

An Analysis of the Certified in Production and Inventory Management Program's Impact
on Fox Valley Businesses

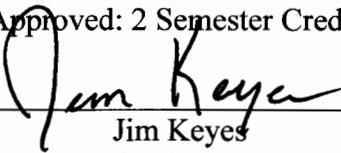
by

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A Research Paper
Submitted in Partial Fulfillment of the
Requirements for the
Master of Science Degree
in

Career and Technical Education

Approved: 2 Semester Credits



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ABSTRACT

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An Analysis of the Certified in Production and Inventory Management Program's Impact on Fox Valley Businesses			
(Title)			
Career and Technical Education	Jim Keyes	May 2005	73
(Graduate Program)	(Research Advisor)	(Month/Year)	(# of Pages)
American Psychological Association, 5 th edition			
(Name of Style Manual Used in this Study)			

The Certified in Production and Inventory Management (CPIM) is a certification program for operations management professionals. This certification is offered through APICS, The Association for Operations Management.

The impact of the knowledge associated with the CPIM on business results is difficult to measure for many reasons. Tangible and intangible effects may play a role in the complexity associated with measuring the value of corporate training programs. Consider the influence of challenging economic times and increasing competitive pressures on training budgets.

This study looks at companies that employ CPIM professionals and the resulting impact of their knowledge on business measurements. Both tangible and intangible

effects will be included in this research. Also included in this study is to determine if the training budgets available for training like CPIM have changed over the past five years. The goal of this study is to determine if there is a direct link between CPIM knowledge and business performance results.

The researcher will interview representatives of 23 Wisconsin companies and collect quantitative and qualitative data to investigate the value of CPIM on business results. The researcher will look for significance in the data. Further recommendations for research will also be included.

Acknowledgments

When I made the decision to prepare a Masters thesis, I recognized that temporarily sacrifices would be required. During this period many people have provided support, help and encouragement to help me through this busy time.

I would like to recognize those at UW-Stout who have been helpful to me as I progressed through my research. In particular I would like to acknowledge Jana Reeg-Steidinger for guiding me through the electronic research world and inspiring me through her beautiful pictures of flowers. Dr. Amy Gillett helped me to realize that even I could write a thesis. Both Dr. Howard Lee and my research advisor, Jim Keyes, kept me focused on what is important so I could plan my graduation date.

Thank you to the representatives of the 23 companies comprising my research sample. Discussions with all of you were interesting and informative.

I would like to acknowledge those at work that provided me with encouragement as I struggled to find time to complete this requirement. Thanks go to Kaye Krueger and Jerry Eyler for understanding my need to be flexible as I prepared this paper.

Thank you to my friends who understood when I told them I had to limit my time spent with them as I worked on my thesis. I acknowledge Sue Barnhill, Mary Beth Gehrke, Carol Kastrinos, Tom and Vickie Last, and Larry and Brycie Marine for understanding during the busy times.

Out of everyone the person that was most affected was my husband Steve. His encouragement, support, and love sustained me through this process. He inspired me with his positive attitude and his firm belief in my ability to accomplish this goal.

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CHAPTER ONE

INTRODUCTION

This research explores the value of a specific employee-based certification process on business results. While certifications provide benefits for individuals, the focus of this paper will be on the value of certification for companies. Many businesses fully or partially fund individual certification processes for their employees. In return for the funding of these training opportunities, these companies expect that the resulting knowledge will provide value to the business enterprise. This research will attempt to identify if companies recognize any impact from certification on their business results.

To begin this chapter, the current economic realities influencing training budgets in business and industry will be overviewed. Business enterprises have to decide how to best spend dollars available for training and education. These budgetary decisions are affected by business economic cycles.

After reviewing the economic conditions affecting company training budgets, this chapter focuses on a specific body of knowledge and certification process. This research introduces APICS, the Association for Operations Management, and a specific certification known as the Certified in Production and Inventory Management (CPIM).

The chapter closes by exploring the challenges associated with relating the effects of the CPIM on business results. This is done by specifically identifying the problem statement, the purpose of the study, and the research objectives.

Background

Certification programs accomplish four objectives. First, certification programs

such as the certified public accountant (CPA) or the certified purchasing manager (CPM) offer a body of knowledge surrounding a specific subject matter. Secondly, certification programs verify an individual has met specific standards. Third, certification programs maintain a professional code of ethics. Lastly, certification programs encourage high quality output (Dodds, 1995). Reputable certification programs give businesses the confidence that their certified employees are knowledgeable in a specific area of study.

Over the past decade, intense global competition has forced manufacturing businesses to take a life-or-death review of their operating expenses against their revenue (Zandi, 2004). If an expense is perceived as not contributing value to the bottom line in some way, the expense is regarded as a waste from a business perspective and is reduced or eliminated entirely. The training budget, including those dollars normally set aside for certification training, is a target for reduction, especially during a business downturn (Slania, 2002).

Despite the recent turnaround demonstrated by key economic indicators like increased consumer spending, business profits, and productivity since mid-2003, companies are not showing increased commitment to allocating budget dollars for corporate training (Taylor, 2003). This trend is not only observed in the private sector. In fact, a survey conducted by the Chartered Institute of Personnel and Development (CIPD) concluded that 26% of the public sector training budgets over the coming year are expected to be cut (Philpott, 2004). Budgets to support training and certification will not be easily reinstated.

One of the reasons for decreased spending particular to certification programs is the difficulty linking the certification process with expertise (Glassie, 2003). Certification

does not guarantee employees are able to apply the theory from what they have learned to actual work situations. Certified individuals may be excellent test-takers, while noncertified individuals may perform competently in a work situation but are unable to demonstrate their knowledge in a test environment.

Another reason for decreased spending is lack of results that are measurable. Ford Motor Company has temporarily discontinued dollars for their corporate training program until it can be justified through solid business results (Merritt, 2003).

As illustrated with the Ford example, the paybacks that result from investments in training and certification programs are not always easy to quantify. The identification and the calculation of the value-added financial benefits from an enterprise's investment in newly acquired knowledge is not straight-forward. Traditional accounting methods seldom capture the financial benefits that accrue from investments in intellectual capital (Lev, 2004).

Benefits that result from the use of intellectual capital are numerous but hard to quantify. The knowledge base of an entire company is augmented through certification of their employees (Cohen, 2001). Certification encourages lifelong learning for the individual (Eagle, 2004) which is dispersed throughout corporate culture as a whole (Delahoussaye, Ellis, & Bolch, 2002). As a result of properly focused individual and group learning the organization is better positioned to evolve into whatever enterprise the current competitive environment dictates. To address these issues, professionals use current certification knowledge to recommend changes required for their companies to remain competitive (Dodds, 1995).

More benefits for certification and training include the ability to have the

knowledge within the company to solve complex business issues and lead projects without sacrificing intellectual property (Kirkwood & Pangarkar, 2004). In addition, certification programs aid the problem solving process (Musthaler, 2003), and develop respect for the individual as well as the corporate entity (Wright, Sczyrba, & Maher, 2003).

The realities associated with the balance between the value of certification and the benefits to an enterprise have been discussed. In addition, the reality of the current competitive business climate with respect to tight training budgets has been introduced. The next step is to narrow the scope to one particular certification program known as Certified in Production and Inventory Management (CPIM).

The CPIM program is designed to provide current operations management knowledge to professionals in the field of production and inventory management. The CPIM is offered through APICS, the Association for Operations Management. According to the APICS website (Association for Operations Management [APICS], n.d.b.), more than 75,000 professionals around the world have been certified since 1973.

Statement of the Problem

The CPIM program certifies that an individual exhibits a standard of competence in production and inventory management with a potential to provide value for business and industry (APICS, n.d.b.). Yet, businesses driven by the challenging economic environment are reducing budgets that typically fund training programs like the CPIM. Businesses expect return on their training investment. Due to the complexity of calculating return from training programs, companies find it difficult to measure the

value of the CPIM program.

Purpose of the Study

The purpose of this study will be to analyze specific business results at a sample of Fox Valley businesses currently employing professionals with CPIM. Located in northeastern Wisconsin, the geographical area of the Fox Valley includes the counties of Winnebago, Outagamie, Waupaca, Waushara, and Calumet (Fox Valley Technical College, 2004, Area served, ¶ 1). Within this sample of Fox Valley companies, professionals with budget authority will be interviewed during the fourth quarter of 2004 and the first quarter of 2005. The findings of this study are of relevance to businesses interested in improving their financial position by investing training budgets in professional development. This study investigates if Fox Valley businesses perceive either tangible or intangible value by employing individuals who have earned CPIM.

Research Objectives

The objectives of this analysis focus on business results from a sample of Fox Valley businesses that employ people who have earned CPIM.

1. Identify tangible performance measurements that improve business profitability as a result of CPIM training.
2. Identify intangible benefits that result from CPIM training.
3. Understand to what degree the business environment has affected training budgets that fund CPIM programs within the past five years.

Significance of the Study

The research results are significant to four distinct parties. This includes businesses in any location and providers of CPIM education. In addition, the APICS organization and Fox Valley Technical College (FVTC) will also be interested in the results of this study. The following paragraphs explore each of these elements.

1. Businesses need to justify expenditures due to intense global competition. The benefits resulting from intellectual capital investments are difficult to identify and measure (Lev, 2004). If enterprises were given quantifiable data to link the CPIM program with business success, the allocation of budget dollars to CPIM programs may increase.

2. Educational providers need to market and sell APICS products. The results generated from this research will provide specific benefits for targeted customers as a part of a marketing package educators need.

3. APICS will obtain feedback from this study to assist in their society-level value proposition project. Information obtained from this research may set the foundation for a larger APICS-driven value proposition project in the future.

4. FVTC strategic planning initiatives include growth in providing contract training within economic development. This study will assist FVTC in striving toward this initiative by quantifying the benefits derived from investments in intellectual capital.

Scope and Delimitations

This study is limited to investigating businesses with employees who have achieved CPIM in the Fox Valley area of Wisconsin. The subjects of the study will be

representatives from companies selected from the Fox Valley chapter of APICS membership database. Listed below are further limitations of the research.

