percent HP.

02 Thus, granting ASK OEM status would boost sales of the entire HP computer product line.

03 Second, ASK would save HP considerable sales and overhead expense as OEM by selling HP's machine as part of a total solution, arranging with HP to have the machine drop-shipped, and taking care of accounts receivable and payment from customers.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-020 | you are making a pitch to a prospective customer or cooperator or someone you want to win over to your cause, | focus on how what you do can help solve his problems. | greater leverage |
| 000-225 | party A is an original equipment manufacturer (OEM) of party B, | party A can decide whether or not to buy from party B for the other necessary components of the final system, if there are any. | local fact |
| 000-226 | it's about getting certain resources or supplies you need from others, | try to have multiple suppliers from whom you can get the resources you want. | greater leverage |
| 000-228 | party A, as party B's OEM, does not need to have B's equipment until the moment of sale of the whole system, | party A should have B ship the equipment directly to the customer at the moment of final sale, instead of buying the equipment from B beforehand. | reducing operation cost |

## B.3 SCRIBANTE OF MAJERS

### B.3.1 scr-01

**Episode ID:** scr-000-010 **Page:** 47 **Venture:** MAJERS Corp.

**Time:** 1963

**Comment:** scr-01

**Conditions**

***Sequence Condition***

I wanted to sell my bleach beyond the local market areas.

**Actions**

### *Sequence Action*

I had subscribed to newspapers in other cities where I might sell my product to learn what bleach was selling for in larger markets.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-446 | it's about products sold through groceries, | their prices are usually advertised in the local newspapers. | local fact |
| 000-447 | you are competing or try to compete in a market, | you should try to find out information about your competitors such as their identities, their activities, their performances. | being prepared |

**Episode ID:** scr-000-020 **Page:** 48 **Venture:** MAJERS Corp.

**Time:** 1963

**Comment:** scr-01

**Conditions**

### *Sequence Condition*

The ads showed me that my competitors' prices were lower than mine, so low that I couldn't be competitive. That knowledge stopped me from expanding into these markets.

**Actions**

### *Sequence Action*

It came to me that if I wanted to know what my product was selling for in other cities, wouldn't other manufacturers also benefit from the same information? And there were thousands of other items on supermarket shelves, the possibility is endless.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-453 | it's about grocery market in the United States since 1960s, | manufacturers of grocery goods usually sell their products to individual customers through grocery companies. | local fact |
| 000-019 | you have successfully solved one | try to locate others in similar situation | replicating |

| | | | |
|---|---|---|---|
| | person's problem, | who you can potentially help too. | success |

**Episode ID:** scr-000-050 **Page:** 49 **Venture:** MAJERS Corp.

**Time:** 1963

**Comment:** scr-01

**Conditions**

***Sequence Condition***

I subscribed to newspapers in the fifty to fifty-five largest markets. After I received the newspapers with grocery ads…

**Actions**

***Sequence Action***

01 I would tag each retail grocery ad with a pre-printed sticker that showed the ACV for the retail grocery ad in each market. The tag would indicate what's known as the "all commodity volume,"

02 or what percent of the market the grocery company represented in that particular city. This approach showed the reader the potential sales volume of each retail grocery account in the various markets.

03 Then I carefully clipped all the grocery ads to compile them in a handy album form.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-452 | it's about retailers, such as grocery companies, | a critical measure of their relative standing in a market is their respective market shares. | local fact |
| 000-047 | it's about doing what you do, | be constantly on the lookout for ways of better doing what you do. | continuing improvements |

**Episode ID:** scr-000-060 **Page:** 49 **Venture:** MAJERS Corp.

**Time:** 1963

**Comment:** scr-01

**Conditions**

### *Sequence Condition*

Some people thought I was missing a few gears; others, including my wife, thought I needed a real job with a stable salary. "You're doing what?" she sighed.

**Actions**

### *Sequence Action*

What I was trying to do, what I just knew could be a success, wasn't easily explained, much less understood by someone who wasn't in the grocery business.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-321 | you believe you are doing the right thing, | don't allow other people's disapproving opinions or how things were done differently before prevent you from doing it. | taking control |

**Episode ID:** scr-000-070 **Page:** 50 **Venture:** MAJERS Corp.

**Time:** 1963

**Comment:** scr-01

**Conditions**

### *Sequence Condition*

Then I carefully clipped all the grocery ads to compile them in a handy album form and had them printed at Barnhart Press, a nearby printing house. It cost a buck to print apiece.

