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What Makes a Good Journal?

Ashok Gupta
Editor-in-Chief

Evolving... Yes, that is what we have been doing for the last 15 years! Every change in editorship offers an opportunity to ask, where are we going? Where have we been? What value are we providing to our readers? How can we do better?

We believe a good journal captures and disseminates ideas with impact:

- Ideas that our academic readers find helpful in improving business education so they can prepare students for the challenges yet unrecognized.
- Ideas worth pursuing for further research to improve the practice of management. Ideas that make them say—Aha!
- Ideas that our practicing managers find relevant in solving their immediate as well as long-term, articulated and unarticulated problems. We want to offer them solutions that are based on rigorous reliable research. Solutions they can count on.

We hope we are becoming a journal that offers ideas with impact. We hope that our readers eagerly wait to receive every issue of the journal and refer to it often. The current editorial team salutes our predecessors who have worked hard in the continuous improvement of the journal. Our pursuit for excellence involves encouraging submission of the best manuscripts and inviting practitioners to share their valuable experiences. We want to be known as an outlet of rigorously conducted, relevant, scholarly activities of those academicians who consider research as their other passion after teaching. We will love to hear what you think of our progress.

In this issue...

To maintain sustainable competitive advantage, a firm needs to implement customer value and satisfaction strategies to retain current customers and acquire new ones. Garver and Cook discuss the components of corporate culture that facilitate the use of customer value and satisfaction data by examining what best practices companies do.

Boyer examines how investment in advanced manufacturing technologies (ATM) impacts financial performance. Based on a longitudinal analysis of patterns of investments in fifty metal working companies in 1994, 1996, and 1998, the study finds that there is a two-year time lag between investments in ATM and improvement in a plant's financial performance.

The article by Lussier et al. describes the "realities" of strategic planning in small business and entrepreneurial firms using an Entrepreneurial Strategy Matrix. Based on a survey of 184 firms, the study found that the five most commonly used strategies included: work to create a competitive advantage, maintain innovation, cost reduction, defend current products/services from competitive threats, and create first mover advantage by quickly bringing new products to market.

A set of four articles are presented in the *Business Education* section to highlight innovation in business curricula and some interesting issues facing business education. Rooney and Rea describe a curricular innovation—the Electronic Portfolio Project at the Haworth College of Business, Western Michigan University. The goal of the portfolio is to provide cumulative evidence of how well students are making the linkages among their education, experiences, expectations, and

What Makes a Good Journal? (continued)

professional goals. Experience based suggestions are provided for effective implementation of a portfolio approach on a large scale.

Gabric and McFadden examine the student/employer perceptual differences in the skills desired in an entry-level operations management job. The study found significant differences between employers and students in their perceptions of the importance of general skills, technical skills, and personality characteristics; employers value general skills significantly higher than technical skills. Suggestions for operation management curricula re-engineering are presented.

The third article in this section by Brewer et al. examines the effect of mixing business and non-business students in a business core course. The study found significant differences between the two group of students in attitude toward the course and their performance in the course. Strategies for managing classroom diversity for greatest benefit to both groups of students are presented.

Human-computer interaction is the subject of the study by Towell and Lauer who found that human-computer interaction is more stressful for MIS students than other business students because their use of computers is greater and their grades are more heavily weighted toward computer work. Recommendations for coping with computer-related stress are made. ■

Strengths and Challenges for Regional Schools



David Graf
Dean, College of Business
Northern Illinois University

The arrival of the new millennium heralds some good news on the positioning of large regional schools and colleges of business. Rather than fade against the blistering competition by the nationals, multinationals, and privates (large and small), regional schools continue to thrive in their market niche. There are some good reasons for this market condition.

The market for students and graduates is well defined. Regional schools provide a solid value for students of modest means who are often first-generation college students, first-generation Americans or non-traditional students. These students tend to reflect the demographic diversity forecast for the 2000 work force. For regional schools who have focused on this market, it has become a renewable resource.

Determined mainly by geography, regional schools have earned solid reputations for producing hard-working graduates who contribute to the success of key regional firms where they are employed. A graduate focus on working professionals has earned regional schools high marks for a solid mix of theory and practice in both instruction and research. This practice has assisted regional schools in forging a strong working relationship with key firms.

A close working relationship with key firms has resulted in additional opportunities for faculty to engage in outreach activities. Regional firms also participate by providing student and faculty internships and business projects. Executives often contribute to relevant course content when they visit classrooms or teach courses where the professional dimension is valued. Executive advisory boards representing regional firms have been instrumental in helping us lead educational change, thus strengthening our role in the educational marketplace.

Key firms, while located regionally, have taken our faculty and students

national and even global. The result has allowed us to expand our reach beyond the region in many powerful ways through international exchanges in both the educational and business sectors.

Regional schools are maturing. Our alumni base continues to grow and mature. Graduates are being promoted to higher levels of responsibility. It is no longer unusual for our graduates to assume the position of corporate CEO. The result of their successes is being reflected in greater affiliation with the school in terms of time, talent, and monetary gifts.

Successful market strategies and conditions are paying off. The success of regional schools is beginning to be reflected in public measurements. "Best Lists" publications in US NEWS, Computerworld, Business Week and other national magazines and journals are beginning to include our schools. This has occurred in both overall ratings of colleges and within academic areas.

Achievements reflect where we have been but there is plenty of room for growth. As the nation's major business schools have found, moving up comes with greater challenges and costs. Important basic issues and questions must be addressed in the near term.

The market for new faculty is becoming more competitive and costly. The number of doctoral graduates has decreased at precisely the time when many of our senior faculty are retiring. As the market has tightened, the cost of replacement faculty often exceeds the value of the retiree's income lines. The challenge is to continue to hire carefully and effectively in order to consolidate our gains in quality and stature. Increased enrollment and a fixed state budget also threatens the balance between reaching more students while continuing our intellectual contributions and professional activities.



State support for our institutions is unlikely to increase dramatically. The role of deans, administrators and faculty must include a marketing component along with more traditional roles. This new paradigm requires building a budget that includes more external dollars to supplement state support and tuition. The marketing component is also important to attract high-quality students and an engaged alumni base.

Technology is dramatically changing the way we interact with our learners. We have some major decisions to make in how we deliver our instruction, to whom we deliver it, and how we communicate with each other. Will we utilize web-based instruction to support our instruction, or will it become a new medium for instruction? Do we break out of our region through technology? Does the technical infrastructure support faculty instructional and research collaboration both within and outside the boundaries of the institution? It is obvious that as our schools become more complex and integrated within our region, we must find new ways to communicate with each other through such technologies as intranets and extranets.

The educational community is beginning to think of partnering. We need to dialog more openly with other universities to identify how we can work together. Our regions have become hotbeds of competition — national and international players, many of whom have more money and fewer curricular constraints in quickly delivering instruction. The issue of money, rapidity and reach often affect the quality of our educational programs as well. Subsequently, we are faced with the decision of whether to expand to new and more uncertain markets.

These challenges are intimidating but also exciting. Regional schools have carefully crafted their missions and most have developed strategic plans, including a strong measurement and feedback component. This activity will become ever more important in the years ahead. Strategic plans should be living, working documents supported by active involvement by students, faculty, business executive boards and other stakeholders. What started as a mandate will need to become a map to a successful future. Now is the time to act and commit to advance our role in our regions and beyond. ■

Facing the Future: Coping with Times of Change

Michael Sansolo
*Senior Vice President
Food Marketing Institute*

Perhaps the best way to describe the pace of change that industry faces today comes from Ernest Hemingway's novel "The Sun Also Rises." In one scene a character is asked how he managed to lose a considerable fortune. The character responds that he did it two ways: "gradually, then suddenly."

In a sense, that is how change hits us. Think about how many people you know who have cell phones. For years, we have seen more and more people using these devices. Then consider this: in 1999, nearly seventeen million Americans bought a cell phone, which averages out to one new cell phone every other second.

The food industry is in the throes of similar sweeping and fast moving change. A recent survey by the Food Marketing Institute found that nearly 60 percent of our retail and wholesale members saw their local market impacted by mergers and acquisitions during 1999. Mergers and acquisitions are not new, it is just the pace that seems so enhanced these days.

To offer a quick glimpse of these forces of change, let's consider a simple series of statistics and events and their impact on consumers and how the food industry serves them.

Where's the growth?

In the food industry, this has been the big question for most of the past fifteen years. Real sales or inflation adjusted sales have grown or declined slightly year after year thanks to slow population growth, increased eating away from home, and mounting competition for all of the traditional products in the supermarket. In many years the inflation adjusted growth figures for the \$450 billion industry, as tracked by our Food Industry Speaks reports, barely topped 0.5 percent.

(In truth, the trend altered slightly in 1999 as the industry posted some of its best growth figures of the decade. However, it is impossible to overlook the impact of Y2K and the extra stock-up shopping that consumers did for the problem that never materialized.)

The lack of growth has contributed to a massive remaking of the industry's competitive landscape.

One way to grow

The lack of growth has contributed to a massive remaking of the industry's competitive landscape. Mergers and acquisitions are nothing new to the industry, but the pace of consolidation and the scope of some of the deals grew significantly in just the past three years. The market share of the industry's largest companies best shows the pace of this activity. In 1994, Deloitte Consulting reports that the four largest food retailers accounted for 19 percent of sales; at the end of 1999, the top four account for 31 percent. The top eight now account for 46 percent, up from 31 percent five years ago.

One of the clear drivers of this change is the lack of easy growth in the market place. Minus that, companies have turned to mergers to enter new markets and build on their strengths. The impact of these acquisitions should leave two key thoughts with the entire industry.

First, the surviving companies of all this activity (and that includes some smaller companies also growing through mergers) is that the fittest usually win. In each of the past five years, the industry's post-tax net profit has exceeded the historic average, which means that the survivors are likely those making the best use of emerging technologies and other efficiency drivers.

Second, the trend is far from over. Every month brings some new stunning merger to the front pages of our newspapers. As I write this article, United and US Airways are working on the details of their proposed merger and food manufacturer consolidation is talked about daily. On the retail side, more mergers are always possible. The US food industry remains significantly less consolidated than nearly every country in Western Europe, so the potential for more mergers is very high.

New players keep coming

And all the growth will not come from traditional players. More than one-fourth of shoppers tell us they regularly buy supermarket type items from non-traditional competitors such as mass merchants, warehouse clubs, drug stores and others. Competition today is more varied and complex than ever and that is not going to change any time soon.

Again, a single statistic gives us pause. If Wall Street is a judge of potential (and we know it can be), the most valuable food retailers in the US at the beginning of this year were Wal-Mart and Amazon.com. We are not surprised by Wal-Mart topping the list. The Arkansas retailer is close behind Kroger in the battle for retail dominance in the food industry and continues to roll out stores and formats in search of more business. Amazon may be a surprise, but through its Homegrocer.com subsidiary, it is becoming part of our industry. The virtual bookseller has yet to produce a profit and the gyrations of the NASDAQ are impacting market value, yet we can not easily dismiss the potential power of the Internet market place.

Oh, that Internet!

Let's not dismiss anything about the Internet lightly. Again, a quick statistic: Newsweek Magazine reported recently that it took almost fifty years for 25 percent of the American population to use electricity. It took nearly thirty years for television to attract 25 percent of the country. The Internet reached 25 percent of the population in just over five years and the growth is still astounding.

In truth, we do not know what the full power of the Internet is. We do not know if, when, or how much money will be made in business-to-business or business-to-consumer, but we do know that we are seeing a revolution in the way we communicate, gather information and do so much more. The potential of the Internet is staggering and clearly we must find a way of making certain we harness whatever power we can.

While we are on this topic, let's challenge ourselves to make certain we respect the revolution that is going on here. I heard one very smart, well-respected CEO recently comment that he is now hooked up and getting e-mail. That is a great step, but would hardly seem like an achievement to any fifteen-year-old or even ten-year-old. This technology isn't for our kids, it's for all of us. We can not forget that.

It's not the economy, stupid

In the midst of all this change, the issues that drive consumers have shifted radically also. In 1992, candidate Bill Clinton was right to focus on the economy.

All the consumer studies (FMI Trends) we did showed that economic issues were the top concern for the population.

Today, we have a white-hot economy that, despite recent oil price hikes and the roller coaster ride of the stock market, continues to roll on. Consumers tell us the economy is no longer their issue. Today, the worry is about social issues and the breakdown of values in our society. As marketers who see the consumer weekly, the food industry must stay mindful of this. After all, if it concerns our shoppers, it must concern us.

Beyond the baby boom

...And because shoppers are so important, we have to stay up on all the demographic trends. Today, Americans are more diverse than ever.

Yet one group outnumbers them all. Since 1978, more than eighty million people have been born in this country. That's slightly more than were born in the post-war boom, which is frequently cited as causing so much change. These young people are growing up in different families, with different lifestyles and a completely different sense of the world. Few of them have personal memories of anything from the Soviet Union to Johnny Carson.

We have to recognize that this group will not want to eat, shop, cook, or work exactly the way their parents or grandparents did. As employers and as marketers we have to understand the nuances of this new market, to have any chance of winning them over. It's an enormous task.

What's for dinner?

For the food industry the biggest challenge may be winning back mealtime. This new generation has grown up in the era of eating out and it's hard to imagine them wanting to cook exactly the way their grandparents did thirty or forty years ago. There are two big concerns here. First, over the past thirty years, we have watched ongoing erosion in mealtime. In the early 1970s, US Government statistics showed that Americans spent two-thirds of their food dollars to eat at home. Today, we spend almost equal amounts eating at home or outside the home.

More troubling is that nearly 40 percent of the fifteen to twenty-four-year-old shoppers surveyed for FMI Trends this year say they eat their main meal of the day outside the home three or more times per week. That's double the percentage of all shoppers older than twenty-four! Winning back mealtime is going to take innovative solutions and we need them quickly.

So far, the retail food industry has produced only isolated successes in the battle for mealtime. As we move to the future we need to find new innovations to make shopping and cooking easier and eating more exciting. Like the Internet, this is an issue that cannot be ignored.

Help wanted

One of the big problems in building better customer service is finding anyone to deliver that service. The national unemployment rate currently sits at 3.9 percent, essentially the level at which new employees are impossible to find. In some local areas, the unemployment rate drops to around 2 percent and recruiting has become a non-stop job itself.

For our industry, we have to start by getting the word out to prospective employees that food industry jobs can be exciting and diverse. We need people with a wide range of skills and as an industry we offer a large amount of managerial responsibility in a significant number of jobs. The market for workers may be tough, but there is hope. Consider that of today's ninth grade class, only 26 percent will eventually earn four-year college degrees, according to a study by Cornell University. We are an industry with jobs and potential for those who get their degrees and those who do not, but we must do a better job of communicating those possibilities.

And once we get people, we have to work to keep them. Industry turnover rates remain extremely high, approaching 80 percent for part-time store workers, according to our FMI Speaks survey. Today's work force has new needs and values that are every bit as different from their parents as their eating habits. Again, we have to learn about these differences and learn to respect them if we are to succeed.

What you don't know can't help

Learning and respecting differences are extremely difficult if we do not know that differences exist. But they do and in very large ways. Many of you might be surprised to learn that radio stations geared to African-American audiences draw more listeners each day than country or talk formats. You might be surprised to learn of a recent Harvard University study suggesting that inner city markets hold significantly greater spending potential among consumers than wealthy suburbs.

As we hunt for ways to grow businesses we can not forget the parts of our communities that the same Harvard study says are vastly under-served and in need of retail development. Again, we have to think outside the box to look for new ideas and possibilities.

None of this will be easy. D&W Food Centers in Grand Rapids has begun an innovative and extremely challenging program to help teach its employees about the scope and breadth of racism in this country. It is an extremely difficult program to complete, but one that leaves attendees knowing so much more at the end. Likewise, expanding to new markets won't be easy, but based on the response of retailers who are doing it, the gains at the end more than justify the effort.

Is that your final answer?

New ideas can come from anywhere, as can new successes. We have to look no further to the single most popular television show in the US, "Who Wants to be a Millionaire?"

The idea actually came from a show in the United Kingdom, but the results are incredible. In one year, the show boosted ABC to the top of the ratings and has caused all other networks to program everything they do around it. It may not be the most clever show ever created and Regis Philbin may not be the most dynamic host, but you would be hard pressed to win that argument with the show's millions of loyal watchers.

For the retail industry, the lesson is clear. Let's look outside the usual sources for ideas. What other kinds of shopping trips or stores excite consumers? What web sites get us to visit them daily? What creative approaches might we take to find new success?

Let's consider what will really turn on shoppers and not dismiss any idea without carefully thinking about today's marketplace and what today's shoppers will really want. Remember that our shoppers do not live in a vacuum. They visit the mall, the Internet, watch television and movies, and draw experiences from a range of areas. What can we learn from them?

Most importantly, remember (despite what Regis says) there is no final answer. Change is a constant in this industry. As long as shopper's tastes and needs change; as long as competition evolves in new directions and with new players; as long as employees' goals change; and as long as technology keeps producing new tools and challenges, we must be prepared to change with it all. No matter what the speed.

For years we have watched our stores change. New products and departments are added constantly. Other sections are remade by the same changes. Today's supermarket may not look incredibly different from those we ran a week ago, but looks very different than a typical store did ten, twenty, or thirty years ago.

And keep in mind that at any point in the past, we would have looked at the pace of change and said it was coming two ways: quickly and very quickly. Today is no different; we just have to be prepared to act. Facing the future: coping with times of change. ■

About the Author

Michael Sansolo, Senior Vice President, Food Marketing Institute, oversees education, industry relations and research departments. The three departments produce nearly fifty educational conferences annually, a wide range of training and development materials, and numerous original research reports.

Sansolo works directly with FMI's board level Industry Relations and Independent Operator committees. He also chairs a special advisory committee of manufacturers and is on committees overseeing each of FMI's major conventions.

Best Practice Customer Value and Satisfaction Cultures

Michael S. Garver, *Central Michigan University*
Robert L. Cook, *Central Michigan University*

Abstract

To use customer value and satisfaction data effectively, the company culture must embrace, support, and encourage customer value and satisfaction initiatives. The purpose of this article is to discuss the nature of a customer value and satisfaction culture and to model how best practice companies transform their cultures. The research results make a contribution to the literature by revealing unique insights into the nature of a customer value and satisfaction culture and by offering practitioners a model of how to manage such a culture.

Introduction

In the face of intense global competition, many companies are implementing customer value and satisfaction strategies to retain customers, acquire new customers, and maintain a sustainable competitive advantage (Woodruff 1997). For decades, the marketing literature has discussed the importance of customer value and satisfaction and placed these constructs at the cornerstone of the marketing concept (Narver and Slater 1990; Levitt 1960).

Recognizing the importance of customer value and satisfaction, world-class companies measure and manage customer value and satisfaction as a key component of various business strategies (Gale 1994). Illustrating this point, TQM strategies revolve around the customers' requirements and their satisfaction relative to the competition, using these data to drive process improvements (Gale 1994). As a result, customer value and satisfaction research is the most prevalent type of research conducted by companies today (Oliver 1999).

Academic researchers have conducted a plethora of research studies examining customer value and satisfaction (Babin and Griffin 1998), yet these studies focus on conceptualizing, measuring, and testing theoretical models containing these constructs. While this research has built a solid foundation for understanding and measuring these important constructs, business practitioners now need help in using this data for internal decision making. Currently, only a handful of academic articles

While most practitioners collect customer value and satisfaction data, the real challenge is getting employees to use this data to drive continuous improvement.

address using customer value and satisfaction data (Mentzer, Bienstock, and Kahn 1995). While most practitioners collect customer value and satisfaction data, the real challenge is getting employees to use this data to drive continuous improvement. At a recent practitioner conference, the following comments were expressed by participants:

"We have all this information, now what do we do with this information?"

"We get these great reports on customer satisfaction, but they sit and collect dust!"

While there are many potential roadblocks to effectively using customer value and satisfaction data, company culture may be the most important (Webster 1994). Organizational culture has been shown to have a dramatic impact on implementing strategy (Frankwick, Ward, Hutt, and Reingen 1994), getting employees to engage in desired behaviors (Baker and Sinkula 1999); and overall business performance (Appiah-Adu and Singh 1999; Hauser and Dellena 2000; Narver and Slater 1990). Marketing researchers generally define organizational culture as the pattern of shared values and beliefs that help individuals understand organizational functioning and thus provide them with the norms for behavior in the organization (Deshpande, Farley, and Webster 1993). Today, most research on marketing culture falls under the domain of market orientation (Hooley, Lynch, and Shepherd 1990; Han, Namwoon, and Rajendra 1998).

This article is the result of a research study examining best practice customer value and satisfaction programs. This article will explore the following two research questions:

1. What is the nature of a customer value and satisfaction (CVS) culture?
2. How do best practice companies transform and manage their cultures?

To answer these questions, the following steps will be taken. First, the research methodology will be discussed. Subsequently, for each research question, a literature review will be presented followed by qualitative research results. Research results will then be compared to the literature, and research propositions will be offered. Finally, managerial implications, research limitations, and future research will be discussed.

Methodology

We chose qualitative research to explore this phenomenon because it allows new concepts and theories to emerge from the data (Deshpande 1983; Bononma 1985). Even as research matures, qualitative research is a valuable tool to confirm, contrast, and contribute unique findings to the literature (Fournier and Mick 1999). This section discusses: 1) selecting a sample of best practice companies, 2) collecting qualitative data, 3) analyzing qualitative data, and 4) testing for data and interpretation quality.

Best Practice Companies Sample

Best practice companies were selected on the following criteria:

- The company has won a quality award.
- The company has been discussed as a best practice company in a respected publication.
- The company has presented a best practice at a CVS practitioner conference.
- The company is respected as a leading edge company.
- From the researcher's perspective, the company has best practice characteristics (innovative, unique, high data utilization rates, culture, etc.).

Each company selected for this study meets at least three of the criteria, and most meet all five criteria, resulting in nine best practice companies included in the study.

Data Collection and Analysis

To collect data for this study, in-depth interviews were conducted with the person in each company responsible for leading and managing the collection, analysis, and use of CVS data. Often, participants had titles such as Director of Customer Satisfaction, Vice President of Quality, or Manager of Customer Loyalty. Most interviews were conducted at the participant's workplace to preserve the context, yet other interviews were conducted over the phone because of the participant's location.

Interviews began with general background questions, followed by open-ended questions. The goal was to allow participants to tell their story from their own perspective. Probing questions were used to clarify responses and to dig deeper into the participant's thought processes. Interviews ranged from 1.5 to 2.5 hours, and all interviews were audio-taped and transcribed.

Grounded theory analysis techniques—open and axial coding—were used to analyze the data. Grounded theory analysis techniques use a systematic set of procedures to develop constructs, themes, and theoretical models (Strauss and Corbin 1990). Grounded theory is quickly gaining acceptance as a rigorous approach to qualitative research (Weitz and Jap 1995).

Open coding is an analysis technique where the researcher breaks apart qualitative data to assess its characteristics, properties, and conceptual dimensions (Strauss and Corbin 1990). Open coding techniques were employed with the raw data to discover the nature of a CVS culture and how participants manage these cultures. At first, the analysis was conducted at a holistic level, followed by analysis at more specific and detailed levels.

Axial coding focuses on developing relationships between different constructs developed from open coding (Strauss and Corbin 1990). The researcher developed working hypotheses between constructs, particularly those constructs influencing the development of a CVS culture. Negative case analysis was used within and across interview transcripts, attempting to find evidence to disconfirm working hypotheses. If the proposed hypothesis holds, then there is stronger evidence for this relationship. The result is a theory that is grounded in data.

Assessing Trustworthiness of Qualitative Research

In qualitative studies, it is important to ensure data quality and interpretations. To assess the trustworthiness of the data and analysis, we applied a framework proposed by Lincoln and Guba (1985). In this framework, different techniques were employed to ensure and test for 1) data integrity, 2) credibility, 3) dependability, and 4) confirmability (see Appendix 1).

Concerning analysis techniques used to ensure trustworthiness in the findings, the interviewer first promised to safeguard participant identities. From the nature of their candid statements, participants seemed quite comfortable discussing important issues. Next, triangulation across sources was used to test for redundant results, ensuring that findings did not come from a single participant, but instead from the majority of participants. Each participant discussed the nature and importance of culture, and their attempts to manage this culture.

Negative case analysis is at the heart of the constant comparative process from grounded theory and was used in all data analysis activities (Glaser and Strauss 1967). This process was also used in conjunction with theoretical

sensitivity, a technique that uses familiarity with the literature to help researchers become more exacting in their analysis. Once preliminary findings were generated, a confirmability audit was conducted with an independent auditor. The auditor was given several transcripts and the preliminary findings, and assessed whether or not the findings were represented in the data. The auditor confirmed the researcher's conceptualization. Finally, member checks with a subset of participants were conducted. The researcher provided a subset of participants with preliminary findings and they confirmed the results as valid.

Literature Review and Research Results

In this section, a literature review for each research question will be presented, followed by qualitative research results and a comparison to the literature. To give the reader more insight into the qualitative results, actual participant quotes will be presented in italics.

Market Orientation Frameworks

As discussed earlier, little research attention has been devoted to the understanding and use of CVS data. While no research explicitly explores a CVS culture, research on market orientation cultures is related and will be used as a theoretical foundation.

Kohli and Jaworski (1990) put forth a model of market orientation that has inspired a stream of research. They conceptualize market orientation as 1) intelligence generation, 2) intelligence dissemination, and 3) responsiveness. Intelligence generation refers to collecting market data about customers, competitors, supply chains, and exogenous market factors, with particular attention paid to customers and competitors (Narver and Slater 1990). While CVS data is the cornerstone of intelligence generation (Narver and Slater 1990) and the most common type of research (Oliver 1999), collecting CVS data is only a portion of market orientation data.

Intelligence dissemination is the communication and distribution of this data to all employees in the organization. Because cross-functional cooperation is an important aspect of market oriented companies (Narver and Slater 1990), all processes and functions (manufacturing, logistics, sales, etc.) must receive market information to react to a changing marketplace. Additionally, intelligence dissemination includes all interpersonal and system-wide communication strategies which may be used "to sell" this data to different functional areas.

Responsiveness is organizational action based on intelligence generation and dissemination. Responsiveness is the implementation and use of market information in all internal activities and decision making. This dimension is similar to cross-functional integration, put forth by Narver and Slater (1990). This concept suggests that employees from different functions work in teams,

using market data to design and improve core business processes.

The conceptualization put forth by Kohli and Jaworski (1990) is defined solely as behavioral activities. In contrast, other researchers argue for attitudinal components of market orientation, conceptualizing it as a corporate philosophy of how to conduct business (Han, Namwoon, and Srivastava 1998; Drucker 1954). For example, Deshpande, Farley, and Webster (1993) draw comparisons of culture to market orientation, yet they define culture as shared beliefs and values. In addition, Avlonitis and Gounaris (1997) argue that market orientation may be a combination of both attitudes and behavior, with attitudes guiding these behaviors. The market orientation literature is maturing, yet debate still surrounds the conceptualization of a market orientation, with researchers taking two different approaches – a behavioral approach or an attitudinal approach (Avlonitis and Gounaris 1997).