1. The researcher is CPIM certified and teaches CPIM workshops. Many of the subjects of the survey are CPIM certified. The researcher and subjects may exhibit bias towards the positive results of the CPIM program because of their personal involvement.

2. As students progress through the CPIM process, participating companies may have other educational initiatives and improvement projects in progress. These initiatives and projects are variables that could affect the outcome of the research.

3. The scope of this research project is limited to a sample of the businesses within the Fox Valley. As such, the results may not be representative of the entire population and may not represent all locations and all manufacturing environments.

4. Interview responses may not represent a cross section of all industry and manufacturing environments.

5. The interview questions are developed by the researcher. Every attempt will be made to develop a reliable and valid instrument, but it may not be free of bias. Raw data will be retained for 18 months and available to the Fox Valley chapter of APICS and APICS Society for independent analysis should bias be a concern.

6. The subjects of the research may be concerned that their company is regarded in a favorable manner. As a result, the subjects may withhold detailed information from the researcher especially when the findings are negative.

7. The subjects of the study were selected from the Fox Valley Chapter of APICS's membership database. Out of a total of 52 companies, 29 have employees with the CPIM designation. The researcher attempted to contact a representative from each of

the 29 companies to request time for an interview. Because granting the interview is a gesture of goodwill, some companies may have decided that the interview was not a priority over their business concerns.

Definition of Terms

The terms and their associated definitions that appear in this section are provided to the reader for purposes of understanding and clarification of the subject matter.

Association for Operations management (APICS) — The Association for Operations Management builds operations management excellence in individuals and enterprises through superior education and training, internationally recognized certifications, comprehensive resources, and a worldwide network of accomplished industry professionals. Founded in 1957, the society supports nearly 60,000 members in 20,000 companies worldwide. (APICS, 2005, APICS announces corporate award of excellence program, ¶ 8).

Certified – to confirm and verify in writing (Patterson & Litt, 1993).

Certified in Production and Inventory Management (CPIM) – A certification administered by APICS to recognize a high level of production and inventory management knowledge (Blackstone, Cox & University of Georgia, 2005).

Certified Public Accountant (CPA) – A certification administered by the American Institute of Certified Public Accountants (AICPA) to recognize a high level of public accounting knowledge (American Institute of Certified Public Accountants, n.d.).

Certified Purchasing Manager (CPM) – A certification administered by the Institute of Supply Management (formerly the National Association of Purchasing

Managers – NAPM) to recognize a high level of supply knowledge (ISM, 2004).

Customer service ratio – In general terms, this measurement compares what inventory was picked or shipped to meet production or shipping schedules and is shown as a percentage. High customer service ratios mean that the inventory was available for picking and shipping when the inventory was needed. Low customer service ratios mean that stock outs occurred and that production or shipping will be late (Blackstone, Cox & University of Georgia, 2005).

Fox Valley - The Fox Valley Chapter of APICS area of coverage is the same as Fox Valley Technical College. Located in northeastern Wisconsin, the geographical area of the Fox Valley includes the counties of Winnebago, Outagamie, Waupaca, Waushara, and Calumet (Fox Valley Technical College, 2004, Area served, ¶ 1).

Inventory turnover – Expressed as the annual cost of goods sold divided by the average inventory level. This measurement is an indicator of how quickly inventory moves through the operation (Blackstone, Cox & University of Georgia, 2005).

Manufacturing environments – Different types of manufacturing and purchasing organizations exist on a continuum of volume and variety. For example, some companies produce high volumes of product, with very little variety. On the other end of the continuum are companies that produce low volumes of product with high variety (Blackstone, Cox & University of Georgia, 2005).

Operations management – All activities within a business that support the production or outsourcing of a product or service. Operations management applies to both a manufacturing environment as well as a service environment. (Blackstone, Cox & University of Georgia, 2005).

Summary

This chapter began by exploring the current economics motivating the reduction of training budgets within business and industry. Today's challenging economic conditions are affecting training budgets available to support training including certification preparation. To justify these training expenditures, business must consider the payback they will get from the increased knowledge their employees receive.

APICS is a specific entity that provides a particular certification. APICS, The Association for Operations Management, and the CPIM certification were introduced.

Exploring the challenges associated with the effects of the CPIM on business results was covered in the final section of this chapter. This was done through the problem statement, the purpose of the study, and the research objectives.

Chapter 2, the literature review, broadens the topics introduced in the first chapter. More detailed information will be provided on APICS, the history of CPIM, expected outcomes of training, and the effect of economic conditions on corporate training budgets.

CHAPTER TWO

LITERATURE REVIEW

Introduction

This chapter will begin with a profile of the Association for Operations Management (APICS) and the Certified in Production and Inventory Management (CPIM) program. To provide background, this section includes information about the history of CPIM. Next, the value of training on business results is explored. Here literature on both tangible and intangible outcomes from training in business and industry is reviewed. Chapter 2 concludes with a review of the business climate's affect on corporate training budgets.

APICS Profile

A professional in the field of operations management has to answer numerous questions in a typical workday. These question may include what inventory should be produced, how many parts should be purchased, and when should the product be manufactured (Arnold & Chapman, 2000).

APICS, the Association for Operations Management, offers a body of knowledge to assist operations professionals to answer those questions. Established in 1957, APICS comprises 269 chapters including nearly 60,000 members plus 40 international affiliates (Association for Operations Management [APICS], n.d.). The mission of APICS is to be “the global leader and premier provider of information and services in production and inventory management and related areas to enable members, enterprises, and individuals

to add value to their business performance” (APICS, n.d.a, ¶ 2).

Of the 269 APICS chapters, ten are located in Wisconsin (Association for Operations Management Region 14 [APICS14], n.d.). The focus of this research is on one of 10 Wisconsin chapters. The Fox Valley Chapter of APICS has 247 members, of which 107 are certified in production and inventory management.

Individuals involved in APICS typically hold a job as material managers, buyers, planners, production managers, systems analysts, academia, or consultants, although members are not limited to these professions (APICS, n.d.b). APICS provides the opportunity for formal learning about operations management for these individuals to support their company’s business through the CPIM.

CPIM Profile

The CPIM is an internationally acknowledged certification administered by APICS to recognize a high level of production and inventory management knowledge (Blackstone, Cox & University of Georgia, 2005).

The current curriculum of CPIM covers five topic areas. The five modules include Basics of Supply Chain Management, Master Planning of Resources, Detailed Scheduling and Planning, Execution and Control of Operations, and Strategic Management of Resources. Successful students become technically proficient with production and inventory logic within the content of these five courses (APICS, n.d.b). To earn the CPIM, individuals must pass all five examinations.

Within each of these five modules, key terms and concepts are identified and taught to standardize communications between the student and their coworkers.

Examples of subjects discussed in these modules include forecasting, buying, production planning, lean manufacturing, and distributing products and services (APICS, n.d.b.).

The CPIM program requires members to stay current in the production and inventory management. Professionals who have become certified are required to earn certification maintenance points. In this way, those who have become certified continue to keep themselves informed of new techniques and strategies in operations management (APICS, n.d.). APICS recognizes the change in the operations management field and encourages professionals with CPIM to pursue life-long education through certification maintenance.

Certified professionals spanning many disciplines maintain their certification status, as do CPIMs. Other professional associations that require certification maintenance include Certified Manufacturing Accountants (Dodds, 1995), Certified Information Systems Security Personnel (Tuesday, 2002), and Certified Purchasing Managers (ISM, 2004).

CPIM History

APICS initiated the CPIM program in 1973. The time periods since 1973 are separated into three decades: 1973-1982, 1983-1992, and 1993-2002 for purposes of discussion in this paper. Each of these decades will be reviewed in terms of the number of certifications bestowed and technology advancements.

1973-1982

Between 1971 and 1973, APICS was focused on identifying study materials and

creating the examinations. The APICS President of 1970, Fred Bulleit, used a membership survey to determine there was a need for a certification program. There were six reasons identified by Bulleit which underscored why this certification was needed. These reasons are summarized from the *Production & Inventory Management Journal*, pages 2-3 and outlined in Table A appearing below (Bulleit, 1972).

Table A

Reasons for CPIM from (Bulleit, 1972)

Certification Reasons	Explanation
1. Self-improvement	Individuals desire to pursue professional development.
2. Courses and curricula	Additional courses were needed to document and expand the body of knowledge.
3. Chapter offerings	The educational offerings should be a compliment to certification.
4. Society publications	Standardized instructor materials were needed.
5. Professional recognition	Further acknowledgement of the depth and breadth of the body of knowledge required to support the production and inventory management function was needed from business and industry.
6. Esprit de corps	Heightened professional pride in what the production and inventory management professional receives from membership.

In 1973, APICS introduced a certification program designed to meet these anticipated needs. Named Certified in Production and Inventory Management (CPIM), this certification was designed to fill the educational needs of working professionals in this field (APICS, n.d.).

The growth of the CPIM program from its infancy in 1973 was rapid. According to the APICS organization, 8,819 people (Table B) received their CPIM designation during this first decade between 1973 and 1982 (M. Fitzgerald, personal communication, June 29, 2004). One of the reasons for this swift growth of CPIM certification during this period was due to technology innovations. Computerized material requirements planning (MRP) systems were now affordable for many businesses.

Table B

CPIMs Earned Since 1973

Years	Number of People Who Earned CPIM
1973-1982	8,819
1983-1992	44,308
1993-2002	30,211

MRP tracks all inventory items in great detail. As a result, MRP freed the production and inventory professional from performing tactical inventory calculations. Instead of performing these detailed calculations, the professional was released to focus on strategic process issues like past-due deliveries and part shortages. As businesses embraced MRP, production and inventory professionals needed the common vocabulary and skills that accompany the implementation of the MRP system (Frenandez-Ranada, Gurrola-Gal & Lopez-Tello, 2000).

1983-1992

Evolution of systems and technology continued to challenge production and inventory management professionals between 1983 and 1994. More specifically, this evolution involved the integration between production and inventory systems and other company business systems. Computer processors were becoming faster and the coding of the software was becoming more efficient. Leading the way to the next generation of MRP, MRPII established a common database between functions (Ptak & Schragenheim, 2000).

