POWELL, ELIZABETH ERIN M.S. An Analysis of Project Management Methodology as Applied to Demand Forecasting Software Implementation within a Leading Apparel Corporation. (Under the direction of Dr. Nancy L. Cassill and Dr. Jeffrey A. Joines.)

The purpose of this study was to identify formal project management methodology as well as to investigate a forecasting software implementation project. As companies face challenges of improving supply chain performance and creating cost effective business strategies, projects emerge for process improvement. Formal project management has developed to successfully guide and complete projects of any kind on time and on budget, but also to incorporate change management for thorough alignment. The Project Management Institute's® methodology provided the conceptual framework for this study.

A sample of one software implementation project from a division of an industry-leading apparel manufacturing and marketing corporation was examined. Using a case study approach, project team members were interviewed via an email questionnaire. Respondents were asked to identify and explain the components of formal project management that were developed and used during the software project.

Results determined the extent to which PMI's® project management methodology was utilized. Conclusions successfully identified portions of the framework that would have benefited the project, including risk and quality planning. There must be a single project manager that assumes complete responsibility for project decisions, rather than sharing the role among three project managers. Project team members must not carry dual employment responsibilities, but should be able to focus only on project duties. Additional technical resources both in people and hardware, including a test environment are needed for future similar projects. Complete senior management commitment is essential for future projects.

AN ANALYSIS OF PROJECT MANAGEMENT METHODOLOGY AS APPLIED TO DEMAND FORECASTING SOFTWARE IMPLEMENTATION WITHIN A LEADING APPAREL CORPORATION

by
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BIOGRAPHY

The author, Erin Powell was born in Raleigh, NC on April 10, 1980 to M.A. “Kim” and Rori Powell. She has one younger brother, Sam.

Erin grew up in Bonsal, NC and graduated from Northwood High School in Pittsboro, NC in 1998. She received her Bachelor of Science degree from North Carolina State University in Textile Technology with a concentration in Polymer Chemistry in 2002. She was then accepted into the graduate school at NCSU to earn a master’s degree in Textile Technology and Management from the College of Textiles with a minor in Business Management from the College of Management. She is currently completing the requirements for the degree and looks forward to pursuing a career in the textile industry.

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1.0 CHAPTER I - INTRODUCTION

1.1 INTRODUCTION

Competition within the apparel industry has grown more intense with increased global sourcing prospects. A company's competitive strategy defines the set of customer needs that it seeks to satisfy through its products and services (Chopin, 2001). Alternative business strategies evolve through this examination in order to remain competitive. The make or buy decision becomes exposed as an obvious business opportunity by finding the optimal combination of global sourcing and "in house" and/or vertically integrated manufacturing. The product development strategy specifies the portfolio of new products that a company will try to develop and dictates whether the development effort will be made internally or outsourced (Chopin, 2001). Accurate business planning and product forecasting is critical in the equation to remain competitive. All supply chain design and planning decisions are based on a forecast of customer demand (Chopin, 2001).

An inaccurate, under-forecast presents the situation to chase popular apparel items. By the time demand is realized, the company must include lead times to procure additional raw materials and successfully increase manufacturing capacities in the decision to chase the product. The company is left with the decision to assume demand will still be present after these lead times, or realize a missed opportunity. Full-product sourcing does not bode well for chasing products, due to increased lead times.

An inaccurate, over-forecast creates excess, obsolescent inventory. There may not always be discount retail outlets for sales due to unique customer manufacturing specifications. The lost investment of time and resources is difficult to regain in this situation.

Technological advancements of the time have created formal business and supply chain planning software packages designed for large corporations. Among these is forecasting software that creates a statistical baseline forecast that might be incorporated with judgmental elements to finalize a product forecast. This software has the capability to utilize extravagant quantities of data to potentially create more accurate forecasts. Popularity of software packages has grown for many reasons. One is that companies lack the internal resources and time to develop the software on their own (Lientz & Rea, 2002).

The implementation of a software package is not a simple undertaking, especially for a large, established corporation. Failure occurs often because of the faulty assumption where Management views these packages as a rapid fix to both business processes and systems, where you push the package and fit the process around it (Lientz & Rea, 2002). In most cases, this requires formal project management to be successful. In a survey conducted by KPMG Management Consulting in 1994, respondents were asked which of a range of remedies had been applied to "runaway projects." Three of the top four were to apply additional time, money, and people. The second resolution behind additional time was to practice better project management procedures (Smith, 2001).

1.2 PURPOSE

The purpose of this investigation is to understand formal Project Management methodology and document an application of this strategy in an apparel industry setting. Standard literature and proven best practices will be documented. A forecasting software implementation project at a large corporation will be used as a case study.

There are often multiple projects simultaneously conducted within a large corporation, all with the primary goal of decreasing unnecessary expenditures and ultimately

improving customer service levels. New technology is a constant focus and software is continuously upgraded to offer the best opportunity to gain an advantage over the competition. Oftentimes, several different vendors may have systems running together for various areas of one business, and all must work together harmoniously. Legacy systems within an established corporation also present a challenge with the introduction of new technology. The successful completion of improvement projects, and especially new software implementation is essential, but is rarely completed within original budget or time projections.

The United States corporation used in this case study has multiple business divisions. One of its manufacturing divisions is a forecast driven apparel supply chain. Historically, the forecasting department has not utilized formal forecasting software. The forecasting accuracy was evaluated as lacking in performance and executive management issued mandatory improvement. A well known and industry leading forecasting software package was chosen for implementation in an effort to deliver increased forecast accuracy.

The implementation was not only a change for the forecasting department, but was also a drastic change for the overall division of the corporation. Formerly, senior management mandated the final forecast according to corporate sales goals. With this new software implementation came a change in corporate culture to rely more on a realistic volume demand forecast.

1.3 RESEARCH OBJECTIVES

Research objectives of this study are to understand project management and accurately review the application of a case study project in a textile industry setting. In particular, the objectives will identify the extent to which the Project Management Institute's

Project Management Framework was utilized and to assess the success of the project given this proven methodology. The specific objectives are to:

1. Identify and document the phases and participants of the forecasting software implementation project from beginning to end hereafter referred to as Software.
2. Understand organizational, behavioral, and systems restrictions and catalysts for each of the Software implementation phases and participants.
3. Develop a learning critique that determines the effectiveness of each phase of the project.
4. Establish recommendations for a repeatable process that companies with similar challenges may use for more efficient transition and successful implementation.

1.4 SIGNIFICANCE OF THE STUDY

The case study approach will provide greater insight for the corporation into the level of project management incorporated into their systems implementation project. Perspectives from project members can potentially be correlated to the success rate of the project.

Recommendations will be established for future projects for the corporation. Project team members may potentially be introduced to formal Project Management. The company will gain a learning tool through the case study evaluation. This type of project was unique to the business division, as no other similar project had been attempted. Therefore, there was not an example from which lessons had been learned. Results and recommendations will assist in future investment choices for the corporation and reveal more cost effective and efficient means of execution.

1.5 LIMITATIONS OF THE STUDY

One limitation of the research is it focused solely upon one department in one division of one corporation. Initially it was to be an evaluation from two different business divisions, but only one replied. Evaluation of similar Software implementation projects across different corporations would provide greater basis for recommendations. Generalizations may not be made for divisions within the corporation or for outside corporations, but will be specific to this project.

Research conducted relied on the memory of project participants. The sections of the data collection instrument that evaluated the degree of specific project management utilized attempted to filter bias results through questions not requiring opinion. However, memory recall may be influenced by opinion in other questionnaire sections. The project success rate at the time of the questionnaire completion may have also biased the answers of the Respondents.

The questionnaire was distributed individually to company employees for the forecasting division. These employees were hand picked and chosen from multiple business departments including Forecasting, Sales Planning, Supply Chain, and Information Technology. Not all Respondents were members of the project team, but eventually were affected by the Software implementation project.

The response rate for one division was 50%, while the response rate for the second division was 0%. This limits the range of answers to the questionnaire and may result in bias results.

2.0 CHAPTER 2 – REVIEW OF LITERATURE

2.1 GLOBAL APPAREL INDUSTRY

Mounting global tensions and continued economic decline raise questions about where to invest the next dollar. The global manufacturing, marketing, and retail environment must be ever more closely monitored. One steadfast clause is still that no matter how tough times get, the consumer is still going to eat, drink and get dressed (Mourtada, 2003). This is good news for the apparel industry.

"Think Globally, Act Locally" is the catch phrase of current competition. This is the practice of customizing product and services for regional consumption in accordance with the local languages, currency, culture, and regulatory climate (Miranda, 2003). There is a difference between operating around the globe and truly being a global business (Miranda, 2003). One survey that was conducted in 1996 to determine the number of global brands only turned up a handful of qualifiers (Mitchell, 2002). The criteria stated that the brand could be considered "global" if it was sold in 33 countries or more. A different study of 200 "billion-dollar brands" by AC Nielsen in 2001 found that only 43 brands passed its global test. The testing criterion in this research was to sell in each of the world's four major economic regions, with at least five percent of its sales outside of the home region. The results indicted that 78 percent of the biggest brands are still only regional or generate more than 95 percent of its sales in its home country (Mitchell, 2002). One key to globalization is the ability to reconcile business processes to be globally efficient and locally accountable (Miranda, 2003).

The retailer is paying close attention to the opportunity for global expansion, but also closely monitoring for that local accountability. Proctor & Gamble has determined it needs

to understand two moments of truths. One is the moment when the consumer opens the good and uses it at home. The second, which is actually the first moment of truth, is the moment when a consumer chooses a product in the store. The advice given by Coca-Cola Great Britain & Ireland president Tom Long is to spend less time in their offices and go out and meet the consumer. Another piece of advice is that as brands expand around the world, the idea of making the product relevant to the day is important. He disagrees with the concept of global vs. local and says that the question really is "why should I buy your products today" (Benady, 2003).

Gaining and then maintaining consumers through service is the goal of the retailer. Recently, the retailer has assumed greater responsibility for consumer satisfaction. It used to be that the manufacturer determined the needs of the consumer. Now, the retailer is no longer viewed as the intermediary between the manufacturer and the consumer, but is now much more responsible for consumer satisfaction. Therefore, the retailer will have greater interest and influence over its manufacturer (Dawson, 2000).

The balance of power among members of the supply chain is undergoing greater scrutiny in recent times. "A critical factor in channel relationships between manufacturers and retailers is the relative bargaining power of both parties. Greater retailer power promotes channel coordination. There are conditions in which the presence of a powerful retailer might actually be beneficial to all channel members" (Iyer & Villa-Boas, 2003, pg. 80).

At some points, the retailer power may be beneficial to all members of the supply chain, but the exact quantity of that benefit is often difficult to measure and depending on the evaluating party, the results may differ. "There has been considerable debate in the trade press and academic literature about whether retailers have recently increased their power

relative to manufacturers of consumer products." Research to determine the power of Wal-Mart was performed to determine whether the retail giant is wielding power in ways that hurt or help the financial fortunes of its suppliers. "The results show that Wal-Mart suppliers that hold a small share of their respective markets do not perform as well financially as small-share suppliers not identifying Wal-Mart as a primary customer. On the other hand, large-share suppliers to Wal-Mart perform better than their large-share counterparts. This indicates that there are opportunities for suppliers to become beneficiaries of Wal-Mart's power, not just be victims of this power. Indeed, small-share suppliers may find it an attractive strategy to partner with Wal-Mart, to trade off initial financial suffering for the enjoyment of the fruits of the partnership later" (Bloom et al, 2001, pg.296).

The drivers of the supply chain have evolved over the past few years, especially with the growth of Wal-Mart, which surpassed Exxon Mobil as the largest global corporation in 2002 (*Advertising Age*, 2003). "While the supply chain is no longer manufacturer driven, it is also the case that the demand chain is not totally retailer driven. Some manufacturers with strong brands and good information systems are able to operate efficiently in a demand chain environment, controlling the demand chain and making decisions on what to produce. But, even in these cases, the retailer still produces the "experience" which the consumer buys. The current mix of processes is complex with, in some cases, retailers being powerful and in others manufacturers being in this position. The traditional approaches of economics find difficulty in handling the ambiguities of these different demand chain relationships, which exist alongside each other, possibly in a single ship, and interact among themselves" (Dobson, 2001, pg.7).

A Japanese retailer striving to stay ahead of Wal-Mart's move into Japan is moving aggressively to squeeze out the middleman, whereby persuading the supplier to discontinue dealing with wholesaler and deal with it directly (Zimmerman & Fackler, 2003). Remaining competition in any marketplace pushes the need for lean supply chain operations to achieve exceptional customer service. There is always an opportunity for improvement to reach that goal at each stage of the supply chain. A well-defined project is often the result of a recognized needed improvement. Structured Project Management emerged as a solution for the most time and cost efficient results toward sustained and increased competitiveness. With constant push toward lean operations, supply chains and manufacturing "must do more with less" (Lientz & Rea, 2002).

2.2 SUPPLY CHAIN MANAGEMENT

The alignment of processes within an organization, taking a product from ideation to customer, includes all areas of what is known today as the supply chain. Supply chain management has grown over the past decade into the best practices methodology for business management. As the world has become not only global in marketplace, but also presents global production opportunities, the realization of possible supply resources enhances the need for supply chain management. According to Chopin (2001), the ultimate goal of every supply chain is to maximize the overall value generated. Therefore, closely managing every stage, directly or indirectly, that contributes to fulfilling a customer's request meets the purpose of supply chain management (Chopin, 2001).

Supply chain performance evaluation is crucial for a company's success. Improvements within the supply chain have the ultimate goal of improving efficiency and

increasing profit margins as well as customer satisfaction. Most likely upon evaluation, projects will emerge for supply chain improvement.

"Strategic fit requires that a company achieve a balance between responsiveness and efficiency in its supply chain that best meets the needs of the company's competitive strategy" (Chopin, 2001, pg 49). The four drivers of the supply chain, inventory, transportation, facilities, and information, must be examined to determine potential improvement areas. Information is potentially the biggest driver of performance in the supply chain as it directly affects each of the other drivers (Chopin, 2001).

