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A view of development in management for increasing profitability in the corporate landscape

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Abstract

Purpose – The purpose of this paper is to examine the need for a statistical approach in the development of personnel aspiring for a technical manager/technical team leader position in order to increase corporate profitability. It outlines the details of management training for managerial positions by chronicling the research of thirty academic studies in management strategy as well as real world experiences, which provides a statistical viewpoint for the development of a technical manager/technical team leader as a significant contributor to profitability within the corporate landscape.

Design/methodology/approach – This study begins by validating the strategic management model (Process 1), which states that managerial influences in the organization are important to consider and greatly affect the profitability of a corporation. Statistical methodologies are introduced as tools for the analysis in the development of the technical management/technical team leader position. Using interval-based analytical hierarchy process (i-AHP), the beginning of the process to develop a manager starts with Process 2 at their initial position, developing an employee using personnel management techniques and statistically measuring motivation and commitment. After the employee has demonstrated their abilities and gained knowledge of the people and processes, another assessment is conducted to enter the employee into a development position; Process 3. Process 3 considers the key metrics which will be necessary to allow the employee to develop corporate advantages. Process 4 shows the critical concepts (Process 1 and Process 2) that managers must consider when taking a technical manager/technical team leader role, including personnel development, knowledge management, and project management.

Findings – Corporate profitability is profoundly dependent on the development of employees throughout their careers. The profitability achieved within a corporation landscape can be evaluated and improved through the proposed processes. These processes not only can improve the ability for a newly appointed technical manager/technical team leader to overcome obstacles and navigate difficult situations but also increase the chances for: developing employees to increase corporate profitability, increase corporate profitability themselves, and to develop as a future manager who will be significantly increasing corporate profitability.

Originality/value – This study proposed the statistical processes to develop a technical manager/technical team leader candidate by creating a link between the initiation of the employee's career, their future job positioning, team working skills, leadership attributes, development of technical management/technical team leading skills, and later management skills to increase corporate profitability.

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Keywords Management effectiveness, Knowledge management, Management training, Development management, Management lifecycle
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1. Introduction: corporate level management and the need for guidance

High level corporate strategy must consider many variables in the determination of the key aspects that will ensure a future for the business. These criteria, strategic endeavors, and the decision-making process, made by executive management can lead to unbridled successes or to devastating losses. Strategies to achieve profitability are derived from two main sources: the study of industrial organization economics and the field of strategic management. Industrial organization economics within a particular industry (i.e. aerospace, pharmaceuticals, etc.) are assumed to be alike in strategically important aspects; therefore the focus of the classic model is on the firm's competitive advantage gained from the opportunities and strengths applied against threats and weaknesses from a corporate perspective and therefore states that managements influence is minimal (Roquebert *et al.*, 1996). The alternative drive to profitability, strategic management, states that fundamental decision making in a corporation is based on manager's perceptions and that the choices made by these managers largely accounts for the variation in the company's performance (Ketchen and Shook, 1996; Dawkins *et al.*, 2007).

This paper will use the strategic management model to provide guidance in training and maintaining personnel that have the greatest potential for becoming technical managers/technical team leaders, who will have the greatest positive impact on corporate profitability. Statistical methodologies are introduced as tools for the analysis for the development of a technical manager/technical team leader, which creates a link between the initiation of the employee's career, their future job positioning, team working skills, leadership attributes, development of technical management/technical team leading skills, and later management skills. The research was conducted by chronicling the research of thirty academic studies in management strategy. The findings from previous research will provide a background for this papers research and the result will establish the unique perspective of this research.

2. Literature review

Research on the question "what drives profitability" in the corporate landscape covers a wide range of topics from the philosophies of strategic management vs industrial organization economics, theories of personnel management, determining factors of organizational commitment, and the influence of knowledge management. In the research there has been significant debate as to the most influential factor to a corporation's profitability, but the thematic research conducted provides a wealth of information on the contributing factors that lead to a company's success and the role that managers take in corporate profitability (Islam *et al.*, 2012).

Scholarly research into the effect that managers have on corporate profitability centers on the arguments between the philosophies of strategic management vs industrial organization economics. In essence, the argument debates whether or not managers are a significant contributor to the profitability of a corporation. The insights provided by the research show that the philosophy of strategic management is valid.

An employee's attachment and commitment to an organization, the affect on their ongoing experience within the same corporation, and the affect on corporate profitability has been debated. There have been many thematic research articles written on the effects of pre-scientific management, Taylorism, and Paternalism and the affect on performance

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and corporate profit from a committed employee. The research has provided a process in which contributing factors can be identified, resulting in the ability to develop a personalized reward strategy, increasing corporate profitability due to the performance of an employee.