Customer Value and Satisfaction Culture

Our data suggests that the importance of a CVS culture cannot be overstated, because it dramatically affects the actual use of CVS data. Clearly, if the culture does not embrace, support, and encourage the use of CVS data, then internal employees will not use CVS data and research efforts to collect CVS data are essentially wasted. Data from this study show that culture is the lens through which people see, understand, and react to their world. Corporate culture tells employees what aspects of their world are important, what data are valuable, and what behaviors are expected. Building from previous research (Deshpande and Webster 1989; Kohli and Jaworski 1990), our data suggests that a CVS culture is a shared set of attitudes, values, beliefs, knowledge, and behaviors that help focus employees on the importance of listening to, understanding, and using CVS data.

The data revealed that a CVS culture includes the following four dimensions: 1) employees throughout the organization realize the importance of CVS data, 2) employees have the desire, ability, tools, and regularly listen to customers, 3) employees have the desire, ability, and actually conduct behaviors to understand CVS data, and 4) employees have the desire, ability, and actually conduct behaviors that utilize CVS data for internal decision making. Our data reveals that a CVS culture consists of both attitudes and behaviors, a finding which is in contrast to most market orientation frameworks. The following excerpts were typical of participants and reveal important themes of a CVS culture:

"We have a strong interest in a customer intense culture, a strong focus on customer intensity. So that means that the goal is to create customer intensity everywhere. You have to get people really thinking about it and we have always been known for high

quality and really good customer service, but it really goes beyond that. It is a strong focus on the customer. Really listening to the customer. Taking that customer feedback, turning that data into information, and integrating it into the decision making."

"It's all about getting our employees to realize that our customer satisfaction data is just as important as our financial data, because it will affect our financial outlook down the road. From there, its getting feedback from our customers, making sense of this feedback, and leveraging this information throughout our organization to improve."

Importance of CVS Data. In a CVS culture, employees believe that satisfying the customer is essential for business success. Our data suggests that best practice cultures believe that CVS is an early indicator of future financial performance and competitive advantage. Interviews revealed that employees are overwhelmed with information from many different sources. Culture guides employees through this sea of information and suggests the relative importance of different data. What data is essential, nice to have, or not that important? In best practice companies, culture mandates the continual monitoring of CVS data and integrating this data into decision making. Employees focus on CVS data in equal proportion to internal quality, productivity, and financial measures.

While getting employees to recognize the importance of CVS data may be assumed in other market orientation frameworks, its relative importance is not discussed. We make this fundamental belief explicit because participants told us that their biggest challenge is getting internal employees to adopt the beliefs that CVS data is critically important to the future financial success of the organization.

Listening to Customers. In today's business environment, many companies state the importance of CVS and being customer focused, yet results suggest that firms cannot be customer focused unless they systematically listen to customers by collecting CVS data. Listening to customers includes both the systematic collection and distribution of CVS data to all employees.

In contrast to the literature, our data suggests that data collection and dissemination should be conceptualized as one construct. Why? In leading edge companies, collecting CVS data is outsourced to third party marketing research firms. This is done for many reasons (objectivity, experience, expertise, etc.), yet from the firm's perspective, data collection is rarely seen. When employees listen to customers, the data has already been collected and they access this data from their information system or intranet site. Thus, collection and dissemina-

tion of this data occurs simultaneously, especially when internet technologies are used to capture data.

Concerning the collection of data, best practice companies use an arsenal of qualitative and quantitative research tools that allow employees to "listen to customers" on a systematic basis. For example, participants use a wide variety of different CVS survey instruments such as critical incident surveys, relationship surveys, benchmark surveys, won-lost and why surveys, lifecycle surveys, and customer contact surveys. Qualitative tools include focus groups, in-depth interviews, customer visits, and participant observation. While this topic is beyond the scope of this paper, future research needs to explore the use of customer listening tools by companies.

...the days of developing and distributing reports are long gone. ...information systems or intranet sites are used to distribute on-line reports and raw data for specific analysis.

Concerning dissemination, the days of developing and distributing reports are long gone. Instead, information systems or intranet sites are used to distribute on-line reports and raw data for specific analysis. The following quote illustrates this point:

"Every employee in our organization has access to this information, it comes in the form of an overall report and in raw data form, so that later they can analyze this data however they want. This is key to our program and getting people to use this data."

It is critical that employees have access to CVS data that is under their direct control. For example, a logistics manager on the East Coast may not be concerned about worldwide CVS results. However, this same manager tends to be very interested in data about his/her responsibilities. Employees' ability to "drill down" to relevant data makes the data actionable and more meaningful. One participant stated,

"We are then slicing it in such a way, so that the guy that is out in the field in the sales office in France or the guy that is working a factory in Belgium can actually get data that is meaningful to him and he can do something with it."

In contrast to Kohli and Jaworski (1990), our data revealed that collection of CVS data is not the responsibility of the entire company. Instead, primary responsibility for collecting CVS data often falls under an independent function (e.g., customer satisfaction), or under the responsibility of traditional functions such as quality,

marketing, or marketing research. In all but one company, the actual collection of CVS data was contracted out to a third party.

Understanding CVS Data. Throughout the interviews, participants often stated that, “employees must be able to understand customer data and turn that data into information.” Participants discussed that employees must “internalize the customer” and “see managerial issues from the customer’s perspective.” Regardless of being readily available, if the data is not analyzed nor fully understood, then it cannot be effectively used to drive continuous improvement. Understanding CVS data is a key dimension of a CVS culture, one that is difficult to obtain.

Our data suggests that employees use various analysis tools and techniques. For example, participants all discussed many different analyses including quadrant analysis, relative importance analysis, relative performance analysis, trend analysis, verbatim analysis, and segmentation analysis. While an in-depth discussion of analysis is beyond the scope of this article, these analyses were conducted at both an aggregate and “drill down” level. Despite its importance in our data, understanding CVS data is absent from most frameworks of market orientation (Narver and Slater 1990; Kohli and Jaworski 1990). Only Wrenn (1997) discusses the importance of understanding data in his conceptualization of market orientation. Our interviews revealed that employees have access to large amounts of data, yet may understand only a small portion of this data. Furthermore, many employees may lack the skills necessary to turn data into information. Without fully understanding CVS data, decision making is limited.

Using CVS Data for Internal Decision Making. Interviews revealed that the real payoff of CVS programs is when employees use CVS data to drive process improvements. In CVS cultures, employees have a strong desire, ability, and actually use CVS information to improve company performance. In these cultures, employees use CVS data to guide decision making, knowing exactly how they create value and satisfaction for the customer. Furthermore, employees are continuously examining CVS data, looking for ways to improve their process performance. One participant said,

“Using the data is where the rubber hits the road, the real payoff of this stuff, yet most companies tend to stop at data collection.”

Consistent with the extant research, using or responding to data is what drives competitive advantage. Our findings confirm Narver and Slater’s (1990) research, suggesting that cross-functional teams and a process orientation are critical to using to CVS data. Best practice

companies are process oriented and often use cross-functional teams to refine core processes and CVS data is used to identify problems and guide process improvements.

Antecedents to a CVS Culture and Market Orientation

The vast majority of research has focused on the link between market orientation and performance (Wrenn 1997), with little research focusing on how to manage or specifically develop a market orientation within the company to achieve superior performance (Han, Namwoon, and Srivastava 1998). Wrenn (1997) summarizes the existing research on market orientation, yet strategies to transform this culture are not even included in his framework. To fill this gap, our focus turns to review antecedents to a market orientation.

In their original model, Kohli and Jaworski (1990) examined antecedents to the development of a market orientation. They discussed that senior management can have a dramatic impact on shaping organizational values that are central to a marketing culture (Webster 1994). Researchers have long discussed the dramatic impact executive level attention and scrutiny can have on implementing various business strategies (Argyris 1966). Levitt (1969) discussed the importance of “signaling behavior,” noting that employees often pay more attention to executive behaviors than to their spoken words.

In addition to executives, researchers have discussed other roles that are critical in influencing change and cultural transformations (Whiteley 1991; Hammer and Champy 1993). These roles focus on the leadership of a process owner who is responsible for the design, development, and implementation of his/her process.

While organizational systems may include many different variables (departmentalization, formalization, centralization, etc.), market-based reward systems may be the most important (Kohli and Jaworski 1990). Measurement and reward systems have long been thought to shape both desirable and undesirable behaviors in employees. Market-based measures, evaluations, and rewards are proposed to significantly influence the development of market orientation (Kohli and Jaworski 1990).

Finally, researchers have noted the importance of research expertise and quality. Clearly, the more expertise associated with the research, the higher its utilization (Deshpande 1982).

Research Propositions

Our data revealed interesting strategies that positively influence a CVS focused culture. Customer champions and executives influence culture directly, and by designing and implementing these strategies.

Customer Champions

Our analysis showed that successful CVS programs have strong customer champions. Customer champions

are defined as individuals in the organization who design, develop, and lead the firm's CVS program. Customer champions not only direct the collection of CVS data, but they enhance the understanding and use of CVS data for internal decision making. They are process owners of a CVS program, having a direct effect on the company culture, as well as an indirect effect through implementing various CVS strategies for transforming culture (see Figure 1). Champions see themselves as customer advocates who represent the customer inside the organization. Being a champion is part of their responsibilities, yet successful champions are passionate about bringing the voice of the customer inside their firms. Being an agent of change, customer champions are continually selling the importance of listening to customers, understanding customers, and using CVS data for internal decision making. Participants said,

"I'm an advocate of the customer, I represent them inside the organization, in every meeting I attend!"

"You have to understand your culture and how you implement change within your culture because if you are doing this new, it is change and people by human nature are normally resistant to change."

Executive Support, Intensity, and Persistence

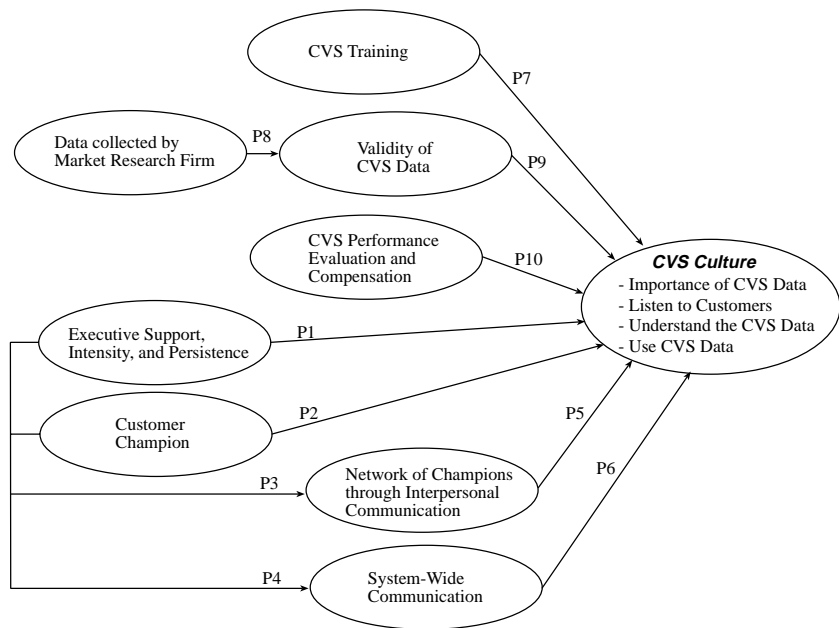
To transform the company culture, our analysis revealed that executive level support, intensity, and persistence are critical (see Figure 1). Although spoken words are important, executive actions have the greatest impact on transforming culture. Participants said,

"The thing that most people will say is if you are trying to put a program like this in place in a company, is that the first thing you have to have is buy in from the CEO. And if you don't have that, it's an uphill battle. I do have to say that the support that we have from the CEO's office is genuine, and that has really kind of paved the way."

"Most executives agree that a customer focus is important, but do they walk the talk?"

Executive level support, intensity, and persistence are characterized by the following questions:

Figure 1
Developing a Customer Value and Satisfaction (CVS) Culture



Note: Correlation between independent variables are not shown in this figure.
*P1– P10= Research Propositions

- Do executives say CVS is important, or do they act in a way that “signals” its importance?
- Do executives persistently focus on CVS issues, or do they treat CVS as the latest fad?
- Do executives intensely question CVS results?
- Do executives proactively search and ask for solutions to CVS problems?
- Do executives give CVS results the same amount of time and scrutiny as financial results?
- Is CVS first or last on the executive meeting agenda?
- Do executives support CVS issues with adequate resources?
- Do executives view initiatives for their CVS ROI as well as their financial ROI?
- Do executives act on fixing CVS problems or seizing CVS opportunities?

Similar to the literature, our data confirms the importance of executive level support, intensity, and persistence (Hammer and Champy 1993). In particular, signaling behaviors were discussed as particularly important to influencing culture (Argyris 1966; Levitt 1960). Our conceptualization of a customer champion is relatively new to the literature. Whiteley (1991) implicitly discussed customer champions and their ineffectiveness as a reason why customer focus strategies fail. From these findings, the following propositions are put forth:

P1: Executive support, intensity, and persistence has a positive influence on a CVS culture.

P2: An effective customer champion has a positive influence on a CVS culture.

Strategies Employed by Customer Champions and Executives

Executives and customer champions have a direct influence on changing company culture, yet they also have an indirect influence on company culture by developing and implementing various CVS strategic initiatives (see Figure 1). The following CVS initiatives have a positive influence on transforming culture: building a network of customer champions through interpersonal communication, communicating CVS issues and results system-wide throughout the organization, implementing CVS training programs, establishing the validity of their CVS program, and evaluating and compensating CVS performance.

Building a Network of Customer. Particularly with new CVS programs, best practice companies know the importance of building a network of customer champions. Whereas the customer champion is responsible for the CVS program, our data suggests that a network of champions is defined as a group of key internal players (opinion leaders in the organization) from various functional areas, processes, and managerial levels who help support and transform a CVS culture. In one company, a customer champion and an executive spent months building their network of champions through one-to-one meetings, group discussions, and informal conversations. Once developed, the network of champions helped transform the culture. Another participant stated,

“How do we get buy in and with whom do we have to talk to? The communications development was very critical. Who needs to have buy-in for this process for it to work? It was all the different levels of people that work for the company, cross functionally. Who do we really need to talk with to get people on board?”

To build a network of champions, our data suggests that customer champions position CVS data as a complement to other managerial tools, tie CVS to other strategic initiatives, communicate the value of CVS tools, and engage in two-way communication. Champions, who position CVS as a complement and not a replacement to other managerial tools, are often successful in gaining the buy-in of key internal employees. One participant said,

“It is just now they are looking at different data about the dealership. That is how we try to position it. When you are evaluating your business, you get reports from all aspects of your business. You look at your new car sales, parts, service, etc. All we are saying to you is that there is just another piece to the mix, and that it is

what the people who do business with you are saying about us.”

Additionally, many participants discussed tying CVS initiatives in with other strategic initiatives to gather individual support. In one situation, key players were not “buying in” to the program. As soon as the champion articulated how the CVS program would enhance their ability to meet their functional goals, these key employees became champions of the program.

Each interviewee stressed that showing the value of CVS data and tools is absolutely critical. Participants discussed the value of CVS data and tools, including:

- CVS is a diagnostic, continuous improvement tool.
- CVS is a predictive tool and early indicator of future business performance.
- CVS is a tool for understanding customers.
- CVS is a tool for growing the business.
- CVS is a tool for recognizing people who excel at taking care of customers, and NOT a tool for punishing people.

“There’s the old cliché ‘What’s in it for me?’ You really have to be able to show everybody what is in it for them and this is something that we are still hacking through here. When you start to get down into the second or third tier of management, these people really need to be convinced that what you are doing has a benefit to them and a benefit to the customers. Realizing, obviously, if they don’t believe in this or understand the value of it they’re not going to use any of the data.”

Participants stressed that successful customer champions believe in two-way communication and listening to internal customers. When launching a new program, champions elicit feedback from key internal employees, allowing them to help develop and become part of the program. Getting their feedback on the front end, helps improve the CVS program and obtains buy-in of key internal players. Once CVS programs are up and running, champions continually elicit feedback, continuously looking for ways to improve. One participant stated,

“We are in an environment where people give a lot of input into different things. So you have to understand what their needs are and you have to really listen to what they are saying because people are not very straight-forward with what they are trying to say. You have to learn how to really listen to people and that will help you get them on board.”

System-Wide Communications to the Organization

To influence the company culture, best practice companies know the importance of system-wide communication for keeping CVS “top of mind.” To accomplish

this goal, system-wide communication includes using a variety of mediums, developing CVS mission statements, and sharing success stories. Our data revealed that best practice companies keep employees ever mindful of CVS by using various communication tools (intranet, meetings, newsletters, e-mail, etc.) to frequently communicate the importance of CVS, along with CVS opportunities. Communication through different media is an effective strategy for influencing company culture (see Figure 1). One best practice company uses the following communication tools:

- a CVS feature in the company's monthly newsletter,
- monthly CVS meetings,
- a video series featuring the importance of CVS along with CVS results,
- multi-media communication tools to discuss CVS results,
- regular e-mail communication about CVS, and
- access to CVS data in the company's information system (7 days a week, 24 hours a day), located next to other important data (internal quality, financial results, etc.).

Mission Statements. One participant wrote out a detailed mission statement for their CVS program. Her mission statement addressed the following questions: "Why is a CVS program important?" "How would the data be collected?" "How would the data be analyzed?" "How would this information identify continuous improvement efforts?" "How would the program unfold?" Once the mission statement was clearly articulated, she shared her mission statement with key players, helping her to gain buy-in and to transform the company culture. In addition to the mission statement being a great sales tool, it helped her to clarify CVS issues and to form persuasive arguments for the merit of her CVS program. This participant stated,

"Did you see the movie, Jerry McGuire? You know at the beginning of the movie he puts together that mission statement. That is exactly what I feel like. I put together this big mission statement on why we needed to have a program. What we really need to be looking at as far as satisfaction, loyalty, and re-purchasing is how it could impact our bottom line. Then I outlined a type of program and first steps and kind of incorporating that into the company. I tried to make sure that all the key players were aware of what was going on and why we were doing it. So I took it to the president of sales, the president of HR, even the CFO."

Sharing Success Stories. Most participants discussed sharing success stories as an effective tool to help transform culture. Resistance to CVS programs seems to

crumble when outside success stories from respected companies are brought into the organization. Employees "buy in" when respected companies have broken new ground and have been successful. Outside experts such as respected consultants, speakers, or academic researchers may be more successful than internal managers in selling the value of CVS programs. Sharing success stories are especially effective if they are recognized and praised by high-level executives. One participant stated,

"So I think that we have a long way to go in publicizing our success, but that seems to be the best way to get people on board."

Communication to influence values, beliefs, and behaviors is not particularly new or groundbreaking, yet communication strategies as an antecedent to the market orientation is in contrast to the literature. Communication is conceptualized as part of intelligence dissemination in market orientation frameworks (Kohli and Jaworski 1990). Yet our data revealed distinct differences to this model. Our data revealed that dissemination of data through corporate information systems was part of a CVS culture, and communication strategies are antecedents that influence a CVS culture. Findings from this study view communication as a change management tool, one that persuades employees about the importance of listening to, understanding, and using CVS data. The following propositions are put forth:

- P3: Interpersonal communication strategies used by executives and customer champions influence the development of a network of champions.
- P4: Executives and customer champions develop and implement system-wide communication strategies.
- P5: A network of champions will positively influence a CVS culture.
- P6: System-wide communication strategies will positively influence a CVS culture.

CVS Training

One participant stated, "People resist what they don't understand." Training is an effective tool used by customer champions to educate employees on the importance of CVS, the validity of the company's CVS program, and how to listen to, understand, and use CVS data for decision making. Although CVS training will have many benefits to the company, training is a tool to help educate employees and transform the company culture. Training programs should clearly influence employee attitudes, beliefs, values, skills, and behaviors.

The importance of training programs in fields such as personal selling is well developed in the literature (Ingram and Laforge 1996), yet examination of training on research utilization and market orientation is non-

existent. Our data revealed that training programs are an essential tool to change beliefs and teach behaviors, suggesting the following proposition.

P7: CVS training programs positively influence a CVS culture.

Validity of the CVS Program

Demonstrating and communicating the validity of CVS data is critical to transforming culture. As stated by one participant, *“If employees believe in the validity of the data, then they are more likely to buy into the program and use the information.”* In some companies, displaying the statistical validity of CVS data is a major hurdle. Employees need to believe that valid, scientific methods are behind the firm’s CVS program. One participant stated,

“So we wanted to make sure that we had a good cross section, statistically valid samples from those areas and then in our calculations. Then we could get the divisions to agree on it. One of the biggest bumps was getting them all to agree to put their skin in the game and to make everybody comfortable that the numbers are statistically sound and valid.”

Similar to nomological validity, culture is enhanced when a strong relationship is shown between CVS data and other traditional performance measures (revenue, profit, market share, etc.). In one company, a strong linkage between CVS results and market share was discovered, turning a “wavering executive” into a passionate CVS advocate. Another participant stated,

“When you can’t really align and show people quantitatively that customer satisfaction equals financial results, then I think people get a disconnect.”

As stated by most participants, internal employees have more confidence in CVS data when data collection is performed by an objective marketing research firm. CVS programs have more perceived validity when a third party collects the data. The impact of perceived data validity on culture is critically important, confirming findings from the research utilization literature (Deshpande 1982). Besides their perceived expertise in research methods, objective third parties presumably collect data that is free from managerial bias, greatly influencing perceptions of valid, scientific data. Our data suggest the following propositions:

P8: Using market research firms to collect CVS data influence employee perceptions of CVS data validity.

P9: The perceived validity of CVS data will positively influence a CVS culture.

Evaluating and Compensating CVS Performance

Evidence from this study reveals that performance evaluation and compensation structures have a direct influence on company culture (see Figure 1). Evaluating and rewarding employees on CVS performance sends a clear message, that “CVS is important.” Our data show that evaluating and compensating CVS performance clearly motivates and focuses employees on CVS issues and opportunities. Employees often resist CVS programs, yet tying performance evaluations and variable compensation to CVS results tends to shift the focus from resisting the data to learning how to use the data to achieve their targets.

Most companies tie, or are in the process of tying, variable compensation to CVS results. In fact, between 20 percent and 35 percent of variable compensation is attributed to CVS performance. The key point is that all employees need to be responsible for CVS performance and that compensating the fulfillment of CVS targets motivates and focuses employees toward important objectives. If variable compensation is tied to non-CVS targets (i.e., financial performance), then it is imperative that variable compensation also be tied to CVS performance.

“What has happened in the past is that right up until about two years ago all of the salespeople were compensated only on sales volume and market share. When you try to introduce a customer measurement in there that does not directly compute with sales volume and market share, everybody would say, ‘Yeh, yeh, yeh, customer satisfaction is good, but none the less, when it came right down to the wire, everybody just looked at pushing that equipment through the supply chain. They didn’t worry about their satisfaction very much. One of the things that people will say a lot is that this process has got to be tied to compensation in some way and it is true.”

This study also suggests that the firm’s culture and business environment be assessed when determining whether or not to compensate employees on CVS results. In one company, compensating CVS performance led to game playing and data manipulation by its dealer network and salespeople. In this scenario, compensating CVS performance jeopardized data quality. This company abolished its CVS compensation plan and now relies on other strategies to influence culture and to keep employees focused on CVS data.

Consistent with our findings, evaluation and compensation have been identified as positively influencing culture (Kohli and Jaworski 1990). Because organizations reward desired outcomes and behaviors, evaluating and rewarding CVS performance “signals” to employees that a CVS program is important. These findings suggest the following proposition:

P10: Evaluating and compensating employees on CVS performance will positively influence a CVS culture.

Practitioner Implications

This article offers practitioners new insights about managing a CVS culture. The conceptualization and model help practitioners fully understand a CVS culture, and how to manage and influence this culture. Consistent with the literature, CVS cultures are best conceptualized in varying degrees instead of dichotomous in nature (Kohli and Jaworski 1990). All participants discussed the never-ending journey of managing a CVS culture, noting that culture can always improve. In order to improve, practitioners need to understand their current situation. How strong is the current culture and how can it improve? To assess a CVS culture, it should be measured and compared to the findings put forth in this study (i.e., a CVS audit). Because of managerial biases, one best practice company uses an independent auditing team to assess current strengths and weaknesses of their CVS program and culture. Once strengths and weaknesses are identified, initiatives can be developed to improve the CVS program and culture. Just as practitioners use CVS data to improve performance with customers, CVS audits can use internal customer data to improve the culture and overall CVS program. Future research needs to put forth a methodology for conducting CVS audits as well as their current use and benefits.

Limitations, Future Research, and Conclusions

As in any research, this study has limitations that must be overcome in future research. First, the research findings are based primarily on participants' verbal reports, which are known to possess certain limitations. These limitations are most likely in the form of articulation difficulties, social desirability, and memory recall bias. Additionally, verbal reports were coded and interpreted using researcher judgment. Although grounded theory techniques are designed to limit researcher bias, some bias may creep into the results. While the researcher has confidence in the results, future research needs to overcome these limitations.

Future research should quantitatively examine the constructs and propositions put forth in this article. Developing valid measurement scales and statistically testing the model is a logical extension of this study. Structural equation modeling is an ideal statistical technique to validate constructs and test the theoretical model put forth in Figure 1.

Future research could also further examine different dimensions of a CVS culture. For example, how do companies listen to their customers? How do best practice companies analyze CVS data to get maximum understanding and knowledge from their data? How do companies identify continuous improvement opportunities? How do best practice companies respond to or use CVS data to drive process improvements?

Additionally, future research could examine the antecedents to a CVS culture in more depth. For example, how are best practice training programs structured and implemented? How do best practice companies evaluate and reward CVS performance? What skills are required of successful customer champions? How are information systems structured to disseminate and analyze CVS data? Future research in these areas could be very helpful to CVS practitioners.

In conclusion, researchers have paid little attention to using CVS data in practice. This study examines a CVS culture, a key component in getting employees to listen, understand, and utilize CVS data. Future research needs to focus on how practitioners can better utilize CVS data to drive continuous improvement and competitive advantage. ■

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Appendix 1 Summary of Trustworthiness Analyses

Category	Techniques	Result
Data Integrity - How do we know whether the findings are based on false information from the informants?	Safeguarding Participant Identities Triangulation across Participants	Participants had the psychological freedom to discuss a wide range of possibly sensitive issues. Researcher looked for redundant results across participants.
Credibility - How do we know whether or not to have confidence in the findings?	Negative Case Analysis	A process used throughout data analysis that stringently tests working hypotheses identified in the data.
Dependability - How do we limit interpretation instability?	Member Checks	A subset of participants was presented with preliminary findings from the study to make sure that the researcher's interpretation was reasonable.
Confirmability - How do we know the degree to which the findings emerge from the context and the participants and not solely from the researcher?	Confirmability Audit	Independent auditors examined both the data (i.e., transcripts) and preliminary findings communicated in a rough draft.

