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**An empirical examination of the organization life cycle in high  
technology organizations**

**Hanks, Steven Howard, Ph.D.**

**The University of Utah, 1990**

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**AN EMPIRICAL EXAMINATION OF THE ORGANIZATION LIFE CYCLE  
IN HIGH TECHNOLOGY ORGANIZATIONS**

by

**Steven H. Hanks**

**A dissertation submitted to the faculty of  
The University of Utah  
in partial fulfillment of the requirements for the degree of**

**Doctor of Philosophy**

**Graduate School of Business**

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THE UNIVERSITY OF UTAH GRADUATE SCHOOL

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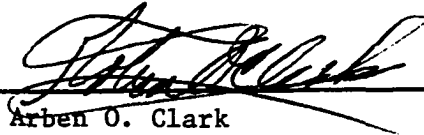
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I have read the dissertation of Steven Howard Hanks  
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## **ABSTRACT**

The organization life cycle paradigm suggests that organizations evolve through a series of distinct developmental stages as they grow in size and complexity. Over the years, numerous models have been proposed, yet there has been remarkably little effort to validate these models empirically. While most models suggest a common general pattern of growth, they differ as to the number of stages proposed and the specific characteristics of each stage. On the whole, life cycle stage definitions remain vague and general, making application of the theory in specific cases difficult. The result has been a plethora of models, each comprised of vague and loosely defined stages, of only marginal utility as guides for management decision making.

Progress in the study of the organization life cycle must begin with a reanalysis of the basic constructs involved. The most critical issue is the definition of life cycle stage. It is proposed in this study that each life cycle stage consists of a unique configuration of organization context, strategy and structure.

An exploratory field study is conducted in an effort to examine this configurational definition of life cycle stages. Data regarding organization context, strategy and structure are collected from a sample of 166 Utah based high technology organizations. Cluster analysis is employed to empirically identify common configurations.

Analysis of the derived clusters suggests support for the configurational definition of life cycle stages. At least four developmental stages are identified and their characteristics discussed. Implications of the study are discussed and directions for future research are suggested.

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## **CHAPTER 1**

### **INTRODUCTION**

It has long been argued in organizational literature that as firms evolve, they grow through a series of recognizable stages. This process is referred to as the organization life cycle. Scholars have argued that as firms move through life cycle stages, differing problems must be addressed, resulting in the need for different management skills, priorities, and structural configurations (Adizes, 1979, 1989; Chandler, 1962; Greiner, 1972; Kazanjian, 1988; Kimberly & Miles, 1980; Miller & Friesen, 1984a; Quinn & Cameron, 1983; Smith, Mitchell & Summer, 1985). Often, the management practices that foster growth in one stage become stumbling blocks in subsequent stages (Adizes, 1989; Flamholtz, 1986; Galbraith, 1982; Greiner, 1972).

The life-cycle model presents a compelling analogy. It suggests that organizations evolve in a consistent and predictable manner. A valid life cycle model could be of great value to those managing growing firms. It could provide a road map, identifying critical organizational transitions, as well as pitfalls the organization should seek to avoid as it grows in size and complexity. An accurate life-cycle model could provide a time table for adding levels of management, formalizing organization procedures and systems, and revising organization priorities. It could help management know when to "let go" of cherished past strategies or practices that will only hinder future growth. Recruitment of critical skills could be timed to coincide with organizational needs. The benefits of such a model would certainly be great.

Life cycle issues are particularly important in technology-based organizations, which, due to short product life cycles, often experience periods of extremely rapid growth. It is not uncommon in these industries for firms to grow from start-up to maturity and decline within just a few years. Organization crises (Greiner, 1972) must be faced earlier and with greater

rapidity than in less volatile industry settings.

Leading an organization through this growth process is a difficult managerial task. Venture capitalists talk of the "executive limit scenario" which postulates that there are limits to the ability of venture founders to make the necessary changes in their management styles to adapt to changing organizational complexity and size (Meyer, Lenoir & Dean, 1988). The entrepreneurial founders of high technology ventures, while well trained in the technical aspects of their job, often have limited training and experience in leading organizations and find themselves unprepared to manage organization transitions effectively. An understanding of the organization life cycle and the associated management imperatives could aid entrepreneurial founders in this difficult managerial process.

The life cycle paradigm is well established in the literature. Davis (1951) proposed one of the earlier models. Chandler (1962) in his landmark work, *Strategy and Structure*, identified a four stage model of organizational evolution. One of the better known models is that of Greiner (1972), who suggested that organizations grow through five evolutionary stages, separated by brief periods of "revolution," or dramatic organizational change.

To date, numerous models of growth stages in organizations have been proposed, many of which are reviewed later in this study. At a general level, there is a high degree of similarity among life cycle models, suggesting a progression through stages of emergence, growth, maturity, and in some models, decline (Baird & Meshoulam, 1988; Miller & Friesen, 1984a; Quinn & Cameron, 1983; Smith et al., 1985). However, upon closer examination, a number of incongruities emerge. For instance models range from three (Smith et al., 1985) to ten (Adizes, 1989) hypothesized stages. Models also differ as to the specific characteristics used to define the stages. These incongruities make application of life cycle theory in specific organizational settings difficult.

Differences between models can be traced to two methodological problems. First, most models of the organization life cycle are conceptually, rather than empirically based. Miller and Friesen (1984a) describe this problem as follows:

While different authors have examined different variables in discussing organizational evolution, the consensus is that the nature of corporate development is quite structured. The anecdotal reports and the models described do seem rich and suggestive. Unfortunately, they are not based upon any strong empirical evidence...(p. 1161)

In the absence of careful empirical analysis, a plethora of conceptually based models have emerged, each having its own unique twist. Which of these models best depicts organization growth? Lacking empirical study, this question remains unanswered.

Second, measures used to delineate the various stages of development lack specificity. For instance, a dimension used in most life cycle models is organization size, yet few specific parameters are provided. Other dimensions, such as formalization, specialization, and centralization exhibit similar problems. Lacking specific measures, life cycle stage definitions remain vague and general, making application of the theory to specific cases very difficult. There is a need to move from categorical measures of organization life cycle dimensions to higher level measures which are more amenable to empirical analysis.

In recent years, a few empirical studies of the organization life cycle have emerged, providing important contributions to organization life cycle theory (Kazanjian, 1988; Miller & Friesen, 1984a, Smith et al., 1985). However, most of these studies have defined the growth stages a priori, using existing conceptualizations. The lack of specificity and empirical rigor in these typologies may account for unexpected intrastage variance found in some analyses (Shani et al., 1988). A great deal of empirical work remains to be done in validating and "fine tuning" the life cycle model.

Models of organizational phenomena can be categorized into two types: typologies and taxonomies. Typologies are derived conceptually, a priori, often relying on heuristic categorizations of one or two variables. Most models of the organization life cycle fall into this category. Taxonomies, on the other hand are derived empirically through multivariate data analysis. They are defined by common patterns of relationships identified in the data. Taxonomies provide greater specificity than do typologies. Pinder and Moore (1979) called for greater use of taxonomic methods of theory development because they tend to provide greater explanatory and predictive power. There is a need for a taxonomy of the organization life cycle.

This study represents an early effort toward developing a taxonomy of the organization life cycle in high technology organizations. Although much has been written about the organization life cycle, our understanding of the basic constructs remains primitive.

Exploratory work is necessary before the life cycle can be effectively operationalized and hypotheses tested.

The primary research question guiding this study is, "What constitutes a life cycle stage?" A clear definition of this construct is essential before progress can be made in the study of the organization life cycle. Only then can questions regarding the number of stages, characteristics of each stage, and key contingencies be addressed.

Methodologically the study involves the empirical identification and examination of what Miller and Friesen (1984b) call "configurations," patterns of variables which tend to cluster together reflecting "integral interdependencies among their elements." The rationale of this approach is explained by Miller and Friesen (1984b) as follows:

Organizations are...complex entities whose elements are composed of tightly interdependent and mutually supportive elements such that the importance of each element can best be understood by making reference to the whole configuration. Organizational structures, production systems, information-processing procedures, strategies, and environments all tend to influence each other. Our thesis is that they do so in a manner that gives rise to a small number of extremely common and sometimes discretely different configurations....Configurations may represent common organizational structures, common scenarios of strategy making in context, and even common developmental or transitional sequences.

What is crucial is that a relatively small number of these configurations or types are believed to encompass quite a large fraction of the population of organizations. It is precisely this quality that gives the configurations their pedagogical and predictive utility. By discovering and studying the nature, behavior, and performance consequences of the most common configurations, we can ultimately bring to bear a great deal of descriptive and prescriptive knowledge concerning many organizations. (p. 1)

Existing typologies of the organization life cycle have defined life cycle stages along numerous organizational and contextual dimensions. Among these are organization age, size and growth rate, formalization, centralization, specialization, structural configuration, vertical differentiation, dominant management problems and strategies. It is proposed in this study that life cycle stages consist of a unique configurations of these dimensions. If organizations evolve through a sequence of stages, as theorized, then, in a cross-section of organizations, several stages should be represented. Identification of these stages should therefore be possible by empirically clustering organizations based on common configurations of these dimensions.



The fundamental issue explored in this study is the validity of this configurational definition of life cycle stage. Do distinct configurations emerge in the analysis? Do these configurations, on the aggregate, reflect a sequence of developmental stages? Affirmative answers to these questions will lend support for the configurational definition.

## **CHAPTER 2**

### **REVIEW OF LITERATURE**

In this chapter a review of the organization life cycle literature is presented. The intent is to acquaint the reader with the current state of research in the field. The review is arranged in five segments. The first segment contains a brief introduction to the life cycle analogy. In the second segment, a detailed review of content issues associated with the life cycle paradigm is presented. Recent life cycle models are compared and commonalities identified. The third segment examines the dynamics of the organization life cycle construct; how organizations are theorized to move from one stage to the next. In the fourth segment, the findings of recent empirical studies are reviewed. Finally, the fifth segment summarizes the current state of organization life cycle research, suggesting areas for future research.

#### **The Life Cycle Analogy**

In an effort to explain changes that occur in organizations as they grow in size and complexity, management scholars have adopted the biological analogy of the life cycle. Kimberly (1980) introduced the life cycle analogy this way:

The point is that when one views the population of organizations, one sees demographic changes. These demographic changes reflect, in the aggregate, the fact of birth, life, and death among organizations. (p. 2)

The life cycle paradigm emerged out of a concern that many traditional theories of organization effectiveness are compromised by a failure to take into account contingencies such as organization age, size and complexity (Kimberly, 1980; Quinn & Cameron, 1983). It suggests that as organizations evolve, they grow through a series of predictable stages of development and that these stages are characterized by unique configurations of strategic, structural and contextual characteristics.

The use of this biological analogy has been a source of some controversy among organization theorists. Scholars such as Penrose (1952), Rhenman (1973), and Van de Ven (1979) have criticized the analogy because of its lack of precision when applied to the organizational setting. Organization growth occurs far less predictably than does the growth of biological organisms. While acknowledging its limitations, Kimberly (1980) offered the following defense of the analogy:

If used improperly, and by that I mean if tested strictly, the life cycle metaphor will be found wanting. It is the strict test that in my view is misguided at this stage of development of the field. There is a more compelling sense, however, in which the life cycle concept is constructive. It does push us to ask new questions about organizations, it does lead us to take seriously the proposition that history and, as Sarason (1972) suggests, prehistory powerfully shape the organizational here and now, and it does force us to think deeply about the influence of context on organizational life.  
(p. 9)

While the life cycle analogy has its limitations, it does provide a framework that can aid our understanding of changes which occur in organizations as they grow in size and complexity.

#### **Life Cycle Stages: A Comparison of Models**

Over the years, numerous theories and models have been developed in an effort to explain the life cycle process (Adizes, 1979, 1989; Baird & Meshoulam, 1988; Block & MacMillan, 1985; Chandler, 1962; Churchill & Lewis, 1983; Davis, 1951; Downs, 1967; Drucker, 1954; Filey & Aldag, 1980; Flamholtz, 1986; Galbraith, 1982; Greiner, 1972; Katz & Kahn, 1966, 1978; Kazanjian, 1988; Kimberly, 1979; Lyden, 1975; Miles & Snow, 1978; Miller & Friesen, 1983, 1984a; Mintzberg, 1979; Quinn & Cameron, 1983; Rostow, 1960; Salter, 1968; Scott, 1971; Smith et al., 1985; Scott & Bruce, 1987; Smith & Gannon, 1987; Tobert, 1974; Tyebjee, Bruno & McIntyre, 1983). Although these models differ as to the specific number of stages, characteristics studied, and names assigned each stage, there is a considerable amount of commonality among them.

The sheer number of models makes synthesis a challenging process. However, previous literature reviews can greatly assist the reader. Quinn and Cameron (1983) reviewed nine models (Adizes, 1979; Downs, 1967; Greiner, 1972; Katz & Kahn, 1978; Kimberly, 1979; Lippitt & Schmidt, 1967; Lyden, 1975; Scott, 1971; Tobert, 1974); Miller and

Friesen (1984a) synthesized seven models (Adizes, 1979; Downs, 1967; Greiner, 1972; Kimberly, 1979; Lyden, 1975; Quinn & Cameron, 1983; Scott, 1971) in defining growth stages in their research; Smith et al. (1985) reviewed five (Abernathy, 1976; Galbraith, 1982; Mintzberg, 1973; Schalon, 1980; Scott, 1971); and Baird and Meshoulam synthesized eleven (Chandler, 1962; Churchill & Lewis, 1983; Davis, 1951; Drucker, 1954; Filey & Aldag, 1980; Greiner, 1972; Katz & Kahn, 1966; Mintzberg, 1979; Rostow, 1960; Salter, 1968; Tyebjee et al., 1983 ) in their summary model. Summary models developed in these reviews range from three to five stages, each stage characterized by unique organizational characteristics, problems and leadership requirements.

Table 2.1 presents an extensive comparison of ten recent life cycle models, segmented by dimension, across five theorized stages of the organization life cycle. The five stage comparative model was selected in the interest of parsimony and ease of comparison. The table illustrates similarities and differences between the models. Included in the comparison are the four synthesized models noted above as well as six other life cycle models (Adizes, 1989; Flamholtz, 1986; Galbraith, 1982; Greiner, 1972; Kazanjian, 1988; Scott & Bruce, 1987). Flamholtz (1986), Scott and Bruce (1987) and Kazanjian (1988) are included because of their current nature as well as the fact they have not been synthesized into the other summary models. Adizes (1989) is included because of its rich descriptive nature, even though previous work by the author (Adizes, 1979) has been synthesized into summary models by Quinn and Cameron (1983) and Miller and Friesen (1984a). While Greiner (1972) is reviewed in the summary models, it is included because it serves as a baseline model in the field. The final model, Galbraith (1982), is included because it was developed in a high technology setting, making it important for consideration in this study.

In comparing these models, three important questions will be addressed:

1. What constitutes a life cycle stage?
2. Through how many life cycle stages do organizations grow?
3. What are the characteristics of each stage?

A valid model of the organization life cycle must address each of these questions.

**Table 2.1**  
**Comparison of Life Cycle Models**

<b>Model</b>	<b>Start-up Stage</b>	<b>Expansion Stage</b>	<b>Consolidation Stage</b>	<b>Diversification Stage</b>	<b>Decline Stage</b>
<b>Names and Numbers of Stages:</b>					
<b>Adizes, 1989</b>	1)Courtship 2)Infancy	3)Go-Go 4)Adolescence	5)Prime 6)Stable		7)Aristocracy 8)Early Bureaucracy 9)Bureaucracy 10)Death
<b>Baird &amp; Meshoulam, 1988</b>	1)Initiation	2)Functional Growth	3)Controlled Growth	4)Functional Integration 5)Strategic Integration	
<b>Flamholtz, 1986</b>	1)New Venture	2)Expansion	3)Professional-ization 4)Consolidation	5)Diversification 6)Integration	7)Decline
<b>Galbraith, 1982</b>	1)Proof of principle/ Prototype 2)Model Shop	3)Start-up/ Volume production	4)Natural growth	5)Strategic maneuvering	
<b>Greiner, 1972</b>	1)Creativity	2)Direction	3)Delegation	4)Coordination 5)Collaboration	
<b>Kazanjian, 1988</b>	1)Conception & Development 2)Commercial-ization	3)Growth	4)Stability		
<b>Miller &amp; Friesen, 1984b</b>	Birth	Growth	Maturity	Revival	Decline

Table 2.1, Continued

Model	Start-up Stage	Expansion Stage	Consolidation Stage	Diversification Stage	Decline Stage
<b>Names of Stages (Continued):</b>					
Quinn & Cameron 1983	Entrepreneurial	Collectivity	Formalization	Elaboration of Structure	
Scott & Bruce 1987	1)Inception 2)Survival	3)Growth 4)Expansion	5)Maturity		
Smith, et al., 1985	Inception	High growth	Maturity		
<b>Age:</b>					
All Models	Young. . . . .			Old	
<b>Size:</b>					
Flamholtz, 1986	\$0-\$1 million sales	\$1-\$10 million sales	\$10-\$100 million sales	\$100-\$500 million sales	
Miller & Friesen, 1984b	Small	Medium	Larger	Very large	Market sized; Similar in size to maturity stage
Smith, et al., 1985	Small . . . . .		Large		
Galbraith, 1982	1) a handfull of employees 2)20-30 up to 50-100 employees	3)Expands to about 1000 employees	4)Increases to about 1500 to 2000 employees		

Table 2.1, Continued

Model	Start-up Stage	Expansion Stage	Consolidation Stage	Diversification Stage	Decline Stage
<b>Growth Rate:</b>					
Adizes, 1989			6) Lower growth expectations		
Miller & Friesen, 1984b		Rapid growth	Slower growth	Rapid growth	Slow growth
Galbraith, 1982	Inconsistent	Rapid growth	Growth slowing or declining		
Flamholtz, 1986		Rapid growth & expansion			
<b>Business Tasks/Challenges:</b>					
Adizes, 1989	1) Develop idea; Build internal commitment; Reality testing; 2) Undertake risk; Obtain resources	3) Develop consistency, focus, clear objectives			7-9) Retrenchment/turnaround; Revitalization
Flamholtz, 1986	Identify & define market niche; Develop products & services	Acquire resources; Develop operational systems	Develop management systems	Develop a corporate culture	