Knowledge management within an organization has been established as a key factor in the profitability of a corporation (Sarfaraz and Jenab, 2012; Sarfaraz *et al.*, 2012). The debates found within the research focus on the critical metrics within an organization. These key metrics are passed onto an employee during different times in their career and lead to the employee developing competitive advantages (Jenab and Sarfaraz, 2012). The research has provided a process in which critical metrics can be identified.

Research into various management positions have focussed on learning by doing, passive, and active adaption. Research into the technical management/technical team leader position has focussed on project prioritization, strategic planning, employee coaching, development and advancement, hiring and succession management, budgeting, problem solving, networking, and barrier removal. The results of the research show a close link between the technical manager/technical team leader and technical employees, with the technical manager/technical team leader taking charge of the development of employees. The success of the technical manager/technical team leader will lead to a greater contribution to corporate profitability and prepare the technical manager/technical team leader for a future management position through personnel management, knowledge management, and learning a managerial role.

This research utilizes statistical methodologies as tools in the analysis for the approach used to develop an employee aspiring to be a technical manager/technical team leader and the qualitative effect on increasing profitability in the corporate landscape. This is accomplished by demonstrating that an employee's development and future contributions to the corporation has a significant impact on profitability. The management of the employee by the technical manager/technical team leader provides the employees motivation and establishes commitment by utilizing the meta analysis approach to determine the individuals contributing factors to motivation and commitment. The transfer of key knowledge metrics using the analytic network process (ANP) approach, provide the technical employee the ability to gain competitive advantage; establishing worth within the corporation and increasing corporate profitability. The technical management/technical team leader position develops management skills by employing personnel and knowledge management techniques while current managers provide current insights into greater influences on corporate profitability. Figure 1 presents the flowchart of the proposed technical manager/technical team leader development leading to a future managerial position and increased corporate profitability.

3. Description of research processes

(1) Process 1 – strategic management:

- the principal of strategic management is validated in Process 1 using *F*-statistical analysis;
- top level executives realize that managers performance is critical to profitability; and
- the selection and development of employees that show management capability early will lead to profitability in the long run.

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(2) Process 2 – personnel management:

- focus on overall job satisfaction, occupational commitment (i.e. their job function), and perceived organizational support;
- meta-analysis data to demonstrate statistical organizational commitment; and
- correlation to motivational and commitment contributing factors lead to a happier, more productive, more successful (and therefore more profitable) team.

(3) Process 3 – the development position and knowledge management:

- optimal knowledge is transferred to the managerial candidate based on statistical significance (ANP) to drive competitive advantages; leading to increased profitability.

(4) The technical Manager/technical team leader position:

- begin influencing starting employees profitability through personnel management;
- determine key metrics in developing technical employees to gain competitive advantages; and
- project planning, barrier removal and completion of managerial projects; as shown in Figure 3 leading to direct reports profitability, project profitability, and future management potential for significant contributions to corporate profitability.

By covering the validity of the strategic management process we can show that the development of key management personnel is critical to a corporation's pursuit of profitability. Management of acquired personnel and management of corporate knowledge will be considered and key training techniques for managerial candidates will be shared, using statistical processes, to provide a unique point of view on the development of a technical manager/technical team lead.

Process 1 will differentiate the various methods and demonstrate the validity of the strategic management philosophy. Process 2 will cover the implementation of personnel management, which is ongoing throughout the employee's time and in the technical manger/technical team leader position. During the development and management of personnel, the human aspects (i.e. conflicts, interpersonal issues, development

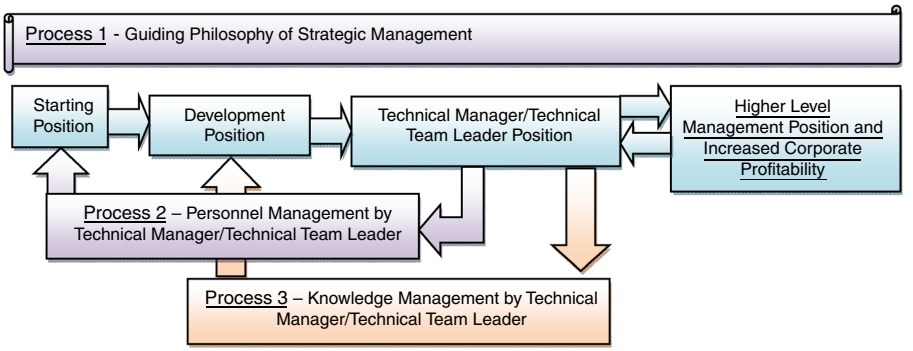

Figure 1. The proposed flowchart of technical manager/technical team leader development for increased corporate profitability

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complications), can lead to failures within the corporation due to problem oversimplification, gimmicks for motivation, static concepts of resolution strategies, backhanded reward programs, and potential motivators; each of these are assessed.

