INFORMATION TO USERS

This manuscript has been reproduced from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps.

Photographs included in the original manuscript have been reproduced xerographically in this copy. Higher quality 6" x 9" black and white photographic prints are available for any photographs or illustrations appearing in this copy for an additional charge. Contact UMI directly to order.

ProQuest Information and Learning
300 North Zeeb Road, Ann Arbor, MI 48106-1346 USA
800-521-0600

EXPLORING STRATEGIC ROLE OF IT FROM THE PERSPECTIVE OF ANSOFF'S AND PORTER'S GENERIC STRATEGIES

Nina Milova

A Thesis
In
The John Molson School of Business

Presented in Partial Fulfillment of the Requirements
for the Degree of Master of Science in administration at
Concordia University
Montreal, Quebec, Canada

April 2001

Abstract

Exploring Strategic Role of IT
From the Perspective of Ansoff's and Porter's
Generic Strategies

Nina Milova

The current study represents an exploratory research in the area of strategic alignment of information systems. It examines the concept of strategic alignment from the perspective of Porter's generic strategies and Ansoff's strategic grid. Porter's generic strategies were found to exist in the form of principal components, while Ansoff's quadrants exist in the form of strategic groups. The results indicate that fit between technology and strategy use can be identified in the form of mediation, with differentiation strategy being a mediating variable between IS factors and business performance and in terms of gestalts, that represent a special form of fit between industry type, strategy, technology use and business performance.

The results have the following practical implications

1). The only generic strategy that consistently leads to improved performance for Canadian firms is differentiation, and therefore, this is the strategic element that businesses have to pay the most attention to.

2). IS can be effectively used to support differentiation strategy and since differentiation strategy leads to improved performance, the proper strategic role of IT is to support differentiation.

3). Successful strategies differ between industry groups. For fast growing industries with heterogeneous products differentiation strategy plays by far the most important role, and technology can be effectively used to support differentiation. For industries with homogeneous products it is essential to combine differentiation strategy with price strategy to achieve high performance.

4). Technology use and its impact on performance can vary across industry groups. Growth industries should pay more attention to the development of strong technological architecture that would support differentiation strategy, and IT has higher impact on their business strategy.

Further confirmatory research in this area is in order to validate these exploratory findings.

Acknowledgements

My special thanks to my supervisor, Anne-Marie Croteau, for her support and understanding, as well as to my committee members, Emilio Boulianne and Jerry Tomberlin for their valuable input. I appreciate the support that my family has given me during the years of my studies, and I dedicate this thesis to Fraidun, because without him it could never be the same.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF EXHIBITS

LIST OF APPENDIXES

1. Introduction

As information technology plays an increasingly important role in the business environment, the question about its role within a business enterprise becomes increasingly important. In the past, the main role of IT was to eliminate routine office work and reduce the costs. Now IT plays a more prominent strategic role within organizations. Past research has shown that although on average IT investments have zero net present value, the innovative IT investments have positive NPV (Dos Santos, B.L., Peffers, K. and Mauer, D. C., 1993). Many studies have found that the use of information technology by itself does not ensure improved business performance. However, alignment of IT strategy with business goals was found to have a positive impact on performance (Chan & Huff, 1997, Bergeron & Raymond, 1995). A significant theoretical contribution to the understanding of business strategy and strategic role of IT was made by Michael Porter (1980, 1985). However, the past empirical research on strategic alignment of information technology did not rely on his theoretical foundation. The main objective of the current study is to empirically investigate the strategic role of IT within the framework of Porter's theoretical work. Another strategic typology, developed by Igor Ansoff (1957) is also investigated in conjunction with IT use. This study attempts to investigate the ways of aligning information technology strategy with the business's generic strategy and business environment. It also attempts to expand the understanding of Porter's generic strategies, their use in conjunction with technology use and business environment and their links to other strategic classifications, such as the ones suggested by Miles and Snow (1978).

2. Strategic Typologies and Their Significance for Managerial Theory and Practice

In the IS and managerial literature, strategy can be represented in a number of different ways. Three approaches, descriptive, multivariate and gestalt, were discussed by Hambrick (1980).

The Descriptive Approach is used in qualitative research, such as case studies. This approach does not treat strategy as a measurable construct, and is useful for theory building.

The Multivariate Approach measures strategy in term of several key variables. The approach has an advantage of added objectivity in strategic research and allows the application of multivariate techniques to analyzing strategic behavior of the firms. However it can be viewed as simplistic, since it does not account for the fact that different elements of strategy can seldom be separated from one another. Several previous studies in the area of strategic alignment of IT operationalized strategy in terms of seven dimensions, suggested by Venkatraman (1989 b): company aggressiveness, company analysis, company internal and external defensiveness, company futurity, company proactiveness, company risk aversion, company innovativeness (Chan and Huff, 1997, Bergeron and Raymond,1995).

The Gestalt Approach compensates for the main weakness of the multivariate approach in that it presents strategies as complete forms. In the past, several strategic typologies were developed, which help researchers and practitioners to get an insight on how

strategies of different firms vary between each other, and what are the main ways of gaining competitive advantage. Instead of representing strategies as a set of separate variables, typologies usually put an emphasis on one key idea, underlying the strategy of the firm. While such an approach may still be a simplification, it represents a valuable step forward towards understanding strategies systematically. In the past, several studies in the area of strategic alignment of IT (Subherval and Kirs, 1994, Croteau, Raymond and Bergeron, 2000)) used the strategic typology developed by Miles and Snow (1978), which categorized businesses as prospectors, analyzers, defenders and reactors.

Several other strategic typologies were developed and frequently used in managerial literature. The current study is concerned with two of them, which are among the most popular among academics and practitioners. They are the strategic grid suggested by Ansoff (1957) and Porter's (1980) generic strategies.

2.1 Ansoff (1957)

Igor Ansoff (1957) has identified four different types of product-market strategy shown in the Exhibit 1 below:

Exhibit 1. Ansoff's Product/Market Strategy Grid

	Current products	New products
Current markets	Market penetration strategy	Product development strategy
New markets	Market development strategy	Diversification strategy

Market penetration is an effort to increase company's sales without departing from an original product-market strategy. The company seeks to improve business performance either by increasing the volume of sales to its present customers or by finding new customers for present products.

Market development is a strategy in which the company attempts to adapt its present product line (generally with some modifications in the product characteristics) to new

missions. An airline company, which adapts and sells its passenger transport for the mission of cargo transportation is an example of this strategy.

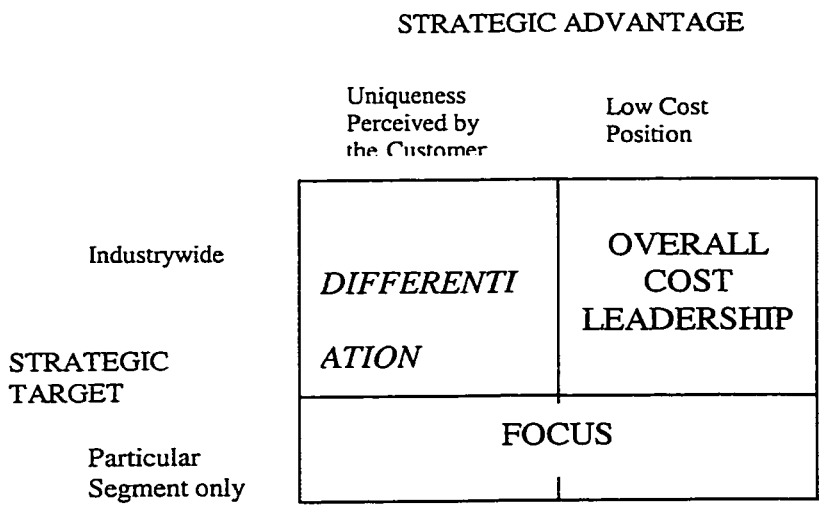
Product development strategy, on the other hand, retains the present mission and develops products that have new and different characteristics, such as will improve performance of this mission.

Diversification is the final alternative. It calls for a simultaneous departure from the present product line and the present market structure.

2.2 Porter (1980)

Michael E. Porter (1980) has identified the three generic strategies shown in the Exhibit 2 below:

Exhibit 2. Porter's Generic Strategies



Overall cost leadership is an effort to achieve a low cost relative to its competitors in the industry

Differentiation is a strategy in which the company attempts to differentiate the product or service offering by the firm, creating something that is perceived industrywide as unique. This can be achieved through brand image, technology, customer service, dealer network and many other means.

Focus strategy requires targeting a particular buyer group, segment of the product line or geographic market. While two previous strategies are aimed at building competitive advantage industrywide, focus strategy is build to serve a particular target very well, and each functional policy is built with this in mind.

Among other popular strategic typologies are the strategies for technology-based businesses, discussed by Ansoff & Stewart in 1967 (first-to-market, follow-the-leader, application engineer and me-to), strategic typology, developed by Miles and Snow in 1978 (prospector, analyzer, defender and reactor) and Freeman's (1974) strategic types. As will be shown in the following section, both multivariate and gestalt approaches were previously used in the studies on Strategic Alignment of IS. The study by Chan and Huff (1997) employs the multivariate approach, suggested by Venkatraman, while strategic types of Miles and Snow and their relationship to IT deployment and organizational performance were studied previously by Croteau (1998) and Croteau, Bergeron & Raymond (2000). However very little is known about the use of IT and its strategic

alignment in the framework of the two strategic typologies, presented here. In the following section it will be explained why this represents a significant gap between theoretical foundation and empirical work in the area of strategic alignment of IS. As Ansoff's and Porter's typologies are very commonly used as educational tools and in managerial practice, this also represents a significant gap between theory and practice.

3. Strategic Alignment of Information Technology: Theoretical Foundation and Empirical Studies

The purpose of this chapter is to evaluate the most important empirical and theoretical studies conducted before and related to the technology use, its strategic role and its impact on organizational performance. The section presents the theoretical foundation studies, most frequently cited in the literature on IS strategic alignment and discusses some empirical studies, conducted in the recent years on strategic alignment of IS. Consistent with the objectives of the current study, the focus will be on the view of strategy in the IS literature. Previously used approaches and constructs, related to representation of strategy, will be identified. The review shows that in spite of the attempts of researchers to test the theoretical concepts, still a significant gap exists between theoretical foundation and empirical studies in this area of research.

3.1 Theoretical Foundation

3.1.1 McFarlan (1984)

One of the first theoretical frameworks for analyzing strategic impact of information systems was presented by McFarlan in 1984. He suggested considering several important issues to evaluate strategic impact of information technology.

1. Change the basis of competition by allowing cost, product differentiation, or market specialization advantages,

2. Generate new products, allowing existing products to be tailored to specific customer needs, and

3. Improve product quality and distribution. In addition, information systems, operating within an interorganizational network, can strategically alter the balance of power between buyer and supplier organizations.

McFarlan argued that information technology will have a particularly strong strategic impact if it can secure the company's competitive position by creating barrier to entry for competitors or by building in switching costs for the customers. He also mentioned that information technology can dramatically change the nature of competition within an industry. For example, they can switch the nature of competition from being cost-based into being differentiation-based, or the opposite way around. In some cases

information technology can switch the balance of power in customer and supplier relationship. Furthermore, according to McFarlan, information technology will have strategic impact if it can generate new products.

We can see that McFarlan relates strategic impact of IT to Porter's generic strategies: product differentiation, cost leadership and focus. The theory implies that technology can be significantly related to differentiation and cost leadership strategy. Some empirical tests of this proposition will be presented later in this paper.

3.1.2 Porter and Millar (1985)

At about the same time Porter has extended his strategy theory into the area of strategic use of IT. In the work of Porter and Miller (1985) the authors identify three specific ways in which information technology can lead to competitive advantage.

1. Information technology alters industry structure
2. Information technology supports differentiation and cost leadership strategies
3. It also can spawn completely different businesses

Their work also suggests the ways to identify the opportunities to exploit information technology for competitive advantage through the value chain analysis. The value chain is composed of a set of activities that the company performs to produce and distribute its product. In order to stay competitive, the company has to either perform these activities at a reduced cost or to alter these activities in a way that would result in a superior product or improved service. The company has to constantly look for opportunities to apply information technologies to the activities within the value chain in a way that would result in either cost competitiveness or improved product differentiation.

They suggest five steps that the company can take to exploit opportunities created by the information revolution:

1. Assess the information intensity of products and processes.
2. Assess the role of information technology in industry structure
3. Identify and rank ways in which information technology could create a competitive edge.
4. Consider how information technology could create new businesses.
5. Develop a plan to take advantage of information technology.

Once again, this theoretical work emphasizes that technology use is related to both cost leadership and differentiation strategy. Also it outlines the importance of analyzing industry structure with respect to competitive strategy and technology use. The current study will address these two issues empirically.

3.1.3 Wiseman (1985)

The author has developed a theory of strategic trusts that was also relying on Porter's (1980) strategic theory. Wiseman suggests a grid that can help managers to identify and analyze strategic options. The grid includes three strategic targets: suppliers, clients and competitors and the main orientations the firm can take to build the competitive advantage: differentiation, cost reduction, innovation, growth and alliance.

The grid constitutes the interface between the competitive strategy and information technology of the firm.

In 1991 Bergeron, Buteau and Raymond conducted a study applying and comparing Porter's value chain and Wiseman's theory of strategic trusts. They found that both methodologies are efficient at generating ideas about application of information technology, however Porter's value chain helps to generate more ideas concerning the internal operations of the company, while Wiseman's methodology helps to come up with more ideas regarding external opportunities.

3.1.4 Das, Zahra and Warkentin (1991)

The model suggested by the authors implies that in order to optimize the financial performance strategic MIS planning has to fit the business strategy. According to the model the external environment plays an important role in formulating business strategy. Within this study the four strategic types, developed by Miles & Snow (prospectors, analyzers, defenders) are analyzed and an appropriate IS profile is suggested for each of these types. However the authors mention that it can be useful to consider the business strategy from the perspective of other typologies. Also the authors associate the types developed by Miles & Snow with Porter's generic strategies. Prospectors are said to have preference for differentiation strategy, defenders are expected to follow cost leadership strategy, while analyzers combine the two. Although Porter's and Miles and Snow strategic typologies are clearly related to each other, alternative views exist on how

exactly they are connected. Later in the paper, these alternative views will be explained in more detail.

3.1.5 Henderson and Venkatraman (1993)

Another significant contribution to our understanding of strategic alignment of IT was made by Henderson and Venkatraman (1993). They suggest a model by which strategic alignment is represented as a fit between internal domain (business and IT infrastructure) and external domain (business and IT strategy). According to the model, alignment also requires consistency in the choices made in the business and technology areas.

The authors suggest four approaches to aligning IT and Business domains. Two of these approaches are driven by business strategy. The strategy execution approach suggests that the business strategy is used as a basis for configuring both business and IS infrastructure. Technology transformation perspective suggests that business strategy has an influence first on IT strategy, which is translated into appropriate IT infrastructure.

The other two perspectives imply that IT strategy can also be a driver of the business strategy. Competitive potential alignment perspective suggests that in some cases strategic choices made in the IS area can influence strategic choices made in the business area. The business strategy will influence organizational infrastructure. Service level alignment perspective suggests that IT strategy can determine IS infrastructure, which in tern will have an impact on organizational infrastructure.

The authors state that none of the alignment perspectives can be viewed as superior to another, because the strategic alignment is a complex process in some cases it can be initiated through the business strategy, while in other cases it can be driven from the new developments in IT domain. It is worthwhile to point out that although strategic alignment requires consistency between internal and external, technological and business domains, the alignment process is always driven by the external, rather then the internal domain. Organizations are supposed to adapt their internal structure to their strategic behaviors and not the other way around. The authors also discuss how the strategic alignment perspective is different from the traditional linkage approach. Compared to traditional linkage, the alignment perspective is more multidimensional and takes a better account of the complex associations that exist between business and technology areas. The empirical results in the current study will offer some additional insight on the interaction of internal and external domain and exploit the multidimensional approach to investigate the complex interrelationships between business and technology areas.

3.2 Empirical Studies

3.2.1 Chan and Huff (1997)

One of the first important empirical studies in the area of strategic alignment of IS was performed by Chan & Huff in 1997. The study attempted to investigate the impact of the business strategic orientation, information systems strategic orientation and strategic alignment on the business performance. The study relied heavily on the theoretical foundation of Venkatraman. Business strategy was operationalized using the STROBE instrument developed by Venkatraman (1989b). The instrument, used in the study,

consisted of seven strategic dimensions: aggressiveness, analysis, internal and external defensiveness, company futurity, proactiveness, risk aversion, and innovativeness. IS strategic orientation was operationalized in terms of seven dimensions corresponding to the seven dimensions of business strategy. Strategic alignment was measured as matching and moderation scores. These two approaches to strategic alignment, were presented in Venkatraman's work (1989a) and are widely accepted in management and IS literature as ways of measuring fit. Finally, business performance was represented in terms of both, growth and profitability, as suggested by Venkatraman (1989b).

The results of the study indicate that IS effectiveness results from IS strategic alignment more then from IS strategic orientation. In fact, IS strategic orientation by itself is significantly negatively related to IS effectiveness, while IS effectiveness is positively related to business performance. IS strategic alignment and business strategy have significant positive impact on business performance.

3.2.2 Sabherwal and Kirs (1994)

The study by Subherwal & Kirs investigated how the alignment between critical success factors and IT capabilities can influence organizational performance. Other factors, such as environmental uncertainty, functional integration, IT management sophistication and perceived IT success were included in the framework. The data for the study was obtained from 244 large academic institutions, which were classified according to the critical success factors. The critical success factors used in the study included reputation, teaching effectiveness, non-academic development of students, and student placement.

The ideal IT deployment profile was developed for each of the groups. The alignment was measured from the deviation score from the ideal profile for each group. Then, the alignment scores were used as inputs in the regression analysis.

The regression results indicate that IT management sophistication is significantly related to IT strategic alignment. Strategic alignment, in turn, is significantly related to perceived IT success, as were environmental uncertainty, and IT management sophistication. Strategic alignment was also shown in the study to have a significant impact on business performance. However perceived IT success was not related to business performance.

3.2.3 Bergeron and Raymond (1995)

The objective of the study was to relate the strategic orientation of a business and strategic IT management to organizational performance. The data for the study was collected from survey of pairs of CEO and CIO of 126 companies. The business strategic orientation was measured on the seven dimensions suggested by Venkatraman (1989). The principal component analysis identified five underlying factors for the questionnaire items, related to IT management: information systems positioning, strategic IS use, new IT applications, architecture planning and security. Business performance was measured in terms of growth and profitability, like in most studies. The alignment between business strategic orientation and strategic IT management was assessed using moderation (interaction) perspective.

The results of the study confirm the hypothesis that businesses strategic orientation is positively related to business performance. More strategically oriented businesses are more likely to manage IT strategically, and that interaction effect between businesses strategic orientation and strategic IT management is positive, i.e. the effect of strategic IT management is higher for businesses with stronger strategic orientation. However, just like in many other studies, the hypothesis that strategic IT management has a positive independent effect on business performance was not confirmed.

3.2.4 Croteau(1998), Croteau, Bergeron and Raymond (2000)

The studies attempted to investigate the effect of alignment between IS and business strategy on business performance. However, the business strategic orientation was assessed using Miles & Snow (1978) typology; which classifies businesses with regard to their strategic behavior as prospectors, analyzers, defenders or reactors. This was a welcome move from the multidimentional approach suggested by Venkatraman. As was discussed before, using strategic typologies has certain advantages over using a multidimensional approach. Another contribution of the study, published in the year 2000 was the measurement of strategic alignment as covariation. The results of the study confirm that IT strategic alignment is positively related to business performance for Prospectors and Analyzers. No evidence was found that IT deployment has any impact for defenders and reactors. There was also not possible to come up with an optimal IT deployment profiles for them. For Prospectors the optimal IT deployment profile involved strong IT Architecture, attention to evaluation of IS and, and use of IT as a strategic tool. For analyzers decentralized structure was recommended, in combination to

greater attention, paid to technological education. The current study uses the same sample of Canadian companies and the same measurement scales for IT deployment and performance variables. The new measures will be developed for the strategic constructs on the basis of the same questionnaire items.

3.3 Other Relevant Recent Studies

3.3.1 Reich and Benbasat (2000)

The studies, discussed previously in this paper, suggest an evidence that strategic alignment of information technology has a positive impact on business performance. This study investigates the social organizational factors that influence strategic alignment. The data for the study was collected from 10 business units from semi structured interviews, written business and IT strategic plans, minutes from IT steering committee meetings and other strategy documents. The alignment was operationalized as the degree of mutual understanding of current objectives (short-term alignment) and the congruence of IT vision (long-term alignment) between business and IT executives. The research model initially included four factors that could influence IT strategic alignment: shared domain knowledge between business and IT executives, IT implementation success, communication between business and IT executives and connection between business and IT planning processes. All of the four factors were found to influence short-term alignment. Only shared domain knowledge was found to influence long-term alignment. A new factor, strategic business plans was found to influence both, short-term and long-term alignment. The study results reaffirm the importance of strategic business planning and suggest that in order to align business and IT strategy it is important that business

executives have a good understanding of issues, related to IT and IT executives should be equally knowledgeable and involved in the business issues.

3.3.2 Baets (1996)

The study investigated the causes for strategic alignment or misalignment in the banking industry. The work suggests that the main problem in generating improved IS strategy alignment is a lack of overall sector knowledge (not skills) amongst banking managers. Awareness of IS issues (even the softer ones) does not resolve problems, but the application of these issues does.

The study results indicate that business managers in the banks are aware of IS issues and consider them to be important for their business strategy. The study results indicate that luck of awareness about business problems can be a reason for management's inability to cope with IT issues. The results also show that high awareness of IS planning and strategy process improves the understanding and awareness of the issues of IS Strategic Alignment, and that understanding of the stages involved in IS strategy alignment improves the understanding of the dynamics of the process. The results observed in the study also suggest the importance of the management's mind sets for strategic alignment.

3.3.3 Kettinger, Grover, Guha & Segars (1994)

The objective of the study was to investigate the factors that determine the sustainability of competitive advantage achieved with implementation of strategic information systems. Three types of factors were investigated in this study:

environmental factors, foundation factors (companies internal strengths and weaknesses), and action strategies. Two propositions were tested;

1. Strategic users of IT will realize sustained gains in profitability and/or market share relative to competitors in their respective industries.
2. Strategic users of IT that realize sustained improvement in performance will exhibit differences in sustainability factors from those that do not.

The study used content analysis of case studies, obtained from the literature review. Environmental factors were assessed in terms of number of direct competitors within the industry. Foundation factors were measured in terms of size, slack resources and asset turnover, employee efficiency and cost efficiency and technological resources. Most of them were measured with the help of financial ratios. Action strategies were assessed as risk management strategies in terms of current ratio, times interest earned, and equity to debt ratio. The study found that all of these factors were significant in determining the sustainability of competitive advantage of strategic IS. Performance was assessed in terms of growth and profitability. The discriminant function, containing these factors was obtained in this study. The function was able to classify accurately 23/28 cases as either above or below average performers. The study results confirm that both external environmental factors as well as internal resources of the company and strategies used play an important role in determining sustainability of competitive advantage.

4. The Concept of Fit in Managerial and IT Literature

Fit is by far the most complex and the most ambiguous concept, used in strategic alignment literature. In this chapter we explain what is usually implied by "fit" in managerial literature and how this concept is operationalized in empirical studies.

4.1 Venkatraman (1989)

Throughout several studies Venkatraman was discussing the concept of fit in management literature and the way of operationalizing it. In one of his articles, Venkatraman (1989), identified and discussed six different kinds of fit.

1. Fit can be identified in the form of **moderation**, where the interaction between two variables affects performance in a certain way. Regression analysis, including main and interaction effect and two and three way ANOVA are used to establish this kind of fit.
2. Also with the help of regression-based path analysis, fit can be established as **mediation**. This form of fit would mean that a certain variable has an effect on performance through another variable.
3. **Fit as matching** implies that a certain level of one variable has the best effect on performance when combined with a specific level of another variable.
4. Establishing **fit as profile deviation** involves identifying either empirically or theoretically an ideal profile and then showing that performance of the business will depend on how closely it adheres to this ideal profile.

5. Establishing **fit as gestalts** involves identifying groups of companies sharing a combination of particular characteristics and then identifying the gestalts, the types that perform better then others. This perspective is most useful when a large number of variables is involved. Instead of looking at linear relationship between a few variables, as for example is the case with fit as mediation, moderation and matching, with gestalt approach researchers attempt to identify frequently recurring clusters of attributes, called gestalts. Multivariate statistical tools, such as cluster analysis and MANOVA are used to establish fit as gestalts. Since a larger number of variables is considered with this approach the degree of precision has to be relaxed. However it is important to establish both descriptive and predictive validity of gestalts within this perspective. To establish descriptive validity it is important to link gestalts to some theoretical positions, implied by fit. To establish predictive validity gestalts have to be linked to an external criterion variable, such as performance.
6. Finally, **fit as a covariation** establishes fit as the second order factor that combines two variables into a latent variable, representing fit, which can affect performance.

Venkatraman emphasized the importance of justifying theoretically the type of fit used in the studies. Also, he encourages using multiple forms of fit and comparing them.

5. Concept of Fit as a Gestalt: Previous Research and Directions

The current study is the first in the area of strategic alignment of IT that attempts to examine fit as gestalts. However this way of establishing fit was frequently used before in other areas of managerial literature. In 1988 Thomas & Venkatraman have reviewed the previous studies of strategic groups and suggested directions for their future research. The research on strategic groups was classified into four types, which are presented in the Exhibit 3.