Combining the original demand for knowledge about MRP systems with the thirst for MRPII knowledge, demand for certification grew. APICS responded to the need for integration education by certifying another 44,308 individuals (Table B) between 1983 and 1992, a 402% increase over the prior decade (M. Fitzgerald, personal communication, June 29, 2004).

1993-2002

Over the following decade, 1993-2002, the business environment continued to evolve. Big, bulky mainframe computers were being replaced with high-powered, efficient personal computers (PCs). PCs allowed users more flexibility in obtaining the information they needed to support their company in a global market. To reduce delivery lead times, the integration of systems and technology was spreading to the entire supply chain. Businesses needed to learn how to communicate data to their customers and their suppliers (Ptak & Schragenheim, 2000). Systems that manage supply chain integration through one centralized database of information are known as enterprise resources

planning (ERP) systems (Blackstone, Cox, & University of Georgia, 2002).

Despite the need for production and inventory professionals to keep current with the increasingly complex business environment during this decade, the number of people attaining CPIM status declined by 32%. Between 1993 and 2002, 30,211 people (see Table B) obtained their CPIM.

The backgrounds of APICS and the CPIM have been established, along with a brief history of CPIM. Next is a literature review of corporate training programs and their tangible impact on business results.

Training and Tangible Business Results

Recognizing that training opportunities such as CPIM certification consumes financial resources, corporate America expects to see tangible results. According to Business Week's survey of executive education, 42% of those surveyed sent more employees to training five years ago than they did in 2003 because they did not see tangible results (Merritt, 2003).

Xerox Corporation is a company interested in connecting the value of a training experience with the business results. According to Ray Sizemore, Xerox Manager of Evaluation and Testing Services, "We look at 'performance impact' and ask if learners increase their job productivity as a result of completing a specific learning event" (Keenan, 2000, p. 23).

Motorola is another company that is interested in relating the value of training to their profitability. Motorola uses a return on investment (ROI) worksheet to quantify this value for their training programs (Slania, 2002).

Federal Express takes a unique approach to understanding the impact of their training on reducing expenses. Federal Express found that the opportunity cost not to train employees was \$2,341 per employee. Compare that to the training cost of \$450 and the net loss per employee comes to \$1,891 (Anonymous, 2005).

Another way to look at training and business results is to focus on corporate sales growth. Revenue improvements, rather than cutting costs, is a top priority as reported by 80% of 456 CEOs surveyed by IBM with support from Economist Intelligence Unit and Nikkei Research. This same survey also found that 60% of CEOs surveyed responded that a lack of appropriate human resource skills is the chief obstacle required for this revenue growth (Bednarz, 2004).

Determining the effect of training on business results is not always performed with formal evaluation systems according to Knowledge Advisors Learning Analytics Best Practices Research Study. In their 2004 survey, they discovered that only 34% of the organizations surveyed had a formal evaluation system to measure training results in place (Berk, 2004). This survey found that businesses may not be aware of how to measure the actual impact of training as tangible corporate performances measurements.

Moreover, the process of measuring the impact of training on company results can be difficult and expensive. An ROI project to measure the tangible value of training can consume as much as 5% of a training program's budget (IOMA, 2005).

The impact of training on tangible business results has been reviewed in this chapter by examining what companies like Xerox, Motorola, and Federal Express are doing. While some businesses have sophisticated systems to measure training's impact on business results, most do not have these performance measurement systems in place.

Training and Intangible Business Results

There is value associated with intangible results from training programs.

Although less obvious, intellectual capital as a result of training has an opportunity to make a significant impact on a business. Traditional accounting practices do not always quantify these results and therefore intangible business results may go unnoticed.

Moreover, training costs traditionally considered expenses should be regarded as assets (Lev, 2004).

An example of an intangible benefit from certification and other training includes higher employee morale which may lead to reduced employee turnover (Darbe, 2002). Darbe in his article "If You Train Me, I'll Leave, If You Don't, I'll Stay", points out that individuals that participate in certification programs are valuable to an organization's future.

Some companies go to great lengths to ensure that knowledge remains within their company. Desouza and Awazu recognize this in their article, "Securing Knowledge Assets". Businesses should recognize how important knowledge resources are to the competitive strength of their operations. Without the knowledge base required to compete, companies risk going out of business (Desourza & Awazu, 2004).

Another example of an intangible benefit derived from certification and other training includes the exposure students have to other departments and companies outside of their own. When participating in educational opportunities with individuals employed by other companies, students benchmark implementation of potential new processes, systems, and procedures in other companies before bringing them inside their own company (Van Wert, 2004).

Attempts to measure intangible results from training programs have been conducted. An example of this is a study pioneered by Mark A. Yount, Assistant Professor of Management at Skidmore College and Scott A. Snell, Professor and Director of Executive Education at Cornell University. This study found statistically significant relationships between a company's intellectual capital and their business performance. The study separated intellectual capital into human, organizational and social capital. All three intangible classifications of capital were found to be significantly correlated to business performance. Yount and Snell (2004) explain, "Additionally, the intellectual capital-performance relationships are not only statistically significant, but practically meaningful as well. For example, a one standard deviation increase in organizational capital increases performance (ROA and ROE) by 35%" (p. 351).

A different way of measuring intangible assets involves a scorecard system. Performance measurements are related to when and how organizational knowledge is shared and tracked. This system treats intangible knowledge as if it were a tangible asset. Holland and Toelle (2001) explain:

One of the best ways to make knowledge management work is by steering its use with the company's performance-management system. That helps ensure that those making extra efforts to generate and share knowledge get recognition, and those who withhold information at critical times are explicitly discouraged from this behavior. Over time, the net result is the creation of a culture that shares and values knowledge. (p. 93)

Current Business Climate and Training Budgets

Even if the perception of the tangible and intangible results that may accrue from training are favorable, the business reality of making a profit exists. Business and industry training involves the allocation of expenses against revenue within a company budget. Any dollars originally allocated to training expense in a good economic cycle may be reallocated due to reduced revenue in a difficult economic situation.

The business climate today is complex and challenging. Commissioned by the National Governors Association, Mark Zandi (2004) reported economic survey results for the manufacturing sector in the United States. The following points illustrate the state of the manufacturing economy at the end of 2003.

In Zandi's research, he found that manufacturing production has fallen greater than 6% and not recovered for four straight years. He also found that across the nation, manufacturing payrolls have fallen 20% since the late 1990's. Another finding of the study was that manufacturing utilizations over the past two years have been short of an 80% target.

Zandi (2004, p. 3) reported in the study that, "The 2001 recession would have been avoided altogether without the sharp contraction in manufacturing." Furthermore, Zandi commented about international competition and how it has been consuming more global market share over the last three decades. As of the end of 2003, almost one-third of the US demand is satisfied by non-US production.

Not all of the economic news is grim, however. The business environment for the six months prior to May 2004 has shown signs of recovery. In fact, the May Institute of Purchasing Management's (ISM) Employment Index has risen over the past seven

months, after showing negative trends for more than three years prior (ISM, 2004).

Despite signs that the economy appears to be rebounding, Chris Taylor in his article, "What's Next?" explains that companies are still reluctant to allocate enough funds to bring training budgets back to their pre-recession levels. In addition, companies are also asking trainers to make do with less resources and employee training time (Taylor, 2003). Even companies that are not touched by the difficult economic conditions of the past few years are looking for ways to reduce training budgets (Slania, 2002). Training budgets are often slashed because they reduce cost, with no consideration given to the revenue the training generates (Krell, 2002).

Summary

Chapter 2 began with profiles of the APICS organization and the CPIM. As the CPIM history is unfolded, technological advancements of importance to operations management was reviewed. The history of the CPIM was presented as background information.

Companies have implemented performance measurement systems to track tangible results from their training programs. Although more difficult to measure, efforts are being made to track intangible results from training and certification programs. The chapter concluded with a review of the current business climate's affect on corporate training budgets.

Chapter 3 will focus on the researcher's methodology. The research method, subject selection, and data management will be discussed as it relates to the impact of CPIM on business results.

CHAPTER THREE

METHODOLOGY

Research Method

To research the effect of the CPIM on Fox Valley business results, the researcher received permission from the Fox Valley Chapter of APICS to use their membership database. The chapter's database contains members from 52 companies. Out of these 52 companies, 29 of them have employees with the CPIM designation. Using contact information from this database, the researcher attempted to interview a representative from each of the 29 member companies to obtain data about business results.

The design of the survey instrument contains open and closed questioning. The first eight questions on the survey are demographic. The demographic questions were designed to provide background information on the companies researched. Descriptive statistics including counts and percentages will be used to summarize the demographic data obtained from the interviews.

The first research objective is to identify tangible performance measurements that improve business profitability as a result of CPIM training. Questions nine through 15 and questions 17 and 19 were designed to investigate this first research objective. All questions relating to the first research objective were quantitative in nature. Descriptive statistics including counts and percents will be used to summarize the data collected from the interview questions.

The second research objective is to identify intangible effects that result from CPIM training. Question 16 on the survey was designed to investigate this research

objective. Information obtained from this question is qualitative in nature.

The last research objective is to understand to what degree the business environment has affected training budgets that fund CPIM programs within the past five years. Question 18 was designed to investigate this research objective. The question is quantitative and will be summarized with counts and percentages.

The final question numbered 19 was asked in review of the previous 18 questions. Question 19 gives the respondent the opportunity to clarify or discuss any of the previous survey questions (see Appendix A).

Selection of Subjects

The research sample consists of 29 companies with members in the Fox Valley Chapter of APICS as of October 2004. Out of 52 member companies, 29 have employees with the CPIM designation. The researcher emailed representatives from each of these 29 companies and asked the selected APICS member to identify the most appropriate individual within their company to conduct the interview (see Appendix B). Two criteria were used to select representatives of the 29 companies. The criteria included that the subjects must have budget authority and knowledge of business metrics relevant to this study.

If the researcher did not receive a reply to the email cover letter, a follow up telephone call was placed. If the phone call was not answered or returned no further attempts to contact the company for the purposes of this research were made.