**Actions**

### *Sequence Action*

In February 1963 I mailed the five hundred books to retail grocery chains, wholesalers, manufacturers, newspapers, advertising agencies, and trade magazines.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-447 | you are competing or try to compete in a market, | you should try to find out information about your competitors such as their | being prepared |

| | | | |
|---|---|---|---|
| | | identities, their activities, their performances. | |
| 000-454 | it's about grocery business in the United States since 1960s, | retail grocery chains, wholesalers, manufacturers, newspapers, advertising agencies, and trade magazines are usually cooperators with each other when the parties involved are of different nature, e.g. retail grocery chains cooperate with manufacturers. | local fact |
| 000-455 | it's about grocery business in the United States since 1960s, | retail grocery chains, wholesalers, manufacturers, newspapers, advertising agencies, and trade magazines are usually competitors with each other when the parties involved are of the same nature, e.g. manufacturers compete with other manufacturers. | local fact |
| 000-473 | you are competing or try to compete in a market, | you should try to find out information about your cooperators such as their identities, their activities, their performances. | being prepared |
| 000-035 | you try to heighten the awareness of potential customers of your product/service and elicit their responses, | send out your advertising materials to potential customers through direct mail. | greater leverage |
| 000-194 | it's about serving customers, | try to focus on potential customers who are high in their purchasing power, their level of interest in your product or service (due to availability of alternatives, etc), and the utility of your product or service to them. | greater leverage |

**Episode ID:** scr-000-080 **Page:** 50 **Venture:** MAJERS Corp.

**Time:** 1963

**Comment:** scr-01

**Conditions**

### *Sequence Condition*

Along with the booklet of clipped grocery ads in each envelope I mailed…

**Actions**

### *Sequence Action*

01 I also included an introductory letter from me and a reply card for them. In the letter I explained what the booklet of ads was and what it could do for them.

02 I suggested a subscription from of $3.37 a week for a single copy. The annual subscription price was $175 for fifty-two weekly booklets.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-020 | you are making a pitch to a prospective customer or cooperator or someone you want to win over to your cause, | focus on how what you do can help solve his problems. | greater leverage |
| 000-222 | party A can generate benefit for party B, | party A often can use this to get compensated somehow accordingly by party B for its effort. | greater leverage |

**Episode ID:** scr-000-090 **Page:** 51 **Venture:** MAJERS Corp.

**Time:** 1963

**Comment:** scr-01

**Conditions**

### *Sequence Condition*

At the end of the first three weeks, I had sixty annual subscriptions: the Campbell Soup Company in Camden, N.J., 26 Safeway divisions, all of the divisions of Foodfair out of Philadelphia, the Great A&P Tea Company, etc.

**Actions**

### *Sequence Action*

I printed and mailed 440 more solicitation samples.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-019 | you have successfully solved one person's problem, | try to locate others in similar situation who you can potentially help too. | replicating success |
| 000-272 | you have successfully solved a problem, | apply your solution to similar problems. | replicating success |

### B.3.2 scr-02

**Episode ID:** scr-000-160 **Page:** 63 **Venture:** MAJERS Corp.

**Time:** 1967

**Comment:** scr-02

**Conditions**

***Sequence Condition***

There were fourteen lines of text per column inch for the newspaper grocery ads. Around 1967, at the beginning of our computerized information stage…

**Actions**

***Sequence Action***

01 We reported to our clients the number of newspaper features and each ad's individual lineage by brand and by retailer within each market. Lineage is an advertising term that relates to the line of print in each one column inch of newspaper space.

02 Thus our clients could discern how much retail grocery newspaper advertising their competitors were doing.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-460 | it's about ads, | besides the count of the number of ads, the quantity of the volume of ads usually also contains useful information, such as advertising spending. | general fact |

| | | | |
|---|---|---|---|
| 000-047 | it's about doing what you do, | be constantly on the lookout for ways of better doing what you do. | continuing improvements |

**Episode ID:** scr-000-170 **Page:** 63 **Venture:** MAJERS Corp.

**Time:** 1967

**Comment:** scr-02

**Conditions**

### *Sequence Condition*

01 When I was selling our lineage information in a sales call, the brand manager at General Foods, in the Birds-Eye Division, told me: "This data doesn't tell me anything important."