"Project Management is a valuable skill for supply chain managers to have since more and more work is being structured as a project. Projects have certain characteristics that make them unique compared with other forms of work. A project is a series of tasks that require the completion of specific objectives within a certain time frame; has defined start and stop dates; consumes resources, particularly time, personnel, and budget; and operates with limited resources" (Monczka, Trent, and Handfield, 2002, pg. 375).

Effective supply chain performance starts with the forecast generation (Morrison, 1996). Implementation of forecasting software into an existing demand planning or supply chain planning systems can potentially lower manufacturing, warehousing, and fulfillment costs (Wilson, 2001). Managing risk and obsolescent inventory is a primary objective for forecasting accuracy in the supply chain. (Armstrong, 1999). Inventory levels may be managed and held at a minimum to maintain excellent service levels. Forecasting may not only include the predicted performance of particular products, but it is also important to forecast the actions of suppliers, distributors, complimentors, government, and people within one's firm to successfully manage products in the supply chain (Armstrong, 1999).

2.3 PROJECT MANAGEMENT

2.3.1 Definitions

The definition of Project Management has become more defined and yet broader over the years as the trends of the marketplace, roles of businesses, and responsibilities of individuals have evolved. Documentation of experiences with projects allows for each individual to offer suggestions for future projects from a lessons-learned point of view. Plenty of variations exist, each depicting the continuous stages of development. Table 1 is a collection of Project Management definitions.

Table 1. Collection of Project Management Definitions

Concept	Definition	Source
Responsibility	"(Project Management is) the exercise of responsibility and decision-making about a project, the authority to execute within the boundaries of the project, and the accountability to deliver the results of a project in the context of agreed-upon customer expectations, commitments, and constraints."	(Mullaly, 2003, pg. 2)
Basic Thought Process	"Project management includes the application of simple, but not always obvious, rules of common sense to uncommon and complex situations, with deadlines and tight budgets."	(Kimmons, 1990, pg. 5)
Systems Management	"Project management is the application of the systems approach to the management of technologically complex tasks or projects whose objectives are explicitly stated in terms of the time, cost, and performance parameters."	- Cleland and King (Kimmons, 1988, pg. 5)
Commitment for Results	"Establishing a committee is not project management. Just about everything that characterizes committees is prejudicial to good project management…A committee is oriented toward recommendations; a project is oriented to results…Appointing a project manager is not, by itself, establishing a project.	- Martin (Kimmons,1976, pg. 5)
Relevance to many Industries	"The professional activity of designing, structuring, scheduling, organizing, managing and controlling projects is usually called Project Management. Nowadays, there is a growing number of professionals with an initial background in Engineering, Sciences, Economics, or Management who has developed specialized skills in this area and work as project managers. Project Management is clearly an interdisciplinary field requiring a scientific methodology and appropriate technical instruments."	(Tavares, 1999, pg. 6)
Evolving Methodology	"…the traditional view of project management is no longer good enough. Today's world of project management is much more demanding than the old "on time, in budget, to spec" one. It is about managing projects as entities. Its focus is the project. It is about accomplishing projects successfully. It is about managing change and transition. And today, as never before, it is value driven. It is about meeting and exceeding customer expectations; about getting the best bang for the buck, creating value, and shortening implementation schedules (time to market)."	(Morris, 1994, pg. 2)

2.3.2 Historical Development

"Managing projects is one of the oldest and most respected accomplishments of mankind. We stand in awe of the achievements of the builders of the pyramids, the architects of ancient cities, the masons and craftsmen of great cathedrals and mosques; of the might and labor behind the Great Wall of China and other wonders of the world" (Morris, 1994, pg.1). Project management dates back to the first engineering structures of the world and has evolved to include not only new technological advancements, but defined interactive roles of those that make it happen.

Other than aerospace, defense and construction, the majority of the companies in the 1960s maintained an informal method for managing projects. Through the 1970s and then the 1980s, more companies moved to more structured methodologies mostly due to the complexity of the projects (Rich, 2003).

3.3.3 Technology Advancement

New technology has opened unfathomable doors in the most recent decades. Continuous improvements demand that companies upgrade regularly to stay competitive. "Project management in the early 1990s was between a company and a contractor" (Kimmons, 1990, pg.15). Today, project management can include process improvement projects within a company. It will include the interaction of numerous company employees and most likely an on-site contractor. In the case of information technology installations or upgrades, an employee of the software company will stay onsite throughout the project. "General systems theory has been in existence for more than four decades. Today, project management is viewed as applied systems management" (Rich, 2003).

3.3.4 Project Management Methodology/Framework

The Project Management Institute (PMI®) is currently the authority in the field of project management. It publishes the guide to the Project Management Book of Knowledge (PMBOK®) and currently owns the rights to the Approved American National Standard (ANSI). There are more than 45,000 members in the Project Management Institute®.

Early project management was seen as solely scheduling or as estimating and cost control of the work (Kimmons, 1994). PMI® breaks down project management groups and knowledge areas. The knowledge areas are: integration management, scope management, time management, risk management, cost management, quality management, human resources management, communications management, and procurement management. The five project phases of the methodology and framework are: initiating, planning, controlling, executing, and closing. Just as there are many definitions of project management, there are various methodologies per each expert's definition. By and large, they are simply unique twists to the generally accepted methodology.

The generally accepted methodology is defined by PMI® and contains several project phases that comprise the project life cycle utilizing five project processes, and nine knowledge areas. As the PMBOK® states, project management is an emerging profession. The PMBOK® is generally accepted, meaning that the knowledge and practices described are applicable to most projects most of the time, and that there is widespread consensus about their value and usefulness. "Generally accepted does not mean that the knowledge and practices described are or should be applied uniformly on

all projects; the project team is always responsible for determining what is appropriate for any given project" (PMBOK® Guide 2000, pg 7).

2.3.4.1 Project Phases

As shown below in Figure 1, "(P)rojects are generally divided into three major project phases as a means to improve management control. Each project phase is marked by completion of one or more deliverables. A deliverable is a tangible, verifiable work project such as a feasibility study, a detail design, or a working prototype. The conclusion of a project phase is marked by review of both key deliverables and project performance to date, to a) determine if the project should continue into its next phase and b) detect and correct errors cost effectively. These phase-end reviews are often called phase exits, stage gates, or kill points" (PMBOK® Guide 2000, pg. 11).

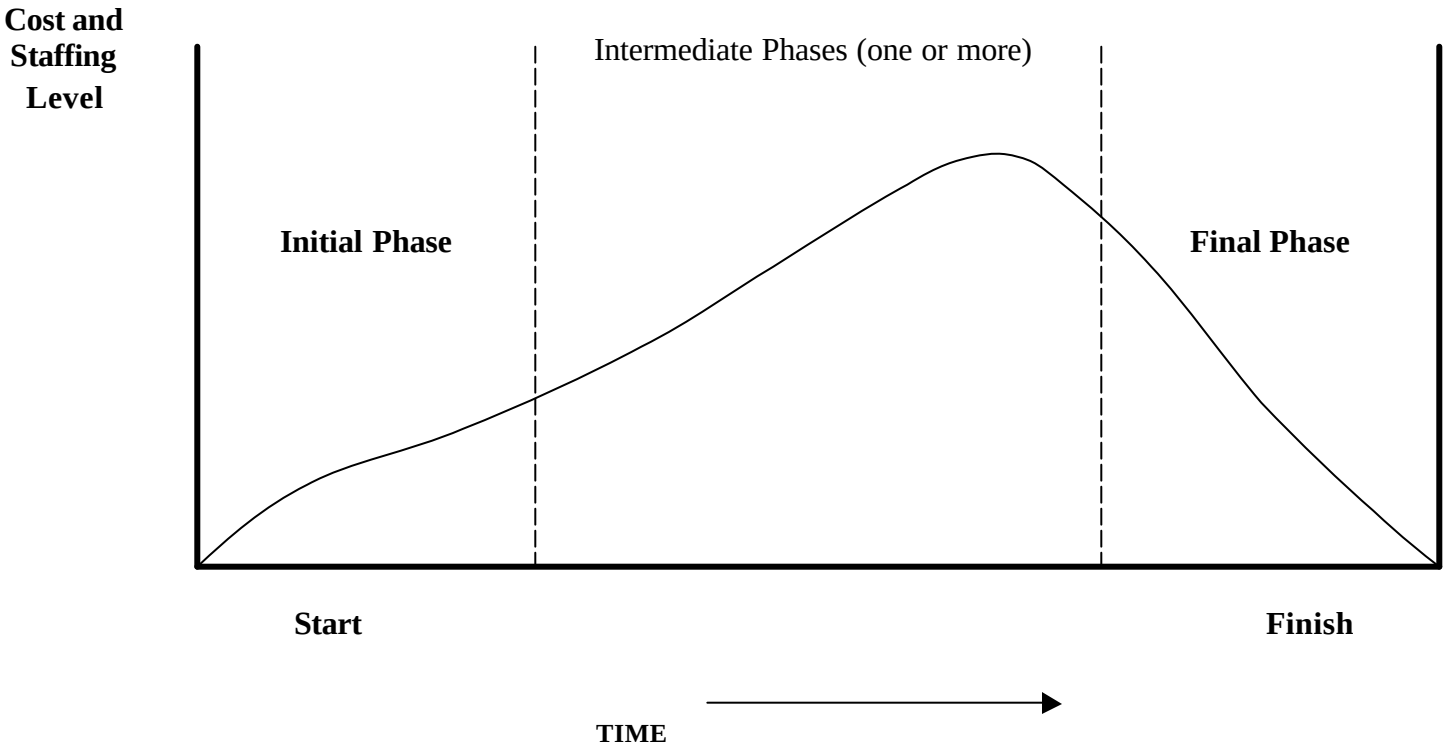

Figure 1. Generic Project Life Cycle

**A Guide to the Project Management Body of Knowledge (PMBOK® Guide), 2000 Edition.
NEWTOWN SQUARE, PENNSYLVANIA: PROJECT MANAGEMENT INSTITUTE, 2000.**

"A needs assessment or a feasibility study is generally the first step toward a project when a company identifies an area of opportunity. The phase sequence defined by most project life cycles generally involves some form of technology transfer or handoff such as requirements to design, construction to operations, or design to manufacturing" (PMBOK® Guide 2000, pg. 12). Deliverables are usually approved before work starts on the next phase. The project life cycles generally define the technical work that should be done in each phase and the persons that should be involved (PMBOK® Guide 2000).

"Most project life-cycle descriptions share a number of common characteristics: cost and staffing levels are low at the start, higher toward the end, and drop rapidly as the project draws to a conclusion, the probability of successfully completing the project is lowest, and hence risk and uncertainty are highest, at the start of the project where the probability of successful completion generally gets progressively higher as the project continues, and finally, the ability of the stakeholders to influence the final characteristics of the project's product and the final cost of the project is highest at the start and gets progressively lower as the project continues" (PMBOK® Guide 2000, pg. 12). A major contributor to this occurrence is that the cost of changes and error correction generally increase as the project increases in time (PMBOK® Guide 2000).

"Project management is an integrative endeavor – an action, or failure to take action, in one area will usually affect other areas. The interactions may be straightforward and well understood, or they may be subtle and uncertain. These interactions often require tradeoffs among project objectives – performance in one area may be enhanced only by

sacrificing performance in another. Successful project management requires actively managing these interactions" (PMBOK® Guide 2000, pg. 29).

The interactive processes, taken from PMBOK® (2000, pg.13) are shown above in Figure 2. "Projects are composed of processes. Project management processes may be organized into five groups of one or more processes each:

- Initiating processes. Authorizing the project or phase
- Planning processes. Defining and refining objectives and selecting the best of the alternative courses of action to attain the objectives that the project was undertaken to address.
- Executing processes. Coordinating people and the resources to carry out the plan.
- Controlling processes. Ensuring that project objectives are met by monitoring and measuring progress regularly to identify variances from plan so that corrective action can be taken when necessary.
- Closing processes. Formalizing acceptance of the project or phase and bringing it to an orderly end" (PMBOK® Guide 2000, pg 31)

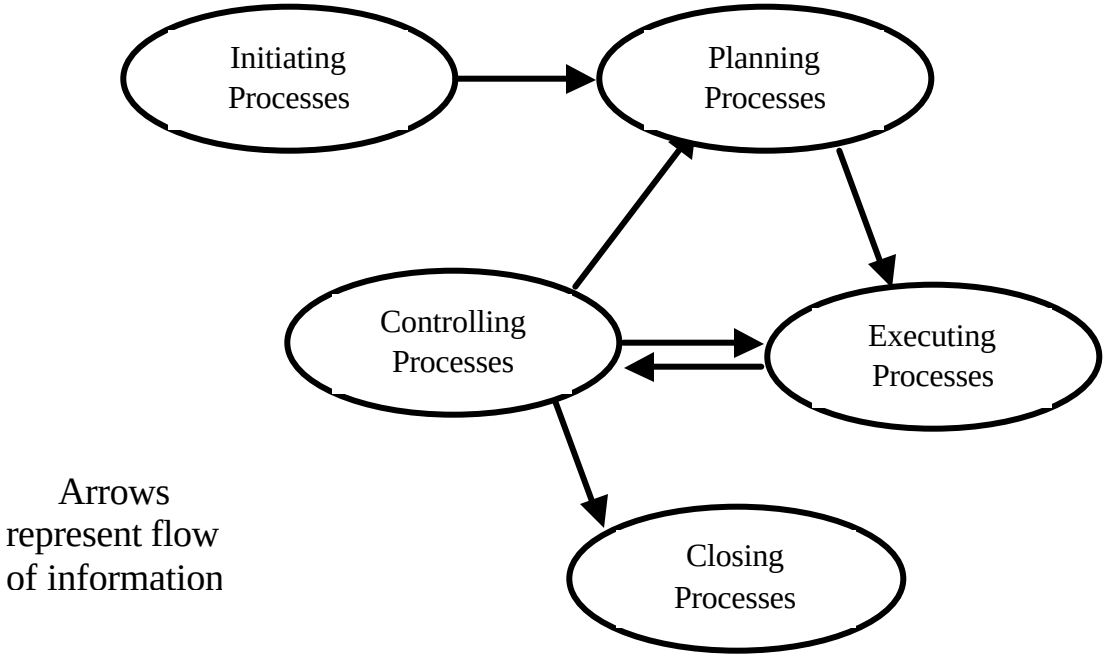

Figure 2. Links among Process Groups in a Phase

A Guide to the Project Management Body of Knowledge (PMBOK® Guide), 2000 Edition. Newtown Square, Pennsylvania: Project Management Institute, 2000, pg. 31

Phases overlap one another and Controlling is usually involved in the entire process, as shown below in Figure 3.