Instrumentation

The research method for this study was an interview that was conducted either in person, via telephone, or via email with a representative from each of the 29 companies. Each subject received a cover letter outlining the generic scope of the study, along with a request to participate sent via email. A consent form was included, and all human subject training and Internal Review Board authorization requirements were met.

The interviews took place during December 2004, January 2005, and February 2005. Before the interviews were conducted, consent forms were received from all respondents.

The instrument was developed by the researcher since one was not located with the characteristics that specifically represented the CPIM body of knowledge. Ordinal data and nominal data will provide the researcher with information consistent with descriptive research. In addition, the researcher included open-ended questions to gather qualitative data related to the subjective nature of this study.

The interview contains 19 questions. Out of the 19 questions, the first eight questions pertain to demographics. The demographic data gives the researcher insight as to the distribution of results in regard to company size in terms of employees and sales, organizational structure and infrastructure, how many employees at their location are CPIM, what their job titles are, and if CPIM is a requirement for any job at their company. These demographic questions were asked to provide background to the reader of this research.

The non-demographic portion of the survey which includes Questions 9-12 and Question 15 investigates the respondent's evaluation of business results before and after

CPIM. Subjects were asked for any positive and/or negative bottom-line results that CPIM knowledge has influenced. This measurement is meaningful to the research because it relates the CPIM knowledge to business results. Additionally, this measurement is meaningful because it determines the direction of the response and whether it is favorable or unfavorable.

Questions 13, 14 and 17 explored a strategic company-wide perception of the CPIM. This measurement is meaningful to the research to determine if the CPIM value is recognized throughout the company or if it is held valuable by individuals within the company.

Question 16 addressed intangible effects obtained from CPIM knowledge. This question is meaningful because it measures the magnitude and the direction of intangible effects.

Question 18 explored the availability of training dollars at the company over the past five years. This information is meaningful to determine if the sample of businesses have had the same budgetary challenges as found in the literature review.

Finally, Question 19 is open-ended. This question asks if there is anything further the subject would like to discuss with the researcher. This question is meaningful to the researcher to gather any additional qualitative information relevant to the research topic.

Data Collection and Recording

A cover letter including the request to participate was emailed to the subjects prior to scheduling interviews. Some participants requested that the survey questions be sent prior to the interview. This was done so the respondents would gain permission from

their employers to participate as a respondent in the study.

After the cover letter was emailed, the researcher phoned or emailed representatives from each of the 29 Fox Valley Chapter companies to set up interview appointments. The interviews were scheduled and conducted in December 2004, January 2005, and February 2005. Using the interview script and survey, the researcher manually recorded all responses to the survey in written form.

Data Processing and Analysis

After the interviews were conducted, the researcher coded the quantifiable results and entered them into an Excel spreadsheet (see Appendix C). The Excel spreadsheet was coded so that each respondent of the survey remains confidential. The 23 respondents are listed in the rows of the spreadsheet in column A.

The columns of the Excel spreadsheet include each of the 19 questions. The researcher sequentially assigned codes to each possible response for every question. After the interview was concluded, the researcher entered the responses into the spreadsheet with the appropriate numeric code responding to the answers the respondent gave.

The middle section of the Excel spreadsheet counts the number of responses for each question. Question 19 does not include numeric data because it was an open-ended question.

The last section of the Excel spreadsheet contains the percentage calculations for each question. Again, Question 19 does not include numeric data because it was an open-ended question.

Due to the subjective nature of this topic, open-ended feedback is necessary

although it is not statistically significant. All qualitative information will be gathered in a Word document (see Appendix D).

Limitations of the Methodology

This study has several limitations that the reader should be aware of. These limitations are listed below.

1. The survey instrument has been conducted over the phone, in face-to-face interviews, or through email. The researcher recorded the responses manually in a written form for each survey question. Although care was taken to record responses accurately, these notes are subject to interpretation of the researcher.

2. The intent of the survey instrument is to gather nominal and ordinal data for descriptive statistical analysis from 29 Fox Valley companies. As a result of the design of the survey and the small sample size, inferential statistics including correlations are not applicable to this study.

3. The scope of this research project is limited to a sample of the businesses that are members of the Fox Valley Chapter of APICS. As such, the results may not be representative of the entire population and may not represent all locations and all manufacturing environments.

4. Due to the nature of the database, interview responses may not represent a cross section of all industries or company size.

5. The interview questions are developed by researcher. Every attempt will be made to develop a reliable and valid instrument, but it may not be totally free of bias. Raw data will be retained for 18 months and available to the Fox Valley chapter of

APICS and APICS Society for independent analysis should bias be a concern. The protection of identities will be handled through coding of results so that no company names will be revealed. No subject names will be revealed.

6. The subjects of the research may be concerned that their company is regarded in a favorable manner. As a result, the subjects may withhold detailed information from the researcher especially when the findings are negative.

7. The subjects of the study were selected from the Fox Valley Chapter of APICS's membership database. A total of 52 companies have members in this chapter. Out of these 52 companies, 29 have employees with the CPIM designation. The researcher will attempt to contact a representative from each of the 29 companies to request time for an interview. Because granting the interview is a gesture of goodwill, companies may decide that the interview is not a priority over their current business concerns.

8. The researcher is dependent upon the representative of the company from the Fox Valley Chapter of APICS database to identify a subject qualified to meet the research criteria of budget authority and knowledge of business metrics. As a result of this dependency, the researcher has limited control over the selection of the respondent and their ability to meet the research criteria.

Summary

The methodology associated with this research utilizes interviews to gather data from a sample of Fox Valley companies about the value of the CPIM for their business. The selection of subjects to include 29 companies has been outlined. Descriptive

statistical techniques are used to analyze the data.

In addition to accumulating quantitative data from the interviews, the researcher has also gathered qualitative data. Although not statistically significant, this data may explain reasons supporting the respondent's responses.

Chapter 4 presents the results of these interviews. Demographic data, tangible business results, intangible business results and the economic impact on training budgets will be discussed.

CHAPTER FOUR

RESULTS AND DISCUSSION

The research was conducted on Fox Valley companies employing individuals with the Certified in Production and Inventory Management (CPIM). The CPIM body of knowledge is offered by APICS, the Association for Operations Management. The Fox Valley Chapter of APICS offered the use of their membership database for purposes of this study. Although 29 company contacts were attempted, 23 interviews were performed obtaining a 79.3% response rate. Of the six companies not participating, four companies declined to participate in the survey and two companies did not respond to the invitation to participate. All of the respondents have budget responsibility and have knowledge of business metrics.

The instrument used for the study was a survey drafted by the researcher with 19 questions. These questions were conducted in an interview format with the researcher over the phone, in person, or through email. The survey is found in Appendix A. This chapter presents the results of this survey.

The survey consists of a total of 19 questions. Of these 19 questions, eight are demographic, eight questions support the first research objective, one question supports the second research objective, and one question supports the third objective. In addition to these 19 questions, a clarification question was asked to conclude the interview.

Demographic Data

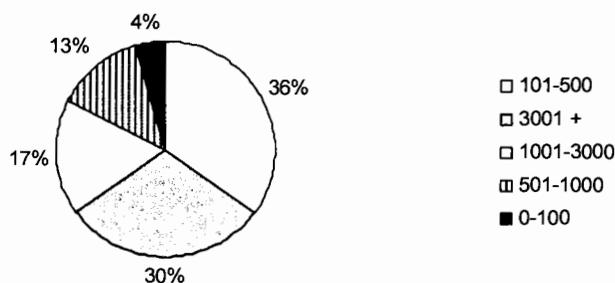
This section includes eight demographic questions and the survey results for these

questions. As presented in the Significance of the Study in chapter 1, other organizations interested in this demographic information include businesses, educational providers, the APICS organization, and Fox Valley Technical College.

Question 1: How many employees does your company employ?

A pie chart outlining company size by number of employees is presented below. Eight companies out of the 23 surveyed employ between 101 and 500 people, representing the mode with 36%. The second highest frequency is represented by seven companies representing 30% of the sample employing between 3001 or more employees. Together these two groups accounted for 66% of the respondents. Figure 1 provides the remainder of the information about the rest of the respondents.

Figure 1: Company Size-Number of Employees



Question 2: Are your resource management functions (planning, buying, materials management) Centralized?

Out of the 23 companies represented, 14 of them or 61% have centralized resource management functions including planning, buying, and materials management.

Seven companies have decentralized resource management functions including planning, buying, and materials management. The two remaining companies have centralized resource management functions organized within multiple divisions.

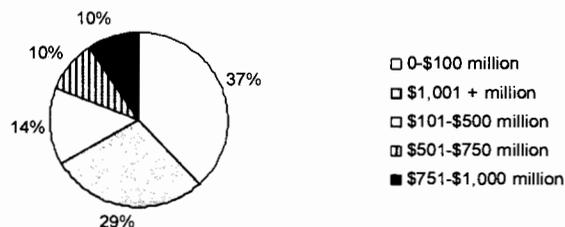
Questions 3 and 4: Does your company have multiple production/warehousing facilities? If your company has multiple production/warehousing facilities, are they located in one county?

Twenty-one companies out of the 23 companies surveyed have multiple production and/or warehousing facilities. Of these 21 companies, 5 of them are located within the same county. Two companies do not have multiple production and/or warehousing facilities.

Question 5: What were your company's sales last year?

Two of the 23 companies in the sample opted not to release sales information. Figure 2 illustrates the revenue earned during the last fiscal year by the respondents companies. The data indicates that 37% of the respondents were from companies with less than \$100 million of sales. Twenty-nine percent of the survey respondents earn more than \$1,001 million of sales.

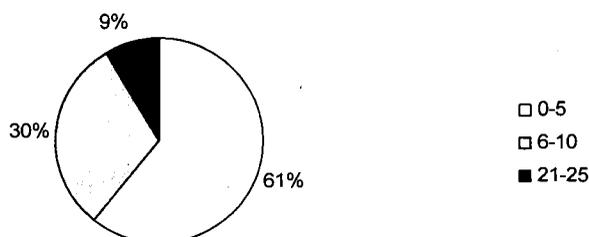
Figure 2: Company Size-Sales



Question 6: How many of your company's employees are CPIM's?