02 "Ten ads with 100 lines versus one ad with 40 lines, what does that mean? Which is better for me? Why don't you come up with a method that would qualify the grocery news-paper features, something like best, good, fair," he said.

03 "That way, I'd know where to spend my trade promotion dollars."

**Actions**

### *Sequence Action*

I set out to find out how to qualify ads as he asked. From that point on, I'd ask retailers the same question: "When you put your weekly ads together, what is your criteria?"

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-046 | a customer has important problems that your current product/service cannot help solve, | try to develop the new product/service that can help. | responsiveness to feedback |
| 000-054 | it's about the focus of the business, | prefer solving universal problems instead of idiosyncratic problems (even if those universal problems cost more and take longer to solve). | greater leverage |
| 000-322 | you are trying to understand a situation or solve a problem, | try to get as near to the source of the situation or problem as possible, e.g. through first-hand experience of the situation or by listening to people with | direct approach |

first-hand experience.

**Episode ID:** scr-000-180 **Page:** 64 **Venture:** MAJERS Corp.

**Time:** 1967

**Comment:** scr-02

**Conditions**

| *Sequence* | *Condition* |
|---|---|
| 01 | I was told that they basically have three levels of feature ads: the "best buys," for items that carry the biggest ads and the biggest discounts to entice customers into stores to buy their grocery needs for the week. |
| 02 | Next come lesser value features, and, lastly, products are listed at shelf price to collect the co-op advertising monies from the manufacturer. |

**Actions**

| *Sequence* | *Action* |
|---|---|
| 01 | I developed a promotional index of measuring ads by "weight," or, as we called it, the A, B, or C feature ad. |
| 02 | A feature, for products given the most dominant newspaper promotion space, coupled with perhaps an in-store display and priced 25 percent below shelf price, could move product at an astronomical rate. |
| 03 | B features, for products with less newspaper ad dominance and priced around 10 to 15 percent below shelf price, also had impressive rises in sales. |
| 04 | C features, for products with much smaller ad space and usually no discount, slightly increased sales movement by the ad alone. |

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-461 | it's about ads, | focus on the impact of the ads on the movement of products. | greater leverage |
| 000-475 | it's about the impact of the ads on the movement of products, | usually the important factors include the dominance of the ad relative to other ads and the extent of the price discount. | local fact |

### B.3.3 scr-04

**Episode ID:** scr-000-340 **Page:** 81 **Venture:** MAJERS Corp.

**Time:** 1968

**Comment:** scr-04

**Conditions**

| *Sequence* | *Condition* |
|---|---|
| 01 | Goodyear used MAJERS services, but the purchasing agent was the market research director. At that time, we weren't earning enough money from Goodyear and decided to drop the company when they refused to sign a new, higher priced contract. |
| 02 | I stopped in to see the president of Goodyear Tire and Rubber Company, Tom Barrett, my old fraternity brother and told him our margin was such that we couldn't justify continuing with Goodyear as a customer. |
| 03 | "You talk about margins," he said, "But I think you're making your decision based on the wrong margin. If you focused on helping us improve Goodyear's mar-gin, 1 would see to it that your own margin is taken care of." |

**Actions**

| *Sequence* | *Action* |
|---|---|
| | From that day on, our sales efforts targeted chief executive officers, chief operation officers, and vice presidents of sales and marketing, not directors of market research. |

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-007 | what you do does not fully achieve your objective, | try to make adjustments to what you do based on the feedback. | responsiveness to feedback |
| 000-020 | you are making a pitch to a prospective customer or cooperator or someone you want to win over to your cause, | focus on how what you do can help solve his problems. | greater leverage |
| 000-131 | when making request to an organization, there are insiders in critical positions who (potentially) need what you do most, | try to communicate to them and elicit their help. | greater leverage |

| | | | |
|---|---|---|---|
| 000-176 | a chance or one-time happening benefits you, | you may find it a good idea to systematize or institutionalize it if feasible. | seeking structural solutions |

## B.4 YUNUS OF GRAMEEN BANK

### B.4.1 yun-03

**Episode ID:** yun-000-150 **Page:** 72 **Venture:** Grameen Bank

**Time:** 1976

**Comment:** yun-03

**Conditions**

***Sequence Condition***

01 The success of our three-share experiment for the farmers highlighted a problem I had not focused on before. It was clear to me that the bigger the farmer, the greater the benefit earned from my Three-Share Farm experiment.