Exhibit 3. A Classificatory Scheme for Strategic Groups Research

Narrow ('parts') (uni-dimentional)	I. A priori definition using a narrow conceptualization of strategy, and may be empirically supported	II. Empirical development using a narrow conceptualization of strategy
Broad ('holistic') (multi-dimentional)	III. A priori definition using a broader conceptualization of strategy, and may be empirically supported	IV. Empirical development , using a broader conceptualization of strategy
	A priori (theoretically specified)	A posteriori (empirically derived)

Based on the review of the previous studies, the authors come up with the following observations:

1. *No Industry is Homogenious.* It is usually possible to identify strategic groups, using cluster analysis within any industry environment. Therefore the existence of several strategic groups is not by itself a significant finding. Only when the identified groups can be backed up theoretically can they represent a significant contribution.
2. *Implicit Acceptance of Prespecified Boundaries of Industry.* Most of the studies relied on the SIC code for a definition of industry boundaries. This industry definition also limits the industry boundaries to a particular country. The author suggests a move towards a more flexible definition of industry and viewing it more as environmental types.
3. *No Consistent Pattern in Group Characteristics.* It was noted that conceptualization of strategic groups varied significantly across studies. This can be attributed to the non-uniformity of the choice of variables used to develop strategic groups. This makes it difficult to meaningfully compare and aggregate the findings. The authors mention that the use of common operationalization schemes, such as Porter's or Miles & Snow types could be one of the ways to resolve this problem.
4. *Lack of Clarity in the Description of Groups.* There are no studies in which the group description would satisfy all of the three important criteria: a). that each group is composed of businesses , that follow a similar strategy, b). firms within

each group resemble one another more closely than firm's outside the group and c). that firms within each group are likely to respond similarly to market opportunity or a threat. The first two criteria, however, are met in some studies.

5. *Weak Evidence in Performance Variation Across Groups.* The suggestion is that whenever no significant variation in performance is found between groups it can be that different strategies are equally effective. The research in this case can be focused on identifying differences within groups that effect performance. Also it is suggested that multiple measures of performance are incorporated into analysis of strategic groups, such as growth and profitability measures used in the study by Dess and Davis (1984), and many others.

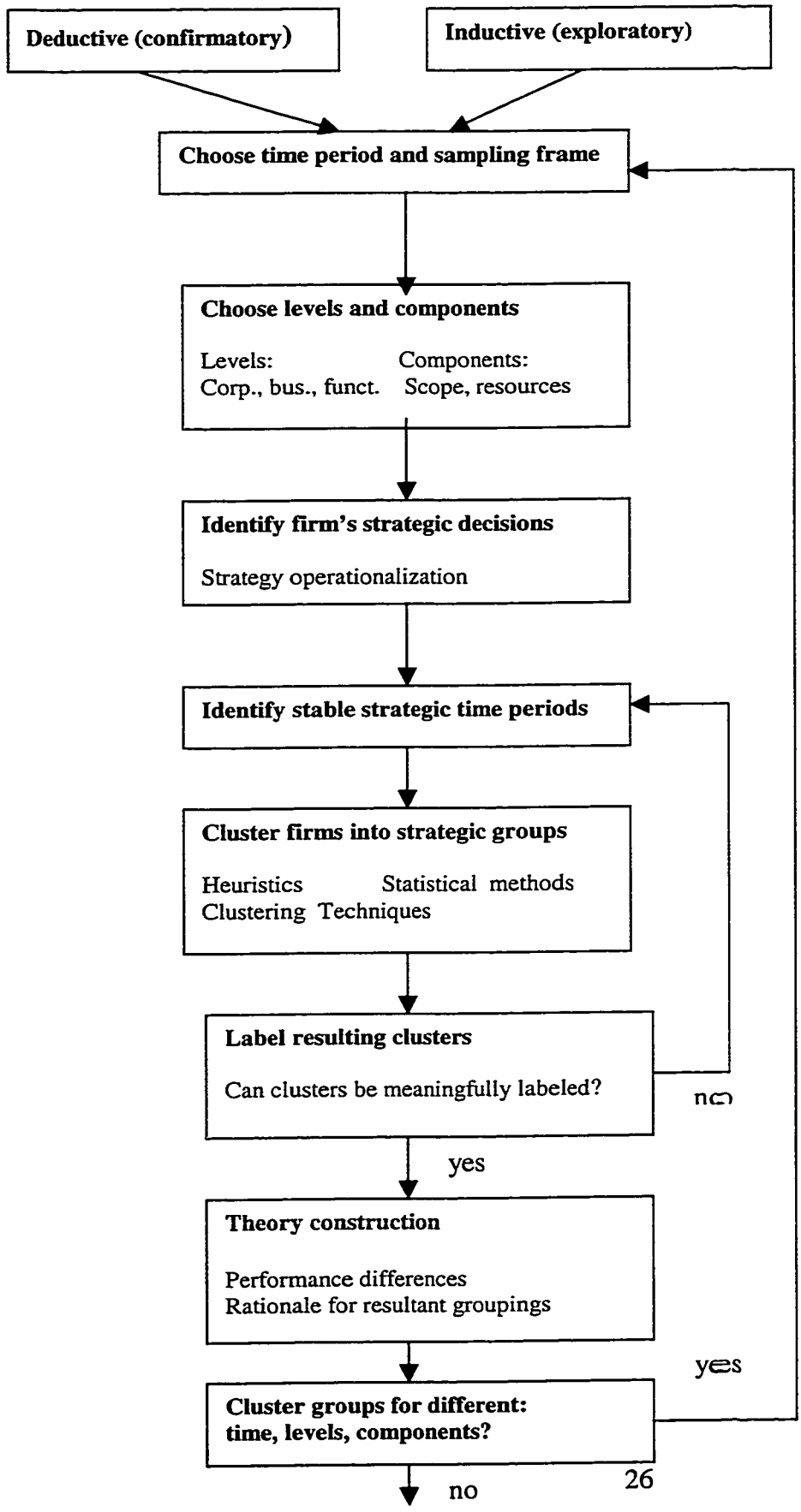
The authors suggest the following criteria for effective strategic group analysis;

1. Sampling frame has to be explicitly justified. In many cases it is not appropriate to confine the sample to a SIC-based industry definition.
2. The strategy should be operationalized in such a way that it matches the key bases of competition in the market place, it bears a strong relationship to some common theoretical discussion on strategy types, and follows basic measurement criteria for reliability and validity.
3. It is necessary to pay attention to both prior theoretizing and post-hoc reconciliation of group differences.
4. In terms of data analytic issues, it is advisable to test the stability of clusters, and to move from exploratory to confirmatory analytic techniques.

5. It is important to incorporate managerial perceptions into interpretation of the strategic groups.
6. The analysis of the strategic groups should be linked to an external (criterion) variable, such as performance or future strategic behavior, that can be predicted on the basis of group membership.

Another set of recommendations for conducting strategic group analysis was suggested by Segars & Groover (1993). Their recommendations were more specifically concerned with exploration of impact of information technology using strategic groups and cluster analysis. The authors suggest a methodology for conducting strategic group analysis, which is presented in Exhibit 4. They also note that in the area of research for information technology for competitive advantage some synergies can be derived from combining numerical analytical methods with case studies.

Exhibit 4. Research Methodology for Identifying Strategic Groups



Step 1
Determine relevant time period

Step 2
Determine levels of strategy to be examined: corporate, business or functional level. Choose relevant component of strategy: scope and/or resource deployment

Step 3
Identify variables that best capture the firm's scope and resource deployment decisions

Step 4
Identify periods of homogeneity in strategic beghavior within industry

Step 5
Cluster firms in groups for each

Step 6
Test the descriptive validity by examining resulting clusters. Can they be meaningfully labeled?

Step 7
Examine resulting clusters for performance or other differences, that can have implications for existing or new theory

Although this framework presents some useful ideas for conducting strategic group analysis, some of the steps in it are difficult and sometimes unnecessary to perform. It is unnecessarily restrictive. The recommendations of Tomas & Venkatraman (1988) provide us with more flexible and useful guidelines.

Several studies in 1990's used strategic group analysis to study IT impact on organizational performance. Two of these studies will be presented below.

5.1 Mahmood (1993)

The objective of this study was to investigate how information technology investments affect organizational strategic and economic performance. The data on IT investment, used for the study was obtained from a *Computerworld* study that reported the list of 100 most effective users of information technology. The data on organizational performance was obtained from the compact DISCLOSURE database. The multidimensional cluster analysis was performed in order to classify the companies included in the sample according to their IT investment budget and strategic and organizational performance. Initially three clusters were obtained, which reflected moderate, high and extremely high strategic and economic performance and levels of IT investment. Further, subgroups were identified. Each of the groups, corresponding to the particular levels of IT investment was further broken down into subgroups reflecting moderate, high and extremely high performance. Further, these various subgroups were compared between each other on different items, related to IT investment. The results of this study provide rather inconclusive evidence. Groups with high IT investment budget

often showed only moderate performance. And groups with high performance often had only moderate IT budget.

There are several reasons why the study by Mahmood fails to meet its objectives. First of all, cluster analysis was not the best technique to investigate relationship between IT investment and performance. Second, the top companies, included in *Informationweek* 500 could or could not be representative of the companies in general, as they were supposed to represent the highest performing companies. Finally, the small subgroups (some of which contain as little as one observation) that resulted from the cluster analysis can not serve as the basis for any conclusions. The biggest problem with the methodology used in this study is selection on the dependent variable. First, the companies included in the sample were already better performing then average firms, which also poses the problem of a limited range. Second, they were further broken down into groups according to their performance. If the intention of the study was simply to find out if there is a relationship between IT investment and organizational performance simple linear regression analysis could serve better this purpose. However if the purpose was to discover more complex interrelationships more sound theoretical justification and better operationalization of variables could be necessary.

5.2 Fiedler, Grover & Teng (1996)

Although this study was not specifically concerned with the study of strategic groups, it is discussed here, because it used cluster analysis to identify relationships between organizational structure and IT structure. The study attempted to use multistep cluster analysis in order to identify, which IT structure is linked to which organizational

form. The data was collected through a survey of IT executives, representing 313 companies. Four types of IT structures were identified through cluster analysis:

1). Centralized (centralized processing, low communication, low sharing)

2). Decentralized (decentralized processing, low communication, low sharing)

3). Centralized cooperative (centralized processing, high communication, high sharing

4). Distributed cooperative computing (decentralized processing, high communication, high sharing)

It was found that functional organizational structure was related to centralized computing, while decentralized computing was related to product organizational form. Distributed cooperative computing was related to both matrix and product organizational forms.

6. Porter's and Ansoff's Strategies: Previous Research

While the previous chapter examined more closely the concept of fit, which is central to the current study, the purpose of the current chapter is to present a detailed literature review on one of the most important constructs of this study: business strategy. More specifically, in this chapter we will examine the previous research performed on Porter's and Ansoff's strategies. Very few studies examined these strategies in conjunction with IS and IT use, most of them simply attempted to investigate the strategies and their influence on business performance. None of them however, took the alignment perspective to IS - business strategy interaction.

The first section of the chapter presents the most frequently sited studies, which employed Porter's generic strategies. Five of them were performed in the 80's, another three conducted in late 90's.The comparison of the results of these two groups of studies can give us an idea of how Porter's strategic groups and their performance were affected with time.

6.1 Early Studies

6.1.1 Hall (1980)

Hall's work represents both, valuable empirical study and a sound theoretical foundation that helps us to achieve understanding of the generic strategies and their effect on performance. The study presents extensive and qualitative analysis of 64 companies from 8 industries. The purpose of the study was to identify key factors that make companies succeed or fail in the hostile environment, during the times of economic recession. The following conclusions were drawn by the author and supported with examples of the companies, included in the sample.

- Great success is possible even in hostile environment of maturing industries. As industries mature weak competitors go out of business, while stronger competitors can solidify and improve their position.
- Strategies, leading to success share common characteristics. The most successful companies were able to achieve either or both of the lowest cost position, or the highest product/service quality position. Notice that those correspond to Porter's Cost leadership and Product Differentiation strategy, and the conclusion implies

that the two strategies are not mutually exclusive and can be effectively used together. This is somewhat contradictory to Porter's theory, which suggests that successful companies should pursue only one generic strategy and avoid getting stuck in the middle, between several strategies.

- Successful strategies come from purposeful moves toward a leadership position. Successful companies are the ones that can be first to exploit opportunities to cut costs or achieve better differentiation.
- Problems come from failure to gain or defend a leadership position. Companies that knew success during the time of growth, but fail to keep up with the pace of their competitors by making poor strategic choices often become marginal competitors and go out of business.
- The diversification strategy can not always help to recover a deteriorating industry position. Diversification from the companies main business into, new, faster growing segments is best achieved when implemented early and approached carefully.
- Structural evolution moves toward a dynamic equilibrium as basic industries face a hostile environment. In a mature industry four competitive subgroups can be found that are defined as follows.

    1. *Leadership position* is held by competitors who achieved either or both of lowest cost or most differentiated position. We can notice that this position can be viewed as equivalent to "prospectors" in Miles & Snow classification.

2. *Next best position* is held by the second lowest cost or highest differentiation company. This position is vulnerable and dependent on the actions of the leader. This is why companies in this position will analyze the industry environment and the leaders moves, which is why companies of this kind were labeled as "analyzers" by Miles & Snow.
3. *Next worst position* is held by competitors who finish in the third place. In the hostile environment growth and return prospects for these companies are bleak. The best way for survival for such companies is to select a niche position and try to protect it. Therefore, according to Porter such companies would be said to adhere to "focus" strategy. Under Miles and Snow typology, they would de labeled "defenders".
4. *Marginal or failing position* is assigned to companies, who end up last in the competition for the lowest cost and/or highest differentiation. Such companies will either have to go out of business or be subsidized. Because of the lack of competitive advantage of any kind, such companies will have to react to enormous pressures put on them by their stronger competitors, which is why they would be called "reactors" by Miles & Snow.

This analysis is very useful in reconciling the two widely used strategic typologies: Porter and Miles & Snow. It shows that the sources of competitive advantage lie within Porter's generic strategies, while Miles & Snow types are manifestation of the competitive position held in the market.

6.1.2 Hambrick (1983)

The study investigated strategic behavior of the firms and its implications for performance in two business environments, which were labeled as "disciplined capital goods makers" and "aggressive makers of complex capital goods. These two types were two of the eight strategic types, previously developed by the author through cluster analysis. The study tested three following propositions:

1. *The primary strategies pursued by high-performers among the two industry setting will closely resemble Porter's three generic strategies-cost leadership, differentiation and focus*
2. *Even though all three of Porter's strategic types may be found among the two industry settings, not all three Porter's types will be found in each industry setting*
3. *Even when found in both settings, a generic strategy will tend to have a different configuration in each setting.*
4. *Market share leaders in the two industry types will differ in their strategic tendencies.*
5. *The primary strategies pursued by high performers in an industry will differ from the primary strategies pursued by low performer in the industry.*

The study used the PIMS database. The data were examined for 107 disciplined capital goods makers and 57 aggressive makers of complex capital goods. The variables, used for the study were separated using a panel of judges into non-environmental and

environmental types. Non-environmental variables were further subdivided into "strategic position" and "strategic choice variables". Six strategic position variables and 11 strategic choice variables were identified using factor analysis and used as inputs for cluster analysis. The objective of cluster analysis was to identify the strategic structures of profitable and unprofitable strategic groups in the two business environments. Return on investment was used as a performance measure in this study. The configuration of groups, that were formed, generally supports all the propositions, except for proposition 4. The analysis showed that in both business environments the companies that achieved the highest return on investment also had the highest market share and were pursuing differentiation as the main strategy of their business.

6.1.3 Dess & Davis (1984)

The study addressed the question of whether in practice businesses follow Porter's generic strategies and what implications these strategies have for the business performance in terms of both, growth and profitability. The study used the data collected from structured interviews on 22 manufacturing firms in paints and allied products industries. The factor analysis and the panel study identified which of the 21 strategic items were related to differentiation, overall cost leadership and focus strategy. The cluster analysis identified four strategic groups, related to overall cost leadership, differentiation, focus and "stuck in the middle" strategies. One-way analysis of variance procedure was used to compare the groups on their growth and profitability. The results indicated that the groups were significantly different in terms of growth and approached statistical significance for profitability measure. The focus cluster was performing the

best in terms of sales growth, while overall cost leadership strategy was the most successful in terms of profitability. The inconsistency of this result with Hambrick (1983) could be attributed to the fact that the sample for Dess and Davis study came from only one industry and one geographic area, where specific business conditions or the nature of product, could cause differentiation strategy become ineffective.

6.1.4 Miller and Friesen (1986 a, b)

Similar to the two previous studies, this study performed a cluster analysis to investigate the existence of three generic strategic types and their influence on business growth and profitability. Once again, PIMS database was used. Five clusters were extracted and their robustness was tested, however they did not reflect pure strategic types. The resulting groups used Porter's generic strategies in combinations. The authors attribute this discrepancy with the previous studies to their focus on the consumer durable goods industry. When the clusters were compared on growth and profitability it appeared that the most successful companies were strong on each of the three strategic orientations, while the poor performers were weak on all of them. This is consistent with the conclusion drawn by Hall (1980).

6.1.5 White (1986)

In his work Porter (1980) proposed a set of organizational attributes that fit each strategy. The study represents 69 business units from 12 different multi-business firms to test if these characteristics actually represent the fit. Referring to the work of Hall (1980), White assumes that although under certain circumstances cost leadership and differentiation strategy may pose conflicting objectives, it is possible to follow the two strategies simultaneously. He distinguishes pure differentiation, pure cost leadership, mixed differentiation-cost leadership strategy as well as the group of companies without any strategic orientation.

Three main hypotheses were formulated and tested in the study using multidimensional cluster analysis.

Hypothesis 1

Following Porter's proposition it was hypothesized that business units with cost strategies will exhibit higher performance within organizations with low autonomy, tight control and frequent evaluation.

Hypothesis 2

It was hypothesized that because of the need for cross functional coordination, companies, following differentiation strategy will perform best within organizational context where functional responsibilities are self-contained within the business unit.

Hypothesis 3

It was also hypothesized that cost strategies will benefit from shared, or centralized functional responsibility.

The results of the study indicate that businesses following cost leadership and differentiation strategies simultaneously have the highest return on investment. The highest sales growth was achieved by firms, following differentiation strategy. The results also confirm the proposition that businesses, oriented at cost leadership strategy benefit from low autonomy and more control. Frequent reviews were not found to have significant effect on performance for different kind of strategies. Some support was found for the third hypothesis, since for pure differentiation strategy business units with self-contained function showed significantly higher growth, but results for ROI were not significant. For businesses, pursuing cost leadership strategy, the ones with shared function had significantly higher ROI.

6.2 Recent Studies

6.2.1 Booth and Philip (1998)

The study used the data from semi-structured interviews of 16 senior executives from leading edge companies. The study tried to compare the competency driven approach to gaining competitive advantage to technology driven approach suggested by Michael Porter. The authors found that Porter's generic strategies work better in combination

rather then isolation and that technology and innovation can play an important strategic role, but not in isolation from other factors. The authors came to the conclusion that, the dynamic environment of the modern business world suggest that managers should shift from relatively static approach, suggested by Porter to more flexible and dynamic approach, such as competency driven approach. Technology is also, supposed to be used for competitive advantage in conjunction with competency driven approach. Segev (1988), also suggested that Porter's generic strategies are most applicable for more rigid industry environments. Nevertheless the results indicate that cost leadership and differentiation always remain important strategic elements.

6.2.2 Borch, Huse & Senneseth (1999)

The study attempted to identify how availability of resources affects the strategy of small entrepreneurial firms. Strategy was measured using likert scales on 15 items. Factor analysis identified four factors, which were related to product, market, price and growth strategies. It was noted that product and price strategies were identical to Porter's differentiation and overall cost leadership strategies. Further, regression and cluster analysis were used to see what strategy-resource configurations are found in the entrepreneurial firms. Four clusters were identified. It was found that very few firms, with the exception of traditional firms (firms, whose main resources are financial strength and locational advantage), favor the use of price (or cost leadership) strategies. Firms, having technological resources tend to use product differentiation strategies or growth strategies. These findings are consistent with findings presented in this study.

6.2.3 Swartz and Teach (2000)

The study investigated the following two proposals:

Proposal 1: Study entrepreneurial firms one industry at a time

Since the results can vary across industries, it is inappropriate to generalize the findings across different industries. It is more appropriate to evaluate each industry separately. Although it is true that results can vary by industry, it is more appropriate to differentiate the industries in terms of theoretically meaningful dimensions, as suggested by Thomas and Venkatraman (1988), rather then in terms of SIC code as was done in this study.

Proposal 2: Strategies must be studied longitudinally, rather then at some point-in-time

The study was attempting to show that results can as well very over time. Although, again it is true that results can be shown to vary by year, when the studies were conducted, as was done in this study, I would suggest that it would be more theoretically meaningful to define the time intervals in terms of stages in the economic cycle, rather then years, as was done in the study by Swartz and Teach. Nevertheless their results provide us with a very useful evidence that both time and industry can studied can have an effect on the link between Porter's and Ansoff's strategies and performance. Strategies were used as independent variables in the study. They included traditional grand strategies as well as Ansoff's and Porter's strategies. Technology-based strategies of innovation, quality commitment, uniqueness and use of new technologies were also included in the study (Swartz &Teach, 1998). Sales growth was used as a dependent variable in the study. Regression analysis was used to establish the relationship between strategic constructs and growth. The results indicated that although only differentiation strategy has an aggregate positive effect on the performance, cost leadership has a

significant positive impact in some industries and significant negative impact in other industries. Product development and diversification strategies were also found to have significant impact on performance in certain industries. It was also shown that for a given industry different strategies were significantly related to growth in different years. In particular, for SIC code 7372 cost leadership strategy had a significant negative relationship to performance in 1994 and had no effect in all other years for the studied period (1992-1996). Differentiation strategy had a significant effect in 1992 and 1993. Market development strategy had a strong significant relationship to performance, but only in 1996, and diversification had a significant positive effect only in 1994. Although the conclusions drawn in the study about the time and industry effect are important, the study would make a more significant theoretical contribution if it defined industry boundaries in a less rigid way, i.e. in terms of important industry characteristics, rather then SIC codes, and considered time in terms of the stages in the economic cycle rather then years.

6.3 Other Relevant Studies

6.3.1 Segev (1989)

The goal of the study was to systematically compare Porter's strategic typology to the one of Miles & Snow. As was mentioned in earlier studies, Segev agrees that the two typologies do not directly correspond to each other. They also are not mutually exclusive. They rather represent two different aspects of a complex phenomenon, which was

previously mentioned by White (1986), and which becomes obvious from the study conducted by Hall (1980).

The comparative analysis and synthesis was implemented based on the proximities of profiles, developed for each of the strategies through the committee of judges who evaluated each of the strategies based on 31 attributes. The proximities for these profiles were calculated and presented in a matrix and in a two-dimensional monotonic scaling. The pilot study identified two varieties of focus strategy; differentiation-focus and cost-focus. Analysis of the matrix indicated that the profile of differentiation strategy is most close to the Prospector, Analyser was close to both differentiation and cost-focus, Defender is close to cost focus and reactor is stuck-in-the middle. Porter's cost leader was found to be closest to Analyser, and Defender, Cost-Focus was equivalent to Analyser, differentiation-focus was similar to both, Prospector and Analyser, and Stuck-in-the-middle was similar to reactor. This result confirms, once again the conclusion drawn by Hall (1980).

6.3.2 King & Grover (1991)

The study used the data, collected from the survey of 84 senior IS executives. The study attempted to identify the areas of application of IS resources, identify organizational factors that facilitate and inhibit the use of information resources, and identify the frequency and nature of the processes used for developing strategic uses of information resources. The study tried to prove that an important distinction exists between strategic use of information and information technology. Two areas of application, used in the

study, product/service differentiation and cost competitiveness are related to Porter's generic strategies. Other two constructs, market segmentation and new product planning can be related to Ansoff's market development and product differentiation strategy. The weakness of the study, however is that it does not use any of the classifications consistently, strategies from the two typologies are mixed together which does not allow for their systematic evaluation. The fifth area of application, customer service, was found to be the most important application area, however it was also the most closely related to product differentiation strategy. Among the companies, included in the sample 45.24% reported the use of information technology as a strategic weapon to support differentiation strategy, and 66.67 percent used it for cost competitiveness. Information technology was used as a strategic resource for new product planning by 32.14% of the firms. And 41.67 used it for market segmentation. Customer service application of information technology was found to be closely related to the application of IT for product and service differentiation. The application of IT for new product planning and for market segmentation were also found to be significantly related.

6.3.3 Farrel, Hitchens and Moffat (1993)

The study addressed the following questions.

Does performance differ between strategic groups?

Does formulating and implementing strategy make a difference?

A sample of companies from Scotland and the South East of England was selected. The companies were broken down into strategic groups based on the opinion of the executives from these companies and on the researchers' examination of some objective data.

Because of the small size of the groups, following cost leadership and cost differentiation strategy, these groups were not compared to other firms. However 27 companies were implementing differentiation strategy, 28 companies were following focus differentiation strategy and 20 companies were "stuck-in-the-middle", i.e. not competing based on cost leadership, differentiation, or focus strategy. It was found that groups, following differentiation and focus differentiation strategy were performing better then stuck –in the-middle companies on many measures of performance. No significant difference was found between differentiation and focus differentiation groups.

6.3.4 Smith, Venkatraman and Wortzel (1995)

The study used mail survey data of independent television retailers, attempting to prove that consistent goals and strategies between manufacturer and retailer enhance both retail and brand performance. The results indicated that retailers, pursuing merchandise differentiation strategy were better able to cooperate and establish strategic fit, than retailers pursuing cost leadership strategy.

6.3.5 Lim, Sharkey and Kim (1993)

This is one of the few recent studies that were performed using Ansoff's growth strategies. The study attempted to evaluate the various dimensions of strategy, relevant to Ansoff's strategies in an international marketing context. The competitive advantage was operationalized as advantage in pricing, technology, product uniqueness, marketing and sales expertise, production and strategic planning. A mail survey was conducted among

three Ohio industry groups, which dealt with equipment manufacturing. Multivariate discriminant analysis was performed to evaluate the relationships between international marketing strategy and its determinants. The analysis was performed on both, complete and reduced sample. The complete sample included all companies that responded to a questionnaire, while reduced sample included only businesses, involved in export activities. Two similar discriminant functions were identified for both samples. One of the functions represented top management commitment, while the second one represented international market aspirations. Market penetration strategy represented low level of top management commitment and average international market aspiration, product development strategy represented medium level of management commitment and low international market aspiration. Market development strategy represented medium level of top management commitment and high level of international market aspiration, and diversification strategy represented high level of management commitment and international market aspiration.