Table 2.1, Continued

Model	Start-up Stage	Expansion Stage	Consolidation Stage	Diversification Stage	Decline Stage
<b>Business Tasks/Challenges:</b>					
Galbraith, 1982	1) Invent & make prototype 2) Make it well & Test it	3) Make & distribute product in volume	4) Make business profitable	5) Dominate niche & find avenue of future growth	
Kazanjan, 1988	1) Build prototype, Sell product & business idea to financial backers 2) Making product work well, learning to produce in quantity, Set up task structure	3) Produce, sell & distribute in volume, Overcoming functional crises (engin., mktg., mfg., fin.) Avoiding shake-out due to ineffectiveness or inefficiency	4) Maintain growth momentum & market share		
Miller & Friesen, 1984b	Becoming a viable entity	Achieving rapid sales growth; Amassing resources; Scale efficiencies	Smooth & efficient functioning	Diversification & expansion of product/market scope	
Quinn & Cameron, 1983	Marshalling of resources; Entrepreneurial activities		Efficiency & maintenance	Domain expansion	



Table 2.1, Continued

Model	Start-up Stage	Expansion Stage	Consolidation Stage	Diversification Stage	Decline
<b><i>Business Tasks/Challenges (Continued):</i></b>					
Scott & Bruce, 1987	1)Obtaining customers; Economic production 2)Managing revenues and expenses	3)Managed growth; Amassing resources 4)Financing growth; Maintaining control	5)Expense control; Productivity		
Smith, et al., 1985	Getting organization going; Gaining support of resource suppliers	Managing demands of expansion	Garner support for status quo or restructuring to allow new growth		
<b><i>Mid-Stage Hurdles and End-of-Stage Crises:</i></b>					
Adzizes, 1989	1)Sufficient commitment to take the risk	3)Founder or family trap (insufficient delegation)			
Flamholtz, 1986		Personal Control Blind (insufficient delegation)			
Galbraith, 1982	2) Lack of any structure	3)Power transfer from engineering to administration			

Table 2.1, Continued

Model	Start-up Stage	Expansion Stage	Consolidation Stage	Diversification Stage	Decline Stage
<b>Mid-Stage Hurdles and End-of-Stage Crises (Continued):</b>					
Greiner, 1972	1)Leadership Crisis (founder burdened with unwanted management responsibilities)	2)Autonomy Crisis (insufficient delegation)	3)Control Crisis (due to decentralized units, delegation)	4)Red Tape Crisis (excessive bureaucracy)	
Miller & Friesen, 1984b			4)Adaptation/Renewal		
<b>Strategy:</b>					
Adizes, 1989	2)product orientation	3)reactive sales orientation			
Baird & Meshoulam, 1988	Limited products & market				
Flamholtz, 1986	1-2)Orientation towards major innovations & willingness to take big risks		3-4)Oriented toward incremental innovations and calculated risk		
Miller & Friesen, 1984b	Niche strategy; Major & frequent product innovations; Use middlemen in marketing; Some vertical integration	Product lines broadened; Incremental product innovations; Some diversification	Product/Market consolidation; Efficiency focus; Conservative; Short term focus; Follow competition; Few innovations;	Product/market segmentation & diversification; Bold, forward-looking, integrated strategy	Product/Market consolidation; Liquidation; Price cutting; Lethargic, unresponsive; Short-term focus

Table 2.1, Continued

Model	Start-up Stage	Expansion Stage	Consolidation Stage	Diversification Stage	Decline Stage
<b>Strategy (Continued):</b>					
Quinn & Cameron, 1983	Formation of a niche			Domain expansion; Adaptation	
Scott & Bruce, 1987	<p>1) Single product line, limited channels and market; Major investments in plant and equipment; Sources of capital - Owners, friends &amp; relatives, suppliers, leasing; No product/market R&amp;D</p> <p>2) Single product line with increasing scale &amp; channels; Major investments - working capital; Source of capital - Owners, suppliers, banks; Little product/market R&amp;D</p>	<p>3) Broadened but limited line, single market, multiple channels; Major investments - working capital &amp; extended plant; Source of capital - banks, new partners, retained earnings; Some new product development</p> <p>4) Major investments - new operating units; Source of capital - retained earnings, new partners, secured long term debt; R&amp;D focus on new product innovation and market research</p>	<p>5) Contained lines, multiple markets and channels; Major investments in maintenance of plant &amp; market position; Source of capital - retained earnings &amp; long term debt; R&amp;D focus - process innovation</p>		

Table 2.1, Continued

Model	Start-up Stage	Expansion Stage	Consolidation Stage	Diversification Stage	Decline Stage
<b>Key Skills/Resources:</b>					
Adizes, 1989	<p>1)Product champion; Market vision; Reality testing; Emotional commitment to idea</p> <p>2)Willingness to take the risk; Regular infusions of cash; Careful monitoring of cashflow &amp; receivables; Hard working, results-oriented founder; Intense commitment; Supportive spouse</p>	<p>3)Ability to focus, set objectives &amp; priorities;</p> <p>4)Professional manager, functional specialists; Administrative skills, systems policies; Founder willing to let go; Manager willing to say "no"; Profit orientation</p>	<p>5)Management training capability;</p> <p>Leadership balance;</p> <p>6)Need renewal; Need "stretch" goals</p>		<p>7-9) Strong leadership (May need leadership change); New vision; Effective information system</p>
Fiamholtz, 1986	<p>1)Ability to see market need; Willingness to make risky investment; Ability to create an embryonic organization, develop basic systems of day-to-day operations, and hire good people</p>	<p>2)Infusion of resources (human, financial &amp; physical); First line managers need basic supervisory skills (motivation, communication, performance appraisal, work planning and organization</p>	<p>3)Need people adept in formal administration, planning, organization; Management development activities to change self-vision of the firm &amp; and build administrative skills; General management skills</p>		

Table 2.1, Continued

Model	Start-up Stage	Expansion Stage	Consolidation Stage	Diversification Stage	Decline Stage
<b>Key Skills and Resources (Continued):</b>					
Galbraith, 1982		3)Power needs to shift from engineering to manufacturing; Authority must be assigned regarding who decides what; Efficiency, cost and volume become important; Strong need for organization & systems (but existing people often lack needed skills)	4)Must develop ability to manage diversity; Must decentralize management of some products while retaining functional structure; Must institutionalize product development process, including integration of different functions;	5)Ability to wisely diversify; Ability to manage organization culture	
Quinn & Cameron, 1983		High commitment and willingness to work long hours	Adaptation & renewal		

Table 2.1, Continued

Model	Start-up Stage	Expansion Stage	Consolidation Stage	Diversification Stage	Decline Stage
<b>Mistakes to Avoid: Adz. 1989</b>	<p>1) Founder makes promises he will later regret; Profit only motive; 2) Hiring mediocre people or rational analyzers (need doers) Sharing stock prematurely; Premature delegation; Underfunding; Premature rules and procedures; Founder's loss of control; Discounting to buy market share</p>	<p>3) Overconfidence; Too many directions at once; Getting into unfamiliar businesses; Assume increased sales automatically increases profits; Founder or family trap; Remote control embrace (founder removes self, but retains control); Loss of founder or key technical people; Throw out administrative types; Reward individual performance while company loses money</p>	<p>5) Complacency; Excessive bureaucracy; Loss of environmental responsiveness  6) Same as above</p>		<p>8) Firing critics of status quo</p>

Table 2.1, Continued

Model	Start-up Stage	Expansion Stage	Consolidation Stage	Diversification Stage	Decline
<b>Basis of Organization:</b>					
Adizes, 1989	1)No structure	3)Organized around people, not tasks	5)Functional		
Galbraith, 1982	1)No organization as such; Informal;	Functions & hierarchy begin	Functional	Functional with overlay matrix and profit centers	
Kazanjian, 1988	2)Resembles new product development team Discrete functions formed	3)Hierarchy grows, Functional specialization			
Miller & Friesen, 1984b	Undifferentiated; Simple	Departmentalized; Functional; Managers appointed to head marketing, and production, perhaps R&D and accounting	Departmentalized; Functional	Divisional by market	Mostly Functional
<b>Formalization of Structure:</b>					
Adizes, 1989	1)None 2)Very informal, personal	4) Structure redefined	5) formal structure		

Table 2.1, Continued

Model	Start-up Stage	Expansion Stage	Consolidation Stage	Diversification Stage	Decline Stage
<b>Formalization of Structure (Continued):</b>					
Baird & Meshoulam, 1988		Added structure			
Flamholtz, 1986	1-2) Informal structure with overlapping responsibilities		3-4) Explicit role descriptions		
Kazanjian, 1988	1) Structure & formality non-existent	3) Add more formal structure & reporting mechanisms	4) Has & adheres to formal structure		
Miller & Friesen, 1984b	Informal	Some formalization	Formal, Bureaucratic		Formal, Bureaucratic
Quinn & Cameron, 1983		Informal structure	Stable structure	Elaboration of structure	
Smith et al., 1985	No formal structure	Formal structure	Formal structure		
<b>Formalization of Procedures and Systems:</b>					
Adizes, 1989	1) Few policies & procedures; Very Informal, personal		5) Formal systems & planning; High plan adherence; Institutionalized vision & creativity; Precedent important		



Table 2.1, Continued

Model	Start-up Stage	Expansion Stage	Consolidation Stage	Diversification Stage	Decline Stage
<b>Formalization of Procedures and Systems (Continued):</b>					
Flamholtz, 1986	<p>1-2) Informal, ad hoc planning</p> <p>1-2) Partial, ad hoc control, seldom use formal measurement</p> <p>1-2) Budget not explicit, seldom follow-up on variances; 1) Strategic planning informal, intuitive</p> <p>1) Control quite informal, via day to day interaction</p>	<p>2) Recommends one to two day planning retreat per year, in spite of hectic work pace,</p> <p>2) Control needs to increase dramatically, including formal planning system, responsibility accounting, management by objectives</p>	<p>3-4) Formal systematic planning; Formal, planned control system, including explicit objectives, measures, evaluation &amp; rewards; Management by standards, variances; 3) Need to establish a formal strategic planning process; 4) Well institutionalized strategic planning process; 3) Requires sophisticated control tools, including formal control system, budgeting down to individual products &amp; profit centers; 4) More sophisticated systems</p>		

Table 2.1, Continued

Model	Start-up Stage	Expansion Stage	Consolidation Stage	Diversification Stage	Decline Stage
<b>Formalization of Procedures and Systems (Continued):</b>					
Galbraith, 1982	Personal, subjective reward system; Informal, natural, policies adopted spontaneously	Systematic, impersonal reward system; Centralized functional organization emerges	Impersonal, formal, objective, reward system		
Greiner, 1972	1)Control via market; Frequent, informal face-to-face communication; Modest salary with promise of equity benefits	2)Accounting systems, inventory and purchasing systems, incentives, budgets and work standards added	3)Profit centers, bonuses; Infrequent communication with top management	4)Formal planning systems added; Corporate staff expanded; Portfolio management; Technocratic functions centralized, operating functions decentralized; Stock options & profit sharing offered 5)Social control and self discipline take place of many formal controls; Downsizing central staff; Improved meetings, information system, cross-functional coordination	

Table 2.1, Continued

Model	Start-up Stage	Expansion Stage	Consolidation Stage	Diversification Stage	Decline Stage
<b>Formalization of Procedures and Systems (Continued):</b>					
Kazanjian, 1988	1)Formality non-existent; 2)Communication face-to-face; Employees involved or witness founder actions		4)Has & adheres to formal structure and procedures		
Miller & Friesen, 1984b	Few formal controls, information systems  Bold, intuitive decision making; Low multiplexity, integration	Greater attention to environmental scanning and financial controls  More levels of management involved in decision making; Team approach to decision making	Greater emphasis on formal cost controls, budgets, performance measures  More careful weighing of decision alternatives	Information system must encompass more than informal controls  Formal mechanisms for integrative communication, including task forces, project teams; Careful, systematic analysis and decision making	Absence of well defined information processing system; Dearth of effective controls; Unable to respond quickly to change
Quinn & Cameron, 1983	Informal, face-to face communication	Informal communication	Formalization of rules; Institutionalized procedures		

Table 2.1, Continued

Model	Start-up Stage	Expansion Stage	Consolidation Stage	Diversification Stage	Decline Stage
<b>Formalization of Procedures and Systems (Continued):</b>					
Smith, Mitchell & Summer, 1985	Informal, face-to-face communication; Little formal planning; Low adherence to plans	Moderately formal communications; Budgets  High Adherence to plans	Very formal communications  5 year plans Rules & Reg's. Low adherence		
Scott & Bruce, 1987	1)Simple book-keeping; Eyeball control 2)Simple book-keeping; Personal control	3)Accounting systems, simple control reports 4)Budgeting systems, monthly sales and production reports; Delegated control	5)Formal control systems; Management by objectives		
<b>Centralization / Decentralization:</b>					
Adizes, 1989	2)Centralized, one person show, Lack management depth				
Greiner, 1972	1)Centralized		3)Greater responsibility given to managers of plants and market territories		

Table 2.1, Continued

Model	Start-up Stage	Expansion Stage	Consolidation Stage	Diversification Stage	Decline Stage
<b>Centralization / Decentralization (Continued):</b>					
Greiner, 1972 (Continued)			Decentralized structure; Technocratic functions centralized, operating decisions decentralized		
Miller & Friesen, 1984b	Power highly centralized	Somewhat less centralized; More levels of management involved in decisions	Moderate centralization; Professional management, more participative approach	Divisional structure; Power can still be quite centralized if corporate staff monitors closely; Strategy making highly centralized; Decision making is decentralized	Moderate centralization; Locus of decision making at top
Mintzberg, 1973 & Smith, et al., 1985	Entrepreneurial decision making; Individual judgement	Professional management; Analytical tools guide decisions	Professional management; Decisions via bargaining		
Quinn & Cameron, 1983	"Prime mover" has power			Decentralization	
Smith, Mitchell & Summer, 1985		Centralized	Decentralized		

Table 2.1, Continued

Model	Start-up Stage	Expansion Stage	Consolidation Stage	Diversification Stage	Decline Stage
<b>Top Management Composition:</b>					
Adizes, 1989	One person show				
Galbraith, 1982 & Smith et al., 1985	Generalists/ "Jack-of-all-trades"	Specialists	Strategists/ Planners; Professional management team		

### **What Constitutes a Life Cycle Stage?**

Organization life cycle theorists have argued that organizations grow through a series of distinct stages. In spite of the many models of growth stages which have been developed over the years, there has been remarkably little attention in the literature toward defining the construct of life cycle stage.

As illustrated in Table 2.1, life cycle stages are described along multiple dimensions. While there is substantial variability in specific dimensions used in a given model, most involved some measures of organization situation or context (age, size, growth rate and focal problems), strategic orientation, and structure (basis of organization, formalization, differentiation, centralization). Of these dimensions, the contextual and structural variables seem to have been used most consistently among the models, and strategic orientation used more sporadically. Differences in life cycle stages can be characterized by differences in these dimensions.

Miller and Friesen (1984b) in their "quantum theory" of organizations suggest the study of organization configurations or patterns of variables which cluster together, reflecting integral interdependencies. Using this approach and drawing from the dimensions introduced above, a life cycle stage can be defined as a *unique configuration of variables related to organization context, strategy and structure*. The interdependency among these variables is well established in organization theory (Chandler, 1962; Galbraith, 1973; Galbraith & Kazanjian, 1986; Rumelt, 1978). The transition between stages can be characterized as a reconfiguration of these dimensions (Galbraith, 1982; Miller & Friesen, 1984b).

The idea of growth stages suggests a step-wise development of organizations, characterized by significant reconfiguration as organizations move from one stage to the next. Constant iterative change is inconsistent with the idea of stages or configurations (Miller & Friesen 1984b). Iterative change would suggest constant movement along a series of continua. Were organizations to grow in such a pattern, specific stages or configurations would be indistinguishable. Longitudinal studies of organization development (Miller & Friesen, 1980, 1984b; Tushman, Newman & Romanelli, 1986) support the concept of growth stages or configurations. This will be discussed in greater detail in a later section of this

chapter.

Having defined life cycle stage, our attention now turns to the second major question: How many life cycle stages are there?

### **How Many Life Cycle Stages?**

As illustrated in Table 2.1 (first two pages) there is a fairly broad range in the number of stages specified as the organization emerges from birth through maturity and eventually declines. Smith et al. (1985) suggest a three stage model. Four stage models are proposed by Baird and Meshoulam (1988), Quinn and Cameron (1983) and Kazanjian (1988). Five stages are theorized by Galbraith (1982), Greiner (1972), Miller and Friesen (1984a), and Scott and Bruce (1987). Flamholtz (1986) proposed a seven stage model, though the latter three stages are only briefly discussed. Finally, Adizes (1988) proposes the most complex model, proposing ten developmental stages.

In spite of this broad variance in number of stages, a comparison of stage content reveals a fairly consistent pattern of organization evolution. All of the models include one or more stages related to organization birth or start-up, expansion, and maturity. All but three (Adizes, 1989; Kazanjian, 1989; Smith et al., 1985) include one or more diversification or revival stages. Only three authors (Adizes, 1989; Flamholtz, 1986; Miller & Friesen, 1984a) include a decline stage or stages in their life cycle models.

Exclusion of decline stages in the majority of models can most likely be attributed to two characteristics of organization decline. First, the impact of decline on organization structure and systems is far less predictable than changes associated with growth. Second, organization decline can actually occur at any stage in the life cycle. Onset of organization decline following the start-up stage may well have different causes and manifestations than decline occurring after the diversification or revival stage. This accounts for some inconsistencies in the descriptive commentary of the decline stages later in this chapter.

While the models suggest a fairly consistent pattern of organization growth, there is wide variance as to the specific number of stages. The selection of five stages in Table 2.1 was chosen simply for parsimony and ease of comparison. The models range from three to



ten stages, but which number, if any, is correct? Do all organizations go through the same series of stages? Are there contingencies which affect the number of stages? These questions remain unanswered to date in the literature. Extensive taxonomic study remains to be done before the number-of-stages question can be answered more definitively. Such efforts could greatly strengthen the predictive utility of the life cycle model.