Advanced Manufacturing Technology Investment Patterns

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Abstract

This study presents a longitudinal analysis of patterns of investment in advanced manufacturing technologies (AMT) and financial performance. Investments in AMT from fifty manufacturing plants in the metalworking industries are examined. Data was collected via mail surveys administered to fifty manufacturing plants at three separate data collection times: 1994, 1996, and 1998. This study seeks to fill a void in the area of technology management, which is comprised primarily of cross-sectional studies that do not address the dynamic nature of investments in technology. The results suggest differences in the evolutionary profile of several technologies, including e-mail, bar coding, robotics, and computer aided design. Further tests indicate that there is a positive relationship between many of these technologies and plant financial performance. Finally, the longitudinal data suggest that there is approximately a two-year time lag between investment in technology and performance improvements.

Introduction

Researchers have portrayed the factory of the future as based on AMTs and the economies of scope they engender: paperless, almost workerless, and possessing the ability to produce a large variety of products cost effectively and in lot sizes as small as one (Goldhar and Jelinek 1983; and Nemetz and Fry 1988). Many companies are now achieving “factory of the future” type success. Allen-Bradley, Cummins Engine, and Ingersoll Milling are widely cited as classic examples of the ability of AMTs to revolutionize the ways in which products are manufactured (Lei and Goldhar 1991). Although these success stories provide powerful enticement to companies considering investments in new technologies, they also conceal the fact that there are more failures than successes in AMT implementation (Saraph and Sebastian 1992). Numerous explanations for such failures have been suggested. Many companies fail to develop leaner, more organic organizational structures (Snell and Dean 1992), while others employ poor operations strategies that focus

on low cost as the key strategic priority at the expense of flexibility or quality (Nemetz and Fry, 1988; Roth and Miller 1992).

Longitudinal research is important because one of the primary benefits of AMTs is their extreme flexibility.

While the bulk of research on AMTs has traditionally been based on anecdotal evidence or small sample sizes, more recent studies have provided evidence derived from larger, survey-based samples that AMTs are associated with improved performance (Boyer, Leong, Ward and Krajewski 1997; Ettl and Reza 1992). Unfortunately, the majority of studies in the AMT literature share two common methodological characteristics: (1) an emphasis on small sample, anecdotal data and (2) a cross-sectional approach (Boyer, Ward and Leong 1996). The paucity of large sample, survey-based studies limits the degree to which findings may be generalized, while the cross-sectional nature of these studies prevents researchers from gaining a true perspective on the evolution of AMTs. Numerous researchers have noted the need to perform longitudinal analyses of companies that invest in AMTs (Snell and Dean 1992; Swink and Way 1995; Boyer et al. 1997). Longitudinal research is important because one of the primary benefits of AMTs is their extreme flexibility. This flexibility allows these technologies to be used for a wider variety of products than more traditional, dedicated equipment. As a result, AMTs generally are expected to have a longer, useful lifespan because of the ease with which they can switch from one product to another. Furthermore, the greater complexity of control systems in AMTs suggests that a greater skill level is required to successfully tap the full benefits of these technologies (Adler 1986). The greater complexity suggests that adopters of AMTs may experience a time lag between adoption, skill development, and ultimate performance gains.

Despite the multitude of manufacturing plants that have implemented some form of AMT, there has been remarkably little research examining how investment in these technologies evolves over time. Thus, the objective of this research is to examine the development and evolutionary patterns of AMTs in a manner that builds on previous longitudinal studies.

Theoretical Framework

In contrast to earlier automation efforts that emphasized economies of scale, advanced manufacturing technologies and flexible automation incorporate economies of scope. As a result, automation based on flexible technologies no longer involves physically linking various centers. Instead, various technologies can now be linked together electronically. Thus, the manner in which investments in AMTs evolve can be expected to be radically different than the evolution of more traditional manufacturing technologies (Parthasarthy and Kotha 1995).

The empirical literature on AMTs has primarily examined how companies invest cross-sectionally, at one point in time, but has not investigated whether there is an ongoing stream of investments. Extant studies that have examined AMTs in a longitudinal manner fail to authoritatively analyze the nature of AMT evolution. First, Meredith and Vineyard (1993) offer a study that examines only three firms and only a single technology, flexible manufacturing systems (FMS). A principal finding of the study was that the ways in which the FMSs were used changed “dramatically over the study duration” (Meredith and Vineyard 1993, 22). The authors conclude that while the longitudinal study did expose some interesting findings involving the evolution and development of manufacturing strategy and investments in FMS, there is a need for further, broader-based research in the area of technology management. Second, Dean and Snell (1996) examine a larger number of firms, but their measure of AMT investment is unidimensional and their study does not examine how AMT investment evolves, only how it relates to manufacturing strategy and performance.

The current study builds on the results of Boyer (1999), that found evidence to support the incremental model of technological evolution. First, we examine investments in individual technologies. The technologies examined in this study include a range of well-developed technologies such as computer-aided design, robotics, Computerized Numerical Control (CNC) machine tools, etc. These technologies have been employed in a large number of manufacturing plants for over a decade. Table 2 shows the technologies examined in this study. Since there is no clear consensus, proposition 1 is stated in a null format: i.e., it states that there is no change in individual investments over the time period from 1994 to 1998.

Proposition 1: Investments in individual technologies do not change between 1994 and 1998.

While AMTs offer numerous benefits such as increased flexibility, greater control of processes, and faster throughput, the end goal is to achieve improved performance at the plant level. Numerous researchers suggest that investments in AMTs ultimately contribute to improved plant performance (Goldhar and Jelinek 1983; Lei, Hitt and Goldhar 1996). For this study, performance is measured at the plant level in terms of financial indicators such as profit and growth.

While AMTs are considered to offer numerous benefits, ...the end goal is to achieve improved performance at the plant level.

There are several logical reasons why the AMT-performance relationship should be examined longitudinally. First, AMTs are fairly complicated technologies that require a large amount of training to master. It is reasonable to expect that there is a learning curve associated with such technologies that hinders the immediate realization of performance gains following their installation. Second, it is conceivable that there is a lag period during which old products are cleared out of the system. Third, organizations that replace workers with AMTs may not immediately realize performance improvements due to the initial costs associated with downsizing the workforce. We therefore examine the following proposition:

Proposition 2: Investments in AMTs are positively related to performance improvements at the plant level. The timing of performance improvements as a result of AMT investments is likely to be delayed.

Methods—Data Collection

The first round of data collection occurred during the first half of 1994. A second round of data collection was conducted during the first three months of 1996. This second round of data collection involved only those manufacturing plants that participated in the earlier survey. Therefore, the 1996 sample is a subset of the 1994 sample. Finally, a third round of data collection was conducted in January, 1998. This effort involved contacting the companies that participated in 1996. Henceforth, the three samples of data will be referred to as the 1994, 1996, or 1998 sample.

The sample consists of companies in the metalworking industries (SIC codes 33-37), chosen because they are considered by many to be the industries that most widely use AMTs (Boyer et al. 1996). The unit of analysis is individual manufacturing plants with fifty or more

employees. The 1994 survey instrument was pretested and then sent by mail to a sample of individuals from 491 manufacturing plants. These individuals were randomly selected from the membership rosters of two organizations sponsoring the survey: the Fabricators and Manufacturers Association International and the Computer and Automated Systems Association of the Society of Manufacturing Engineers. The survey yielded 202 usable responses, or a 41.1 percent response rate. Surveys were targeted at managers with primary responsibilities in manufacturing related areas, including plant managers, manufacturing managers, and engineering managers.

The initial contact sample for 1996 consisted of the 202 plants that responded to the 1994 survey. A shortened version of the 1994 questionnaire was mailed to each of the 202 individuals that filled out the 1994 version. A total of 112 usable responses were received out of the contact sample of 202. The final round of data collection occurred in January, 1998. The participating plants from 1996 were contacted. These plants were asked to fill out a two page questionnaire involving just the questions on technology investment and plant performance. A total of fifty manufacturing plants returned surveys in 1998. While a sample size of fifty is generally not sufficient for anything other than rudimentary statistical tests, an exception is appropriate in this case because of the longitudinal, multiple data point nature of the data. In fact, the 1998 sample represents 10 percent (50 plants out of the 491 contacted in 1994) of the initial contact list that have provided data in 1994, 1996, and 1998.

Table 1 profiles the respondents to the 1994, 1996, and 1998 surveys and the entire population of metalworking firms in the U.S. based on industry membership, classified according to two digit standard industrial classification (SIC) codes. The distribution of respondents across SIC codes is very similar for the three samples. Table 1 also shows the number of employees

and annual sales for each sample. Note that the mean number of employees and mean annual sales for the 1994 and 1996 samples are calculated for the fifty plants that also participated in the 1998 survey, rather than the 202 plants in the 1994 sample or the 112 plants in the 1996 sample. This allows a more controlled comparison by directly pairing 1994, 1996, and 1998 annual sales for the same plants. Unless specifically noted, all further statistical tests in this paper will be conducted on the combined sample with responses for fifty plants for 1994, 1996, and 1998. There are a few statistical anomalies. For example, the average annual sales increase from \$65.9 million in 1994, to \$127 million in 1996, but decrease to \$112.9 million in 1998. This result, while counterintuitive, is due to small differences in the sample—only thirty-six of the plants answered this question in 1996, while thirty-nine answered it in 1998.

Results

Proposition 1 – Patterns of AMT Investment

Table 2 presents the mean response for each of the twenty AMTs for each of our three samples (1994, 1996, and 1998). This data will be used to examine proposition 1. Table 2 also shows the mean response for each the three aggregated technology scales (Design, Manufacturing, and Administrative), each of which is comprised of the mean of the technologies included in that scale. Note that the cronbach's alphas measuring inter-item reliability are all greater than or equal to the recommended threshold value of 0.70 (Boyer et al. 1996). The individual technologies are rank ordered within each scale according to the 1998 responses. Several interesting results are apparent. Technologies that are experiencing increased usage include both robotics and electronic mail. The use of robotics has increased significantly from 1994 to 1998,

Table 1
Sample Profile

SIC Code	Population ^A		1994 Sample ^B		1996 Sample ^C		1998 Sample ^D	
	Number ^A	%	Number	%	Number	%	Number	%
33 Primary metal	6,661	5.5	11	5.4	6	5.4	3	6.0
34 Fabricated metal	36,092	29.8	52	25.7	30	26.8	14	28.0
35 Machinery, except electrical	52,091	42.9	90	44.6	48	42.9	22	44.0
36 Electric & electronic machinery	15,922	13.1	9	4.5	4	3.6	2	4.0
37 Transportation equipment	10,505	8.7	40	19.8	24	21.4	9	18.0
Total	121,271	100.0	202	100.0	112	100.0	50	100.0
Employees per plant: Mean			445.1 ^E		463.0 ^E		519.2	
Annual sales: Mean (\$ millions)			65.9 ^E		127.0 ^E		112.9	

Notes:

- A. Source: United States Census of Manufactures (1987).
 B. 491 plants contacted, 1994 sample.
 C. 202 plants contacted, 1996 sample.
 D. 112 plants contacted, 1998 sample.
 E. Calculated for 50 plants which also participated in 1996 and 1998 surveys.

although it is difficult to think of a logical explanation for this increase. A similar increase in the use of electronic mail is more readily explained by the explosion in internet usage. In fact, the largest increase in e-mail usage occurred between 1994 and 1996 (3.44 to 3.94) rather than from 1996 to 1998 (3.94 to 4.19). The timing of the increase corresponds with the first wave of the internet explosion, which occurred roughly in 1995 (Greiner 1996). The relatively heavy usage of e-mail in these manufacturing firms suggests that manufacturers can productively employ this communication tool.

Another technology that experienced increased investment was bar coding/automatic identification, which increased from a mean of 3.06 in 1996 to a mean of 3.57 in 1998. This result fits with numerous media reports of firms using bar coding to track raw materials and work in process inventories. Bar codes have been widely adopted over the last several years as an efficient and accurate method of more precisely tracking material flows through manufacturing plants.

Two of the technologies show a significant decline in investment. The use of Computer-Aided Design exhibits declining usage from 1994 to 1998. This is interesting because CAD is one of the most commonly used AMTs.

The decline in usage could be because respondents do not view this technology as “new” any longer. Thus, it may be an unnoticed resource since it is viewed as a prerequisite to other technologies. Similarly, office automation is experiencing decreased usage. Again, this may be because it is no longer viewed as “new” or “radical.”

Proposition 2 – Relationships between AMT Investment and Performance

Table 3 shows the correlations between each of the twenty technologies and two performance measures: profit and growth. The table is organized to show correlations sequentially, with the first two columns of numbers representing the correlations between the investment in each technology in 1994 and profit and growth in 1998. The second and third sections then show correlations between technology investment in 1996 and 1998, respectively, and profit and growth in 1998. Performance is assessed in terms of profit and growth. Two questions relating to market share growth and sales growth are drawn from Swamidass and Newell (1987). These two questions ask respondents to rate their plant’s position with respect to competitors on a seven point Likert scale ranging from 1 = significantly lower to 7 = significantly higher. The average of these two questions is labeled GROWTH. The second performance measure consists of three questions drawn from Vickery, Droge, and Markland (1993). These questions ask respondents to rate their plant’s position relative to competitors in terms of return on investment, growth in ROI, and return on sales. The average of these three questions is labeled PROFIT.

Table 3 shows that many technologies are directly correlated with increased profit and growth. For example, office automation is significantly correlated with both profit and growth for all three time periods (investment levels in 1994, 1996, and 1998). Similarly, CNC machine tools are correlated with profit for all three time periods. It is interesting that given the high prevalence of these tools, they still provide a means of separating manufacturing plants from the pack rather than just maintaining the status quo. Office automation has some of the strongest correlations with both profit and growth, yet we saw in Table 2 that office automation is generally receiving less attention. This contradiction may be occurring for one of two reasons. First, it may be that the plants in the sample feel that office automation is not a cutting edge technology and does not offer additional incentives for further investment. Alternatively, this result may be due to inaccurate measurement. In particular, since the AMT survey was first administered in 1994, there have been numerous technological advancements that are not included in more recent versions of the survey. For example, enterprise resource planning has become a leading initiative over the last several years. Further research is needed to better capture new technologies as they develop.

Table 2
Technology Investment Comparison: 1994 - 1998

	1994	1996	1998
Design Technologies	4.04	3.98	3.94
Computerized numerical control (CNC)	5.00	5.00	5.14
Computer-aided design (CAD)	5.24*	5.12	4.83
Computer aided manufacturing (CAM)	4.08	4.22	4.09
Computer-aided engineering (CAE)	3.66	3.72	3.84
Environmental control systems	3.67	3.79	3.80
Bar coding/automatic identification	3.43	3.06**	3.57
Computer-aided process planning (CAPP)	3.14	3.08	3.07
Flexible manufacturing systems (FMS)	2.88	3.07	2.92
Manufacturing Technologies	3.21	3.26	3.34
Material requirements planning (MRP)	4.08	4.10	4.06
Office automation	4.26**	3.62	3.77
Real-time process control systems	2.92	3.06	2.77
Group technology (GT)	2.77	2.91	2.59
Automated material handling systems	2.29	2.24	2.52
Robotics	2.00**	2.22	2.49
Administrative Technologies	3.44	3.38	3.47
Electronic mail	3.44**	3.94	4.19
Manufacturing resource planning (MRP II)	3.82	3.80	3.73
Electronic data interchange (EDI)	3.45	3.32	3.27
Activity-based accounting systems	3.43	3.13	2.99
Decision support systems	2.77	2.64	2.79
Knowledge-based systems	2.21	2.61	2.44

Notes:

Each technology shows the mean of all respondents’ answers on a seven point scale asking them to rate the amount of investment in each technology between the extremes of 1 = No Investment, to 4 = Moderate Investment, to 7 = Heavy Investment. Pairwise t-tests of 1994/1998 and 1996/1998 investments were made with * denoting $p < 0.10$ and ** denoting $p < 0.05$. An asterisk(s) in the 1994 column indicates a significant difference between the 1994 investment for that technology and the 1998 investment, while an asterisk(s) in the 1996 column indicates a difference between 1996 and 1998.

Table 3
Correlations between Technology Investment (1994,1996, and 1998) and Performance (1998)

	94 Technology-98 Performance		96 Technology-98 Performance		98 Technology-98 Performance	
	Profit	Growth	Profit	Growth	Profit	Growth
Computer-aided manufacturing (CAM)	0.23	0.22	0.26*	0.19	0.25	0.29**
Computer-aided design (CAD)	0.13	0.11	0.14	0.03	0.03	0.16
Computer-aided engineering (CAE)	0.13	0.08	0.26*	0.26*	0.10	0.09
Computer-aided process planning (CAPP)	0.05	0.13	0.07	0.30**	0.31**	0.32**
Robotics	-0.09	0.16	0.03	0.17	-0.02	0.23
Real-time process control systems	0.30*	0.10	0.07	0.22	0.06	0.13
Group technology (GT)	0.15	0.19	0.30*	0.13	-0.01	0.04
Flexible manufacturing systems (FMS)	-0.09	0.19	0.12	0.26*	-0.02	0.04
Electronic mail	-0.27*	0.09	-0.13	0.05	-0.01	0.17
Electronic data interchange (EDI)	-0.06	0.27*	0.21	0.41**	0.22	0.34**
Office automation	0.38**	0.28**	0.28*	0.41**	0.21	0.33**
Computerized numerical control machines (CNC)	0.37**	0.22	0.37*	0.07	0.32**	0.12
Automated material handling systems	-0.09	0.08	-0.14	0.24	0.01	0.21
Environmental control systems	0.09	0.17	0.16	0.14	-0.02	0.04
Bar coding/automatic identification	-0.01	-0.07	-0.13	-0.01	-0.10	-0.04
Knowledge-based systems	0.05	0.01	0.17	0.27*	0.10	0.23
Decision support systems	0.18	0.11	0.24	0.31**	0.10	0.20
Material requirements planning (MRP)	0.06	0.17	-0.03	0.14	0.05	0.17
Manufacturing resource planning (MRP II, including capacity requirements planning)	0.06	0.21	0.05	0.04	0.14	0.27*
Activity-based accounting systems	0.13	0.13	0.27*	0.28*	0.01	0.15

Note:

* $p < 0.10$
** $p < 0.05$

The overall pattern of technology-performance correlations suggests that there is approximately a two-year lag between investment and performance improvement. This observation is based on six out of forty (15%) of the 1994 technology-performance correlations being significant at least at the $p < 0.10$ level. Fourteen out of forty (35%) of the 1996 technology-performance correlations are significant at the $p < 0.10$ level, while seven out of forty (17.5%) of the 1998 technology-performance correlations are significant at the $p < 0.20$ level. The highest number of significant correlations occurs in the 1996-1998 timeframe, suggesting that there is approximately a two-year time lag between technology investment and improved performance. In order to more definitively examine these relationships, more detailed information regarding specific technology investments and their timing would be needed.

Discussion

This study has presented the results of a three-part, four-year data collection effort regarding relationships between technology investment and performance. The results indicate several interesting patterns. Technologies of increasing importance within the manufacturing community include robotics and electronic mail, both of which had dramatically higher investments in 1998 than

in 1994. In addition, bar coding experienced increased investment from 1996 to 1998. Both e-mail and bar coding are technologies that have been examined fairly widely in the popular press. It is refreshing to see evidence that these technologies are being applied in the manufacturing sector. E-mail can provide a faster and more consistent method of communication in manufacturing plants. This streamlined communication technique provides a means of achieving better strategic consensus within manufacturing plants, which has been posited as a major factor contributing to improved performance (Boyer and McDermott 1999). Similarly, bar coding has been utilized by numerous companies to provide faster, more accurate tracking of raw materials, work-in-process, and finished goods inventories. The current study provides important verification that manufacturing companies are quickly increasing their utilization of both e-mail and bar coding.

Not all technologies received increased attention. Technologies that experienced decreased usage include office automation and computer-aided design. This result may indicate that these technologies are no longer seen as "cutting edge," or possibly that the cost of investing in these technologies has decreased to the point where plants do not view these investments as significant portions of their budget. Either way, this data provides important insights into the evolutionary patterns of technology

investment – companies can not make onetime investments, but instead must be aware that their technological position must be continuously reevaluated.

This study also presented data regarding the technology-performance relationship. There is strong evidence that advanced manufacturing technologies do contribute significantly to improved performance. Furthermore, there is evidence of a time lag between investment in technology and performance improvements. This time lag appears to be approximately two years and is likely due to the presence of learning curve effects. Managers should be prepared to exercise patience and expect new investments in technology to take months or even years to reach their full potential. In addition, managers should also realize that developing new skills in the workforce through training and the willingness to experiment with new technologies is a critical factor affecting success.

While the current study provides important insights into the evolution of technological investment and the relationship with performance, it does suffer from some important limitations that should be addressed in future research. For example, there is a strong need to develop a methodology to more exactly assess changes in technology over time and the effect on performance. The methodology used in this research is very generalizable but loses significant specificity for two reasons. First, there is no data reflecting exactly when particular investments were made in each technology and each plant. Second, the use of Likert scale measures allows a generalizable study but creates interpretability issues because of the subjective nature of the scales. Future research should seek to more definitively study when and how specific technologies are implemented. This can be done by focusing more specifically on one or two technologies and gathering more tightly controlled data that is specific to a single industry or technology. ■

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Strategies Used by Small Business Entrepreneurs

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Abstract

This descriptive study of 184 small firms identified strategies most frequently used by their managers. These strategies were identified using the Entrepreneurial Strategy Matrix, a situational model in which the identification of levels of innovation and risk lead to prescriptions of appropriate strategies. Concurrently, this model was empirically tested and its validity supported. Of the strategies used, the five most common were: “work to create a competitive advantage,” “maintain innovation,” “lower the costs of developing and/or maintaining one’s venture,” “defend product/service as it is now,” and “create a first mover advantage.” In addition, there were no differences between the use of strategies by entrepreneurs in service and manufacturing industries.

Introduction

There is a comprehensive body of literature on strategic planning (Porter 1996), the effects of strategic planning on performance (Veliyath and Shortell 1993), and the effects of strategic planning on small business performance (Covin and Slevin 1991; Watts and Ormsby 1990). Much of the research on the effects of strategic planning on small business performance focuses on comparing differences between those that conduct formal planning and those that do not (Robinson and Pearce 1983). However, this study found no empirical investigations that focus on non-formal small business entrepreneurial planners, nor any that identify the wide variety of strategies used by them. The most common strategy construct is the Miles and Snow (1978) adaptive strategy typology (Golden and Dollinger 1993) with only four strategies.

Based on the Schwenk and Shrader (1993) findings that strategic planning is beneficial for small firms, the purpose of this study is to examine which strategies are being used by small business managers and entrepreneurs, as suggested for further research by Kargar (1996). Van Auken and Sexton (1985) found that although most small businesses do not engage in rigorous strategic planning, a sizeable percentage do engage in less formal types of

The purpose of this study was to examine which strategies are being used by small business managers and empirically test the Entrepreneurial Strategy Matrix.

planning. In conclusion, further research is warranted into the underlying “realities” of small business strategic planning. Thus, the first gap in the literature that is addressed in this study is the descriptive research question: Which strategies are most commonly being used by small business entrepreneurs?

The purpose of this study was to examine which strategies are being used by small business managers and empirically test the Entrepreneurial Strategy Matrix. The Entrepreneurial Strategy Matrix (ESM) (Sonfield and Lussier 1997) identifies a wide variety of strategies, and it is beginning to be cited in textbooks as a useful entrepreneurial strategic management model (Corman and Lussier 2000; Lussier 2000; Scarborough and Zimmerer 2000). However, the ESM was initially published as a conceptual model without an empirical testing base. Thus, a secondary purpose of this study is to empirically test the ESM. In addition, an extensive yet concise review of the small business entrepreneurial strategy literature follows.

Literature Review

Planning and Performance

There is ample literature examining the effects of strategic planning on the financial performance of small firms. However, researchers have reported conflicting conclusions (Schwenk and Shrader 1993). Some researchers have concluded that small firms do not commonly practice strategic planning (Gable and Topol 1987; Robinson and Pearce 1984; Van Auken and Sexton 1985), and others have concluded that there is little or no significant relationship between strategic planning and the performance of small businesses (Cragg and King 1988; Gable and Topol 1987; Kallman and Shapiro 1978;

Orpen 1985; Robinson, Logan, and Salem 1986; Robinson and Pearce 1983; Robinson, Pearce, Vozikis and Mescon, 1984; Shrader, Mulford, and Blackburn 1989). Also, in the world of formal strategic planning, the "strategy" is seldom evident until after its implementation is well along (Hayes and Upton 1998).

In contrast, several other researchers have concluded that there is a positive relationship between formal strategic planning and financial performance in small firms (Ackelsberg and Arlow 1985; Bracker, Keats, and Pearson 1988; Bracker and Pearson 1986; Jones 1982; Robinson 1982; Segev 1987; Shuman 1975; Van Auken and Sexton 1985; van Hoorn 1979; Wood, Johnston, and DeGenaro 1988; Watts and Ormsby 1990).

...strategic planning should be seriously considered by small firm managers as it is a beneficial activity.

Still other reviewers of the literature on the effects of formal planning on financial performance have also reported mixed results. Lyles, Baird, Orris, and Kuratko (1993) stated that formal planners outperformed non-formal planners. Hofer (1976) concluded that planning probably had a beneficial impact on success. Armstrong (1982) also concluded that formal planning benefited firms. Robinson (1982) stated that small firms that use outsiders to aid in formal strategic planning outperformed those that do not. However Shrader, Taylor, and Dalton (1984) concluded that there is no apparent systematic relationship between formal planning and performance and that there is great disparity in the measurement of formal planning across studies. Robinson and Pearce (1984) argued that strategic issues are the domain of large firms and that formal strategic planning has not been a popular practice among small firms because they have neither the time nor staff to invest in strategic planning. Small business managers need to be more concerned with the day-to-day operational problems of running the firm. Pearce, Freeman, and Robinson (1987) indicated that integrating the findings across studies is difficult due to the methodological differences of prior studies. Discrepancies may be due to the use of different variables, different samples, and different industries used by various researchers.