02 The smaller and poorer you were, the smaller was your share of' the benefit. Worst paid of all were the women who did the threshing of the paddy. They were landless and assetless and without hope.

03 The `poor' is a much larger collection of people than the small or marginal farmers.

**Actions**

***Sequence Action***

I turned my mind to the problem of the landless, assetless people who lived and worked next door. I began visiting the poor households in Jobra to see if I could help them directly in any way.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-007 | what you do does not fully achieve your objective, | try to make adjustments to what you do based on the feedback. | responsiveness to feedback |
| 000-322 | you are trying to understand a situation | try to get as near to the source of the | direct approach |

| | | | |
|---|---|---|---|
| | or solve a problem, | situation or problem as possible, e.g. through first-hand experience of the situation or by listening to people with first-hand experience. | |
| 000-323 | you are trying to solve a problem, | you need to find out first the true situation of the problem. | greater leverage |
| 000-326 | the scale of the entire problem is overwhelming, | start with and focus on a small piece of it. | reducing "enemy" defense |

**Episode ID:** yun-000-160 **Page:** 6 **Venture:** Grameen Bank

**Time:** 1976

**Comment:** yun-03

**Conditions**

### *Sequence Condition*

There were three parts to the village: a Muslim, a Hindu and a Buddhist section. I personally had little knowledge about Buddhist family.

**Actions**

### *Sequence Action*

When we visited the Buddhist section we used to take our student, Dipal Chandra Barua, with us. He came from a poor Buddhist family in Jobra.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-331 | you want to interact with people, | try to have someone on your side who can more easily relate to those people, for example, familiarities and shared commonalities is often a big plus. | reducing "enemy" defense |

**Episode ID:** yun-000-170 **Page:** 7 **Venture:** Grameen Bank

**Time:** 1976

**Comment:** yun-03

**Conditions**

### *Sequence Condition*

01 One day, as Latifee and I were making our rounds in Jobra, we stopped at a completely run-down house. We saw a woman working with bamboo making a stool. Children were running around naked in the yard.

02 We did not have to strain our imaginations to guess that her family found it extremely difficult to survive.

03 I wanted to talk to her. Alarmed by our voice, she immediately abandoned her work, sprang to her feet and disappeared inside the house.

**Actions**

### *Sequence Action*

'He is very beautiful, this one,' I complimented a small naked baby.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-332 | you want to put a mother at ease, | it's usually a good idea to compliment a mother on her baby. | general fact |
| 000-333 | you want people to talk to you freely, | you need to first put them at ease. | reducing "enemy" defense |

**Episode ID:** yun-000-180 **Page:** 7 **Venture:** Grameen Bank

**Time:** 1976

**Comment:** yun-03

**Conditions**

### *Sequence Condition*

Feeling reassured, the mother appeared in the doorway holding her baby. And I was able to begin to talk to her.

**Actions**

### *Sequence Action*

I did not use a pen and note-pad while talking to her. I let my students do that on return visits.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-333 | you want people to talk to you freely, | you need to first put them at ease. | reducing "enemy" defense |
| 000-334 | it's about rural women in Bangladesh in the 1980s, | they would be scared and not feel at ease if the person who talks to her in the first time was using a pen and note-pad. | local fact |

**Episode ID:** yun-000-190 **Page:** 10 **Venture:** Grameen Bank

**Time:** 1976

**Comment:** yun-03

**Conditions**

***Sequence Condition***

01 Sufia suffered because the cost of the bamboo was 5 taka and she didn't have the necessary cash. Her life was miserable because she could survive only in that tight cycle - borrowing from the trader and selling back to him.

02 I resisted the urge to give Sufia the money she needed. She was not asking for charity.

**Actions**

***Sequence Action***

I was trying to see the problem from Sufia's point of view. I imagined I was a worm and had to overcome the obstacle facing me.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-335 | you want to help someone having a problem, | first try to see if he could help himself solve this problem before offering him any help from outside. | greater leverage |

**Episode ID:** yun-000-200 **Page:** 10 **Venture:** Grameen Bank

**Time:** 1976

**Comment:** yun-03

**Conditions**

### *Sequence Condition*

01 I had no solution to Sufia's problem. The trader always made certain that he paid Sufia a price that only covered the cost of the materials and just enough so that she would not die, but would need to keep on borrowing from him.