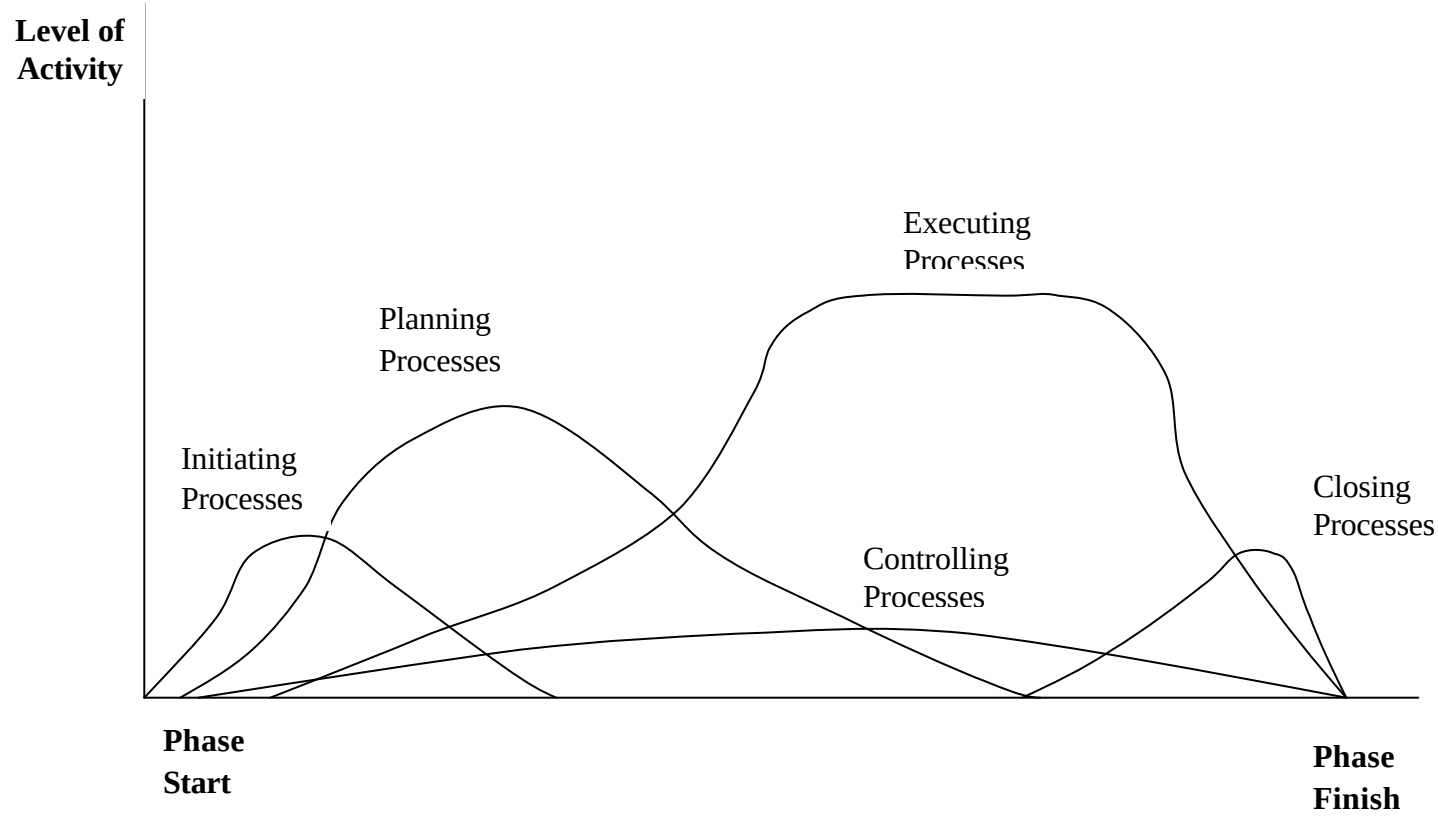

Figure 3. Overlap of Process Groups in a Phase

A Guide to the Project Management Body of Knowledge (PMBOK® Guide), 2000 Edition.
NEWTOWN SQUARE, PENNSYLVANIA: PROJECT MANAGEMENT INSTITUTE, 2000.

"Within each process group, the individual processes are linked by their inputs and outputs. Inputs are documents or documentable items that will be acted upon. Tools and techniques are mechanisms applied to the inputs to create the outputs. Outputs are documents or documentable items that are a result of the process" (PMBOK® Guide 2000, pg. 32).

2.3.4.2 Knowledge Areas

The following matrix, Table 2, describes the five processes and the knowledge areas that are found in each (PMBOK® Guide 2000, pg. 38).

Table 2. Mapping of Project Management Processes to the Process Groups and Knowledge Areas

A Guide to the Project Management Body of Knowledge (PMBOK® Guide), 2000 Edition. NEWTOWN SQUARE, PENNSYLVANIA: PROJECT MANAGEMENT INSTITUTE, 2000.

Process / Knowledge Area	Initiating	Planning	Executing	Controlling	Closing
Project Integration Management		- Project Plan Development	- Project Plan Execution	- Integrated Change Control	
Project Scope Management	- Initiation	- Scope Planning - Scope Definition		- Scope Verification - Scope Change Control	
Project Time Management		- Activity Definition - Activity Sequencing - Activity Duration Estimating - Schedule Development		- Schedule Control	
Project Cost Management		- Resource Planning - Cost Estimating - Cost Budgeting		- Cost Control	
Project Quality Management		- Quality Planning	- Quality Assurance	- Quality Control	
Project Human Resource Management		- Organizational Planning - Staff Acquisition	- Team Development		
Project Communications Management		- Communications Planning	- Information Distribution	- Performance Reporting	- Administrative Closure
Project Risk Management		- Risk Management Planning - Risk Identification - Qualitative Risk Analysis - Quantitative Risk Analysis - Risk Response Planning		- Risk Monitoring and Control	
Project Procurement Management		- Procurement Planning - Solicitation Planning	- Solicitation - Source Selection - Contract Administration		- Contract Closure

Table 2 was a graphical format of the Project Management Knowledge Areas and the phases in which they belong. The following is an explanation and description of each of the Nine Project Management Knowledge Areas and the components of which they are comprised. (PMBOK® Guide 2000, pg. 189-191)

2.4.1.2.1 Project Integration Management

A subset of project management that includes the processes required to ensure that the various elements of the project are properly coordinated. It consists of:

- Project plan development. Integrating and coordinating all project plans to create a consistent, coherent document.
- Project plan execution. Carrying out the project plan by performing the activities included therein.
- Integrated change control. Coordinating changes across the entire project.

2.4.1.2.2 Project Scope Management

A subset of project management that includes the processes required to ensure that the project includes all the work required, and only the work required, to complete the project successfully. It consists of:

- Initiation. Authorizing the project or phase.
- Scope planning. Developing a written scope statement as the basis for future project decisions.
- Scope definition. Subdividing the major project deliverables into smaller, more manageable components.
- Scope verification. Formalizing acceptance of the project scope.
- Scope change control. Controlling changes to project scope.

2.4.1.2.3 Project Time Management

A subset of project management that includes the processes required to ensure timely completion of the project. It consists of:

- Activity definition. Identifying the specific activities that must be performed to produce the various project deliverables.
- Activity sequencing. Identifying and documenting interactivity dependencies.
- Activity duration estimating. Estimating the number of work periods that will be needed to complete individual activities.
- Schedule development. Analyzing activity sequences, activity durations, and resource requirements to create the project schedule.
- Schedule control. Controlling changes to the project schedule.

2.4.1.2.4 Project Cost Management

A subset of project management that includes the processes required to ensure that the project is completed within the approved budget. It consists of:

- Resource planning. Determining what resources (people, equipment, materials) and what quantities of each should be used to perform project activities.
- Cost estimating. Developing an approximation (estimate) of the costs of the resources needed to complete project activities.
- Cost budgeting. Allocating the overall cost estimate to individual work activities.
- Cost control. Controlling changes to the project budget.

2.4.1.2.5 Project Quality Management

A subset of project management that includes the processes required to ensure that the project will satisfy the needs for which it was undertaken. It consists of:

- Quality planning. Identifying which quality standards are relevant to he project and determining how to satisfy them.

- Quality assurance. Evaluating overall project performance on a regular basis to provide confidence that the project will satisfy the relevant quality standards.
- Quality control. Monitoring specific project results to determine if they comply with relevant quality standards and identifying ways to eliminate causes of unsatisfactory performance.

2.4.1.2.6 Project Human Resource Management

A subset of project management that includes the processes to make the most effective use of the people involved with the project. It consists of:

- Organizational planning. Identifying, documenting, and assigning project roles, responsibilities, and reporting relationships.
- Staff acquisition. Getting the needed human resources assigned to and working on the project.
- Team development. Developing individual and group skills to enhance project performance.

2.4.1.2.7 Project Communications Management

A subset of project management that includes the processes required to ensure timely and appropriate generation, collection, dissemination, storage, and ultimate disposition of project information. It consists of:

- Communications planning. Determining the information and communications needs of the stakeholders: who needs what information, when they will need it, and how it will be given to them.
- Information distribution. Making needed information available to project stakeholders in a timely manner.
- Performance reporting. Collecting and disseminating performance information. This includes status reporting, progress measurement, and forecasting.

- Administrative closure. Generating, gathering, and disseminating information to formalize phase or project completion.

2.4.1.2.8 Project Risk Management

Risk management is the systematic process of identifying, analyzing, and responding to project risk. It includes maximizing the probability and consequences of positive events and minimizing the probability and consequences of adverse events to project objectives. It includes:

- Risk management planning. Deciding how to approach and plan the risk management activities for a project.
- Risk identification. Determining which risks might affect the project and documenting their characteristics.
- Qualitative risk analysis. Measuring the probability and consequences of risks and estimating their implications for project objectives.
- Risk response planning. Developing procedures and techniques to enhance opportunities and reduce threats from risk to the project's objectives.
- Risk monitoring and control. Monitoring residual risks, identifying new risks, executing risk reduction plans, and evaluating their effectiveness throughout the project life cycle.

2.4.1.2.9 Project Procurement Management

A subset of project management that includes the processes required to acquire goods and services to attain project scope from outside the performing organization. It consists of:

- Procurement planning. Determining what to procure and when.
- Solicitation planning. Documenting product requirements and identifying potential sources.

- Solicitation. Obtaining quotations, bids, offers, or proposals, as appropriate.
- Source selection. Choosing from among potential sellers.
- Contract administration. Managing the relationship with the seller.
- Contract closeout. Completion and settlement of the contract, including resolution of any open items.

2.3.5 Roles/Responsibilities of Stakeholders

"Project stakeholders are individuals and organizations that are actively involved in the project, or whose interests may be positively or negatively affected as a result of project execution or project completion; they may also exert influence over the project and its results. The project management team must identify the stakeholders, determine their requirements, and then manage and influence those requirements to ensure a successful project. Stakeholders identification is often especially difficult, but key stakeholders on every project include:

- Project Manager – the individual responsible for managing the project.
- Customer – the individual or organization that will use the project's product. There may be multiple layers of customers. For example, the customers for a new pharmaceutical project may include the doctors who prescribe it, the patients who take it, the insurers who pay for it. In some application areas, customer and user are synonymous, while in others customer refers to the entity purchasing the project's results and users are those who will directly use the project's product.
- Performing Organization – the enterprise whose employees are most directly involved in doing the work of the project.
- Project team members – the group that is performing the work of the project.

- Sponsor – the individual or group within or external to the performing organization that provides the financial resources, in cash or in kind, for the project" (PMBOK® Guide 2000, pg. 11).

"The structure of the performing organization often constrains the availability or terms under which resources become available to the project. Organizational structures can be characterized as spanning a spectrum from function to projectized, with a variety of matrix structures in between. The classic functional organization is a hierarchy where each employee has one clear superior. Staff members are grouped by specialty, such as production, marketing, engineering, and accounting at the top level, with engineering further subdivided into functional organizations that support the business of the larger organization" (PMBOK® Guide 2000, pg. 19).

"At the opposite end of the spectrum is the projectized organization. In this organization, team members are often collected. Most of the organization's resources are involved in project work, and project managers have a great deal of independence and authority. Projectized organizations often have organizational units called departments, but these groups either report directly to the project manager or provide support service to the various projects" (PMBOK® Guide 2000, pg. 20). Table 2 is a means by which to gauge the composition of a company and its receptiveness to project management methodology.

Table 3. Organizational Structure Influences on Projects

A Guide to the Project Management Body of Knowledge (PMBOK® Guide), 2000 Edition. NEWTOWN SQUARE, PENNSYLVANIA: PROJECT MANAGEMENT INSTITUTE, 2000.