Schwenk and Shrader (1993) directly confronted this discrepancy in the literature by applying meta-analysis to the past research on formal planning and performance in small firms. The meta-analysis included fourteen prior studies measuring planning as the independent variable and performance as the dependent variable. There were two types of performance measures—growth in sales or revenue and return on assets, sales, and investment. The results indicated a positive association between planning

and sales and revenue growth, and the relationship between planning and return measures was also positive. Thus, although the size of the effects for planning reported in the individual studies was not large, the overall relationship was positive and significant ($p < .05$). Thus, in general, regardless of the planning type and process used, strategic planning should be seriously considered by small firm managers as it is a beneficial activity. However, Schwenk and Shrader (1993) only addressed a limited area of the contradictions in the literature. There are probably dozens of contextual factors that affect the importance of strategic planning in various situations. Hence, there is a need for this and other studies that contribute increased understanding to the role of strategic decision-making and its affect of new business development and new wealth creation.

Strategic Planning Systems Characteristics

Based on the assumption that strategic planning has a positive effect on performance, researchers have studied strategic planning systems characteristics to determine which characteristics should be included in the strategic plan to optimize performance. Although many strategic planning systems characteristics have been presented in the literature, no consensus exists (Kargar 1996). For example, Ramanujam and Venkatraman (1987) proposed six dimensions for strategic planning systems: use of techniques, attention to internal facets, attention to external facets, functional coverage, resources provided for planning, and resistance to planning. Veliyath and Shortell (1993) identified five dimensions: planning implementation, market research competence, key personnel involvement, staff planning assistance, and innovativeness of strategies. More recently, based on the literature, Kargar (1996) included five dimensions: the degree of internal orientation of the system, the degree of external orientation, the level of integration achieved within functional departments, the extent of key personnel involvement in the planning process, and the extent of the use of analytical techniques in addressing strategic issues. The need for an effective marketing plan has been recently supported (Lancaster and Waddelow 1998; Pearce and Michael 1997), as has been the advice and counsel provided by the board of directors to the CEO (Daily and Dalton 1994).

There are also variables that potentially moderate the effects of strategic planning on performance (Jauch and Osborn 1981). Some of these moderating variables may include types and structures of industries (Hatten, Schendel, and Cooper 1978; Hitt, Ireland, Palia 1982; Hitt, Ireland, and Stadter 1982), the environment (Boulton, Lindsay, Franklin, and Rue 1982; Bourgeois 1980; Dean, Brown, and Banford 1998; Dollinger 1985; Duncan 1972; Fredrickson and Mitchell 1984; Lindsay and Rue 1980; Matthews and Scott 1995), competitive strategy (Beard and Dess 1981; Carter 1990), the size and

Table 1
Entrepreneurial Strategies

Strategy (N = 184)	Use n / %	Do Not Use n / %	Use Ranking
<i>GROUP A=High Innovative Low Risk—Ir (n = 24 13%)</i>			
1. Move quickly with my unique venture to create and market it before my competitors.	86 / 46%	99 / 54%	5
2. Keep competitors out of my market by protecting my product/service with methods such as patents and contracts.	37 / 20%	147 / 80%	9**
3. Lock in my investment costs, such as negotiating long-term contracts with outsources/suppliers etc., to insure that they do not rise as the venture progresses.	67 / 36%	117 / 64%	6**
<i>GROUP B=High Innovative High Risk—IR (n = 64 35%)</i>			
4. Reduce risk by lowering investment and operations costs in some way, such as outsourcing work.	64 / 35%	120 / 65%	7**
5. Maintain innovation.	143 / 78%	41 / 22%	2**
6. Enter a joint venture with another company to further strengthen my venture.	59 / 32%	125 / 68%	8**
<i>GROUP C=Low Innovative Low Risk—ir (n = 28 15%)</i>			
7. Defend my position: product/service as it is now.	109 / 59%	75 / 41%	4*
8. Maintain status quo—I'm satisfied with little or no business growth.	15 / 8%	169 / 92%	13**
9. Maintain status quo—I'm satisfied with my financial performance now.	31 / 17%	153 / 83%	10**
<i>GROUP D=Low Innovative High Risk—iR (n = 68 37%)</i>			
10. Work to create a competitive advantage over competitors.	164 / 89%	20 / 11%	1**
11. Lower the costs of developing and/or maintaining my venture.	117 / 64%	67 / 36%	3**
12. Be a franchisee, rather than independent, to improve my chances of success.	17 / 9%	167 / 91%	11**
13. Sell or close my business.	16 / 9%	168 / 91%	12**

The frequencies for strategy (use vs. do not use) significance differences * < .05 ** < .01

development stage of firms (Jauch and Osborn 1981), strategy use under different types of competition (Chaganti, Chaganti, and Machajan 1989), and corporate versus independent new venture (Shrader and Simon 1997).

The Entrepreneurial Strategy Matrix

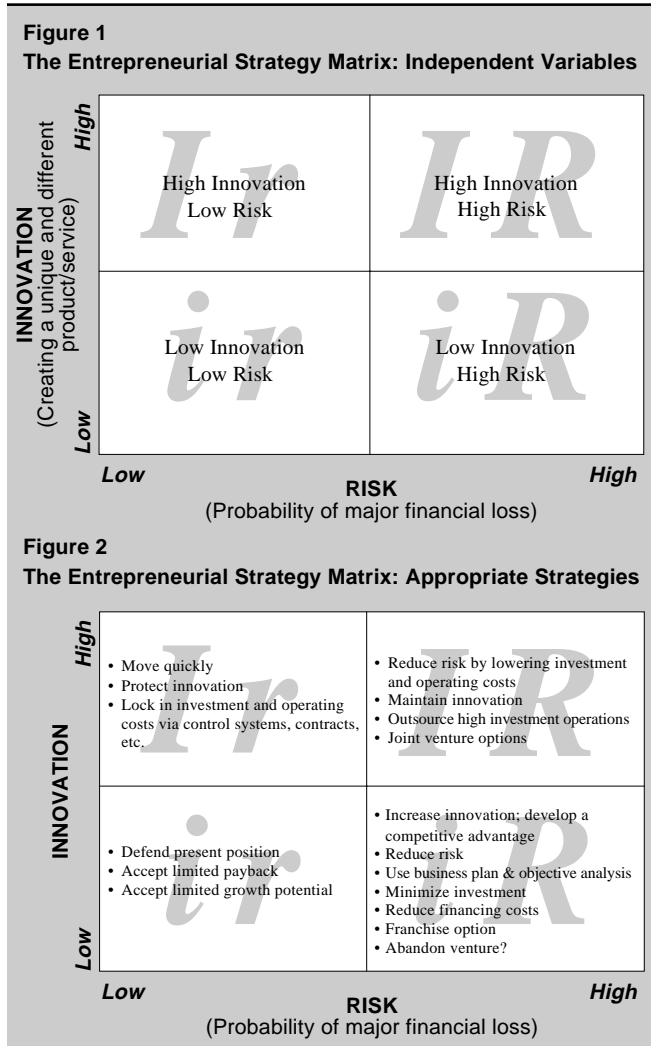
The Entrepreneurial Strategy Matrix (ESM) (Sonfield and Lussier 1997) is used as the basis for this study. This model is a situational model, which suggests appropriate strategies for both new and ongoing ventures in response to the identification of different levels of venture innovation and risk. Such identification leads to the placement of the venture in one of four cells of a matrix, and appropriate strategies are presented for that cell. Since ventures may be classified as being either high or low in terms of innovation and risk, the Entrepreneurial Strategy Matrix is a model appropriate for both entrepreneurial ventures involving high innovation and often corresponding high risk, and traditional small business ventures, which are generally low in innovation (Sonfield and Lussier 1997). This study includes both types of small business ventures, see Figures 1 and 2.

One of the strengths of the ESM (and a reason for its development) is that it is appropriate for small business managers and entrepreneurs to use. Unlike more sophisticated strategy models with many independent and

dependent variables (such as Lumpkin and Dess' [1996] "alternate contingency models of the entrepreneurial orientation-performance relationship" and Covin and Slevan's [1991] "Conceptual Model of Entrepreneurship as Firm Behavior," most business practitioners find it relatively easy to evaluate the two variables of innovation and risk (Sonfield and Lussier 1997).

Although the ESM is a recently developed model, early empirical testing supports its validity (Puetz and Hunt 1998). Thus, the ESM was selected for investigation in this study for three reasons. First, the ESM is not concerned with measuring the degree of formality of strategic planning, such as formal or non-formal planner (Lyles et al., 1993). However, it does provide a wide variety of strategies that may be used by small business managers and entrepreneurs who do not prepare formal strategic plans. Thus, the ESM can be used to identify a wide variety of types of strategies being used regardless of the level of formality in planning. Secondly, the ESM is a relatively new conceptual model, recently cited in textbooks (Corman and Lussier 2000; Lussier 2000; Scarborough and Zimmerer 2000) with only limited empirical testing. Third, unlike the Boston Consulting Group Matrix (BCG) (Hedley 1977), the Generic Competitive Strategies Model (Porter 1980), and the Adaptive Strategy Typology (Miles, Snow, Meyer, and Coleman 1978), which were designed primarily for large businesses, the ESM was designed as an alternative model for

The Entrepreneurial Strategy Matrix



M.C. Sonfield and R.L. Lussier. (1997). The Entrepreneurial Strategy Matrix: A Model for New and Ongoing Ventures. *Business Horizons* 40(May-June):73-77.

use by small business ventures and, as discussed above, is also more easily used by the small business manager and entrepreneur than more complex models.

According to Puetz and Hunt (1998), “Each cell of the ESM is populated with small business owners who have survived under their respective business conditions. Each cell has profiles and strategies that work successfully for the members in that cell. The matrix can help owners to understand their preferences and strategic position within the market.” “This study has shown the rigor and value of the model” (p. 59). Thus, the ESM can be of value both as a prescriptive model, assisting the businessperson to choose appropriate strategies for a new or ongoing venture. The ESM can also be used as the basis for empirical testing to better understand managerial processes of strategic formulation and implementation. This article focuses on the latter value of the ESM.

Purpose of the Study and Hypotheses

Again, this study found no published journal articles empirically investigating the identification of a wide variety of strategies being used by small business ventures. The purpose of this study was to determine which strategies are most commonly being used by small business entrepreneurs, using the ESM as the means of measurement. Thus, the first step was to determine the validity of the ESM to determine if it is a legitimate entrepreneurial strategy model. If the ESM was validated, the second step was to determine the strategies being used. Based on the purpose of the study, following the necessary steps, three hypotheses were developed.

Hypothesis 1: The ESM is a valid measure of small business strategies.

Hypothesis 1 is based on prior empirical research testing that supported the validity of the ESM (Puetz and Hunt 1998). Three separate tests were run to further determine if the ESM is a valid model for small business venture strategic management. The three research questions and statistical testing is explained in the Methodology section—Analysis of Hypothesis 1.

Hypothesis 2: Various strategies are being used by small business ventures.

Small business and entrepreneurial ventures are not evenly distributed among the four ESM cells (Puetz and Hunt 1998). The distribution of self-identifications of strategies should correspond to the distribution of self-identified placement of ventures into cells (Sonfield and Lussier 1997). Thus, if the ESM has validity, then the use of the strategies should not be equal, or some strategies are used more frequently than others.

Hypothesis 3: Entrepreneurs in services and manufacturing industries use different strategies.

Although less critical to the purpose of the study, Hypothesis 3 investigates the question of whether type of industry affects the strategies chosen by small business and entrepreneurial ventures. Gowen and Tallon (1999) stated that “...there are several...natural differences... between manufacturing and service firms” (p. 35).

Methodology

Design and Sample

The primary methodology was survey research. A national random sample of small businesses was prepared by a mailing list company. The sample was stratified to ensure adequate representation in the eight industry groups used by Dun and Bradstreet (1998). The 900

questionnaires were mailed to the owner/manager names supplied by the mailing list company with follow-up interviews conducted with non-respondents. Self-reporting methodologies using mail questionnaires and/or telephone interviews have been used to test the Miles and Snow Typology (Hambrick 1983; Zahra and Pearce 1990) and the Porter model (Miller 1988), and were thus considered appropriate for this study.

Measures

The strategies were taken from the ESM model (Figure 2) and listed on the questionnaire by cell group: A= I-r, B=I-R, C=i-r, and D=i-R. Note that for easier understanding during surveying, the wording of some strategies were operationally defined and some of the overlapping strategies in cell D=i-R were combined. Participants were asked to identify all listed strategies they used and then to identify the strategy group (A-D) that best described their overall set of business strategies. Thus, each of the thirteen strategies was nominally recorded as being used or not being used. The strategy groups of the matrix were used as four measures of the venture strategy variable. Participants were also asked if they used any strategies not listed in the ESM, and if yes, to list them. The objective was to identify the strategies being used. Thus, respondents were not asked if they use a business plan, as this question would measure degree of planning vs. non-planning, nor were they asked for financial performance. Both of these factors have been extensively covered in the literature.

Analysis of Hypothesis 1

The ESM was tested for validity in three ways. The first test was to determine if the ESM strategies were inclusive. In other words, if the strategies in the matrix are not actually used by entrepreneurs then the ESM is not valid. A Chi-square test was run using the numbers of respondents who use and do not use the strategies listed in the ESM (Figure 2). The second test was to determine if there is excessive overlap between the strategies. In other words, do the common strategies being used fit within the four groups of the matrix with little overlap? If there is a high correlation between the strategies, they may be measuring the same thing and thus the use of the four strategy groupings may be questionable. Kendall categorical correlations were run between each of the thirteen strategies. The third test was to determine if the individual strategies can predict the group selection. In other words, if participants are not selecting the appropriate overall strategy, the use of the four strategy groupings is questionable. Discriminant analysis was run with the four strategy groups A-D as the dependent variable and the thirteen strategies as the independent variables. In order to not reject Hypothesis 1, all three tests of the validity of the model must be significant at the .05 level. If Hypothesis 1 was rejected,

the model would not be validated and Hypotheses 2 and 3 would not be tested.

Analysis of Hypothesis 2

Hypothesis 2, relating to the frequency of use of strategies, was tested to determine if there is a significant difference in the numbers of respondents who use and do not use each strategy. Thus, a Chi-square was run for each of the thirteen strategies. Overall, the frequencies of each strategy usage response can be ranked to identify the most commonly used strategies. Thus, if there are significant differences in the frequency of strategies used, do not reject Hypothesis 2.

Analysis of Hypothesis 3

Hypothesis 3, use of strategies by industry, was tested to determine if there is a significant difference in the numbers of entrepreneurs in the service and manufacturing sectors using each strategy. To test Hypothesis 3, a Chi-square was run for each of the thirteen strategies by industry. The sample included services (n = 130, 71%) and manufacturing (n = 54, 29%) industry groupings.

Results

Out of 900 surveys mailed, ninety-eight came back non-deliverable and seventy-eight were completed. Follow-up telephone interviews with non-respondents produced an additional 116 questionnaires, resulting in a total of 194 questionnaires. Ten were not used due to missing data, thus, the sample included 184, with a response rate of 20 percent. The respondents included 109 (59%) males and 75 (41%) females; 130 (71%) compete in the service sector and 54 (29%) in the manufacturing industry. The average business existed for ten years, employed twenty people, and is owned by a person with two years of college. Responses came from thirty-five states.

Non-response Bias

Although a response rate of just 10 percent is not unusual, tests were run to make sure that non-response bias was not problematic. To test for non-response bias, it is customary to use late respondents as surrogates for non-respondents (Nwachukwu, Vitell, Gilbert, and Barnes 1997). However, like Lussier (1995), this study went a step further and used a telephone follow-up with non-respondents. The answers of the seventy-eight original mail respondents were compared to the 116 telephone non-mail respondents; approximately 59 percent of the sample were original non-respondents. None of the answers were significantly different at the .05 level. Also, similar to Shaw, Delery, Jenkins, and Gupta (1998), logistic regression was run to determine if membership as respondent or non-respondent could be predicted; it could not ($p = .37$). Thus, non-response bias should not be problematic.

Hypothesis 1

Hypothesis 1, regarding the ESM validity, was not rejected by all three tests, thus supporting the validity of the ESM. The test of inclusiveness of strategies indicates that very few entrepreneurs ($\chi^2=17.25$, $p=.000$) use strategies not identified in the matrix. Thus, although providing business ventures with the strategies provides some bias, the validation work provides preliminary evidence of the validity of the matrix and the strategies included in the ESM appear to be heavily used. For the second test, regarding overlap in strategies, of the seventy-eight correlation coefficients, only fifteen were significant at the .05 level. A correlation of .40 or above is considered high and a large sample size increases the probability of finding a correlation. In this study, only one of the correlations exceeded .40 (.556). The two correlated variables were strategies 8 and 9: maintaining status quo—"satisfaction with one's financial performance now" and "satisfaction with no business growth." Also, of the other significant correlations, only two were .30 and the rest were lower. Thus, the ESM common strategies used fit within the classifications identified by the matrix with little overlap in strategies, further supporting the findings of Puetz and Hunt (1998). For test three, selecting the appropriate strategy group, the discriminant analysis results were significant ($p=.000$), or if one knows the individual strategies one can predict the strategy group selection of respondents. Thus, the ESM is considered a valid measure of strategy and Hypothesis 2 and 3 were tested.

Hypothesis 2

Hypothesis 2 was not rejected, thus supporting that some strategies are more frequently used than others. Chi-square tests within each of the thirteen strategies revealed significant differences between all but one of the frequencies of entrepreneurs who use and do not use each strategy (Table 1). By far the most commonly used strategy is "to work to create a competitive advantage over competitors" (89% of the entrepreneurs said they use this strategy). Ranked second in use (78%) was "to maintain innovation." The third most commonly used strategy was "to lower the cost of developing and/or maintaining my venture" (64%), with fourth place going to "defend my product/service as it is now" (59%). With a large drop in frequency of use, the fifth most commonly used strategy was "to move quickly with one's unique venture to create and market it before competitors can" (46%), or to create a first mover advantage.

With the current discussion in both the academic and practitioner literature about the need for competitive advantage, innovation, and cost cutting, the sizable response rates for these strategies were to be expected. However, the specific response rates and their rankings could not be predicted, and this data therefore provides a better understanding of the respondents' priorities with regard to these strategic tactics.

Hypothesis 3

Hypothesis 3, with regard to whether entrepreneurs in services and manufacturing industries use different strategies, was not supported, indicating that the ESM has universality of use between these two industry groupings. Of the thirteen strategies, the only one that was significantly different ($p=.045$) between services and manufacturing was "keep competitors out of one's market by protecting one's product/service with methods such as patents and contracts." This one difference provides further support for the hypothesis as it is logical because manufacturers make products that can be patented, whereas services cannot be similarly protected.

Conclusions and Implications

The current literature is focused on formal strategic planning (Porter 1996), the effects of formal strategic planning on financial performance (Schwenk and Shrader 1993), and strategic planning systems characteristics (Kargar 1996). This study extends the literature related to wealth creation through new business development, as well as existing venture development, because it descriptively identified the broad range of strategies and frequency of use of these strategies by small business ventures. No prior studies were found that address these gaps in the literature.

Statistical testing supports the validity of the ESM as a useful model in entrepreneurial venture strategic planning because the strategies in the cells are in fact those most frequently used by business ventures, and the strategy responses correspond with the situation (cell) responses. Furthermore, each of the ESM strategies is a separate and inclusive strategy, as each strategy being used fits within the classifications of the matrix with little overlap between them. In addition, the study supports the universality of the model as no differences in use of strategies were found between service and manufacturing firms.

The ESM has been tested and validated for its descriptive power. Thus, it should be useful to small business managers and entrepreneurs, and their consultants, in both new and ongoing ventures, and may therefore improve financial performance. However, the primary purpose of this study was not to test the ESM for its prescriptive power, nor to determine its effects on financial performance. There is literature that indicates that formal planners outperform non-formal planners (Schwenk and Shrader 1993). Thus, the conclusion that the ESM is a useful model for small business entrepreneurs is based on the fact that using the ESM is a formal strategic process, and thus may result in improved financial performance. Still, further research is needed to empirically validate its prescriptive power and the relationship between the ESM and financial performance.

Given the limited prior research focusing on the nature of strategies used by small business entrepreneurs, the

...ESM [is] a useful model in entrepreneurial venture strategic planning...no differences in use of strategies were found between service and manufacturing firms.

findings of this current study are a starting point toward further analysis in this direction. The ESM, and other strategic management models (including well-established models developed primarily for large business organizations), must be further tested for validity. With such testing, consistent determinations of validity can lead to better practitioner understanding, acceptance and use of these models, with positive business performance benefits.

Based on this testing of the Entrepreneurial Strategy Matrix, further research should also investigate the role of innovation and risk in strategic planning and performance, as the ESM suggests changing strategy based on level of innovation and risk. Further research should also identify differences in level of financial performance based on innovation and risk. Also, the link between formal planning and informal planning and the use of the ESM in operational planning can also be investigated. ■

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People, Prose, and Processors: The Haworth College of Business Electronic Portfolio Project

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Abstract

This article describes the origin, design, and implementation of the Haworth College of Business Electronic Portfolio Project, a curricular innovation that is one of the key components of the college's newly revised and re-accredited undergraduate business program. Included in the article is a description of the portfolio process, its creation, and initial implementation, including implementation challenges and issues. Throughout the discussion, goals and the challenge of meeting them are examined, and suggestions for continuous improvement are explored. The article offers key issues to consider before adopting a portfolio process on a large scale.

The Haworth College of Business Portfolio Project: A Conceptual Description

The Bachelor of Business Administration (BBA) Program Electronic Portfolio Project of the Haworth College of Business was conceived as a reflective, process-oriented framework for student-centered independent learning and assessment and is a requirement for admission to the college and for graduation. The portfolio is a dynamic and on-going project that students complete on their own over the course of their enrollment in the college. For students, the portfolio project provides the opportunity to document the evolution of their knowledge, skills, and attitudes, express their individual talents and drive, inventory their strengths and weakness, and develop a strong foundation for making informed choices about course and major selection. It also provides an opportunity for polishing or improving communication skills and for becoming proficient in using technology to increase communication effectiveness. For the college, the portfolio provides cumulative evidence of how well students are making the linkages among their education, experiences, expectations, and professional goals and is one mechanism by which the college can monitor and assess program quality.

This article provides a brief overview of the Haworth College of Business, an overview of uses of academic portfolios, a synopsis of current pedagogical ap-

...the portfolio provides cumulative evidence of how well students are making the linkages among their education, experiences, expectations, and professional goals...

proaches to portfolio design and usage that influenced the design of the college's portfolio, and a description of the evolution of the portfolio from working concept to pilot to implementation. We also share assumptions made about the benefit of portfolio projects, the implementation challenges encountered, and our reflections and suggestions for those thinking about using such a project on a large scale.

The Haworth College of Business: Background

The Haworth College of Business is the second largest of the seven degree granting colleges that form Western Michigan University, a regional university with enrollments nearing 30,000 students. The college is the twelfth largest undergraduate business school in the nation. Approximately 130 faculty teach in the college, which offers traditional business majors as well as specialty majors including food marketing and industrial supply management. Within the college, class sizes range from 300-350 students in large lectures for survey courses such as marketing, introduction to business, and the introductory computer course to twenty-five in the freshman writing course taught in the college. The "average" class size ranges from thirty-five to sixty students. Every effort is made to keep large lecture classes to a minimum, and faculty of all ranks teach at the freshman and sophomore levels.

In fall semester 1998, with a record freshman class of over 700, the college underwent visitation by The International Association for Management Education (formerly AACSB) for reaffirmation of accreditation, and simultaneously launched its newly revised undergraduate program. This new program, the result of two

Table 1
Haworth College of Business Mission Statement

Creed

Partners for Business Knowledge and Leadership

Mission Statement

The Haworth College of Business is committed to partnerships among students, employers, faculty, alumni and the business community that advance the achievement of high-quality education. Such active partnerships challenge the foundation of our knowledge and skills and enhance our ability to change. Meeting these challenges requires an evolving combination of teaching, research and service activities among partners.

College Goals

- To deliver the best undergraduate business program in Michigan and the surrounding states by the year 2006.
- To provide excellent, targeted graduate education and seminars primarily for business professionals and international students by the year 2004.
- To design, implement and support centers of excellence in designated, specialized educational programs by the year 2000.
- To further understanding of cultural diversity among domestic and international partners.
- To develop business relationships which proactively support the mission of the Haworth College of Business.
- To build development programs for faculty and staff that increase their knowledge of contemporary business practices and technological innovations in order to improve the College's teaching and research programs.

years of analysis and planning, was an initial step out of traditional silos and toward an integrated, cross-functional approach to teaching business theory, principles, and practices. The program's design reflects the college's mission and its goal for the undergraduate program.

Three significant changes to the program include:

- The creation of six integrated core courses designated BUS.
- The addition of a program option requirement which may be met through an internship, study abroad, or field research with a faculty member.
- The addition of a portfolio requirement.

Table 2 highlights these changes, which were approved by the entire faculty. The BUS courses form the integrated core and were developed by a cross section of faculty from the college's five departments as were program option and portfolio requirements.

The BUS core and the portfolio are intended to promote increased retention and understanding of the functional relationships that inform modern organizations, to encourage students to assume ownership for their own education, and to foster habits of reflection, introspection, and evaluation that are the hallmarks of critical, thoughtful thinkers. Their design and purpose reflect a

number of concerns that emerged during the initial evaluation of the BBA program. Specifically, faculty were concerned that students too often lack realistic expectations about education or careers and, as a consequence, lack the ability to set realistic goals or to make informed choices about course or major selection. We were equally concerned about the tendency of many students to view courses as discrete entities taken to meet a requirement then checked off their educational to-do lists, and the accompanying tendency to view general education courses or courses outside their majors as "useless." The portfolio, as noted earlier, is the mechanism whereby students can demonstrate their understanding of the linkages among education and experiences as well as a means for them to place meaning and value on what they know, what they can do, and what they believe.

Academic Portfolios as Assessment Instruments: An Overview

Portfolios as collections of documents have many purposes or uses. Career portfolios focus primarily on an individual's career readiness and have long been used by artists or designers. In addition, the portfolio as a place to collect evidence of students' abilities has long been an integral component of writing programs at the college level, usually in English departments but increasingly in business communication courses taught in colleges of business, including the Haworth College of Business. In recent years the use of portfolios has expanded to include writing across the curriculum programs, and to include such subjects as mathematics, sciences, engineering, and psychology. The success of portfolio approaches that include quantitative and/or technical disciplines makes clear their potential for use in business disciplines as well.

Elements of this approach are a factor in the design of the Haworth College of Business' portfolio. The portfolio is intended in part to provide a mechanism for strengthening students' communication skills by emphasizing those skills across the curriculum, not just in the communication courses.