02 Her income would be kept perpetually at such a low level that she could never save a penny and could never invest in expanding her economic base. Right now her labour was almost free.

**Actions**

### *Sequence Action*

It came to me that Sufia's status as virtually a bonded slave could only change if she could find the initial capital she needed at a fair rate.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-226 | it's about getting certain resources or supplies you need from others, | try to have multiple suppliers from whom you can get the resources you want. | greater leverage |

**Episode ID:** yun-000-210 **Page:** 11 **Venture:** Grameen Bank

**Time:** 1976

**Comment:** yun-03

**Conditions**

### *Sequence Condition*

From Sufia's situation, I came to realize the usurious rates that had kept poor people in their poverty.

**Actions**

### *Sequence Action*

The next day I called in Maimuna, a university student who collected data for me, and I asked her to assist me in making a list of how many in Jobra, like Sufia, were borrowing from traders at usurious rates.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-019 | you have successfully solved one person's problem, | try to locate others in similar situation who you can potentially help too. | replicating success |
| 000-062 | you have more work than you can do yourself, in which your involvement is not essential. | try to delegate such work to others. | greater leverage |
| 000-323 | you are trying to solve a problem, | you need to find out first the true situation of the problem. | greater leverage |

**Episode ID:** yun-000-220 **Page:** 12 **Venture:** Grameen Bank

**Time:** 1976

**Comment:** yun-03

**Conditions**

***Sequence Condition***

01 Within a week, we had prepared a list. It named forty-two people who in total had borrowed 856 taka, a total of less than $27.

02 I handed Maimuna the $27 and told her, `Here, lend this money out to the forty-two on our list…. They don't have to pay any interest. I am not in the money business.'

**Actions**

***Sequence Action***

One week later, I decided to approach the local bank manager and request that his bank lend to the poor.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-337 | a problem is long-lasting or widely spread, | usually its solution should be institutionalized to be effective, as opposed to ad hoc. | seeking structural solutions |
| 000-338 | it's about lending people money as a regular function, | it's usually banks' business. | general fact |

### B.4.2 yun-04

**Episode ID:** yun-000-280 **Page:** 87 **Venture:** Grameen Bank

**Time:** 1977

**Comment:** yun-04

**Conditions**

***Sequence Condition***

01 Because the poor I wanted to help didn't have collateral for the money they borrow, we lent to them without collateral. At first I had no idea what I was getting myself into. To my amazement and surprise that more than 98 per cent of our loans were repaid

02 Traditional banks in Bangladesh are gender-biased and do not want to lend money to women, who constituted less than 1 per cent of all the borrowers in Bangladesh put together. I always thought such situation was downright discrimination against women.

**Actions**

***Sequence Action***

I wanted at least 50 per cent of our experimental projects' borrowers to be women.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-321 | you believe you are doing the right thing, | don't allow other people's disapproving opinions or how things were done differently before prevent you from doing it. | taking control |

**Episode ID:** yun-000-290 **Page:** 88 **Venture:** Grameen Bank

**Time:** 1977

**Comment:** yun-04

**Conditions**

***Sequence Condition***

Since I wanted at least 50 per cent of our experimental projects' borrowers to be women, little by little we had reached a sizeable number of women as our borrowers.

**Actions**

### *Sequence Action*

We studied the effects of the loans on the life of the poor we lent to and how our borrowers used their loans,

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-344 | you want to learn and improve what you do in a certain subject field, | proactively seek out and study the feedback, which includes any consequence of or response to what you do. | responsiveness to feedback |

**Episode ID:** yun-000-310 **Page:** 89 **Venture:** Grameen Bank

**Time:** 1977

**Comment:** yun-04

**Conditions**

### *Sequence Condition*

01 We learned that credit given to women brought about changes faster than when given to men and that destitute women adapted quicker and better to the self-help process than men.

02 Our previous experience of lending to women had drawn us formidable opposition came from the husbands, who generally wanted the loans to go to them.

03 The mullahs and the money-lenders also saw us as a direct threat to their authority in the village. Even the educated civil servants and professionals argued against us based on their prior conceptions.