### **Life Cycle Stage Characteristics**

Table 2.2 presents a summary or synthesis of the ten models by dimension and stage. This table capsulates at a general level, current thinking regarding the characteristics of life cycle stages. As illustrated in the Table, organizations are theorized to evolve through five general stages: Start-Up, Expansion, Consolidation, Diversification, and Decline. The characteristics of each of these stages are discussed below.

#### **Stage I: Start-Up**

The first stage, *Start-Up*, is representative of Adizes' Courtship and Infancy stages, Baird and Meshoulam's Initiation stage, Flamholtz's New-Venture stage, Galbraith's Proof of Principle/Prototype and Model Shop stages, Greiner's Creativity stage, Kazanjian's Conception and Development, and Commercialization stages, Miller and Friesen's Birth stage, Quinn and Cameron's Entrepreneurial stage, Scott and Bruce's Inception and Survival stages and Smith, Mitchell and Summer's Inception Stage. At this stage the organization is new, or very young, has few employees, and its growth rate is inconsistent. Predominant goals include creation of a product or service and survival in the marketplace. Key business tasks include identification of a market niche, prototype development, learning how to produce the product in quantity, and setting up a basic task structure. Important resources must also be obtained in the Start-Up stage. Obtaining sufficient financial capital is often a major challenge. At this stage that the entrepreneur must undertake substantial risk, often mortgaging personal assets to obtain needed start-up capital.

Most firms at this stage pursue a niche strategy, presenting a very narrow product line, often a single product to a single market. The new venture generally undertakes

**Table 2.2**  
**Life Cycle Stages: Summary Model**

Dimension	Start-up Stage	Expansion Stage	Consolidation Stage	Diversification Stage	Decline Stage
<b><u>CONTEXT:</u></b>					
Age:	Young .....			Older	Oldest or any age
Size:	Small .....			Largest	Declining
Growth Rate:	Inconsistent	Rapid positive	Slow growth	Rapid positive	Declining
Business tasks or challenges:	Identify & define market niche; Undertake risk; Obtain resources; Build prototype; Learn to produce in quantity; Set up task structure; Obtain customers	Volume production and distribution; Capacity expansion; Ensuring adequate resources; Develop economies of scale; Develop operational systems; Overcome functional crises	Make business profitable; Expense control profitability; Develop management systems	Diversification/Expansion of product/market scope	Revitalization; Redefinition of mission & strategy
<b><u>STRATEGY:</u></b>					
Product/market scope:	Niche strategy; Single product & market	Broadened, but limited line	Contained lines, multiple markets and channels	Segmentation and diversification	Consolidation of products & markets
Investments:	Plant & equipment; Working capital	Working capital; Capacity expansion	Maintenance of plant & market position	Acquisition of related and/or unrelated businesses	

Table 2.2, Continued

Dimension	Start-up Stage	Expansion Stage	Consolidation Stage	Diversification Stage	Decline Stage
<b>STRATEGY (Continued):</b>					
<b>Product development:</b>	Major & frequent product innovations	Incremental product innovations	Few product innovations; Follow competition; Process innovation focus	Entrance into new markets via acquisition or internal development	None (harvest) Major innovations (retrenchment/turnaround)
<b>Key skills/resources:</b>	Product champion; Market vision; Reality testing; Willingness to take risk; Hands on, results oriented manager; Ability to create embryonic organization and task systems; Careful monitoring of cashflow & receivables; Intense commitment	Ability to focus, set objectives & priorities; Founder willing to "let go"; Basic administrative systems; Infusion of resources; Managers need basic supervision skills; Profit orientation	People adept in formal planning, organization, administration	Ability to wisely diversify; Ability to manage organization culture	Strong leadership; Clear vision
<b>Mistakes to avoid:</b>	Premature promises; Hiring analyzers or mediocre employees; Premature formalization, delegation; Discounting to gain accounts	Overconfidence; Overextension; Loss of founder &/or key people; Ejection of administrative types	Complacency; Excessive bureaucracy; Loss of environmental responsiveness	Overextension of management systems	Sacrifice last vestiges of creativity

Table 2.2, Continued

Dimension	Start-up Stage	Expansion Stage	Consolidation Stage	Diversification Stage	Decline Stage
<b>STRUCTURE:</b>					
Basis of organization:	Undifferentiated; Simple	Departmentalized; Functional	Departmentalized; Functional	Divisional by function	Mostly functional
Formalization of structure:	Very informal	Moderately formal	Formal, bureaucratic	Formal, bureaucratic	Formal, bureaucratic
Formalization of processes/ Standardization	Very informal, personal, intuitive, flexible; Few policies and procedures; Little formal planning; Personal control; Simple bookkeeping	Formal systems begin to emerge, but enforcement is inconsistent (responsibility accounting, information system, simple control reports & budgets, personnel systems, work standards, etc.)	Formal planning and control systems in place and enforced; Specific objectives and measures; Formal rules, & institutionalized procedures. Careful attention to variances	Increased formalization at corporate level; Planning and control become more sophisticated and integrative; Cultural control becomes more important	Excessive bureaucratization; Dearth of effective controls; Inability to respond to change
Centralization:	Highly centralized in founder	Somewhat less centralized; More levels of management involved in decisions	Moderately centralized; More levels, professional mgt.; More participative approach to decisions	Corporate strategy centralized; Business level decisions decentralized to operating units	Moderate centralization; Locus of decision making at the top
End of Stage Crises:	Leadership crisis (need strong business leader); Lack of structure	Founder or family trap (insufficient delegation)	"Red tape" crisis (excessive bureaucracy)		

Sources: Adizes, 1989; Greiner, 1972; Galbraith, 1982; Baird & Meshoulam, 1988; Kazanjian, 1988; Smith, Mitchell & Summer, 1985; Miller & Friesen, 1984b; Flamholtz, 1986; Quinn & Cameron, 1983; Scott & Bruce, 1987;

significant and frequent product innovations (Miller & Friesen, 1984a). Major investments are made in product development, plant and equipment and working capital (Scott & Bruce, 1987).

Formal organization structure is almost nonexistent during the Start-Up stage. A simple organization structure (Mintzberg, 1979) is generally employed, directed by the founder, who supervises the work of a few employees. Job assignments are very general. The tone is very flexible, informal and personal. There are few if any formal systems; planning and control occurs on an ad hoc, often, intuitive basis. Decision making is highly centralized in the organization founder.

Key skills during the Start-Up stage include creativity (Greiner, 1972), market vision, intense commitment and the willingness to undertake risk (Adizes, 1989) on the part of the founder. The founder must be an adept "hands-on," results oriented doer. The organization must be "up and running" as quickly as possible if it hopes to survive. Cash flow must be carefully monitored.

Potential crises at the Start-Up stage include Adizes' (1989) commitment crisis, and Greiner's (1972) leadership crisis. The commitment crisis is a critical transition point between Adizes' Courtship and Infancy stages. The key task in the Courtship stage is commitment building, and it is not until sufficient internal commitment has been attained, demonstrated by the founder's willingness to undertake personal risk (i.e., mortgaging personal assets), that the organization moves into the infancy stage. When commitment is insufficient, Adizes calls this an "affair." The desire to make money alone is insufficient to generate sufficient commitment in this stage; days are long, pressures intense, and little if any profit is made. Only an intense emotional commitment to the idea can propel the founder through this difficult period of organization growth.

According to Greiner, growth in the Start-Up stage is a result of the creativity of the founder. However, as the organization begins to grow, the technically oriented founders often find themselves burdened by unwanted managerial responsibilities. Greiner (1972) describes the resultant Leadership Crisis as follows:

As the company grows, larger production runs require knowledge about the efficiencies of manufacturing. Increased numbers of employees cannot be managed exclusively through informal communication....Additional capital must be secured, and new accounting procedures are needed for financial control. Thus the founders find themselves burdened with unwanted management responsibilities....At this point, a crisis of leadership occurs. (p. 42)

The solution to this crisis, according to Greiner, is "to locate and install a strong business manager." This, however, is difficult because founders are often reluctant to relinquish control. Firms that are able to make this transition move into the next evolutionary stage, Expansion.

Success in the Start-Up stage generally results from the intense personal involvement and leadership of the founder. The organization has minimal structure to ensure flexibility as the founder works to adapt the organization to the needs of the marketplace. Care must be taken to avoid premature delegation and formalization of organization structure and processes. Delegation can be premature, because the founder's vision of the organization is still emerging. Attempting to delegate can become frustrating to both the founder and the subordinate at this stage. Only later, as the founder's vision and organization mission become more stabilized, will delegation become effective (Adizes, 1989).

The Start-Up stage is an intense learning process for the organization founder. Two critical judgement errors often occur at this stage. First, according to Adizes (1989), founders often make promises they later come to regret. These commitments may result in premature equity sharing, or discounts given to major customers to gain their business. The second type of judgement error occurs in hiring. Lacking experience founders may hire mediocre people. This can create a severe management crisis at later stages when there is a pressing need for individuals to take on increasing managerial responsibility. A related crisis can occur when a founder hires individuals of the rational analyzer variety. While the founder should seek skilled individuals, the need at this stage is for doers, not analyzers. By avoiding these mistakes, the founder can avert major problems at later stages of the life cycle.

**One Stage or Two?** Four of the models (Adizes, 1989; Galbraith, 1982; Kazanjian, 1989; Scott & Bruce, 1987) portrayed the Start-Up Stage as two distinct substages. Adizes

(1989) Courtship and Infancy stages are discussed above. The focal task of Courtship is building internal commitment, and during Infancy, the focus turns to gathering key resources. Courtship is a dreaming and thinking stage, while Infancy is a doing stage. The transition to Infancy occurs as the founder undertakes personal risk, initiating actual development of the organization.

Galbraith (1982), Kazanjian (1989) and Scott and Bruce (1986), presented similar models of substages. The focal task during the first segment is prototype development (Galbraith's Proof of Principle/Prototype stage, Kazanjian's Conception stage, and Scott and Bruce's Inception stage). Once this is accomplished, the firm moves to the next stage which involves product refinement, volume production, and managing revenues and expenses (Galbraith's Model Shop stage, Kazanjian's Commercialization stage, Scott and Bruce's Survival stage). Each of these models is developed with manufacturing firms (high technology manufacturing firms, in the cases of Galbraith and Kazanjian) in mind, and this may account for their similarity.

### **Stage II: Expansion**

Assuming the organization survives the Start-up stage, it now moves into the second developmental stage, *Expansion*. The Expansion stage is representative of Adizes' (1989) Go-Go and Adolescence stages, Baird and Meshoulam's (1988) Functional Growth stage, Flamholtz's (1986) Expansion stage, Galbraith's Start-Up/Volume Production stage, Greiner's (1972) Direction stage, Kazanjian's and Miller and Friesen's (1984a) Growth stages, Quinn and Cameron's (1983) Collectivity stage, Scott and Bruce's (1987) Growth and Expansion stages, and Smith, Mitchell and Summer's (1985) High Growth Stage.

At this point in time the organization's product is fully developed and is receiving a positive acceptance in the market place. Thus the Expansion stage firm is older and a little bit larger than at the previous stage. The most dramatic difference at this stage is the rate of growth. In the expansion stage, the organization undergoes a period of rapid positive growth.

Growth brings new challenges to the organization. To meet increasing product demand, production capacity must be expanded and additional people hired. The organization must develop the ability to produce and distribute its products or services in volume to an increasingly diverse set of customers. Existing physical, financial, human and informational resources are stretched to the limit. Ensuring adequate supplies of these resources becomes a major task during this stage. Some economies of scale and experience should also be attained during this stage.

During the Expansion stage, the product line may be broadened somewhat, but is still quite limited (Scott & Bruce, 1986). Product innovations tend to be incremental. To meet growing demand, major investments must be made in working capital and production capacity.

Moderately formal systems and structure begin to emerge during the Expansion stage. Functional departments are formed for key areas of engineering, production, marketing, and administration, and the structure changes from simple to functional. Operating systems are developed in areas such as responsibility accounting, basic budgets and control reports, work standards and personnel systems (Flamholtz, 1986). While these systems may be in place, enforcement is often inconsistent due to the rapid pace of growth. While decision processes are still quite centralized, it is less so than in the Start-up stage, as functional managers become involved in some decisions.

The addition of structure and systems is not always accepted with open arms at the Expansion stage. These innovations are often met with strong resistance from the organization founder as well as "old guard" employees. Galbraith (1982) describes this challenge as follows:

Herein lies the trap. Success during the prototype stage provides energy, commitment, confidence, esprit de corps, and a belief (which is a valid one) that success was in part due to the lack of structure and constraint. For many people, the current organization, or lack thereof becomes an end in itself. The attractiveness of this venture organization is why they joined. Then when the next stage begins and requires structure, these people resent the change to their eventual detriment....This lack of stagewise planning has caused many ventures to fail or require new management. (p.75)

Effective Expansion stage leaders must be able to say "no" and to effectively delegate. The initial success experienced by the Expansion stage organization can



sometimes lead to overconfidence. Adizes labels his early Expansion stage as "Go-Go," characterized by the tendency of the organization to go in too many directions at once, often overextending itself. There is a need in the Expansion stage for the organization to focus, choosing among alternative products and markets, establishing priorities, and setting specific objectives.

The major crisis associated with the Expansion stage is the founder or family trap. This occurs when the founder or founder's family is unwilling or unable to delegate responsibility effectively. Strong central decision making was essential in the Start-Up stage. However, this approach can bring the Expansion stage organization to a screeching halt, severely hampering future growth potential. This inability to "let go," or to constantly override decisions of subordinates, results in a decision-making backlog, greatly compromising the ability of functional departments to carry out their role. The solution to this crisis is effective delegation. Some founders are able to discipline themselves to do this. However, it is often necessary for the founder to remove himself or herself from day to day operations, accepting a "chairman of the board" or "chief technical officer" type of role.

Recognizing the need for formal operating systems, the founder may bring in a strong administrative manager during the Expansion stage. A power struggle often emerges between the administrative manager and the organization founder and "old guard" employees. Success in Stage I resulted in part from the organization's flexibility, informality, and adaptability. As the administrative officer seeks to bring formal planning, budgeting and control systems, the "old guard" resists these restrictions complaining of excessive bureaucracy and red tape.

There are several possible outcomes to this power struggle. First, the founder may fire the administrative officer, moving the organization back into the "founder trap." Another possible scenario is that the administrative officer and the board of directors may team up to expel the founder from the organization. This can result in a major loss of technical and entrepreneurial talent to the organization, especially if other members of the technical or entrepreneurial core of the organization exit with the founder. This power struggle is a very difficult dilemma which must be resolved during the Expansion stage. The ideal solution is

to reach some compromise which allows for delegation of administrative systems without necessitating the exodus of the founder and technical core of the organization.

A second major challenge or crisis in the Expansion stage is deciding who has authority to make what decisions. As the organization grows and functional departments are organized, the question often arises as to who has authority to make certain decisions. For example, who will decide on compensation levels for sales staff; the marketing director, or director of personnel? These kind of turf battles are to be expected in Stage II and must be resolved.

As in the Start-Up stage, some authors (Adizes, 1989; Scott & Bruce, 1987) portrayed the Expansion stage in two substages. For Adizes, the division point between his Go-Go and Adolescence stages is the attainment of some focus and administrative controls in the organization. In the Scott and Bruce model the focal problem changes from acquiring resources in their Growth stage to financing growth and maintaining control in their Expansion stage. The remaining eight authors depicted Expansion as a single stage.

### **Stage III - Consolidation**

Stage III, *Consolidation* is representative of Adizes' (1989) Prime and Stable stages, Baird and Meshoulam's (1988) Controlled Growth stage, Flamholtz's (1986) Consolidation and Professionalization stages, Greiner's Delegation stage, Kazanjian's Stability stage, Quinn and Cameron's (1983) Formalization stage, Miller and Friesen's (1984a), Scott and Bruce's (1987), and Smith, Mitchell and Summer's (1985) Maturity stages. In the Consolidation stage, the organization is larger than during the Expansion stage, but the organization is now growing at a slower rate. Cost control and productivity become key concerns, as the focus turns from growth to profitability. There is some consolidation of the product line, but the product is sold through multiple channels.

Product innovations are incremental, often following changes in competing products. Emphasis turns from product innovation to process innovation, designed to improve production efficiency and reduce unit costs. Major investments during the Consolidation stage are directed toward plant maintenance and retention of market share.

During the Consolidation stage, the organization retains its departmentalized, functional structure; however, the structure and systems become more formal and bureaucratic than in the Expansion stage. The management hierarchy is comprised of several levels, and top management is comprised of a team of professional managers (as opposed to the entrepreneurial management in the earlier two stages). Decision making becomes less centralized, and a more participative management style is employed. Formal planning and control systems are established and enforced through careful attention to variances. Rules are established and policies institutionalized. Effective leaders at this stage must be adept at formal planning, organization and administration.

Three major crises face organizations at the Consolidation stage: (1) Excessive bureaucracy, (2) a loss of responsiveness to environmental changes, and (3) market saturation. Bureaucratic rules and controls bring important efficiencies to the Stage III organization. However, excessive controls can lead to a "red tape crisis" (Greiner, 1972), as the organization becomes bogged down by excessive rules and procedures. Following rules becomes more important than effectively serving customers, resulting in diseconomies rather than economies of scale. The second crisis, not unrelated to the first, is the loss of environmental responsiveness. Bureaucracies work well in stable environments, but they are very slow to change. Consolidation stage organizations may become complacent, their focus turned inward, and fail to observe or react to significant changes on the environment. Either of these crises, if not managed well, can move the organization into decline. The solution to these crises is decentralization, which moves the organization into its next stage of development.

A third potential crisis at this stage is a saturated market, which is overcome by diversification into either other related or unrelated markets through acquisition or spinning off existing product groups into independent divisions.

#### **Stage IV - Diversification**

Stage IV, *Diversification* is representative of Baird and Meshoulam's (1988) Functional Integration and Strategic Integration stages, Flamholtz (1986) Diversification and

Integration stages, Galbraith's (1982) Strategic Maneuvering stage, Greiner's (1972) Coordination and Collaboration stages, Miller and Friesen's (1984a) Revival stage, and Quinn and Cameron's (1983) Elaboration of structure stage. At this stage, the organization reaches its largest size as it again undergoes a period of rapid positive growth, spawned by expansion or diversification of the product market scope. Expansion of product market scope can be achieved through any of several strategies including market segmentation, acquisition of related or unrelated businesses (diversification), or developing new product or services internally.