Portfolios as a method of assessing student learning, faculty competence, and program quality have been employed by educators in both education colleges and in the K-12 setting for many years. In fact, portfolios as instruments for conducting authentic assessment rather than performance assessment have gained in prominence as a result of increased concerns about the quality of educational systems, the increased push toward accountability of educational institutions, and growing discomfort with standardized tests. (Courts and McNerney 1993, Strickland and Strickland 1998, Shaklee, et.al 1997, Cole, Ryan, Kick 1995.) Specifically, authentic assessment requires students to demonstrate their

Table 2
Program Revisions

Old PBA (pre-business administration)	New PBA (pre-business administration)
<ul style="list-style-type: none"> • BIS 102, Introduction to End User Computing • MATH 116, Finite Mathematics with Applications (or equivalent Math course) • BIS 142, Informational Writing • ECON 201, Principles of Microeconomics • ECON 202, Principles of Macroeconomics • ACTY 210, Principles of Accounting I • ACTY 211, Principles of Accounting II • MATH 216, Business Statistics • A Behavioral Sciences course 	<ul style="list-style-type: none"> • BIS 102, Introduction to End User Computing or BIS 110, End User Computing • MATH 116, Finite Mathematics with Applications (or equivalent) • BIS 142, Informational Writing • ECON 201, Principles of Microeconomics • ECON 202, Principles of Macroeconomics • ACTY 210, Principles of Accounting I • ACTY 211, Principles of Accounting II • MATH 216, Business Statistics • BUS 175, Business Enterprise • BUS 270, Information and Communication Infrastructure • BUS 275, Analytical Foundations • MGMT 250, Organizational Behavior • MKTG 250, Marketing Principles
Old BBA (upper level business core)	New BBA (upper level business core)
<ul style="list-style-type: none"> • BIS 340, Principles of Business Communication • BIS 350, Management Information Systems • FCL 320, Business Finance • FCL 380, Legal Environment • MGMT 300, Fundamentals of Management • MKTG 250, Marketing Principles • MGMT 499, Strategic Management 	<ul style="list-style-type: none"> • FCL 320, Business Finance • FCL 380, Legal Environment • BUS 370, Integrated Communication in Business • BUS 375 Production and Service productivity • BUS 475 Strategic Business Solutions Upper level economics as specified by departments;Upper level quantitative course as specified by majors;Program Option.

understanding of concepts and their ability to apply them, which is not the same as filling in circles on multiple choice tests. For business schools seeking accreditation, assessment and continuous improvement activities are a requirement. Portfolios provide an excellent vehicle for establishing and monitoring both program content and student learning if they are designed to help students meet educational objectives. This approach is the lynchpin of the Haworth College of Business portfolio project design.

Portfolio assessment is also a by-product of changing assumptions and attitudes about the nature of teaching and learning. Particularly strong influences come from the cooperative learning and problem-based learning theorists, notably Johnson and Johnson (1994), Kagan (1990), and Savery and Duffy (1994) who stress the importance of student-centered active learning and student responsibility for learning. In fact, much of the literature on portfolio design and use suggests quite strongly that portfolios work best if the curriculum is designed to facilitate and promote active learning (Shaklee 1997, p. 6). Again, for business schools seeking to ensure their graduates have the knowledge, skills and attitudes sought by twenty-first century employers and can “hit the ground running,” a portfolio project can

represent added value in the curricular mix. As Shaklee also notes, “portfolio assessment describes both a process and a place,” the latter being, of course, wherever materials are collected.

The process, which is almost universally described the same way, requires the following: active student involvement in which real tasks related to the educational process are performed; outcomes that are collected over time; and use of the information gathered from the collected materials to make significant decisions about curriculum and instruction. To meet these requirements, faculty become responsible for creating conditions that encourage students to develop their competencies and talents. In short, learning becomes a personal transaction among students and between faculty and students as they work together (Johnson and Johnson 1994, p. 262).

The literature on both cooperative learning and portfolio assessment also mandates that it is the responsibility of the faculty to be very clear about the educational objectives they wish to both “teach” and assess. Activities, assignments, and requirements must be clearly designed to meet specific, well thought out, clearly articulated outcomes. They must also encourage students to construct, discover, transform, and extend their own knowledge by actively participating in the learning process. What this requirement means is that activities and assignments, whether completed individually or collaboratively, must demand reflection on the part of students. Student responses to projects or assignments must demonstrate understanding of knowledge along with the facts and the ability to evaluate and place a value on their own outcomes or activities. Useful guidance for faculty in higher education may be found in *Assessment in higher education: Politics, pedagogy, and portfolios* (Courts and McInerney 1993). Based upon their own experiences, the authors recommend starting small to ensure the requirement is one students will understand and fulfill and that faculty can understand and work with, a requirement that can be met by seeking and listening to faculty input. They further recommend a clear description of what the portfolio is, what it will contain, and how it

Table 3
Nine Objectives of New BBA

Upon completion of their business degree program, students should be able to:

1. Understand essential business knowledge.
2. Make effective business decisions.
3. Communicate effectively.
4. Understand and apply global knowledge and diverse perspectives.
5. Demonstrate effective teamwork and leadership.
6. Demonstrate an understanding of business operations and product and process technology.
7. Understand and use computer-based information systems and infrastructures.
8. Practice acceptable standards of ethical and professional behavior.
9. Participate in professional development activities.

will be monitored or evaluated; this recommendation also means being very clear about what the portfolio is for and how it will be used by both learner and teacher (pp. 83-85). Portfolios designed in this way provide the means for starting students down the path to “lifelong learning,” which is regularly cited as a necessity for success in the corporate world.

The Haworth College of Business Portfolio Project: The Process

The college’s new BBA program was designed and revised to ensure that it met current AACSB guidelines, reflected the college’s new mission and goals, and would enable students to demonstrate an ability to meet nine key outcomes.

In designing the college’s portfolio project, the portfolio implementation team developed a four-stage process that would provide concrete linkages to the BUS core courses and discipline-specific core courses including, accounting, management, marketing, finance and two communication courses. The stages reflect, as well, the implementation team’s sense of how activities could be designed both to promote learning and enable students to demonstrate achievement of the nine BBA Program objectives.

In addition, as Table 4 shows, the activities are cumulative and require active student involvement in which real tasks related to the educational process are performed; the stages themselves also promote outcomes that are collected over time and that should show increasing sophistication.

Although the portfolio carries no credit and is not graded, the implementation team recommended two “gates” be set for evaluation. The first gate occurs during Stage 2, when students apply for admission to the BBA program. The second occurs during Stage 4 when students apply for graduation. For Stage 2, the evalua-

tion is primarily a checklist to verify students have met the preliminary, or minimum, requirements. Evaluation at Stage 4 is still being developed.

The Haworth College of Business Portfolio Project: The Place

In general, portfolio approaches have tended to be centered in one department, at least that has been the trend in higher education, even as these approaches have moved beyond the English department and across the curriculum. Until recently, the “place” was folders filled with written documents maintained either by the students themselves or by faculty and advisors. With rapid advances in technology, there has also been a trend toward web-based portfolios to facilitate access to portfolios and to overcome storage problems. The movement toward CD-ROM, floppy storage or electronic portfolios when feasible is occurring both in K-12 and in higher education.

Initially, some faculty involved in the program design process and some on the portfolio implementation team envisioned the portfolio as a collection of written documents students would review with faculty advisors at various points in their programs. Some even suggested requiring students to purchase a standard portfolio “wallet.” In the end, however, three factors contributed to the decision to recommend a technology driven portfolio rather than hardcopy documents or even a combination of hardcopy and technology based, although the electronic approach was not universally embraced by faculty in the college.

The first factor contributing to the use of electronic portfolios was our size. Neither faculty nor the advisors had much enthusiasm for the notion of being responsible for storing and/or maintaining upwards of 5,000 students’ portfolios (or any portion thereof) for a period of four to five years. Faculty were also concerned about the impact of portfolio review on their advising loads and on their time. They certainly wanted no part of maintaining advisee portfolios in their offices.

The second factor was a matter of ownership and responsibility. Papers, essays, and reports printed and placed in binders for evaluation of some type tended to be viewed as the sole responsibility of the business communication faculty, who in turn were not overly excited about adding thousands of documents to those they already evaluated as part of their courses.

The final factor was our commitment to integrating communication and communication technology across the curriculum and to use the portfolio itself as the major linkage among core courses. It was the assumption of the implementation team that a web-based approach would aid in the integration goal and resolve the storage issue, as students could simply save their work on discs or CD-ROMs and/or upload them to the web. It was also

Table 4
Portfolio Stages

Stage 1

By the end of their freshman year, students must have:

- completed the initial design of their electronic portfolios;
- written an initial statement of personal, educational, and career goals;
- developed a knowledge log documenting understanding of essential business concepts and the dynamics of business decision making;

- begun an assessment of skills necessary for academic and professional success;
- begun creation of an attitudes log reflecting on ethical and professional behavior, team work, leadership, and their views on diversity and tolerance for diverse points of view, cultures, values, and customs.

Stage 2

By the end of the sophomore year, and prior to application for admission to the BBA Program, students must have completed their individualized portfolio design. Students must have:

- revised and updated their statement of personal, educational, and career goals;
- documented the impact of Stage 1 portfolio activities and classroom activities on current thinking;
- refined skills /attitudes logs both as an on-going personal inventory and as a means to devise a preliminary Job Search strategy;
- completed a working draft of a resume;
- completed a revised outline of course selection for future semesters,

- including required courses, general education selections, and preliminary thoughts on selection of major and Program Option;
- constructed an updated knowledge log demonstrating understanding of business information and communication infrastructures and of qualitative and quantitative techniques using critical thinking for research and decision making across the business functions;
- verified that they have registered with Career Services through a program known as Bronco Jobs Plus (a database is being constructed that will provide real-time feedback via ASP pages).

Stage 3

By the junior year, students' portfolios should reflect more sophisticated understanding of the linkages among course concepts and experiential activities and students' abilities to extend those to choice of major, program option, and career goals. Items that should be in the portfolio at the end of the third year include:

- a declaration of major and updated course selection with an explanation of choices for electives, general education courses, and proposed minors as these relate to educational and career goals;
- a description of Program Option (Internship, International Experience, or Research Project) selected and initial log of activities reflecting knowledge, skills, and attitudes learned during the experience;

- a refined statement of professional goals to include a definition of personal and professional ethics;
- updated and refined resumes including a traditional targeted or chronological resume to be sent on paper, a scannable resume, and a Web resume with appropriate hyperlinks;
- continued development and refinement of Job Search strategy begun in Stage 2;
- initial integration of knowledge, skills, and attitudes logs into a reflective statement of how course work, experiential activities (membership in organizations, work, community service, for example) demonstrate the student's ability to meet the Nine BBA degree program objectives.

Stage 4

By their Senior year, students' portfolios will include:

- a final report on the student's Program Option (Internship, International Experience, or Research Project)
- final documentation of Job Search strategies, with a list of possible employers, activities completed and progress to date
- final versions of traditional, scannable, and Web resumes
- a final reflective analysis of students' educational experiences at Western Michigan University and the Haworth College of

Business This analysis should focus on how these experiences demonstrate the knowledge, skills, and attitudes reflected in the Nine BBA degree program objectives and include polished reflections on professional ethics, diversity, and intercultural issues in business. The content and design of the final Portfolio should reflect students' sense of professionalism and demonstrate their abilities to write polished and correct documents for a variety of audiences as well as their competencies in using communication technology.

assumed that a technology approach would be more relevant and exciting for students and that ease of access to content would encourage broader faculty participation, alleviating their concerns about the burdens of review.

The guidelines for portfolio creation presented in Table 5 reinforce the underlying purpose of the portfolio and reflect the web-based approach.

Implementation Challenges: The Pilot

The portfolio implementation team's proposal for the portfolio did not receive approval until March 1998. While the team was satisfied with the proposed outline in general, there was nonetheless concern about the full ramifications of implementation. Key concerns related to: technology issues, a lack of more widespread faculty

Table 5
Portfolio Components

EPP Components

Individual Page

This includes your initial statement of personal, educational, and career goals. This page may also be used as a goal setting or planning page, or you may choose to develop a separate Future or Target page specifically for course selection and schedule planning and setting learning objectives.

Thought Questions

- Why did you choose WMU and the HCOB?
- What do you hope to gain from your education?
- What role do you see extra-curricular and experiential (work, community service) activities playing in your education?
- What are your tentative career goals?

Knowledge Log

Your knowledge log is the place to document your understanding of concepts you are learning in your courses and track your success in meeting learning objectives you have set for your courses and “things” you learn from experiential activities such as work, volunteering, community service, participation in student organizations—whatever you choose to include as a learning experience.

Suggestions for Knowledge Creation

- Becoming familiar with resources at WMU.
- Taking aptitude and interest tests at the Career Services Center.
- Visiting at least three campus student organizations, including at least one for business students.
- Joining and participating in at least one student organization.
- Attending Career Day and Career Services Brown Bag Lunches.
- Interviewing at least one business person about his or her chosen profession and what he/she looks for or values in an employee.
- Talking with professors and advisors.
- Reading business periodicals.

Skills Log

Your skills log should reflect your grasp of the skills necessary to succeed both as a student and as a professional. In addition, it should reflect on going self-assessment and goal setting. You should focus on skills you possess, skills you need to acquire, skills you would like to “polish.”

Thought Questions

- Which of these skills do I possess to some degree? and which do I need to work on?
- How strong are my communication (writing, speaking, and listening?) skills?
- How strong are my end-user computing skills? (BIS 102 or BIS 110)
- How strong are my quantitative skills?
- How good am I at thinking critically and solving abstract problems?

Attitudes Log

Your attitudes log is the place to begin to record your reflections on such things as ethical and professional behavior, being a team player and a team leader, and diversity and intercultural communication and interactions.

Thought Questions

- What are the qualities and values of successful business people/entrepreneurs?
- What are the values of successful organizations?
- What do you think it means to be a professional?
- What do you value in others?

Fun Page

A fun page that tells more about you and your individual interests: information about your home town or home country, your family, your pets, your hobbies, and membership in organizations. *Whatever you want within appropriate limits.*

E-mail link

An e-mail link which will serve as your door to communication with others and to receiving valuable feedback.

Homepage

Last but not least, you will need a Homepage to organize your site.

input and involvement in the design process, and a lack of clarity about how to incorporate portfolio activities into a course without “teaching” it or detracting from content delivery. The team recommended to pilot the project with the incoming freshman fall class. Instead, the pilot was initiated in late Spring after only four weeks of further discussion and planning. The classes

selected for the pilot were sections of BIS 142, Information Writing and BIS 102, Introduction to End-User Computing, which are part of the required freshman core offered through the Department of Business Information Systems. A combined total of fifty students were enrolled in these sections. From a pedagogical perspective, the team did not have the luxury of care-

fully thinking together about how to incorporate the portfolio project into the syllabi while maintaining course content integrity or how to balance the need for content comprehension and the need for some technical basics.

Creating the portfolio guidelines was, in retrospect, the “easiest” part of pilot development. Essentially, we limited the pilot materials to the requirements for Stage 1 and emphasized an introduction to the portfolio concept and the development of a personal page, a fun page, and the Knowledge, Skills and Attitudes logs. In addition to the printed guidelines, which were distributed to students in pamphlet form, we also designed a series of templates for students as they learned uploading and page creation. These templates included rather precise questions for students to answer in completing their logs, some of which are listed in Table 5.

Developing the pilot materials was one thing; incorporating them into classroom assignments without teaching the portfolio was another. Although students could complete assignments in each class to be translated into portfolio entries, the concept of a portfolio was so foreign to most students that instructors found it necessary to devote time to teaching the portfolio and allow students to work on materials in class. In addition, the fifty students possessed not only widely varied writing skills but also widely varied computer skills, a description that applies, in fact, to all our entering students. Some were already skilled in web page development; others were self-described as basically computer illiterate. Time, or lack thereof, again became an issue. Students felt overwhelmed and perceived they needed to know everything at once. To ease anxieties the team developed an approach that required students to develop content stored on a disk for eventual conversion to HTML using Netscape Composer. The BIS142 instructor introduced content topics and the portfolio in both the BIS142 and BIS 102 classes. The BIS102 instructor handled the technical side.

The issue of technology access and support presented the first evidence that we had developed our portfolio concept in isolation from other elements within the institution, something Courts and McInerney (1993) specifically warn against. First, the university’s current policy is to not allow students to have personal web pages that outlive a particular course. Since the web-based portfolio in the college of business would need to exist for four or more years, the issue of allowing one group of students something others did not have became a concern for the Provost’s office although approval was eventually granted.

While we had included the college’s director of computing services in our deliberations and had his support for use of a server in the college to house the students’ portfolios, we had not enlisted the support University Computing Services (UCS; now Office of Information Technology [OIT]), the division that controls all computing on campus. The issue of long-term portfolio development and maintenance, for example, raised a

different issue for the staff and managers in OIT and set off the first round of attempts to clarify purposes and roles. In the end, we were speaking two separate languages: the language of the educator and the language of the technology expert. We were concerned about program continuity; they were concerned with issues of hardware, “space,” and control (a term often used interchangeably with security).

Our assumption that technology exists to support pedagogy and aid in delivery of quality instruction was a bit naive, and we were caught somewhat by surprise when a curricular issue became a hardware/software battle. While we had the server, owned by the college of business, a faculty member skilled in Web design and UNIX protocols, and the support of the dean, OIT was unwilling to relinquish its control of the system, which included access as well as account and password creation, and could not appreciate the urgency of the situation. The outcome in this “round” was that the team eventually got the server and accounts and mounted the pilot templates, but not by the first day of class.

One obvious objective of the pilot was to get student feedback about the process and to gather their input on how “things” might work better. If students are to be actively involved in their own education, they need to have a voice that is heard. What they told us offered no surprises, but did impact our approach to development of portfolio materials for full-scale implementation. As might be expected, students wanted more precise and detailed instructions for performing the technology component of the portfolio. This request led to the development of a series of technical FAQs posted on the portfolio web site (<http://www.hcob.wmich.edu/portfolio>). There was also universal concern about the overwhelming amount of information students felt they were being asked to absorb in a short period of time. While part of this reaction was a function of the time frame in which we had to do the pilot, essentially five weeks, the feelings of frustration and anxiety on the part of students has become a continuing concern.

More surprising was the feedback related to content development. The students almost universally recommended keeping guidelines for development of page content to a bare minimum. They preferred open-ended questions such as those found on the Attitude Log page (see Table 5) as these questions allowed them (or forced them) to think in some depth before responding. At the same time, they recommended eliminating prompts on the personal page that encouraged perfunctory answers. Underlying their suggestions was their knowledge that they were preparing something that could eventually become “public.” In a rather remarkable turn of events, many students were concerned that their own writing not appear superficial, but they were also concerned that other people’s portfolios not appear that way either. These suggestions demonstrated a growing awareness of the importance of “image” and “style.” From this feed-

back we determined that guidelines should both assist students and provide a means to assess progress, but they must not be overly prescriptive. What students were telling us was that it is difficult to be reflective if you are being told how to reflect.

We also learned through observation that student collaboration and mentoring have potential for moving the process along effectively and determined that such “partnering” activities should be actively encouraged. Because the students, as has been noted, had varying levels of competence or comfort with both technology and written communication, their portfolios tended to develop in various ways. Students with fairly strong writing skills developed acceptable content for their portfolios. Those more interested in the technical, “fun” stuff tended to ignore their writing assignments during lab time and to spend time playing with the technology. When students actually began to look at other portfolios, many were initially embarrassed either because their sites had nothing but technical gimmicks or because their sites still used the templates provided and seemed to be only “dull” prose. Embarrassment soon gave way to learning partnerships students formed on their own and with no prompting. Those strong in technology but weak in written communication paired with their opposites to provide feedback, guidance, and mutual support. As it turned out, peer pressure emerged as having the potential to become the most effective means of motivating students to be professional and precise.

Implementation Challenges: The Learning Curve Begins

The lessons learned during the pilot provided useful guidance for development of a series of implementation initiatives, which were completed in a two-month period. The first initiative was the creation of informational and explanatory materials for incoming students. These materials included an overview and a series of FAQs designed to explain the portfolio as both process and place. The content FAQs explain the portfolio components and offer guidance for content development. For initial implementation only stages 1 and 2 were included (see Table 4). In addition, technical FAQs provided students with basic technical information requested by students during pilot. These documents were used as the basis for the portfolio homepage (<http://www.hcob.wmich.edu/portfolio>).

The second initiative was the formation of a student mentoring team (seven students from the pilot), to help in explaining the portfolio process to students and faculty. This was a self-selected group who saw the value in the portfolio process and who were eager to keep their own web pages. We named this group the Piloteers. These students’ portfolio pages were linked to the portfolio homepage to provide examples for incoming students.

The group also agreed to give traveling presentations in the freshmen level classes and to plan instructional workshops for students needing help with the technical aspects of the process.

Technology control issues continued to be a concern. The Office of Information Technology was unwilling to relinquish control of the server, a development that would continue to cause much frustration for students, the Piloteers, and faculty, particularly the webmaster. Having accounts and passwords ready to go by the start of the semester became a matter of “wait and see.”

Education of faculty to enable them to introduce the portfolio effectively was also a major concern. We created a set of FAQs for the faculty and set up a CONFER site (a WMU electronic discussion board) as a means to bring more of our colleagues into the process.

Implementation Challenges: The Learning Curve Grows Steeper

The compressed time frame in which we developed the portfolio project meant that faculty involvement in the process was severely limited, a fact that also tended to diminish any sense of faculty responsibility for the portfolio. Courts and McInerney (1993) specifically warn against assuming that because the committee working on the project understands what is going on that colleagues will as well (p. 84). By the end of the pilot, only two faculty members and seven students had a substantial understanding of the project. In addition, there was limited faculty input into the project after the work of the implementation team, primarily because the pilot and follow-up activities occurred while most faculty were away from campus. Thus, portfolio implementation appeared to be mandated from the top down, an approach that Courts and McInerney (1993) note does not motivate faculty, and it proceeded without a designated coordinator. Consequently, initial portfolio implementation occurred in a less than methodical way.

The portfolio was introduced in two required freshman core courses: Business Enterprise (the newly developed BUS 175) and Informational Writing (BIS 142). Seven faculty members, the majority of them Informational Writing instructors, became responsible for implementation. None of the faculty had sufficient information prior to the start of the semester to build the portfolio into course syllabi. A “crash” course in the portfolio was needed to bring more faculty into the information loop. Unfortunately, providing faculty with useful and necessary information was further complicated by differing expectations of just where and how the portfolio would be “introduced” and faculty reluctance to hold special meetings either prior to or during the first few weeks of the new semester.

When a meeting did occur, the issues voiced were often: *Who is teaching this? I can't teach technology. I*

have too much material to cover already; how can I be expected to add additional content? Ultimately, while we shared all the documents created during and after the pilot, including faculty FAQs, and offered suggestions for assignments, we were not connecting with our colleagues, who did not share our knowledge or experiences.

Students received a brief introduction and their portfolio account numbers and passwords in Business Enterprise. However, this course is a large lecture with approximately 300 students per session, making the introduction rather superficial. To provide a more in-depth introduction, the seven Piloteers began making presentations in each of the fifteen sections of Informational Writing. They also organized a series of workshops to help get students and faculty acclimated to the portfolio process. These workshops focused on the technical aspects of FTP and saving Word documents in HTML. The responsibility of the faculty was to ensure students attended the workshops with content on disks to use in the process. As the academic year progressed, faculty teaching the required courses began to develop content assignments which furthered portfolio development. The faculty responsible for the introductory computer classes were also included in planning for future semesters. Representative assignments include developing an educational mission statement in Business Enterprise and composing a personal essay in Informational Writing. By second semester, faculty teaching Informational Writing were also initiating activities and assignments that could be posted to the students' Knowledge, Skills, and Attitudes logs. These efforts, plus the requirement of registration with the university's career services represented a move toward ensuring all students would be able to meet the minimum portfolio requirements necessary for admission to the upper level curriculum.

During this first year, on-going policy and political struggles with OIT contributed to moments of chaos. Most of the visible manifestations of underlying policy challenges surfaced in the form of student accounts not working, passwords failing, and lengthy queues for computer usage. Many of these challenges were addressed as we encountered them, but more slowly than we would have hoped.

Based upon what we had learned in year one, we made some adjustments to the implementation process, changes we anticipated would provide a less chaotic introduction for the incoming 1999 freshman class which numbered 818 (a 23 percent increase over the year before). Many of these changes, in effect, formalized deadlines and obligations for faculty and for students. The most significant changes included the shifting of password distribution from the large lecture Business Enterprise classes to Informational Writing and to the labs for End User Computing. Since enrollment in these classes is held to approximately twenty-five, students receive more than a cursory introduction and

are less prone to lose their account numbers and passwords. In addition, accessing the accounts and learning the basics is done in these smaller classes, during class time, in workshops conducted by the mentors. Portfolio content creation requirements were also tightened. As part of their coursework in Informational Writing, students are required to develop content for each of the required logs in addition to posting their personal essays. Those in the computer class complete the design and upload an appropriate homepage by the end of the semester.

[Student mentors from the pilot class] received formal recognition as the portfolio peer mentoring team and a new identity.

In a significant move, the Piloteers also received formal recognition as the portfolio peer mentoring team and a new identity. By March 1999, the original seven had grown to twenty students and became the reactivated mother chapter of Alpha Beta Chi, a national business communication honorary, affiliated with the Association for Business Communication. The mentors have their own office, phone, and computer system complete with software and an e-mail account. They hold office hours and help their peers with technical and content questions. Some mentors have taken to strolling the college's computer lab looking for people who need help with technical and content questions. Alpha Beta Chi members also develop FAQs and worksheets for their workshops and classroom presentations. In addition, the dean has funded a graduate assistantship for the portfolio, a position held by one of the original Piloteers who is now in the MBA program and who does all of the scheduling of workshops for both the BIS 102 and BIS 142 classes and who works with the transfer students who now must meet the portfolio requirement. As a result of these changes, portfolio introduction progressed a little more smoothly during 1999-2000, with only lingering technology malfunctions and occasional miscommunication disrupting activities; passwords that will not work or inability to access the server being among the most prevalent.

Members of Alpha Beta Chi have also become champions of the portfolio to faculty and administrators in the college. While the experiences of the first year enlarged the pool of faculty and students with a fairly solid understanding of the portfolio process, the faculty most actively involved remain those teaching at the freshman level. This fact posed a problem as students in the first portfolio cohort advanced to the sophomore level courses including Information and Communication Infrastructure (BUS 270), Analytical Foundations (BUS 275), and introductory marketing and management, and have

applied for admission to the upperlevel, professional curriculum. Individually and as a group, members of Alpha Beta Chi have made presentations at departmental meetings, met with the dean, and conducted an informational session for interested faculty across the college. A requirement of membership in this group is the maintenance of an exemplary portfolio. Their portfolios are accessible through the portfolio homepage.