**Actions**

### *Sequence Action*

So gradually we focused almost exclusively on lending to women.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-272 | you have successfully solved a problem, | apply your solution to similar problems. | replicating success |

| | | | |
|---|---|---|---|
| 000-321 | you believe you are doing the right thing, | don't allow other people's disapproving opinions or how things were done differently before prevent you from doing it. | taking control |

**Episode ID:** yun-000-330 **Page:** 90 **Venture:** Grameen Bank

**Time:** 1977

**Comment:** yun-04

**Conditions**

***Sequence Condition***

| | |
|---|---|
| 01 | Women having access to credit is not a traditional practice in Bangladesh; indeed many have said it is a social revolution. |
| 02 | With poor women having access to loans, while men in the family did not, we soon found enormous tensions between husbands and wives. |
| 03 | We didn't want the women to risk either their load or their marriage for the other. But such a balancing act were difficult for our borrowers. |

**Actions**

***Sequence Action***

We tried to find an institutional solution to this problem rather than seeking it outside Grameen. We addressed the husbands directly by involving them in collective. We explained to them everything we did.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-124 | resolving an issue entails interactions (such as argument and counter-argument, request and reply, question and answer, etc) between multiple parties, | try to have all the involved parties together at one place. | greater leverage |
| 000-337 | a problem is long-lasting or widely spread, | usually its solution should be institutionalized to be effective, as opposed to ad hoc. | seeking structural solutions |

| | | | |
|---|---|---|---|
| 000-347 | it's about family dispute, | have a reputable third party present to mediate in order to make people's behavior and attitude more reasonable and constrained. | reducing "enemy" defense |
| 000-370 | you want to improve people's acceptance of new things, | try to provide them with related information, knowledge, etc. | reducing adoption cost |
| 000-437 | you are doing business, | you should try to make the customers' entire experience of using your product or service as trouble- and difficulty-free as possible. | reducing adoption cost |

**Episode ID:** yun-000-360 **Page:** 93 **Venture:** Grameen Bank

**Time:** 1977

**Comment:** yun-04

**Conditions**

***Sequence Condition***

01 How does one get women borrowers in a country where no poor woman has ever borrowed money from a bank before? I was having a terrible time getting women interested. At first, we had no women borrowers at all.

02 Straightforward ads, such as "ATTENTION ALL WOMEN: WELCOME TO OUR BANK FOR A SPECIAL LOAN PROGRAMME FOR WOMEN!" wouldn't work because 85% of women in the countryside cannot read, or they are not free to come out of the house without their husbands.

**Actions**

***Sequence Action***

So we made a conscious effort to seek out female borrowers.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-439 | your effort to solve a problem is not successful or is not possible, | try another way to solve it. | perseverance |

**Episode ID:** yun-000-370 **Page:** 94 **Venture:** Grameen Bank

**Time:** 1977

**Comment:** yun-04

**Conditions**

### *Sequence Condition*

| | |
|---|---|
| 01 | In Bangladesh, there were the rules of purdah, which refers to the Koranic injunction to guard women's modesty and purity. In its most conservative interpretation, it means women are forbidden to be seen by men except their closest male relatives. |
| 02 | Even where purdah is not strictly observed, custom, family, tradition, and decorum combine to keep relations between women and men in rural Bangladesh extremely formal. |
| 03 | The villagers were so used to bowing and scraping before figures of authority. |

**Actions**

### *Sequence Action*

| | |
|---|---|
| 01 | So when I would try to meet village women, I never dared knock on their doors. Instead, I would stand in a clearing between several houses, so everyone could see me and observe my behaviour. And I would wait. |
| 02 | I never asked for a chair, or for any mark of respect. I would stand outside their door and chat as informally as possible, explaining what we were trying to do. |
| 03 | I tried to say funny things, show genuine affection for the children, avoid wearing expensive clothes, usually brought one of my female students with me. |
| 04 | I also told my students and co-workers to do the same. |