As the organization begins serving multiple markets, its environment becomes dramatically more complex and heterogeneous. In response, Stage IV organizations generally adopt a divisional form (Mintzberg, 1979) of structure, granting considerable autonomy to product groups or divisions. Strategic planning and control systems become increasingly more formal and sophisticated at the corporate level, but operating decisions at the business level are decentralized to the individual divisions. As corporate management no longer controls day to day operations, cultural control becomes more important.

The major crisis faced by firms at this stage is integration. Care must be taken to ensure that management systems are sufficiently sophisticated to oversee a diverse conglomeration of organizations. Care must be taken to avoid overcontrolling these organizations, making them ineffective, yet control must be sufficient to ensure that vital synergies between business units are attained.

#### **Stage V - Decline**

Stage V, *Decline*, is reflective of Adizes' (1989) Aristocracy, Early Bureaucracy, Bureaucracy, and Death stages, and Flamholtz's (1986) and Miller and Friesen's Decline stages. Decline can follow any of the previous four growth stages. It is characterized by declining size and sales, consolidation of product lines and markets.

The level of product development at this stage is likely to depend on the business strategy of the organization. If the firm is pursuing a harvest strategy, or has reached a state of lethargy, little or no product development will be taking place. On the other hand if

the firm is pursuing a turnaround strategy, the pace of product development may be frantic. The focal business task of declining organizations is organization renewal.

Assuming the organization has reached the consolidation stage prior to declining, the structure is expected to be mostly functional, quite formal and bureaucratic. Older firms may well be excessively bureaucratic, which contributes to the organization's demise (Adizes, 1989). Centralization is expected to be moderate, with the locus of decision making power at the top of the organization.

Declining organizations need strong, directive leadership. They often have a need for a real awakening, necessitating a redefinition of organization mission or purpose. It is not uncommon for new leadership to be brought in to direct this reconfiguration. Bureaucratic inefficiencies must be removed and the organization redirected toward better meeting the needs of the marketplace.

Adizes (1989) depicts organization decline in four substages: Aristocracy, Early Bureaucracy, Bureaucracy and Death. The four stages portray a steady downward spiral, beginning with wealth and complacency, and proceeding through increasing bureaucratic red tape, infighting and diminished market responsiveness. As the organization progresses through these stages, it becomes increasingly difficult to refocus and turn the organization around. Failing this, the organization becomes lethargic and eventually dies.

### **Dynamics of the Organizational Life Cycle**

In the previous section, literature regarding stages of the organization life cycle were reviewed. In this section, the focus turns from the content of life cycle stages, to the dynamics of the organization life cycle, the theoretical underpinnings of why and how firms are proposed to move from one growth stage to the next.

As discussed above, each stage of the life cycle can be conceived as a configuration ( Galbraith, 1982; Miller & Friesen, 1984b) or pattern of interrelated variables (age, growth rate, size, structural form, formalization, focal problems or priorities, and strategic orientation), which tend to cluster together at a given period of an organization's evolution. Movement from one developmental stage to the next involves a reconfiguration

along these dimensions. But, what causes this reconfiguration and by what means does it take place? A comprehensive theory of organization growth and decline must go beyond the definition of stages to examine the dynamics of movement between stages.

Organization growth has been examined from multiple perspectives. Baird and Meshoulam (1988), in their discussion of life cycle dynamics, identified four different kinds of models used to explain organization growth: hierarchical models, evolutionary models, stage models and metamorphosis theory. Hierarchical models (Boulding, 1956; Chaffee, 1985) portray organization growth and change as a process of adding discrete building blocks, each stage building upon previous stages.

Evolutionary models (Alchian, 1950; Aldrich & Pfeffer, 1976; Burns & Stalker, 1961; Galbraith, 1973; Lawrence & Lorsch, 1967; Thompson, 1967; Woodward, 1965) focus on the relationship between the organization and its environment. The argument here is that organizations change through adaptation to environmental conditions. Organizations, which are able to maintain a good environmental "fit," continue to grow and expand. Those that do not experience decline and eventually death.

The third group of models, stage models (Salter, 1968; Scott, 1971; Stopford, 1968), incorporates elements of the first two models. Baird and Meshoulam (1988) describe this integration this way:

Sequential building blocks and environmental responsiveness are incorporated into stage models, and to that is added the idea that managerial action permits the organization to adjust to the environment. (p.117)

Building on the works of Rostow (1960) and Chandler (1962), these models argue that management adjusts strategy and structure to gain an appropriate "fit" between the organization and environment. Thus, the distinguishing feature between evolutionary and stage models is the inclusion of managerial action, adapting the organization to the environment, as opposed to the organization simply reacting to the environment.

A major limitation of stage models, according to Baird and Meshoulam, is that they fail to answer the question of how organizations change from one stage to the next. Metamorphosis theory, their fourth categorization, provides an answer to this question:

Metamorphosis models propose that change occurs when the fit between the organization and the environment is so bad that the organization's effectiveness and survival is threatened (Baird & Meshoulam, 1988: p. 117).

As the organization reaches this crisis point, dramatic reconfiguration occurs (Chandler, 1962; Starbuck, 1965). Thus the organization retains a given configuration (or stage) until that configuration no longer provides an adequate fit with the environment. At this point the organization undergoes a major transition to a subsequent stage of development.

There is strong support in the literature for Metamorphosis Theory. Greiner (1972), argued that as firms grow in age and size, they undergo periods of "evolution" and periods of "revolution." Evolutionary periods are characterized by prolonged growth with no major upheaval in organization practices. Revolutionary periods are characterized by "substantial organizational turmoil" and change. As periods of evolution unfold, the very factors causing growth become stumbling blocks and inhibit movement into the next evolutionary stage. Thus, movement into the next stage requires upheaval, or "revolution."

This evolution/revolution model of organization change has been supported by recent longitudinal studies at the McGill University (Miller & Friesen, 1980, 1984a; Mintzberg, 1987) and Columbia University (Romanelli & Tushman, 1986; Tushman, Newman & Romanelli, 1986). Mintzberg described the change process observed in the corporate histories studied at McGill this way:

Most of the time they pursue a given strategic orientation. Change may seem continuous, but it occurs in the context of that orientation (perfecting a given retailing formula, for example) and usually amounts to doing more of the same, perhaps better as well. Most organizations favor these periods of stability because they achieve success not by changing strategies, but exploiting the ones they have. They, like craftsmen, seek continuous improvement by using their distinctive competencies in established courses.

While this goes on, however, the world continues to change, sometimes slowly, occasionally in dramatic shifts. Thus, gradually or suddenly, the organization's strategic orientation moves out of sync with its environment. Then what Miller and Friesen call a strategic revolution must take place. That long period of evolutionary change is suddenly punctuated by a brief but revolutionary turmoil in which the organization quickly alters many of its established patterns. In effect, it tries to leap to a new stability quickly to reestablish an integrated posture among a new set of strategies, structures and culture. (p. 71)

Miller and Friesen (1984b) argued that the very existence of organization configurations supports the evolution/revolution pattern of growth:

Were it common for organizations to make such transitions in piecemeal and disjointed fashion, the case for configuration could be weakened. A large number of organizations constantly undergoing piecemeal changes should cause a random cross-section of them to display a great deal of variety. In other words, clustering would break down, and so would our case for configuration. But the economics of adaptation, as well as some recent empirical evidence, argue for a dramatic quantum approach to organizational change—long periods of the maintenance of a given configuration, punctuated by brief periods of multifaceted and concerted transition to a new one. (p.23)

Tushman and his colleagues at Columbia observed a similar pattern of change. Based on their longitudinal study of computer firms, Tushman, Newman and Romanelli (1986) identified two types of organization change. The first was a form of incremental change, which they labeled *convergent*; the second they labeled *discontinuous*, or *frame-breaking* change, which "involves simultaneous shifts in strategy, power, structure, and controls." According to the authors, frame-breaking change is essential to successful growth:

Recent studies of companies over long periods show that the most successful firms maintain a workable equilibrium for several years (or decades), but are also able to initiate and carry out sharp, widespread changes (referred to as reorientations) when their environments shift. Such upheaval may bring renewed vigor to the enterprise. Less successful firms, on the other hand, get stuck in a particular pattern. The leaders of these firms either do not see the need for reorientation or they are unable to carry through the necessary frame-breaking changes. While not all reorientations succeed, those organizations which do not initiate reorientations as environments shift underperform. (p.29)

Consistent with metamorphosis theory, the Tushman et al. study found that organizations seldom undertake frame-breaking change voluntarily. In most cases, frame-breaking change occurs as the organization faces crises related to a loss of fit with the environment:

Upheaval, sooner or later, follows convergence if the company is to survive; only a farsighted minority of firms initiate upheaval prior to incurring performance declines. (p. 31)

Building on the concept of configuration, there appears to be general consensus that organizations evolve through long periods of stability, separated by periods of dramatic multidimensional change. Generally, the driving force behind change is declining performance, which occurs as the organization's configuration "moves out of sync with its environment" (Mintzberg, 1987).



### **Growing Pains**

How can organization managers tell when its time for reconfiguration? Flamholtz (1986) argued that as organizations outgrow their existing structure and systems, they begin to experience "growing pains". These include:

1. People feel "that there are not enough hours in the day."
2. People spend too much time "putting out fires."
3. People are not aware of what other people are doing.
4. People lack understanding about where the firm is headed
5. There are too few good managers.
6. People feel that "I have to do it myself if I want to get it done correctly."
7. Most people feel meetings are a waste of time.
8. When plans are made, there is very little follow-up, so things just don't get done.
9. Some people feel insecure about their place in the firm.
10. The firm continues to grow in sales but not in profits.

According to Flamholtz, occurrence of these growing pains is a signal that the existing configuration is no longer adequate. The above list centers on internal, structural issues only. Perhaps a similar list of growing pains could be developed relating to the interface between the organization and the external environment.

### **Empirical Analysis of the Organizational Life Cycle**

Most of the literature to date regarding the organization life cycle has been conceptual in nature. However, recently, a few empirical studies have begun to emerge. Some of the findings of these studies have been discussed above. In this section, I will briefly review the design and findings of four recent empirical analyses of the organization life cycle (Kazanjian, 1988; Miller & Friesen, 1984a; Smith et al., 1985; Shani et al., 1988). This will aid the reader in understanding the current state of organization life cycle theory in terms of empirical validation and development.

#### **Miller and Friesen, 1984a**

Miller and Friesen (1984a) conducted a longitudinal study of life cycle stages, based on extensive case histories of thirty-six organizations. Studying the development of these firms, Miller and Friesen divided firm histories into a series of "snap shots," or historical segments, occurring between major organizational transitions. Organizational characteristics

at each stage were then scored along 54 variables measuring strategy, structure, decision making style, and strategy. Based on these scores, the research team then assigned the resulting 171 score profiles (all snap shots, all stages) into five life cycle stages. The Miller and Friesen five stage model was derived from the literature, and is summarized in Table 2.1. The following criteria were used by Miller and Friesen to categorize historical segments into stages.

**Birth.** Firm is less than 10 years old, has informal structure, and is dominated by owner-manager.

**Growth.** Sales growth greater than 15%, functionally organized structure, early formalization of policies.

**Maturity.** Sales growth less than 15%, more bureaucratic organization.

**Revival.** Sales growth greater than 15%, diversification of product lines, divisionalization, use of sophisticated controls and planning systems.

**Decline.** Demand for products levels off, low rate of product innovation, profitability starts to drop off.

One way analysis of variance revealed significant differences across life cycle stages in terms of size, complexity and strategy.

One interesting finding of the Miller and Friesen study is that firms do not necessarily move through the stages in a linear fashion. Table 2.3 contains plots of life cycle stage progression for five of the firms analyzed. While firms, on the whole, moved generally from birth to decline, they may skip stages or revert back to certain stages. Consider the example of Ayer, an advertising firm. Miller and Friesen identified 11 periods of time separated by 10 corporate transitions. Using their classification scheme, they show Ayer beginning with a birth phase, followed four periods categorized as growth stages. Next is a maturity phase, followed by two growth periods, a revitalization period, a decline period, and finally, a revitalization period.

A study of firm differences across life cycle stages revealed that firms increase in size and complexity as they move through life cycle stages. Structural differentiation, participation in decision making, and information processing variables all increased

**Table 2.3**  
**Miller and Friesen's Firms, Periods, and Phases**

Firm	Period										
	1	2	3	4	5	6	7	8	9	10	11
Ayer	B	G	G	G	G	M	G	G	R	D	R
IBM	M	G	M	G	M						
Macy's	B	G	G	G	D	M	M	G	G		
Sears	G	G	M	G	D	G	G	R			
Waltham	B	B	G	G	G	M	M	D	D	M	D

\* B, G, M, R, D stand for birth, growth, maturity, revival and decline phases of the life cycle respectively.

Adapted from Miller, D. & Friesen, P. H. (1984). A longitudinal study of the corporate life cycle, *Management Science*, 30(10), 1161-1183.

successively through the four growth phases.

Examination of strategic thrusts across life cycle stages revealed an alternating pattern between aggressive and conservative strategies, as firms move through the five stages. Stages 1 (Birth), 2 (Growth) and 4 (Diversification) were generally associated with innovative strategies such as aggressive product development and diversification, while in stages 3 (Maturity) and 5 (Decline) strategies focused on efficiency of operations and economies of scale.

Stage I firms tended to pursue a niche strategy with major and frequent product innovations. There was some vertical integration at this stage, and extensive use of middle men in distributing the organization's products. Stage II firms had slightly broadened product lines, and only incremental product innovations. There was some diversification occurring at this stage. Stage III firms tended to have a conservative, short-term focus, exhibited by consolidation of product lines, a tendency to follow the competition, and a focus on efficiency. Stage IV firms pursued strategies of expansion and diversification. Finally, declining firms (Stage V) pursued strategies of consolidation, price cutting and liquidation.

This study makes some very important contributions to the literature. First, as a longitudinal study, it examines organization growth and decline over time. Each of the case histories covered a minimum of twenty years duration. The findings that organizations do not move through stages in a linear fashion is a nice contribution. Second, the study gives us insight into strategies pursued by companies during the various growth stages.

The major limitation of the study is that the stages of development are defined a priori, through predefined categories, rather than empirically through patterns in the data. Nevertheless, the authors did find significant differences in situation, strategy, and structural characteristics between the stages. This certainly lends support to their five stage typology.

#### **Smith, Mitchell and Summer, 1985**

Smith et al. (1985) used cluster analysis to categorize electronics firms by their stage in the organizational life cycle. The authors identify three distinct stages which they label Inception, High Growth, and Maturity. This was the only study found in this review which

used an empirical basis for categorizing firms into life cycle stages. Concurrence among these stages and existing organizational theory provides preliminary support for the life cycle construct.

There are two important limitations of this study. First, the sample size used in the analysis is small (n=27). Prior to conducting cluster analysis, fifteen organizational indicators were factor analyzed to identify five underlying dimensions. Replication of the study with a larger sample would increase the reliability of the results.

Second, Smith et al. clustered the firms using a three group constraint. The question arises as to whether three is the appropriate number of clusters. While there is theoretical support for three life cycle stages, there is also support for four (Quinn and Cameron, 1983) or five (Baird & Meshoulam, 1988; Greiner, 1972), or perhaps more (Adizes, 1979). Exploratory analysis utilizing differing cluster constraints may shed further light upon the appropriate number of life cycle stages (Harrigan, 1985).

#### **Kazanjian, 1988**

Kazanjian (1988) used a grounded theory approach in his examination of the organization life cycle. The two-part design involved intensive case studies of two computer based office product manufacturing firms, followed by an empirical study involving a sample of 105 venture funded firms.

Based on his case studies, Kazanjian proposed a stage-of-growth model for technology based organizations, comprised of four stages. Each stage is characterized by dominant management problems:

The managers of these technology-based new ventures faced strategic operational problems from the time of product conceptualization through organizational maturity. Further, some of these problems seem to have been more dominant than others at times, and a sequential pattern of dominance seemed to exist. The particular problems faced at a given time appeared to be strongly associated with a venture's position in a particular stage of growth (Block & MacMillan, 1985; Galbraith, 1982). (p. 261)

Kazanjian's stage-of-growth model is comprised of four stages, each characterized by one or two dominant management problems which are associated with other structural characteristics. The dominant problems and their related stages are summarized below:

<u>Dominant Problems</u>	<u>Stage of Growth</u>
Resource acquisition and technology development	Stage 1: Conception and Development
Production related start-up	Stage 2: Commercialization
Sales/Market share growth and organizational issues	Stage 3: Growth
Profitability, internal controls, and future growth base	Stage 4: Stability

Based upon this four stage model, Kazanjian developed four propositions which he tested via survey data from 105 venture backed high technology firms. The propositions were:

1. Stage 1 firms will rate problems associated with resource acquisition and technology development higher than will firms in other stages.
2. Stage 2 firms will rate problems associated with production start-up, vendor relations, facilities, and field support of the product higher than will firms in other stages.
3. Stage 3 firms will rate problems associated with sales growth, market share growth, and internal organizational mechanisms higher than will firms in other stages.
4. Stage 4 firms will rate problems associated with profitability, internal controls, and future sources of growth higher than will firms in other stages.

Stage 1 firms did rate technology and product development problems as most important; however, these problems were also highly important in stage four. Kazanjian attributes this to the importance of second and third generation products at this stage.

Stage 2 firms were projected to identify production start-up problems as most important. This proposition was not supported. Production related problems showed no significant difference across the stages.

As proposed by Kazanjian, Stage 3 firms rated sales and marketing problems more important than did firms at the other stages. Organization concerns were of greater concern for firms in stages 3 and 4 than they were in stages 1 and 2.

Stage 4 firms ranked technology and product development as being most important. Organization concerns were also important. Thus proposition 4 was moderately supported.

The Kazanjian study is significant in that it suggests that growth stages are defined by dominant problems faced by the organization. This contrasts with other models where organization structural characteristics (centralization, formalization, specialization, etc.) are the dominant factors in defining life cycle stages. While not entirely conclusive, Kazanjian's empirical analysis does provide modest support for the model.