As represented in Figure 3, 61% of companies surveyed have zero to five employees with the CPIM designation. Seven companies have six to ten employees with the CPIM designation representing 30%. Two companies representing 9% have more than twenty-one employees with the CPIM designation. There were no companies with 11 to 20 employees with the CPIM designation.

Figure 3: Number of Employees with CPIM per Company



Question 7: What positions within the company do the CPIM's Hold?

Table C details the number of respondents within a specific operations management function in which an individual with CPIM was employed at the time of the survey. Most often identified was the planner function cited by 11 respondents, representing the mode. The number of responses totals more than 23 companies because a single company may have multiple employees with CPIM in multiple positions.

Table C

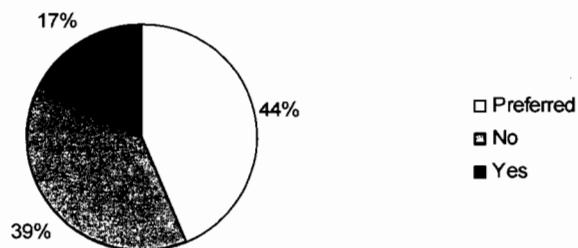
Company Functions Currently Held By Employees with CPIM

Company Function	Number of Respondents
Planner	11
Buyer	9
Materials Manager	9
Inventory Control	5
Information Technology	3
Production Supervisor or Manager	3

Question 8: Is CPIM a requirement for any of your jobs?

As illustrated in Figure 4, 17% of respondents representing four companies answered affirmatively when asked this question. Ten companies representing 44% prefer employees with CPIM designations, while nine companies representing 39% do not designate a requirement for the CPIM for positions at their companies.

Figure 4: CPIM as a Requirement of a Job



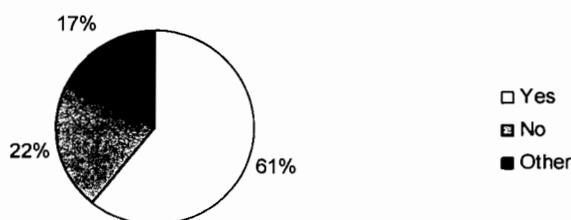
Tangible Performance Measures

This section of chapter 4 addresses the first research objective. This objective is to identify performance measurements that improve business profitability as a result of CPIM training. The following text includes eight survey questions and the related survey results that address this research objective. A summary of these results appears in the last section of this chapter.

Question 9: Are there any significant metrics that have been affected as a result of CPIM education at your company?

Sixty-one percent representing 13 out of 21 respondents reported that significant metrics have been affected as a result of CPIM training, as represented in Figure 5. When asked this question, 22% or five respondents did not conclude with certainty that CPIM education had a direct affect on their company's performance measurements. Four subjects were uncertain as to identifying a direct link between CPIM knowledge and metrics at their company.

Figure 5: Companies with Significant Metrics Affected by CPIM



Question 10: Please identify any positive bottom-line improvements that CPIM knowledge has made on your company's business results.

Respondents were told they may list more than one option or add to a list of suggested responses including inventory turns, employee turnover, customer service, or cash flow. Out of the 23 companies represented in the sample, 22 reported a positive bottom-line improvement from CPIM in their companies.

Thirteen respondents identified inventory turns while 10 companies identified improvements to customer service. Seven respondents indicated that they have experienced positive results on cash flow, while two respondents identified employee turnover. Employee turnover is listed as a positive metric for these two companies because employees with CPIM received increased salaries, which reduced employee turnover. Further metrics identified in the other category include inventory accuracy, transaction costs, and on-time deliveries among other metrics. See Table D and Appendix D for detailed responses.

Table D

Positive Improvements from CPIM

Improvement	Companies
Inventory Turns	13
Customer Service	10
Cash Flow	7
Employee Turnover	2

Question 11: Please identify any negative bottom-line results that CPIM knowledge has made on your company's business results.

Five respondents in the sample did report negative bottom-line results due to CPIM knowledge in their companies. Two of the respondents mentioned increased employee turnover due to more attractive salaries outside the company for individuals with CPIM. One other metric identified as unfavorable includes CPIM employee over-utilization. Another unfavorable effect mentioned was that non-CPIM employees may become demoralized when they are not asked to participate in projects. A final unfavorable comment addressed an over-reliance on complex software systems for inventory management instead of using simple manual and visual techniques. The summarized answers to this question appear in Appendix D.

Question 12: Are you able to share specific figures with me regarding these measures of business results?

Question 12 asked respondents to share specific performance measurements. Fourteen out of the 23 respondents volunteered specific performance measures with the researcher. Summarized results appear in Table E while detailed responses appear in Appendix D.

Table E

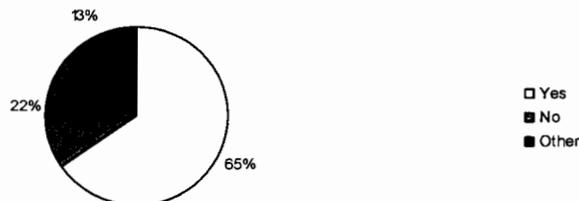
Performance Measurements

Performance	Number of Companies
Increased Inventory Turnover	7
Improved On-time Deliveries	4
Increased Inventory Accuracy	2
Increased Sales	1

Question 13: Does your company believe that CPIM education is valuable? Why/Why Not?

Fifteen companies representing 65% of the sample reported that CPIM education is valuable. Five companies representing 22% of the sample replied that CPIM education is not valuable. Three companies chose the other category for their response.

Figure 6: Percentage of Companies Indicating CPIM is Valuable



Thirteen percent or 3 respondents out of the sample appears in the other category. When asked to explain, the respondents indicated that their companies have had recent changes in top management. These respondents are not certain if the new management regards CPIM education as valuable.

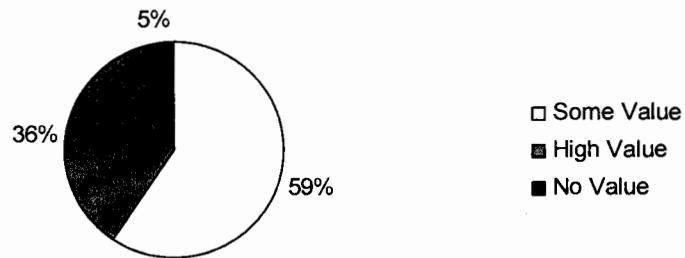
The second part of this question asked respondents to comment on why CPIM is valuable (see Appendix D). Comments included both specific and general applications. An example of a specific CPIM topic one respondent gave was the sales and operations planning process. An example of a general application one respondent shared is that any educational program is valuable.

Most of the comments from respondents as to why CPIM is not valuable focused on the lack of understanding by others in the company as to what CPIM is. Because of this lack of understanding the company does not find value in CPIM. Other comments addressed competing factors for time making it difficult to reserve time for CPIM education.

Question 14: Please rate your company's view of the value associated with the CPIM body of knowledge.

Question 14 asked the respondents to rate the value associated with CPIM. Here, the majority of the respondents representing 59% of the sample or 13 companies indicated that the CPIM has some value. Eight respondents representing 36% indicated that the CPIM has high value, while one respondent replied that CPIM has no value. See Figure 7.

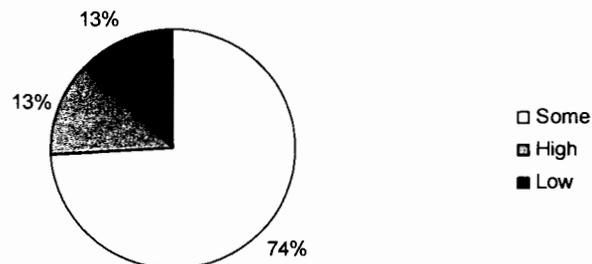
Figure 7: CPIM Value



Question 15: How do you relate the value rating you gave in question 14 to your company's profitability?

Seventy-four percent of the respondents representing 17 out of 23 companies reported that there is some relationship between CPIM and profitability, while 3 or 13% of the respondents replied that there is a high relationship between CPIM and profitability. Also, 3 out of 23 respondents indicated that there is a low relationship between CPIM and profit. These concepts are illustrated in Figure 8.

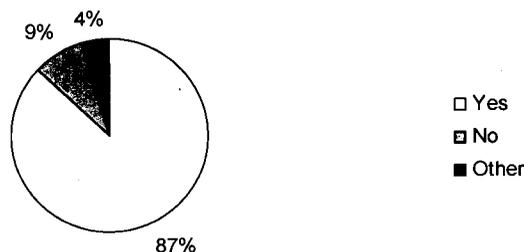
Figure 8: Relationship Between CPIM and Profit



Question 17: Are CPIM's promotable in your company?

The last question regarding tangible business results was about promoting CPIMs. Twenty respondents or 87% of the sample reported that employees with CPIM designations were able to be promoted in their companies. Two respondents indicated that CPIMs were not able to be promoted in their companies, while one respondent answered that the question is non-applicable.

Figure 9: Promotability of Individuals with CPIM



Intangible Performance Measurements

This section addresses the second research objective. This objective is to identify intangible effects that result from CPIM training. One question on the survey addressed this research objective.

Question 16: Please list any intangible effects (good or bad) from CPIM knowledge?

All but two companies listed at least one good intangible effect CPIM has on their company. One respondent replied that there was a negative intangible affect from CPIM knowledge. One company did not respond with any intangible results.

Some of the good intangible effects companies gained from CPIM knowledge include the information gleaned from networking, fact-based decision making, and the sharing of a common vocabulary. Two respondents mentioned that intangible benefits were a result of employing CPIM individuals that customers recognized. More comments are found in Appendix D.

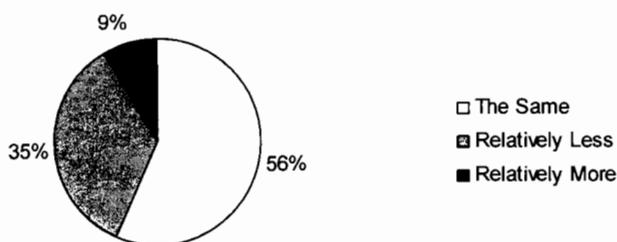
Training Budgets

This section of chapter 4 addresses the third research objective. This objective is to understand to what degree the business environment has affected training budgets over that past five years that may potentially fund CPIM programs. One question on the survey addressed this research objective.