Organizational Structure / Project Characteristics	Functional	Matrix			Projectized
		Weak	Balanced	Strong	
Project Manager's Authority	Little or None	Limited	Low to Moderate	Moderate to High	High to Almost Total
Percent of Performing Organization's Personnel Assigned Full Time to Project Work	Virtually None	0-25%	15-60%	50-95%	85-100%
Project Manager's Role	Part-Time	Part-Time	Full-Time	Full-Time	Full-Time
Common Titles for Project Manager's Role	Project Coordinator /Project Leader	Project Coordina-tor/Project Leader	Project Manager/ Project Officer	Project Manager/ Program Leader	Project Manager/Pro-gram Leader
Project Management Administrative Staff	Part-Time	Part-Time	Part-Time	Full-Time	Full-Time

"For years, project management was derided as a low-tech, low-value, questionable activity. Only recently has it been recognized as a central management discipline" (Morris, 1994, pg.1). "The Project Manager must have authority. Without it, he/she will not be effective. A potentially good project manager will try to achieve results, but without authority, all he will do is upset himself, other managers, and the organization in general. In addition to assigning him decision-making authority, top management must assign the project manager control over the resources to do the job" – Charles Martin (Penner, 1994, pg. 11). "If you are a project manager, you are proactive, not reactive" (Lewis, 2001, pg 72). "The project team manages the work of the projects, and the work typically involves competing demands for: scope, time, cost, risk, and quality, involves stakeholders with differing needs and expectations, and involves identified requirements" (PMBOK® Guide 2000, pg. 6).

2.3.6 Change Management

"There are many different human factors that are a part of project management. The stumbling block to introducing a rigorous or structured approach to projects is that it requires a cultural change by internal users. However, one of the reasons for the high rate of project failures today is due to a lack of a disciplined use of the best organizational practices and the effective management of resources" (Monczka, Trent, and Handfield, 2002, pg. 374).

"A project is a problem scheduled for solution" - J.M Juran (Lewis, 2001, pg. 6). Realizing the problem is the first step. Being willing to change is the next. It is human nature to dislike change. However, in order to stay competitive, organizations have to learn to compete and think in new ways (Heracleous, 2000).

There are several facets of change within an organization, trickling down from top executives through to the lower-ranking employees. The complexity includes political battle, cultural barriers, inertia of organization structures and systems, and bounded rationality of managers (Heracleous, 2000). Change is viewed differently at each level.

Three things to consider on how to deal with change include recognizing how most people deal with change haphazardly; understanding why change is so difficult, and understanding the relationship between change and transition (Wirtz, 2001).

The role of a CEO should act less as commanders or architects and more as coordinators, coaches and premise-setters. The reason is that the first two roles separate thinking and acting, strategy formulation and implementation. A strategy or change program formed in the mid of one individual is much more problematic to implement than one, which encompasses the input of people who have to live with it (Heracleous, 2000).

Middle managers must take charge to increase visibility, craft and deliver strong change messages, and develop strategies to accompany each transition stage (Wirtz, 2001). This is the connection between the CEO and the other employees. It is important to not create a disconnect during change. It is also important to know your resistance from the beginning and have a game plan in mind (St-Amour , 2001).

Employees doubt and fear feasibility of the project both for the impact it will have on the organization and individual impact. Employees will pessimistically predict only marginal benefits to company if the plan is carried out, while adding more stress to them individually. As with the three phases of information technology developments, there are three major classifications of employees during transition (St-Amour , 2001). The

achievers comprise ~20% and will quickly embrace the change. Adopters are the majority at ~ 60% and will take the middle road. These employees will embrace the change as long as it is well handled. And finally the abstainers are about 20% of employees. They do not want anything to do with the change and keep their distance from the processes (St-Amour , 2001).

Throughout each level of management, though, there are three primary areas that must be managed with the ending of the old era. People feel losses – loss of attachments, turf, structure, future, meaning, and control. Then the "neutral zone" must be managed, where there is support through chaos and confusion from ending to new beginning. Finally, the new beginning must be managed while new attitudes should be developed and rewarded (Wirtz, 2001).

Culture change of the company is often simultaneously integrated with the tangible change associated with projects. "Culture is the set of shared attitudes, values, goals, and practices that characterizes an organization" (Lientz & Rea, 2002, pg. 251). "You can't make project management work in an organization in which nobody believes in project management" (Lewis, 2001, pg 58).

"Einstein once said, 'You can't solve a problem using the thinking that created it in the first place'. If you are going to make project management work in your organization, both the paradigm (a belief of what the world is like; a model of reality) must change and people must be made to understand that they will experience less pain long-term by good planning than if they avoid it. This suggests the culture of the organization must change" (Lewis, 2001, pg 64).

"When you undertake a project, it is within the context of an organization. The people who are involved in the project and the organization exist within a wider culture. The culture of the organization includes how issues are addressed, how decisions are made, how actions are taken, the extent to which the organization supports initiative and empowerment versus control, how the work is organized, how the work is reviewed, the value placed on project management, the degree of flexibility and structure in work, and the approach and attitude toward technology" (Lientz & Rea, 2002, pg 251).

"(In the area of technology)…companies can be grouped into categories. Innovators are companies who embrace new technology before it is widely in use. They tolerate a high degree of failure if they can achieve a few successes. Dabblers are organizations that test out new technology, but fail to adopt anything new. This is due to fear. The Followers are organizations that wait until a firm in their industry adopts and shows success of the new technology. The category of your firm greatly impacts the nature of the project and that of project management" (Lientz & Rea, 2002, pg 252).

2.3.7 Success Factors and Evaluation

"Organizations have come to rely on technological innovation as a central component of their competitive strategy" (Reddy, 1990). The costs of failed implementation efforts can add up quickly. It will encounter a waste of an enormous amount of time and money. "It will result in lower employee morale, diminished trust and faith in senior managements and will end up creating an even more inflexible organization, since an organization which has failed to change will encounter more employee cynicism in its next attempt" (Heracleous, 2000, pg.75).

In 1993, Griffith and Northcraft developed a proposed model to understand cognitive determinants of technology implementation success. "Their model emphasizes that differences in cognitions (thoughts, perception, and constructed understandings) among users, designers, and implementers are critical determinants of implementation success."

Table 4. Top Reasons for Problems (Lientz & Rea, 2002, pg. xviii)

1	Lack of top management commitment
2	Failure to gain user commitment
3	Misunderstanding requirements
4	Lack of user involvement
5	Failure to manage end-user expectations
6	Changing scope and objectives
7	Lack of required knowledge and skills in the team
8	Changing requirements
9	New technology
10	Insufficient or inappropriate staffing
11	Conflicts among user departments

Popularity of software packages is growing for many reasons. Software packages have more capabilities than in the past, companies lack the internal resources and time to develop the software on their own and the internal legacy systems have aged to the point where many must be replaced (Lientz & Rea, 2000). "Management views these packages as a rapid fix to both business processes and systems. Customization brings problems in

keeping new versions of the software compatible with various customized efforts. Vendors only make profits in overhead on time and materials for customization. It is often more fruitful to devote these resources to new releases and versions of the core software" (Lientz & Rea, 2000, pg. 9).

According to the Standish Group's Chaos Report, which surveys the results of IT implementation projects, it should be almost understood that projects will exceed original time and budget expectations. In a survey of 365 responding companies, 16.2% completed their projects on-time and on-budget with all features and functions as initially specified. In the survey, 52.7% reported that the project was completed and operational, but over-budget, over the time estimate, and offered fewer features and functions than originally specified. Finally, 31.3% reported that projects were altogether cancelled at some point during the development cycle. "In the United States, we spend more than $250 billion each year on IT application development of approximately 175,000 projects. In 1994, the average cost of a development project for a large company is $2,322,000; for a medium company, it is $1,331,000; and for a small company, it is $434,000" (Standish Group's Chaos Report, pg.2).

One of the major causes of both cost and time overruns is re-starts. For every 100 project that start, there are 94 restarts. This means that 94 of 100 projects will be restarted *at least* once. (Standish Group's Chaos Report) Another major contributor to over-time and over-budget is the thought that additional people will fix the problem. Brook's law states "adding people to an already late project may only make it later" (Lientz & Rea, 2000).

Evaluation, as with roles throughout the entire project, may be viewed at their respective levels. Individual, team, and organizational competence may be evaluated (Frame, 1999). User and implementer understandings influence implementation success. One interesting point is the "paradox of positive value (where) an implementer's positively biased presentation of a technology makes negative surprises inevitable; the paradox of negative experience is that these negative surprises, if managed well, become valuable positive learning experiences for users" (Griffith & Northcraft, 1996, pg. 101).

The old adage that an output is only as good as its inputs is quite relevant here. The effect of training users of the outcome of the project is important to the success of the project. But, perhaps more important to success is the level of project management training per project participant. The project must be successfully completed before anyone may be trained on its results.

"Innovativeness, experience, and academic skill may affect the success of the project. Innovativeness measures subjects' flexibility and willingness to challenge paradigms. It controls for subjects' propensity to push the software to its limits or to try new approaches. Experience controls for subjects' general skill in using systems in creating the forecast. Academic Skill measures each subject's previous performance and controls for ability, and/or motivation to perform well on the project" (Griffith & Northcraft, 1996).

2.3.8 Macro/Micro Influences upon Project Management

There are macro and micro factors that have an effect upon projects and project management. External factors will be classified on the macro level and internal factors are at the micro level. Macro influences include the expansion trend into the global

possibilities to remain competitive. Increased global markets and manufacturing has widened profit margins in the short term of the initial exploring companies and therefore increased the need for lean operations of remaining companies to stay competitive.

"Because projects are becoming more global in nature, and teams are often more culturally diverse than in past years, it is important that project managers learn about and value cultural difference and how to deal with them" (Lewis, 2001, pg 36).

Not only must the global influences of the employees be taken into consideration, but also expansion into a global marketplace and global supply base in the manufacturing environment. "Another observation is that project management is much more than a group of people working on something according to a plan. It is much more dynamic in terms of organization, external factors, methods, and tools. If we treat projects as static, we will lose" (Lientz & Rea, 2002, pg 45). One reason for change includes the move towards that global supply chain and lean operations in times of economic troubles (Rich, 2003).

Micro, internal, influences on project management includes the previously discussed need for change management including hidden agendas for various participants. These rather intangible factors are dealt with more delicately, but could have as great an impact as the macro factors.

2.3.9 New Ideas for Project Management

One opinion on the dynamic nature of project management is that there should be three new foci driving the projects. "New project management must become more customer-focused, explore the use of new management tools, and redefine the role of project managers" (Frame, 1999).

It has been "reveal(ed) that project management has moved beyond its traditional concern with the famous triple constraints of time, budget, and specifications and that the skills and insights required of effective project personnel are far broader today than in the past" (Frame, 1999, pg. xv).

2.4 FORECASTING

2.4.1 Historical Development

Forecasting is a relatively new distinct functioning department within the corporate business world. On the average, the forecasting function is 5.6 years old, meaning it was 5.6 years ago when the average company hired one or more full-time forecasters (Jain, 2002). Businesses now recognize the importance of a formal forecasting department (Jain, 2002). Allocation of resources to this function is vital for success and continuous improvements. The forces that have brought the forecasting function to the forefront are:

- Recognition by business that they need better forecasts for better decisions
- Development in technology for processing, storing, and accessing data
- Willingness among business partners to share information
- An increase in competition
- Shorter product life cycles. (Jain, 2002)

Forecasting has been a localization of distrust and struggles to be considered a value-added entity. Managers tend to have negative attitudes towards the usefulness of formal forecasting. Historically poor forecasts, high and unrealistic expectations of original forecast accuracy, and a direct conflict with the beliefs of future performance are contributing factors to this attitude. This leads to the point where other than death and taxes, few things in life are certain, other than the forecast is always wrong (Johnson, 2002).

2.4.2 Methodology

2.4.2.1 Statistical/Judgmental Methodology

Forecasts improve when human judgment and market data are properly combined (Burruss, 2003). One way to categorize forecasting models is to group them into three sections. Time series, cause-and-effect, and judgmental models are used across many industries. Time series models assume that the past trend will predict and continue into the future. Cause-and-effect models incorporate a driver or independent variable, which will result in an effect, or a dependent variable. Judgmental models are set procedures that are used to arrive at forecasts and utilize expert advice (Jain, 2002).

In a survey conducted and reported in the *Journal of Business Forecasting*, time series models are the most often used (61.33%), cause-and-effect models follow (22.65%), and then judgmental models (13.92%) (Jain, 2002). The time series grouping is comprised of many models, the most important among them are averages simple and moving, Box Jenkins, decomposition, exponential smoothing, and simple trend. Box Jenkins is the most complex model of the five and is used least often. The top three cause-and-effect models include regression, econometric, and neural network. Jain (2002) indicated that the regression is the most popular while neural networks is the least popular. Four judgmental models are listed as analog, delphi, pert and survey where surveys are the most utilized and pert models are the least used (Jain, 2002).

Another means of categorizing forecasting methods has been reported and extensively researched by the University of Pennsylvania. This is an alternate manner of grouping the different methods. There are eleven separate methods, the first five of

which are derived from judgmental sources and the following six are derived from statistical sources.

The judgmental sources include an intentions survey, role playing, expert opinions, conjoint analysis, and judgmental bootstrapping. The following is an explanation of each of the sources and its relationship to one another.

1. Intentions surveys are used to ask people to predict how they would behave in various situations. These are widely used when sales data are not available.
2. Role playing is a relatively new concept and is especially useful in negotiation situations. It is a method that has considerable potential for forecasting, although is seldom used (Armstrong, 1999).
3. Expert opinion studies are different from the intentions surveys. An expert is assumed to have an edge on the issue at hand and may be combined with other experts to develop a forecast.
4. A Delphi procedure is an iterative survey procedure in which experts make forecasts for a problem, receive anonymous summary feedback on the forecasts made by other experts, and then make a further forecast. A Delphi technique offers a useful way to implement many of the basic principles for expert forecasting. It uses more than one expert, unbiased experts, structured questions, and equal weights for each expert's forecast (Armstrong, 1999).
5. Conjoint analysis is a method that is also good for new product decisions. It can be explained by relating consumers' intentions to various factors

that describe the situation. Regressing intentions against factors is the procedure known as conjoint analysis.

6. Judgmental bootstrapping is the last method based on judgmental sources. This approach converts subjective judgments into objective procedures. Experts are asked to make predictions for a series of conditions and these conditions are then converted into a series of rules by regressing the forecasts against the information used by the forecaster. It is a low-cost procedure for making forecasts.