6.3.6 Liao & Greenfield (1997)

The study sought to explore the impact of Porter's generic strategies on corporate research & development in Japanese technology-based firms. Survey of R&D managers data were used. One-way ANOVA F-test with pairwise comparisons using Tukey-b and Sheffe procedure was used across different industry groups against each of Porter's generic strategies. The results indicate that Porter's generic strategies are widely used in Japan, Japanese managers attach similar importance to each strategic alternative, but they

particularly emphasize differentiation strategy and that R&D strategy is highly integrated with the corporate strategy.

6.3.7 Hill (1988)

While Jones and Butler article presents cost leadership and differentiation strategy as two extreme opposites, some of the previous studies found that often differentiation and cost leadership strategies could be used in combination. The article by Hill (1988) explains why and under what conditions differentiation strategy can be compatible with cost leadership strategy. First of all differentiation strategy has an effect of decreasing price elasticity of demand, allowing the company to charge higher prices for its products, second the demand curve shifts upward, increasing demand for the companies products, which results in increase in both, price and volume of sales, producing significantly better profits. This explains why differentiation affects profitability through better market performance. The evidence that differentiation strategy results in increased profits through improved market share growth was found in the current study.

In this way, although differentiation will have an immediate effect of increasing unit costs, the resulting increase in revenue will often offset it. Furthermore, increased volume will help the company to take advantage of the economies of scale and scope. However this situation will not always hold. The lower cost position can only be achieved if differentiation generates a sufficient shift in demand curve and if significant reduction in unit costs occurs due to economies of scale. This will depend on the set of contingencies that are presented in Table 1.

Table 1. A Summary of the Important Contingencies Affecting the Compatibility of Differentiation and Low Cost

Major Contingencies	Secondary Contingencies	Comments
Ability to differentiate	User characteristics Product characteristics	Diversity of users necessary for differentiation
Commitment of users to products of rival firms	Switching costs Brand loyalty	Brand loyalty greatest in mature oligopolies
Product market environment	Market structure Product market evolution	High growth state in Product Life Cycle most important condition
Learning effects	Age of process Complexity of process	Age of process very important: new processes imply significant learning
Economies of scale Economies of scope	Plant level Firm level	Plant level often exhausted at low market share; firm level may be more significant Breadth of product line may be important

This study explains why the generic strategies can have a different impact on organizational performance in different industry environments and can help us to

separated such industry environments meaningfully, not based on SIC code alone, as was suggested by Thomas and Venkatraman (1988)

6.3.8 Jones & Butler (1988)

Jones & Butler (1988) argue that the real underlying dimension of Porter's generic strategies is cost. Since companies have to incur additional costs to differentiate their products, the choice of strategy represents a trade-off between the costs of differentiation and low production costs. They attempt to reconcile Porter's proposition that cost leadership and differentiation strategy are mutually exclusive with Hill's view that they can be achieved simultaneously, with the help of transaction costs theory. While Hill (1988) puts an emphasis on the effect that differentiation and cost leadership strategy has on production costs, Jones & Butler put an emphasis on costs, that are incurred after production, i.e. transaction costs. The article also discusses the product –market choices that have to be made by the firm, which are closely related to Ansoff's strategic quadrants. The article discusses the role that differentiation strategy can play in reducing production costs and maximizing revenue, in the way, similar to Hill's. However it also emphasizes the importance of taking into account transaction costs. If transaction costs contribute to a large degree to the total costs and if the rate at which they increase with increasing differentiation is fast, then differentiation strategy will be less effective in increasing profitability. This emphasizes the importance of taking industry characteristics into account, while analyzing generic strategies once again. The nature of products produced by the industry, the industry growth and the amount of competitors, pursuing either strategy will affect the relative costs and benefits of pursuing either strategy. For

example, in a stale industry, with little growth in revenues, minimizing costs can be more important then trying to achieve higher sales through more differentiated products. Also when revenues, rather then costs alone are taken into account it becomes possible to show that firms that pursue differentiation or mixed strategy are supposed to be able to achieve higher revenue and higher market share then firms that pursue pure cost leadership strategy.

The focus strategy is also discussed. It is suggested that firms, pursuing focus strategy are doing so because they are not able to match the average production and transaction cost of their competitors. This is, again consistent with the conclusion drawn by Hall (1980). Some special conditions are necessary for this strategy to be successful.

6.3.9 Summary and Conclusions

The studies, presented in this section provide inconclusive evidence on how Ansoff's and Porter's strategies effect performance and in which form they exist. Some studies identified strategic clusters, corresponding to the generic strategies, while others report that strategies are used in combinations rather then in their pure forms. The results concerning the effect of strategy on performance are also mixed. These contradictions are not surprising, given that it was demonstrated that both time and industry studied can have an effect on the results for both Ansoff's and Porter's strategies (Swartz & Teach, 2000).

Throughout the studies that were discussed in this chapter we can see an on-going theoretical debate on whether Porter's cost leadership and product differentiation strategies are two extremes of the same continuum, as according to Jones & Butler (1988) or if they are best used in combination, as suggested by Hill (1988) I also believe that this depends on industry. In certain industries the combination of the strategies is possible, in others the choice is necessary, yet in others, companies can choose the point on the continuum between low cost, low differentiation and high cost, high differentiation. This can depend on the nature of industry products and on the cost structure. Other industry factors that can make a difference were discussed by Hill (1988).

While their exists a body of research on Porter's generic strategies and their effect on business performance, not enough research was performed on Ansoff's growth strategies to draw any conclusions about the form in which they exist and the impact that they have on performance and technology use. More research in this area is necessary.

The conclusions that were drawn by Hall (1980), indicate that both differentiation and cost leadership can be seen as tools towards a final strategic goal-achieving leadership position within the industry. According to Hall, the two strategies can be used simultaneously, as long as they do not directly conflict with each other. White (1986) has empirically demonstrated that companies, combining these two strategies are the best performers. The focus strategy, as viewed by Hall (1980) and Jones & Butler (1988) is a way to survive for a company, which did not achieve a leadership position neither in terms of cost nor in terms of superior quality, but has certain strengths, valuable to certain consumer groups.

Not many studies have addressed the use of information technology for competitive advantage in the context of Porter's generic strategies or Ansoff's growth strategies. The most relevant study that we find in this area is the one conducted by Booth & Phillip (1998). The conclusions that the authors draw from the study is, that although IT and Porter's generic strategies are viewed by executives as valuable competitive tools, neither of them can be viewed in isolation from one another and from many from other factors important to company's competitive position. Since this conclusion is rather vague and not supported by empirical data from a sufficiently large sample size, further empirical research in this area is warranted.

Table 2. Summary of Most Important Empirical Studies of Ansoff's and Porter's Strategic Typologies

Study	Research Question	Major Constructs	Methodology	Results
Hambrick (1983)	How can high performance be achieved under each of two different industry environments?	-industry environment -strategy -performance (RI)	*Data Collection* PIMS database of mature industrial products environments *Data Analysis* Factor Analysis, Cluster Analysis	Clusters, corresponding to Porter's generic strategies were identified. Their relationship to industry environment and performance was studied.
Dess & Davis (1984)	Do Porter's generic strategies exist? Do they affect business performance in terms of growth and profitability?	-Strategy -Growth -Profitability	*Data Collection* A field study, comprised of responses of executives of a sample of firms from paints and allied products industries	Three of four clusters identified in the study were corresponding to Porter's generic strategy, while the fourth represented the "stuck in the middle group". The groups were significantly

			Data Analysis Factor Analysis, Cluster Analysis	different on growth and approached statistical significance on profitability.
Miller and Friesen (1986)	Do Porter's generic strategy types appear with some degree of regularity? Do these types differ among each other and from types not displaying differentiation and cost leadership strategy on their growth and ROI performance	-strategy -growth -profitability	*Data Collection* PIMS data base of consumer durable business units *Data Analysis* Cluster analysis	Five clusters were obtained and their robustness was confirmed. The clusters did not represent pure strategic types for neither high or low performing group. Clusters that were strong on all of the strategic orientations outperformed clusters that were weak on them.
Booth & Philip (1998)	What is the role that information technology and competencies of the company play for its competitive advantage?	-strategy -IT use -business performance	*Data Collection* Data from unstructured interviews of 16 IT executives from leading edge companies *Data Analysis* Informal analysis of data, obtained from the interviews of 16 executives.	Most companies used Porter's generic strategies in combination. Innovation and technology use were mentioned by several companies as a potential source of competitive advantage, however it can not be isolated from other factors.
Borch, Huse & Senneseth (1999)	How availability of resources affects the use of competitive strategy in entrepreneurial	-strategy -resources	*Data Collection* Survey of 660 Swedish entrepreneurial firms *Data Analysis* Factor analysis,	Four strategic dimensions were identified. Two of them corresponded to Porter's product differentiation and cost leadership

	firms		regression analysis, ANOVA, cluster analysis	strategy. Most firm's, with exception of traditional firms, avoided use of price strategies. Firms, possessing mainly technological resources favored strategies oriented towards product differentiation and growth.
Swartz & Teach (2000)	The importance of studying strategy by industry and over time.	-strategy -performance	*Data Collection* Content analysis for numerous longitudinal studies of firms that have gone public from 1989 to 1991 *Data Analysis* Regression Analysis	The results provide some evidence that different strategies have different effect on performance for different industries and in different years. Out of Porter's and Ansoff's strategies only differentiation strategy was found to be significantly related to performance for an aggregate sample in 1994.

7. Methodology

7.1 Research Question

The research question that we address in the study is whether there is the form of fit between the choice of strategy and IT deployment profile of the company that is related to organizational performance. More specifically it will be investigated how Porter's and Ansoff's strategies can be effectively combined with technology use in order to improve organizational performance.

As was discussed in section 4.1 of this paper, fit can be established in 6 different forms. The form of fit that was given preference in this study is fit as gestalts, which was investigated with the help of K-mean cluster analysis. This technique was preferred for several reasons. First of all, it is consistent with the exploratory objectives of this research. As this is one of the first quantitative studies that attempts to investigate Porter's and Ansoff's strategies and their effect on organizational performance in conjunction with IT use, we do not have any specific hypothesis. Although some of the studies, reviewed in the theoretical foundation section of this paper tell us that technology can be used to reduce costs and develop superior products, very little is said on how specifically this can happen. Cluster analysis is a flexible technique that can produce results that are easy to interpret and compare with the assumptions made in the previous studies. Cluster analysis was a choice of many other researchers, who previously studied Porter's generic strategies and their relationship to organizational performance, which will make it easy for us to compare and integrate the results of this study with the previous research in this area.

With the help of cluster analysis I will try to find gestalts, i.e. combinations of strategic, technological and environmental factors that are related to organizational performance. I will follow the guidelines, suggested by Thomas and Venkatraman (1988) and presented in section 5.2 of this paper.

In addition to exploring fit in the form of gestalts, I will present some evidence that fit between technology and strategy variables exists in the form of mediation.

7.3 Defining Constructs and Variables

The current study is concerned with four main constructs: IT deployment, strategy, industry environment and performance. This section discusses each of these constructs and defines variables, associated with them.

7.3.1 The Choice of Important IT Constructs

IT constructs, used in this study, were developed by Croteau (1998) through exploratory factor analysis, which was performed on 53 questionnaire items covering different areas of IT deployment within organizations. Based on the questionnaire items that were included for the IT deployment variables we can define them as follows.

TECHNOLOGICAL ARCHITECTURE – refers to the quality of information system infrastructure

IS STRATEGIC ORIENTATION – measures the degree of involvement of IS department into business strategic issues and tendency to use IS for strategic purposes.

TECHNOLOGICAL EDUCATION – measures the tendency of employees towards acquisition of knowledge in IS related areas

IS SOURCING- measured the tendency to use internal IS resources as opposed to external IS resources

IS CENTRALIZATION – measures the tendency towards development of centralized IS as opposed to decentralized architecture.

IS EVALUATION- measures the amount of attention, devoted to evaluation of effectiveness and efficiency of IS.

IT MANAGEMENT STYLE - distinguishes between participatory and authoritarian approaches towards management of IS team.

The following questionnaire items were included for each of the scales:

Technological Architecture ($\alpha = 0.87$)

Item 25	IS department integrates multi-vendor open systems technologies.
Item 23	IS department designs and implements an information architecture that guides applications development.
Item 26	IS department contributes to the effective use of the data resource.
Item 15	IS department plans and manages for effective and flexible communication networks.
Item 27	Technological architecture is designed to respond to our business needs
Item 29	IS department improves information security and control.

IS Strategic Orientation ($\alpha = .84$)

Item 20	IS department has a strategic impact on our firm.
Item 17	IS department contributes to business growth.

Item 47 IS department employees design and implement applications that allow the firm to differentiate itself from competitors.

Item 1 Information systems (IS) are used for competitive advantage by our firm.

Item 49 IS department employees participate to organizational meetings.

Item 48 IS department employees design and implement applications that reduce organizational operations costs.

Technological Education ($\alpha = .80$)

Item 52 IS department employees learn continuously about new technologies and technological applications.

Item 50 IS department employees read technological journals on a regular basis.

Item 51 IS department employees attend information systems associations meetings.

Item 53 Continuous learning about ways to integrate new technologies is encouraged by our firm.

IT sourcing ($\alpha = .91$)

Item 32 Information systems are primarily developed *by external resources*

Item 31 Information systems are primarily developed *in-house.*

IS Centralization ($\alpha = .84$)

Item 22 Information systems are *decentralized.*

Item 21 Information systems are *centralized.*

IS Evaluation ($\alpha = .86$)

Item 5 Information systems *productivity* is measured.

Item 4 Information systems *effectiveness* is measured.

IT Management Style ($\alpha = .70$)

Item 39 *Authoritative* style in the IS project team is preferred.

Item 40 *Participative* style in the IS project team is preferred.

The complete questionnaire is presented in Appendix 1.

7.3.2 Choice of Strategic Constructs

As was discussed previously in this paper, the study uses two strategic typologies, which were widely accepted and previously used in managerial literature but were given little attention in IS research. Introduction of such constructs to the area, represents another contribution of this study and will help to improve the understanding of the complexity of interaction between technological and strategic sides of business management. The instruments for measuring these constructs were developed within this study, based on 23 questionnaire items, related to realized strategy of the firm. These questionnaire items were previously used by Segev (1989) to classify firms according to Miles & Snow typology. This study demonstrates that the same items can be used for the development of measurement scales for the purposes of classification of businesses according to other typologies, more precisely in accordance with Porter (1980) and Ansoff (1957). The development of such scales will be discussed in more details in the subsequent chapter.

7.3.3 Performance Variables

Two performance constructs; Growth and Profitability are widely accepted measures in both Managerial and IS literature. They were used in most of the studies discussed in this paper. In this study, these constructs were measured, using an instrument, developed by Venkatraman (1989 b), based on 8 questionnaire items, representing business performance.

7.3.4 Industry Dimensions

From the literature review, we can conclude that taking industry factors into account is essential when analyzing strategy. Thomas and Venkatraman (1988), suggests that instead of accepting industry boundaries, set by SIC code, researchers should try to isolate important industry characteristics and to consider industry boundaries in accordance with these characteristics. In this study industry types, differing along two dimensions, industry growth and homogeneity of products, will be concidered. The choice of these dimensions is determined by three factors:

1). Their practical importance

2) Their relevance to managerial and economic theory

3). Their relevance to the issues of strategy and technology use.

Managers routinely monitor the growth of industries in which they operate. In fact, the first and the most important criterion for entering a new business and continuing the existing business is growth. Some practical analytical tools, such as Boston Consulting Group (BCG) Product Portfolio Matrix, incorporate growth as one of the main elements of the analysis. According to BCG Matrix, which is frequently used in practice, the strategy for the business unit is determined by the business strength and industry attractiveness. Industry attractiveness is measured primarily by growth.
Homogeneity of products is another important dimension of the industry, the classical economic theory of competition identifies four competitive industry types: perfect competition, imperfect competition, oligopoly and monopoly. According to this theory,

nature of product alone with entry costs, will determine to a large extend the competitive nature of the industry. When entry costs are low, industries with homogeneous products will find themselves in the condition of a perfect, mostly, price or cost based competition, while industries with heterogeneous products, will operate under condition of imperfect competition, which will be mostly differentiation based. Oligopoly and monopoly are less competitive industry types, they occur in the industries with high entry costs, and while monopoly faces no competition at all, the rules of competition for oligopolies are usually neither differentiation nor cost based, therefore they are less relevant to this study. Most often monopolies and oligopolies produce homogeneous products. We can see that homogeneity of product can determine to a large extent the nature of competition in the business environment and the type of generic strategy that will be pursued by the firm (Parkin and Bade, 1991).

7.3.5 Fit

The most complex among other constructs presented in this model, fit represents the degree of harmonization between business strategy and technology use. In this study we consider fit as mediation and as gestalts

7.4 Relationships Between the Key Constructs

7.4.1 Exploring Fit as Mediation

The findings of the previous studies indicate that strategy use is related to organizational performance (Croteau, 1998). Also, the work by McFarlan (1984) and Porter and Miller (1985) suggests that Information Technology can support differentiation strategy by

generating new products and improving the quality of existing products, as well as promoting cost leadership strategy by reducing costs. Porter and Miller (1985), as well as McFarlan (1984), also mention that information technology can enable companies to serve better small market niches, and thus help them to achieve better performance using IT through niche strategy. Can IT lead to improved organizational performance by supporting the key business strategy? The following propositions were tested.

P1: IT deployment can lead to improved performance through product differentiation strategy.

P2: Organizational performance can be improved by IT deployment by allowing to offer the same products at lower prices.

P3: Organizational performance can be improved by IT deployment, by supporting focus strategy, i.e. allowing the company to concentrate resources around the key product line.

P4: IT deployment can improve organizational performance by allowing to serve better small niche markets.

These propositions will be tested using fit as mediation perspective, with the help of multiple regression analysis.

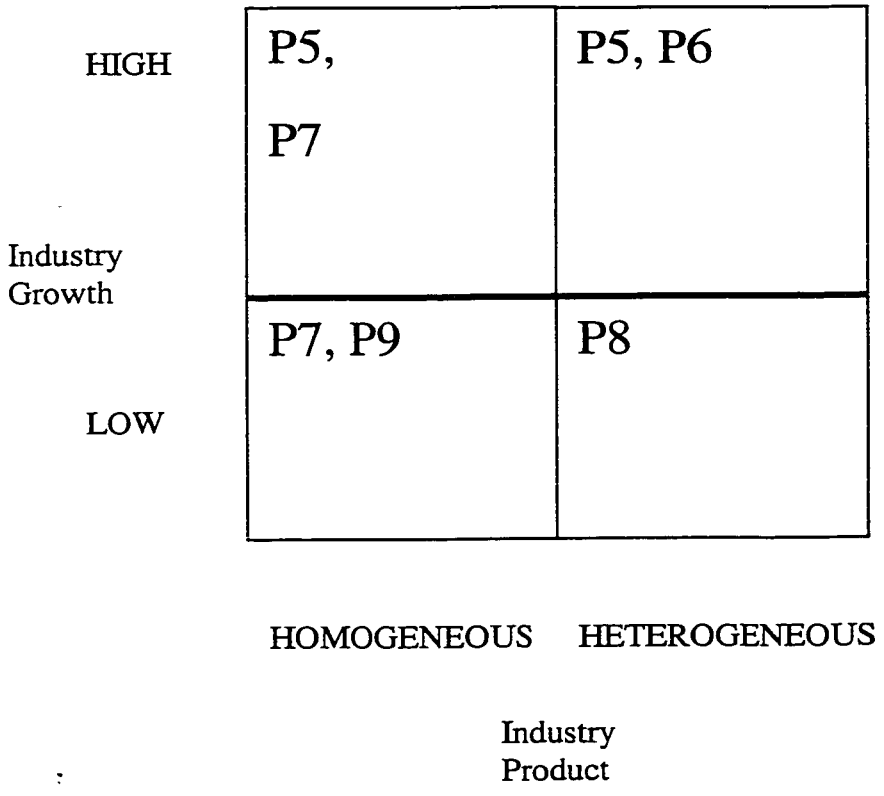
7.4.2 Exploring Fit as Gestalts, Using Two Industry Dimensions

Gestalt approach is the most appropriate one when fit between many variables is examined (Venkatraman, 1989). However, when a large amount of variables has to be studies the degree of precision has to be relaxed. Exploratory multivariate techniques such as cluster analysis are usually considered appropriate in this case. Cluster analysis,

alone with MANOVA was performed to test several propositions, concerning the effect of industry characteristics on IT use, strategy and performance.

The literature review section of this paper highlights the importance of taking industry characteristics into account when analyzing strategy. Two industry dimensions, introduced in the section 7.3.4 will be used. Four industry types will be considered that are presented in the Exhibit 5 below. Propositions were developed for each of these types.

Exhibit 5. Industry Groups and Hypotheses, Related to Their Successful Strategies and IT Use



Both of these industry dimensions were listed as key contingency factors for the application of differentiation and cost leadership strategy in theoretical work, published

by Hill (1988). Hill explains how differentiation strategy will have higher impact for high growth industries with heterogeneous products. In addition Fleming (1991) states that technology will play central strategic role, mainly through product differentiation for new, dynamic, high growing industries, and it will play a less prominent, more supporting role for mature, slow growing industries. The propositions, developed for the four industry groups, concerning their strategy and technology use will rely on the same theoretical foundation, as well as the theory developed by Porter and Miller (1985) and McFarlan (1980).

P5: Companies in growing industries are stronger on strategic impact of IT and they are more likely to use IT to support differentiation strategy.

IT is one form of investment required for business growth. The BCG strategic matrix, discussed earlier in this chapter suggests that businesses in attractive or growing industries should be invested in, while companies in stale industries should be milked or divested. If this is true then companies in growing sectors should be expected to invest more in IT, and be higher on IT deployment variables in general. According to Fleming (1991), in growth industries technology drives business strategy and plays the central role in the process of achieving differentiation, while in mature, slower growth industries, IT plays more supporting role.

P6: Companies in growing industries with heterogeneous products will succeed by using IT to support differentiation strategy.

According to Hill (1988) Differentiation will have the highest impact for growth industries. The number of product attributes was listed in his study as another contingency factor, determining the effectiveness of differentiation strategy. For products

with a large number of attributes (heterogeneous products), differentiation would have a higher impact, then for relatively homogeneous products (products with a small number of attributes). Economic theory shows that industries with heterogeneous products will most likely find themselves under conditions of imperfect competition, which will be differentiation-based. Given that we will expect companies in the growing industries with heterogeneous products to be the highest on both differentiation strategy and IT use we will also expect that for this group both differentiation and IT use will result in improved performance, especially in terms of growth.

P7: Companies in industries with homogeneous products will succeed by using IT to support cost leadership strategy.

Since homogeneous products have fewer attributes, the impact of differentiation strategy on business performance will be lower for industries with homogeneous products. Since opportunities for differentiation in such industries are limited, we can expect competition in the industries with homogeneous products to be mainly cost based. Hence, IT deployment in this industry environment should be aimed mainly at reducing costs. This, however, does not completely outrule differentiation strategy. As explained by Hill (1988) even for the industries with homogeneous products opportunities for effectively applying differentiation strategy can exist if the product appeals to diverse consumer groups, varying in geographic, demographic or psycographic characteristics.

P8: The best performers in slow growing industries with heterogeneous products will combine differentiation strategy with cost leadership, while IT deployment will have less impact on their strategy and performance.

Porter (1980), states that rivalry among competitors increases in the slow growing industries, making it harder for businesses to maintain and expand their market share. As was shown in the qualitative study, performed by Hall (1980) businesses with the strongest competitive position in such slow growing, hostile, industry environments will be particularly strong on differentiation and/or cost leadership. In fact it is to their advantage that they have both, high differentiation and low cost. Based on his qualitative research Hall argues that in fast growing environment virtually any business can survive and achieve good performance. It is only when growth slows down and the competitive environment becomes increasingly hostile that particular strength is required from the business to secure a good competitive position and achieve high performance. Such strength in a hostile, slow growth environment can be best achieved through combination of high differentiation and low cost. The technology use will play less prominent strategic role for mature, slow growth industries, and will more likely be oriented at improving processes, generating new applications and creating system benefits (Fleming, 1991).

P9: Companies in slow growing industries with homogeneous products will combine cost leadership strategy with niche strategy, while IT will have insignificant impact on their strategy and performance.

It is expected that differentiation strategy is hard to implement for homogeneous products, the cost leadership seems to be a more appropriate basis of competition. However, since only one company in the industry can achieve an overall cost–leadership position, we could expect that other businesses will try to stay in the business by serving

some kind of a safe niche. Niche strategy will be particularly appropriate if the market can be easily segmented into many diverse consumer groups, which are homogeneous within, but large enough to generate sufficient sales volume (Hill, 1988). If such attractive small niches do not exist, and if entry costs and fixed costs are high then niche strategy becomes hard to implement. In this case competitive environment can become a monopoly, with only one firm dominating the market, or oligopoly, with a few more or less equal big competitors. Probably, precisely for this reason (the small number of competitors in this industry type) we were not able to obtain sufficient sample size to test this hypothesis. Another study will be required to verify it. The theory, suggested by Hill (1988) implies that differentiation strategy will be less effective in such industry environment.

In these propositions we represent business strategy in terms of Porter's generic strategies. Since very few previous research was done to examine Ansoff's strategies, it is not possible to develop well grounded propositions. We will use exploratory analytic methods to investigate how Ansoff strategies relate to IT deployment and performnce. For Ansoff's strategies we only suggest that an optimal IT deployment profile exists for each of the four growth strategies, included in the grid.