Question 18: On a scale of 1 to 3, please rate your view of the training budget available for CPIM funding over the past five years at your company.

As Figure 10 illustrates, 56% of the respondents representing 13 out of 23 companies reported that the same dollars are available now as were available five years ago. Thirty-five percent representing 8 out of 23 companies reported that relatively fewer dollars are available now than compared to five years ago. Nine percent or two respondents from two companies indicated that relatively more dollars are available now than five years ago.

Figure 10: Training Budgets Over the Last 5 Years



This concludes the presentation of the survey results. The demographic information was presented. Additionally, the results of survey questions associated with each of the three research objectives was presented. The next section summarizes the findings from the survey.

Summary Statement of Findings

This section begins by reviewing findings associated with the first research objective. The rest of this section will be organized in a similar way by presenting the second and third research objectives and their associated findings.

Research Objective One

The first research objective is to identify tangible performance measurements that improve business profitability as a result of CPIM training. The survey results referring to the first research objective are mixed. Some survey questions are tactical in nature because they ask for specific performance measures. Other survey questions are strategic in nature because they focus on a high-level awareness and understanding of CPIM. Depending upon whether the question was tactical or strategic in nature produced

different results.

Tactical Questions

Questions asking for specific performance results include Questions 9, 10, 11, and 12. These survey questions look for evidence of performance measurements that improve business profitability as a result of CPIM training. In every one of these questions, the majority of responses were favorable.

Question 9 found the majority of 61% of the respondents indicated that there are significant metrics in their companies that have been affected as a result of CPIM education.

Question 11 asked for negative bottom-line results from CPIM knowledge on their business. Seventy-eight percent of the respondents indicated no negative effects. Question 12 asked the respondents to share specific performance measurements which included increased inventory turnover, improved on-time deliveries, increased sales, and increased inventory accuracy.

When answering tactical questions 9, 11, and 12, most survey respondents saw a direct link between CPIM training and positive business results. The exception to this conclusion relates to tactical Question 10.

Question 10 asked respondents to list any positive improvements from CPIM that CPIM knowledge has made on their business results. Out of the 23 companies represented in the sample, 22 reported some kind of a positive bottom-line improvement resulting from CPIM in their companies. Improvements in inventory turns were mentioned 13 times, improved customer service was identified 10 times and improved

cash flow was listed 7 times.

Even though 22 out of 23 of the respondents reported some kind of an improvement in their company's bottom-line measurements, there was not one particular measurement that a significant majority of respondents agreed upon. Inventory turnover is a measurement important for most businesses. Yet the research results show that only 13 out of 23 companies reported improvements in this area.

Strategic Questions

Strategic questions are numbered 13, 14, and 15 on the survey. The findings from these questions do not find a strong perception that CPIM education is valuable.

Question 13 revealed that 35% of the sample indicated that CPIM education is not valuable or they did not know how to answer the question. When asked for clarification the most frequent qualitative response given was that there is a lack of recognition within their companies as to what APICS and CPIM are. Although not statistically valid, these comments may explain the reasoning behind the survey results.

The literature review showed that the level of recognition of the APICS body of knowledge has been questioned before. Refer to one of the original reasons behind the need for CPIM as cited in Chapter 2, Table A. Recognition of the profession by industry (Bulleit, 1972) was an issue. The findings of this survey show that the same issue continues to be relevant today for this sample of companies.

Question 14 asked respondents to rate their company's view of the value associated with the CPIM body of knowledge. Sixty-four percent responded that they either thought there was some value or no value. The remainder of the sample of 36%

indicated there was a high value. The data from this sample does not support a strong relationship between the CPIM body of knowledge and high value.

Question 15 asked respondents to rate the relationship between CPIM and profit. Eighty-seven percent of the sample indicated that there was either no or some relationship between CPIM and profit. The results from this sample do not find a direct link between CPIM and profit.

Summary of Findings for Research Objective One

The findings are mixed when comparing the results from the tactical questions to the results from the strategic questions. For this sample the majority of respondents were able to see the impact the CPIM made on business results. However, the opposite is true when looking at the sample results from the strategic questions from a company-wide perspective.

Research Objective Two

The second research objective is to identify intangible benefits that result from CPIM training. The findings show that a majority of the sample found positive intangible value from CPIM training.

The finding of this research agrees with the literature review. The sample recognizes positive intangible affects of training in general and the CPIM specifically. Despite the inability to specifically quantify these benefits, the sample acknowledges they exist and have value.

The literature review in chapter 2 found that implementing a system to validate

the relationship between programs like CPIM training and significant metrics in business can be difficult and expensive. Yet even with the difficulties associated with implementing these systems, the sample found significant positive effects of CPIM training on business results.

Research Objective Three

The last research objective is to understand to what degree the economic environment has impacted training budgets that fund training programs like the CPIM within the past five years. The research sample found that 65% of the companies surveyed have the same or relatively more dollars available now as they did five years ago. These findings do not match the results cited in the literature review in chapter 2.

The literature review found that the challenging state of the economy has had negative effects on training budgets in recent years. This is in direct contrast to the findings from the sample.

Summary

Data collected from the research sample was presented in four sections; demographic data, tangible performance measurements, intangible performance measurements, and training budgets.

The demographic data section provided detail about the sample as a background for the reader. The tangible performance measurements section reported mixed results. Although specific tactical performance measurements that were impacted by CPIM were identified by the sample, the strategic research did not highly value CPIM.

Positive intangible benefits were found to exist as identified by the sample.

Lastly, the majority of training budgets within the sample are the same or more than they had five years ago.

Chapter 5 will present the summary and conclusions of the research. More specifically, the next chapter will discuss in more detail what impact, if any, the CPIM has on Fox Valley businesses.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter is sectioned into three specific parts. These sections include the summary of the research, the conclusions of the study, and the recommendations related to the research. Each of these sections will address the research problem of relating specific business results to CPIM knowledge.

Summary

The Certified in Production and Inventory Management (CPIM) is a certification program for operations management professionals. This certification program is offered through APICS, The Association for Operations Management.

This study looks at companies that employ CPIM professionals and the impact of their knowledge on business results. The goal of the research is to determine if there is direct impact from the knowledge associated with CPIM on business results.

This section of chapter 5 presents an overview of the research problem and presents the methods and procedures used for research.

Restatement of the Problem

The CPIM program certifies that an individual exhibits a standard of competence in production and inventory management with a potential to provide value for business and industry (Association for Operations Management [APICS], n.d.b.). Yet, businesses driven by the challenging economic environment are reducing budgets that typically fund

training like the CPIM. Limited quantifiable data exists to link the value of the CPIM competencies to the profitability of an enterprise for the purpose of justifying future CPIM training.

To study this problem, three research objectives were identified. The research objectives are listed below.

1. Identify tangible performance measurements that improve business profitability as a result of CPIM training.
2. Identify intangible benefits that result from CPIM training.
3. Understand to what degree the business environment has affected training budgets that fund CPIM programs within the past five years.

Methods and Procedures

To research the effect of the CPIM on Fox Valley business results, the researcher received permission from the Fox Valley Chapter of APICS to use their database to form a sample. Using the chapter's membership data, the researcher attempted to interview a representative from each of the 29 member companies. Twenty-three companies participated.

The design of the survey instrument contains questions that are both open and closed. The first eight questions on the survey are demographic. The remainder of the questions was associated with each of the three research objectives.

The researcher scheduled interviews with each of the respondents. The interviews were conducted on the telephone, in person, or through email during December 2004, January 2005 and February 2005. After the interviews were concluded, the quantitative

data was coded and processed primarily for descriptive statistical results. All quantitative and qualitative data is summarized in attached Appendixes C and D.

Conclusions

Results from the study and their relation to the research objectives are discussed in this section of chapter 5. Each of the research objectives is listed along with the related findings.

The first research objective is to identify tangible performance measurements that improve business profitability as a result of CPIM training. Questions related to this objective on the survey were asked from a tactical perspective and from a strategic perspective. The findings from these questions are mixed.

From a tactical perspective, the majority of respondents identified specific tangible performance measurements they know exist because of CPIM knowledge within their companies. The exception to this conclusion relates to the response related to inventory turnover. Only 13 out of 23 companies found improved inventory turns due to CPIM knowledge in their companies.

From a strategic perspective, the majority of respondents did not recognize CPIM knowledge to be of a high value to their companies. Only thirteen percent of respondents indicated that they consider CPIM to be of high value. Even though respondents are able to identify specific measures that are affected from CPIM knowledge, the sample did not indicate CPIM was of high value.

The second major finding relates to research objective two. This objective is to identify intangible benefits that result from CPIM training. The majority of the

respondents indicated that their company realizes a positive impact from intangible benefits from CPIM training.

The third major finding relates to research objective three. This objective is to understand to what degree the business environment has affected training budgets that fund CPIM programs within the past five years. The finding was that a majority of the sample did not see reduced funding for training over the past five years.

Recommendations

The following is a listing of recommendations the researcher suggests for further study. These recommendations are a result of careful consideration of the methods and findings of this research.

Methods

1. Future studies are recommended to be performed by a non-CPIM researcher to control bias. A further recommendation is to target non-CPIM respondents for the same reason.
2. To make the results more meaningful it is recommended that future research be designed to focus on collecting ordinal data instead of nominal data. With this change the results of the study will be supported by correlation statistics instead of descriptive statistics.
3. A larger sample size will allow the results to be generalized across the population. In this study 23 companies participated from a small geographical section of the entire population. In future studies the researcher recommends the sample should

include more companies from areas inside and outside of the United States to more accurately reflect the demographics of the entire APICS organization.

4. The researcher does not recommend research with a control group unless the study has significant resources. The amount of variables when studying the relationship of training on business results is complex and multidimensional.

Findings

1. Based on the findings this researcher recommends expanding the scope of study to include supply chain management including suppliers and customers. Many respondents during interviews discussed the importance of understanding how CPIM affects suppliers and customers, not just their own company's profit.