The methods that are based on statistical sources include extrapolation, rule-based forecasting, analogies, expert systems, multivariate time series methods, and econometric methods. The following is a description of each.

1. Extrapolation is the use of historical data on a series of interest. This may include exponential smoothing, time series, Box Jenkins procedure, as well as other statistical models. As mentioned before, the Box Jenkins is the most complex, but does not necessarily yield more accurate results than a simple exponential smoothing where the most recent data is more heavily weighted to "smooth" out seasonal or cyclical fluctuations.
2. Rule-based forecasting is a type of expert system that allows one to integrated managers' knowledge about the domain with time series data in a structured and inexpensive way. This eliminates the instance where causal forces are contrary to the trend in the historical series and contradict a managers' prior expectations. Analogies are drawn from similar cases or product performance.

3. Expert Systems are rule based systems typically created from protocols or experts (forecasters). Based on certain conditions, rules are fixed and combined to produce the forecast.
4. Multivariate time series methods have not been proven to provide significant benefits for forecasting.
5. Econometric methods use prior knowledge (theory) to construct a model. This involves selecting causal variables, identifying the expected directions of the relationships, imposing constraints on the relationships to ensure they are sensible, and selecting functional forms. Often, these models can directly relate to planning and decision making. These models are most accurate when strong causal relationships can be established.

2.4.2.2 80/20 Rule/Pareto Principle

This rule was developed by Dr. Joseph Duran whereby he investigated his theory that a small percentage of the population typically accounts for a majority of the wealth. The principle now states that a small number of causes are responsible for a large percentage of the effect. The Pareto Principle may help focus efforts when utilizing other forecasting methods. To effectively use the methodology, three issues must be addressed and avoided. Confirm data quality prior to analysis. Beware of "paralysis by analysis" where over analysis may hinder decision making. And finally, this analysis views historical performance and does not reflect future market changes or other external factors (Garodnick, 1999).

2.4.2.3 Collaborative Planning Forecasting & Replenishment (CPFR)

Collaborative Planning Forecasting & Replenishment is somewhat of a project in itself. CPFR is simply the latest embodiment of knowledge and experience that has been compiled to continually improve a company's internal efficiencies while increasing external effectiveness (CPFR.org). These elements of increased efficiencies and effectiveness are to be improved through an increase in forecast accuracy and ultimate customer satisfaction.

"CPFR is the 21st Century's most powerful process for consumer satisfaction. Giving strategy, purpose, and structure to retailer-vendor partnerships, it is the culmination of years of struggle between their competing priorities" (Peterson, 2003) . "To its founders, CPFR is an outgrowth of Vendor-Managed Inventory (VMI) programs that did not perform adequately. It could be argued that CPFR is an evolved form of VMI" (CPFR.org). Regardless, CPFR is a means of increased communication and cooperation between entities in the supply chain that should result in higher customer satisfaction.

CPFR looks beyond a single transaction, beyond simple communication, and involves a deep commitment (from all parties) (White, 2001). "If the manufacturer and retailer can agree that their common goal is to satisfy as many customers as possible, at the highest profit to both parties, they can each win and both make more money" (Peterson, 2003).

Collaboration: "Step one in Collaboration means agreement to confidentiality, a means to resolve disputes, supply chain scorecard metrics and common incentives or goals (i.e. both parties rewarded on profitability, not just sales volume)" (Peterson, 2003).

Planning: "Joint business planning (categories, brands, assortments, skus, key items, etc.) and financials (sales, fill rates, pricing, inventory, safety stock, gross margin, etc.) assures both parties of equal skin in the game and forces common goals for each. In addition, the joint project team develops plans for promotions, inventory policy changes, product introduction and discontinuations, and store groupings" (Peterson, 2003).

Forecasting: This is the key value to which both parties must agree and assume responsibility. Sales and promotions must be integrated into the production plans for increased forecast accuracy. "Even the best forecast will need to be monitored and adjusted in-season, as this is where two sets of eyes, focused on the customers' reaction, can be twice as effective. Any of the certified interoperable software packages can trigger forecast differences between vendor and manufacturers systems. Rules need to be determined on how to resolve those variances, but the basic premise of CPFR is that you solve those differences jointly, with the same end goals" (Peterson, 2003).

Replenishment: "An expected benefit of close collaboration and partnership should be flexibility and joint reaction to surprises." (Peterson, 2003) Retailers should not be held to longer forecast lead times and in return, manufacturers should be able to ship items in short supply to retailers with whom they have entered a CPFR agreement.

This facet of forecasting methodology has shown great promise for mass market retailing giants, Target and Wal-Mart. It will continue to grow in popularity with those trying to stay competitive in this market.

2.4.2.4 New Products and Forecasting

The application of various forecasting methods will depend on the type of new product being introduced to the market. The six different types of new product entries

require a different strategy (cost improvement, product improvement, line extensions, market extensions, new category entries, and new-to-the-world).

The cost improvement new product incorporates reduced cost or price versions of the product for the existing market. The product improvement new products are new, improved versions of existing products/services, targeted to the current market. Line extensions are incremental innovations added to existing product lines and targeted to the current market. Market extensions involve taking existing products/services to new markets. New category entries are new-to-the-company product and new-to-the-company market, but not new to the general market. New-to-the-world products are radically different products/services versus current offerings and markets served (Kahn, 2002).

2.4.2.4.1 Innovation: Initiating Factors

For products to be innovative they must provide new benefits or provide old benefits in new ways (Urban & Hauser, 1993). The key indicators in new product development begin with customer demand. The days of old, which were marked by satisfaction among the masses, are long gone. Over the past 60 years, in virtually every product line, customers have come to demand products ever more finely tuned to their specific needs (Raynor, 1992). Customization, change, and new features attract women in the apparel market.

Variations to daily demands are found in trends of the economy, seasons of the year as associated with school such as prom or back-to-school, holidays that incorporate alternative color, and the four seasons of the weather are potential initiating factors for innovation. The fabric type or garment construction could also fluctuate around these variables.

Forecasting historically stable demand patterns, styles and colors is a difficult challenge within itself, without the innovative new products. However, those new products drive the business and ensure customer satisfaction and brand loyalty. In demand forecasting, statistical models present the basis for predicting consumer demand based on historical demand. However, the need for the judgmental influence arises when predicting the variations of demand and the launch of new products.

When only considering the US, idea generation must revolve around and account for the 113,969,175 million women that are over age 14 (Census, 2002). In the global marketplace however that number is much greater and race, religion, income, and social elements are factors in predicting demand. Each of these will play a role in forecasting products in the apparel industry. Symptoms manifested by inaccurate demand prediction and ultimately poor forecasting include out of stocks, markdowns, spoilage, returns, distribution, and assortment gaps and new product failures (Census, 2002). It is imperative that as much information as possible, both quantitative and qualitative, be fed into a forecasting model for accurate demand measurement to minimize these symptoms.

New product forecasts drive a variety of multifunctional decisions. These include manufacturing decisions on raw materials procurement, manufacturing schedules, and finished goods inventory levels; logistics decisions on physical distribution planning and transportation schedules; marketing decisions on marketing budgets and promotion schedules; sales decisions on support materials and salespeople training; and finance decisions on corporate budgets and financial expectations for the new product. Therefore, the accuracy or inaccuracies in many cases, have an enormous influence on the business as a whole.

2.4.2.4.2 Strategic: Reactive

Chasing a style that has performed better than expected is a classic symptom of a reactive implication, but not necessarily a planned business strategy. There could be other factors involved to create the situation such as material availability and production capacity, but if the style is being chased there most likely has been a forecasting error. The risk associated with using this reactive strategy is losing customers, which results in an inaccurate measurement of demand for future similar styles. Not only is demand difficult to calculate, but once the customers are not satisfied competitors are given the opportunity to improve performance. One method by which the chase can be minimized is to keep a small amount of materials available for emergency situations for primary accounts, such as Wal-Mart.

2.4.2.4.3 Proactive

A proactive strategy is to allocate resources to preempt future events (Urban, 1993), whether positive or negative. In this industry, inventory is often more costly than expediting materials, but neither is desirable. More accurate forecasting may level the two evils. Sales and marketing predicts that every single new product will be the next outrageous success. This may be used as an input to the forecast, but tempering the excitement to form a realistic number may avoid excess inventory.

2.4.2.4.4 Competition

Two-thirds of the new product launches meet reactions by competitors (Debruyne, 2002). The characteristics of the new product launch strategy have a significant impact on both the occurrence and nature of competitive reactions. The competitive effect of radically new products and incrementally new products greatly differs (Debruyne, 2002). Results of one study show that competitors fail to respond to radical innovations and to new products that employ a niche strategy. They do react if a

new product can be assessed within an existing product category and thus represent and ambiguous attack. Both innovative and imitative new products meet reaction in this case (Debruyne, 2002).

2.4.2.4.5 Cross-Functional Integration

Cross-functional teams are needed to develop new products so that a coordinated set of resources, skills, perspectives, and activities may assist in forecasting the performance of new products. Design, engineering, finance, marketing, sales, and production departments often have separate forecasting methods, technologies and agendas. The truth is that any business that forecasts demand in "silos" is just guessing. Objective opinions and fact-based data must be presented before products are approved. Unfortunately, this is not always the case as was demonstrated with intimates that incorporate a vast number of SKUs. Sharing information results in more accurately forecasting demand and ultimate cost savings.

There are two main benefits from holding consensus meetings to review statistically generated forecasts. One of which indicates that all functions within the business are involved in the forecast process as well as aware of the issues involved. The second benefit is that judgment plays a large role in the forecast and overlaying more ideas onto the statistics. At adjournment, all areas of the business own the forecast and may take responsibility (Jain, 2002).

The goal of producing a single-number forecast is to effectively and efficiently integrate the constraints of supply and needs of demand. A Sales and Operations Planning (S&OP) Process is a recent label given to the cross-function team designed to arrive at this single number forecast. An effective S&OP process incorporates regular meetings, generally once per month, to discuss the next forecast. There are three

elements of an S&OP process that should be evaluated and are required for success. These three elements are preparation for the meeting, what transpires during the meeting, and the actions after the meeting (Lapide, 2002).

An unconstrained demand forecast is brought into the meeting, which is generally statistically generated. This should incorporate historical demand as well as all known impacts to future demand including competitor actions, future marketing promotions and pricing strategies. Shipment data alone should not be used as a factor in the "unconstrained" forecast generation. This could underestimate actual demand. The forecast must be presented in a manner that everyone present may understand the values.

The sequence of events during and after the meeting should document the changes made to the baseline forecast and the reasons for the alterations. The resulting constrained forecast will take into account the supply side of the business including material availability, production capacity, and transportation issues. This is another aspect of the cross-functional team described in the generic new product development process.

2.4.3 Forecast Accuracy

Forecast errors may be calculated at several different levels. There are three primary points of measurement: SKU, category, and aggregate. The aggregate forecast reports remain the most accurate and the SKU level forecast is the most inaccurate. This is due to the fact that over-forecasting and under-forecasting can be offset at the aggregate level where the units are grouped together (Jain, 2002). Depending on the original forecasting strategy, the errors could tell different stories. A bottom-up approach is to start at the SKU level and create forecasts. A top-down approach is to start at the

aggregate level and then apply a product mix by percentage to generate a SKU level forecast. Top management will often make recommendations at the aggregate levels.

Forecast errors will generally increase as the forecast is projected further into the future. Just the same, some products are easier to forecast than others. Forecasts of non-matured products have larger errors than matured products; forecasts of promoted products have larger errors than non-promoted products and forecasts of new products have larger errors than existing products (Jain, 2002).

The revisions of forecasts can also effect the accuracy measurement. Ideally, the forecast will be revised up to the last possible time frame. Manufacturing lead times, time to market, and product life cycles will all play a role in the feasibility of updating forecasts. Executive decisions and politics may also make a large difference in the revisions of forecasts.

One issue always remains, what can we do to reduce forecast error (Jain, 2002)?

2.4.4 IT Innovations – New Forecasting Methodology

One method is to implement a software package. "Project management software brings together all the relevant information about a project's resources, time, and costs, and thus support the move toward a more integrated approach to the entire work process" (Monczka, Trent, Handfield, 2002, pg. 374).

3.0 CHAPTER 3 - RESEARCH METHODOLOGY

The purpose of this investigation is to understand formal Project Management methodology and document an application of this strategy in an apparel industry setting.

3.1 RESEARCH OBJECTIVES

Research objectives of this study are designed to understand project management and accurately review the application of a case study project in a textile industry setting. In particular, the objectives will identify the extent to which the Project Management Institute's® Project Management Framework was utilized and to assess the success of the project given this proven methodology. The specific objectives are to:

1. Identify and document the phases and participants of the forecasting software implementation project from beginning to end hereafter referred to as Software.
2. Understand organizational, behavioral, and systems restrictions and catalysts for each of the Software implementation phases and participants.
3. Develop a learning critique that determines the effectiveness of each phase of the project.
4. Establish recommendations for a repeatable process that companies with similar challenges may use for more efficient transition and successful implementation.

3.2 RESEARCH DESIGN

The case study approach was employed to understand formal project management and its utilization for the software implementation project. Qualitative data collection was best suited for this study. Respondents were asked to elaborate upon answers to questions to provide greater insight to the project.

Initially, the Vice President of Demand Planning was involved with research design at a broad level. However, the Director of Forecasting was instrumental in research design development and construction. The Director focused the research upon the division with an on-going project that could be examined from a formal project management perspective. The research objectives were developed with the intent to provide feedback and lessons learned from a position external to the project. The Director identified respondents according to their project roles to most accurately gather data. This ranged from team members on the task force involved in the initial needs assessment to remaining team members resolving administrative closure.

3.3 INSTRUMENT DEVELOPMENT

Qualitative data was gathered through interviews conducted with project team members. The data collection instrument, found in Appendix A, was developed by the researcher to determine the level of formal project management utilized during the forecasting software implementation project. Questions in sections I through IV addressed the background of the project team members to identify qualifications of each team member. Section V of the data collection instrument is based upon the Project Management Institute's® Nine Knowledge Areas of Project Management as described in

Table 1. These nine areas are incorporated in the five stages of project management, as shown in Figure 3.