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-155 | you are the leader AND you are convinced that your organization should pursue a certain goal, | clarify and communicate this goal to your crew. | greater leverage |
| 000-331 | you want to interact with people, | try to have someone on your side who can more easily relate to those people, for example, familiarities and shared commonalities is often a big plus. | reducing "enemy" defense |
| 000-332 | you want to put a mother at ease, | it's usually a good idea to compliment a | general fact |

| | | | |
|---|---|---|---|
| | | mother on her baby. | |
| 000-333 | you want people to talk to you freely, | you need to first put them at ease. | reducing "enemy" defense |
| 000-348 | you want to put people at ease, | showing them that you respect their notions of propriety usually works. | general fact |
| 000-349 | you ask or appear to ask people to respect you simply because of who you are, | you are likely to distance yourself from them, which is detrimental in establishing ease, closeness, openness, candor. | general fact |
| 000-350 | it's about the relationship between a service provider and its clients, | the more ease, closeness, openness, candor between them the better. | seeking commitment |
| 000-351 | it's about putting people at ease, | humor usually works. | general fact |
| 000-352 | you look down or appear to look down on people by displaying what you have that are generally considered superior to what they have, | you are likely to distance yourself from them, which is detrimental in establishing ease, closeness, openness, candor. | general fact |

**Episode ID:** yun-000-380 **Page:** 94 **Venture:** Grameen Bank

**Time:** 1977

**Comment:** yun-04

**Conditions**

***Sequence Condition***

Sometimes even after a conversation that's over an hour with the women, still I was not able to convince these hidden women to seek a loan from Grameen. Sometimes they would send me away, and tell me not to return.

**Actions**

***Sequence Action***

But I would come back the next day.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|

| | | | |
|---|---|---|---|
| 000-109 | your request has been rejected, | do not give up if you believe the reasons for your request are still at least as valid as before. | perseverance |
| 000-354 | it's about making big changes in life, such as overcoming long-held fear or taking up new challenges that were never done before, | it often takes a lot of time to collect sufficient courage and resolve to make the change. | general fact |
| 000-392 | you encounter more problems than you expect or the situation is more difficult than you expect when you are trying to reach your goal, | do what you must and don't give up. | perseverance |

**Episode ID:** yun-000-400 **Page:** 97 **Venture:** Grameen Bank

**Time:** 1977

**Comment:** yun-04

**Conditions**

***Sequence Condition***

During those time, my students and I went out to convince women borrowers on our own.

**Actions**

***Sequence Action***

At the end of every day, I would debrief my students and discover what they had done that day. We would exchange stories, names, make plans for the following day.

**Rule Applications with E-Principles**

| *Rule ID* | *IF* | *THEN* | *E-Principle* |
|---|---|---|---|
| 000-330 | it's about a long-term project or operation, | you should frequently check its performance and resolve any issue that needs to be taken care of. | responsiveness to feedback |
| 000-380 | multiple people are faced with the same or similar situations and concerns, | try to create opportunities for them to interact with each other frequently so that they can share experience, learn from each other, support each other, build solidarity, etc. | greater leverage |

## APPENDIX C

## ARE YOU A GOOD PRETENDER?

If you are granted the same knowledge as another person and asked to face the same real-life challenges, will you be able to pass yourself off successfully as that person by your decisions and actions (actions, for brevity)?

Now is your chance to find out! Here, you are to be given the following set of information about some decision-making episodes from real-life experiences of the protagonist:

- *Episode ID*: identification of the episode, and also used as the identification mark on the separate answer sheet that'll be provided to you.
- *Rules*: the knowledge the protagonist used in the episode—your "pretender's toolkit".
- *Time*: the proximate time when the episode actually happened.
- *Conditions*: the description of the real-life challenge the protagonist faced—also the same challenge you will face yourself now as a pretender. (Note: If there are sequence numbers in front of the conditions, please follow the order in your reading.)

The following instructions will guide you to complete the challenge in each episode:

*Step 1:* Familiar yourself with the protagonist's knowledge in the *Rules* section.

*Step 2:* Read the *Time* and the *Conditions* to understand the challenge, as if you were the protagonist.

*Step 3:* Use *all* the rules in the *Rules* section—instead of your own knowledge of how the situation should be handled—to choose a course of action, which may include one or multiple discrete actions, in response to the challenge.

*Step 4:* Describe your course of action in the *Actions* section of the answer sheet for that episode—with enough information that clearly shows how you would have acted if you had faced that challenge for real.

We recommend you to read the first episode with the information provided on the answer sheet about what the protagonist actually did to warm yourself up. Your challenge begins with the second episode.

Good luck!

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