As did Miller and Friesen (1984a), Kazanjian defines the number of stages a priori. The number of stages was assumed to be four, based upon analysis of previous literature and his two case studies. Survey respondents were asked to self-categorize their firms according to Kazanjian's four stage definitions. Comparison of self-categorizations with firm age, size and sales data, strengthen the validity of these categorizations; however the underlying four stage premise is theoretically, rather than empirically based.

Table 2.4 presents a comparison of mean values of organization age, size and growth rates, by stage of growth, as derived in the Kazanjian and Smith et al. (1985) studies. Examination of the table reveals a few commonalities as well as some striking differences between models. In both models, organization age increases incrementally across the stages. Further, growth rates peak at the high growth stage of both models as well. These patterns tend to fit life cycle theory quite well. Differences in magnitude of organization age and growth rates, between models, are most likely attributable to differences in sample composition.

The most dramatic differences between models are found in the total employee figures. Employment figures increase incrementally across stages in the Kazanjian model. In the Smith et al. model, however, the pattern is different; the highest level of employment is found in the middle stage. The magnitude of employment at this stage is significant in that it is more than twice as large as is found in the maturity stage. This pattern is not supported in the life cycle literature. Conceptual descriptions of the two stages are comparable. It is difficult to believe firms averaging over 1000 employees (Smith's et al. High Growth Stage) and firms with just over 300 employees (Kazanjian's Growth Stage) would exhibit similar structural characteristics.

**Table 2.4**  
**Comparison of Age, Employment and Sales Growth**

<b>Kazanjian (Venture Funded Technology Based Firms)<sup>a</sup></b>				
<b>Characteristic</b>	<b>Conception &amp; Development</b>	<b>Commercialization</b>	<b>Growth</b>	<b>Stability</b>
Age	4.3	5.6	7.1	9.4
Total Employees	58.1	68.1	345.4	423.4
Sales Growth (%)	270.0	320.0	640.0	180.0

<b>Smith, Mitchell &amp; Summer (Electronics Firms)<sup>b</sup></b>			
<b>Characteristic</b>	<b>Inception</b>	<b>High Growth</b>	<b>Maturity</b>
Age	11.0	17.0	20.6
Total Employees	14.0	1066.0	532.0
Sales Growth (%)	6.0	24.0	20.6

<sup>a</sup>Adapted from Kazanjian, R. K. (1988). Relation of dominant problems to stages of growth in technology based organizations, *Academy of Management Journal*, 22(2), 257-259.

<sup>b</sup>Adapted from Smith, K. G., Mitchell, T. R. & Summer, C. E. (1985). Top level management priorities in different stages of the organizational life cycle.



Both the Smith et al. and the Kazanjian studies found support for the life cycle construct. However, comparison of size and growth figures illuminates the need for a standardized definition of life cycle stage, and common measures of life cycle dimensions.

#### **Shani, Domicone, and Perner (1988)**

Shani et al. (1988) conducted a study of strategic planning, decision making processes and organization performance across life cycle stages. Three specific hypotheses were tested:

- H1. Small business organization owners tend to utilize different strategic management practices at each stage of business development.
- H2. Decision making practices by small business organization owners vary at each stage of development.
- H3. Small business organization performance is likely to differ at each of the small business development stages.

Survey respondents were asked to self-classify their organizations based on a three stage typology developed by Vozikis (1980). The Vozikis typology distinguished stages using dimensions of general management, operations, finance and marketing.

Findings in the Shani et al. (1988) study were disappointing, in that no significant differences were observed in strategic planning processes, decision making or performance. Their discussion of these results is quite insightful:

Based on the results from this study, the model of small business stages of development needs to be re-examined. First, a number of relevant dimensions have not been included, such as HRM practices, distinctions between differing accounting systems, and management information systems. Second, the questions of actual number of stages, three stages (as opposed to four, five or some other amount) of development requires further empirical research, since no agreement exists in the literature (e.g. Churchill & Lewis, 1983) and no consensus seems to be eminent. This study's findings showing no apparent distinction between development stages may suggest that rather than "stages of development" firms in fact move along a developmental continuum with few or no dichotomous distinctions along the way. "Incremental," rather than radical movement may be indicated, with a continuous development process rather than explicitly delineated stages being apparent. (p. 11)

The significance of this study is that it points to the lack of precision in present typologies of organization life cycle stages. In spite all the normative support and modest empirical support of growth stage construct, there is clearly a need to further examine its validity through taxonomic examination. Do organizations really evolve through "stages," or does

organization growth occur incrementally along several continua? If organizations do grow through distinct stages, how many stages are there, and what are their characteristics? These questions must be addressed through further empirical research.

### **Summary and Conclusions**

In this chapter, an extensive review of organization life cycle literature has been presented. The chapter began with an introduction to the life cycle analogy. The focus then turned to content issues associated with life cycle stages. A comparison of ten life cycle models was presented and common themes among the models identified. There appears to be common agreement among life cycle scholars that organizations move through a series of stages related to start-up, growth, and maturity. Additional stages related to diversification and decline are included in some models as well.

As illustrated in the findings of the Shani et al. (1988) study, in spite of the *general* agreement between models, the life cycle model is seriously lacking in precision. Important questions remain unanswered. First, do organizations *really* evolve in a stagewise manner? Second, if organizations, do evolve through stages, *how many* stages are there and what are the defining characteristics of each stage? Third, do all organizations evolve through the same series of stages? What contingencies might impact stage of growth patterns? These questions can only be answered through careful empirical analysis.

In the rush to identify stages, remarkably little attention has been paid to the construct itself. Based on a review of dimensions used to describe stages in existing models, it was proposed that a life cycle stage be defined as a unique configuration of organization context, strategy and structure.

Recent studies of the dynamics of organization change suggest that organizations evolve through long periods of stability, separated by periods of dramatic multidimensional change (Miller & Friesen, 1980, 1984b; Tushman, Newman, & Romanelli, 1986). Such a pattern of growth is consistent with the proposed configurational definition of life cycle stages.

The number of stages question remains unanswered in the literature. Models ranged from three to ten stages. A review of empirical studies revealed modest support for three (Smith et al., 1985), four (Kazanjian, 1988) and five stage models (Miller & Friesen, 1984a), yet a comparison of age, size and growth rate figures from two studies revealed some conflicting findings. Ultimately, the number of stages is dependent on how one defines a life cycle stage. Only when some consensus is reached as to this definition, can objective studies of the number of stages be conducted.

Progress in the study of the organization life cycle has been hampered by a lack of empirical investigation. The proliferation of conceptual models suggests a general pattern of stagewise growth, but differences in the number of stages specified, and characteristics used to define stages, leaves the field in a state of confusion. At this point, additional conceptual models would only add to the confusion. Advancement of the field is dependent upon operationalizing the basic constructs and the commencement of systematic empirical testing of the life cycle paradigm.

Systematic examination of the life cycle paradigm must begin with the definition of life cycle stage. If the stage concept can be objectified, then objective testing of the number of stages and the specific characteristics of each can commence. Important industrial, environmental, technological and behavioral contingencies could be tested as well. The configurational approach shows promise as a means of objectively identifying life cycle stages, thus providing an important foundation for future research.

## **CHAPTER 3**

### **RESEARCH METHODOLOGY**

In this chapter the research objectives and methodology employed in the study are reported. The chapter begins with a brief discussion of the objectives and design of the study. This is followed by sections describing the sample, data collection procedures, measures, and data analysis.

#### **Research Objectives and Design**

The fundamental objectives of this study were (1) to examine the validity of the configurational definition of life cycle stages, and (2) assuming that a useful set of configurations could be identified, to examine the number of stages and characteristics of each.

An exploratory field study design was employed in the study. The unit of analysis was the organization. According to Kerlinger (1986) exploratory field studies are appropriate when the objectives are to identify significant variables, discover relationships among variables, and lay the foundation for future, systematic hypothesis testing.

Based on the forgoing review of the organization life cycle literature, a number of dimensions were identified as useful in describing organization life cycle stages. The intent of this study has been to operationalize these dimensions and conduct cluster analysis to identify common configurations in a cross section of organizations. It was believed that a number of configurations could be identified, reflecting stages of organization growth and development.

### Sample

The sampling frame consisted of all companies listed in Utah's High Tech Directory (Bureau of Economic and Business Research, 1987). Inclusion in the Directory is dependent on firms meeting the Bureau of Labor Statistics definition Number 3 (Chemical Week, 1984) of high technology organizations. This definition is as follows:

A proportion of technology-oriented workers greater than the average for all manufacturing industries, or 6.3%; and R&D spending about the same as the average for all industries, or 3.1%. (p. 69)

By focusing on Utah based firms, the sample maintains a certain degree of homogeneity, with each company operating in a similar business environment (Cavusgil & Neven, 1981).

Questionnaires were mailed to the presidents of all 275 companies listed in the Directory. Completed questionnaires were received from 176, for a response rate of 64 percent. Ten completed questionnaires were removed from the analysis because the responding firms represented divisions or branches of non-Utah based firms, or no longer met the definition of high tech. The remaining 166 companies represent 14 industry groups, have mean sales of \$8,987,656 and employ a mean of 141 employees. Descriptive statistics are reported in Table 3.1.

### Procedures

The study was conducted in conjunction with the University of Utah Bureau of Economic and Business Research's annual survey of Utah high technology firms. A two-part questionnaire was mailed to the president of each of the sample firms. Part A asked respondents to provide information about firm origin, sales, employment and work force composition. Part B sought information regarding organization characteristics and strategic priorities. A cover letter described the nature of the study and requested the organization's participation. A copy of the questionnaire is contained in Appendix A. A self-addressed stamped envelope was provided for return of the completed questionnaires. In return for their participation, respondents were promised a copy of the 1989 Utah High Technology Directory and a technical report summarizing the results of the study.

**Table 3.1**  
**Sample Firm Descriptive Statistics**

<b>Category</b>	<b>N</b>	<b>Mean</b>	<b>S.D.</b>
<b>Number of Employees</b>	<b>166</b>	<b>141.38</b>	<b>614.38</b>
<b>1987 Sales</b>	<b>146</b>	<b>\$8,987,655.71</b>	<b>\$42,132,885.87</b>
<b>Age (Years)</b>	<b>166</b>	<b>9.91</b>	<b>8.82</b>
<b>Employee Growth (%)</b>	<b>156</b>	<b>.45</b>	<b>1.22</b>
<b>Sales Growth (%)</b>	<b>130</b>	<b>1.11</b>	<b>3.76</b>

Prior to mailing, the questionnaire was pretested by three practicing managers, representing differing sizes of organizations, to insure that instructions and were clear and understandable. The questionnaire also was reviewed by several colleagues. These reviews resulted in several changes in questionnaire composition and format.

Questionnaires were mailed to each of the sample firms in May of 1988. Firms that had not responded by mid-July were sent a second, follow-up mailing requesting their participation in the study. In mid-August and early-September, nonresponding firms were contacted by telephone, again requesting their participation. Several additional firms responded to this telephone request. Those who were "too busy" or otherwise unwilling to complete the questionnaire were asked to provide some demographic data (Part A only) regarding their firm over the phone.

Respondents are comprised primarily of presidents or top level executives of the participating firms. A summary of survey respondents by job title is reported in Table 3.2.

### **Measures**

Three groups of variables were used in this analysis: measures of organization context, measures of organization structure, and measures of organization strategy.

### **Contextual Variables**

Contextual variables included measures of organization age, size, sales, and growth rate.

#### **Organization Age**

Respondents were asked to report the year the firm was founded. Organization age was calculated by subtracting the year the firm was founded from 1988.

#### **Organization Size**

Organization size was measured by the natural log of the organization's reported total employment at the end of the 1987 fiscal year. The natural log of this measure

**Table 3.2**  
**Summary of Survey Respondent Titles**

Title	Number
Owner	
President	
Chief Executive Officer	
Chairman of the Board	
General Manager	91
Corporate Secretary/Treasurer	8
Controller	
Vice President, Finance	
Chief Financial Officer	10
Vice President	
Executive Vice President	
Vice President, Administration	
Business Manager	21
Vice President, Marketing	
Director of Marketing	
Marketing Manager	11
Vice President, Personnel	
Vice President, Human Resources	
Personnel Director	
Personnel Specialist	9
Technical Vice President	
Engineer	1
Assistant to the President	
Assistant to the Vice President	7
Others	<u>7</u>
<b>Total Respondents</b>	<b>166</b>



minimizes the effect of skewness in these distributions (Blau & Schoenherr, 1971; Khandwalla, 1977; Pugh, Hinkson, Hinings & Turner, 1968).

### Sales

Sales consist of annual revenues for fiscal year 1987. Sales figures were self-reported by respondents.

### Organization Growth Rate

Three measures of organization growth were used in the analyses. These included two measures of employee growth (Employee Growth<sub>1</sub> and Employee Growth<sub>2</sub>) and one measure of sales growth. The two measures of employee growth differ in that Employee Growth<sub>1</sub> uses year one (1986) as a base while Employee Growth<sub>2</sub> uses a year two (1987) base. The formulae for these measures are:

$$\text{Employee Growth}_1 = \frac{(\text{Total Utah Employees 1987} - \text{Total Utah Employees 1986})}{\text{Total Utah Employees 1986}}$$

$$\text{Employee Growth}_2 = \frac{(\text{Total Utah Employees 1987} - \text{Total Utah Employees 1986})}{\text{Total Utah Employees 1987}}$$

$$\text{Sales Growth} = \frac{(\text{Total Sales 1987} - \text{Total Sales 1986})}{\text{Total Sales 1986}}$$

Total sales figures for 1986 and 1987, as well as total employment figures for 1987 were reported by respondents in the questionnaire. In some cases (firms recently added to the Bureau's inventory of high technology firms) employment figures were reported for 1986 as well. However, in most cases, employment figures for 1986 were obtained from previous survey data obtained by the Bureau of Economic and Business Research. These records only contained data on total Utah employment. Therefore, growth rates were calculated on the change in Utah Employment (Total employees might provide a better measure of employee growth, but the percentage of non-Utah employees to Utah employees in these firms is very small).

The formula for Employee Growth<sub>2</sub> uses year two (1987) as the base. This was done in an effort to retain new start-up firms in the cluster analysis. For example, if an organization had no employees in 1986 and 10 in 1987, it is impossible to calculate a growth rate using year 1 (1986) as a base, as the solution to any number divided by zero is

undefined. However, if year 2 is used as the base, then a defined growth rate can be calculated.

### **Technical Ratio**

The technical ratio for each firm was calculated by dividing the number of Utah based technology oriented workers by the total number of Utah based employees at the conclusion of the 1987 fiscal year. Technology oriented workers include scientists, engineers, math specialists, computer scientists and programmers, and technicians.

### **Research and Development Ratio**

The research and development ratio for each firm was calculated by dividing total research and development expenditures (1987) by total revenues (1987). Research and development expenditures and sales figures were self-reported by survey respondents.

## **Structural Variables**

Structural variables included measures of vertical differentiation, organization structure, formalization, centralization and specialization. These variables are operationalized as follows:

### **Vertical Differentiation (Levels)**

Vertical differentiation consists of the total number of management levels in the organization (Dewar & Hage, 1978). Respondents were asked to count the number of levels in the longest line between direct workers and the organization chief executive (including both of these levels). This measure was used in the Aston Studies (Pugh et al., 1976).

### **Basis of Organization (Structure)**

Respondents were asked to self-report their organization's structure. The questionnaire item read as follows:

How is your company organized? (check one)

**Simple Structure:** Owner/Manager assisted by individuals with varying responsibilities. No divisions or functional departments.

**By Functions:** Separate departments or functions (i.e., engineering, marketing, production, personnel).

**By Divisions:** Separate groups for similar products, markets, or geographic regions.

**Other (Please describe):** \_\_\_\_\_

The structure variable was coded as follows: simple structure, 1, by function, 2, by divisions, 3, and other, 4.

### **Formalization**

There are several formalization scales in the literature. The Aston Studies Scale 53.01 (Inkson, Pugh & Hinkson, 1970; Pugh et al., 1968) often is used; however, this scale is too cumbersome for a questionnaire format. Hage and Aiken (1967) also have a formalization scale. Their scale asks respondents questions about their particular position, thus making it inappropriate at the organization level of analysis. A third scale, developed by House and Rizzo (1972) also was inappropriate to the needs of this study. However the scales were very helpful in suggesting indicators of formalization.

Formalization was operationalized using a scale of 11 items. The first ten items used a 7 point Likert scale, ranging from strongly agree to strongly disagree. Items were:

1. Formal policies and procedures guide most decisions.
2. Important communications between departments are documented by memo.
3. Formal job descriptions are maintained for each position
4. The top management team is comprised of specialists from each functional area (e.g., marketing, engineering, production).
5. Reporting relationships are formally defined.
6. Lines of authority are specified in a formal organization chart.
7. Rewards and incentives are administered by objective and systematic criteria.
8. Capital expenditures are planned well in advance.
9. Plans tend to be formal and written.
10. Formal operating budgets guide day to day decisions.

The eleventh item measured the formalization of the decision-making process in the organization based on Mintzberg's (1973) entrepreneurial/professional dichotomy of decision making.

11. To what extent is the method of strategic decision making used by top management in your organization:
- a. **entrepreneurial** - where one individual makes decisions based on personal judgement.
  - b. **professional** - where functional specialists make decisions based on expertise and analytical tools.

(Scale 1-5)

- (1) always entrepreneurial
- (2) frequently entrepreneurial
- (3) 50% entrepreneurial, 50% professional
- (4) frequently professional
- (5) always professional

Cronbach's alpha (Cronbach, 1951) for the 11 item scale was .84, indicating substantial interitem correlation (Nunnally, 1970). The formalization score for each firm was calculated by adding together the responses on each of the individual items.