7.5 Description of Data and Sample, Used in the Study

The survey data collected from business and IT executives of 223 large Canadian enterprises was used for this study. This was the same data used in the previous studies by Croteau (1998), Croteau, Bergeron and Raymond (2000). Two separate questionnaires were used for the survey. One of the questionnaires, containing items, related to IT

deployment was forwarded to the attention of top IT executives, holding the position of CIO or equivalent. Another questionnaire was forwarded to the attention of top business executive, such as CEO or equivalent. This questionnaire contained items, related to business strategic orientation, business performance and business environment. Both of the questionnaires are included in the Appendix 1. They measured all items, related to all of the constructs on 7 items likert scale. The sample was drawn from Dun & Bradstreet Directory of Canadian Businesses, which contained 2000 private Canadian enterprises with 250 employees or more. Out of 1949 enterprises contacted for the study 243 returned two completed questionnaires, which represents the response rate of 12.5%. The final sample was reduced to 223 enterprises, after companies with incomplete questionnaires and small companies, with less then 250 employees were removed.

The companies, included in the final sample, represented 9 Canadian provinces with majority of the sample falling into Ontario (40,8%) and Quebec (33,2%). More detailed descriptive statistics on the sample of companies and respondents are presented in Appendix 2.

7.6 Developing Measurement Scales for Major Strategic Variables

The scales used in this study to measure technology use, performance and industry environment were developed before in the study, conducted by Croteau (1998). One of the challenges of the current work was to develop a measurement scale for Ansoff's and Porter's strategies. This section presents development of measurement scales for Porter's and Ansoff's strategies based on the questionnaire items, that were previously used to classify businesses in accordance with Miles & Snow typology

(Segev, 1986 , Croteau, 1998). The questionnaire contained 23 items related to the realized strategy of the surveyed firms. These items were used to identify important strategic dimensions and develop measurement scales for them. Two different techniques were attempted for this purpose. First, the items were sorted by 10 raters into groups corresponding to the strategic dimensions identified by Porter (1980) and Ansoff (1957), the resulting scales were lacking reliability and the technique was discarded in favor of factor analysis. The exploratory factor analysis was performed using SPSS, which identified 7 principal components. The strongest four principal components were further tested for reliability and used as strategic variables further in this research.

7.6.1 Rating Procedure and Results

Five raters were asked to sort the 23 items according to the strategic quadrants presented in Ansoff's classification. Each rater was provided with a page with instructions and a page of description of the four strategies in accordance with Ansoff's theory. Before the actual rating was performed the raters were required to pass a pretest, which was a shorter version of the same rating procedure with only 8 items and 2 classification categories. The pretest results were highly consistent between raters and also were consistent with the results of exploratory factor analysis, performed on the same items, which supports the validity and reliability of the rating process.
The same procedure was repeated on the same questionnaire items, but using Porter's generic strategies as categories. The results, of the main rating procedure however, did not display a high level of inter-rater reliability. The same procedure was repeated with

five different raters for Porter's strategies. A detailed description of the rating process and results are presented in the Appendix 3.

Because the scales, developed using this procedure were similar, but inferior in terms of reliability to the scales, developed, using exploratory factor analysis, we preferred to use scales developed by this different method, which will be described in the next section.

7.6.2 Results of the Exploratory Factor Analysis

The survey results of the 23 questionnaire items were also used as inputs for the exploratory factor analysis with Oblimin rotation with Kaizer normalization method. This rotation method is recommended in cases when different factors, obtained from the analysis are expected to be correlated between each other. Seven principal components with eigenvalues above 1 were extracted. Four strongest principal components were particularly relevant to the subject of this study and used for further data analysis as principal strategic variables. The total seven principal components explain 61.38 % of the variance, while the first four account for 45.42 %.

A closer look at the first four principal components allows us to identify which element of business strategy they represent.

Principal Component 1: INNOVATION

The first strongest principal component has the eigenvalue of 4.26 and accounts for 18.5% of variance. It is most closely identified by the following questionnaire items:

Our firm leads in innovation in its industry

Our firm adopts quickly promising innovations in our industry

Our firm's actions often lead to a new round of competitive activity in our industry

Our firm responds rapidly to early signals of opportunity in the environment

Our firm tries to protect environment domain in which it operates by stressing *higher quality* then its principal competitors

Our firm believes that being "first-in" in the industry is achieved through the development of new products/services

The reliability analysis was performed on the scale, composed of these 6 items. The alpha coefficient is 78.55%.

Principal Component 2: FOCUS

The second strongest principal component has an eigenvalue of 2.68 and accounts for

11.66% of the variation. It is related to the following questionnaire items:

Our firm tries to maintain a limited line of products/services

Our firm tends to offer a narrower set of products/services then its principal competitors

Our firm concentrates on trying to achieve the best performance in a relatively narrow product-market domain

This principal component is also inversely related to the following item:

Our firm operates in a broad product domain

Reliability analysis was performed on this principal component. The alpha coefficient

obtained for the focus scale is 71.08%

Principal Component 3: PRICE

The third principal component had an eigenvalue of 1.8 and accounted for 7.82% of the variation. It was related to the following items:

Our firm tries to protect environment domain in which it operates by stressing lower prices then its principal competitors

Our firm often reacts to innovations in the industry by offering similar, lower cost products

The alpha coefficient obtained for the scale composed of these two items was 64.4%.

Principal Component 4: NICHE

The final of the four principal components, relevant to our study had an eigenvalue of 1.71 and accounted for 7.43% of varience. The items that were most closely related to this principal component are:

Our firm tries to maintain a safe niche in a relatively stable product/market domain

Our firm tries to locate a safe niche in a relatively stable product/market domain

Reliability analysis of the scale, composed of these two items indicate an Alfa coefficient of 80.91%

Two items from the questionnaire did not belong to any of the principal components. As only the first four principal components were relevant for our study and since the last three principal components appeared to be rather weak and did not account for a high percentage of variance, only the first four principal components were retained. The second iteration was performed only with the items, related to the first four principal

components. After all the items not related to these four principal components were removed the following pattern matrix was obtained:

Table 3. Pattern Matrix for the Items, Related to the Four Strongest Principal Components

	Component			
	Principal Component 1: INNOVATION	**Principal Component 2: FOCUS**	**Principal Component 3: PRICE**	**Principal Component 4: NICHE**
	Alpha = 78.55	**Alpha = 71.8**	**Alpha = 64.4**	**Alpha = 80.91**
17.Our firm adopts quickly promising innovations in our industry.	.800			
10.Our firm leads in innovations in its industry.	.747			
15.Our firm responds rapidly to early signals of opportunities in the environment.	.741			
16.Our firm's actions often lead to a new round of competitive activity in the industry.	.718			
13.Our firm believes that being « firstin » in the industry is attained throughthe development of new products/services.	.598			
4.Our firm tries to protect the environment domain in which it operates by stressing *higher quality* than its principal competitors.	.520			
8.Our firm tries to maintain a *limited line* of products/services.		.771		
3.Our firm tends to offer a narrower set of products/services than its principal competitors.		.763		
6.Our firm concentrates on trying to achieve the best performance in a relatively narrow product-market domain.		.699		
11.Our firm operates in a broad product domain.		-.671		

5.Our firm tries to protect the environment domain in which it operates by stressing *lower prices* than its principal competitors.	.862	
19.Our firm often reacts to innovations in the industry by offering similar, lower-cost products.	.795	
2.Our firm tries to *maintain* a safe niche in a relatively stable products/services domain.		-.904
1.Our firm tries to *locate* a safe niche in a relatively stable products/services domain.		-.874

All the four factors obtained correspond exactly to the four factors described before. We can see from these results that these factors represent Porter's generic strategies, with innovation factor being related to product differentiation, price dimension, related to cost leadership strategy and focus (which refers to focus on a particular *product* or *product line)* and niche, which can be interpreted as focus on a particular market closely related to focus strategy. Therefore to come up with the measurement scales for Porters generic strategies we can simply use the average scores of items, included in each of these factors. It is worth mentioning here that the study by Bosch, Huse and Senneseth (1999) identified similar factors, related to strategy of entrepreneurial firms, which supports the validity of this finding.

The next question that is going to be addressed in this study is whether most companies follow these strategies in their pure form or in combination. A cluster analysis on these four strategic dimensions was performed and the groups that resulted from this analysis were mixed, rather then pure strategic types. This suggests that Porter's generic strategies should be considered as important strategic variables rather then as separate

strategic groups, since such groups in the reality, probably do not exist. See Table 4 for the results of K-Mean cluster Analysis.

Table 4. Groups, Obtained Through K-Mean Cluster Analysis on 4 Strategic Dimensions: Differentiation, Focus, Price and Niche

Final Cluster Centers:Three Group Solution

	Cluster		
	1	2	3
DIFFEREN	5.37	5.22	5.04
FOCUS	2.81	3.62	4.12
PRICE	2.92	4.82	2.44
NOTNICHE	5.05	2.42	2.22

Number of Cases in each Cluster

Cluster	1	57.000
	2	86.000
	3	80.000
Valid		223.000
Missing		.000

Converged in 5 iterations

We can see that the three groups, obtained in this solution do not correspond to three Porter's generic strategies, although the first group is higher on differentiation, then two other groups, it can not be labeled as "Differentiation group" because the difference is small and not statistically significant, as can be shown with the help of MANOVA analysis. Although the third group is significantly higher then two other groups on Focus dimension, it would not be very accurate to label it as a "Focus Group", because it scores higher on Differentiation dimension then Focus dimension. The results of MANOVA analysis are shown below.

Table 5. MANOVA for Groups, Obtained Through K-Mean Cluster Analysis on 4 Strategic Dimensions: Differentiation, Focus, Price and Niche

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	DIFFEREN	3.748	2	1.874	1.951	.145
	FOCUS	57.687	2	28.844	19.514	.000
	PRICE	257.930	2	128.965	132.838	.000
	NOTNICHE	318.817	2	159.408	177.268	.000
Error	DIFFEREN	211.295	220	.960		
	FOCUS	325.182	220	1.478		
	PRICE	213.585	220	.971		
	NOTNICHE	197.835	220	.899		
Total	DIFFEREN	6230.072	223			
	FOCUS	3265.038	223			
	PRICE	3171.822	223			
	NOTNICHE	2549.413	223			
Corrected Total	DIFFEREN	215.043	222			
	FOCUS	382.869	222			
	PRICE	471.514	222			
	NOTNICHE	516.651	222			

An attempt was maid to obtain 4 and 5 group solutions, however they did not converge after 10^{th} iteration.

The next step of this research will be aimed at identifying strategic dimensions related to Ansoff's classification and groups that belong to each of the Ansoff's quadrants.

7.6.3 Ansoff's Strategic Quadrants;

Their Dimensions and Groups, Belonging to Them

The analysis presented in this section shows that it is possible to identify groups belonging to each of the Ansoff's quadrant's and that Ansoff's strategic classification should be viewed in terms of those groups rather then in terms of strategic variables associated with them.

7.6.3.1 Ansoff's Strategic Dimensions

We can notice that three of the four strategic dimensions described in the previous section can be viewed as the dimensions related to Ansoff's strategic classification. The Innovation dimension can also be viewed as Product Development, Focus dimension is similar to Ansoff's Market Penetration and the reverse of Niche strategy would be going after broader markets, which can be seeing as a market development strategy. Although no dimension corresponding directly to diversification strategy was identified through factor analysis, diversification can be viewed as a combination of product development and market development strategies. Cluster analysis followed by the comparison of groups using MANOVA, with pairwise comparisons shows that there are groups of companies corresponding to each of Ansoff's quadrants, including diversification quadrant. The results of this analysis are presented in the following section.

7.6.3.2 Developing Ansoff's Strategic Groups

The average scores were obtained for each company on each of the four strategic dimensions. Then K-Mean cluster analysis was performed using the three variables. Iterations failed to converged. The same procedure was done with five groups. Convergence was achieved and the five groups were compared using MANOVA and Sheffe's pairwise group comparison procedure. Pairwise comparisons between the groups allowed me to come up with the descriptions for the five groups presented in this section.

Table 6 shows the MANOVA results we would expect for each of the groups, falling in each of the quadrants, based on the description of the four product-market strategies, provided by Ansoff and compares these expected results with the results actually achieved through the multiple comparison procedure.

Table 6. Actual and Expected Comparison Results for the Clustered Groups

Group	Expected results	Actual Multiple Comparison Results
Group 1. Market Penetration	This group would be expected to be lower on product development then product development and diversification groups group, lower on market development then market development and diversification group, but higher then all other groups on market penetration dimension.	The group proved to be significantly lower on product development then diversification group and lower then product development group, although not significantly lower. The group is significantly lower on market development then both market development and diversification groups. The group is also significantly higher on market penetration then all other groups. The results are consistent with our expectations.
Group 2 Diversification	We would expect this group to be significantly higher on product development scale then market penetration and market development groups. Also it should be significantly higher on market development scale then product development and market penetration groups.	The group is actually significantly higher on product development scale then all other groups, except for product development group. The group is also significantly higher on market development scale then all other groups. The results are fully consistent with our expectations
Group 3 Niche	This group was identified as a distinct group as a result of cluster analysis. We can identify it by significantly lower orientation towards market development then all other groups, but we can not have any other expectations about it since it was not included in the original Ansoff's grid.	This group is significantly lower then all other groups on market development scale, except for the product development group, from which it is insignificantly lower. It is significantly lower on product development scale then product development and diversification groups. This group is also significantly higher then all groups on market penetration scale, except for the market penetration group, from which it is significantly lower.
Group 4 Product Development	We would expect this group to be higher then market penetration and market development groups on product development. It also should be lower then diversification and market development groups on market development	The group was found to be significantly higher on product development dimension them market development group, and higher (but not significantly) then market penetration group. It is significantly lower on market development then both market development and
Group 5 Market Development	This group can be expected to be higher on market development then market penetration and product development groups and lower on product development then diversification and product development groups	The group is actually significantly higher on market development then both market penetration and market development groups. The group is also significantly lower on product development then both diversification and product development groups

In summary, the actual results for each of the groups are very similar to the results that we could expect, given the definition of the four Ansoff's quadrants. The

differences between the groups on all dimensions are same as expected in direction, and almost all of the differences, except for two, are significant. Besides four strategic groups that comprise Ansoff's classification one extra group (niche group) was identified, which is similar by its description to the market penetration group, except it is even more narrow in terms of the market that it targets and the range of products that it offers. The comparison of the market penetration and niche groups is presented in Table 7.

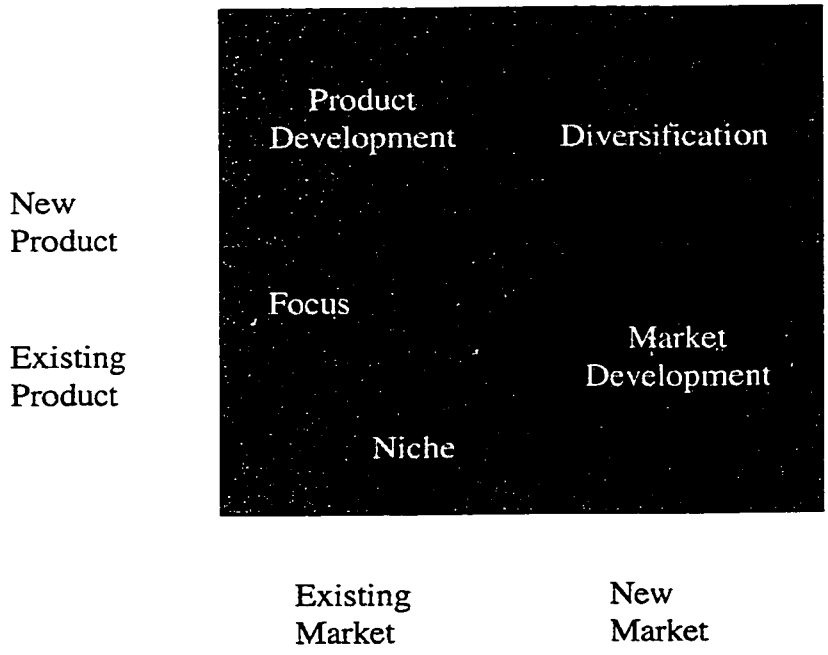
Table 7. Comparison Between Market Penetration and Niche Groups on Three Relevant Strategic Dimensions

Dimension	Comparison
Product Development	The two groups are not significantly different from each other on product development scale. However they are both significantly lower on product development then diversification group.
Market Development	Niche group is significantly lower on market development scale then market penetration group, which means that it is much more likely to target a narrow niche market
Market Penetration	Market penetration group is significantly higher on market penetration scale then niche group. Since market penetration scale also implies a high focus on a particular product or product line we can say that market penetration group is more likely to focus on a particular product then the niche group

7.6.3.3 Ansoff's Grid Revised

This analysis provides some evidence that in reality the companies actually follow one of the Ansoff's strategies. The only amendments that we can suggest to Ansoff's classification is the fact that market penetration strategy can come in two different forms. One form implies a focus on a particularly narrow niche market, another implies a focus on a particular product or a narrow product line. The revised Ansoff's grid assumes the following shape.

Exhibit 6. Ansoff's Grid Revised



7.6.4 Conclusion

The results, presented in the last two sections show that Porter's generic strategies can be identified as important strategic variables and they exist in the form of important strategic dimensions, as we were able to see through the factor analysis. Regression analysis can be further used as a tool to uncover relationships between Porter's generic strategies and variables related to organizational performance and IT use. However companies normally use Porter's generic strategies in combinations rather then their pure form and therefore groups of companies that follow every particular Porter's strategy can not be separated and identified.

On the other hand, Ansoff's strategic quadrants exist in reality in the form of groups of companies that fall into each quadrant, rather then in the form of strategic dimensions. There also exist two "garden varieties" of market penetration strategies. One of them is focused on a particularly narrow niche mrket and another targets a broader market, but with a narrower set of products. These groups are distinct from each other and their performance and IT use can be studied using MANOVA.

7.7 Tests of Propositions

7.7.1 Comparison of Ansoff's Groups on IT Deployment and Performance Variables

The previous section has identified five groups, that accord with Ansoff's classification and compared them on the relevant strategic variables. In this section we present the MANOVA analysis results that compare the five groups on all performance and IT deployment variables. The results indicate that only the niche group is significantly different from some other groups on IT use and growth and business environment. More specifically, this group was found to be lower in growth, IT usage and strategic impact of IT. It also faces less favorable business environment. The niche company has, perhaps voluntarily limited its growth opportunities by focusing on a narrow market, where business conditions are not attractive enough for competitors to enter. However the safety of niche strategy, which is competition-free allows the company to be less dependant on IT use.

The results in Table 8 below show that the five groups are different on the following variables: growth, IT usage, organizational infrastructure, strategic impact, centralization and industry.

Table 8. MANOVA Results for Five Ansoff's Groups

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model						
	GROWTH	**15.440**	**4**	**3.860**	**2.567**	**.039**
	INDUSTRY	**16.011**	**4**	**4.003**	**4.111**	**.003**
	INFRADM	3.358	4	.840	.716	.582
	ARCHTECH	2.691	4	.673	.575	.542
	IMPSTRAT	**17.884**	**4**	**4.471**	**4.822**	**.001**
	VEILNEW	2.790	4	.697	.744	.563
	SOURCE	10.925	4	2.731	.743	.563
	CENTRAL	20.332	4	5.083	2.040	.090
	EVAL	6.342	4	1.586	.732	.571

The multiple comparisons between groups using Scheffe's procedure were performed. The differences between individual groups for growth and IT usage were not significant at 5% level. However Focus group was higher on growth then niche group with alpha of 6.7%. Product development group was higher on IT use then niche group with alpha of 7.3%. The niche group was also significantly lower on strategic impact of IT then diversification and product development groups. The niche group also reported significantly less attractive business conditions then diversification group. No significant differences were found on IT Deployment and Performance variables between Good and Poor performers within groups.

7.7.2 Testing Fit as Mediation on Porter's Strategic Variables.

Multiple regression analysis was performed to identify the relationships between Porter's strategic variables and organizational performance and the role of IT. The results suggest that only differentiation strategy has a positive impact on business performance. The use of focus, niche and price strategies appear to have no impact on organizational performance. Differentiation was also shown to be closely linked to a number of IT usage variables, while focus, price and niche strategies had no relationship to IT use. Thus, proposition 1 was supported, while propositions 2, 3 and 4 were not. While differentiation strategy is related to both IT deployment and Business Performance. Focus, Price and Niche strategies do not lead to better performance and are not related to IT use.

7.7.2.1 Relationship of Strategic Variables to Organizational Performance

The multiple linear regression analysis was performed, where growth and profitability was treated as dependent variables while differentiation, focus, price and niche strategies were treated as independent variables.

The results are presented in Table 9.

Table 9. The Regression Analysis of Growth Against Four Important Strategic Variables

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.511	.261	.244	1.0808

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	89.720	5	17.944	15.362	.000
	Residual	253.472	217	1.168		
	Total	343.192	222			

Coefficients

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	.871	.574		1.517	.131
	DIFFEREN	.396	.076	.313	5.185	.000
	FOCUS	6.164E-02	.057	.065	1.074	.284
	PRICE	-3.669E-02	.050	-.043	-.729	.467
	NOTNICHE	-4.015E-02	.050	-.049	-.802	.423
	INDUSTRY	.439	.074	.358	5.890	.000

a Predictors: (Constant), INDUSTRY, FOCUS, PRICE, DIFFEREN, NOTNICHE
b Dependent Variable: GROWTH

Since focus, price and niche strategies have no relationship to performance they were removed. The resulting model accounted for approximately 25% of the variance and had an F-value of 37.22. The summary of the resulting model is presented in Table 10 below.

Table 10. The Final Model

Coefficients

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	.972	.450		2.162	.032
	DIFFEREN	.379	.075	.300	5.045	.000
	INDUSTRY	.429	.073	.350	5.892	.000

a Dependent Variable: GROWTH

As the next step, the linear regression analysis of the same strategic variables with profitability as a dependant variable was performed. Again, among all the strategic variables, only differentiation turned out to be significantly related to profitability. Industry environment was not related to profitability. The relationship was also much weaker then for growth variable the R-squared, attributed to differentiation was only 5.5%. The numerical results of the regression analysis of strategic variables against profitability are presented in Table 11.

Table 11. Regression Analysis of the Relationship Between Strategic Variables and Profitability

a). Initial Model

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.277	.077	.056	1.1861

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	25.450	5	5.090	3.618	.004
	Residual	305.284	217	1.407		
	Total	330.734	222			

Coefficients

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	3.254	.630		5.167	.000
	DIFFEREN	.281	.084	.227	3.355	.001
	FOCUS	-2.367E-02	.063	-.025	-.376	.707
	PRICE	-3.546E-02	.055	-.042	-.642	.522
	NOTNICHE	-8.106E-02	.055	-.101	-1.476	.141
	INDUSTRY	.126	.082	.105	1.539	.125

a Predictors: (Constant), INDUSTRY, FOCUS, PRICE, DIFFEREN, NOTNICHE
b Dependent Variable: PROFITAB

Table 11 Continued

b). Final Model

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.244	.060	.055	1.1864

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	19.688	1	19.688	13.988	.000
	Residual	311.046	221	1.407		
	Total	330.734	222			

Coefficients

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	3.208	.428		7.503	.000
	DIFFEREN	.303	.081	.244	3.740	.000

a Predictors: (Constant), DIFFEREN
b Dependent Variable: PROFITAB

It was also tested if growth is a mediator between differentiation and profitability by regressing against profitability both differentiation and growth. We saw that once growth variable is introduced into the model, the effect of differentiation on profitability becomes insignificant, which shows that growth is the mediator variable between differentiation and profitability. Growth accounts for about 26% of the variation in profitability. The results of the regression analysis are presented in Table 12.

Table 12. Testing for Mediator Effect of Growth Between Differentiation and Profitability.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.513	.263	.257	1.0523

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	87.125	2	43.562	39.341	.000
	Residual	243.609	220	1.107		
	Total	330.734	222			

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.112	.404		5.222	.000
	DIFFEREN	8.142E-02	.077	.066	1.055	.292
	GROWTH	.477	.061	.485	7.804	.000

a Predictors: (Constant), GROWTH, DIFFEREN
b Dependent Variable: PROFITAB

We can see from this result that controlling for Growth the impact of Differentiation on Profitability disappears, which proves that growth is a mediator variable. The article by Hill (1980), presented earlier in this paper provides some theoretical justification for this relationship. First Differentiation strategy results in improved market share performance and growth in sales. Then higher sales lead to increased profits through improved contribution margins and economies of scale.

In summary, among, all the strategic variables only differentiation appears to have an impact on business performance. Differentiation has the most direct effect on growth

and through growth it is related to profitability. The industry environment also contributes to growth, and together with differentiation accounts for 25% of the variation.

7.7.2.2 Relationship of IT Deployment Variables to Business Strategy

Since differentiation strategy is the only strategy that has a positive impact on organizational performance, we can conclude that only through differentiation strategy IT can improve organizational performance. In this next step we will see, if IT deployment variables are related to differentiation strategy. A regression analysis was performed again with Differentiation strategy as a dependant variable and IT deployment variables as independent. The results of this analysis are presented in Table 13.