Process 3 will cover the critical knowledge personnel posses and the methods in which they will gain an understanding of the intricacies of their new environment. The technical manager/technical team leader position section will evaluate an employee in the fundamental passive and active adaption skills of networking, project management, and knowledge management. Knowledge will be defined in two terms, the explicit knowledge that is demonstrated through words and numbers and the tacit knowledge that comes from intuitions, feelings, and is generally not formalized. After the employee demonstrates the capability of performing to the business's profitability expectations they begin to develop the required technical managerial/technical team leader skills of personnel management, sociological, and psychosocial interactions with those in their working environment.

As a significant contributor within the business unit, management training is conducted by more senior managers and business founders that pass down information from their own experiences. The subtle political nature of the management structure is revealed and the framework for personnel and overall performance control (management control) is discovered.

4. Process 1: the philosophy of strategic management

The struggle to prove the validity of the strategic management philosophy is rooted in the complexity of the corporate model and the details of building a profitable enterprise. There are varying levels of development for businesses ranging from the entrepreneurial start up to the multinational corporation, each of which is led by a manager or management team. There is no doubt that the smaller the enterprise the more effect the manager(s) in charge will have on the profitability and long term successes of the corporation. However, with large scale businesses and the use of top management teams the influence of each individual manager comes into question.

4.1 Background

Strategic management begins with the belief that manager's performance is a critical factor in the profitability of a corporation. The analysis of the effectiveness of this philosophy has traditionally been measured with quantitative corporate data and analyzed using a cluster analysis approach. A cluster analysis approach allows businesses within similar market segments to be analyzed on the same terms with less variability as seen between corporate strategies. The main criticism with this method is that "unlike techniques such as regression and analysis of variance, cluster analysis does not offer a test statistic (such as an *F*-statistic) that provides a clear answer regarding the support or lack of support of a set of results for a hypothesis of interest" (Ketchen and Shook, 1996). The *F*-static analysis provides a null hypothesis and uses statistical comparison tools to fit the data to match using the method of least squares. The least squares method provides quantitative results determining how closely the relative data fits the hypothesis and provides a determination as to whether or not the fit is significant. This process will analyze previous research using the cluster approach as well as research using the *F*-statistic method to demonstrate the validity of the strategic management philosophy. By validating the strategic management philosophy those employees aspiring to become significant contributors to corporations

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profitability will be justified in their pursuit of a technical manager/technical team leader's position.

4.2 Methodology

In total, 45 independent published survey studies were examined from 1977 to 1993 that have used the cluster analysis technique. Each of these academic studies was analyzed for the validity of either the strategic management philosophy or the philosophy of Industrial organization economics by looking at how the variables were defined, chosen, standardized, and how validity was approached by these researchers. The key concepts in the application of cluster analysis in the strategic management research was that there were fundamental interactions between management, corporate strategy, the environment, leadership, and the performance of the company.

The selection of variables to include within these broad definitions yielded three basic approaches to identifying cluster variables: inductive, deductive, and cognitive methods (Ketchen and Shook, 1996). The inductive method considered as many variables as possible and attempted to determine if there are were any significant interactions among them. The strength in this method is the holistic view of the possible significant interactions that may be missed in other theories that make assumptions; the weakness is that the inclusion of irrelevant variables can cause deterioration in the solutions validity (Punj and Stewart, 1983). The deductive method only considered those variables which were consistent among the groupings and made the assumption that those that were not consistent, were not significant. The concern with this approach is that key variables may be missed. During the chronological research review it was found that the inclusion of variables that were left out of papers from previous research resulted in the discovery of significant factors being incorrectly left out. An example of this can be seen in the research completed by Schmalensee in 1985, which included the firm's market shares, the firm's effects, the industry effects, and encountered disturbances but lacked references to management altogether (Schmalensee, 1985). In 1991, Rumelt conducted similar research, concerned with the lack of inclusion of management (among other things) as significant to the firm's rate of return. Upon adding the left-out variables to his *F*-statistical model, he was able to determine that they were indeed significant (Rumelt, 1991). The cognitive method relied on top management teams and expert manager opinions to select which variables were to be included in the analysis. The implication is the lack of objectivity/bias in the consideration for the importance of management as a variable for the analysis; however, the experiences from top level management provided valuable insights into the critical factors affecting the business so it could not be completely discounted.