Portfolio Benefits

Linking portfolio activities to core courses during each year of the program fosters a cross-functional approach to course content and assignments and encourages students to develop an appreciation for the interdependence of the essential business functions. In short, the portfolio provides a means for breaking down the silos in a large college with a diverse group of students, many of whom work at least part-time. It also provides a mechanism for a cross-functional approach in a university system where “cluster scheduling” and team teaching can be accomplished, but only for some students. Ultimately, the electronic portfolio offers students “personalized attention” in a large school setting.

While many unanticipated benefits of the portfolio will undoubtedly emerge over time, a core of desired benefits seems obvious. Faculty benefit from increased possibilities for revised approaches to course content selection and delivery. They also benefit from increased opportunities for cross-functional collaboration with peers throughout the college and the university. These opportunities, in turn, ensure that the courses in the BUS core truly reflect a cross-functional approach, that core courses still taught within departments (business information systems, management, marketing, finance, and accountancy) mesh with other courses, and that general education courses become more important and relevant to our graduates. Faculty also benefit from the opportunity to work with students to develop meaningful “hands on” exercises and portfolio activities that enable students to showcase their abilities to apply the knowledge learned in a particular class.

Students benefit by assuming ownership for their own education and acquiring an appreciation for the value of lifelong learning. As they create and refine their portfolios, students gain meaningful experience in developing and applying vital critical and creative thinking skills, in planning and creating written communication that demonstrates their skills and knowledge to a real-world audience, in honing their technological skills to present a professional and “unified” image of themselves, and in developing exceptional project and time management skills. Creating an effective and professional portfolio also enables students to demonstrate other skills necessary in the twenty-first century workplace. These skills include the ability to take initiative, to think for themselves, to be very clear about what knowledge, skills, and

attitudes they can bring to an employer, and to work well both independently and in collaboration with others, which is encouraged by faculty introducing the portfolio. Partnering extends beyond the visible activities of the mentors to include students helping students in class, in the dorms, and in the labs.

Employers benefit in a variety of ways, perhaps most obviously in the area of screening applicants for internships or entry level employment. Members of the Dean’s Business Advisory Board, for example, reacted enthusiastically and favorably to a presentation of parts of portfolios created by members of Alpha Beta Chi. They were impressed with the knowledge and the creativity exhibited in the portfolios and with the fact that they could learn much more about applicants by viewing their portfolios than they could by reviewing traditional resumes. Issues that seemed most pertinent centered on what the portfolios revealed about what students know and what they can do. Equally important were the values and attitudes reflected in the students’ attitude logs. In short, portfolios can provide employers with a clear picture of the potential value a student can bring to their organizations and how well the student will fit within the organization’s culture.

Being able to access student portfolios also provides the business community with valuable knowledge about what is being taught in a school’s curriculum and what knowledge, skills, and attitudes students will take from the program. Members of the Dean’s Advisory Board and members of the college’s alumni group have volunteered to provide feedback on student portfolios. Participating in the feedback/evaluation process can benefit the business community by giving them a voice in the area of curriculum content and delivery even as it enables them to forge meaningful partnerships with both faculty and students. In a way, this benefit may be of most interest to the business community as it provides them some assurance that their future employees will be those who can hit the ground running. It also provides some assurance that their insights and input are vital components in the design and delivery of effective business programs.

Final Reflections

We believe that the Haworth College of Business Electronic Portfolio Project is sound and has the potential for adding tremendous value to our programs and for our students. As the literature recommends, the design was built with a clear set of objectives in mind and with a reflective slant that would make portfolios authentic assessment tools for students, the college, and for the business community that will employ our graduates. The strategy of linking portfolio activities to required core courses is also in keeping with best practices of portfolio design and if properly applied should enable students to connect concepts learned in one course to concepts used or

usable in another. This feature also has the potential for breaking down disciplinary silos and moving toward a cross-functional and integrated approach to program delivery.

We recommend thinking very carefully about the role of technology in portfolio design and about when to introduce technology into the mix. In our implementation experiences, from pilot to present, we have asked students to create original content for the portfolio even as we asked them to use advanced microcomputer end-user skills and interact with a sophisticated UNIX server. They must, at a minimum, use Netscape Composer to create an HTML document and know how to upload these documents into their portfolio accounts. Teaching students to move away from the linear presentation of materials is a struggle in itself; when one adds technical skills, it can be a disaster. While the Alpha Beta Chi workshops conducted by students are quite effective in helping other students acquire these skills, the mentors are the first to suggest that students must have content before they move to the next level. The real danger in our current approach is that technology will assume a larger role than it should in the creation process. If students see technology and web page design as the "end" rather than the "means," their portfolios will lose much of the reflective and thoughtful qualities that are, in fact, the ultimate objective of an authentic assessment portfolio. The mixing of things technical with things conceptual also creates problems for faculty whose major focus is on concept and content development.

A further consideration for those thinking of implementing an electronic portfolio is that of institutional support. If the IT infrastructure is not in place or does not support a large-scale implementation, frustrations and barriers will abound. No matter how much enthusiasm students, faculty, and staff bring to the portfolio, there will always be recurring technical challenges. As more students need accounts and space for their portfolios, this demand will have to be met with more hardware and better methods to handle account creation and maintenance. The challenge for the administration and the technical support staff is to create an environment that allows students to focus on the implementation of their ideas, rather than worrying about whether or not they have a functional portfolio account. To make the portfolio easier to implement for faculty, staff and external partners, the college must incorporate technology that will help people find the necessary information in a timely manner.

While our initial experiences confirm that faculty who begin to develop an understanding of the portfolio are more than willing to participate in its implementation, they have also clearly demonstrated that the best source of support and encouragement to keep students working independently on the portfolio must come from other students. In fact, without student enthusiasm and acceptance, the portfolio would not work at all. If the Alpha Beta Chi mentors did not make a commitment to holding

orientation sessions, keeping office hours, answering numerous questions, and enthusiastically proclaiming the benefits of this project to anyone who will listen to them, the portfolio would soon become yet another meaningless checklist requirement. Without the mentors' support and the enthusiasm they bring to the portfolio, new students would not see the importance and the relevance of this experience to themselves. No matter how much technology or faculty support we have, without the students driving the portfolio, it runs the risk of not fulfilling its objectives. Since one objective of the portfolio is to encourage students to assume ownership and responsibility for their own learning, students taking the lead seems entirely fitting. ■

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Student and Employer Perceptions of Desirable Entry-level Operations Management Skills

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Abstract

The purpose of this study is to determine whether there is a significant difference between employers and students on their perceptions of the importance of skills and traits critical for securing entry-level employment in operations management. Another major concern in this study is whether employers value general skills more than technical abilities. To address our research questions, a two-page questionnaire was developed. We found significant differences in mean scores between employers and students in their perceptions of the importance of general skills, technical skills, and personality characteristics. In addition, our findings indicate that employers value general skills significantly higher than technical skills. The results of this study provide a foundation for operations management programs in curricula reengineering and ultimately provide the business community with more qualified applicants.

Introduction

Most business schools find it necessary to continually examine their curriculum in order to enhance the educational experience and achieve continuous quality improvement. To assure a viable curriculum, some academic departments are developing closer contacts with their stakeholders. They are also attempting to adapt curriculum to meet the changing needs and skills required by employers. Research suggests that a majority of operations management departments regularly consult with industry on curricular issues (McFadden, Jansen and Towell 1999). As they begin to develop closer ties with industry, the academic community becomes more aware of the needs of the business community. The intent is to close the gap in understanding between the academic community and business industry.

At the College of Business at Northern Illinois University (NIU), this business outreach includes developing strategic alliances and partnerships with local companies,

Some academic departments are... attempting to adapt curriculum to meet the changing needs and skills requested by employers.

surveying stakeholders, conducting focus groups, receiving input from student and alumni organizations, and creating executive advisory boards at both the college and department levels. The Department of Operations Management and Information Systems (OMIS) at NIU created its Executive Advisory Board to improve communications with the business community and to help provide a direction for future program development and student career preparation.

At the first OMIS Executive Advisory Council Meeting held on October 23, 1998, discussions of “what businesses need” pointed to a lack of understanding. A central question was whether it was more beneficial to emphasize technical skills over general skills, or vice versa. Also, the group wondered whether gaps existed between perceptions of students and the business community regarding the value of certain skills and traits.

The purpose of this study is to compare perceptions of operations management students to those of employers regarding the value of specific skills necessary for employment. We evaluate qualities beneficial for securing entry-level employment in operations management. We group items identified in the literature into three categories (or factors) based on whether the item relates more to a qualitative, quantitative, or personal attribute. Qualitative attributes tend to be more generic or broad-based skills that would be desirable for any type of entry-level business position. Therefore we define these items as general business skills. Examples of general business skills consist of working in teams, problem-solving, handling ambiguous situations, and effective communica-

An earlier version of this research was presented at The Midwest Decision Sciences 2000 Conference and won the “Innovative Education Award.”

tion. Quantitative attributes tend to deal more with technology- or discipline-based knowledge and we refer to these as technical skills. Technical skills include knowledge in programming languages, database management, and linear programming. Finally, personal attributes are inherent traits or qualities in an individual and so we classify these items as personality characteristics. Personality characteristics include traits such as being conscientious, motivated, and ethical. We compare student perceptions and employer expectations on all three factors and assess the importance to employers of general business skills versus technical operations management skills.

This study can assist operations management majors to understand the skills and personality traits valued by employers.

The knowledge gained from this study can assist operations management majors in assessing their level of understanding of the skills and personality traits valued by employers. The study identifies important general skills, technical skills, and personality characteristics that students should concentrate on acquiring in order to prepare themselves for the job market. The results of the study provide students with guidance in preparing resumes and in identifying skills and characteristics to emphasize during interviews. This study also provides a foundation and methodology that is broadly applicable to other departments, other operations management programs, and their students. Many skills can be achieved through curricula experiences. This study has provided our department with a foundation for curricula and course redesign and helped to educate our majors on employer expectations. Other departments that house the operations management and information systems discipline can use the results of this study to improve similarly.

Literature Review

Many business schools attempt to prepare highly skilled operations management students for positions after graduation. For successful community-based education, it is important for the academic community to foster relationships and develop open lines of communication with both students and the business community (Graf 1997). Communication must flow between not only the academic community and students, and the academic community and the business community, but also between the business community and the students. Moreover, if the academic community is aware of the needs and desires of the business community, and this information is not communicated to the students, resistance and

frustration may develop. In order to more effectively match employer needs with student attributes, it is first necessary to remove any misconceptions among students about what employers are seeking.

The academic community maintains ties with the business community in a variety of ways. Some departments and colleges develop strategic alliances and partnerships with business firms. Many of these firms provide input to colleges during curricular reengineering. Consulting work and faculty externship programs also provide an opportunity for interaction between the business community and the academic community. Through mutual involvement in professional organizations such as Decision Sciences Institute (DSI), the Institute for Operations Research and Management Sciences (INFORMS), and American Production and Inventory Control Society (APICS), the business community and the academic community also interact and share needs and desires.

In the literature, research has focused on identifying gaps between the academic community and the business community regarding perceptions of the importance of various skills necessary for employment (Gilsdorf 1986; Levenburg 1996; McFadden, Jansen, and Towell 1999). Research has focused on identifying the skills sought by employers to examine the implications for curriculum redesign. McFadden, Jansen, and Towell (1999) suggest that increased interaction between the business community and the academic community will be a major trend in the new millennium. Their findings indicate that the academic community is beginning to understand what businesses want from their graduates, and are attempting to design curricula to meet the needs of the business community.

Prior research has also attempted to identify skills and characteristics employers value in applicants (Hakel and Schuh 1971; Powell and Posner 1983; Atkins and Kent 1988; Kanungo and Misra 1992). Kane's (1993) study reported that Fortune 500 recruiters focus on the candidate's people skills because they assumed that graduates possess the appropriate technical skills. In Martell and Carroll's (1994) study, Fortune 500 managers stated that, although the technical skill requirements needed for a position differ across functional areas, general skills and personal characteristics were the same across functional areas. Drake, Kaplan, and Stone (1972) found motivation/ambition to be the most important attribute sought by employers. In Tschirgi's (1972) study, employers valued communication skills above both grade point average and work experience. Maes, Weldy and Icenogle (1997) found that oral communication skills were more important to employers than written communication.

Research has also focused on the link between the academic community and students. The relationship between students and the academic community is the

strongest and longest of the three links. Students are exposed to faculty perceptions through their classroom experiences over several years. Some students also build connections with faculty members through student organizations. Faculty members tend to communicate to students their perceptions of the needs of the business community. Faculty perceptions may bias students' opinions.

Numerous studies (Mandt 1982; Hildebrandt, Bond, Miller, and Swinyard 1982; Behrman and Levin 1984; Hahn, Mabert, and Biggs 1984; Houshyar 1990; Harris 1994) address the issue of whether business schools are adequately preparing students to succeed in today's highly technical and global marketplace. In the 1970s, Livingston (1971) argued that university and industry training failed to develop the skills and traits necessary for success in business. More recently, several articles show that business schools have failed to improve students' oral and written communication skills (Clarke and Franklin 1985; Atkins and Kent 1988; Buckley, Peach, and Weitzel 1989; Harris 1994; McEwen 1997; Levenburg 1996). Studies propose steering away from theoretical teaching to a more applications-oriented approach (Buckley, Peach, and Weitzel 1989; Hammond, Hartman, and Brown 1996; McFadden, Jansen, and Towell 1999). Some research indicates that programs should concentrate on management development instead of quantitative skills (Behrman and Levin 1984; Buckley, Peach, and Weitzel 1989; Levenburg 1996). Other studies suggest that operations management programs lack focus on various technical skills, such as management information systems (Berry and Lancaster 1992; Mueller and Ma 1999). McFadden, Jansen, and Towell (1999) found that operations management programs have been placing greater emphasis on the use of computer-based tools and are building stronger MIS skills into the curriculum. Understanding current trends and receiving feedback from the business community allows business schools to improve the performance and marketability of graduates.

The link between the students and the business community is the weakest of the three links. Most undergraduate students have little interaction with the business community prior to graduation. They may gain some exposure during work-related experiences such as internships. Students may also interact with business managers briefly during classroom experiences. For example, practitioners may volunteer to speak in classes or students may be required to interface with the business community as part of a class project. Other ways that students interact with the business community include student membership and involvement in professional organizations and plant tours of both manufacturing and service facilities. However, the relationships that develop during these encounters tend to be short in duration and limited in depth and scope.

Little research focuses on the link between the business community and students. Hafer and Hoth (1981) matched employers' and students' perceptions in the areas of accounting, marketing, and management. In our study, we compare operation management students' perceptions to employer preferences to identify any inconsistencies between the two groups. It may be possible that students enter the interview process with incorrect assumptions about the skills valued by employers. If students do not fully understand the types of skills (general vs. technical) and personality characteristics most attractive to employers, they may not take full advantage of opportunities available during the undergraduate experience or effectively "sell" themselves during the interview process.

Research Hypotheses

It is clear that differences still exist between the skills needed by the business community and the skills acquired by operations management students. Minimizing the gap between the ability of graduating students to capably perform and the skills deemed important by employers is one goal of the OMIS department at NIU. In order to accomplish this goal, we must clearly identify those general skills, technical skills, and personality characteristics valued by employers. In addition, we must understand students' perceptions of the technical and general skills they deem most marketable. Then we must work to close the gap in understanding between students' perceptions and employers' expectations to better prepare students to succeed. The following research hypotheses are addressed in this study:

1. There will be differences between employers and students in their perceptions of the importance of general business skills, technical skills, and personality characteristics.
2. Employers will perceive that general business skills are more important than technical skills for obtaining an entry-level position.
3. Students will perceive that general business skills are more important than technical skills for obtaining an entry-level position.

Some argue that business educators have an obligation to prepare students for the challenges of a highly competitive global environment. To better serve the needs of the business community as well as the students, our department is interested in continuous quality improvement in education. We must be aware of students' perceptions (or possible misconceptions) of skills and characteristics valued by employers. Our objective is to explore any gaps between employer expectations and student perceptions.

Methods

To address our research hypotheses, we surveyed two groups: (a) operations management employers and (b) undergraduate operations management majors at Northern Illinois University. A two-page questionnaire was developed that was brief and free of specialized jargon. Three factors were of interest in this study 1) general skills, 2) technical skills, and 3) personality characteristics. Each factor had at least fifteen questions associated with it. In the first section of the survey, respondents were asked to "indicate how important it is for prospective employees to have the following general skills." In the second and third sections, respondents answered the previous question regarding technical skills and personality characteristics. They were instructed to indicate the importance level of each skill/characteristic on a 5-point Likert scale, where 5 = high importance; 3 = medium importance; and 1 = low importance. The survey instrument was pilot-tested on a small group of students and practitioners to assess the instrument's face validity and clear up any ambiguity and wording issues. The individual items for general skills, technical skills, and personality characteristics were based on the literature (Levenburg 1996; Maes, Weldy, and Icenogle 1997) as well as on research conducted by our own strategic planning career preparation initiative team in 1997. The internal consistency of the items within each factor was also statistically evaluated in this study.

We surveyed 193 Chicago-area employers that were obtained through our departments' employer database. We selected only those firms that requested resumes from our students. Surveys were addressed to specific contacts at each company. The targeted respondents were operations managers rather than human resource managers because we felt they could more accurately assess important skills and characteristics of operations management professionals. We concentrated on regional firms because they hire our graduates. Thus, our findings would be directly applicable to our students' recruiting efforts and our curriculum. A total of eight surveys were returned as undeliverable. Out of the remaining 185 surveys, 36 surveys were returned yielding a response rate of 19.5 percent. As can be seen from Table 1, half of the respondents were from organizations of over 10,000 employees. Their Chicago-area sites ranged in size from under 1,000 employees (54.3%) to over 10,000 employees (11.4%). Major industries represented in the population were consulting, manufacturing, retail, and transportation. Respondents sought applicants with an area of emphasis in operations (43.2%), logistics (10.8%), and information systems (46.0%).

A similar questionnaire was also developed for operations management students. Currently, over 550 NIU students have a declared major in OMIS. The OMIS department at NIU offers a Bachelor of Science degree in operations management. Operations management students

Table 1
Demographics of Employer Respondents

<i>By Industry</i>	<i>Percent</i>
Aerospace	2.8
Consulting	13.9
Consumer Products	5.6
Financial Services	8.3
Food Services	2.8
Manufacturing	16.6
Retail	11.1
Transportation	13.9
Utilities	5.6
Wholesale	2.8
Other	16.6
<i>By Size of Organization</i>	
Under 1,000 employees	13.9
1,001-5,000 employees	19.4
5,001-10,000 employees	16.7
Over 10,000 employees	50.0
<i>By Size of Chicago Site</i>	
Under 1,000 employees	54.3
1,001-5,000 employees	25.7
5,001-10,000 employees	8.6
Over 10,000 employees	11.4
<i>By Starting Salary of Employees</i>	
Under 25,000	5.7
25,001-30,000	22.9
30,001-35,000	22.9
35,001-40,000	28.5
Over 40,000	20.0
<i>By Area of Emphasis Seeking</i>	
Operations	43.2
Logistics	10.8
Information Systems	46.0

must select an area of study in business operations, business information systems, business logistics or operations systems (a general degree that combines these areas). A two-page questionnaire was administered at the beginning of the Spring 1999 semester to OMIS students enrolled in two required courses. The first was a quantitative methods course that is geared towards junior-level students and is a pre-requisite to various senior-level operations management courses. The second was an advanced operations management course that is typically taken in the senior year. Since these courses are required for OMIS majors, regardless of their area of emphasis, we were able to achieve a sample from various areas of study. We were also able to capture responses from a large percentage of juniors and seniors. Only two students were enrolled in both courses in the spring semester. To avoid sampling bias, students were instructed to complete only one survey. Out of the 179 surveys completed in the two courses, 178 surveys were usable. Table 2 provides demographics of student respondents. The sample appears to be fairly representative of the population of operations management students at NIU.

Table 2
Demographics of Student Respondents

<i>By Age</i>	<i>Percent</i>
Early 20s	93.8
Over 25	6.2
<i>By Gender</i>	
Male	64.6
Female	35.4
<i>By Academic Level</i>	
Junior	44.4
Senior	55.6
<i>By Internship Experience</i>	
Experience	32.0
No experience	78.0
<i>By Area of Emphasis</i>	
Business Operations	7.9
Logistics	7.3
Information Systems	79.8
Operations Systems	5.1

Table 3
Cronbach’s Alpha (α) of Multi-Item Correlation Measures for Desirable Characteristics Questionnaire

	<i>Employers</i> <i>α</i>	<i>Students</i> <i>α</i>
General skill factor	0.892	0.908
Technical skill factor	0.878	0.862
Personality factor	0.902	0.887

Among employers and students, we computed an overall mean total score for each factor. We assessed the internal consistency of the sets of questions within each factor using Cronbach’s alpha (Cronbach, 1951; Hosmane, Maurath, and Manski, 2000). As seen in Table 3, the values of Cronbach’s alpha ranged from 0.862 to 0.908, indicating strong internal consistency among items within each factor. These findings validate the use of the various sets of questions to represent each factor of the study.

Multivariate Analysis of Variance (MANOVA) was used to assess differences between students and employers on the three factors of interest (Hypothesis 1). To determine whether employers (and students) valued general skills significantly more than technical skills (Hypothesis 2 and 3), we compared the overall mean scores of general skills (m_G) to the overall mean scores of technical skills (m_T) using a one-tailed paired t-test. The null hypothesis and alternative hypothesis are as follows:

$$H_0: \mu_G \leq \mu_T$$

$$H_a: \mu_G > \mu_T$$

In addition to hypothesis testing, rankings were developed that summarize the relative importance to employers of various general business skills, technical skills, and personality characteristics. Similarly, rankings were produced on student perceptions of the importance of these skills and traits.

Table 4
Employers’ and Students’ Mean Scores for Skills and Personality Factors

	<i>Employer</i> <i>Mean</i>	<i>Student</i> <i>Mean</i>
Overall mean: general skill factor	3.937	4.291
Overall mean: technical skill factor	2.970	3.993
Overall mean: personality factor	3.527	3.946

Results

Our first research hypothesis was whether the overall scores for general business skills, technical skills, and personality characteristics would differ for employers and students. The analysis using MANOVA (Wilks’ Lambda; $F = 31.64$ with $df = (3, 209)$, $p\text{-value} = 0.0001$) indicates that all three factors were significantly different for employers and students. Table 4 provides the mean scores for each factor. Given that a mean score of 3.0 indicates medium importance, employers and students feel that all three factors are of moderate importance for entry-level operations management employment. Interestingly, students had higher mean scores than employers in all three areas.

To address hypothesis 2, whether general skills were more important than technical skills among employers, a one-sided paired t-test was used to compare sample means. At $\alpha = 0.05$ there is sufficient information to say that the overall mean score for general management skills (3.937) was significantly higher than the overall mean score for technical abilities (2.970).

Our third research hypothesis was whether students believed general skills were more important than technical skills. This hypothesis was also statistically confirmed at the .05 level. We found that the students’ overall mean score for general management skills (4.291) was significantly higher than the mean score for technical abilities (3.993).

Employer Perceptions

Important general skills for an entry-level position: Table 5 lists general skills in the order of importance among employers. Verbal communication, problem-solving, and listening skills were ranked as the top three general management skills valued by employers. The following skills were ranked at the bottom of the list: global awareness, follows structured format/method, and negotiation/conflict-resolution skills.

Table 5
General Business Skills: Employer Rankings

Rank	General Skill / Ability	Mean Score	Standard Deviation
1	Verbal communication skills	4.706	0.579
2	Problem-solving skills	4.588	0.609
3	Listening skills	4.441	0.705
4	Team-building skills	4.265	0.931
5	Written communication skills	4.088	0.793
6	Organizational skills	4.029	0.834
6	Time management skills	4.029	0.969
8	Leadership skills	4.000	0.985
9	Appreciating diversity	3.941	0.919
9	Handling ambiguous situations	3.941	0.886
11	Working independently	3.853	0.821
12	Cross-functional perspective	3.794	0.845
13	Negotiation/conflict-resolution	3.500	0.862
14	Follows structured format/method	3.265	1.082
15	Global awareness	2.853	1.132

Table 6
Technical Skills: Employer Rankings

Rank	Technical Skill / Ability	Mean Score	Standard Deviation
1	Word processing	4.088	0.900
2	Spreadsheets	4.029	0.969
3	Databases	3.529	1.354
4	Operating systems	3.382	1.280
5	Project management	3.235	1.281
6	Programming languages	3.088	1.505
7	Presentations	3.059	1.127
8	Inventory management	2.882	1.513
9	Logistics management	2.824	1.314
10	Quality management	2.618	1.303
11	Forecasting	2.588	1.351
12	Resource planning & control	2.529	1.134
13	Web designing	2.500	1.285
14	Telecommunication	2.353	1.098
15	Quantitative analysis	2.294	1.219

Important technical skills for an entry-level position: Table 6 provides the relative rankings, mean scores and standard deviations of technical skills evaluated by employers. Word processing and spreadsheet abilities ranked highly important, with mean scores above 4.0. On the other hand, quantitative analysis, telecommunication, and web designing were ranked at the bottom of the list.

Important personality traits for an entry-level position: Table 7 focuses on personality characteristics valued by employers. Given that a score of 3.0 signifies medium importance, most traits were considered moderately important to employers. Employers tend to value students who are ethical, responsible, and flexible. Controversial had the lowest ranking at 1.935.

Table 7
Personality Characteristics: Employer Rankings

Rank	Personality Trait	Mean Score	Standard Deviation
1	Ethical	4.774	0.497
2	Responsible	4.645	0.608
3	Flexible	4.548	0.568
4	Motivated	4.452	0.675
5	Enthusiastic	4.355	0.551
6	Conscientious	4.323	0.702
6	Personable	4.323	0.702
8	Intelligent	4.290	0.693
9	Confident	4.258	0.682
10	Self-confident	4.065	0.629
11	Persistent	3.968	0.795
12	Creative	3.935	0.854
13	Rational	3.903	0.870
14	Sense of Humor	3.839	0.860
15	Caring	3.839	0.735
16	Curious	3.806	0.792
17	Technical	3.701	0.973
18	Extrovert	3.516	0.851
19	Methodical	3.484	0.926
19	Aggressive	3.484	0.996
21	Risk-taker	3.355	0.877
22	Visionary	3.258	0.729
23	Prudent	3.226	1.055
24	Self-sacrificing	3.065	0.998
25	Adventurous	3.000	0.816
26	Compromising	2.968	0.912
27	Compliant	2.871	0.846
27	Fearless	2.871	1.118
28	Perfectionist	2.742	1.094
30	Conforming	2.710	0.783
31	Cautious	2.701	0.902
32	Worldly	2.548	0.810
33	Conventional	2.419	0.807
34	Controversial	1.935	0.892

Student Perceptions

Important general skills for an entry-level position: Table 8 provides a ranking of general skills in order of importance among students. Along with employers, students ranked verbal communication, problem-solving, and listening skills as the top three general management skills necessary for obtaining a position after graduation. Students felt that following structured format/method, working independently, and appreciating diversity were the least important skills. In all the cases, students rated the general management skills higher than did employers.