Table 13. Regression Analysis of Differentiation on IT Deployment Variables

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.398	.158	.131	.9175

Predictors: EVAL, CENTRAL, INFRADM, SOURCE, VEILNEW, IMPSTRAT, ARCHTECH
Dependent Variable: DIFFEREN

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	34.067	7	4.867	5.782	.000
	Residual	180.976	215	.842		
	Total	215.043	222			

Coefficients

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	4.225	.520		8.126	.000
	INFRADM	.110	.060	.121	1.844	.067
	ARCHTECH	-8.306E-02	.094	-.078	-.879	.380
	IMPSTRAT	.423	.083	.428	5.124	.000
	VEILNEW	-.291	.081	-.286	-3.581	.000
	SOURCE	9.148E-03	.033	.018	.275	.784
	CENTRAL	-1.710E-02	.039	-.028	-.435	.664
	EVAL	3.432E-02	.051	.051	.678	.498

From this regression analysis we see that at least two IT variables are significantly related to differentiation. The surprising fact is that the relationship between Technological Education and Differentiation is negative. The reason for this surprising result is that the coefficients of this regression model cannot be interpreted meaningfully, because of the multicollinearity issue. Most of the IT variables are significantly correlated between each other, as we can see from the following correlation matrix:

Table 14. Correlation Coefficients Between IT Deployment Variables

Correlations

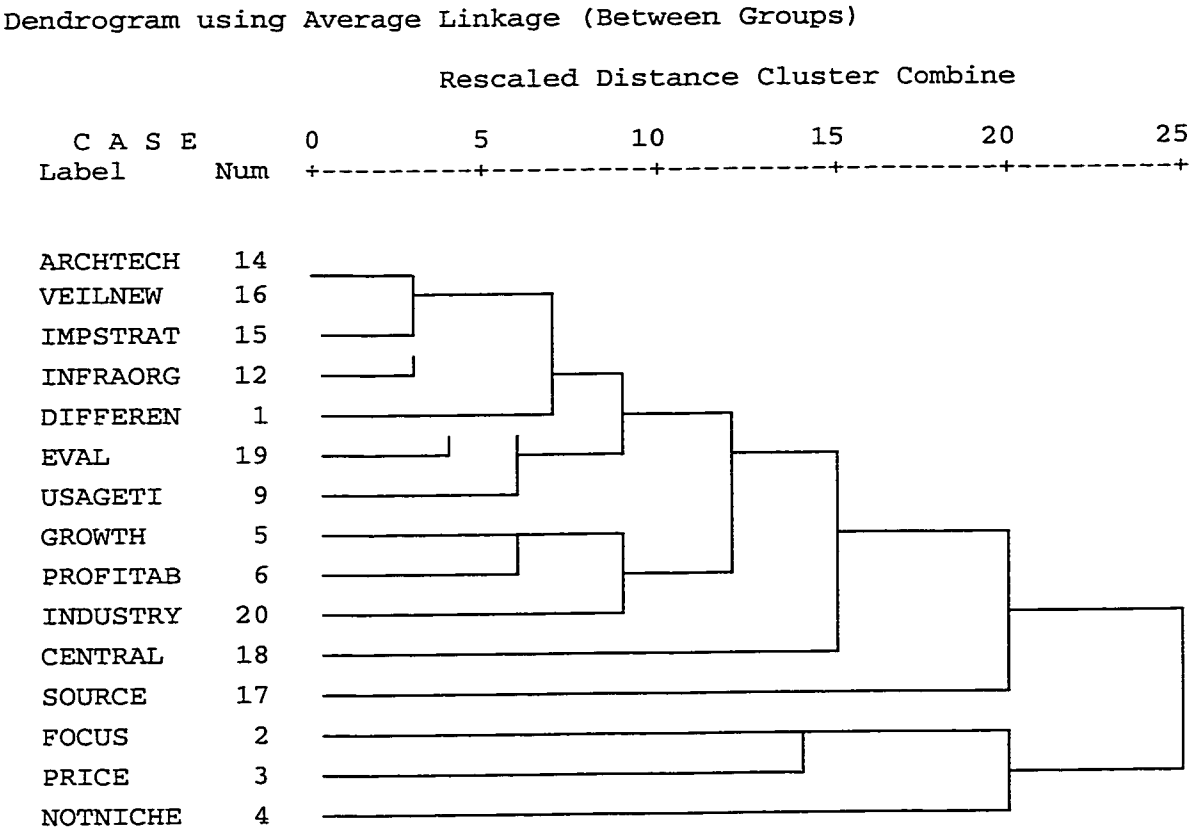
		INFRADM	ARCHTECH	IMPSTRAT	VEILNEW	SOURCE	CENTRAL	EVAL
INFRADM	Pearson Correlation	1.000	**.185**	**.135**	**.292**	.073	.044	**.147**
	Sig. (2-tailed)	.	**.005**	**.043**	**.000**	.281	.515	**.028**
ARCHTECH	Pearson Correlation	**.185**	1.000	**.603**	**.566**	.077	.024	**.509**
	Sig. (2-tailed)	**.005**	.	**.000**	**.000**	.252	.724	**.000**
IMPSTRAT	Pearson Correlation	**.135**	**.603**	1.000	**.461**	.208	.118	.468
	Sig. (2-tailed)	**.043**	**.000**	.	**.000**	.002	.078	.000
VEILNEW	Pearson Correlation	**.292**	**.566**	**.461**	1.000	.073	.042	**.397**
	Sig. (2-tailed)	**.000**	**.000**	**.000**	.	.276	.532	**.000**
SOURCE	Pearson Correlation	.073	.077	**.208**	.073	1.000	.144	.129
	Sig. (2-tailed)	.281	.252	**.002**	.276	.	.031	.055
CENTRAL	Pearson Correlation	.044	.024	.118	.042	**.144**	1.000	.057
	Sig. (2-tailed)	.515	.724	.078	.532	**.031**	.	.398
EVAL	Pearson Correlation	**.147**	**.509**	**.468**	**.397**	.129	.057	1.000
	Sig. (2-tailed)	**.028**	**.000**	**.000**	**.000**	.055	.398	.

Although the regression analysis provides us with some evidence that there is a strong link between IT deployment variables and differentiation strategy, it is not very appropriate, because of multicollinearity problem. We can, however, use other analytical techniques to investigate the relationships between IT deployment variables and business strategy. In the following section we use hierarchical cluster analysis for this purpose.

7.7.2.3 Investigating the Impact of IS on Business Strategy and Performance

The hierarchical cluster analysis of all the strategic, performance and IT constructs, used in this study, was performed.

Exhibit 7. Relationships Between IT Use, Business Performance and Strategy, as Revealed by Hierarchical Cluster Analysis

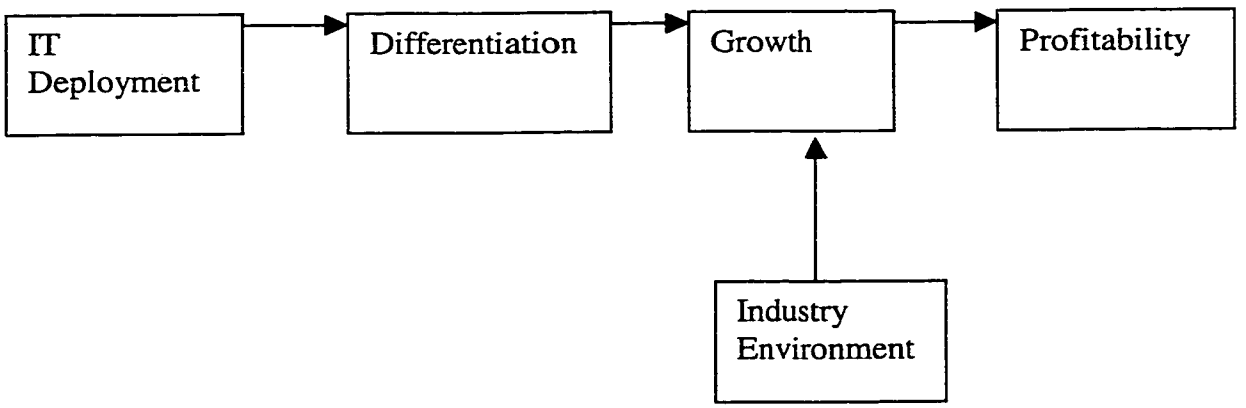


The dendogram shows that differentiation is most closely linked to all of the important IT variables, while focus, price and niche strategies are not. Differentiation

is also more closely related to performance variables, then all other strategic variables, as we saw from the previous regression analysis.

Given these results we can suggest the following model of IT role:

Exhibit 8. The Mediation Alignment Model



The model implies that the form of fit between IT and strategy use that is closely related to performance is mediation. The most important mediating variable is product differentiation. According to this model IT deployment will result in better business performance only in the case when it leads to better product differentiation. Since the methods of statistical analysis that were used to arrive to this model were exploratory in nature in order for us to be convinced of the validity of this model, further research will have to test it using more confirmatory methods, such as path analysis or structural equation modeling. This research would have to be performed on a different sample, and is outside of the scope of this study.

7.7.3 Investigating Industry Effects Using Gestalt Approach

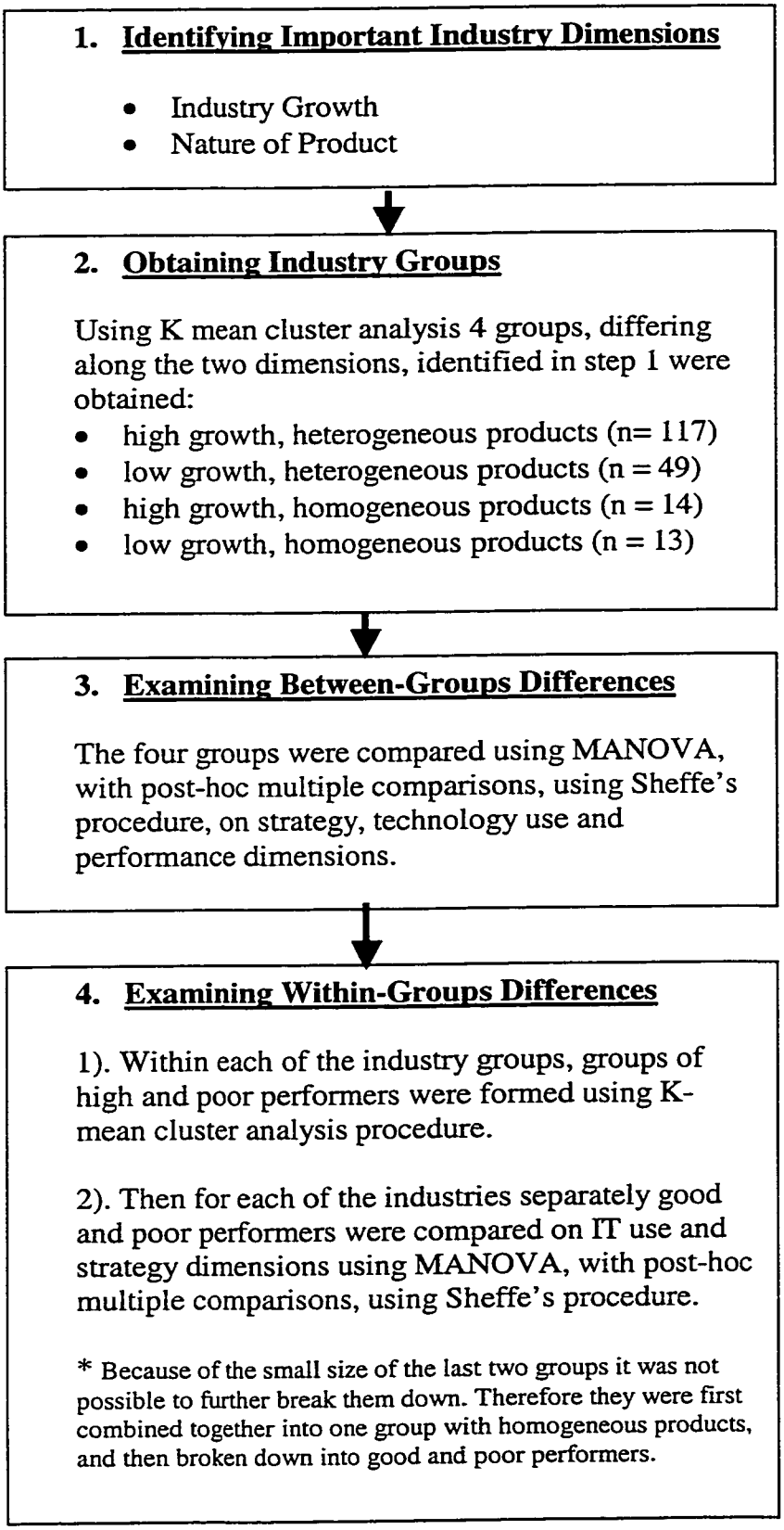
The 5 propositions, presented in section 7.4.2 were tested using cluster analysis and MANOVA. All the dimensions relevant for this analysis, including strategy, technology use, performance and industry, were developed before and used in the previous sections of this paper in exactly same way. The only dimension that had to be developed was the nature of industry product.

The product dimension was assessed from the questionnaire item asking to report the industry in which the business operates. Industries such as mining and agriculture were classified as industries with homogeneous products. Industries such as consumer goods or services were classified as industries with heterogeneous products. It was not possible to classify all the observations in this sample, because of the ambiguous or missing industry definition for some of them. As a result, the sample, used for this section of the study is different from the sample used in the previous section. This can be seeing as an advantage, because it allows us to validate some of the results, obtained in the previous section on a different sample. The total sample size for companies in all industry groups was 193. Out of the total sample 117 observations fell into the group with heterogeneous products and high growth, 49 of them fell into the group with heterogeneous products and low growth, 14 companies had homogeneous products and high growth and 13 companies had homogeneous products and low growth. Because of the small number of companies in the last two groups, they had to be combined into one group with homogeneous products for further analysis.

As the next step between-group differences were examined using MANOVA. The groups were compared on all the dimensions related to strategy, technology use and performance.

Finally, within-group differences were studies. For this purpose each of the groups was further broken down into subgroups of poor performers and high performers. The high and low performance groups were obtained by clustering the observations on growth and profitability dimensions. This resulted in four clusters, one of which was composed of companies high on both growth and profitability, one low on both of the measures and 2 groups with companies high on only either growth or profitability measure. The resulting high and low performance groups within each of the industry groups were compared again on strategic dimensions and technology use, to see which factors could account for the difference in their performance. The steps of the analysis are summarized in the Exhibit 9.

Exhibit 9. Steps in the Analysis of the Industry Groups



7.7.3.1 Testing Between-Group Differences

MANOVA results are presented in Table 15 below;

Table 15. Results of MANOVA for the Four Industry Groups

Between-Group Differences : Multivariate Tests

	Value	F	Hypothesis df	Error df	Sig.
Pillai's Trace	.348	1.807	39.000	537.000	.002
Wilks' Lambda	.684	1.841	39.000	524.883	.002
Hotelling's Trace	.416	1.873	39.000	527.000	.001
Roy's Largest Root	.257	3.538	13.000	179.000	.000

Tests of Between-Subjects Effects for Each of the Variables

Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
DIFFEREN	***7.768***	***3***	***2.589***	***2.790***	***.042***
FOCUS	1.431	3	.477	.279	.840
PRICE	2.399	3	.800	.358	.783
NOTNICHE	16.602	3	5.534	2.338	.075
GROWTH	**41.494**	**3**	**13.831**	**9.700**	**.000**
PROFITAB	4.353	3	1.451	.975	.406
INFRADM	.482	3	.161	.128	.943
ARCHTECH	***7.869***	***3***	***2.623***	***2.966***	***.033***
IMPSTRAT	**20.290**	**3**	**6.763**	**7.621**	**.000**
VEILNEW	2.105	3	.702	.713	.546
SOURCE	10.057	3	3.352	.891	.447
CENTRAL	10.843	3	3.614	1.484	.220
EVAL	7.916	3	2.639	1.171	.322

The results presented in the table above, indicate that the four groups are different between each other on growth and strategic impact of IT ($p < .001$). They also could be different between each other on their use of differentiation strategy and technological architecture, however this results are less significant ($p<.05$)

Furthermore, the four groups were compared between each other individually on these four variables, where the difference between groups was significant.

For DIFFERENTIATION, it was not possible to tell exactly which group was different from others, because all significance levels were over 10%.

For GROWTH variable, group with heterogeneous products in growth sectors was performing significantly better then group with heterogeneous products in non-growth sector ($p < .001$). Group with homogeneous products in slow growth sector was performing worse than both groups from high growth sectors.

For STRATEGIC IMPACT OF IT group with homogeneous products in slow growth sector was significantly lower than both groups with heterogeneous products ($p < .001$).

For TECHNOLOGICAL ARCHITECTURE group with homogeneous products and low growth sector was weaker than both groups with heterogeneous products.

The results are also shown in the table below:

Table 16. Multiple Comparisons of Four Industry Groups on Individual Variables

Multiple Comparisons
Scheffe

Dependent Variable	(I) Cluster Number of Case	(J) Cluster Number of Case	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
DIFFEREN	1	2	-.3323	.1639	.253	-.7947	.1301
		3	-9.8265E-02	.2919	.990	-.9218	.7252
		4	.3300	.3005	.752	-.5177	1.1778
	2	1	.3323	.1639	.253	-.1301	.7947
		3	.2340	.2724	.864	-.5345	1.0025
		4	.6623	.2816	.141	-.1321	1.4567
	3	1	9.827E-02	.2919	.990	-.7252	.9218
		2	-.2340	.2724	.864	-1.0025	.5345
		4	.4283	.3710	.722	-.6183	1.4749
	4	1	-.3300	.3005	.752	-1.1778	.5177
		2	-.6623	.2816	.141	-1.4567	.1321
		3	-.4283	.3710	.722	-1.4749	.6183
GROWTH	1	2	-.8919	.2032	.000	-1.4650	-.3187
		3	-.9256	.3619	.092	-1.9464	9.517E-02
		4	.3792	.3725	.793	-.6717	1.4300
	2	1	.8919	.2032	.000	.3187	1.4650
		3	-3.3755E-02	.3377	1.000	-.9863	.9188
		4	1.2710	.3491	.005	.2863	2.2558
	3	1	.9256	.3619	.092	-9.5169E-02	1.9464
		2	3.375E-02	.3377	1.000	-.9188	.9863
		4	1.3048	.4599	.048	7.390E-03	2.6022
	4	1	-.3792	.3725	.793	-1.4300	.6717
		2	-1.2710	.3491	.005	-2.2558	-.2863
		3	-1.3048	.4599	.048	-2.6022	-7.3905E-03
ARCHTECH	1	2	5.430E-02	.1600	.990	-.3971	.5057
		3	.1883	.2850	.932	-.6156	.9921
		4	.8352	.2934	.047	7.691E-03	1.6628
	2	1	-5.4303E-02	.1600	.990	-.5057	.3971
		3	.1340	.2659	.968	-.6162	.8841
		4	.7809	.2749	.048	5.450E-03	1.5564
	3	1	-.1883	.2850	.932	-.9921	.6156
		2	-.1340	.2659	.968	-.8841	.6162
		4	.6470	.3622	.366	-.3747	1.6687
	4	1	-.8352	.2934	.047	-1.6628	-7.6909E-03
		2	-.7809	.2749	.048	-1.5564	-5.4497E-03
		3	-.6470	.3622	.366	-1.6687	.3747
	1	2	2.023E-02	.1603	.999	-.4320	.4724

IMPSTRAT							
		3	.3999	.2855	.581	-.4054	1.2052
		4	1.2747	.2939	.000	.4456	2.1037
	2	1	-2.0234E-02	.1603	.999	-.4724	.4320
		3	.3797	.2664	.567	-.3719	1.1312
		4	1.2544	.2754	.000	.4775	2.0314
	3	1	-.3999	.2855	.581	-1.2052	.4054
		2	-.3797	.2664	.567	-1.1312	.3719
		4	.8748	.3629	.125	-.1488	1.8983
	4	1	-1.2747	.2939	.000	-2.1037	-.4456
		2	-1.2544	.2754	.000	-2.0314	-.4775
		3	-.8748	.3629	.125	-1.8983	.1488

1- heterogeneous products, slow growth

2- heterogeneous products, high growth

3- homogeneous products, high growth

4- homogeneous products, low growth

These results indicate that companies in growth sectors perform better then companies in slower growing sectors. However we do not have enough evidence to believe that companies in growth sectors are different on technology use. It is possible, however to conclude that for companies with heterogeneous products technology has a higher impact then for companies with homogeneous products, although we do not know what that would mean theoretically. It could be because of one particular industry, such as agriculture, that dominated this group. This means that this finding should be interpreted with caution. Therefore the support for Proposition 5 was not found.

7.7.3.2 Within Group Differences

The next step was to look separately at each of the industry groups and find the intra-group characteristics that can distinguish between good and poor performers.

1. Growth Industries with Heterogeneous Products

For the group of companies in the fast growing industries with heterogeneous products 13 companies with low growth and low profitability, 40 companies with high growth and high profitability, 42 companies high on growth only and 22 companies low on growth only were identified. These four groups were also compared using MANOVA with Sheffe's procedure. The numerical results are presented in Table 17.

Table 17. Results of MANOVA for the Four Different Performance Groups within Growth Industries with Heterogeneous Products

Multivariate Tests

	Value	F	Hypothesis df	Error df	Sig.
Pillai's Trace	.423	1.565	33.000	315.000	.028
Wilks' Lambda	.625	1.593	33.000	304.161	.024
Hotelling's Trace	.525	1.618	33.000	305.000	.020
Roy's Largest Root	.324	3.096	11.000	105.000	.001

Table 17 Continued

Tests of Between-Subjects Effects

Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
DIFFEREN	**14.875**	**3**	**4.958**	**5.855**	**.001**
FOCUS	3.400	3	1.133	.658	.579
PRICE	5.202	3	1.734	.739	.531
NOTNICHE	7.683	3	2.561	1.023	.385
INFRADM	7.851	3	2.617	2.415	.070
ARCHTECH	1.278	3	.426	.463	.709
IMPSTRAT	.925	3	.308	.357	.784
VEILNEW	5.738	3	1.913	1.946	.126
SOURCE	2.683	3	.894	.242	.867
CENTRAL	2.568	3	.856	.396	.756
EVAL	10.873	3	3.624	1.746	.162

R Squared = .135 (Adjusted R Squared = .112)

Differentiation strategy was the only factor, distinguishing between good and poor performers (the groups high on both measures and the groups low on both measures). The groups high on only one measure were not found to be significantly different on any of the strategic or technology use variables. The good and poor performers were not found to be significantly different on any of the variable, related to IT use. However it was found, with the help of regression analysis that differentiation strategy for this group was closely linked to strategic impact of IT, while strategic impact of IT, in tern, was linked to a number of other IT deployment variables: technological architecture, evaluation, sourcing, and technological education. The results of the regression analysis are presented in Tables 18 and 19 below:

Table 18. Regression of Differentiation Strategy on IT Deployment Variables

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.428	.183	.131	.9103

a Predictors: (Constant), EVAL, CENTRAL, SOURCE, INFRADM, VEILNEW, ARCHTECH, IMPSTRAT

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	20.249	7	2.893	3.491	.002
	Residual	90.319	109	.829		
	Total	110.568	116			

a Predictors: (Constant), EVAL, CENTRAL, SOURCE, INFRADM, VEILNEW, ARCHTECH, IMPSTRAT

b Dependent Variable: DIFFEREN

Coefficients

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	3.781	.727		5.200	.000
	INFRADM	.157	.084	.170	1.867	.065
	ARCHTECH	3.776E-02	.119	.037	.318	.751
	IMPSTRAT	**.380**	**.124**	**.359**	**3.061**	**.003**
	VEILNEW	-.364	.104	-.374	-3.494	.001
	SOURCE	-3.205E-02	.047	-.063	-.687	.493
	CENTRAL	8.089E-02	.060	.121	1.356	.178
	EVAL	8.015E-03	.070	.012	.114	.909

a Dependent Variable: DIFFEREN

Table 19. Correlation Coefficients Between IT Deployment Variables for High Growth -Heterogeneous Product Industry Group

Correlations

		INFRADM	ARCHTECH	IMPSTRAT	VEILNEW	SOURCE	CENTRAL	EVAL
INFRADM	Pearson Correlation	1.000	.204	.230	.276	.056	.056	.238
	Sig. (2-tailed)	.	.028	.013	.003	.549	.546	.010
ARCHTECH	Pearson Correlation	.204	1.000	.581	.502	.054	.019	.479
	Sig. (2-tailed)	.028	.	.000	.000	.561	.840	.000
IMPSTRAT	**Pearson Correlation**	**.230**	**.581**	**1.000**	**.475**	**.225**	**.147**	**.469**
	Sig. (2-tailed)	**.013**	**.000**	.	**.000**	**.015**	**.113**	**.000**
VEILNEW	Pearson Correlation	.276	.502	.475	1.000	.005	.078	.412
	Sig. (2-tailed)	.003	.000	.000	.	.956	.403	.000
SOURCE	Pearson Correlation	.056	.054	.225	.005	1.000	.194	.093
	Sig. (2-tailed)	.549	.561	.015	.956	.	.036	.318
CENTRAL	Pearson Correlation	.056	.019	.147	.078	.194	1.000	.046
	Sig. (2-tailed)	.546	.840	.113	.403	.036	.	.626
EVAL	Pearson Correlation	.238	.479	.469	.412	.093	.046	1.000
	Sig. (2-tailed)	.010	.000	.000	.000	.318	.626	.

This suggests that strong IT deployment facilitates strategic impact of IT, which provides foundation for differentiation strategy, which in tern, results in improved performance. Thus the analysis supports the 6th proposition.

2. Slow Growth Industries with Heterogeneous Products

When good and poor performers within slow growing industries with heterogeneous products were compared, no significant difference was found between them in terms of IT use or strategic orientation. This suggests that success factors in this industry group have yet to be investigated. We did not find any support the proposition 8. It is also possible that significant results were not obtained due to the small size of this group, as only 49 observations fell in this category.