Sections I and II of the data collection instrument determine demographics of the respondent. The basic employee information and technical qualifications of each team member is gathered in these sections. The enter and exit dates of each project team member to the company and specifically to the project is critical to establish the knowledge base for each stage of the project. Section II applies more directly to the Information Technology team members, but is also applicable to the overall information systems understanding of each team member given the nature of the project. The researcher developed these sections for statistical and follow-up purposes.

Sections III and IV of the data collection instrument determine part of the needs assessment for the project. This section is more specifically for the original Forecasting department and Software selection process. The purpose of the Software implementation was to improve quantitative forecast accuracy. Given more time, the impact and success of the project may be determined. However, this is the beginning of qualitative assessment. The researcher developed these sections to establish relationships between respondent's qualifications and roles and responsibilities as directly relate to Sections II and V.

Section V (questions 1, 2, and 3) of the data collection instrument was developed by the Researcher to determine the project management familiarity level of each employee. Question 4 (sections a through i) specifically followed the Project Management Institute's® Nine Knowledge Areas of Project Management (PMBOK® 2000) as they relate to the Five Phases of Project Management. The professional and

educational background from Sections I through IV of the project team members is important to determine the qualification of answers in this section.

Section VI of the data collection instrument determines the approach to change management and directly relates to roles and responsibilities (Section I). Successful project implementation can be simultaneously associated with proactive change management direction. This section will also determine, through the Organizational Structure Matrix, the state of the department during implementation. It may also correlate to the project success rate by determining receptiveness to the project. This section of the questionnaire was developed by the researcher to determine receptiveness to the project and possibly directly correlate project success rate. The Organizational Structure Matrix is directly from the Project Management Institute® (PMBOK® 2000).

Section VII of the data collection instrument provides additional qualitative feedback from project team members. This is the opportunity for team members to make recommendations for future project undertakings. It was developed by the Researcher to allow respondent to elaborate upon issues faced during implementation with regard to the individual, the project, or the company.

3.4 SAMPLE SELECTION

The sample chosen for this was a division within one of the world's leading apparel corporations. This division manufactures and markets apparel products and has leading name brands in several product categories. Demand forecasting includes the mass, department store, and specialty retail channels of distribution. This division implemented the forecasting software to improve its forecasting accuracy.

The project team was identified including executives, project managers, and project team members from the forecasting, sales planning, supply chain, and information technology departments. Since this was an information technology project, there was close interaction between the individual departments.

A task force was originally created to evaluate candidates for software selection. Sales pitches were given and a four-hour demonstration was also given for each candidate. One software was specifically chosen. Four of eight respondents were members of this task force.

Although only one company was chosen, a good evaluation of the research objectives was achieved due to the size and complexity of the company. The SKU proliferation provided additional variables that a smaller company could not have offered.

3.5 DATA COLLECTION

Specific company employees were contacted via email during Winter 2003 in order to prepare the individuals to expect the requested completion of the data collection instrument in the following months. Data was collected over a two week time period during Winter 2004. The data collection instrument was distributed via email with a reminder of contact earlier in the winter. Sixteen questionnaires were requested for completion from Division A. Eight individuals completed and returned the questionnaire for data analysis. Subsequent telephone calls and clarification emails were required with three respondent. Personal follow-up was held with one respondent who wished to supply additional information.

Face-to-face interviews would probably not only increase the response rate, but also improve the quality of answers for future research and data collection. The

questionnaire may have seemed too time consuming and negatively affected the response rate. Also, it was evident that some respondents only nominally answer questions with yes/no responses, but others may have not separated bias emotions they developed during the project to objectionably answer the questionnaire.

Note: Another division within the same corporation initially agreed to participate in the study. This division also manufactures and markets industry leading apparel items. The same Software was implemented in this division. However, at the time of the study, the division was not able to participate due to imminent departmental due dates and obligations.

3.6 DATA ANALYSIS

With this pilot study, descriptive analysis was conducted and results reported in tables by research objective in Chapter 4.

4.0 CHAPTER 4 - RESULTS

4.1 SAMPLE DESCRIPTION

Sample respondents were contacted across several functional departments within their divisions. The functional departments included information technology, supply chain management, sales planning, production planning, and forecasting. Each played a different role in the overall project team. The project titles ranged from observer to participant to executive leadership. The sample size of respondents was eight.

4.2 RESULTS – RESPONDENT PROFILE, QUESTIONNAIRE SECTIONS I - IV

Respondents ranged in length of participation time on the Software project. One respondent was specifically hired to perform duties for the software project, but hired several months after the project had started. One respondent was hired simultaneously with Software selection. Six respondents were previous corporate employees and assumed roles in the project in addition to normal responsibilities. These respondents ranged in time with the company from twenty-eight years to only a few months.

Section II also established respondent demographics and is summarized accordingly. Respondents ranged in levels of Information Technology training. Four respondents had expert to moderate training and four respondents had limited to zero training. Five respondents expressed expert to moderate levels of information technology implementation training. One respondent who answered with limited information technology training explained to have moderate implementation training. Three respondents had limited or zero implementation training.

Four respondents were involved in the selection of the oftware. In all cases, Respondents were members of the task force assigned to evaluate candidates and choose

the best one for the business. In three cases, the software was chosen before the company hired the respondent. In one case, the respondent was simply not a member of the Task Force.

Section III further established qualifications of respondents. Six respondents were involved in the forecasting department prior to the software implementation project. Two respondents did not play a role in the forecasting department prior to the project. One respondent was specifically hired as an information technology team member. The other respondent was hired as a new member of the forecasting department altogether.

All respondents who actively played a role in forecast generation used a combination of statistical and judgmental forecasting methodology. The importance of this was explained in Chapter 2.

Section IV will be summarized for all eight respondents and reported as the answers were given. Section IV specifically identifies the team members and their responsibilities within the software implementation project. Question 3 illustrates the volatility of the team members and the knowledge base fluctuation.

1. What was your specific title within the Software project?

Technical Administrator, Director of Forecasting (former during project completion), Director of Forecasting (new during project completion), Mass Forecasting Manager, Forecasting Project Manager, Information Technology Project Manager, Team Member. Three Respondents did not have specific project team member responsibilities/titles.

2. What was your responsibility for the Software implementation?

Linked End User, System process and framework design, Project implementation, Co-Sponsor, Advisor, Day-to-day responsibility management. Two Respondents did not have specific Software implementation responsibilities.

3. Did your responsibilities within the Software implementation change throughout the process?
   _____ No _____ Yes, please explain

Three Respondents answered Yes. Two of those Respondents explained their responsibilities shifted within the department. One Respondent entered into the Forecasting department from another department. Four Respondents answered No. One Respondent explained to not have responsibilities within the department.

4. What were your specific deliverables?

Specific deliverables varied among Respondents. Training, Confirm satisfactory translation of forecast across functional departments within Division, On-time and On-budget delivery.

5. At any point, did you make the recommendation for "no go?" Please explain your selection.
   _____ No _____ Yes

Two Respondents answered Yes. One Respondent explained to have expressed concern before project start. One respondent expressed concern during System implementation. Five Respondents answered No. One Respondent explained to have moved from the project before there was significant difficulty.

4.3 RESULTS – PROJECT MANAGEMENT SPECIFIC, QUESTIONNAIRE

SECTION V

Section V specifically pinpoints the formal Project Management methodology employed during the Software implementation project. Answers will be summarized and reported as were given by the Respondents.

1. Describe your familiarity with The Project Management Institute.

Four Respondents had no familiarity with the Project Management Institute®. Three were aware of PMI®, but not very familiar. One Respondent was a member of PMI ®and PMI® certified (PMP®).

2. Describe your familiarity with formal Project Management.

Three Respondents had no familiarity with formal project management. Two Respondents had some familiarity. Three Respondents were experienced with formal project management.

3. What is your level of Project Management training?

Three Respondents had no level of project management training. Two Respondents were self-instructed or trained on the job. Three Respondents had received formal instruction or had taken short courses on project management.

4. Based on your knowledge, describe the fulfillment of each of these components of project management as they pertain to the Software implementation. Please explain your role in each part.
    a. Project Integration Management
        i. Project plan development. Integrating and coordinating all project plans to create a consistent, coherent document.

            Reasonably fulfilled, Responsibility shared between three project managers (Forecasting, IT, Software consultant). Significant underestimation of the IT infrastructure and IT resources needed to stay on plan.

ii. Project plan execution. Carrying out the project plan by performing the activities included therein.

Fair/poor execution. Included IT and business delays. High turnover rate within forecasting department.

iii. Integrated change control. Coordinating changes across the entire project.

Good job by project managers. Some lack of coordination was evident in some missed schedules.

b. Project Scope Management

i. Initiation. Authorizing the project or phase.

OK. Responsibility shared between three project managers (Forecasting, IT, Software consultant).

ii. Scope planning. Developing a written scope statement as the basis for future project decisions.

OK. There was written scope statement, but did not utilize a formal software. Responsibility shared between three project managers (Forecasting, IT, Software consultant).

iii. Scope definition. Subdividing the major project deliverables into smaller, more manageable components.

OK. Responsibility shared between three project managers (Forecasting, IT, Software consultant).

iv. Scope verification. Formalizing acceptance of the project scope.

OK. Responsibility shared between three project managers (Forecasting, IT, Software consultant). Scope was agreed upon, but persons were not converted.

v. Scope change control. Controlling changes to project scope.

OK. Responsibility shared between three project managers (Forecasting, IT, Software consultant). There were no formal change control procedures, one-on-one meetings with user groups helped in exercising control on changes and scope creep.

c. Project Time Management

i. Activity definition. Identifying the specific activities that must be performed to produce the various project deliverables.

Good by project managers.

ii. Activity sequencing. Identifying and documenting interactivity dependencies.

Good by project managers.

iii. Activity duration estimating. Estimating the number of work periods that will be needed to complete individual activities.

Not very good. Especially early estimates of IT work needed, and later on never seemed to be able to meet any of the dates. There was no project standard established for this project (being a new/first time implementation of a new software system), this was left to the individuals concerned. It was decided by senior management that this work would be done parallel to current work responsibilities.

iv. Schedule development. Analyzing activity sequences, activity durations, and resource requirements to create the project schedule.

Early development focused on great detail. It turned out to not be very good. Especially early estimates of IT work needed, and later on never seemed to be able to meet any of the dates.

v. Schedule control. Controlling changes to the project schedule.

It was decided by senior management that this work would be done parallel to current work responsibilities. This changed the schedule dramatically from original plan. Changes communicated to organization, but chronically pushed back.

d. Project Cost Management

i. Resource planning. Determining what resources (people, equipment, materials) and what quantities of each should be used to perform project activities.

Originally developed in great detail. Poor early estimates of hardware requirements and IT resources needed to build the infrastructure. Not enough personnel were dedicated to project. No test environment was set up.

ii. Cost estimating. Developing an approximation (estimate) of the costs of the resources needed to complete project activities.

Originally developed in great detail. Original consulting component was at a fixed price, but project ran over the time and went on a time and materials basis after 10 months on the project, resulting in large cost overrun.

iii. Cost budgeting. Allocating the overall cost estimate to individual work activities.

More specific plan and timeline should have been created once parallel work was required.

iv. Cost control. Controlling changes to the project budget.

Priority was to have Software implemented, and incremental extra costs were absorbed without significant discussion.

e. Project Quality Management
   i. Quality planning. Identifying which quality standards are relevant to he project and determining how to satisfy them.

   There was no formal quality planning/control system. Quality management was left to the individuals. Responsibility shared between three project managers (Forecasting, IT, Software consultant).

   ii. Quality assurance. Evaluating overall project performance on a regular basis to provide confidence that the project will satisfy the relevant quality standards.

   There was no formal quality planning/control system. Quality management was left to the individuals. Responsibility shared between three project managers (Forecasting, IT, Software consultant).

   iii. Quality control. Monitoring specific project results to determine if they comply with relevant quality standards and identifying ways to eliminate causes of unsatisfactory performance.

   There was no formal quality planning/control system. Quality management was left to the individuals. Responsibility shared between three project managers (Forecasting, IT, Software consultant).

f. Project Human Resource Management
   i. Organizational planning. Identifying, documenting, and assigning project roles, responsibilities, and reporting relationships.

Generally good planning component. Completed by Project Senior Managers. Reworked by Senior Management. More time could have been spent on workflow related to generation of quality forecast.

ii. Staff acquisition. Getting the needed human resources assigned to and working on the project.

Poor. Unable to secure IT side lead after original person left. Unable to hire the tech resource for several months, unable to get forecasting resources committed to the project due to workload and understaffing due to forecasting department turnover. Not enough resources dedicated.

iii. Team development. Developing individual and group skills to enhance project performance.

Limited. One project team member was sent to a Software conference very late in the project stages. No real development of other staff. Due to limited resources, training could not be performed effectively.

g. Project Communications Management

i. Communications planning. Determining the information and communications needs of the stakeholders: who needs what information, when they will need it, and how it will be given to them.

Very good due to Forecasting Project Manager.

ii. Information distribution. Making needed information available to project stakeholders in a timely manner.

This was done very well and all the stakeholders used to be informed of changes to timelines and tasks in a fairly detailed fashion.

iii. Performance reporting. Collecting and disseminating performance information. This includes status reporting, progress measurement, and forecasting.

Satisfactory. Limited tools were in place to measure progress.

iv. Administrative closure. Generating, gathering, and disseminating information to formalize phase or project completion.

Not much of this was done.
IT closure was formal.

h. Project Risk Management
    i. Risk management planning. Deciding how to approach and plan the risk management activities for a project.

    This was not done. This was a sorely missing part of the project that needed to include the go/no-go decision points and project exit strategy.

    ii. Risk identification. Determining which risks might affect the project and documenting their characteristics.