2. Based on this study, the researcher recommends further research on just how significant intangible business results are to business. As discussed in the literature review, creative ways of measuring intangible results are being developed, tested, and deployed.

3. While conducting interviews the researcher occasionally noticed a mismatch between the perception of CPIM content and the actual CPIM body of knowledge. Future research in this area to clarify this perception would be of interest to the APICS organization and employers.

References

- American Institute of Certified Public Accountants (AICPA), *The uniform CPA examination*. (n.d.). Retrieved June 15, 2004, from: <http://www.cpa-exam.org/>
- Anonymous. (2005, January). Three quick and easy ways to gauge your training outcomes. *IOMA's Report on Managing Training and Development*, 5, 1. Retrieved May 5, 2005 from ProQuest ABI/Inform Global.
- Arnold, J.R., & Chapman, S. (2000). *Introduction to materials management*. Upper Saddle River, NJ: Prentice-Hall.
- Association for Operations Management (APICS), *About APICS*. (2005) Retrieved May 6, 2005, from: <http://www.apics.org/about/pressroom/default.htm>
- Association for Operations Management (APICS), *Certified in production and inventory management*. (n.d.a). Retrieved June 16, 2004, from: <http://www.apics.org/about/mission.htm>
- Association for Operations Management (APICS), *Certified in production and inventory management*. (n.d.b). Retrieved June 8, 2004, from: <http://www.apics.org/certification/CPIM/default.htm>
- Association for Operations Management (APICS), *Certification maintenance*. (n.d.). Retrieved June 29, 2004, from: <http://www.apics.org/certification/maintenance/default.htm>
- Association for Operations Management (APICS), *San Diego hosts 2004 APICS international conference and exposition*. (2004). Retrieved June 15, 2004, from: <http://www.apics.org/About/PressRoom/2004/06-01-2004.htm>

Association for Operations Management Region 14 (APICS14), *APICS region 14*

contacts. (n.d.). Retrieved June 29, 2004, from:

<http://www.apics14.org/contacts.html>

Bednarz, A. (2004, March). IBM survey: training, tech needed to grow revenue. *Network World*, 21(10), 15-16.

Berk, J. (2004, June). The state of learning analytics. *T+D*, 58(6), 34-39.

Blackstone, J. H., Cox, J. F., & Terry College of Business at the University of Georgia.

(2005). *APICS dictionary (11th ed.)*. Alexandria, VA: APICS.

Bulleit, F. E. (1972, Third Quarter). Why certification? *Production and Inventory Management Journal*, 1.

Cohen, D. (2001, June). Is certification in your future? *HR Magazine*, 46(6), 296.

Darbe, A. (2002, April). If you train me, I'll leave, if you don't, I'll stay. *Credit Union Magazine*, 36.

Delahoussaye, M., Ellis, K., & Bolch, M. (2002, August). Measuring corporate smarts. *Training*, 39(8), 20.

Desouza, K. & Awazu, Y. (2004, August). Securing Knowledge Assets. *J@pan Inc*, 58, 24-27.

Dodds, D. (1995, February). A professional designation: The CMA's competitive edge. *CMA Magazine*, 69(1), 2.

Eagle, A. (2004, May). Seal of approval. *Health Facilities Management*, 30-34.

Fernandez-Ranada, M., Gurrola-Gal, F., & Lopez-Tello, E. (2000). *3C a proven alternative to MRPII for optimizing supply chain performance*. Boca Raton, FL: CRC Press.

- Glassie, J. C. (2003, June). Certification programs as a reflection of competency. *Association Management*, 55(6), 17.
- Holland, D. & Toelle, B. (2001, May). Managing knowledge as a company asset. *World Oil*, 222(5), 92-93.
- ISM, *Certification and accreditation*. (n.d.) Retrieved June 15, 2004, from:
<http://www.ism.ws/Certification/index.cfm>
- ISM, *May manufacturing ISM report on business*. (2004, June) Retrieved June 29, 2004,
from: <http://www.napm/>
- Keenan, W. (2000, June 12). Sales training ROI? *Industry Week*, 249(11), 23.
- Kirkwood, T., & Pangarkar, A. (2004, February). Independent means. *CMA Management*, 77(9), 12-13.
- Krell, E. (2002, December). Calculating success. *Training*, 39(12), 46-50.
- Lev, B. (2004, June). Sharpening the intangibles edge. *Harvard Business Review*, 82(6), 109-116.
- Merritt, J. (2003, October 20). The education edge. *Business Week*, 3854, 86-90.
- Musthaler, L. (2003, April). Certifications are worth it. *Network World*, 20(17), 53.
- Philpott, J. (2004, April). Training: The economic context. *Reflections*, 5-9.
- Patterson, M. & Litt, M. (1993). *New Webster's expanded dictionary*. Miami, FL: P.S.I. & Associates, Inc.
- Ptak, C., & Schragenheim, E. (2000). *ERP tools, techniques, and applications for integrating the supply chain*. Boca Raton, FL: CRC Press LLC.
- Slania, J. (2002, March). The proof is in the performance. *Crain's Chicago Business*, 25(9), SR1-3.

- Taylor, C. (2003, December). What's next? *T+D*, 57(12), 40-43.
- Tuesday, V. (2002, April). Certification value more political than practical. *Computerworld*, 36(14), 48.
- Van Wert, I. (2004, December). Is your company a learning organization? *American Printer*, 234(3), 48.
- Wright K., Sczyrba, M., & Maher, M. (2003, December). The value of professional certification. *ABA Bank Compliance*, 24(11), 36.
- Yount, M. & Snell, S. (2004, Fall). Human resource configurations, intellectual capital and organizational performance. *The Journal of Managerial Issues*, 16(3), 337-360.
- Zandi, M. M. (2004, February). *Manufacturing's performance and prospects*. Retrieved June 13, 2004 from http://www.nga.org/nga/legislativeUpdate/1,1169,C_ISSUE_BRIEF^D_6614,00.html

APPENDIX A

Interview Script and Survey

Introductory Comments:

Thank you for your time to allow me to interview you for my research project, *An Analysis Of The Certified In Production And Inventory Management Program's Impact On Fox Valley Businesses*. Your answers to these questions are valuable to this research.

You have signed the consent form to allow me to ask you the following questions. This form was designed so you know that information about your identify and your company's identify will be kept confidential. That is to say that I, as the researcher, will know your identity, but when the research is reported it will not identify you or your company. Instead the research will identify responses from "Fox Valley" companies.

Do you have any questions before we begin?

There are 19 questions which will us up to an hour to complete. Shall we get started?

Interview Questions:

1. How many employees does your company employ?

- 0-100 employees
- 101-500 employees
- 501-1000 employees
- 1001-3000 employees
- 3001 +

2. Are your resource management functions (planning, buying, materials management) centralized?

- Yes
- No
- Other

3. Does your company have multiple production/warehousing facilities?

- Yes
- No
- Other

4. If your company has multiple production/warehousing facilities, are they located in one county?

- Yes
- No
- Other

5. What were your company's sales last year?

0-\$100 Million

\$101-500 Million

\$501-750 Million

\$751-1000 Million

\$1001 +

6. How many of your company's employees are CPIM's?

0-5 employees are CPIM

6-10 employees are CPIM

11-15 employees are CPIM

16-20 employees are CPIM

21 + employees are CPIM

7. What positions within the company do the CPIM's hold? (May indicate more than one.)

Materials Manager

Production Supervisor or Manager

Planner

Buyer

Information Technology

Accounting

Inventory Control

Other

8. Is CPIM a requirement for any of your jobs?

Yes

Highly preferred

No

Other

9. Are there any significant metrics that have been affected as a result of CPIM education at your company? Significant metrics may include but are not limited to inventory turns, employee turnover, customer service, and cash flow.

Yes

No

Other

10. Please identify any POSITIVE bottom-line improvements that CPIM knowledge has made on your company's business results.

Inventory turns

Employee turnover

Customer service

Cash flow

Other

11. Please identify any NEGATIVE bottom-line results that CPIM knowledge has made on your company's business results?

- Inventory turns
- Employee turnover
- Customer service
- Cash flow
- Other

12. Are you able to share specific figures with me regarding these measures of business results?

13. Does your company believe that CPIM education is valuable?

- Yes
- No
- Other

Why/why not?

14. Please rate your company's view of the value associated with the CPIM body of knowledge.

- 1-No value
- 2-Some value
- 3-High value

15. How do you relate the value rating you gave in question 14 to your company's profitability?

- 1-High Relationship between CPIM and profitability
- 2-Some relationship between CPIM and profitability
- 3-Low relationship between CPIM and profitability

16. Please list any intangible affects (good or bad) from CPIM knowledge?

17. Are CPIM's promotable in your company?

- Yes
- No
- N/A

18. On a scale of 1-3, please rate your view of training budget available for CPIM funding over the past 5 years at your company.

1. Relatively less dollars are available now than 5 years ago.
2. The same dollars are available now as were available 5 years ago.
3. Relatively more dollars are available now than 5 years ago.

19. Is there anything else I should know about the effect of CPIM on your company's business results?

Closing comments:

We have finished the interview. Thank you for your time and information. If you have any follow up comments that you would like to get to me after I leave today, please contact me. Do you have my contact information?

Thank you for your time. I will forward a copy of my paper to you after it has been completed. Thank you for your valuable time.

APPENDIX B

Interview Cover Letter

Hi <Name>,

I'm finishing my Master's this Spring at the University of Wisconsin-Stout. To get a Masters in my program, Career and Technical Education, I am required to write a research paper.

My thesis is about "An Analysis of the CPIM Program on Fox Valley Businesses". As part of my research I am to interview members of Fox Valley businesses. The reason I am contacting you is because your company has employees who are members of the Fox Valley Chapter of APICS and some of them have earned their CPIM.

<Name>, I would like to interview someone with budget responsibility who can answer questions about inventory turns, employee turnover and cash flow. I'm not necessarily asking for specific results (unless they can be shared), but looking more for the effect on business results in a general way. All interview results will be kept confidential. My goal with this research is to validate if the CPIM has value for companies that affects business results.