### **Specialization**

The specialization scale is adapted from Pugh et al. (1968). A similar scale was used by Blau, Falbe, McKinley and Tracy (1976). Respondents were given a list of 20 functional areas and were asked to check those in which they had at least one full-time employee. The item is scored by counting the number of functions checked. Scale items were:

1. Public/Shareholder Relations
2. Shipping and Receiving
3. Building Maintenance
4. Customer/Product Service
5. Production Planning/Scheduling
6. Personnel
7. Advertising
8. Legal Affairs
9. Purchasing
10. Sales
11. Quality Control
12. Employee Training
13. Market Research
14. Accounting
15. Inventory Control
16. Industrial Engineering
17. Research & Development
18. Safety/Security
19. Payroll
20. Finance

The Aston Studies Specialization Scale (No. 51.01) contained descriptions of 16 different

functional activities (Pugh, et al., 1968). The scale item definitions were later updated in Inkson, Pugh and Hinkson (1970). The functional titles listed above are representative of activities described in the Aston studies scales. The decision to use functional titles was based on the need to conserve space on the questionnaire and reduce the time required by respondents to complete the questionnaire.

### **Centralization**

Oldham and Hackman (1981) define centralization as "the extent to which the locus of decision making is in the upper levels of the organization hierarchy." The two most commonly used centralization scales are The Aston Studies' Scale No. 54.10, Lack of Autonomy of Organization (Pugh, et al., 1968), and Aiken and Hage's (1966) Participation in Decision Making Index. In this study, centralization is measured through an adapted, abbreviated version of the Aston Studies Scale. This is similar to the approach taken by Geeraerts (1984). Respondents were given a list of five decision issues. They were then asked to indicate the level of management that must approve the decision before legitimate actions may be taken. The question was written as follows:

**Who is the last person whose permission must be obtained before legitimate actions may be taken in the following areas? (Enter the number of the appropriate approval level)**

0 = Direct Worker	3 = Division head (over several functions)
1 = Foreman, or first line supervisor	4 = President, or chief executive officer
2 = Department head	5 = Board of directors

Promotion of a direct worker  
 Addition of a new product or service  
 Unbudgeted expenditures (\$500-\$1000)  
 Selection of type or brand of new equipment  
 Dismissal, or firing of a direct worker

The scale is scored by adding up the total of all five responses. A high score on this scale indicates a high level of centralization in the firm. Firms having relatively lower scores are more decentralized.

### **Strategy Variables**

To examine strategic priorities across life cycle stages, respondents were given a list of twenty competitive methods that might be used by the organization. Scale items were

adapted from strategy dimensions identified by Miller and Friesen (1984a) and Dess and Davis (1984). Respondents were asked to report the degree of importance of each strategic method to the overall strategy of the organization. Items were scored on an 8 point scale (0 = Not Used, 1 = Minor Importance, and 7 = Major Importance). Items were:

1. Minimizing the use of outside financing
2. Consolidation of operations, product lines
3. Maximizing operating efficiency
4. New product development
5. Attracting and retaining experienced/trained personnel
6. Cutting prices
7. Refining existing products
8. Extensive advertising
9. Controlling distribution channels
10. Joint ventures with other companies
11. Use of middlemen or distributors in marketing products
12. Being able to manufacture specialty products
13. Having products in high price market segments
14. Innovation in manufacturing processes
15. Following the lead of competitors
16. Increasing production capacity
17. Diversification into new product markets
18. Geographical expansion
19. Growth through acquisition of other companies
20. Specialization in market segments with little competition

### **Data Analysis**

Data were analyzed in a two phase process. This process is summarized in Table 3.3. In Phase I, organizations were clustered into life cycle stage configurations based on underlying patterns among contextual and structural variables. In Phase II, strategic priorities were examined across life cycle stages.

#### **Phase I: Identification of Growth Stage Configurations**

Exploratory cluster analysis was utilized to determine if life cycle stages could be identified based upon underlying patterns in the data. Cluster analysis is an exploratory technique which groups observations in a manner which maximizes between group variance, and minimizes within group variance. Identification of underlying relationships is one of the appropriate uses of cluster analysis (Everitt, 1980). An agglomerative hierarchical method that used Ward's (1963) criterion was used. Ward's method was selected because studies of multiple algorithms found this method to be one of the most reliable (Milligan, 1980). Data

**Table 3.3.**  
**Data Analysis Overview**

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**Phase I - Identification and Interpretation of Growth Stage Configurations**

- A. Identification of Growth Stage Configurations**  
**Independent Variables: Demographic and Organization Variables**  
**Dependent Variables: Life Cycle Stage (Cluster Groups)**  
**Statistical Procedure:**  
**Cluster Analysis (Wards Method)**
- B. Interpretation of Growth Stage Configurations**  
**Independent Variable: Life cycle Stage (Cluster)**  
**Dependent Variables: Contextual and Structural Variables**  
**Statistical Procedures:**  
**Multivariate Analysis of Variance**  
**Univariate Analysis of Variance**  
**Canonical Discriminant Analysis**  
**Examination of Descriptive Statistics**

**Phase II - Examination of Strategic Priorities**

- A. Scale Development and Validation**  
**Independent Variables: Strategy Variables**  
**Dependent Variables: Strategy Dimensions**  
**Statistical Techniques:**  
**Principle Components Analysis**  
**Reliability Analysis (Coefficient Alpha)**  
**Calculation of Unit Weighted Scale Scores**
- B. Examination of Interstage differences**  
**Independent Variable: Life cycle Stage (Cluster)**  
**Dependent Variables: Strategic Priority Scales**  
**Statistical Procedures:**  
**Multivariate Analysis of Variance**  
**Univariate Analysis of Variance**  
**Canonical Discriminant Analysis**  
**Examination of Descriptive Statistics**
-

were standardized prior to the analysis and outliers were removed to avoid clusters of one (Milligan, 1980).

The appropriate number of clusters was determined based on examination of four factors: the Cubic Clustering Criteria (Sarle, 1983), the Pseudo F statistic (Callinski and Harabasz, 1974) and the Pseudo T<sup>2</sup> statistic (Duda & Hart, 1974), and interpretability of the clusters. Although there is no ideal technique for determining the appropriate number of clusters (Green, 1978; Harrigan, 1985; Pung & Stewart, 1984), examination of the above factors can provide useful insight into the choice. One approach is to look for consensus among the three indicators: local peaks in the cubic clustering criteria and pseudo F statistic, combined with a small value of the pseudo T<sup>2</sup> followed by a larger value for the next cluster fusion (SAS Institute, 1985).

Independent variables in the analysis were company age, the natural log of firm size, employee growth<sub>t</sub>, formalization, centralization, vertical differentiation, structure and specialization. Dependent variables were the derived clusters.

To verify that the centroids of the derived clusters were indeed different, multivariate analysis of variance was conducted. Independent variables in the analysis were the derived life cycle stage clusters; dependent variables included the contextual and structural variables utilized to form the cluster groups. An F-Test was performed to verify that group centroids were significantly different. This was followed up by a series of univariate analyses of variance with the life cycle stage cluster as the independent variable and individual contextual and structural variables as dependent variables. Univariate F statistics were calculated to identify those variables which have appreciably different means between clusters.

Canonical discriminant analysis was performed to examine the specific differences between clusters. Canonical discriminant analysis is a statistical technique for studying relationships among groups for a set of variables (Watson, 1982). A number of canonical discriminant functions can be identified, and differences between clusters can be analyzed based upon their relative loadings on the canonical discriminant functions. To aid in interpretation of the clusters, clusters were plotted along the first two discriminant functions



(Gnanadesikan, Kettenring & Landwehr, 1977).

### **Phase II: Examination of Strategic Priorities**

The objective of Phase II was to examine differences in strategic priorities across life cycle stage clusters. As the strategic priority variables were not utilized in forming the clusters, examination of interstage differences between stage clusters vis-a-vis these variables provides insight into the predictive utility of the taxonomy, as well as aiding in interpretation of the cluster stages.

Principle components analysis, with an orthogonal rotation was performed to identify the underlying dimensions of the strategy variables. Principle components analysis was selected because of its wide acceptance as a means of identifying underlying dimensions in multivariate data, requiring no prior assumptions about the data (Cooley & Lohnes, 1971). Significant factors were determined based on the Scree test (Cattell, 1965). Variables with high loadings (.50 or above) on a given factor were then combined into a scale. Cronbach's alpha (Cronbach, 1951) was calculated to examine interitem reliability of each scale. Unit weighted scale scores were then calculated for subsequent analysis.

Multivariate analysis of variance was performed to test for differences in group centroids. The independent variable in these analyses was life cycle stage cluster, and dependent variables utilized in the analysis included the six strategic priority scales. This was followed by a series of univariate analysis of variance procedures to examine differences between stages in regard to the individual scales. Life cycle stage was the independent variable and the individual strategic priority scales served as the dependent variables. Finally, canonical discriminant analysis was performed to identify specific differences in strategic priority among the life cycle stage clusters.

## CHAPTER 4

### RESULTS

Cluster analysis using Ward's (1963) minimum variance method was employed to develop a taxonomy of organization life cycle stage configurations. The variables used to form the clusters were the natural log of organization size, employee growth, company age, structure, number of levels, specialization, formalization, and centralization. Table 4.1 presents the Cubic Clustering Criteria, Pseudo F and Pseudo  $T^2$  statistics for each cluster iteration (SAS Institute, 1985). The cubic clustering criteria shows a declining pattern with a local peak occurring at the sixth cluster iteration. The Pseudo F statistic shows a steady decline with no discernable peaks. Examination of the pseudo  $T^2$  revealed valleys at five, seven and nine clusters, with the lowest value occurring at seven clusters. Based on these indicators, an argument can be made for either six or seven clusters. Upon examination of these two solution options, it was observed that the seventh cluster was very small (four observations) and added little interpretability to the six cluster solution; therefore, the six cluster solution was chosen.

Multivariate analysis of variance (MANOVA) of the six groups and eight variables resulted in a multivariate  $F_{40,495} = 14.415$  ( $p < 0.0001$ ), indicating that the clusters present appreciably different configurations of the clustering variables. One-way analysis of variance (ANOVA) was conducted to test for differences in cluster means for each of the eight individual variables. The resulting F statistics indicate that significant differences exist in mean values for each of the variables. Mean values for each variable, by cluster, and corresponding F statistics are reported in Table 4.2 .

Canonical discriminant analysis of the six groups and eight variables was conducted. Three canonical discriminant functions were significant in differentiating among the clusters. The canonical correlations for the three functions were .93 ( $p < 0.0001$ ), .71 ( $p < .0001$ ) and

**Table 4.1**  
**Cubic Clustering Criteria, Pseudo F and Pseudo T<sup>2</sup> Statistics**

Number of Clusters	Cubic Clustering Criteria	Pseudo F	Pseudo T <sup>2</sup>
1	0.00		44.23
2	-3.35	44.23	19.14
3	-4.33	34.61	13.29
4	-5.31	28.87	10.33
5	-5.80	25.87	9.92
6	-5.45	23.83	10.45
7	-5.61	22.47	6.70
8	-5.83	21.20	7.92
9	-5.52	20.20	6.82
10	-5.18	19.50	9.11

**Table 4.2**  
**Mean Values By Cluster and Univariate F Statistics**

	Entire Sample (n=126)	Cluster A (n=24)	Cluster B (n=33)	Cluster C (n=29)	Cluster D (n=10)	Cluster E (n=7)	Cluster F (n=23)	F Value (df 5,120)
Age	8.91	4.29	7.36	6.66	16.20	18.71	12.65	17.435 ***
Size <sub>log</sub>	3.12	1.65	2.99	3.96	5.91	1.82	2.97	71.590 ***
Employee Growth <sub>2</sub>	.14	.21	.33	.15	.07	-.15	-.08	5.314 ***
Specialization	6.29	1.50	4.91	10.17	15.3	0.57	6.17	54.806 ***
Levels	3.31	2.20	3.18	4.00	5.7	1.71	3.22	38.311 ***
Structure	1.82	1.21	2.00	2.28	2.40	1.00	1.60	21.865 ***
Centralization	16.81	19.29	18.08	14.44	15.10	19.57	15.26	22.130 ***
Formalization	45.21	38.92	45.88	52.89	53.20	29.71	42.39	13.979 ***

\*\*\* p < .01

.58 ( $p < .0001$ ). Discriminant loadings were calculated and are reported in Table 4.3. The discriminant loadings characterize the nature of group differences. Variables with the highest absolute loadings on the first discriminant function were organization size<sub>log</sub>, specialization and number of levels. This dimension can be labeled "organization complexity." High loading variables on the second function include organization age (negative loading) and employee growth<sub>2</sub>. This dimension appears to reflect dynamism. Variables with high loadings on the third canonical discriminant function include centralization and organization age.

Cluster centroids were computed and are plotted along the first two discriminant functions in Figure 4.1. Isodensity circles which are expected to contain approximately 90 percent of subjects in each group were also plotted in the figure. This plot illustrates, graphically, differences between cluster groups. Clusters A, B, C and D portray four levels of organization complexity. Clusters E and F are comparable in complexity to Clusters A and B, but portray less dynamism. Table 4.4 presents the mean values of the eight clustering variables, number of employees, annual revenues, sales growth, and employee growth<sub>1</sub>, in each cluster. The four additional variables aid in the interpretation of the cluster groups. Characteristics of each cluster are discussed in detail in Chapter 5.

Examination of strategic priorities across growth stage configurations involved a two step process. First, seven strategic priority scales were developed and their internal reliability assessed. Having developed scales, differences in strategic priorities among the life cycle cluster groups were then examined. The results of each of these analyses are presented below.

Principle components analysis with a varimax rotation (Dielman, Cattell, and Wagner, 1972) was employed to identify the underlying dimensions among the fifteen strategic priority variables. The analysis revealed seven significant factors, based on the scree test (Cattell, 1965). The seven factor solution accounted for 72% of the total variance. Rotated factor loadings, eigenvalues and communalities are reported in Table 4.5. The factors are displayed in order, left to right, according to the amount of variance explained.

**Table 4.3**  
**Canonical Discriminant Function Loadings (Clustering Variables)**

Variable	Function I	Function II	Function III
Employee Growth <sub>2</sub>	-.01	.42	.15
Age	.07	-.68	.50
Size <sub>top</sub>	.65	-.12	.40
Structure	.34	.27	.05
Specialization	.58	-.11	-.04
Formalization	.27	.25	.16
Centralization	.31	.23	.61
Levels	.48	-.02	.20

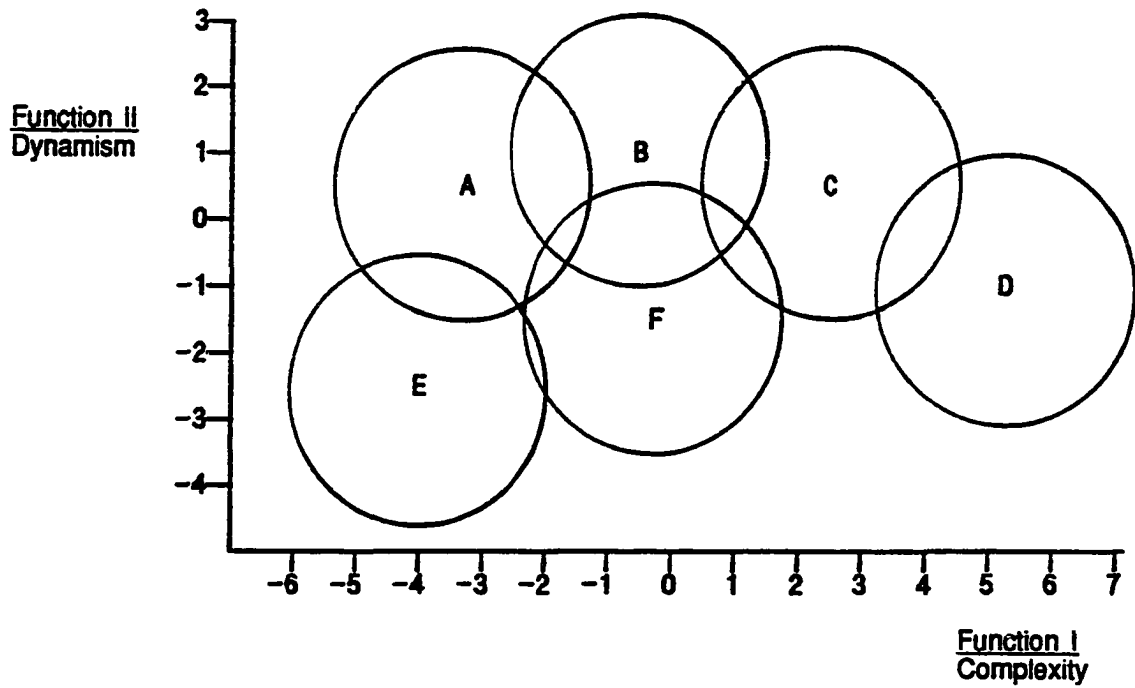


Figure 4.1. Plot of cluster centroids and group overlaps: Clustering variables. Circles are 90% sample isodensity circles.