3. Industries with Homogeneous Products

The data did not contain enough observations for industries with homogeneous products this is why the fast and the slow growing groups were combined together to analyze the companies with this industry characteristic. The total size of the two combined groups was n=27. The companies within this industry group were broken down into good performers (n=12, high score on both, growth and profitability) and poor performers (n=15, low on both growth and profitability) and then compared on strategy, technology use and industry growth. While industry growth did not appear to be an important factor distinguishing between the two groups, it was found that strong performers within homogeneous industry groups were higher on both the use of differentiation and the use of cost strategy. See Table 20 below:

Table 20. Results of MANOVA for High and Low Performance Groups within Industries with Homogeneous Products

Multivariate Tests

	Value	F	Hypothesis df	Error df	Sig.
Pillai's Trace	.769	4.545	11.000	15.000	.004
Wilks' Lambda	.231	4.545	11.000	15.000	.004
Hotelling's Trace	3.333	4.545	11.000	15.000	.004
Roy's Largest Root	3.333	4.545	11.000	15.000	.004

Tests of Between-Subjects Effects

Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
DIFFEREN	**4.486**	**1**	**4.486**	**10.973**	**.003**
FOCUS	1.902	1	1.902	1.251	.274
PRICE	**5.787**	**1**	**5.787**	**5.117**	**.033**
NOTNICHE	2.738	1	2.738	1.044	.317
INFRADM	.342	1	.342	.275	.605
ARCHTECH	.819	1	.819	.643	.430
IMPSTRAT	.681	1	.681	.506	.483
VEILNEW	5.202E-04	1	5.202E-04	.000	.985
SOURCE	1.182	1	1.182	.326	.573
CENTRAL	5.791	1	5.791	1.899	.180
EVAL	.719	1	.719	.203	.656

Furthermore, for this group, sourcing was the only IT variable, related to differentiation, with companies using internal IT being able to achieve better differentiation. IT use did not appear to have relationship to cost leadership strategy. The correlation coefficients between Cost Leadership and Differentiation strategy and IT Deployment variables are shown in table 21 below. The regression analysis of strategy variables on IT Deployment variables was not appropriate to perform because, as we can see from the table, correlation coefficients between the dependent IT deployment variables are high for this group as well, raising multicollinearity issues, again.

Table 21. Correlation Coefficients Between Differentiation and Cost Leadership Strategy and IT Deployment Variables.

Correlations

		DIFFEREN	PRICE	INFRADM	ARCHTECH	IMPSTRAT	VEILNEW	SOURCE	CENTRAL	EVAL
DIFFEREN	**Pearson Correlation**	**1.000**	**-.004**	**.076**	**.176**	**.257**	**.067**	**.418**	**-.007**	.069
	Sig. (2-tailed)	**.**	**.983**	**.705**	**.381**	**.195**	**.739**	**.030**	**.972**	.733
										27
PRICE	**Pearson Correlation**	**-.004**	**1.000**	**-.180**	**.197**	**-.034**	**-.204**	**.037**	**.230**	.061
	Sig. (2-tailed)	**.983**	**.**	**.370**	**.324**	**.865**	**.306**	**.854**	**.249**	.762
										27
INFRADM	Pearson Correlation	.076	-.180	1.000	.359	.190	.524	-.118	.015	.361
	Sig. (2-tailed)	.705	.370	.	.066	.343	.005	.559	.941	.064
										27
ARCHTECH	Pearson Correlation	.176	.197	.359	1.000	.798	.675	.087	-.142	.714
	Sig. (2-tailed)	.381	.324	.066	.	.000	.000	.664	.480	.000
										27
IMPSTRAT	Pearson Correlation	.257	-.034	.190	.798	1.000	.547	.030	-.199	.498
	Sig. (2-tailed)	.195	.865	.343	.000	.	.003	.881	.320	.008
										27
VEILNEW	Pearson Correlation	.067	-.204	.524	.675	.547	1.000	.022	-.240	.628
	Sig. (2-tailed)	.739	.306	.005	.000	.003	.	.915	.229	.000
										27
SOURCE	Pearson Correlation	.418	.037	-.118	.087	.030	.022	1.000	-.247	.161
	Sig. (2-tailed)	.030	.854	.559	.664	.881	.915	.	.215	.423
										27
CENTRAL	Pearson Correlation	-.007	.230	.015	-.142	-.199	-.240	-.247	1.000	-.104
	Sig. (2-tailed)	.972	.249	.941	.480	.320	.229	.215	.	.605
										27
EVAL	Pearson Correlation	.069	.061	.361	.714	.498	.628	.161	-.104	1.000
	Sig. (2-tailed)	.733	.762	.064	.000	.008	.000	.423	.605	.
										27

Therefore proposition 7 was partially supported. While it is true that cost leadership strategy plays a more important role for companies in the industries with homogeneous products, differentiation strategy is still the most important success factor for the companies in this group. There is no evidence that IT deployment can support cost leadership strategy for this group as well. Because of a limited size of the group of companies with homogeneous products it was not possible to evaluate, whether technology plays a more important role for supporting cost leadership strategy within high growth environment. It appears that IT does not play a significant role in supporting cost-leadership strategy overall. Also the use of niche strategy did not appear to improve performance for the companies in this group. The surprising finding is that differentiation strategy is an important factor in achieving better performance even for companies with homogeneous products. Clearly, the fact that a product cannot be easily differentiated does not mean that the companies should not attempt to differentiate it through service, advertising, branding, promotion and other marketing techniques. This result can be theoretically justified, since Hill (1988), explained that differentiation can have a significant impact even for heterogeneous products, whenever diverse consumer groups exist. Also he proved that in some cases the use of differentiation strategy can lead to cost reduction through higher sales volume and economies of scale.

7.7.3.3 Summary and Discussion

The results, presented above indicate that differences exist between various industry groups in terms of their performance, strategic orientation and technology use. Companies in growing sectors are stronger on IT use and they perform better in terms of sales growth.

Companies in growth sectors with heterogeneous products benefit from using IT to support differentiation strategy. Overall, IT has an important impact for the companies with heterogeneous products; they also have stronger technological architecture. For the companies with homogeneous products IT impact is not as strong. These companies benefit from combining cost leadership strategy with differentiation strategy. Focus and niche strategies were not found to have any impact on organizational performance. These results are consistent with the views of other researchers, who showed that differentiation and cost leadership strategies can be successfully used in combination (Hall, 1980, Miller & Fraizen, 1985, White, 1986, Hill, 1988). It is also consistent with the view of Hall (1980), whose research showed that focus strategy is appropriate for companies that cannot have an overall leadership position in terms of cost and/or differentiation. We therefore would not expect companies, following niche strategy to show superior performance. It could be also interesting to incorporate other industry characteristics into this kind of analysis. Within the framework of this study it would be particularly interesting to perform the same kind of analysis, considering the industry dimensions in terms of Porter's five forces model. Unfortunately this is outside the scope of his paper. This kind of study however, could be done in the future. In the meantime we believe that

the two industry dimensions, included in this analysis provide a simple, but useful summary of important industry characteristics, and allow us to gain some insight on how strategic use of IS can differ across industries.

8. Summary of Results and Discussion

As the first step, the exploratory analysis, presented in this paper found that Porter's generic strategies exist in the form of factors relevant to the realized strategy of the firm. According to McFarlan (1984) and Porter and Miller (1985) information technology can support differentiation strategy as well as overall cost leadership strategy. While our study results confirm that differentiation strategy is closely related to IT deployment, there is no evidence that IT deployment can help companies to implement cost leadership strategy and offer products at lower prices, compared to competition. This finding can help us to explain the well known productivity paradox of information technology. A lot of companies invest in expensive IT applications, hoping that they are going reduce costs. This, however, is not happening. There are several possible reasons for this. It is possible that the costs of acquiring and maintaining Information Technology are high compared to benefits, derived from it. It is possible that a lot of times IT is not used as intended, and again, the expected benefits are not realized. It is possible that cost benefits are passed to the consumers as competitors are fast to adopt the cost-saving technology, as was suggested by Hitt and Brynjolfsson (1996). Finally it is possible that cost leadership strategy does not work particularly in Canada because of its high labor costs.The study results indicate that the only way in which IT can improve the bottom line is by helping businesses to produce better products and services, which will result in market share

gains and improved profits. The results of the study indicate that innovation is the central strategic factor to obtaining competitive advantage and achieving higher business performance. The study by Dos Santos, Peffers and Mauer (1993) also indicate that while financial markets on average to not react positively to IT investment announcement, stock usually increases in value right after announcement of an innovative IT investment. It looks like investors in financial markets also agree that the proper role of IT is to support innovation. For Canadian businesses price, niche, and focus strategies do not necessarily lead to improved business performance, while differentiation strategy has a significant positive impact on it. It looks like the strongest businesses in Canada are most likely to follow differentiation strategy. According to many sources (Segev , 1986, Hall, 1980), such strongest businesses are most likely to be prospectors or analyzers. This is why we can say that the results of this study agree with the results obtained in the previous studies, by Croteau (1998), Croteau et al. (2000), where IT was found to have the strongest impact for Prospectors and Analysers and no impact for defenders and reactors.

Industry characteristics can have an important impact on the way that the companies use strategy and technology to their advantage. IT plays a more important strategic role for companies in growth industries. In fast growing industries, with heterogeneous products differentiation strategy is the only avenue to success. As it is true in general IS can be used to support differentiation. In industries with homogeneous products technology plays a less prominent role. The most successful businesses in industries with homogeneous products combine differentiation and price-based strategy. Finally, the

findings indicate that Fit exists as a higher order factor comprising business strategy, technology use and organizational performance. Which proves that Porter's generic strategies, IT deployment and organizational performance are related to each other.

9. Conclusions and Limitations of the Study

9.1 Theoretical Contribution

The study makes theoretical contribution in several ways;

1). Previously, MIS researchers used to measure strategy using seven dimensions developed by Venkatraman (1989b): company aggressiveness, company analysis, company internal and external defensiveness, company futurity, company proactiveness, company risk aversion, company innovativeness. While this is a very useful approach to analyzing strategy, the current study results indicate that managers see strategy more in terms of dimensions, similar to Porter's generic strategies: differentiation, focus, price and niche. The results confirm, however, that Porter's generic strategies need not to be used in isolation from one another. For some industry groups, such as industries with homogeneous products differentiation and cost leadership strategies are best used in combination. The study results also show that most of the businesses adhere to one of Ansoff's growth strategies: market penetration, market development, product development and diversification.

2).The study confirms that the fit between IS and business strategy exists in at least three different forms: mediation and gestalts.

3). The study demonstrates that IS use and successful business strategies vary across industry groups.

9.2 Practical Contribution

The study also makes an important practical contribution in several ways;

1). The results indicate that among all generic strategies differentiation strategy has the most significant impact on business performance of Canadian firms, and therefore this is the strategic element that most businesses have to give special attention to.

2). We also saw that IS use is most closely related to differentiation strategy, and therefore, supporting differentiation strategy should be viewed as the proper strategic role of IS.

3). Differentiation strategy, supported by strong IS architecture plays an especially important role for companies in the growth sectors with heterogeneous products.

4). For companies in industries with homogeneous products it is essential to combine differentiation strategy with price strategy in order to succeed.

9.3 Limitations

1). It is necessary to remember that research, presented in this paper is exploratory. Some confirmatory research in this area is warranted.

2). The analysis was performed on the sample of Canadian firms from the private sector. It is questionable if the results can be generalized beyond this group.

2). Strategy and performance were measured in a snapshot, rather then over a period of time. As strategies represent a sequence of actions, which develop and take shape over time, and as they are oriented towards achieving higher long-term, rather then immediate performance, it would be more appropriate to measure and study them in a longer time frame. Also, as strategies are oriented at improving long-term, rather then immediate performance it is preferable to measure performance over time or develop alternative measures of performance, that can assess the long-term effect of business strategy. Such measures could be based on financial market data, as they capture the value of business position in the long run. Another longitudinal study in this area could significantly improve the results as well as our understanding of strategic alignment.

References

Ansoff, H.I. (1957) Strategies for Diversification. *Harvard Business Review,* September-October, 113-124

Ansoff, H.I. and Stewart, M. (1967) Strategies for Technology-Based Business. *Harvard Business Review,* November-December, 71-82

Baets, W. R. J. (1996) Some Empirical Evidence on IS Strategy Alignment in Banking. *Information and Management*, 30, 155-177

Bergeron, F., Buteau, C. and Raymond, L. (1991) Identification of Strategic Information Systems Opportunities: Applying and Comparing Two Methodologies. *MIS Quarterly,* March, 89-103

Bergeron, F., and Raymond, L. (1995) The Contribution of Information Technology to the Bottom Line: A contingency Perspective of Strategic Dimensions. *Proceedings of the Sixteenth International Conference on Information Systems,* Amsterman

Booth, M.E. and Philip, G (1998) Technology, Competencies, and Competitiveness: The Case for Reconfigurable and Flexible Strategies. *Journal of Business Research,* 41, 29-40

Borch O. J., Huse M. and Senneseth K(1999) Resource Configuration, Competitive Strategies, and Corporate Entrepreneurship: an Empirical Examination of Small Firms. *Entrepreneurship Theory and Practice,* Fall, 49-70

Chan Y. E., Huff, S.I., Barklay, D. W., and Copeland, D. G. (1997) Business Strategic Orientation, Information Systems Strategic Orientation, and Strategic Alignment .*Information Systems Research*, Jun

Croteau A.M. (1998) Harmonisation du Deployment Technologique avec la Strategie D'Affaires: Augmentation de la Performance Organisationnelle. *Ph. D. Thesis, Universite Laval*

Croteau A. M., Bergeron F. and Raymond L. (2000) Strategie d'affaires et deployment de l'information: Alignement et Performance. *Montpellier*

Dess,G. G. and Davis P. S. (1984) Porter's (1980) Generic Strategies as Determinants of Strategic Group Membership and Organizational Performance. *Academy of Management Journal,* 27, 3, 467-488

Dos Santos, B.L., Peffers, K. and Mauer, D. C. (1993) The impact of information technology investment announcements on the Market Value of the Firm. *Information Systems Research,* 4:1, 1-23

Farrel , P.N., Hitchens, D. M., and Moffat, L. A. R. (1993) The Competitive Advantage of Business Service Firms: A Match. *The Service Industries Journal,* 13,1, 40

Fiedler, K.D., Grover, V. and Teng J. T. C. (1996) An Empirically Derived Taxonomy of Information Technology Structure and Its Relationship to Organizational Structure. *Journal of Management Information Systems,* 13, No. 1, 9-34

Fleming S. C. (1991) Using Technology for Competitive Advantage. *Research Technology Management,* Sep/Oct, Vol. 34, Iss. 5

Freeman, C (1974), The Economics of Industrial Innovation, Penguin, Harmondsworth, England

Hall, W.K.(1980) Survival Strategies in a Hostile Environment. *Harvard Business Review,* September-October, 75-85

Hambrick, D.C. (1980), Operationalizing the Concept of Business-Level Strategy in Research, *Academy of Management Review*,5, 4,567-575

Hambrick D. C. (1983) Porter's (1980) High Profit Strategies in Mature Capital Goods Industries: A Contingency Approach. *Academy of Management Journal,* 26, 4, 687-707

Hill, C.W.L. (1988) Differentiation Versus Low Cost or Differentiation and Low Cost: A Contingency Framework. *Academy of Management Review,* 13, 3, 401-412

Hitt, L. M. and Brynjolfsson, E (1996) Productivity, business profitability, and consumer surplus Three different measures of information technology value *MIS Quarterly,* 20, 2, 121-143

Jones, G.R. and Butler, J. E. (1988) Costs, Revenue, and Business-Level Strategy. *Academy of Management Review,* 13, 2, 202-213

Liao, K.D. and Greenfield P. F. (1997) The impact of Generic Competitive Strategies on Corporate R&D: an Empirical Study in Japan. *International Journal of Technology Management,* 13, No. 5/6, 542-553

Lim, J.S., Sharkey, T. W., and Kim, K. I. (1993) Determinants of International Marketing Strategy. *Management International Review,* 33, 103-120

Kettinger, W. J., Grover, V., Guha, S. and Segars, A. H. (1994) Strategic Information Systems Revisited: A Study in Sustainability and Performance. *MIS Quarterly,*March 1994, 31-58

King, W.R. and Grover, V. (1991) The Strategic Use of Information Resources: An Exploratory Study. *IEEE Transactions on Engineering Management,* 38, No.4, 295-305

Mahmood, M.A., (1993) Associationg Organizational Performance with Information Technology Investment: an Exploratory Research. *Operational Research Society,* 2, No.3 185-200
Miles, R. E., and Snow, C. C. (1978) *Organizational Strategy, Structure and Process.* McGraw Hill, New-York.

Miller, D., and Friesen P. H. (1986 a) Porter's (1980) Generic strategies and Performance: an Empirical Examination with American Data. Part I: Testing Porter. *Organization Studies,* 7, 1, 37-55

Miller, D., and Friesen P. H. (1986 b) Porter's (1980) Generic strategies and Performance: an Empirical Examination with American Data. Part II: Performance Implications. *Organization Studies,* 7, 3, 255-261

Mirani, R. and Lederer A. L. (1989) An Instrument for Assessing the Organizational Benefits of IS Projects. Decision Sciences, 29, 4, 803-838

Moore, G. C., and Benbasat I. (1991) Development of an Instrument to Measure the Perceptions of Adopting an Information Technology Innovation. *Information Systems Research, 2,3,* 192-219

Parkin, M and Bade, R. (1991) *Economics: Canada in the Global Environment,* Addison-Wesley publishers Limited, New York

Porter, M. E. (1980) *Competitive Strategy: Techniques for Analyzing Industries and Competitors,* The Free Press, New York

Porter, M. E. and Millar V. E. (1985) How Information Gives You Competitive Advantage. *Harvard Business Review, 63, 4,* 149-160

Racoff, N., Wiseman C., and Ulrich W. A. (1985) Information Systems for Competitive Advantage: Implementation of a Planning Process *MIS Quarterly*, December

Reich, H. R., and Benbasat, I. (2000) Factors That Influence the Social Dimension of Alignment Between Business and Information Technology Objectives. *MIS Quarterly,* 24, 1, 81-113

Segars, A.H. and Grover, V (1994) Strategic Group Analysis: A Methodological Approach for Exploring the Industry Level Impact of Information Technology. *Omega,* 22, 13-34

Segev, E. (1989) A Systematic Comparative Analysis and Synthesis of Two Business-Level Strategic Typologies. *Strategic Management Journal,* 10, 487-505

Segev, E. (1987) Strategy, Strategy-Making, and Performance in a Business Game. *Strategic Management Journal,* 8, 565-577

Smith, G.E., Venkatraman, M. P. and Wortzel, L. H. (1998) Strategic Marketing Fit in Manufacturer-Retailer Relationships: Price Leaders Versus Merchandise Differentiators. *Journal of Retailing,* 7, 3, 297-315

Sutcliffe, K. M. (1994) What Executives Notice: Accurate Perceptions in Top Management Team. *Academy of Management Journal,* 35, 5, 1360-1378

Swartz R. G. and Teach R. D. (2000) Research Note: Entrepreneurship Research: An Empirical Perspective. *Entrepreneurship Theory and Practice,* Spring, 77-81

Thomas, H. and Venkatraman, N. (1988) Research on Strategic Groups: Progress and Prognosis. *Journal of Management Studies,* 25:6, 538-554

Venkatraman, N. (1990) Performance Implications of Strategic Coalignment: A Methodological Perspective. *Journal Of Management Studies,* 27, 1, 19-41

Venkatraman, N. (1989a) The Concept of Fit in Strategy Research: Towards Verbal and Statistical Correspondence. *Academy of Management Review,* 14, 3, 423-444

Venkatraman, N. (1989b) Strategic Orientation of Business Enterprises: The Construct and Its Measurement. *Management Science,* 35, 8, 942-962

Venkatraman, N., Grant J.H. (1986) Construct Measurement in Organizational Strtegy Research. *Academy of Management Review,* 11, 1, 71-87

White, R.E.(1986) Generic Business Strategies, Organizational Context and Performance: An Empirical Investigation. *Strategic Management Journal,* 7, 217-231

APPENDIX 1

Questionnaires, Used for Collection of Data Used in This Study

1. Business Strategy

2. IT Deployment

Si vous désirez la version française du questionnaire, veuillez nous contacter et nous vous la ferons parvenir rapidement.

BUSINESS STRATEGIES

This questionnaire is aimed at the CHIEF EXECUTIVE OFFICER or a member of the top level management.

Would you please answer all the questions. There are no good or bad answers. Indicate your first impression. This questionnaire takes about ten to fifteen minutes to complete.

I. ACTUAL CHARACTERISTICS OF YOUR INDUSTRY

Using the following scale, please indicate your level of agreement with the following items related to the **actual characteristics of your industry**. Please circle the number that best represents your opinion. For any item that is not applicable to your situation, please circle *na (not applicable)*.

highly disagree	*moderately disagree*	*slightly disagree*	*neutral; no agreement no disagreement*	*slightly agree*	*moderately agree*	*highly agree*	*not applicable*
1	*2*	*3*	*4*	*5*	*6*	*7*	*na*

For firms in our principal industry,

M1	1.	Demand for the products/services is growing and will continue to grow.	1	2	3	4	5	6	7	na
M2	2.	The investment or marketing opportunities are very favorable at the present time.	1	2	3	4	5	6	7	na
M3	3.	The opportunities to expand the scope of the existing products/services are extremely limited.	1	2	3	4	5	6	7	na
M4	4.	Resources for growth and expansions are easily accessible.	1	2	3	4	5	6	7	na
M5	5.	Sales have been growing and are likely to grow.	1	2	3	4	5	6	7	na
M6	6.	The total value of assets are growing and will continue to grow.	1	2	3	4	5	6	7	na
M7	7.	Capital expenditures are growing and will continue to grow.	1	2	3	4	5	6	7	na

II. ACHIEVED BUSINESS STRATEGY

Using the following scale, please indicate your level of agreement with the following items related to your **achieved business strategy** (not wished). Please circle the number that best represents your opinion. For any item that is not applicable to your situation, please circle *na (not applicable).*

highly disagree	*moderately disagree*	*slightly disagree*	*neutral; no agreement no disagreement*	*slightly agree*	*moderately agree*	*highly agree*	*not applicable*
1	*2*	*3*	*4*	*5*	*6*	*7*	*na*

D1	**8.**	Our firm tries to *locate* a safe niche in a relatively stable products/services domain.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
D2	**9.**	Our firm tries to *maintain* a safe niche in a relatively stable products/services domain.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
D3	**10.**	Our firm tends to offer a narrower set of products/services than its principal competitors.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
D4	**11.**	Our firm tries to protect the environment domain in which it operates by stressing *higher quality* than its principal competitors.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
D5	**12.**	Our firm tries to protect the environment domain in which it operates by stressing *lower prices* than its principal competitors.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
D6	**13.**	Our firm concentrates on trying to achieve the best performance in a relatively narrow product-market domain.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
D7	**14.**	Our firm places less stress on the examination of changes in the industry that are not directly relevant to the firm.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
D8	**15.**	Our firm tries to maintain a *limited line* of products/services.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
D9	**16.**	Our firm tries to maintain a *stable line* of products/services.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
P1	**17.**	Our firm leads in innovations in its industry.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
P2	**18.**	Our firm operates in a broad product domain.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
P3	**19.**	Our firm product domain is periodically redefined.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
P4	**20.**	Our firm believes that being « first-in » in the industry is attained through the development of new products/services.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
P5	**21.**	Not all our firm's efforts invested in being « first-in » in the industry in development of new products/services prove to be profitable.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
P6	**22.**	Our firm responds rapidly to early signals of opportunities in the environment.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
P7	**23.**	Our firm's actions often lead to a new round of competitive activity in the industry.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
A1	**24.**	Our firm adopts quickly promising innovations in our industry.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**

II. ACHIEVED BUSINESS STRATEGY (following)

highly disagree	*moderately disagree*	*slightly disagree*	*neutral; no agreement no disagreement*	*slightly agree*	*moderately agree*	*highly agree*	*not applicable*
1	*2*	*3*	*4*	*5*	*6*	*7*	*na*

A4	**25.**	The innovations which are chosen by our firm are carefully examined.	**1 2 3 4 5 6 7 na**
A5	**26.**	Our firm often reacts to innovations in the industry by offering similar, lower-cost products.	**1 2 3 4 5 6 7 na**
A6	**27.**	Our firm carefully monitors competitors' actions in our industry.	**1 2 3 4 5 6 7 na**
R1	**28.**	Compared to its competitors in the industry, our firm is aggressive in maintaining its products/services domain.	**1 2 3 4 5 6 7 na**
R2	**29.**	Our firm takes many risks.	**1 2 3 4 5 6 7 na**
R3	**30.**	Our firm responds to areas in which pressure is made on it by its environment.	**1 2 3 4 5 6 7 na**

III. BUSINESS PERFORMANCE

Using to the following scale, would you please indicate **your perception along the following dimensions related to your actual business performance.** Please circle the number that best represents your opinion. For any item that is not applicable to your situation, please circle *na (not applicable).*

very low	*moderately low*	*slightly low*	*neutral; neither high neither low*	*slightly high*	*moderately high*	*very high*	*not applicable*
1	*2*	*3*	*4*	*5*	*6*	*7*	*na*

BP1	**31.**	The sales growth position relative to our principal competitors is:	**1 2 3 4 5 6 7 na**
BP2	**32.**	My satisfaction with sales growth rate is:	**1 2 3 4 5 6 7 na**
BP3	**33.**	The return on corporate investment position relative to our principal competitors is:	**1 2 3 4 5 6 7 na**
BP4	**34.**	My satisfaction with return on corporate investment is:	**1 2 3 4 5 6 7 na**
BP5	**35.**	My satisfaction with return on sales is:	**1 2 3 4 5 6 7 na**
BP6	**36.**	The market share gains relative to our principal competitors are:	**1 2 3 4 5 6 7 na**
BP7	**37.**	The net profit position relative to our principal competitors is:	**1 2 3 4 5 6 7 na**
BP8	**38.**	The financial liquidity position relative to our principal competitors is:	**1 2 3 4 5 6 7 na**

IV. PLEASE PROVIDE SOME BACKGROUND INFORMATION FOR OUR ANALYSIS

39. What is your title? _____

40. How long have you been in this position? _____ /year(s)

41. How long have you been working for this firm? _____ /year(s)

42. How many employees work in your firm? _____

43. What is your firm's total revenues?

- Less than 1 million $
- 1 to 19 million $
- 20 to 49 million $
- 50 to 99 million $
- 100 to 249 million $
- 250 to 499 million $
- 500 to 999 million $
- Over 1 billion $

44. What is your primary industry?

- Agriculture, forests and fisheries
- Mining
- Construction
- Communications
- Transports
- Health
- Manufacturing
- Wholesale
- Retail trade
- Finance, insurance and real-estate
- Services
- Other: _____

Please return this questionnaire by using the attached postage-paid envelope or by faxing it to Anne-Marie Croteau (418) 656-2624.