    This was not done.

    iii. Qualitative risk analysis. Measuring the probability and consequences of risks and estimating their implications for project objectives.

    This was not done.

    iv. Risk response planning. Developing procedures and techniques to enhance opportunities and reduce threats from risk to the project's objectives.

    This was not done.

    v. Risk monitoring and control. Monitoring residual risks, identifying new risks, executing risk reduction plans, and evaluating their effectiveness throughout the project life cycle.

    This was not done.

i. Project Procurement
    i. Management Procurement planning. Determining what to procure and when.

    Hardware procurement was generally slow. Never got a test server, so all work and changes were done on the production server. Mistakes caused rework and delays.

    ii. Solicitation planning. Documenting product requirements and identifying potential sources.

Satisfactory. One month of time was wasted following Software methodology to create vast documentation of future state, which eventually would not be able to fit the business. This was an attempt to make the Software do something it was not meant to do.

iii. Solicitation. Obtaining quotations, bids, offers, or proposals, as appropriate.

This was handled by IT. Satisfactory.

iv. Source selection. Choosing from among potential sellers.

Chosen by original task force. The choice seemed correct at the time. Really need to see the various alternative software tools in action, at least in prototype mode with real Company data, before making a decision.

v. Contract administration. Managing the relationship with the seller.

Needed trial period to facilitate a graceful exit if Software was not deemed a good fit.

vi. Contract closeout. Completion and settlement of the contract, including resolution of any open items.

On-going.

4.4 RESULTS – CHANGE MANAGEMENT SPECIFIC, QUESTIONNAIRE

SECTION VI

Section VI specifically addressed the change management element of the project. Answers are listed as given by the Respondents. Results from Question 3 are reported in the form m/n where n is the number of Respondents and m is the number that specified this level.

1. What is your understanding of the purpose of the Software implementation project?

    - Inconsistent and inaccurate forecast was a weak link within supply chain. Software was chosen to arrive at a more accurate and efficient consensus forecast to drive the supply chain.

- The purpose was to have a common platform for all business divisions within the corporation; integrate multiple data streams/sources to one; provide a collaborative input tool; provide exception base forecast management; have a robust engine to process the massive amounts of quantitative data and generate a baseline statistical forecast.

- The purpose was to move company forecast process closer to "best in class."

- Three purposes; to improve accuracy of forecasts, to improve the processes; to move all Division's of business onto one common platform.

- To provide better forecasting and reporting tool for Division.

- Purposes are understood, but irrelevant without Senior Management support/conversion.

- Increase profitability through improved forecasting; reducing inventories while maintaining or increasing service levels.

- To provide a tool to automate generation of a statistical forecast, to manage overrides to the forecast, to track forecasting performance, to improve forecasting performance, and ultimately to improve customer service and the financial performance of Division.

2. How do you see this software as a "fit" for the company?

    - Software has excellent collaboration platform (between user groups) and has excellent forecasting algorithms that can be tuned to fit an environment like Division's.

    - Software is leading edge technology which is very flexible to meet needs of Division.

    - Technical capabilities good. Handling of data inefficient, not user friendly.

    - Yet to be determined. Still struggling at this point to improve processes.

    - To be determined. Software is not being utilized to its fullest potential.

    - Not a good "fit" until supported by Senior Management.

    - Too much "horsepower" for the limited staffing that the current Division business model can afford to run it.

- Fit was unknown at beginning of process. After starting implementation and doing initial solution design in the tool, Software did not appear to be a good fit for this apparel industry. SKU intensive industry resulted in huge Software datasets and hardware requirements much greater than originally estimated by Manu sales team. This was not a feasible solution to have SKU detail in Collaboration module.

3. How would you describe the culture of your Business division? Please refer to the attached Organizational Structure Matrix as presented by the Project Management Institute. Rate each of the five Project Characteristics on the left side of the matrix by the Organization Structure, moving left to right from Functional to Projectized.

    a. Project Manager's Authority:

        Functional (Little or None): 0/8

        Weak (Limited): 2/8

        Balanced (Low to Moderate): 4/8 One Respondent explained Moderate authority limited by the needs and realities of the company as well as the end users of the software.

        Strong (Moderate to High): 1/8

        Projectized (High to Almost Total): 0/8

        One Respondent did not choose from Figure 5. Organizational Structure Influences on Projects

    b. Percent of Performing Organization's Personnel Assigned Full Time to Project Work:

        Functional (Virtually None): 0/8

        Weak (0-25%): 4/8

            One Respondent explained this was from the business side.

        Balanced (15-60%): 2/8

        One Respondent explained that persons assigned were not back-filled.

        Strong (50-95%): 1/8

        Projectized (85-100%): 1/8

c. Project Manager's Role:

   Functional (Part-Time): 0/8

   Weak (Part-Time): 0/8

   Balanced (Full-Time): 0/8

   Strong (Full-Time): 6/8

   Projectized (Full-Time): 1/8

   One Respondent did not choose from Figure 5. Organizational Structure Influences on Projects

d. Common Titles for Project Manager's Role:

   Functional (Project Coordinator/Project Leader): 0/8

   Weak (Project Coordinator/Project Leader): 1/8

   Balanced (Project Manager/Project Officer): 1/8

   Strong (Project Manager/Program Leader): 5/8

   Projectized (Project Manager/Program Leader): 1/8

e. Project Management Administrative Staff:

   Functional (Part-Time): 2/8

   Weak (Part-Time): 1/8

   Balanced (Part-Time): 1/8

   Strong (Full-Time): 3/8

   Projectized (Full-Time): 0/8

   One Respondent did not choose from Table 3. Organizational Structure Influences on Projects

Table 5 is a summary of the above results as they relate to Table 3. Answers are highlighted in bold.

Table 5. Results - Organizational Structure Influences on Projects.

A Guide to the Project Management Body of Knowledge (PMBOK® Guide), 2000 Edition. Newtown Square, Pennsylvania: Project Management Institute, 2000.

Organizational Structure / **Project Characteristics**	**Functional**	**Matrix**			**Projectized**
		Weak	Balanced	Strong	
Project Manager's Authority	Little or None	**Limited**	**Low to Moderate**	Moderate to High	High to Almost Total
Percent of Performing Organization's Personnel Assigned Full Time to Project Work	Virtually None	**0-25%**	**15-60%**	50-95%	85-100%
Project Manager's Role	Part-Time	Part-Time	Full-Time	**Full-Time**	Full-Time
Common Titles for Project Manager's Role	Project Coordinator /Project Leader	Project Coordina-tor/Project Leader	Project Manager/P roject Officer	**Project Manager/ Program Leader**	Project Manager/Pro-gram Leader
Project Management Administrative Staff	**Part-Time**	**Part-Time**	**Part-Time**	**Full-Time**	Full-Time

4.5 RESULTS – SUGGESTIONS AND RECOMMENDATIONS,

QUESTIONNAIRE SECTION VII

Section VII is reported as Respondents' answers were given.

1. What portion of the project was best executed?

    - The Software selection process.
    - None of the project was best executed.
    - Product Selection
    - Project Integration Management pertaining to technical roll-out (after project control was taken over by Company personnel) was the best executed.
    - Thorough documentation of all meetings, participant opinions/contributions, and project decisions. Strong "chain of evidence."
    - To deliver such a complex solution in the timeframe of execution.
    - Initial needs assessment.

2. What was the major contributing factor to that smooth execution?

    - Received input from key stakeholders.
    - There was not a smooth execution on any level.
    - Core competency of group; breadth and depth of their review and recommendations.
    - A clear understanding of the user requirements by the technical team contributed a great deal to such smooth execution.
    - Very dedicated project manager highly motivated to make the project succeed, very skilled at documenting the project.
    - Securing a great deal of Software resources to make the deadline.
    - Solid process from Consulting group.

3. What would you have done differently in your position?

- Ensured that the Software could deliver what was needed and execute a better training process.

- Made sure upper management knew of changes. Sometimes theory cannot always be applied in the "real world."

- Should have taken the time (although lost entire staff to project) to present a more thorough study of impact on current processes and the need to run parallel systems until project was complete.

- I would have had consultants with both functional and technical knowledge during the initial planning, scoping, and execution phases of the project. I would have spent considerable time in project scoping by specifying deliverables around the "to-be" day-in-the-life activities of the forecaster.

- Asked for time to evaluate the software selection before making the Software purchase decision.

- Pushed harder to focus on consolidating the Divisions processes to a common ground before selecting a software package, as well as getting buy-in from the executive team for more time to focus on defining process prior to the selection process. Basically, we did too much at one time.

- Little.

4. Is there any point you feel would have justified a "no go" situation?

    - "No go" would have been justified if the Software could not deliver what was needed to manage the business.

    - Yes, multiple times.

    - No, too much invested up front to go to a "no go."

    - Fortunately, no.

    - Yes, three months into the project, it was apparent that the selected Software was not capable of handling the magnitude of the company's forecasting challenge. System pre-sales estimates of hardware requirements were grossly undersized. Significant custom programming was required to try to "fit" Software to the SLIA requirements.

    - Six/seven months into the project when we had so many crucial milestones were not being realized. The organization still had the project

team rush to an arbitrary deadline. In doing so, we still had to redesign it before the forecasters used the tool.

- No.

5. In what ways could the project have been executed more smoothly?

    - Additional training.

    - We needed more time to agree on a process/procedures before be bought/looked at a system. Everyone in one section of the forecasting Division was new to the company. These persons did not have a full grasp of forecasting concepts to adequately design a new System.

    - The 'old' system and process must be maintained until the implementation of the new one can truly replace it. Proper staffing to run implementation project and current systems and processes.

    - By better integration of the external (Software) functional and technical consultants' roles, during the project planning and execution stages when Software consultants were leading the project. There were gaps between the functional requirements specified and translation into technical specifications during the time when Software consultants were at sight. By strictly enforcing scope control (change control), some of the nice-to-have features could have been left out for a faster and smoother implementation.

    - You cannot fully evaluate a package based on the sales pitch. We did not learn all the implications of the decision until actually getting into the tool, doing the design and prototype work, and going through training. Unfortunately, once a purchase has been made, there is not a politically correct way to gracefully kill the project. Early on in the project, it is possible to see that there is extreme danger of project failure – yet fear and inertia keep the project going. A free trial period of 90 or 180 days would have permitted a more objective evaluation of the tool and allowed for a go/no-go decision without severe implications to the decision makers.

    - Many months were building the infrastructure (clean, complete, consistent data, master files of items, customers, etc., and historical data in the required level of detail) required to support the Software tool.

    - Full staffing needed to be set from the beginning. The information technology resource position was filled too late in the project.

    - More "people" resources from the business-side, Company technical function more intimately involved from the beginning (the project went

through three IT project managers in 4 months), and the entire organization realistically assessing the tremendous change management effort that we were embarking upon at one time.

- Better end user training, development of better tools to assist in moving data into system and more time in Pilot process.

- Been allowed to create a Development Environment rather than pushing towards an arbitrary deadline when Software was not ready.

The following Table 6. Restrictions and Catalysts for Project Phases illustrates the results for Research Objective 2 and will be explained in Chapter V conclusions.

Table 6. Restrictions and Catalysts for Project Phases

	Initiating	**Planning**	**Executing**	**Controlling**	**Closing**
Organizational	+ Great Needs Assessment performed by consulting group.	- Lack of complete information with regards to all solutions to the problem.	- Lack of thorough Change Management though organization to adopt new methodology.	- Over-budget project erosion.	* In progress.
Behavioral	+ Drive towards improved forecast, improved customer service.	- Turnover within department hindered enthusiasm and knowledge base.	- Lack of personnel for successful project team. - Lack of senior management support for project.	+ Highly motivated project managers.	* In progress.
Systems	+ Software was chosen as solution and immediate "fix all."	- Under estimation of resources available. - Under estimation of resources needed.	- No test environment was established. - Data integrity hindered adequate execution.	- Features were added through project development.	* In progress.

5.0 CHAPTER 5 - CONCLUSIONS AND RECOMMENDATIONS

5.1 SUMMARY

This section will resolve the four research objectives.

Research Objective 1. Identify and document the phases and participants of the forecasting software implementation project from beginning to end hereafter referred to as Software.

The five stages of project management were realized for Division A, although not fully enough for project success. This assessment will follow Figure 3. Overlap of Process Groups in a Phase explained in Chapter 2 and will be described according to Figure 4. Mapping of Project Management Processes to the Process Groups and Knowledge Areas which is also explained in Chapter 2.

Based upon results from Respondents, Project Scope Management was satisfactorily achieved during the Initiation phase. The Planning phase included Scope Planning and Scope Definition and both were not formally completed. The major component was during the Controlling phase. The Scope Verification and Scope Change Control appeared to lack complete acceptance. There did not appear to be complete support from senior management and there were no formal scope change measures in place.

Project Integration Management does not have an Initiation component. During Planning, the project plan development initially was sufficient. As the project entered the Executing phase, it became apparent that the project plan inaccurately estimated necessary resources. The Controlling phase contains crucial Integrated Change Control.

The changes were well communicated throughout the entire project. This, however, does not keep a project on-time and on-budget.

Project Time Management contains only Planning and Controlling phases. Planning includes activity definition, activity sequencing, activity duration estimation, and schedule development. Activity definition and sequencing were well defined. However, activity duration estimation was underestimated due to underestimates of hardware necessities and personnel requirements. Schedule development was also not very good due to the aforementioned underestimations. In the Controlling phase, the Schedule Control included well-communicated changes within the organization, but was chronically pushed back.

Project Cost Management also contains Planning and Controlling phase components. Resource Planning, Cost Estimating and Cost Budgeting are within the Planning phase. These three sections were not well defined or estimated. Poor early estimates of hardware requirements and IT resources needed to build the correct infrastructure were major contributors. The Cost Control component during the Controlling phase appeared to be irrelevant once the project had been adopted. The priority was to successfully complete the project at what seemed to be any price.

Project Quality Management includes tasks in the Planning, Executing, and Controlling phases. Quality Planning within the Planning phase was not developed. Quality Assurance during the Executing phase was left at the discretion of the individual. Quality Control during the Controlling phase was also left to the judgment of the individual. There were no formal quality management systems.