**Table 4.4**  
**Mean Values By Cluster (Clustering and Descriptive Variables)**

	Entire Sample (n=126)	Cluster A (n=24)	Cluster B (n=33)	Cluster C (n=29)	Cluster D (n=10)	Cluster E (n=7)	Cluster F (n=23)
Age*	8.91	4.29	7.36	6.66	16.20	18.71	12.65
Size <sub>log</sub> *	3.12	1.65	2.99	3.96	5.91	1.82	2.97
Size <sub>actual</sub>	66.07	6.46	23.64	62.76	495.40	7.00	24.65
Annual Sales <sub>(000)</sub>	4936.18	271.06	1402.68	3707.81	45756.38	406.41	2048.34
Employee Growth <sub>1</sub>	.41	.29	.94	.28	.57	-.01	.04
Employee Growth <sub>2</sub> *	.14	.21	.33	.15	.07	-.15	-.08
Sales Growth	1.29	.91	2.97	.99	.37	.34	.44
Specialization*	6.29	1.50	4.91	10.17	15.3	0.57	6.17
Levels*	3.31	2.20	3.18	4.00	5.7	1.71	3.22
Structure*	1.82	1.21	2.00	2.28	2.40	1.00	1.60
Centralization*	16.81	19.29	18.08	14.44	15.10	19.57	15.26
Formalization*	45.21	38.92	45.88	52.89	53.20	29.71	42.39

\* Variables used to form the cluster solution



**Table 4.5**  
**Results of Rotated Principal Components Analysis: Strategic Priority Variables**

Strategic Priorities	Factors							Communality
	I	II	III	IV	V	VI	VII	
Innovation in manufacturing processes	.80	.24	.15	.09	.01	-.08	.08	.75
Increasing production capacity	.75	-.09	.07	.06	.18	.16	.02	.64
Being able to manufacture specialty products	.21	.75	.24	.01	-.19	.20	.07	.76
Specializing in market segments with little competition	-.27	.72	.05	.20	.18	-.04	-.08	.67
Having products in high priced market segments	.33	.62	-.16	.07	.08	-.32	-.18	.67
Use of middlemen or distributors in marketing products	.08	.06	.85	-.02	.03	.13	.13	.76
Controlling distribution channels	.15	.02	.72	.11	.36	-.13	-.16	.73
New product development	-.08	.15	.14	.81	.14	-.02	-.01	.73
Attracting and retaining experienced/trained personnel	.28	.03	-.06	.81	-.10	.12	.10	.77
Refining existing products	.02	.02	-.02	.09	.81	.13	.13	.70
Maximizing operating efficiency	.17	.02	.21	-.06	.69	.05	.05	.56
Cutting prices	-.02	.09	-.01	.07	.10	.81	-.02	.82
Following the lead of competitors	.42	-.30	.04	.03	.17	.60	-.15	.68
Minimizing the use of outside financing	.07	-.03	.07	.14	.11	-.12	.88	.84
Joint ventures with other firms	.03	.20	.48	.29	-.20	-.13	-.52	.69
Eigenvalue	2.73	2.04	1.39	1.35	1.25	1.10	.89	
Proportion of variance	.18	.14	.09	.09	.08	.07	.06	
Total Communality								11.45

Unit weighted factor scales were then developed for each factor, using high loading (.50 and above) variables as scale items. The seven scales and corresponding alpha coefficients are reported in Table 4.6. Alpha coefficients on the individual scales ranged from .52 to .84, suggesting moderate reliability of the constructs (Nunnally, 1970)

The first factor centers on manufacturing. Two variables loaded high on this factor. They were (1) innovation in manufacturing processes, and (2) increasing production capacity. Cronbach's alpha for this scale, called manufacturing growth, was .65.

Niche related strategic priorities load high on the second factor. High loading items include (1) being able to manufacture specialty products, (2) having products in high priced market segments, and (3) specializing in market segments with little competition. Each of these items relate to focusing on a specific market niche, as opposed to attempting to serve a broad range of market needs. Cronbach's alpha for this scale was .52, suggesting an adequate, but not particularly strong interitem correlation.

The third factor is related to the development and control of market channels. Two strategic priorities loaded high on this dimension: (1) use of middlemen or distributors in marketing products, and (2) controlling distribution channels. Cronbach's alpha for this scale was .63.

The fourth factor is related to product development. Two strategic priorities loaded high on this factor: new product development, and attracting and retaining experienced/trained personnel. The linkage between these two items likely relates to the fact that these firms are technology based organizations. The ability to undertake product development activities is closely related to their ability to attract and retain employees with state of the art technical skills. Cronbach's alpha for this scale was .61.

The fifth strategy reflects efficiency. High loading variables include refining existing products, and maximizing organization efficiency. Cronbach's alpha for the scale was .57.

Cutting prices and following the lead of competitors load heavily on the sixth factor. I label this dimension the "clone" strategy. Cronbach's alpha for the clone scale was .58.

The final factor, which I call independence, loads heavily on two strategic priorities. These are (1) minimizing the use of outside financing, and (2) joint ventures with other firms.

**Table 4.6**  
**Composition of Strategic Priority Scales**

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**Manufacturing Scale:**

Innovation in manufacturing processes  
Increasing production capacity  
(Alpha .65)

**Niche Scale:**

Being able to manufacture specialty products  
Having products in high priced market segments  
Specializing in market segments with little competition  
(Alpha .52)

**Marketing Channels Scale:**

Use of middlemen or distributors in marketing products  
Controlling distribution channels  
(Alpha .63)

**Product Development Scale:**

New Product Development  
Attracting and retaining experienced/trained personnel  
(Alpha .61)

**Efficiency Scale:**

Refining existing products  
Maximizing operating efficiency  
(Alpha .57)

**Clone Scale:**

Cutting prices  
Following the lead of competitors  
(Alpha .58)

**Independence Scale:**

Minimizing the use of outside financing  
Joint ventures with other firms  
(Alpha .84)

---

The first variable loads positively (.87) and the second loads negatively (-.59). Thus, it appears that firms seeking to minimize the use of outside financing tend also to avoid joint ventures with other firms. Hence firms scoring high on this scale can be viewed as placing a high value on independence. In developing this scale, the second item was reverse scaled to portray the inverse relationship between the variables. Cronbach's alpha was very high for this scale (.84).

Multivariate analysis of variance (MANOVA) was performed, grouping firms by cluster, to determine if there were significant differences between the groups in terms of their strategic priorities. The results indicate that the cluster groups do portray significantly different profiles of strategic priorities ( $F_{35,461} = 1.664$ ,  $p < .0114$ ). One-way analysis of variance (ANOVA) was conducted to test for mean differences between clusters for each of the individual strategy scales. The resultant F statistics indicate that four of the scales had significant differences in means between cluster groups: the market channels scale, the niche scale, the manufacturing growth scale and the independence scale. The remaining three, the product development, efficiency and clone scales were not significantly different between the groups. Scale means on each cluster and F statistics are reported in Table 4.7.

Canonical discriminant analysis of the six clusters and the four significant strategic priority scales was conducted. The equality of the group mean vectors was tested and resulted in a multivariate  $F_{20,372} = 2.448$  ( $p < 0.0006$ ). Thus the clusters present significantly different profiles for the four strategic priority scales. Two canonical discriminant functions were significant in differentiating among the clusters. Canonical correlations for the two functions were .41 ( $p < 0.0006$ ), and .38 ( $p < .0106$ ).

The discriminant loadings were calculated and are reported in Table 4.8. Strategic priority scales loading high on the first canonical discriminant function were market channels (.68), manufacturing growth (.68) and the independence scale (.40). This dimension appears to be related to organization maturity. High loading variables on the second function were the niche scale (.87) and the independence (-.62). This dimension is related to product focus.

**Table 4.7**  
**Description of Sample and Clusters by Mean Scores**

	Entire Sample (n=126)	Cluster A (n=24)	Cluster B (n=33)	Cluster C (n=29)	Cluster D (n=10)	Cluster E (n=7)	Cluster F (n=23)	F Value (df 5,115)
Product Development	5.66	5.56	5.63	5.90	5.80	5.07	5.70	0.716
Market Channels	3.16	2.42	2.59	3.71	3.60	2.79	4.02	2.618 **
Niche	4.58	4.93	3.69	5.11	4.71	3.90	4.97	3.410 ***
Manufacturing	3.73	2.98	3.17	4.50	4.60	4.36	3.80	2.989 **
Independence	4.29	3.48	4.52	4.11	4.05	5.86	4.65	2.488 **
Clone	2.50	2.17	2.24	2.79	2.90	2.79	2.59	1.022
Efficiency	5.35	5.22	5.19	5.76	5.43	5.17	5.31	0.744

\*\* p < .05  
\*\*\* p < .01

**Table 4.8**  
**Canonical Discriminant Function Loadings (Strategic Priorities)**

<b>Strategic Priority</b>	<b>Function I</b>	<b>Function II</b>
<b>Marketing Channels</b>	<b>.68</b>	<b>.27</b>
<b>Niche</b>	<b>.31</b>	<b>.87</b>
<b>Manufacturing</b>	<b>.68</b>	<b>.10</b>
<b>Independence</b>	<b>.40</b>	<b>-.62</b>

Cluster centroids are plotted along the first two discriminant functions in Figure 4.2. Isodensity circles (see Watson, 1982) which are expected to contain 30 percent of the subjects in each group were also plotted in the figure.

Analysis of Figure 4.2 reveals that three of the cluster groups (C, D and F) employ very similar strategy configurations. The remaining three clusters have different strategic priority profiles. While Clusters A and B exhibit similar profiles in regard to market channels and manufacturing (the first discriminant function) their profiles differ in that Cluster A places a higher priority on the niche strategy and a lower priority on independence than do firms in Cluster B. Firms in Cluster's C and F rate a niche strategy as more important and independence less important than do firms in Cluster B. While having similar profiles regarding the niche and independence scales, Clusters B and E differ in mean priorities on the marketing channels and manufacturing scales

Figure 4.3 presents a profile of the seven strategic priority scales for each of the six cluster groups. The y-axis measures mean strategic importance of scale items. As illustrated in the figure, the product development scale is of highest importance in all clusters except E and F, in which the independence and efficiency scales are of higher importance, respectively. The least important strategy across all scales was the clone strategy. The remaining four scales showed greater variation between stages. The strategic profiles of each cluster group are discussed in Chapter 5.

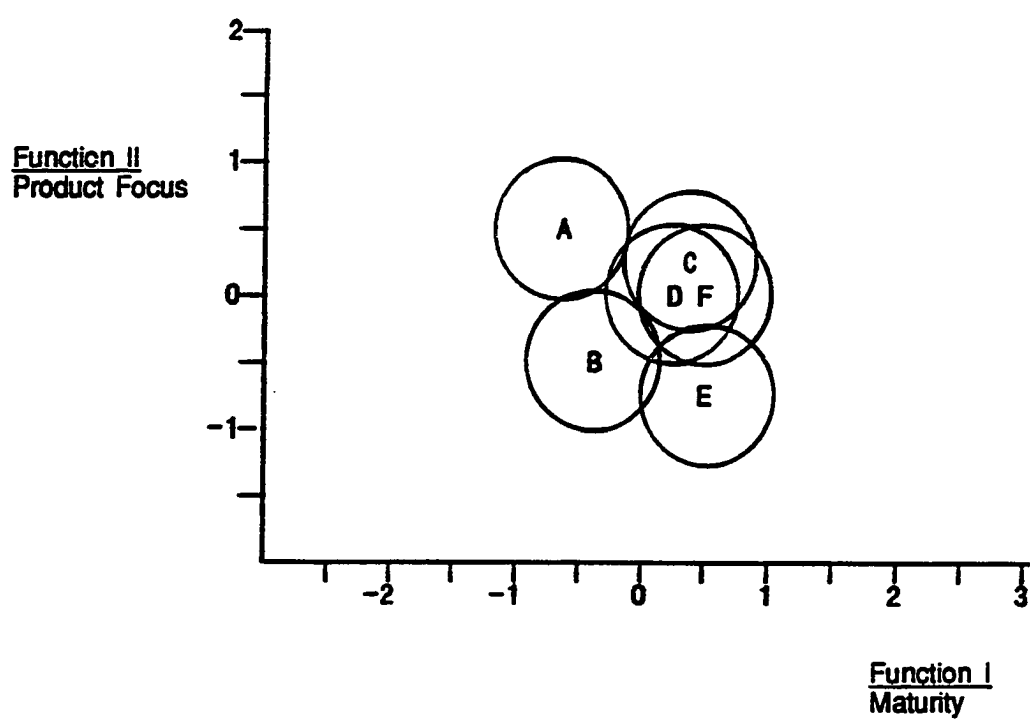
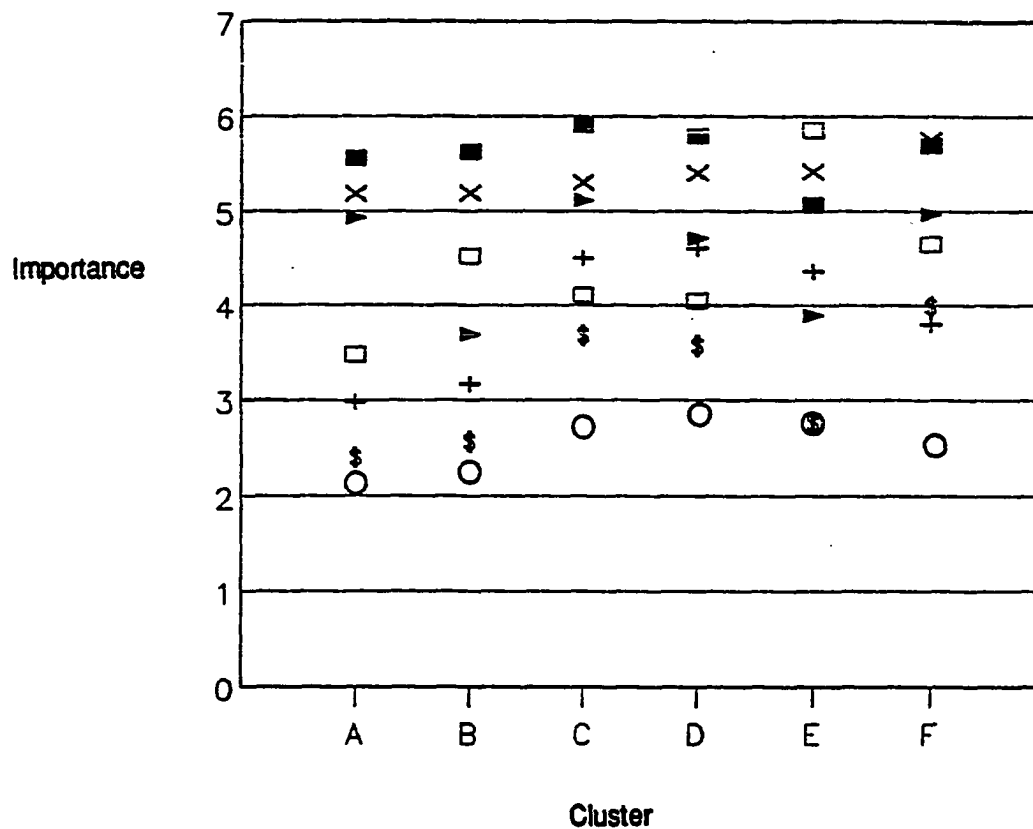


Figure 4.2. Plot of cluster centroids and group overlaps: Strategic priority variables. Circles are 30% sample isodensity circles.





Legend

■	Product Development
\$	Market Channels
▲	Niche
+	Manufacturing Growth
□	Independence
X	Efficiency
○	Clone

Figure 4.3. Plot of strategic priority scales by cluster

## **CHAPTER 5**

### **DISCUSSION AND CONCLUSIONS**

This chapter begins with a discussion of the findings relative to the configurational definition, and the derived taxonomy of life cycle stages. This is followed by sections reviewing the limitations and contributions of the study. The chapter concludes with a few suggestions for further research.

#### **Discussion of the Findings**

It was proposed in this study that life cycle stages could be defined and operationalized as unique configurations of organization context, structure and strategy. The results of this study provide general support for this proposition.

First, six distinct configurations were identified in the cluster analysis. While the cross-sectional nature of this study limits our ability to reach definitive conclusions as to the sequencing of stages, the derived taxonomy suggests a sequence of four developmental stages, characterized by clusters A, B, C, and D. As illustrated in Table 4.4 annual revenues and organization size increase incrementally across clusters A through D. Structure changes from primarily simple (A) to functional (B and C) to partially divisional structure (D). The number of organization levels increases incrementally across the four stages, ranging from 2.2 (A) to 5.7 (D). Formalization and specialization increase across the stages, while centralization displays a declining pattern.

Second, patterns of strategic priorities across the stages provide further support for the validity of the derived configurations. Four of the strategic priority scales, the niche, independence, manufacturing, and market channels scales, were significant in discriminating between the cluster groups. Mean strategic priority scores suggest a logical sequence of differing organization priorities across the clusters. Characteristics of each stage are

discussed below.

### **Characteristics of the Stages**

As noted above, Clusters A, B, C, and D suggest a sequence of four developmental stages. In the discussion which follows these clusters are labeled Stages I through IV, respectively. Clusters E and F are more difficult to classify. They are similar in size and structure to Stage I and II firms, yet present very different patterns of age, growth rate, and strategy. Therefore, these two clusters are respectively labeled Stage IB and Stage IIB.

In proceeding through the stage descriptions, the reader may wish to make periodic reference to tables and figures presented in Chapter 4. Mean values of structural and contextual variables by cluster are summarized in Table 4.4. Table 4.7 presents mean values by cluster for the strategic priorities. The relative importance of strategic priorities by cluster are depicted in Figure 4.3.

#### **Cluster A: Stage I**

Cluster A consists of young, small firms. The mean age is just over 4 years, annual sales average near \$217,000, and mean employment is 6.46 employees. On the average, these firms are growing quite rapidly, with sales growing at 91% and employment at 29%. The basis of organization structure is simple (1.21), with a mean of 2.2 organization levels, and 1.5 specialized functions. The organization is highly centralized (16.81) and quite informal (Formalization = 38.92).

The three most important strategic priorities at this stage were product development, efficiency, the niche strategy, followed by independence, manufacturing, market channels, and the clone strategy. Relative to the other stages, organizations at this stage rated efficiency, independence, manufacturing, market channels, and the clone strategy lower than any other stage. The lower priority of the independence strategy is reflective of the firms' needs to attract outside financing and interest in forming joint ventures with other firms.

### **Cluster B: Stage II**

Stage II consists of firms which are slightly older and larger than firms in Stage I. The mean age is 7.36 years, mean employment is 23.64 employees, and mean sales are approximately \$1.4 million. Relative to other stages, firms at this stage average the highest rate of sales and employment growth. Sales growth averages at 297% and employment is growing at 91%.

Firms in this stage have generally adopted a functional basis of organization (Structure = 2.00). Compared to Stage I firms, they have an additional organization level (Levels = 3.18) and 3.4 specialized functions (Specialization = 4.91). Organization decision making is still very centralized (18.08), but less so than Stage I, and organization systems are a little more formal than Stage I (45.88).

With the exception of the Niche and Independence scales, the strategic priority scales at Stage II have the same relative order of importance as at Stage I. The Niche and Independence scales have changed position, with the Independence scale increasing from a mean of 3.48 at Stage I, to 4.52 at Stage II, and the Niche scale decreasing from 4.93 to 3.69.

The reader will recall that the independence scale is comprised of two items (1) minimizing the use of outside financing, and (2) joint ventures with other companies (negative loading). As noted above, the low relative priority at Stage I is likely due to the fact that firms at this stage are seeking outside financing and joint venture opportunities to aide in getting their product to market. Once an initial footing is gained Stage II, acquisition of these outside resources is not such a critical need, thus the Independence score rises.