4.3 Discussion of results

The research conducted on the 45 academic studies suggests that a deductive method is the most valid. In addition, extreme care should be taken to ensure that the variables chosen are representative of the general population of interest. The key breakthrough in the validity of strategic management was the use of the *F*-test in the statistical analysis of the results when used with a deductive approach in the late 1980s, which took a more comprehensive look at the research to date and began including the statistical methodologies. One sample which stated that the low performance (profit) of the firm may have been attributed to the "[…] lack of continuity (mentioned by the CEO) in the composition of the top management team (Dess and Davis, 1984)." This

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lack of sales growth, due to insufficient performance by management was confirmed in the research using an overall F-ratio indicating that the cluster groups in the study were significantly different ($p = 0.041$), with a p-value less than one; showing significance in the management groups.The recent inclusion of statistical validation techniques to the cluster analysis performed on recent studies and on previous academic research establishes that the interactions of management personnel has a significant impact on the areas of strategy, environment, leadership, and profit of a firm. Therefore, the selection and development of key management personnel is critical to the success of a business and the importance of training employees that show management capability early will pay off in the long run. The development of these significant corporate contributors begins with the development of new personnel by the technical manager/technical team leader as described in Process 2.

5. Process 2: personnel management

The management of a new employee in their appointed position takes careful consideration of their previous experiences, collected knowledge, and motivations. "It (Personnel management) is a significant part of management concerned with employees at work and with their relationship within the organization (Rashida, 2012)." Management of personnel is intended to keep the employee busy, happy, and engaged. People are the most important asset of a company and therefore require the attention and focus of management in career development and short-term reward systems. Many large companies "[…] publically and emphatically state the importance of their people to their basic strategy and to their success" (Pfeffrey, 1998). In the career path leading to a general management position, the development and understanding of personnel management gained from the technical management/technical team leader position will help to demonstrate the impact of an effective corporate contributor. "Personnel management is an extension to general management. It is concerned with promoting and stimulating competent work force to make their fullest contribution to the concern (Rashida, 2012)."

5.1 Background

There are a few schools of thought that have been developed by various behavioral scientists. The main developments are the pre-scientific management, Taylorism, and Paternalism (Dunnette and Bass, 1963). Pre-scientific management is the philosophy in which personnel are meant to be purchased at the lowest price, maintained at the lowest cost, and maximized for output and profitability. This type of philosophy is typically seen with companies that have lower valued health care, little to no 401 k pay matching, and although initial salaries may be competitive subsequent raises do not cover the inflation rate. For example, suppose an employee is making $45,000 per year and the salary given is 4 percent per year. The actual dollar amounts are then $45,000, $46,800, $48,672, $50,619, etc. If the average inflation during that period is 6 percent per year then the real-dollar amounts, when the time-value of money is considered is equivalent to $45,000, $44,151, $43,318, $42,500, etc (Sullivan *et al.*, 2009). From this example it can be seen that by providing a 4 percent increase in pay to the employee the company is actually making money since the rate of inflation is greater than the raise amount.

Taylorism rationalized the workloads and incentives in order to maximize employee efforts in return for material gains. This is typically seen in sales bonuses, annual

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incentive payments, and profit sharing. Some people may find these benefits to be motivating an provide an extra incentive to maximize efforts where others may view this as a gimmick that is used to pay the employee less than 100 percent if all the targets for the period are not met. For example, the annual incentive payment offered by 3M "[…] links a portion of your pay to company metrics. Based on company performance and eligibility, payments are made to employees annually (3M, 2013)." This plan links approximately 5 percent of your base pay into the sales goal and is in lieu of an end-of-year bonus, essentially saving the business (i.e. costing the employee) a bonus plus a percentage of each employee's yearly salary if the sales goal is not met.

Paternalism seeks to win loyalty through subtle and sophisticated manipulations. This type of philosophy is typically seen in companies that have many programs and rewards, but do not take into account the relative merit of the activity that is being rewarded. For example, a reward may be given for "safety," in a typical Paternalism program the reward will be the same if the employee wore gloves when handling chemicals or changed the path of material handlers to minimize the risk that someone could be injured or killed. In practicality one philosophy is not implemented, but a little of each. This section will determine relevant guidance's that should be provided to technical manager/technical team leader candidates when the employee is determined to have leadership potential.