Project Human Resource Management included components only in the Planning and Executing phases. Organization Planning and Staff Acquisition were critical within the Planning Phase. The Organizational planning was generally adequate. However, the Staff Acquisition was inadequate. Late personnel procurement for all functional departments for the project (IT) and turnover and newness within the forecasting department did not give the project a clean start. Team Development of the Executing phase was practically non-existent. Only one team member was sent to a formal Software conference. There was no project team development.

Project Communications Management contains components in the Planning, Executing, Controlling, and Closing phases. Communications Planning was very good in the Planning phase. Information Distribution was also good in the Executing phase. Performance Reporting in the Controlling phase was only satisfactory. The Administrative Closure of the Closing Phase is still pending, but not much has been performed up to this point.

No parts of the Risk Project Management components were performed. These tasks are fundamental in the Planning and Controlling phases.

Project Procurement Management includes parts in the Planning, Executing, and Closing phases. Procurement and Solicitation Planning were poor and satisfactory, respectively, within the Planning phase. Hardware procurement was a major component that was never achieved. These sources during Solicitation Planning were not judged according to the fit with the Division's available data. Solicitation and Source Selection during the Executing phase was adequate. However, the Source Selection required

additional conditions not agreed upon during negotiation and selection. No respondents were involved with Contract Closure during the Closing phase.

Research Objective 2. Understand organizational, behavioral, and systems restrictions (-) and catalysts (+) for each of the Software implementation phases.

Table 5. Restrictions and Catalysts for Project Phases was presented in the Chapter 4. Results as partial answer to research objective 2. In summary, the Initiation phase included a great needs assessment of the problem, the department and senior management recognized and supported the need for change, and the Software was chosen as the solution. The Planning stage was well executed to the degree of knowledge available at the planning stage. However, the quick fix solution and the underestimation of resources only became apparent during the Execution phase. By this point, it was too late to start over, but there also was not a risk management plan. There was not a lot to control outside of adding features to the Software since the budget seemed to be irrelevant as long as the implementation was completed. The department is still not settled into the final stage of the Software usage and therefore the Closure phase is still in progress.

Section VI of the questionnaire addressed the very important change management strategy utilized by the company, which would include the behavioral part of research objective 2. According to feedback to question 1, all Respondents understood the overall purpose of the project. Answers ranged on question 2 when asked how the Respondent viewed the Software as a "fit" for the problem. All agreed that the Software has great capabilities in itself. However, after getting into the project, it was obvious that this was not a "fit" for the SKU intensive business.

Question 3, assessed the structure of the company and also provides insight to the restrictions and catalysts of the overall project. The project manager's authority ranged from weak to balanced. The percent of performing organization's personnel assigned full time to project work varied by respondent. Fifty percent of Respondents ranked this as weak. The other fifty percent ranged in answers from balanced to projectized. One explanation was that the staff was technically full time, but also was responsible for prior daily activities on top of project work. The project manager's role was unanimously assessed as strong. The project manager's title was also strong. The project management administrative staff support returned a full range of answers from functional to strong. Overall, the Division's set up was not meant for project management. As explained in Chapter 2 Review of Literature, the structure of the performing organization often constrains the availability or terms under which resources become available to the project. Resources were not solely dedicated to the project and therefore hindered the project success. From the results of Question 3 in Section IV of the data collection instrument, the company could be evaluated as a whole. Also from Chapter 2 Review of Literature, companies are assessed as Innovators, Dabblers, or Followers in the area of adopting new technology. This company is clearly a Follower, where it waits until a firm in their industry adopts and shows success of new technology. "The category of your firm greatly impacts the nature of the project and that of project management" (Lientz & Rea, 2002, pg 252).

5.2 CONCLUSIONS

Research Objective 3. Develop a learning critique that determines the effectiveness of each phase of the project and ultimate lessons learned.

The Initiation phase was well developed, beginning with the thorough investigation into the Division's current state by a consulting company. The three primary needs included the need to establish one streamlined forecasting methodology for the Forecasting department, the need to create more accurate, detailed forecasts, and the third need which is a result from the first two is improved customer service. The needs were recognized across the Division, but the solution was not well selected.

Several aspects of the Planning phase should have been assessed in the first place and others needed further development. The use of formal project management and the nine areas of knowledge could have potentially avoided delays and failures. The risk management would have created an outlet once it was realized during execution that the Software was not going to be the best solution. The project cost management would have assisted in establishing go/no-go scenarios once under estimation of resources was recognized. Staff acquisition should have occurred well before the project was started in order to have effective team development in the subsequent Executing phase. Quality planning would have recognized inadequate data integrity. This major delay could have been avoided with this planning phase. A better solution may have been suggested.

The Executing phase was extended beyond time and budget due to initial under estimations in Planning. Although there was project plan execution, it was extended as previously mentioned. The quality assurance was left to the discretion of the individual. Information distribution was good, but the project was still undergoing multiple changes

to push it over time and over budget. Source selection within the executing phase was perhaps the most profound issue. Insufficient time was given to the Software selection to judge the most effective solution. This decision was pushed to meet a corporate deadline.

Controlling phase occurs across all other phases. There is little that could be done to control the changes once the reality set in. The control was to minimize costs where possible, although this did not appear to be a major issue. The goal was to successfully complete the project; therefore the control was to make sure this happened.

The Closure phase is still in progress. The project is still undergoing changes as it is still being fit with the remaining departments within the division.

5.3 RECOMMENDATIONS

Research Objective 4. Establish recommendations for a repeatable process that companies with similar challenges may use for more efficient transition and successful implementation.

A more realistic approach to the planning phase should be utilized in future projects. In this particular case study, senior management set the deadlines and the project plan was designed to comply. However, the gross underestimation of all resources needed was evident in perpetually missed deadlines and continued cost overrun.

Project quality management, one of the nine knowledge areas, was not used at all during the project. All quality control was left to the discretion of the individual. This most definitely should be a part of future projects. This will eliminate a great deal of re-work and mistakes, but also help push the project to stay on time.

Another one of the nine knowledge areas that was not used was the project risk management. This could have been the most important portion of the project that was left out. There was no alternative to the "plan A." Not only will the risk management begin to solve "what if" scenarios, but it will also push the project to stay on time. It will evaluate when the project has gone too far down the wrong path and possibly rectify the problem. The points at which the project should be completely abandoned will also be defined in the risk management planning.

Only one Respondent was PMI® certified and a Project Management Professional®. The ultimate recommendation once a project has been identified is to hire someone familiar with this proven methodology. Another solution would be to have an internal employee that is already familiar with the processes and needs assessment to go through PMI® certification.

One of the main phases of the project that needed more detail was the planning phase. One recommendation from the project analysis was suggested by one of the respondents for future systems implementation projects. The idea is to negotiate for a trial period with the software company to ensure the product will fit the needs of the company. The software consultants would stay on site and help set up the company's software design. Once defined, the trial software should utilize company data to be sure it is a fit for the business. In this case, the realization that the software was not a fit for this SKU intensive business would have emerged more quickly and a better selection could have been made. Software is such a large investment up front that there is no graceful way to abandon the decision if it is realized during the project that this was a poor selection.

5.4 FUTURE WORK

A broader selection of case studies should be found to accurately assess the effectiveness of project management. More cases studies across multiple businesses and in many industries would eliminate bias found only by examining one. This would also provide a mix of successful projects and unsuccessful projects to build better recommendations for future projects. Along with that would documentation of the best practices of successful projects.

By finding these best practice scenarios, the future work could possibly improve upon the PMI® methodology. PMI® states that the methodology is generally accepted and may not work in the strictest sense for all projects. However, if additional findings were valid, possible improvement could be made upon the methodology that could generally help all future industry projects.

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APPENDIX A. DATA COLLECTION INSTRUMENT

Industry's standard Project Management Framework as presented by the Project Management Institute® was used as the basis for the Data Collection Instrument. The questions of the tool were formatted to most accurately judge the extent to which this framework was utilized. The answers should ultimately complete the Research Objectives.

Employee Name _____

Company Division _____

Telephone # _____ Questionnaire Completion Date _____

E-mail Address _____

Manu Project Start/Completion Date _____

Section I. Basic Employment Information:

1. What is your educational background?
2. What is your professional background?
3. When were you originally hired by the Company?
4. What was your original title at hire date?
5. What is your current position with the Company?
6. Were you specifically hired for the **Software** implementation project?
   _____ No _____ Yes, please explain
7. Did you change positions during the **Software** project?
   _____ No _____ Yes, please explain

Section II. Information Technology Project Management Specific:

1. What is your level of Information Technology training?
2. What is your level of Information Technology implementation training?
3. Were you involved in the selection of **Software**?

_____ No_____ Yes, please explain

Section III. Forecasting Specific:

1. Did you play a role in the Company's forecasting Department, prior to **Software**?
   _____ No_____ Yes, please explain your responsibilities

2. What was your methodology to formulate a forecast? Please explain your selection.
   _____ Statistical _____ Judgmental _____ Combination of both

Section IV. Software Implementation Specific:

1. What was your specific title within the **Software** project?

2. What was your Responsibility for the **Software** implementation?

3. Did your responsibilities within the **Software** implementation change throughout the process?
   _____ No _____ Yes, please explain

4. What were your specific deliverables?

5. At any point, did you make the recommendation for "no go?" Please explain your selection.
   _____ No _____ Yes

Section V. Project Management Specific:

4. Describe your familiarity with The Project Management Institute.

5. Describe your familiarity with formal Project Management.

6. What is your level of Project Management training?

7. Based on your knowledge, describe the fulfillment of each of these components of project management as they pertain to the **Software** implementation. Please explain your role in each part.
   j. Project Integration Management
      i. Project plan development. Integrating and coordinating all project plans to create a consistent, coherent document.

      ii. Project plan execution. Carrying out the project plan by performing the activities included therein.

iii. Integrated change control. Coordinating changes across the entire project.

k. Project Scope Management
   i. Initiation. Authorizing the project or phase.

   ii. Scope planning. Developing a written scope statement as the basis for future project decisions.

   iii. Scope definition. Subdividing the major project deliverables into smaller, more manageable components.

   iv. Scope verification. Formalizing acceptance of the project scope.

   v. Scope change control. Controlling changes to project scope.

l. Project Time Management
   i. Activity definition. Identifying the specific activities that must be performed to produce the various project deliverables.

   ii. Activity sequencing. Identifying and documenting interactivity dependencies.

   iii. Activity duration estimating. Estimating the number of work periods that will be needed to complete individual activities.

   iv. Schedule development. Analyzing activity sequences, activity durations, and resource requirements to create the project schedule.

   v. Schedule control. Controlling changes to the project schedule.

m. Project Cost Management
   i. Resource planning. Determining what resources (people, equipment, materials) and what quantities of each should be used to perform project activities.

   ii. Cost estimating. Developing an approximation (estimate) of the costs of the resources needed to complete project activities.

   iii. Cost budgeting. Allocating the overall cost estimate to individual work activities.

iv. Cost control. Controlling changes to the project budget.

n. Project Quality Management
   i. Quality planning. Identifying which quality standards are relevant to he project and determining how to satisfy them.

   ii. Quality assurance. Evaluating overall project performance on a regular basis to provide confidence that the project will satisfy the relevant quality standards.

   iii. Quality control. Monitoring specific project results to determine if they comply with relevant quality standards and identifying ways to eliminate causes of unsatisfactory performance.

o. Project Human Resource Management
   i. Organizational planning. Identifying, documenting, and assigning project roles, responsibilities, and reporting relationships.

   ii. Staff acquisition. Getting the needed human resources assigned to and working on the project.

   iii. Team development. Developing individual and group skills to enhance project performance.

p. Project Communications Management
   i. Communications planning. Determining the information and communications needs of the stakeholders: who needs what information, when they will need it, and how it will be given to them.

   ii. Information distribution. Making needed information available to project stakeholders in a timely manner.

   iii. Performance reporting. Collecting and disseminating performance information. This includes status reporting, progress measurement, and forecasting.

   iv. Administrative closure. Generating, gathering, and disseminating information to formalize phase or project completion.

q. Project Risk Management

i. Risk management planning. Deciding how to approach and plan the risk management activities for a project.

ii. Risk identification. Determining which risks might affect the project and documenting their characteristics.

iii. Qualitative risk analysis. Measuring the probability and consequences of risks and estimating their implications for project objectives.

iv. Risk response planning. Developing procedures and techniques to enhance opportunities and reduce threats from risk to the project's objectives.

v. Risk monitoring and control. Monitoring residual risks, identifying new risks, executing risk reduction plans, and evaluating their effectiveness throughout the project life cycle.

r. Project Procurement

i. Management Procurement planning. Determining what to procure and when.

ii. Solicitation planning. Documenting product requirements and identifying potential sources.

iii. Solicitation. Obtaining quotations, bids, offers, or proposals, as appropriate.

iv. Source selection. Choosing from among potential sellers.

v. Contract administration. Managing the relationship with the seller.

vi. Contract closeout. Completion and settlement of the contract, including resolution of any open items.

Section VI. Change Management Specific:

4. What is your understanding of the purpose/origination of the **Software** implementation project?

5. How do you see this software as a "fit" for the company?

6. How would you describe the culture of your company's division? Please refer to the attached Organizational Structure Matrix as presented by the Project

Management Institute. Rate each of the five Project Characteristics on the left side of the matrix by the Organization Structure, moving left to right from Functional to Projectized.

a. Project Manager's Authority:

b. Percent of Performing Organization's Personnel Assigned Full Time to Project Work:

c. Project Manager's Role:

d. Common Titles for Project Manager's Role:

e. Project Management Administrative Staff:

Section VII. Conclusions/Recommendations:

6. What portion of the project was best executed?
7. What was the major contributing factor to that smooth execution?
8. What would you have done differently in your position?
9. Is there any point you feel would have justified a "no go" situation?
10. In what ways could the project have been executed more smoothly?