The Niche Strategy is significantly lower at Stage II than Stage I. This may reflect a pattern described by Adizes (1989) as the "Go-Go" stage. Adizes noted that many organizations, after experiencing early success, become overly confident, and rapidly expand their product line. According to Adizes, movement to the next stage generally requires some discipline and focus on the part of firm managers.

**Cluster C: Stage III**

While on the average, firms in Cluster C are slightly younger (mean Age = 6.66) than Cluster B, mean size is more than twice as large. Stage II firms employ a mean of 62.76 employees and have average annual sales of over \$3.7 million. Firms in this stage are still growing quite rapidly, but not quite as fast as firms in Stage II. Mean sales growth is 99% and mean employment growth is 28%. Companies in this group average 4 levels of management, 10.17 specialized functions, and generally employ a functional organization structure. These firms have the lowest centralization mean of all the clusters (14.44), and second highest level of formalization (mean = 52.89).

As with the preceding Stages, Stage III firms place a high level of importance on product development and efficiency. Aside from this, Stage III represents a dramatic change in the pattern of the strategic priority scales. Three of the strategic priorities undergo dramatic increases, when contrasted with Stage II: the niche strategy, manufacturing, and market channels. This may indicate a narrowing of the product line, and scaling up of manufacturing and marketing efforts.

The clone strategy, while still least in relative importance, shows a modest increase between Stage II and Stage III. This may reflect some maturing in the industry and intensified competition.

The priority assigned to the independence strategy by Stage III firms is lower than firms in the preceding stage. This likely reflects the need for outside capital to scale up production, and the need for joint ventures as a means of accessing distribution channels.

**Cluster D: Stage IV**

Firms in Cluster D averaged 16.2 years of age, employed a mean of 495 employees, and averaged just under \$46 million in annual sales. These companies experienced sales growth of 37% and employee growth of near 57%. They average 5.7 organization levels and 15.3 specialized functions. While the majority of firms employ a functional organization structure, a divisional structure has emerged in several. Centralization is low (15.10), and formalization is the highest of all the clusters (53.2), though

just slightly higher than Stage III.

Stage IV firms employ eight times as many employees as do firms in Stage III, adding nearly two additional organization levels and five additional specialized functions. There is, however, little difference in strategic priorities between these two stage groups. Strategic priorities maintain virtually the same magnitude and relative order. The only difference worthy of comment is the niche strategy, which is visibly lower in Stage IV. This may reflect some tendency toward broadening the product line.

#### **Cluster E: Stage IB**

Stage IB companies average 18.7 years of age, yet employ a mean of only 7 employees. Employee growth is declining slightly (Employee Growth<sub>1</sub> = -.01, Employee Growth<sub>2</sub> = -.15), but sales are growing at an average of 34%. These firms have virtually no specialization (.57) and less than two organization levels (1.71) and employ a simple organization structure (1.0). Centralization is the highest of all the cluster groups (19.57) and formalization is lowest (29.71).

As illustrated in Figure 5.1, the strategic priority of most importance to firms in Stage IB is independence. This is followed by efficiency, product development, manufacturing, and the niche strategy. The two scales having lowest priority were the market channels and clone strategy. When contrasted to Stage I firms, the biggest differences lie in independence, manufacturing and the niche strategy scales. The niche strategy is rated less important in Stage IB than Stage I, and independence and manufacturing are rated substantially more important.

#### **Cluster F: Stage IIB**

The final cluster group, labeled Stage IIB, consists of firms averaging 12.65 years in age, with average sales of just over \$2 million, and employing a mean of near 25 employees. Most companies in this cluster employ a functional organization structure, yet some still have a simple structure (Structure = 1.6). Employee growth is slow, about 4%, but sales are growing at near 44%. These firms have an average of just over three levels,

and just over six specialized functions. Centralization is moderately low 15.26, as is formalization (42.39).

The highest strategic priority for Stage IIB firms is efficiency. This is followed by product development, the niche strategy, independence, market channels, manufacturing, and the clone strategy. The first four strategies are of moderate to high importance.

When compared to Stage II firms, the most remarkable difference is that Stage IIB firms place significantly greater importance on the niche strategy, market channels, and manufacturing.

### **Some Unexpected Findings**

In examining the derived configurations, some patterns deviated from what was expected based on the theoretical literature. Among these were organization age and three of the strategic priority scales.

It was expected that organization age would increase incrementally across Stages I through IV. This pattern held true for Stages I, II and IV. Contrary to expectations, the mean age in Stage II (7.36) is greater than the mean age of firms in Stage III (6.66). In the literature, several authors have noted that organizations move through life cycle stages at differing rates of speed (Greiner, 1972; Galbraith, 1982; Quinn and Cameron, 1983). This is one possible explanation for the deviation.

Three of the seven strategic priority scales were not significant in differentiating between the cluster groups. Nevertheless, the pattern of these scales provides some interesting insights. As illustrated in Figure 4.3, product development is the highest ranking strategic priority across Stages I through IV. It was expected that product development would be very important at early stages, then of lesser importance during the later stages (Miller & Friesen, 1984a). Perhaps the high priority assigned to this variable reflects dynamic technological environments faced by these firms. The ability to compete in such a setting may require constant product innovation. Traditional manufacturing or service firms may show a very different pattern, across stages, for this variable.

In Stages IB and IIB, product development was of lesser relative importance, ranking third and second respectively.

The efficiency priority ranked second behind product development at each of Stages I through IV. This scale was comprised of two items: (1) refining existing products, and (2) maximizing operating efficiency. The high priority placed on refining existing products again could be attributed to the high technology setting. The consistently high rating of the efficiency scale probably reflects the use of self-reported measures; few managers are likely to "own up" to rating efficiency as a low priority item.

The least important strategy across all stages was the clone strategy, which showed a moderate increase across the four primary stages. Two variables comprised this scale: following the lead of competitors and cutting prices. Given the small size of most sample firms, and relatively high priority assigned the niche strategy, it is not too surprising that this strategy ranked last.

### **Limitations**

In reviewing the results of this study, there are some limitations which merit consideration. First, this is a cross-sectional study, and as such data are captured at one point in time from a cross-section of organizations. Configurations identified in the analysis represent common patterns among organizations in the sample. Cross sectional studies are limited in that they fail to capture the historical context or issues related to transitions in individual firms. These issues must be captured through qualitative or longitudinal research designs.

Second, the sample is heavily skewed toward smaller firms. Thus, the study tells us little about configurations in organizations employing several thousand employees. While the majority of high technology firms are relatively small, (Rogers & Larsen, 1984), greater representation of larger firms in the sample may lead to the identification of additional life cycle stage configurations. Because of this limitation, Cluster D should be interpreted cautiously as the fourth stage. There is a rather large jump in size between clusters C and D. Greater representation of larger firms in a sample may yield one or more additional



cluster groups.

Third, there is a need for improvement in the measures used to measure strategic priorities in this study. The alpha coefficients for all but one of the strategic priority scales indicated only modest interitem correlation (Range = .52 to .65). The exception to this was the independence scale whose alpha was .84. Further, most of the scales consisted of only two items. While the scales are adequate, given the exploratory nature of this study, there is a need to improve the quality of these scales in future studies.

Finally, it must be realized that the results of cluster analysis are dependent on three factors: the variables used to form the clusters, the algorithm selected, and the number of clusters selected in the analysis. Because of these factors, validation of cluster results is somewhat problematic. The findings of this study must be viewed as preliminary, pending replication with other samples.

#### **Contributions of the Study**

In spite of the above limitations, this study makes two important contributions to the literature. First, it presents a methodology for empirically operationalizing the organization life cycle. While the literature abounds in theoretical models of the organization life cycle, very little attention has been paid to the critical construct of life cycle stage. The empirical identification of configurations reflecting developmental stages represents a key building block for future analysis of the organization life cycle. By employing this methodology to multiple samples, patterns of life cycle stages can be explored and important hypotheses generated.

The second contribution of the study is the derived taxonomy itself. The taxonomy presents a picture of growth stages in high technology organizations and provides a baseline for comparison with other taxonomic studies. Beyond this, the patterns displayed provide insight into the growth patterns and strategic priorities of high technology organizations.

#### **Suggestions for Further Research**

Empirical analysis of the organization life cycle remains in its early stages. Preliminary validation of the configurational approach to studying life cycle characteristics

presents an important building block, but much research remains to be done. Some suggestions for future research are outlined below.

First, there is a need to assess the reliability of this approach in other samples. It is important to determine if the derived configurations display consistent patterns in different settings. A good starting place would be replication of the study with a different sample of high technology organizations. This could be followed by replication in different industry settings to assess the impact of industry on life cycle stages. In time, other environmental, technological, and behavioral contingencies might be examined as well.

Second, there is a need for experimentation in the variables used to form the clusters as well. Eight variables were used to form the clusters in this study. Might comparable configurations be identified with fewer variables? Are there additional variables which, if included, would yield more revealing configurations? These issues require further exploratory study.

Third, there is a need for additional longitudinal studies of the organization life cycle which trace organization configurations over time. Both historical and repeated measures designs would provide important insight into patterns of organization growth. Finally, there is a need for rich qualitative studies which capture the nuances of change within individual organizations.

In conclusion, the organization life cycle has great promise as a guide for those who lead growing organizations. An accurate model could help managers know when to let go of cherished past strategies, and provide a time table for adding levels of management, formalizing organization procedures and systems, and revising organization structure. Few would argue with the benefits of such a model. Unfortunately, at present, our understanding of organization growth remains limited. A great deal of work remains to be done in refining the life cycle model. A major impediment in the advancement of knowledge in the field has been the absence of empirical analysis. This study provides a promising building block for future systematic study of the organization life cycle.

**APPENDIX**  
**QUESTIONNAIRE**

**Bureau of Economic and Business Research  
High Technology Survey -- 1987**

**Part A**

Organization Name: \_\_\_\_\_

1. Year company was founded: \_\_\_\_\_
2. Is company a spin-off?    yes \_\_\_\_\_    no \_\_\_\_\_
3. If answer to question 2 is yes, name the organization from which the company evolved:
 

University \_\_\_\_\_

Company \_\_\_\_\_
4. Is company:    Public \_\_\_\_\_    If so, please send an annual report  
                          Private \_\_\_\_\_    If so, indicate number of owners
5. Current President \_\_\_\_\_    Company Founder \_\_\_\_\_
6. Educational profile of founder: (*Check highest level of education completed*)
 

\_\_\_\_\_ high school (12 years)

\_\_\_\_\_ college (12-16 years)

\_\_\_\_\_ graduate work (over 16 years)
7. College or university attended by founder: (*Please identify institution*)
 

Undergraduate: \_\_\_\_\_

Graduate: \_\_\_\_\_
8. Area of study: (*Please identify field of study*)
 

Undergraduate: \_\_\_\_\_

Graduate: \_\_\_\_\_
9. Number of facilities company has in Utah \_\_\_\_\_    outside Utah \_\_\_\_\_
10. Number of employees in Utah \_\_\_\_\_    non-Utah \_\_\_\_\_
 

Projected employment by 1993 \_\_\_\_\_

11. Occupational mix of Utah work force: *(Please indicate the number of employees in each category)*
- |       |                  |       |                                     |
|-------|------------------|-------|-------------------------------------|
| _____ | Scientists       | _____ | Computer Scientists and Programmers |
| _____ | Engineers        | _____ | Technicians (2+ years of education) |
| _____ | Math Specialists | _____ | Hourly Production                   |
12. 1987 Sales: \$ \_\_\_\_\_ 1986 Sales: \$ \_\_\_\_\_  
 Projected sales by 1993 \$ \_\_\_\_\_
13. 1987 R&D Spending: \$ \_\_\_\_\_
14. Geographic Markets: Regional only \_\_\_\_\_ National \_\_\_\_\_ International \_\_\_\_\_  
 Please list countries to which you export product:
15. Estimated annual export sales (1987) \$ \_\_\_\_\_
16. How was the company initially financed? (Please check all that apply and identify the source)
- |                 |       |          |
|-----------------|-------|----------|
| Venture Capital | _____ | Source:  |
| Debt Financing  | _____ | Source:  |
| Savings         | _____ |          |
| Other           | _____ | Explain: |
17. Name and title of person completing survey \_\_\_\_\_

**Bureau of Economic and Business Research  
High Technology Survey**

**PART B**

Company Name: \_\_\_\_\_

Name and title of person completing survey: \_\_\_\_\_

1. How is your company organized? (*Check one*)

\_\_\_\_\_ **Simple Structure:** Owner/Manager assisted by individuals with varying responsibilities. No divisions or functional departments.

\_\_\_\_\_ **By Functions:** Separate departments or functions (i.e., engineering, marketing, production, personnel). If so, how many functional departments? \_\_\_\_\_

\_\_\_\_\_ **By Divisions:** Separate groups for similar products, markets, or geographic regions. If so, how many divisions in your organization? \_\_\_\_\_

\_\_\_\_\_ **Other (Please describe):** \_\_\_\_\_

2. In your organization, which of the functions listed below have at least one person who is employed full-time in that role? (*Put a check in the applicable functions*)

_____ Public/Shareholder Relations	_____ Personnel
_____ Quality Control	_____ Shipping and Receiving
_____ Advertising	_____ Employee Training
_____ Safety/Security	_____ Legal Affairs
_____ Market Research	_____ Building Maintenance
_____ Production Planning/Scheduling	_____ Accounting
_____ Customer/Product Service	_____ Purchasing
_____ Inventory Control	_____ Payroll
_____ Finance	_____ Industrial Engineering
_____ Research & Development	_____ Sales

3. Total number of management/supervisory levels: \_\_\_\_\_

*Count the number of levels in the longest line between direct workers and the organization chief executive (include both these levels) in the production function of your organization. For example, if the line of authority was as follows: President --> Vice President --> Plant Manager --> Department Manager --> Foremen --> Direct Worker, the number of management/supervisory levels would be 6.*

4. Who is the last person whose permission must be obtained before legitimate actions may be taken in the following areas: (*Enter the number of the appropriate approval level*)

- 0 Direct worker  
 1 Foreman, or first line supervisor  
 2 Department head  
 3 Division head (over several functions)  
 4 President, or chief executive officer  
 5 Board of directors

- \_\_\_\_ Promotion of a direct worker  
 \_\_\_\_ Selection of type or brand of new equipment  
 \_\_\_\_ Addition of a new product or service  
 \_\_\_\_ Dismissal, or firing of a direct worker  
 \_\_\_\_ Unbudgeted expenditures (\$500-\$1000)

5. To what extent is the method of strategic decision making used by top management in your organization:

- a. entrepreneurial - where one individual makes decisions based on personal judgement  
 b. professional - where functional specialists make decisions based on expertise and analytical tools

(circle one)

- 1 always entrepreneurial  
 2 frequently entrepreneurial  
 3 50% entrepreneurial, 50% professional  
 4 frequently professional  
 5 always professional

For each of the following items, please mark one number to indicate which statement best describes your organization.

		STRONGLY DISAGREE						STRONGLY AGREE
6.	Reporting lines are formally defined	1	2	3	4	5	6	7
7.	Lines of authority are specified in a formal organization chart	1	2	3	4	5	6	7
8.	Formal job descriptions are maintained for each position	1	2	3	4	5	6	7
9.	Important communications between departments are documented by memo	1	2	3	4	5	6	7
10.	Formal policies and procedures guide most decisions	1	2	3	4	5	6	7
11.	Rewards and incentives are administered by objective and systematic criteria	1	2	3	4	5	6	7
12.	Formal operating budgets guide day to day expenditures	1	2	3	4	5	6	7
13.	Plans tend to be formal and written	1	2	3	4	5	6	7
14.	Capital expenditures are planned well in advance	1	2	3	4	5	6	7
15.	Managers often complain of excessive organizational "red tape"	1	2	3	4	5	6	7

For each of the following items, please mark one number to indicate which statement best describes your organization.

		STRONGLY DISAGREE			STRONGLY AGREE		
16.	Strategic decisions are based on extensive analysis conducted by technical specialists	1	2	3	4	5	6 7
17.	The founder of this organization is the primary decision maker	1	2	3	4	5	6 7
18.	The top management team is comprised of specialists from each functional area (e.g., marketing, engineering, production)	1	2	3	4	5	6 7

Listed below are 20 competitive methods that may be used by your firm/division to attain and sustain profitability. Please indicate how important each method is to the current, overall strategy of your organization.

		DEGREE OF IMPORTANCE						
		NOT USED	MINOR				MAJOR	
19.	Minimizing the use of outside financing	0	1	2	3	4	5	6 7
20.	Consolidation of operations, product lines	0	1	2	3	4	5	6 7
21.	Maximizing operating efficiency	0	1	2	3	4	5	6 7
22.	New product development	0	1	2	3	4	5	6 7
23.	Attracting and retaining experienced/ trained personnel	0	1	2	3	4	5	6 7
24.	Cutting prices	0	1	2	3	4	5	6 7
25.	Refining existing products	0	1	2	3	4	5	6 7
26.	Extensive advertising	0	1	2	3	4	5	6 7
27.	Lobbying with government	0	1	2	3	4	5	6 7
28.	Controlling distribution channels	0	1	2	3	4	5	6 7
29.	Joint ventures with other companies	0	1	2	3	4	5	6 7
30.	Use of middlemen or distributors in marketing products	0	1	2	3	4	5	6 7
31.	Being able to manufacture specialty products	0	1	2	3	4	5	6 7
32.	Having products in high price market segments	0	1	2	3	4	5	6 7
33.	Innovation in manufacturing processes	0	1	2	3	4	5	6 7
34.	Following the lead of competitors	0	1	2	3	4	5	6 7
35.	Increasing production capacity	0	1	2	3	4	5	6 7
36.	Diversification into new product markets	0	1	2	3	4	5	6 7
37.	Geographical expansion	0	1	2	3	4	5	6 7
38.	Growth through acquisition of other companies	0	1	2	3	4	5	6 7
39.	Specializing in market segments with little competition	0	1	2	3	4	5	6 7

**THANK YOU FOR YOUR COOPERATION!**



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