Thank you for your precious collaboration!

If you wish to obtain a summary of the results of this survey, please enclose your business card in the return envelope. If you have any comments or questions, please feel free to contact us.

Anne-Marie Croteau
Ph.D. Student
Laval University
School of Business Administration (43-18-2647)
C.P. 2208, Succ. Terminus
Quebec (Quebec), G1K 9Z9
Tel: (418) 656-3827
Fax: (418) 656-2624
Int.: anne-marie.croteau@sio.ulaval.ca

_____ This confidential number is only used to match the two questionnaires associated with your firm.

Si vous désirez la version française du questionnaire, veuillez nous contacter et nous vous la ferons parvenir rapidement.

INFORMATION TECHNOLOGY DEPLOYMENTS

This questionnaire is aimed at the CHIEF INFORMATION OFFICER.

Would you please answer all the questions. There is no good or bad answers. Indicate your first impression. This questionnaire takes about ten to fifteen minutes to complete.

I. INFORMATION TECHNOLOGY DEPLOYMENTS

Using the following scale, please indicate your level of agreement with the following items related to your **actual information technology deployments of your firm**. Please circle the number that best represents your opinion. For any item that is not applicable to your situation, please circle *na (not applicable)*. Please note that the « Information systems (IS) department » expression refers to the department responsible for technological choices and information systems management.

highly disagree	*moderately disagree*	*slightly disagree*	*neutral; no agreement no disagreement*	*slightly agree*	*moderatel y agree*	*highly agree*	*not applicable*
1	*2*	*3*	*4*	*5*	*6*	*7*	*na*

STRAT1	**1.**	Information systems (IS) are used for competitive advantage by our firm.	**1 2 3 4 5 6 7 na**
STRAT2	**2.**	IS department *facilitates* business process reengineering.	**1 2 3 4 5 6 7 na**
STRAT3	**3.**	IS department *manages* business process reengineering.	**1 2 3 4 5 6 7 na**
STRAT4	**4.**	Information systems *effectiveness* is measured.	**1 2 3 4 5 6 7 na**
STRAT5	**5.**	Information systems *productivity* is measured.	**1 2 3 4 5 6 7 na**
TI1	**6.**	Decision and executive support systems are broadly used throughout our firm.	**1 2 3 4 5 6 7 na**
TI2	**7.**	Our firm communicates business information to its partners via electronic data interchange (EDI).	**1 2 3 4 5 6 7 na**
TI3	**8.**	Distributed systems (client/server) are broadly used throughout our firm.	**1 2 3 4 5 6 7 na**

I. INFORMATION TECHNOLOGY DEPLOYMENTS (following)

highly disagree	*moderately disagree*	*slightly disagree*	*neutral; no agreement no disagreement*	*slightly agree*	*moderately agree*	*highly agree*	*not applicable*
1	*2*	*3*	*4*	*5*	*6*	*7*	***na***

TI4	**9.**	CASE technology is used by IS department members.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
TI5	**10.**	Our organizational level of computerization is high.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
TI6	**11.**	Information technologies implemented are well integrated to the organizational tasks.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
STRAT6	**12.**	Information systems strategic planning is defined in relation with the business objectives of our firm.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
ROLE1	**13.**	IS department position is determined accordingly to the structure and needs of our firm.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
ROLE2	**14.**	IS department prioritizes the effectiveness and quality of software development.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
ROLE3	**15.**	IS department plans and manages for effective and flexible communication networks.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
ROLE4	**16.**	Contributions of the IS department are expected to be high.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
ROLE5	**17.**	IS department contributes to business growth.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
ORG1	**18.**	Most information systems project teams members come from the *IS department.*	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
ORG2	**19.**	IS project teams group people from *various departments*, including the IS department.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
ORG3	**20.**	IS department has a strategic impact on our firm.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
TECH1	**21.**	Information systems are *centralized.*	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
TECH2	**22.**	Information systems are *decentralized.*	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
TECH3	**23.**	IS department designs and implements an information architecture that guides applications development.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
TECH4	**24.**	IS department designs and implements an information architecture that facilitates the integration and sharing of data.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
TECH5	**25.**	IS department integrates multi-vendor open systems technologies.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
TECH6	**26.**	IS department contributes to the effective use of the data resource.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
TECH7	**27.**	Technological architecture is designed to respond to our business needs.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
TECH8	**28.**	IS department adequately plans and manages existing applications portfolio.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
SECUR1	**29.**	IS department improves information security and control.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**

I. INFORMATION TECHNOLOGY DEPLOYMENTS (following)

highly disagree	*moderately disagree*	*slightly disagree*	*neutral; no agreement no disagreement*	*slightly agree*	*moderately agree*	*highly agree*	*not applicable*
1	*2*	*3*	*4*	*5*	*6*	*7*	*na*

SECUR2	**30.**	IS department sets disaster recovery capabilities.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
TECH9	**31.**	Information systems are primarily developed *in-house*.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
TECH10	**32.**	Information systems are primarily developed *by external resources*.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
TECH11	**33.**	Some selected information services are outsourced.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
TECH12	**34.**	Technological infrastructure adequately supports managerial tasks.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
ORG4	**35.**	IS project team structure varies with respect to the *business function* for which the IS project is developed (finances, marketing, *etc.*).	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
ORG5	**36.**	IS project team structure varies with respect to the *type of IS projects*.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
ORG6	**37.**	IS project members are selected on the basis of their *technical expertise*.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
ORG7	**38.**	IS project members are first chosen for their *interpersonal skills*.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
ADM1	**39.**	*Authoritative* style in the IS project team is preferred.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
ADM2	**40.**	*Participative* style in the IS project team is preferred.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
ADM3	**41.**	*Flexible* approach is encouraged in IS project management.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
ADM4	**42.**	*Formal* approach is encouraged in IS project management.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
ADM5	**43.**	IS department *trains* itself human resources.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
ADM6	**44.**	IS department *recruits* already trained human resources.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
CPD1	**45.**	Expertise and capabilities of IS department employees contribute to organizational strategic goals.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
CPD2	**46.**	IS department employees are looking for economical ways to process information.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
CPD3	**47.**	IS department employees design and implement applications that allow the firm to differentiate itself from competitors.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
CPD4	**48.**	IS department employees design and implement applications that reduce organizational operations costs.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
CPD5	**49.**	IS department employees participate to organizational meetings.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
CPD6	**50.**	IS department employees read technological journals on a regular basis.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
CPD7	**51.**	IS department employees attend information systems associations meetings.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
CPD8	**52.**	IS department employees learn continuously about new technologies and technological applications.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**
CPD9	**53.**	Continuous learning about ways to integrate new technologies is encouraged by our firm.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**na**

II. PLEASE PROVIDE SOME BACKGROUND INFORMATION FOR OUR ANALYSIS

54. What is your title? _____

55. How long have you been with the IS department? _____ /year(s)

56. How long have you been with this firm (including other units)? _____ /year(s)

57. How many employees work in the IS department? _____

58. What is the budget allowed to the IS department? _____ **.00 $**

Please return this questionnaire by using the attached postage-paid envelope or by faxing it to Anne-Marie Croteau (418) 656-2624.

Thanks for your precious collaboration!

If you wish to obtain a summary of the results of this survey, please enclose your business card in the return envelope. If you have any comments or questions, please feel free to contact us.

Anne-Marie Croteau
Ph.D. Student
Laval University
School of Business Administration (43-18-2647)
C.P. 2208, Succ. Terminus
Quebec (Quebec), G1K 9Z9
Tel: (418) 656-3827
Fax: (418) 656-2624
Int.: anne-marie.croteau@sio.ulaval.ca

_____ This confidential number is only used to match the two questionnaires associated with your firm.

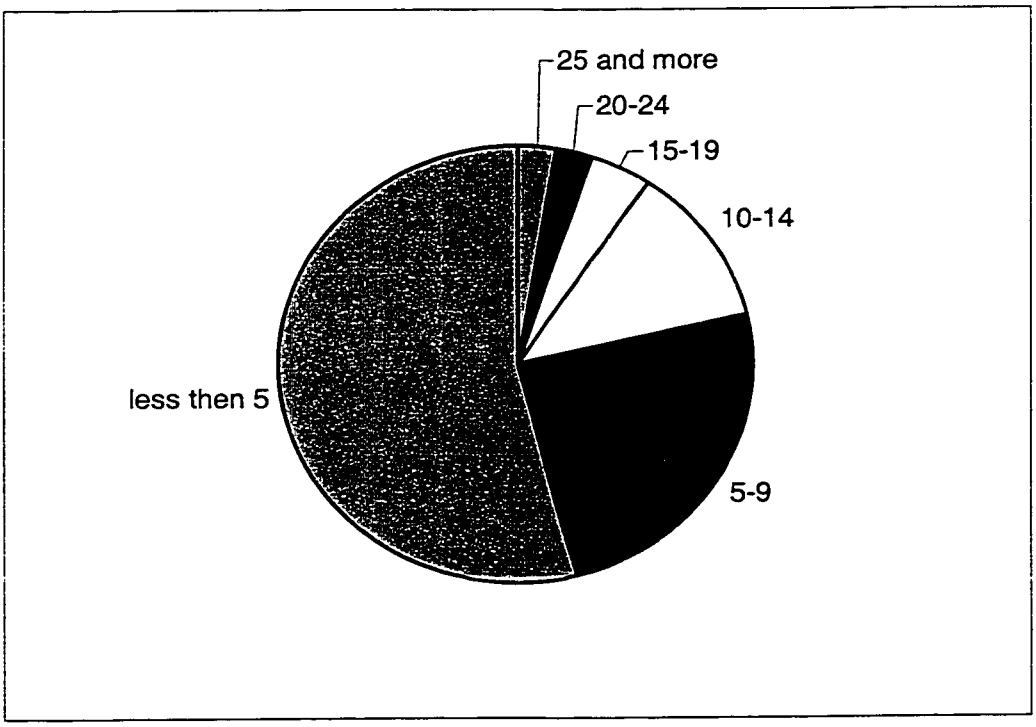
APPENDIX 2

Descriptive Statistics on the Sample of Companies and Respondents

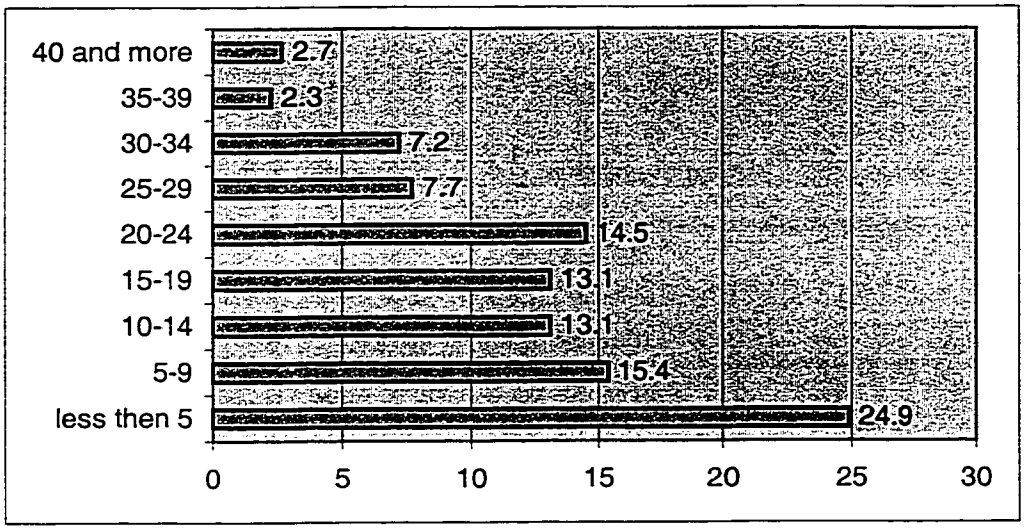
1. Positions, Held by Respondents to the Questionnaire on Strategy

Position Held in the Company	Frequency	(%)
President	98	43.9
Vice- President (other)	54	24.2
General Manager	28	12.6
Vice-President (finance)	20	9.0
Vice-President (MIS)	12	5.4
MIS Manager	6	2.7
Not Identifyed	5	2.2
Total:	223	100

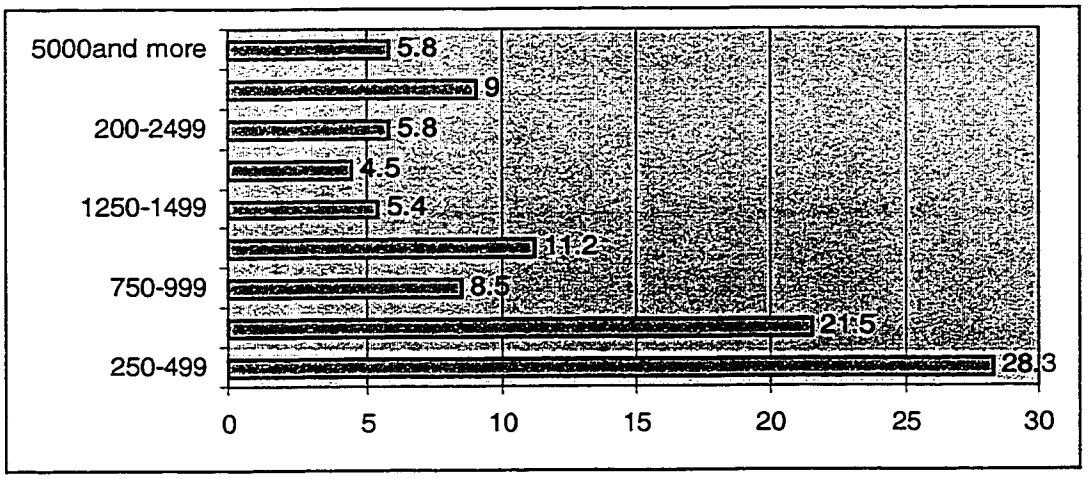
2. Number of Years in the Position Held (μ = 6 years)



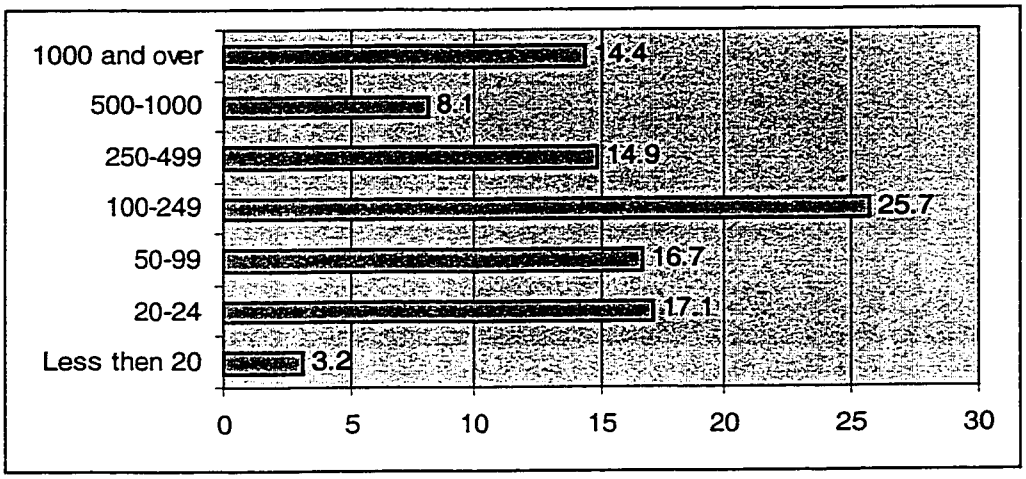
3.Number of Years at the Company (μ = 14 years)



4.Number of Employees at the Company (μ = 3,190)



5.Annual Sales (in millions of dollars)



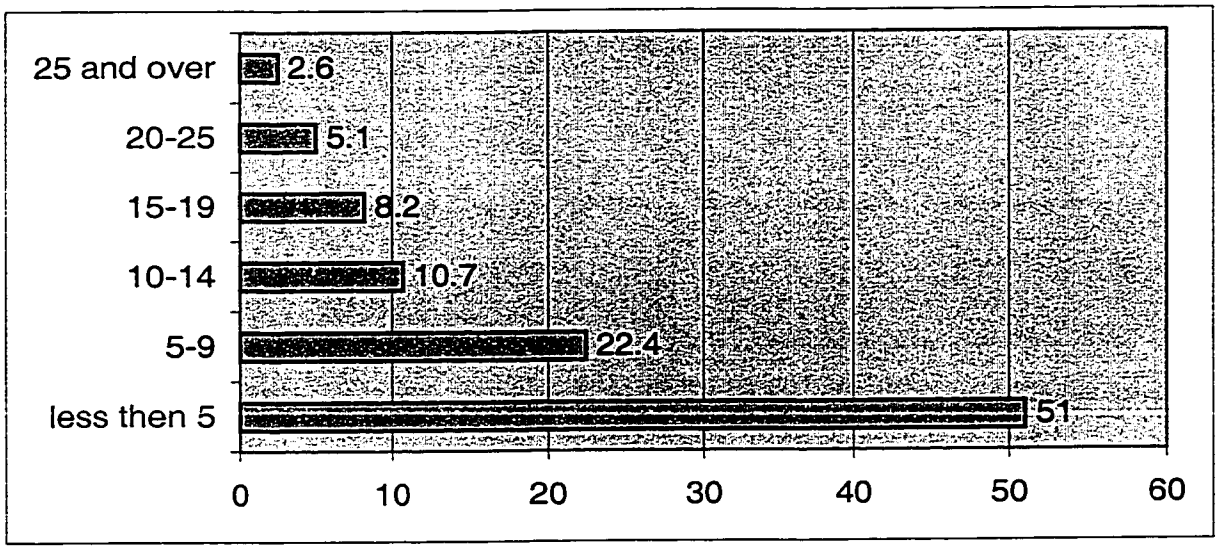
6. Industry

Industry	(%)
Manufacturing	29.1
Services	14.3
Finance	9.4
Retail	7.2
Transportation	7.2
Agriculture	5.8
Wholesale	3.1
Communication	3.1
Mining	3.1
Construction	2.2
Healthcare	1.8
Other	13.5
Total:	100

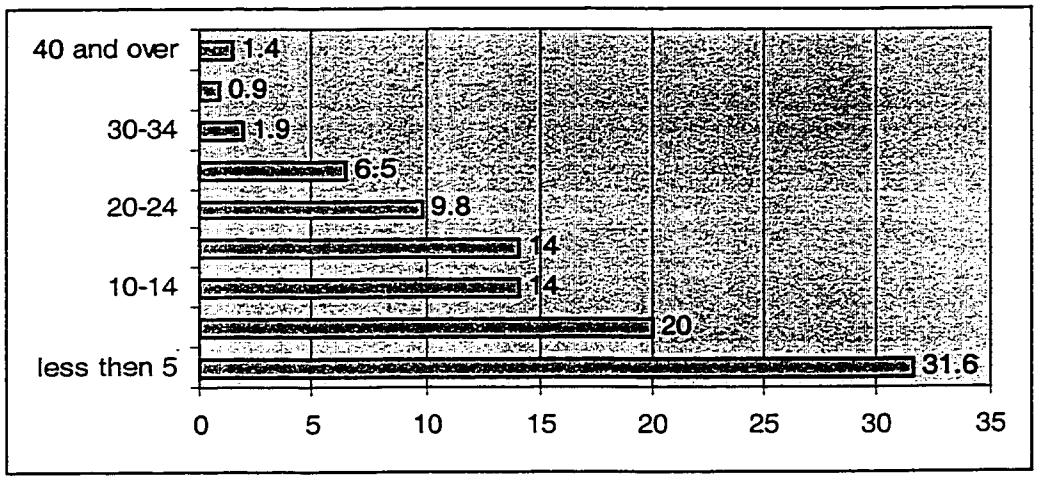
7. Title of the Respondents to the Questionnaire on IT Deployment

Position Held in the Company	Frequency	(%)
Director (MIS)	86	40.4
Vice- President (MIS)	40	18.8
General Manager	24	11.3
Vice-President	21	9.9
Vice-President (finance)	20	9.4
General Director	15	7.0
Not Identifyed	7	3.2
Total:	223	100

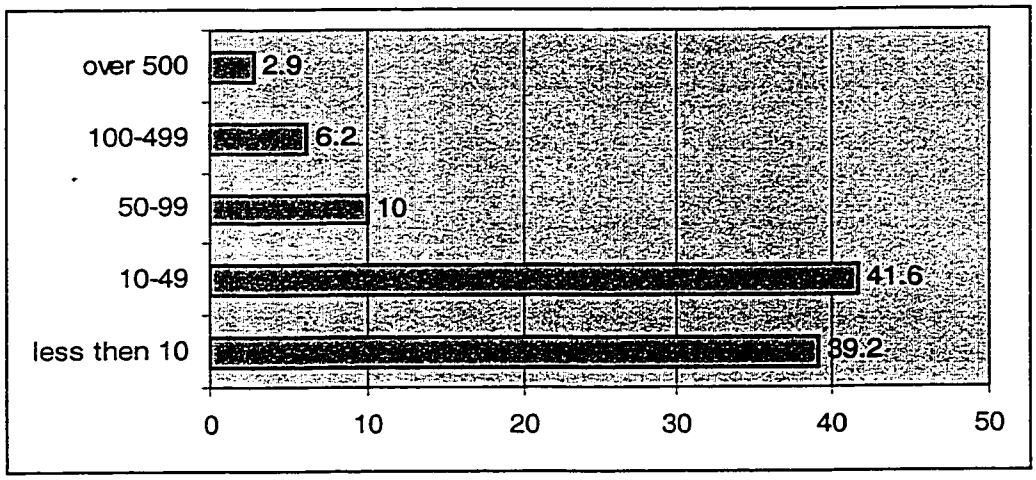
8.Number of Years in the Current Position for IT Deployment Questionnaire Respondents ($\mu = 7$ years)



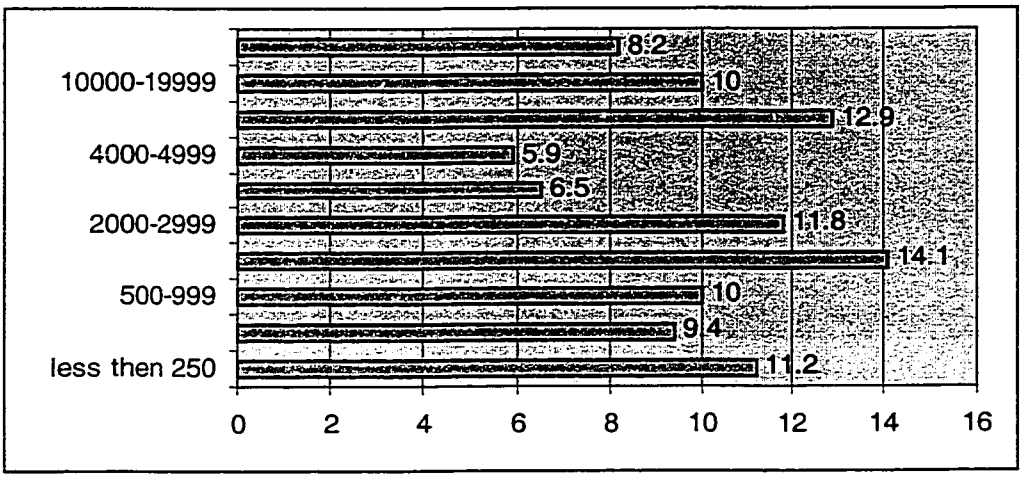
9.Number of Years at the Company for IT Deployment Questionnaire Respondents (μ = 11 years)



10.Number of People in the MIS Department (μ = 62)



10. Budget, Allocated to MIS Department in Thousands of Dollars (μ = 7.7 million dollars)



APPENDIX 3

Developing Measurement Scales for Ansoff's and Porter's Generic Strategies

Description of Rating Procedure and Results

The methodology, that was initially used to develop measurement scales for Ansoff's and Porter's generic strategies was similar to the one used by Moore and Benbasat (1991). Five raters were selected and provided with the following description of Ansoff's growth strategies.

Description of Ansoff's Strategies, Provided to Raters

Igor Ansoff has identified four different types of product-market strategy shown in the Exhibit below:

	Current products	New products
Current markets	Market penetration strategy	Product development strategy
New markets	Market development strategy	Diversification strategy

Market penetration is an effort to increase company sales without departing from an original product-market strategy. The company seeks to improve business performance either by increasing the volume of sales to its present customers or by finding new customers for present products.

Market development is a strategy in which the company attempts to adapt its present product line (generally with some modifications in the product characteristics) to new

missions. An airplane company, which adapts and sells its passenger transport for the mission of cargo transportation is an example of this strategy.

Product development strategy, on the other hand, retains the present mission and develops products that have new and different characteristics, such as will improve performance of this mission.

Diversification is the final alternative. It calls for a simultaneous departure from the present product line and the present market structure.

The raters were provided with 23 cards, each with one of the questionnaire items, related to the achieved business strategy. They were also provided with four envelopes, one for each of the growth strategies. The raters were provided with the following instructions, asking them to classify the items in accordance with the typology:

Dear rater;

You were selected and asked to participate in the study, that attempts to identify various strategic types and IT deployment profiles, corresponding to them. For the purpose of this study you will be asked to sort 23 questionnaire items, printed on cardboard cards, according to the strategic type that they can be associated with.

Please, read the instructions written below and then use your judgment to place each item into the right group.

INSTRUCTIONS

1. Read carefully the description of four strategic types on the next page.
2. Open an envelope, containing 23 cardboard cards with questionnaire items printed on them.
3. You are provided with four envelopes, each corresponding to one of the strategic types. After carefully examining each card and the item printed on it, place it into an envelope that in your opinion it should belong to.