Important technical skills for an entry-level position: The top three technical skills identified by students were spreadsheet proficiency, operating systems abilities, and word processing knowledge (see Table 9). On the other hand, students perceived logistics management, quantitative analysis, and quality management to be the least important technical employment skills. Again, in all cases, students' mean scores for technical skills were higher than employers.

Table 8
General Skills: Student Rankings

Rank	General Skill/Ability	Mean Score	Standard Deviation
1	Verbal communication skills	4.710	0.624
2	Problem-solving skills	4.597	0.625
3	Listening skills	4.557	0.761
4	Time management skills	4.477	0.659
5	Team-building skills	4.472	0.709
6	Organizational skills	4.438	0.656
7	Leadership skills	4.381	0.723
8	Written communication skills	4.330	0.774
9	Cross-functional perspective	4.301	0.782
10	Handling ambiguous situations	4.261	0.756
11	Negotiation/conflict-resolution	4.188	0.803
12	Global awareness	4.017	0.910
13	Appreciating diversity	4.006	0.891
13	Working independently	4.006	0.859
15	Follows structured format/method	3.722	0.954

Table 9
Technical Skills: Student Rankings

Rank	Technical Skill/Ability	Mean Score	Standard Deviation
1	Spreadsheets	4.523	0.644
2	Operating systems	4.436	0.781
3	Word processing	4.331	0.802
3	Databases	4.331	0.866
5	Presentations	4.186	0.865
6	Project management	4.052	0.759
7	Telecommunication	3.983	0.875
8	Programming languages	3.977	1.026
9	Web designing	3.953	1.019
10	Resource planning & control	3.831	1.015
11	Forecasting	3.756	1.053
12	Inventory management	3.750	1.066
13	Quality management	3.674	0.904
14	Quantitative analysis	3.645	1.074
15	Logistics management	3.622	1.050

Important personality traits for an entry-level position: Students believe that employers are most likely to seek out individuals who are motivated, responsible, and confident (see Table 10). Again, controversial was ranked lowest, with a mean score of 2.793. Most characteristics received higher mean scores by students than employers. However, specific characteristics that appear to be more highly valued by employers than students (positive differences) are ethical, conscientious, responsible, flexible, personable, and caring.

Discussion

The results of our study indicate that gaps exist between employer expectations of employment skills and characteristics, and student perceptions of those expectations. The gaps appear to arise from a lack of understand-

Table 10
Personality Characteristics: Student Rankings

Rank	Personality Trait	Mean Score	Standard Deviation
1	Motivated	4.633	0.541
1	Responsible	4.633	0.563
3	Confident	4.586	0.572
4	Intelligent	4.580	0.552
5	Self-confident	4.556	0.596
6	Ethical	4.533	0.646
7	Flexible	4.527	0.568
8	Enthusiastic	4.497	0.656
9	Creative	4.320	0.812
10	Personable	4.290	0.751
11	Persistent	4.154	0.724
12	Technical	4.101	0.784
13	Rational	4.035	0.763
14	Visionary	3.979	0.889
15	Curious	3.970	0.848
16	Aggressive	3.952	0.785
17	Compromising	3.935	0.939
18	Conscientious	3.911	0.786
19	Sense of Humor	3.893	0.951
20	Extrovert	3.763	0.811
21	Caring	3.746	0.787
22	Methodical	3.728	0.885
23	Risk-taker	3.710	0.889
24	Self-sacrificing	3.692	0.859
25	Adventurous	3.663	0.886
26	Cautious	3.651	0.874
27	Compliant	3.591	0.889
28	Worldly	3.562	1.045
29	Fearless	3.461	0.957
30	Prudent	3.396	0.888
31	Conforming	3.343	0.933
32	Perfectionist	3.296	0.967
33	Conventional	3.082	0.916
34	Controversial	2.793	1.074

ing. Our findings have provided preliminary information necessary to begin closing the gaps. In most cases, the gaps do not appear to be problematic because students tend to perceive general and technical skills as *more* important than do employers. However, our study has targeted some areas of concern.

While the most critical gaps in our study were among our three factors (general skills, technical skills, personality characteristics) other more specific gaps between students and employers are worth noting. For instance, a critical gap found in our study was for the personality characteristic "ethical." Interestingly, employers ranked being ethical highest in importance of personality characteristics. On the other hand, students ranked ethics substantially lower in importance (sixth). This finding suggests that students may not realize how much employers value ethical behavior within the business community. Even though the general stigmatism in the business world revolves around companies being competitive and sometimes cutthroat, employers may tend to avoid candidates that are unscrupulous and amoral.

Another important gap was found in the personality characteristic “conscientious.” It received a mean importance score of 4.323 among employers (ranking six out of 34) while the mean score for students was only 3.911 (ranking eighteenth). This finding also suggests that students may not realize how much employers value being meticulous and thorough.

Another interesting finding was that global awareness ranked lowest of all the general business skills valued by employers. Students ranked global awareness higher than employers, but still only twelve out of fifteen. With the business community tackling the trend of globalization, it is surprising that employers rated global awareness as only minimally important ($\mu = 2.853$). One reason for the low global awareness scores might be that employers and students feel that most entry-level positions do not involve international experience or travel.

The employers also ranked operations management courses as less important. These disappointingly low rankings may suggest that universities should reengineer operations management curriculum and expand operations management courses to include more advanced computer applications. Integrating modern computer application assignments into the quantitative operations management courses may help students and employers understand the relevance of quantitative operations management topics.

From our analysis, it can be concluded that general skills are significantly more important to both Chicago area employers and students than technical abilities. Students and employers ranked general management skills in similar order, but they did not assign similar importance scores to them. Students tended to rank most of the general skills as highly important, while employers ranked only about half of the skills as highly important. The difference may be partially explained by the fact that the two groups applied the scale differently. In other words, the students tended to be “easier graders.”

On the other hand, students ranked about half of the technical skills as highly important and the other half with medium importance. Employers ranked only two technical skills as highly important, about half with medium importance levels, and the rest as low importance. To our surprise, even in today’s information-based economy, general skills were significantly more important to employers than technical abilities.

Practical Applications for Students and Educators

The intent of our study was to survey our students and employers to determine whether operations management student perceptions of marketable skills matched actual employer expectations. It is possible that our sample may not represent the views of all operations management students or all operations management

employers. Nonetheless, our method is likely to be broadly applicable to other operations management departments. While examining the data, several themes emerged for operations management students and faculty:

- General management skills are vitally important, especially verbal and problem-solving skills.
- Technical skills, such as computer literacy are important, but do not outweigh general skills.
- Students should be informed of the importance to employers of certain personality characteristics such as being ethical, conscientious, responsible, flexible, personable and caring.
- Operations management courses should develop students’ quantitative abilities with the integration of general management skills, such as problem-solving, team building, and listening.

These findings seem to follow business trends involving cross-functionality and teamwork. It is clear that efforts must be made to minimize any gaps between operations management students’ perceptions of marketable skills and actual skills expected by employers. It is evident that there are significant differences between students and employers in the mean level of importance of various skills and traits. Therefore, it is essential that the academic community continue discussions regarding curriculum development to ensure that students possess both the general management skills and technical abilities to succeed after graduation. Furthermore, it is even more important that students interact more frequently with the business community to understand how they can obtain skills to satisfy business needs. Other strategies for closing the gap might include fostering better communications between undergraduate students and employers, providing students with access to better information on employer expectations, and encouraging continued research in this area. ■

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The Impact of Nonbusiness Majors in a Business Core Course

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Abstract

Most four-year business degree programs have a common body of knowledge (CBK) or “business core,” composed of courses from all the major disciplines in the business curriculum. All business majors, regardless of specialization or area of concentration, are required to take these courses, or their equivalent, as a part of their degree programs. On many campuses, non-business majors are also enrolled in these courses. Some of these non-business students are required by their curriculum programs to take specific business courses; others take them as electives. The result is a mixture of students with varying backgrounds and interests in some CBK classes.

This mix of business and non-business majors in the same course raises several questions, three of which were examined in this study. In a mixed course, is there any difference between business and non-business majors’ attitudes about the course? Is there any significant difference in performance between business and non-business majors in the same course? What are the attitudes of faculty who teach such courses concerning student performance and instruction of the course? A survey was administered to study perceptions of business and non-business majors concerning a single CBK course at one institution. In addition, course grades for business and non-business majors at that institution were compared. Another survey was administered to ascertain the opinions of professors teaching the same CBK course at institutions located throughout the southeastern United States. Results of the surveys showed that faculty and students had different perceptions and that student grades tended to differ by major.

Introduction

A challenge associated with the design and implementation of degree programs in higher education has to do with the diversity of backgrounds, abilities, and interests of the student body. These differences can become particularly evident when students with majors outside of the traditional business areas enroll in courses offered by colleges of business. A student’s ability and motivation to

***...considerable diversity of attitude,
background, and levels of preparation
will be present in a class of mixed
business and non-business majors.***

learn a particular set of topics are presumably influenced by his/her educational preparation and choice of major. Business majors, for example, typically come to a Management Principles course after having taken accounting, economics, legal environment of business, and possibly other business foundation courses. As a result, these students have already been exposed to some basic business principles, concepts, and terminology. Non-business majors would not usually have this foundation. Therefore, placing non-business majors and business majors in the same course can create a class with diverse backgrounds, abilities, and motivation levels.

Existing evidence does indeed suggest that there are significant differences between business and non-business majors in class settings. Although Snodgrass and Behling (1996) found no difference in the moral reasoning level of business and non-business majors who were in the same classes, Giacomino and Akers (1998) found that values and value types held by business and non-business majors did vary significantly. In a recent study, Ridener (1999) reported a significant difference between business and non-business majors on the Ecological Worldview Scale, a measure of environmental attitude. Both the Ridener and Giacomino and Akers studies attributed at least part of the measured attitude differences to differences in background and academic preparation. There is reason to believe, therefore, that considerable diversity of attitude, background, and levels of preparation will be present in a class of mixed business and non-business majors.

Diversity in a classroom setting can be challenging and advantageous, but can it create a situation where neither the business nor the non-business majors get what they need and deserve? The business major needs to gain a solid background in a Management Principles course, for example, to prepare him/her for other management/

business courses; the non-business major in the same course may never take another management or business course. The business major will receive opportunities to incorporate the principles introduced in the management course in future major and core courses, while the non-business major may not. Obviously, the diversity in student needs and expectations can present a challenge to the instructor teaching the course.

Several pertinent issues arise for both students and faculty. For example, does the presence of non-majors in core classes force faculty teaching these classes to “water down” the content to make it more accessible to students with limited business backgrounds? Do majors feel “cheated” by the time spent reviewing concepts they have already learned in order to get non-majors “up-to-speed”? Do non-majors feel core courses are taught at too high a level for them to get the basic business knowledge they are seeking? The purpose of this research is to examine the attitudes of students and instructors and to examine the performance of students in a business course in which both business and non-business majors are enrolled.

Related Research

Designing an educational experience that incorporates relevant and appropriate general and specific knowledge, skills, and abilities for career and life pursuits is a continuous challenge for higher education. Traditionally, four-year institutions of higher education have included a “general education” component as a part of any bachelor’s degree program. The arts, sciences, languages, literature, humanities, etc., are considered to be essential elements of a quality education. In addition to the liberal arts areas, many observers recognize the benefit of including selected courses from other specialized areas, such as business. In fact, Handy (1996) argues that business courses should be a part of everyone’s educational experience. The foundation that business courses provides in disciplines such as economics, finance, marketing, and management is viewed as essential to any career path. According to Handy, any good business course can provide an invaluable body of knowledge and understanding as well as help students to begin thinking strategically. Thus, business courses should not be limited to what Handy refers to as the “fortunate few,” but rather viewed as important to any professional career.

Providing students with a well-rounded college curriculum has taken on a new dimension with the recognition that an interdisciplinary approach may well provide a better educational program. If programs/majors could include courses that incorporated multiple skills and bodies of knowledge, students not only could be exposed to the individual specialist areas but could also learn and apply the relationship between and among these disciplines. For this to occur, there has to be cooperation among those teaching different areas and even an understanding and apprecia-

tion of how the areas are interrelated and dependent (Spiring 1995).

The virtual university, Internet courses, and concepts such as the open university provide further incentives for “tearing down the walls” (Pietrucha 1996) of traditional thinking in higher education. An open university for business, for example, offers both traditional and non-traditional teaching techniques and tactics to expose students to specific and general knowledge and skills in a variety of business areas. Generally, the program includes learning modules and appeals to individuals interested in career advancement or moves, and those seeking an advanced degree in business (Bradshaw 1996)

...many college students will eventually find themselves in some type of management position,...

As many college students will eventually find themselves in some type of management position, regardless of their chosen career paths, a good quality management education could prove beneficial. According to a recent issue of the *Journal of European Industrial Training* (1995) which was devoted to the topic, universities are in a position to teach much of the knowledge and skills needed by a well-educated manager. The best programs provide a good liberal education and knowledge of management and its environment. Additional skills may be best learned by post-graduate seminars, short courses, or post-graduate study.

The development of new courses in interpersonal skills—teamwork, problem solving, leadership, and communication—reflects demands from business communities to teach more than the traditional business curriculum of finance, marketing, and business administration. The reorganization, reengineering, and downsizing of many organizations have placed individuals and companies in a situation where workers are expected to assume greater responsibility and possess greater skills and knowledge in a short period of time. The demand for courses taught by multiple professors from various business disciplines to prepare this multipurpose manager will inevitably increase. Getting this new generation of managers up to speed in a relatively short period will require innovation and cooperation among traditional college programs (Mercer, 1996). An important question is whether traditional colleges of business are up to the challenge of revamping the business curriculum to meet the needs of this new breed of managers. To a great extent, the answer to that question will depend upon the passage of time as well as upon the attitudes of those involved, both faculty and students.

The recognition of the value of prerequisites for preparing students for upper-division business courses

has survived the test of time. However, the barriers created by the prerequisite structure have been successfully challenged and waived for certain courses and programs. Management Principles is one such course for many schools. Three questions related to the diversity created by the mingling of business and non-business majors were the subject of this research. The results presented here should be viewed as preliminary, but they do provide some answers to the three important research questions which need to be addressed:

- (1) Are there any significant differences between business and non-business majors enrolled in the same course in terms of their attitudes about the course?
- (2) What are the attitudes of business faculty who teach this mixture of students regarding student performance and instruction of the course?
- (3) Is there any significant difference in performance between business and non-business majors in the same course?

Methodology

A study was designed to provide evidence on each of the three research questions. The Management Principles course was chosen as the focus for the study since:

- (a) this course (or its equivalent) is a part of the CBK for virtually all four-year undergraduate business programs, and
- (b) this course is one which is often used by non-business majors as either part of a degree program or as an elective.

In order to examine the first two research questions, two questionnaires were developed and pretested in the College of Business at the authors' institution, a regional state university located in the southeastern United States. The student questionnaire was designed to measure the attitudes of business and non-business majors. This questionnaire was administered to all students enrolled in multiple sections of the Management Principles course at the authors institution during the Spring 1999 semester.

The faculty questionnaire was designed to gather information about the attitudes of instructors of Management Principles courses. Since the university where the student questionnaire was administered had only a small number of Management Principles instructors, faculty at other public colleges and universities located in the same geographic area were also sampled in order to obtain a larger sample size. Since the questionnaires were designed for different research populations and to examine a different set of attitudes in each population, there is little direct duplication of questions across the two, although many of the topic areas are similar. The question as to

whether there should be separate courses designed for non-business majors was included on both the student and faculty questionnaires.

The faculty questionnaire was mailed to College of Business Deans in all sixty-three, four-year public colleges and universities located in the southeastern United States, as listed in the *1999 Higher Education Directory* (Rodenhous 1999), for distribution to faculty teaching Management Principles (or equivalent) courses. Institutions in the states of Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia were included in this study. This geographic region was chosen to include appropriate benchmark institutions for the university where the student questionnaires were administered. Recipients were asked to respond to questions relating to: (a) their preferences concerning the provision of separate Management Principles classes for non-business majors, and (b) questions relating to the performance of non-business majors versus business majors in Management Principles classes.

The third research question required an examination of differences in the classroom performance of business and non-business majors. As a means of determining learning performance for the two groups, grades of business and non-business majors who were enrolled in one professor's Management Principles course (in the same university mentioned above) during a recent five-year period were compared.

Results and Analysis

Student Questionnaire

Students enrolled in the Management Principles course at one regional university responded to questions related to their perceptions of the course. A total of 124 students completed the questionnaire: thirty-eight non-business majors and eighty-six business majors. A summary of responses is presented in Table 1.

Examination of Table 1 shows considerable differences in responses of the two student groups. An analysis of variance was performed to determine if the differences between non-business and business major responses concerning the Management Principles course were statistically significant. The resulting statistics indicate that they were. In fact, responses of non-business majors were significantly different from the responses of business majors in every instance. Results of the analysis are summarized in Table 2.

Faculty Questionnaire

A total of forty-three faculty questionnaires were returned, representing twenty-eight different schools. The response rate represents 44.44 percent of the colleges and

Table 1
Student Questionnaire

Statements	Business Majors		Non-Business Majors	
	A/SA	D/SD	A/SA	D/SD
I believe the Management Principles course fits well with my current major	97%	3%	69%	32%
I believe the material covered in this course will be useful in my career	99%	1%	74%	25%
I expect to be in some type of management position one day	90%	9%	82%	18%
This course is unrelated to my future career plans	8%	91%	35%	66%
I believe additional Management courses would be useful to me	84%	16%	39%	61%
There should be separate Management Principles courses for business and non-business majors	50%	50%	63%	37%
I believe I was adequately prepared to take this course	87%	12%	56%	44%
Overall, this course is more difficult than most courses required by my major	49%	51%	71%	29%

Note: Percentages may not total 100% due to rounding.

universities originally included in this study. A summary of the results of this questionnaire appears in Table 3.

There are a number of interesting aspects to be noted in the responses to this survey. Only two respondents (5%) indicated that business and non-business majors are actually placed in separate Management Principles courses at their institutions. Interestingly, while 77 percent of respondents reported that there are prerequisites for enrolling in the Management Principles course at their schools, 30 percent reported that exceptions to the prerequisite(s) are granted. The most often cited prerequisite was the completion of a certain number of credit hours with the completion of specified course(s) as the second most frequent prerequisite.

Table 2
ANOVA Results: Student Questionnaire

Question	Multiple R	R Square	Adjusted R Square	Standard Error	F Statistic	Significance of F Statistic
1	0.478	0.228	0.222	0.702	36.107	0.000
2	0.406	0.165	0.158	0.633	24.150	0.000
3	0.282	0.080	0.072	0.757	10.551	0.001
4	0.372	0.138	0.131	0.801	19.597	0.000
5	0.471	0.222	0.216	0.767	34.803	0.000
6	0.248	0.062	0.054	0.934	8.000	0.005
7	0.369	0.136	0.129	0.683	19.233	0.000
8	0.222	0.049	0.041	0.795	6.318	0.013
Number of Observations:			124			
Total Degrees of Freedom:			123			

A large majority of the respondents did not believe that non-business majors should be placed in a different course or separated from business majors in a Management Principles course and did believe that the diversity created by the presence of non-business majors in their classes makes for a better course. Eighty percent of those responding agreed or strongly agreed that non-business majors should be required to meet the same prerequisites as business majors; ninety-six percent would hold non-business majors to the same performance standards as business majors.

Only 27 percent of respondents believed that non-business majors had more difficulty meeting performance standards than the business majors with a similar percentage agreeing that non-business majors encountered a greater challenge in grasping and understanding management concepts taught in the course. Only 17 percent of respondents believed non-business majors were less motivated than the business majors, but one-third believed non-business majors tended to see less relevance of the material covered in the course than did business majors. Additionally, 33 percent of respondents did believe that the presence of non-business majors in the core Management course affected how the course was taught. A relatively small number of respondents believed non-business majors affected an instructor's student evaluation ratings, but one-third of the respondents either did not know whether they did or had no opinion on the topic.

Student/Faculty Comparison

It is also interesting to note that, on the most directly similar question on the two questionnaires concerning the desirability of separate courses for business and non-business majors, students held opinions which differed from faculty opinions. In order to more formally test this comparison, faculty responses concerning the need for separating business and non-business majors into different Management Principles classes were compared to student responses to the same question. As noted above, a majority of faculty respondents did not agree that such separation was warranted, while a majority of non-business students felt that it was. Business students were equally split on the issue. These differences were found to be statistically significant when comparing responses of faculty to all student responses, to business major student responses, and to non-business major student responses. These results are shown in Table 4.

Comparison of Student Grades

Grades of a total of 385 students were compared to see if there was a difference

Table 3
Faculty Questionnaire

1. Are non-business majors allowed to enroll in the same Management Principles course as business majors?
YES: 41 of 43 respondents = 95% NO: 2 of 43 respondents = 5%
2. Does your College have prerequisites that non-business majors must fulfill before enrolling in your Management Principles core course?
YES: 33 of 43 respondents = 77% NO: 10 of 43 respondents = 23%

Statements	Agree or Strongly Agree	Disagree or Strongly Disagree
Non-business majors should be required to take a different/separate Management Principles class than business majors	15%	85%
Non-business majors should be required to meet the same prerequisites as business majors for taking the core Management Principles course	80%	17%
Non-business majors enrolled in the same Management class as business majors affects how the course material is taught	33%	67%
Non-business majors in general do not perform as well as business majors in Management Principles courses	27%	70%
Non-business majors should be held to the same performance standards as business majors in a Management Principles course	96%	4%
Non-business majors, overall, have a more difficult time grasping and understanding management concepts than business majors	26%	73%
Non-business majors generally see less relevance to the material covered in Management Principles than business majors	33%	62%
Non-business majors are generally less motivated than business majors in Management Principles courses	17%	81%
Instructors tend to receive lower student evaluation ratings in classes with a higher percentage of non-business majors	12%	57%
The diversity created by non-business majors makes Management Principles a better class	84%	14%

Note: Percentages may not total 100% due to NA responses and rounding.

Table 4
ANOVA Results: Faculty vs. Student Questionnaires

Comparison	Number of Observations	Degrees of Freedom	Multiple R	R Square	Adjusted R Square	Standard Error	F Statistic	Significance of F Statistic
Faculty vs. All Students	167	166	0.355	0.126	0.121	0.936	23.837	0.000
Faculty vs. Business Students	129	128	0.334	0.112	0.105	0.872	15.972	0.000
Faculty vs. Non-Business Students	81	80	0.525	0.275	0.266	0.956	30.028	0.000

between grades of business majors and non-business majors in one professor's Management Principles course at the authors' institution. Two hundred fifty-four of the students enrolled over a five-year period were business majors and 131 were non-business majors. A breakdown of the grades of students is presented in Table 5.

An examination of Table 5 shows that business majors seemed to exhibit superior grade performance. In order to more formally test research question 3, grades of the two groups were scaled using weights of A=4, B=3, C=2,

D=1, and F=0. The scaled grades were then compared using the Mann-Whitney U test. This test is a nonparametric alternative to the t-test for comparing two independent samples that does not require the assumption of normality of the difference between the samples (Webster 1992). Since the samples were both large, the z value was computed and found to be -2.02. Using an alpha of .05, the hypothesis that business majors and non-business majors performed equally in the Management Principles course can be rejected. Therefore, using grades as a

Table 5
Grade Breakdown for
Business and Non-Business Majors

Grade	Business	Majors	Non-Business	Majors
A	12	4.7%	5	3.8%
B	60	23.6%	30	22.9%
C	121	47.6%	49	37.4%
D	54	21.3%	30	22.9%
F	7	2.8%	17	13.0%
Totals	254	100.0%	131	100.0%

measure, business majors performed better than the non-business majors over the five-year period.

Conclusions and Discussion

Results of this study indicate that there may be differences in the perceptions of business and non-business majors enrolled in Management Principles courses. In the sample used, business majors tended to have a more positive attitude toward the course in that they saw the course as fitting well with their majors and useful for career preparation. Business majors felt more adequately prepared than non-business majors to take the course and did not necessarily perceive the course to be overly difficult. A greater number of business majors also believed they would one day be in some type of managerial position. Non-business majors reported a higher preference for a separate Management Principles course. Additional surveys including students at other universities should be conducted to ascertain whether the data obtained from one university student group are applicable in general. Decisions concerning prerequisites, course design, instruction, and evaluation may all be influenced and improved by utilizing student input. This is not to imply that students should be course designers, but input from this important stakeholder group could lead to a more relevant, user-friendly curriculum. Cooperation among curriculum planners could lead to recommendations as to how students, particularly non-business majors, could most benefit from courses related to the functions of business. An interdisciplinary approach based on building relationships among disciplines (business and otherwise) may cause non-business majors to see the benefits and relevance of an out-of-major course.

Instructors of Management Principles courses in the sixty-three school sample agreed that business and non-business majors should be required to meet the same prerequisites, held to the same performance standards, and should be enrolled in the same Management Principles course. Attitudes of faculty significantly differed from those of students concerning the offering of separate courses for business and non-business majors. While

“separate but equal” business courses designed specifically for non-business majors may not be the most effective and efficient utilization of resources, identifying and meeting the academic needs of the increasing number of non-business majors in business courses seems prudent.

A five-year comparison of grades of non-business and business students enrolled in Management Principles at one institution indicated that non-business majors did not perform as well as their business major counterparts. A comparison of the performance of business and non-business majors at other universities would be helpful in ascertaining whether the results obtained in this study are indicative of student performance in general. If, indeed, the performance of students at one university reflects the general population, the reasons for the poorer performance of non-business majors must be addressed and remedies explored.

Results of this study indicate that those teaching an increasingly diverse student body should seriously consider how to best meet the broad range of student needs, abilities, and expectations. Additional research involving faculty and students in a other geographic areas is needed to replicate the results of this study. Reasons as to why business and non-business majors have different perceptions should be further explored. The underlying assumptions and beliefs of faculty teaching the business core courses should also be examined. The commitment to continuous improvement in higher education mandates that quality institutions anticipate and meet the needs of the primary stakeholders. Curricula and course design must maintain quality and relevance, and faculty must be willing to lead the way in identifying and implementing appropriate change. ■

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Personality Differences and Computer Related Stress in Business Students

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Abstract

There has been long-term interest in the processes that affect human-computer interaction, particularly those causing stress. Computer related stress has previously been correlated to general stress (Cohen, Kamarack, and Mermelstein 1983) and to somatic complaints (Derogatis et al. 1974). A negative correlation between perceived stress and academic performance has also been documented (Hudiburg and Jones 1991). This study compares computer related stress levels in three business student populations (239 students): juniors who have not begun their major course work, seniors who are MIS majors, and graduate MBA students. Using standard analysis of variance, we found that MIS students experienced a significantly higher number of stressors than the other two groups and a greater average severity of stress than the premajors. Human-computer interaction is suspected to be more stressful for MIS students than other business students because their use of computers is greater and their grades are more heavily weighted toward computer work.