The interview can be conducted in person or over the phone. To meet deadlines, it must be completed by mid-February and will take between 30 minutes and 1 hour.

Here's where you may be able to help me. Do you have budget responsibility and would consider participating in an interview? If you are not comfortable with this, perhaps you may recommend else in your company who I might contact for this interview?

You may respond to this email, or I can give you a call later this week. I've attached the consent form that is required before I can conduct the interview for your information. If you will be doing the interview, I will require it faxed to me at 920-831-5423 before we set an appointment.

Thank you in advance for your time in assisting me to obtain data for my research if you choose to participate.

Best Regards,

Anne Haberkorn, CFPIM, CIRM, Jonah
Manufacturing Productivity Instructor
Fox Valley Technical College

APPENDIX C
Quantitative Data

APPENDIX D

Qualitative Data, Question 10

10. Please identify any POSITIVE bottom-line results that CPIM knowledge has made on your company's business results?

- Inventory accuracy (5)
- Conversion from main frame to J.D. Edwards
- Project management
- Bill of materials accuracy
- Reduced number of dollars per transaction
- Developed more detailed metrics for decision-making and exceptions management
- Warehouse reporting tool
- Cycle counting program implementation (2)
- Sales and Operations Planning implementation
- On-time deliveries
- Revised terms with top 20 suppliers
- Transaction accuracy
- Shop floor quality control
- Used CPIM knowledge to help deal with attrition.
- Less mechanical engineering resource required.
- Schedule attainment
- Lot traceability
- Safety concerns with bill of material accuracy (product explodes if right mix of water is not adhered to.)

APPENDIX D

Qualitative Data, Question 11

11. Please identify any NEGATIVE bottom-line results that CPIM knowledge has made on your company's business results?

- Employee turnover (2) was large at one time – but other factors (manager at the time was not well-liked or respected) and low salaries were involved.
- Over-utilized employee
- One person obtained CPIM and then left
- Hired another CPIM and had to fire them due to poor performance
- How people regard CPIM in the company
- Employee didn't have knowledge so was fired.
- Affects employees who don't follow initiatives.
- Content of material is outdated, no lean manufacturing, however still believes content is relevant.
- The body of knowledge drives company by a software program.

APPENDIX D

Qualitative Data, Question 12

12. Are you able to share specific figures with me regarding these measures of business results?

Increased Inventory Turnover

1. \$3.8 Million to \$2.3 million reduction in total WIP over the past four years frees up cash.
2. Inventory turns has increased every year for the past 3 years. In 2000, turns were 7.9, in 2001 – 8.39, in 2002 – 8.96, in 2003 – 8.92, in 2004 – 10.18.
3. Working capital has decreased by \$5 million dollars.
4. Turns have increased to 16-18 range, with a target of 20.
5. In 2002 inventory days on hand was 97 days. In 2004, inventory days on hand is 58 due to the use of planning bills of material and kanban.
6. Improved turns to 7 in one division, and up to 4 in another division.
7. Inventory turns were at 3 or 4, now they are at 9.

Improved On-time Deliveries

1. On-time delivery has increased by 40% in the past year.
2. On-time delivery from engineering was 13% on time. Now it is 93%.
3. 100% completion on scheduled date including drawings and bills of material.
4. Schedule attainment was 70%, now it is in the mid-80%, not wholly as a result of CPIM.

Increased Inventory Accuracy

1. Increase of inventory accuracy from 54% to 88%.
2. Increase of raw materials inventory accuracy from 82% to 99%.

Increased Sales

1. The incremental sales due to CPIM recognition by customers was \$200,000 in 2004.

APPENDIX D

Qualitative Data, Question 13

13. Does your company believe that CPIM education is valuable? Why/why not?
- Several job descriptions require it.
 - The company pays for the test, class and book. (2)
 - The company recognizes new CPIMs in their newsletter.
 - Sales and Operations planning process is a driving force in the company.
 - In a retail environment, so CPIM does not stand alone to be recognized, rather it is consolidated into other job functions.
 - Any educational program is worthwhile.
 - Not widely understood by leadership.
 - Need lots of certifications within company for a board-based group.
 - One more tool in the toolbox.
 - Secure in job, no other CPIMs at the company
 - CPIM is desirable, but not evidence that someone can do the job.
 - The value of CPIM is starting to dwindle; the company is evolving away from it.
 - My company paid for me to obtain a CPIM. They believe any type of education is a valuable tool. However, the performance appraisal system at my company rewards based on performance. If two people are up for a promotion and only one person holds a CPIM, the one that performs better will still receive the promotion, regardless of who holds the CPIM.
 - Ongoing education.
 - Adds value to a well-educated work force, best in class.
 - Speak the same language.
 - Global company.
 - Do not know what APICS is.
 - Not educated enough to know that APICS is out there. Hard to open up time for education.
 - Gives a knowledge base of basic computer systems and how they work.
 - Cycle counting program did not include root cause problem solving previously.
 - Current owner does not know what APICS or CPIM is.
 - Helps with basic knowledge, to explain, develop or lead a program.

APPENDIX D

Qualitative Data, Question 16

16. Please list any intangible affects (good or bad) from CPIM knowledge?
 1. Good-CPIMs have an understanding for different aspects and can problem solve better. An example is to take the leader or facilitator position for projects as a result of their knowledge base.
 2. Good-Process improvement benefits.
 3. Good-No formal lean program, yet they take lean into account in developing and improving processes.
 4. Good-Promotability
 5. Good-How you relate to your suppliers
 6. Good-Deal better with purchasing
 7. Bad-Frustration with bill of materials and engineering
 8. Good-Develop performance tools and ad hoc reporting
 9. Good-RF system implementation
 10. Good-Networking (2)
 11. Good-Customers recognized CPIM and brought in additional sales (2)
 12. Good-Help with lean implementation
 13. Good-has a significant impact on inventory, understanding the customer better, and what the progress will be.
 14. Good-The CPIM is not required of our employees so when someone earns it, it becomes a leadership benchmark for the manager.
 15. Good-People want to grow and take on more initiative.
 16. Good-A business sense is developed throughout the entire organization.
 17. Good-Decisions are more fact-based.
 18. Good-Initiative is shown in individual with CPIM.
 19. Good-Pride in people.
 20. Good-Getting recognized.
 21. Good-Sense of ownership and attitudes change.
 22. Good-Body of knowledge is useful in the organization.
 23. Good-Better planning
 24. Good-Relate business processes to strategic directives.
 25. Good-Awareness that actions have consequences.
 26. Good-Common language
 27. Good-more people involved
 28. Good-higher visibility of body of knowledge and what it offers.
 29. Good-Education is power, so body of knowledge is still relevant to a variety of functions.
 30. Good-Able to talk intellectually in a cross-functional environment and get everyone on the same page with problem solving.
 31. Good-When top management sees the financial effects of CPIM it heightens the value of the employee.

32. Good-CPIM knowledge has given me an overview of the entire supply chain. In my company, I have held positions in Customer Service, Vendor-managed inventories, and Materials Planning. Each one of these positions focuses on a specific area of the supply chain. Having a CPIM gives me knowledge of the entire supply chain, start to finish. I believe this knowledge gives me an edge over my co-workers. The results are demonstrated in my performance reviews. I have never received less than an "exceeds expectations".
33. Good-Good-the ability to talk in terms of CPIM knowledge with your people.
34. Good-Can't improve methods and have individuals without formal knowledge. CPIM is a big benefit to drive knowledge through the rest of the organization.
35. Good-ERP conversion and ability to implement in today's manufacturing planning and control systems and basic CPIM education.
36. Good-Industry-wide standards and communication of best practices.
37. Good-CPIM exposes and identifies process and product areas for improvement.
38. Bad-Exposure has caused stress in certain areas. Agitates people who hear about a new change.
39. Good-Going through the process is further education and growth. Shows ability and decision to grow and stimulates the learning process. Relational thinking, don't need full CPIM training for benefits.
40. Good-Common sense, helps understand JIT and to educate others, even though they are not CPIM.
41. Good-Supportive, like accounting. Helps to understand value added.
42. Good-Depends upon age group. MRP is old terminology, ERP is new.
43. Good-People are involved and thinking.

APPENDIX D

Qualitative Data, Question 19

19. Is there anything else I should know about the effect of CPIM on your company's business results?

- Better understanding of operations for entire team.
- CPIMs care enough about themselves to learn
- Possess a level or a standard of knowledge.
- There is a tendency to reduce headcount, unless employees have the CPIM. The company is more efficient with less individuals.
- The positive effect of CPIM in one facility has caused the desire for CPIM to spread to other areas of the company.
- Currently there is not a high awareness of CPIM like there was in the 80's and 90's.
- CPIMs are more effective making changes in the company.
- Common vocabulary and jargon used in practice and in software like BPICS and SAP.
- APICS is under-taught and over-sold on consulting side.
- CPIM knowledge has given me tools that I can use to apply to my job. Many education courses I have taken have given me general knowledge, but no specific tools that I can apply. Eventually, knowing the results that have occurred due to my CPIM certification, I plan to pursue a CIRM education. However, it is difficult to measure the results of CPIM certification in my company because employees are not promoted based on education, only performance. It would be interesting to see a study of careers of a group of people that have obtained CPIM's versus those that have not.
- Hard to answer questions because business results are not specifically due to CPIM. Rather is it a combination of experience, education and CPIM that affects the ability to lead, decide and analyze.
- In today's competitive environment, companies need to reach out and take advantage of CPIM and APICS. That's one avenue to get people to help manage the business, one component of the overall picture.
- Been around CPIM for 7 years. Seen my own experiences and certification is definitely a value for nothing more than those who are willing to advance their own knowledge, much like a college degree.
- Training across a number of functional area, even if not for the full certification, crease a common understanding of a company's operation, uses the same terminology.
- CPIM is terminated at our company. Instead lean transition makes you more current.

- Computerized system is becoming obsolete because purchasing is transferring to the shop floor in pull systems to reduce waste.
- Overall, the changes made and the constant trend towards improvement has helped everyone, not just themselves.
- If more people had it they would better understand implementations in other departments.