NOTE: It should be possible to classify most of the items, however, if you believe that some item does not correspond to any of the strategic types you can leave it in the envelop from where you originally got the cards.

Thank you very much for your assistance

Nina Milova

You can find the items and the way they were classified by the five raters in the Table 2.

Prior to classifying the items according to Ansoff's framework the raters were required to pass a pretest for which they were instructed to classify 8 questionnaire items, related to the business performance as either items, related to marketing performance or financial performance.

Raters were fairly consistent on the pretest, where all but one rater classified the items in the same way. See Table 1 for pretest results.

Table 1. Rating Pretest Results

	Rater Information				
	Rater 1	Rater 2	Rater 3	Rater 4	Rater 5
	M.Sc. Student (finance), Second Year Ansoff	Undergraduate Degree (economics) Ansoff	Undergraduat, third year, (finance) Ansoff	M.Sc. Student (marketing), Second Year Ansoff	Marketing Ph. D. Student Ansoff
	Test Items				
The sales growth position relative to our principal competitors is:	market performance	market performance	market performance	market performance	market performance
My satisfaction with sales growth rate is:	market performance	market performance	market performance	market performance	market performance
The return on corporate investment position relative to our principal competitors is:	**market performance**	financial performance	financial performance	financial performance	financial performance
My satisfaction with return on corporate investment is:	**market performance**	financial performance	financial performance	financial performance	financial performance
My satisfaction with return on sales is:	market performance	financial performance	financial performance	financial performance	**market performance**
The market share gains relative to our principal competitors are:	market performance	market performance	market performance	market performance	market performance

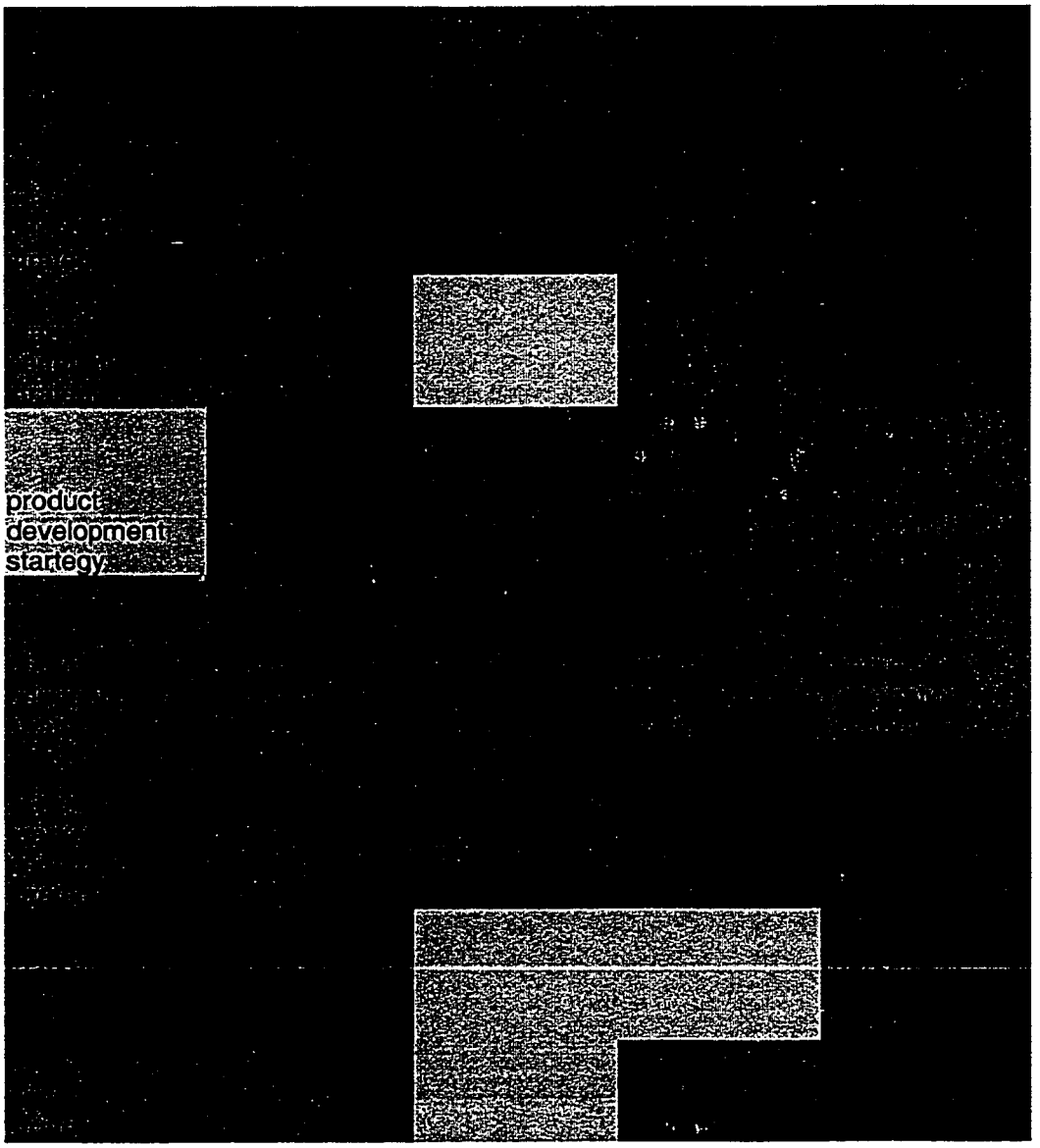
The net profit position relative to our principal competitors is:	**market performance**	financial performance	financial performance	financial performance	financial performance
The financial liquidity position relative to our principal competitors is:	financial performance	financial performance	financial performance	financial performance	financial performance

These ratings are also consistent with the results of exploratory factor analysis of the same items. The factor analysis, which identified two principal components, one of which was correlated with the items that raters categorized as "Financial Performance" and the second was correlated with the items related to "Marketing Performance".

Right after the pretest procedure the same five raters were asked to classify strategy items according to four strategies in the Ansoff's grid. The results of rating of the strategy items according to Ansoff's strategic grid are presented in table 2. These results are inconclusive, although some consistency was achieved on several items. It would be necessary to run the second round of sorting, which would only include the items most directly related to Ansoff's classification, or the items on which highest consistency was achieved.

Table 2. Rating Results for Ansoff's Strategic Typology

	Rater 1	Rater 2	Rater 3	Rater 4	Rater 5
	M.Sc. Student (finance), Second Year Ansoff	Undergraduate Degree (economics) Ansoff	Undergraduat, third year, (finance) Ansoff	M.Sc. Student (marketing), Second Year Ansoff	Marketing Ph. D. Student Ansoff
Strategy Items					
1.Our firm tries to *locate* a safe niche in a relatively stable products/services domain. (MD)					
2.Our firm tries to *maintain* a safe niche in a relatively stable products/services domain. (MP)(F)					
3.Our firm tends to offer a narrower set of products/services than its principal competitors. (MP)					
4.Our firm tries to protect the environment domain in which it operates by stressing *higher quality* than its principal competitors.					
5.Our firm tries to protect the environment domain in which it operates by stressing *lower prices* than its principal competitors. (MP)(CL)					
6.Our firm concentrates on trying to achieve the best performance in a relatively narrow product-market domain. (MP)(F)					
7.Our firm places less stress on the examination of changes in the industry that are not directly relevant to the firm.					
8.Our firm tries to maintain a *limited line* of products/services. (MP)					



9.Our firm tries to maintain a *stable line* of products/services. (MP)

10.Our firm leads in innovations in its industry. (D)

11.Our firm operates in a broad product domain.

12.Our firm product domain is periodically redefined. (PD)

13.Our firm believes that being « first-in » in the industry is attained through the development of new products/services. (PD)(D)

14.Not all our firm's efforts invested in being « first-in » in the industry in development of new products/services prove to be profitable.

15.Our firm responds rapidly to early signals of opportunities in the environment.

16.Our firm's actions often lead to a new round of competitive activity in the industry. (D)

17.Our firm adopts quickly promising innovations in our industry. (PD)(D)

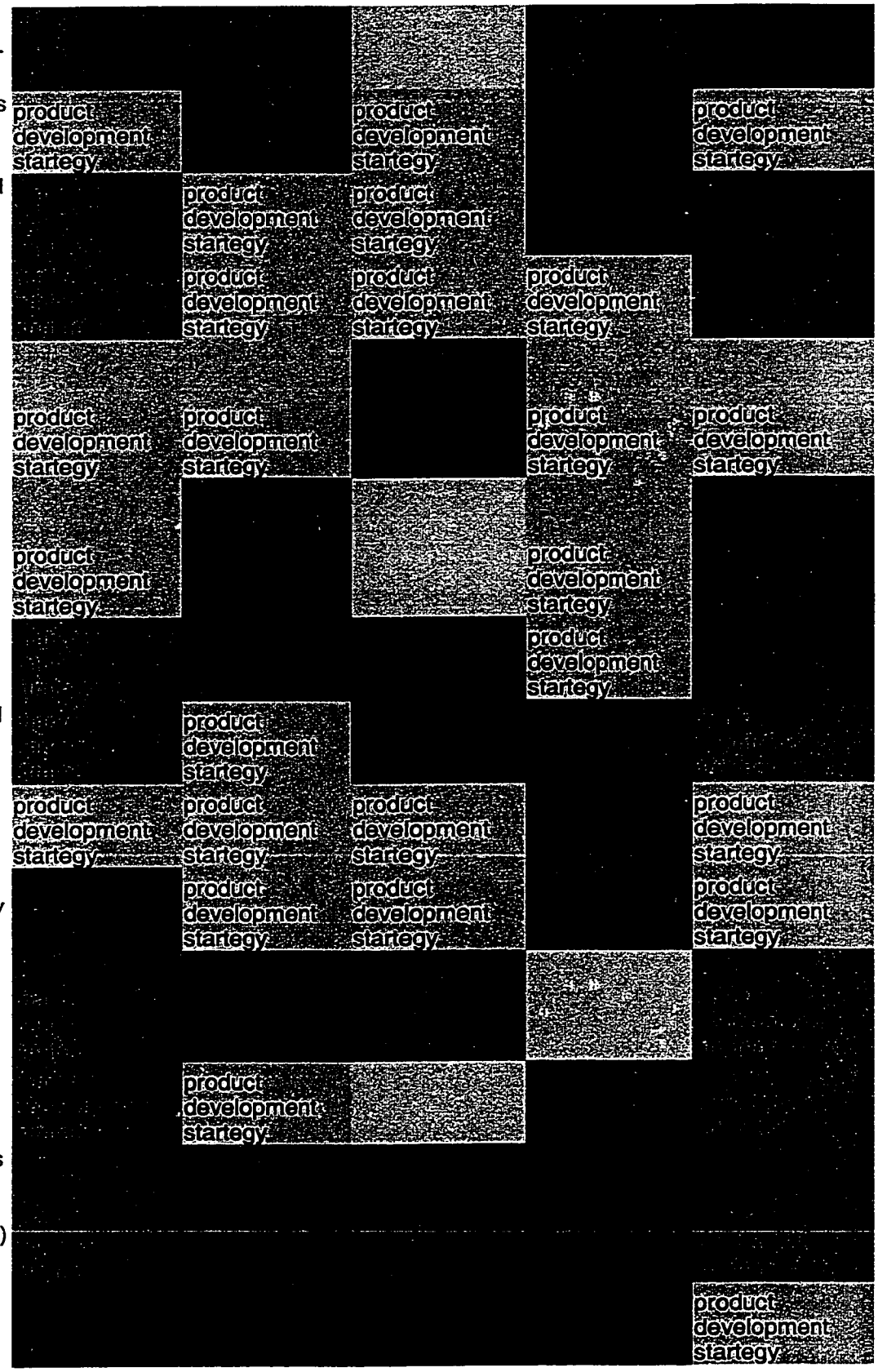
18.The innovations which are chosen by our firm are carefully examined.

19.Our firm often reacts to innovations in the industry by offering similar, lower-cost products.

20.Our firm carefully monitors competitors' actions in our industry.

21.Compared to its competitors in the industry, our firm is aggressive in maintaining its products/services domain. (MP)

22.Our firm takes many risks. (DS)



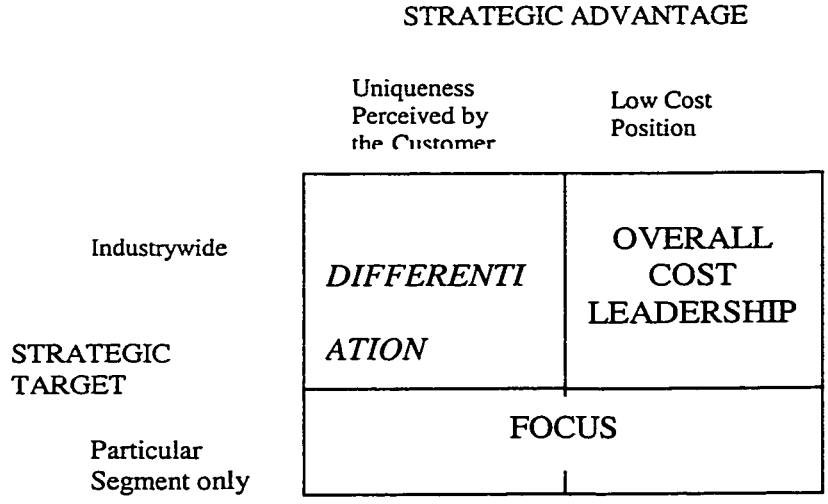
23.Our firm responds to areas in which pressure is made on it by its environment.	product development startegy	product development startegy

Rating Results for Porter's Typology

A similar procedure was performed with a separate set of five raters (not same raters as for Ansoff's typology), who were instructed to classify the same questionnaire items according to three Porter's strategic types. The raters were provided with similar instructions and the description of Porter's generic strategies, provided below.

Description of Porter's Generic Strategies, Provided to the Raters

Michael E. Porter has identified three generic strategies shown in the Exhibit below:



Overall cost leadership is an effort to achieve a low cost relative to its competitors in the industry

Differentiation is a strategy in which the company attempts to differentiate the product or service offering by the firm, creating something that is perceived industrywide as unique. This can be achieved through brand image, technology, customer service, dealer network and many other means.

Focus strategy requires targeting a particular buyer group, segment of the product line or geographic market. While two previous strategies are aimed at building competitive advantage industrywide, focus strategy is build to serve a particular target very well, and each functional policy is built with this in mind.

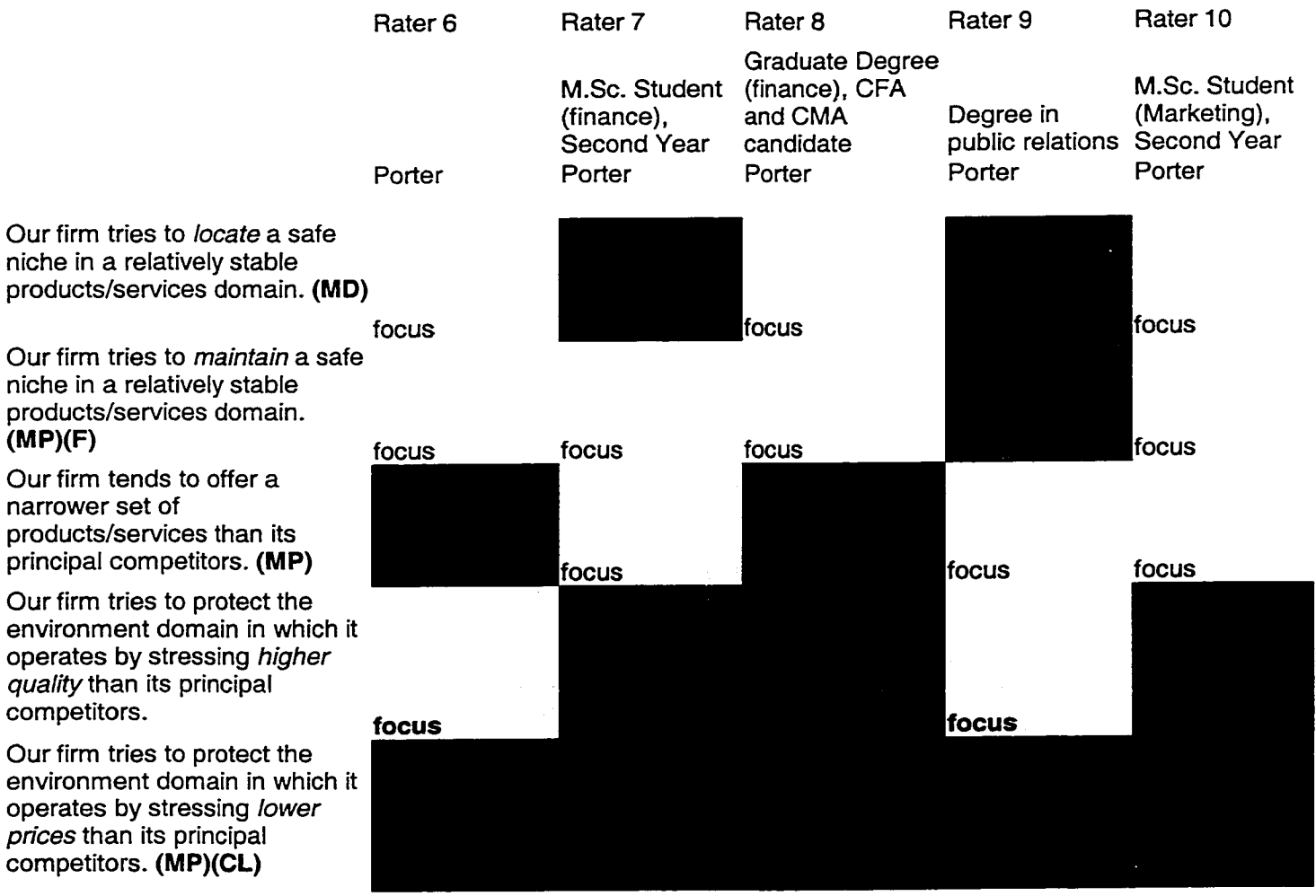
The raters were asked to pass the same pretest, and the pretest data are presented in Table 3.

Table 3. Pretest Results

	Rater 6	Rater 7	Rater 8	Rater 9	Rater 10
		M.Sc. Student (finance), Second Year	Graduate Degree (finance), CFA and CMA candidate	Degree in public relations	M.Sc. Student (Marketing), Second Year
	Porter	Porter	Porter	Porter	Porter
The sales growth position relative to our principal competitors is:	market performance	market performance	market performance	market performance	market performance
My satisfaction with sales growth rate is:	market performance	market performance	market performance	**market performance**	market performance
The return on corporate investment position relative to our principal competitors is:	**market performance**	financial performance	financial performance	**market performance**	financial performance
My satisfaction with return on corporate investment is:	financial performance	financial performance	financial performance	**market performance**	financial performance
My satisfaction with return on sales is:	financial performance	financial performance	financial performance	financial performance	financial performance
The market share gains relative to our principal competitors are:	**financial performance**	market performance	market performance	market performance	market performance
The net profit position relative to our principal competitors is:	financial performance	financial performance	financial performance	financial performance	financial performance
The financial liquidity position relative to our principal competitors is:	**market performance**	financial performance	financial performance	financial performance	financial performance

Right after the pretest, the same five raters were asked to classify the 23 strategy items according as related to Differentiation, Cost Leadership or Focus strategy. Raters were more consistent with Porter's generic strategies then with Ansoff's classification, but results are still inconclusive. Perhaps the second round of sorting would be required in this case as well. See Table 4 for the rating results of the strategy items according to Porter's classification.

Table 4. Rating Results for Porter's Strategic Typology



Our firm concentrates on trying to achieve the best performance in a relatively narrow product-market domain. **(MP)(F)**

Our firm places less stress on the examination of changes in the industry that are not directly relevant to the firm.

Our firm tries to maintain a *limited line* of products/services. **(MP)**

Our firm tries to maintain a *stable line* of products/services. **(MP)**

Our firm leads in innovations in its industry. **(D)**

Our firm operates in a broad product domain.

Our firm product domain is periodically redefined. **(PD)**

Our firm believes that being « first-in » in the industry is attained through the development of new products/services. **(PD)(D)**

Not all our firm's efforts invested in being « first-in » in the industry in development of new products/services prove to be profitable.

Our firm responds rapidly to early signals of opportunities in the environment.

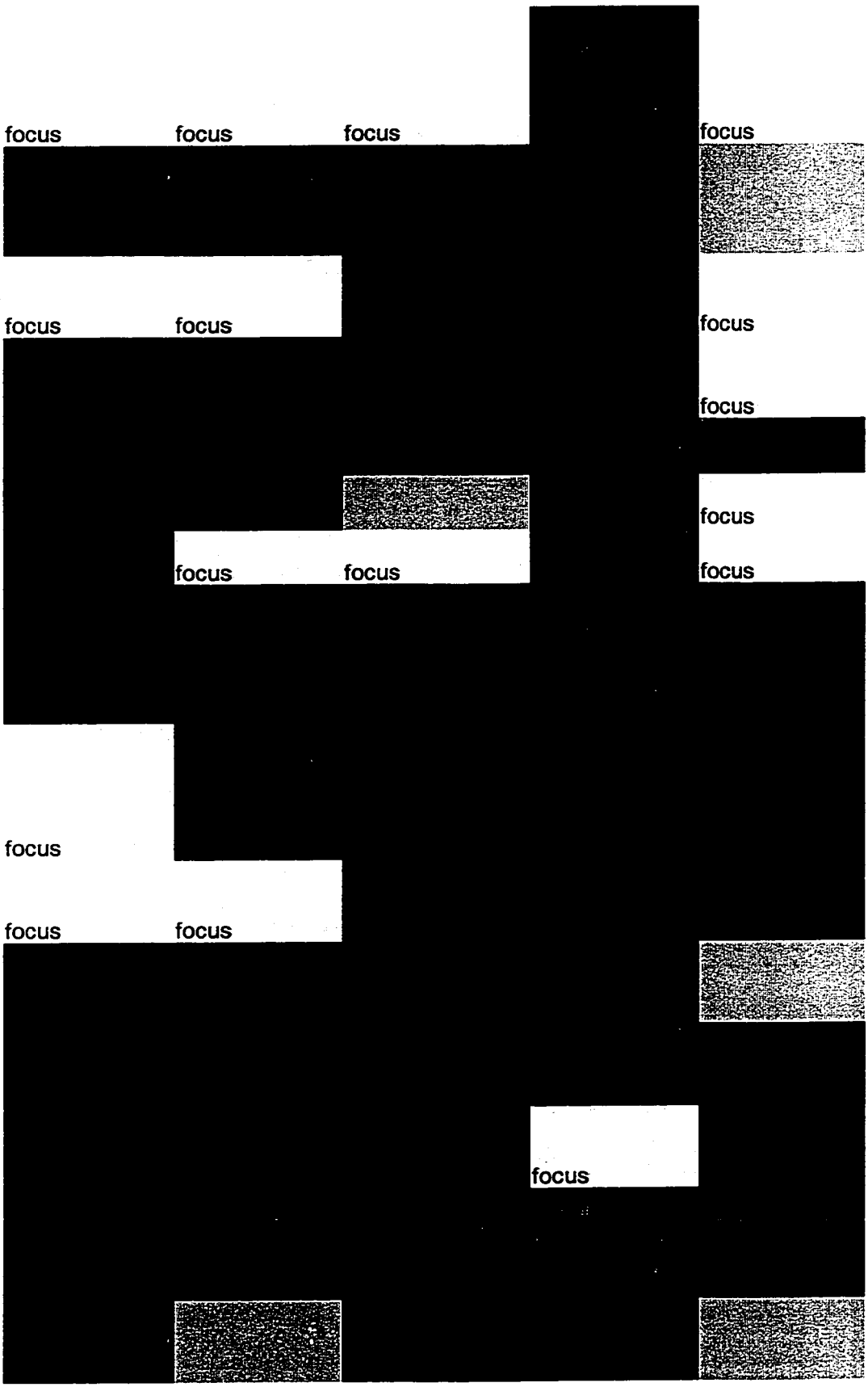
Our firm's actions often lead to a new round of competitive activity in the industry. **(D)**

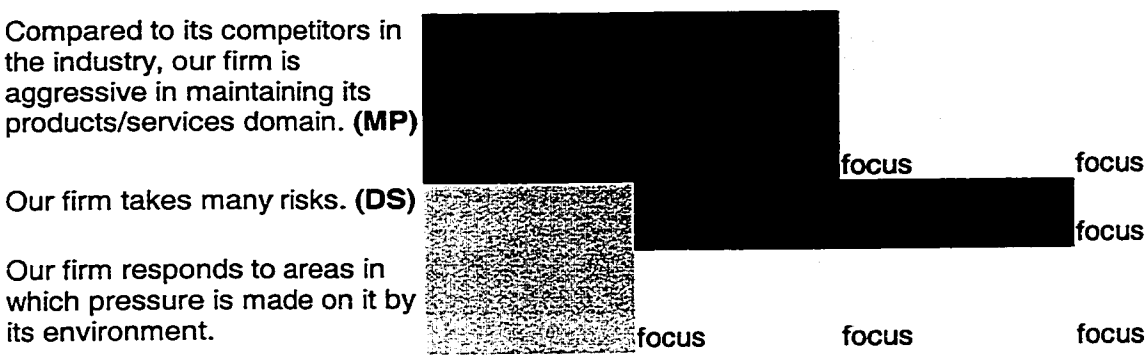
Our firm adopts quickly promising innovations in our industry. **(PD)(D)**

The innovations which are chosen by our firm are carefully examined.

Our firm often reacts to innovations in the industry by offering similar, lower-cost products.

Our firm carefully monitors competitors' actions in our industry.





Although an attempt was made to develop and analyze the scales, developed through this rating procedure, at the end we decided to use the measurement scales developed through exploratory factor analysis, because it was easier to perform, more objective in nature and the resulting scales were more reliable.