This study further considers the various personality types/learning styles of these students and investigates how they might be accommodated to minimize anxiety. The Myers-Briggs Type Indicator (MBTI) test and a computer assignment preference test were administered to the 239 students. Recommendations for different learner types, in terms of environment variables and computer assignment characteristics, were made.

Introduction

There has been long-term interest in the processes that affect human-computer interaction, particularly those causing stress. Brod (1984) refers to this type of stress as “technostress.” He indicates that technostress is a modern disease of adaptation caused by an inability to cope with new computer technologies in a healthy manner. Some studies suggest that different aspects of technology produce greater stress for different kinds of people. Moreland (1993, 59) relates different psychological types to the various sources of stress and indicates that “managers who design programs to reduce their own stress may

be missing opportunities to help staff who have different stress styles.” For example, some people need structured learning environments while others need room to simply experiment with a new technology.

Human-computer interaction is suspected to be more stressful for MIS students than other business students...

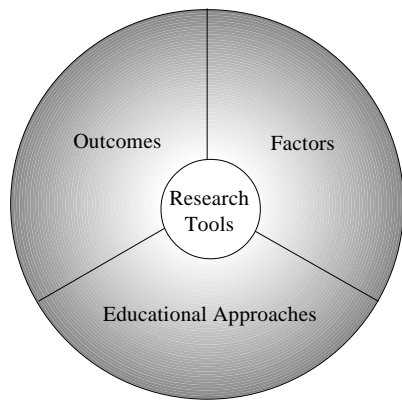
For this study, the authors administered three separate tests to 239 students. The first test measured levels and severity of technostress, using Hudiburg’s Computer Hassles Scale (Hudiburg 1992). The second instrument assessed learning style, using a modified Myers-Briggs Type Indicator (MBTI) test (Gardner and Jewler 1997). The third instrument, “Environment and Assignment Characteristics-Preferences Survey,” was developed by the authors on the basis of the analysis of MBTI personality types and computer instruction techniques provided by Moreland (1993). Stress levels and severity of stress were compared in three different business student populations. The relationship between personality type and computer assignment preferences was also analyzed. The intent was to identify which student population had the greatest technostress and then to identify ways in which the stress might be ameliorated.

Related Research and Implications for the Classroom

As illustrated in Figure 1, educational research often focuses on one or more of the segments: factors, outcomes, or instructional approaches that center around the common hub of research tools. *Factors* that may be considered relevant include gender, age, course of study, previous experience, and learning style. *Outcomes* include such things as performance, grades, and self-confidence. In computer related learning, we are often

interested in outcomes involving adaptation to technology. *Instructional approaches* include variation in control, structure, and environment. The purpose of such research is to find the most effective teaching techniques by understanding relevant factors and desirable outcomes.

Figure 1
Educational Research



This study initially documents a relationship between course of study (factor) and anxiety caused by technology (outcome). We find that MIS students experience more computer related anxiety than other business student populations. Although not considered here, we would suppose that wherever technology plays a greater role, students experience a greater level of computer related stress. Such stress is associated with undesirable consequences such as general stress (Cohen, Kamarack, and Mermelstein 1983), somatic complaints (Derogatis et al. 1974), and weaker academic performance (Hudiburg and Jones 1991).

This study also documents a relationship between personality type (factor) and preferred computer environment and assignment characteristics (instructional approach). The technique used involved empirical validation of previous work done by Virginia Moreland (1993). The intent was to find ways in which to offset increased stress levels through instructional interventions.

The desirability of accommodating individual differences in students has been documented in multiple studies. A recent paper by Mueller and Ma (1999) looks at matching teaching and learning styles when teaching software skills to undergraduate students. They consider the value of accommodating students' preferences in terms of in-class instruction or self-study. They conclude that, "students are likely to learn best, in terms of effectiveness and efficiency, when the teaching method most compatible with each student's choice of learning style is used" (Mueller and Ma 1999, 59).

The value of teaching computer skills to students, through their learning style preferences, was also docu-

mented by Bostrom, Olfman and Sein (1990). Their article reports findings from a series of articles that examine the influence of learning style in learning typical computer tools such as spreadsheets and electronic mail. They conclude that the same training is not suitable for every learner.

Other studies generalize across disciplines. Most comprehensive is a manuscript by Dunn et al. (1995, 353) which reviews forty-two different experimental studies conducted by thirty-six different researchers. Dunn concludes that "matching students' learning style preferences with educational interventions compatible with those preferences is beneficial to their academic environment."

While instruction cannot always be individualized, there is significant research suggesting that it is important to recognize a variety of approaches and to focus on those variables that accommodate the learning style of the majority.

Assessment Instruments

Hudiburg's Computer Hassles Scale

The Computer Technology Hassles Scale was developed by Hudiburg in 1989 as a measure of the construct of computer related stress (Hudiburg 1989). This scale has been correlated with academic performance in computer courses (Hudiburg and Jones 1991). In 1992, Hudiburg used factor analysis to produce a refined and shortened version of the scale which he renamed the Computer Hassles Scale (Hudiburg 1992). Hudiburg has since used this scale to demonstrate construct validity, to study gender differences, and to establish normative data for researchers (Hudiburg, Brown and Jones 1993; Hudiburg, Ahrens, and Jones 1994). In studies using the Computer Hassles Scale, participants are asked to indicate which of thirty-seven hassles have affected them over the past two months and to rank the severity of each hassle on a four point scale (0=not at all; 1=somewhat severe; 2=moderately severe; 3=extremely severe). These hassles include items such as computer system is down, lost data, slow computer speed, and incomprehensible computer instructions. The scale can be scored as the number of hassles experienced (with a range from 0 to 37) or as the severity of hassles experienced (with a range of 0 to 111).

Myers-Briggs Type Indicator Test

There is no clear agreement on learning style theory or measurement. Learning style has been measured using a variety of instruments (Dunn, Dunn, and Price 1989; Edwards 1986; Herrmann 1988; Kagen et al. 1964; Karp and Konstadt 1971; Kolb 1976; Leiberman 1986; Myers and McCaulley 1985; Raudsepp 1992; Wagner and Wells 1985). One popular approach used to explore basic

personality preferences that make people interested in different things and draws them to different fields and lifestyles is the Myers-Briggs Type Indicator (MBTI), based on Carl Jung’s theory of psychological types. The MBTI classifies individuals using four scales: 1) *Extraversion/Introversion (E/I)*, which measures whether a person focuses his attention on the outer or inner world; 2) *Sensing/Intuition (S/N)*, which describes whether a person acquires information through facts or intuition; 3) *Thinking/Feeling (T/F)*, which measures whether a person makes decisions by analysis of evidence or the weighing of feelings; and 4) *Judging/Perceiving (J/P)*, which measures whether a person relates to the world in an orderly or spontaneous way (Myers 1987). This study uses a version of this test designed for college students (Gardner and Jewler 1997). There are sixteen possible MBTI types based on the possible combinations of classifications. The distribution of types represented in this study is provided in Figure 2. A previous study suggests that business students are predominantly of the four TJ types (Myers and McCaulley 1985). This study provides similar findings with 80.7 percent of the students in the TJ categories (the four corners of Figure 2).

Figure 2
Business Students Categorized
by Myers-Briggs Personality Type (N=239)

ISTJ	ISFJ	INFJ	INTJ
14.7%	4.6%	2.1%	0.8%
ISTP	ISFP	INFP	INTP
7.6%	0.8%	1.3%	2.5%
ESTP	ESFP	ENFP	ENTP
2.9%	2.9%	7.1%	1.3%
ESTJ	ESFJ	ENFJ	ENTJ
55.5%	17.6%	17.2%	9.7%

I= Introversion, E=Extroversion, S=Sensing
 I=Intuition, T=Thinking, F=Feeling, J=Judging, P=Perceiving

Environment and Assignment Characteristics
Preferences Survey

Virginia Moreland (1993) makes suggestions regarding environmental conditions and assignment variables that should reduce technostress in the various MBTI types. Moreland is the head of the reference department at Georgia State Library. Librarians, as other technology workers, face an endless proliferation of technological tools as well as escalating user demands. Managers, such as Moreland, are challenged to find appropriate ways to train, support, and staff technological positions. She suggests that different aspects of technology produce different stress for different types of people. She discusses strategies that can be used that take into account these variations. Her work is based on the learning style literature and the theories that underpin the MBTI instrument itself. She does not, however, test her conclusions empirically. This study tests Moreland’s sugges-

tions directly. Based on Moreland’s work, the following propositions are presumed. Preference identifiers such as 1a, 2a, etc. correlated to question numbers on the instrument administered (see Appendix 1).

Hypotheses

This study compares the computer related stress levels in three business student populations. It tests the following research propositions.

1. The mean number of hassles experienced by the three student populations is equal.

Given that

μ_1 = the mean number of hassles for juniors - no major courses yet;

μ_2 = the mean number of hassles for seniors – MIS majors;

μ_3 = the mean number of hassles for graduate MBA students;

The mean number of hassles experienced by each of the three populations will not be different, i.e.

$$H_0 : \mu_1 = \mu_2 = \mu_3$$

$$H_1 : \text{Not all means are equal}$$

2. The mean severity of hassles experienced by the three student populations is equal.

Given that

μ_4 = the mean severity of hassles for juniors—no major courses yet;

μ_5 = the mean severity of hassles for seniors—MIS majors;

μ_6 = the mean severity of hassles for graduate MBA students;

The mean severity of hassles experienced by each of the three populations will not be different, i.e.

$$H_0 : \mu_4 = \mu_5 = \mu_6$$

$$H_1 : \text{Not all means are equal}$$

This study considers environmental preferences for computer assignments. A chi-square analysis is used to determine whether there is a relationship between the environmental factors outlined in Table 3 and MBTI personality type. For each of the sixteen questions concerning paired preferences (see Appendix 1 for question wording), the null hypothesis considers independence from the appropriate MBTI psychological scale. For example:

Hypothesis 3. H_0 : Classification based on question 1 is independent of I/E scale;

H_1 : Classification based on question 1 is not independent of I/E scale.

Table 1
Number of Hassels Experienced
by Business Students Categorized
by Course of Study (Analysis of Variance)

ANOVA: Single Factor

Summary

Groups	Count	Sum	Average	Variance
Pre-majors	149	2220	14.89933	41.49655
MIS majors	36	821	22.80556	55.13254
MBAAs	54	1029	19.05556	40.01572

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	2098.833	2	1049.416	24.3000	.0000	3.0340
Within Groups	10191.96	236	43.1862			
Total	12290.79	238				

Table 2
Average Severity of Stress
in Business Students Categorized
by Course of Study (Analysis of Variance)

ANOVA: Single Factor

Summary

Groups	Count	Sum	Average	Variance
Pre-majors	149	187.2639	1.256805	0.343385
MIS majors	36	54.71717	1.519921	0.191198
MBAAs	54	72.70619	1.346411	0.218254

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	2.0689	2	1.0344	3.5341	0.0307	3.0340
Within Groups	69.0804	236	0.2927			
Total	71.1493	238				

Likewise, hypotheses 4-6 examine questions 2-4 for independence from the I/E scale; hypotheses 7-10 examines questions 5-8 for independence from the S/N scale; hypotheses 11-14 examines questions 9-12 for independence from the T/F scale; and hypotheses 15-18 examines questions 13-16 for independence from the P/J scale.

Results

Hypothesis 1 (the mean number of hassles experienced by the three populations will not be different) is rejected at the .05 level ($p < .001$, see Table 1). The three groups have different average numbers of stressors. A Bonferroni t-test based on familywise error rate (.05), *df* (236), *MSE* (43.18628), and critical *t* value (2.4104) provides minimum significant difference of 3.4083 between MIS majors and MBA students in terms of numbers of hassles (actual difference 3.75000, see Table 1) and a minimum significant difference of 2.5161 between MBA students and pre-majors in terms of numbers of hassles (actual

Table 3
Comparing Environmental Variables Based
on Personality Type

Hypothesis No.	Question No.	Scale	P-value
3	1	I/E	Reject, $p < .0001$
4	2	I/E	Reject, $p = .0004$
5	3	I/E	Reject, $p = .0004$
6	4	I/E	Reject, $p < .0001$
7	5	S/N	Reject, $p = .0004$
8	6	S/N	Reject, $p = .0181$
9	7	S/N	Reject, $p = .0407$
10	8	S/N	Accept, $p = .1710$
11	9	T/F	Reject, $p = .0040$
12	10	T/F	Reject, $p = .0003$
13	11	T/F	Reject, $p = .0025$
14	12	T/F	Reject, $p < .0001$
15	13	P/J	Accept, $p = .9449$
16	14	P/J	Accept, $p = .1933$
17	15	P/J	Accept, $p = .5979$
18	16	P/J	Reject, $p < .0001$

difference 4.15623, see Table 1). We can conclude, then, that not only are the groups significantly different, MIS majors have a significantly greater number of hassles than MBA students, and MBA students have a significantly greater number of stressors than pre-majors.

Hypothesis 2 (the mean severity of stressors experienced by each of the three populations will not be different) is also rejected ($p = .030739$, see Table 2). The three groups have different average severity of stressors. A Bonferroni t-test based on familywise error rate (.05), *df* (236), *MSE* (.292714), and critical *t* value (2.4104) provides minimum significant difference of .242188 between MIS majors and pre-majors in terms of severity of stressors (actual difference .263116, see Table 2). Thus, the test provides evidence that MIS majors students have a greater severity of stress than pre-majors, but fails to provide evidence that other pairwise differences are meaningful.

Chi-square tests are used to determine if there is a significant difference in the response to a question when we categorize according to the relevant MBTI scale.

Many of suggestions made by Moreland are supported in this study (See Table 3). Twelve of the sixteen hypotheses stating that factors are unrelated to the relevant MBTI scale can be rejected (See Appendix 1 for question wording).

Discussion

The purpose of this study was twofold. The first set of research questions had to do with three business student populations, pre-majors, MIS majors, and graduate students. We were interested in technostress in these three

groups and whether the three groups had different stress levels. The perception was that students who used computers more to do their schoolwork would experience more stressors (hassles) and would report greater severity of stress. Using standard analysis of variance, we found that the three groups did have different stress levels. We found that the MIS students experienced a significantly higher number of stressors than the other two groups and a significantly greater average severity of stress than the premajors.

The second set of research questions used chi-square tests to analyze the validity of Moreland's suggestions regarding environmental variables and assignment characteristics favored by the various personality styles. The validity of these twelve suggestions was confirmed, while the remaining four that are shaded in Table 4 could not be confirmed.

The correlation of each of these factors with their associated MBTI scale was clearly significant ($p < .05$).

Of greatest significance however, were questions 1, 4, 12, and 16 ($p < .0001$). For the predominant ESTJ students in our population, this suggests that computer assignments are best done in teams, with students helping each other even as they are learning themselves. Systems should be analyzed, critically evaluated, and back-up plans should be made so that students can be prepared for the unpredictable.

This research also documents that students have preferences with regard to their environment for doing computer work and for the nature of computer assignments themselves. These preferences are strongly linked to personality type as measured by the MBTI tests. The value of teaching students through their personality type has been documented. This would seem to be especially important in student populations where computer stress levels are high. While individualized environments and assignment criteria are not always pragmatic, it is possible to provide a variety of assignment choices and to

Table 4
Propositions

<u>Introverted/Extroverted Scale (I/E Scale)</u>	
Introverted people prefer:	Extroverted people prefer:
1a. A private place to do computer assignments	1b. Doing computer assignments with a team
2a. To rely on written documentation	2b. To have sources other than the written guide to learn new products or skills
3b. To think things through before asking for help	3a. To "think out loud" when getting help
4b. Not to help others until they know clearly what to do	4a. To help people even as they are learning themselves
<u>Sensing/Intuition Scale (S/N Scale)</u>	
Sensing people prefer:	Intuitive people prefer:
5a. To understand the practical advantage of a new product or software	5b. To understand the creative features of a product or software
6b. To be given specific exercises showing features to be mastered	6a. To learn through loosely structured exploration
7a. To have step-by-step instructions to follow	7b. To have only an overall objective which they can fulfill in a variety of ways
*8a. To have a grid showing comparative commands when they need to trouble-shoot a problem	*8b. To have a basic understanding of how something works when they need to trouble-shoot a problem
<u>Thinking/Feeling Scale (T/F Scale)</u>	
Thinking people prefer:	Feeling people prefer:
9a. To understand the rules and logic underlying a product or software	9b. To understand how a product or software will benefit real people
10a. To be given a clear statement of the objectives for an assignment	10b. To have a supportive, friendly climate for learning, minimizing competition
11b. To have a firm grading policy based on objective, consistent criteria	11a. To have grading policies that are subject to the ultimate good of the students; allowing some discretion in interpreting performance
12a. To analyze and critically evaluate systems	12b. To understand peoples' needs and predict their reactions
<u>Judging/Perceiving Scale (J/P Scale)</u>	
Judging people prefer:	Perceiving people prefer:
*13b. To have a sense of direction and goals when services and systems are in rapid flux	*13a. To avoid rushing into decisions without considering the data and alternatives
14b. To have closure on assignments	14a. To be adaptable to change
15a. To schedule computer lab activities	15b. To allow for flexibility in scheduling their work
16a. To have back-up plans so that they are prepared for the unpredictable	16b. To make plans for emergencies as they arise

*Shaded propositions could not be confirmed

focus on those variables that accommodate the learning style of the majority. In classrooms where technology plays a significant role, teachers and trainers will be more effective if they seek to accommodate the different personality types of their students through varied learning environments and assignment characteristics. ■

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About the Authors

Elizabeth R. Towell is an Associate Professor in the Business and Computer Science Departments at Carroll College in Waukesha, WI. Her research interests include database interoperability issues, the role of information systems in quality initiatives, and the evolution of MIS curricula.

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Appendix 1

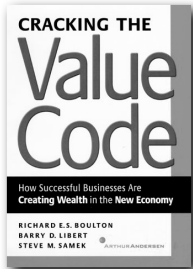
Environment and Assignment Characteristic Preferences Survey

The following items are arranged in pairs (a and b), and each member of the pair represents a preference that you may or may not hold with regard to computer assignments. Rate your preference for each item by giving it a score of 0 to 5 (0 meaning you really feel negative about it or strongly about the other member of the pair, 5 meaning you strongly prefer it of do not prefer the other member of the pair). The scores for a and b must add up to 5 (0 and 5, 1 and 4, 2 and 3). Do not use fractions such as $2\frac{1}{2}$.

I prefer:

____ 1a. A private place to do computer assignments	____ 1b. Doing computer assignments with a team
____ 2a. To rely primarily on written documentation	____ 2b. To have sources other than the written guide to learn new products or skills
____ 3a. To 'think out loud' when getting help	____ 3b. To think things through before asking for help
____ 4a. To help people even as I am learning myself	____ 4b. Not to help others until I know clearly what to do
____ 5a. To understand the practical advantage of a product or software	____ 5b. To understand the creative features of a product or software
____ 6a. To learn through loosely structured exploration	____ 6b. To be given specific example exercises showing features to be mastered
____ 7a. To have step-by-step instructions to follow	____ 7b. To have only an overall objective which I can fulfill in a variety of ways
____ 8a. To have a grid showing comparative commands when I need to trouble-shoot a problem	____ 8b. To have a basic understanding of how something works when I need to trouble-shoot a problem
____ 9a. To understand the rules and logic underlying a product or software	____ 9b. To understand how a product or software will benefit real people
____ 10a. To be given a clear statement of the objectives for an assignment	____ 10b. To have a supportive, friendly, climate for learning; minimizing competition
____ 11a. To have grading policies be subject to the ultimate good of the students; allow some discretion in interpreting performance	____ 11b. To have a firm grading policy, based on objective, consistent criteria
____ 12a. To analyze and critically evaluate systems	____ 12b. To understand people's needs and predict their reactions
____ 13a. To avoid rushing into decisions without considering the data and alternatives	____ 13b. To have a sense of direction and goals when services and systems are in rapid flux
____ 14a. To be adaptable and able to change	____ 14b. To have closure on assignments
____ 15a. To schedule computer lab activities	____ 15b. To allow for flexibility in scheduling my work
____ 16a. To have back-up plans so that I am prepared for the unpredictable	____ 16b. To make plans for emergencies as they arise

Cracking the Value Code: How Successful Businesses are Creating Wealth in the New Economy



By Richard E.S. Boulton,
Barry D. Libert, and Steve M. Samek
©Arthur Andersen
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Inc., 2000

Reviewer: Lucinda L. Van Alst
Ball State University

In 1976, the Financial Accounting Standards Board (FASB), the standard setting body for the accounting profession, published its first concept statement called the *Conceptual Framework for Financial Accounting and Reporting: Elements of Financial Statements and Their Measurement* (FASB, 1976). The framework serves at least two valuable functions. It provides a single foundation to support the development of a consistent set of standards and rules. And, practical problems that emerge due to the rapidly changing business environment can be solved more easily since their solutions are guided by an existing framework.

The authors of *Cracking the Value Code* are essentially agreeing with the FASB's approach to standard setting. They are proposing that businesses would perform better if their managers used a framework that the authors, all partners of Arthur Andersen, developed and named Value Dynamics. The purpose of the framework is to provide a starting point for managers to gather information and gain insight about the resources their businesses have available to create value, which are separate from the physical and financial assets with which the managers are familiar.

The framework and the book itself are the end result of a 3-year study of 10,000 companies by Arthur Andersen. The interest in the study was spurred by the successes of certain businesses in the New Economy, an economy that is different from any previous one due to new technologies, globalization, a new generation of workers, and the increased importance of intangible assets. Further, there was concern about stagnation in financial measurement and reporting systems. Many critics of the current financial reporting systems believe that the formal measurement system has not kept pace with the new global economy and the new ways of creating value. Thus, the study's purpose was to understand the "drivers of value creation," defined by the authors as future value captured in the form of increased market capitalization. Value

creation is different from value realization, which is value captured in the form of past and current earnings or cash flows. Traditional accounting and management information systems gather information on the latter, rather than the former.

Comparing their Value Code with the DNA code, the authors argue that assets are the basic building blocks of value, that is, the "economic DNA" of businesses. The Value Dynamics framework can be used for company analyses by managers to consider their businesses' unique value-creating individual assets and combinations of assets, including those assets not recognized under traditional accounting systems and largely unmeasured. The authors contend it is the interaction of the companies' assets—their economic DNAs—which creates or destroys value.

The shortcomings of the current systems of accounting and management information are well recognized in the profession and have been topics of discussion of accountants, auditors and other interested parties for many years. As the FASB and its predecessor organization grappled with the conceptual framework, assumptions, principles, and constraints, the measurement issue often took center stage. It is also at the heart of the Value Dynamics framework. The Statement of Financial Accounting Concept No. 5 sets forth fundamental recognition and measurement criteria and guidance on what information should be formally incorporated into the financial statements and when. As to measurability, the requirement is that the element of the financial statements has to have a relevant attribute measurable with sufficient reliability.

This is, of course, the crux of the problem for accountants and auditors and, therefore, all users of financial statements. In order for financial information to make its way to the financial statements, it has to be reduced to a monetary amount and be reliable. Reliability means that the information is verifiable, among other things. Verifiability is demonstrated when independent measurers, using the same measurement methods, obtain similar results. If several parties using the same measurement methods would arrive at different conclusions, then the statements would not be verifiable. Auditors could not render opinions on such statements. The authors have glossed over the extreme difficulties involved in trying to assign a monetary value to the intangible assets discussed in the book, even though they have mentioned that it is a problem. It is, in fact, a problem of such magnitude that many of the intangibles mentioned in the book will not be recorded for financial reporting purposes until much more research on measuring the value of such assets has taken place, if ever. Even reporting some of the information in the notes to the financial statements in the near future is

questionable because auditors have to attest to the notes as an integral part of the financial statements.

If however, the measurement issue is ignored, the authors have written a book that could benefit many readers. Their Value Dynamics framework provides an organized way for managers, and others, to consider the assets that businesses are using to create value. The framework centers on five asset classes. Those include the traditional categories of physical and financial assets but add customer assets, employee and supplier assets, and organization assets. The new categories are comprised of primarily intangible assets which have traditionally either been treated as generating expenses or revenues in the financial reporting system or ignored from systematic consideration altogether. The assets include those that are owned as well as un-owned, controlled or not, have distinct life cycles and can destroy, as well as create, value. The authors urge managers to treat their businesses as they would a portfolio of investment securities. That is, their goal should be to acquire the right mix of assets and dispose of any that are not productive.

To assist the managers in doing this, the authors have listed several specific assets within each of the five asset categories. Examining the list may cause some managers to identify assets that they had not considered before or, perhaps, had not thought of as such. For example, the ability to issue debt is identified as an asset, even though debt is typically considered a liability.

The book also showcases businesses that have excelled by altering their business models to take advantage of a unique asset mix. The cases illustrate how one or two of those successful companies used each asset within each category. The cases provide insight in terms of new ways to look at business assets and how to use them. For example, the case about Southwest Airlines Company states that it is creating value with its equipment by operating only one type of plane. By limiting its equipment Southwest has simplified operations and reduced costs. Only a single parts inventory is needed. Ground crews know the plane inside and out which leads to more efficient flight servicing and planes spending more time in the air. Also, training employees is faster since they don't need to learn about a variety of aircraft.

Another benefit is that each chapter concludes with questions that address the chapter topic and describe how companies can use the information in their own business situations. The questions enable managers to consider ways they could modify their business models to succeed in the new economy. In fact, Chapter 10 provides guidance on how to design successful business models.

The authors describe four management misconceptions regarding the basic elements of business organizations as follows: 1) an incomplete view of the enterprise, 2) an incomplete view of strategy, 3) an incomplete understanding of the markets and 4) an incomplete view of value and what creates or destroys it. They believe, based

on the study results, that the key to overcoming these "disconnects" is an asset-centered, value-centered view of strategy.

Finally, the authors state their main point: that there is lasting, new found value being created by businesses and their new canon is that what is most enduring is relationships and knowledge. The challenge, they write, is to develop new systems of information, measurement and reporting that properly identify what creates value. Therein lies the problem: the measurement of properly identified assets.

The measurement issue should not stop business people from reading *Cracking the Value Code*. All students of business, whether practitioners, academicians or university students above their junior year should find the book interesting, potentially helpful in developing business strategy, and entertaining in terms of the showcased firms. Non-accountants may enjoy the book even more since they most likely will not be distracted by the measurement complexity. ■

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