5.2 Methodology

Statistical guidance can be used in the determination of an employee's commitment to remain employed within the corporation. The primary forms of commitment are attitudinal and calculative. The attitudinal commitment represents the emotional connection of the employee for their position and the calculative commitment is the logical point of view of the employee in regards to their future. These concepts are broken down into three sub processes. Affective commitment is the emotional attachment to, identification with, and involvement in the organization, Continuance commitment is the perceived costs associated with leaving the organization, and normative commitment is the perceived obligation to stay with the company.

The individual attributes of each commitment can be considered variables in the analysis of an individual's outcome. These variables include personal characteristics, work experiences, job alternatives, investments, socialization experiences, and organizational investments. The aforementioned variables can lead to the outcomes of turnover, changes in on the job behavior, and ongoing employee commitment, health, and well being (Meyer *et al.*, 2002). Reliability factors must be taken into consideration (normally referred to as "ρ") on a 0 to 1 scaling to determine true correlation of the data. A detailed list of variables included in the statistical modeling is shown below. List of variables used in the statistical analysis of organizational commitment:

- ACS – affective commitment scale;
- NCS – normative commitment scale;
- CCS – continuance commitment scale;
- OCQ – organizational commitment questionnaire;
- OCB – organizational citizenship behavior;
- self-efficacy;
- locus of control;

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- justice: interactional;
- justice: distributive;
- justice: procedural;
- leadership: transformational;
- role ambiguity;
- role conflict;
- organizational support;
- alternatives;
- investments;
- job involvement;
- career commitment;
- satisfaction: overall;
- satisfaction: coworkers;
- satisfaction: extrinsic;
- satisfaction: intrinsic;
- satisfaction: pay;
- satisfaction: promotion;
- satisfaction: supervision;
- satisfaction: work;
- performance;
- withdrawal cognition;
- absence;
- work-family conflict; and
- stress.

A review of a recent Meta analysis was conducted in 2002 using procedures that were described in Hunter and Schmidt (1990). The correlations that were present in the variables in the list (Meyer *et al.*, 2002) were first corrected for reliability using revised reliability estimates obtained since the original report. The true correlations were then recorded as (ρ), and then each variable was given a weight. Sampling variances and credibility intervals were computed using a computer program developed by Stanley (2000). This revised meta-analysis process ensures reliable results, by using statistical comparisons and reliability factors to show significance between the employee (null hypothesis) and the variables listed.

5.3 Discussion of results

The results from the analysis concluded that the correlation between affective and normative commitment was substantial ($\rho = 0.63$). Since the value of ρ was less than one this numerical result indicates that the emotional attachment to the organization

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strongly affects the perceived obligation to stay with the company. As expected the results for normative and commitment measures were opposite signs, indicating that the obligation to stay with the company and the perceived costs associated with leaving the company were opposite in principle, but correlated for approximately 50 percent of the variables listed (Meyer *et al.*, 2002). Therefore, the personnel that have high correlations with the variables listed have a higher probability of feeling the affective commitment and emotional attachment to the company and take into consideration their perceived obligation to stay within the organization, leading to a higher statistical probability that the employee will stay with the company. The key points for learning and development are the overall job satisfaction, occupational commitment (ie their job function), and perceived organizational support. During the starting position phase the technical manager/technical team leader should ensure that these key attributes are being met for each of their direct reports, in turn learning how to increase the motivation and commitment will lead to a higher likelihood of success when the employee becomes a technical manager/technical team leader and lead to a happier, more productive, more successful (and therefore more profitable) team. The development position focusses on technical and knowledge management in order to develop key leadership attributes and competitive advantages.

6. Process 3: the development position and knowledge management

Training a new employee to be a subject matter expert takes time, experiences, and knowledge transfer. The ability for the organization to provide insightful in-depth knowledge into the employee's roles and responsibilities may greatly increase their acclimation into the workplace and their chances for success. Too often companies will lose key individuals and with them the critical knowledge they posses, expecting that the replacement will instantaneously gain an understanding of the intricacies of their new environment. In addition, key background experiences and knowledge are neglected due to time constraints and limited resources.

6.1 Background

Knowledge can be defined in two terms, the explicit knowledge that is demonstrated through words and numbers and the tacit knowledge that comes from intuitions, feelings, and is generally not formalized (Nonaka and Konno, 1998). The concept of knowledge management is not new, and many companies are aware of the impact of successful knowledge transfer with respect to the profitability within the market place, however, what is lacking is an analytical approach which can "[…] systematically evaluate and model complex factors of the knowledge management strategy (Wu and Lee, 2007)." Standardization and implementation of this strategy will allow companies to fully evaluate and analyze their knowledge management methods and determine the most beneficial strategy.

6.2 Methodology

The goal in this evaluation is to develop and chose the best knowledge management strategy. This is accomplished by establishing evaluation criteria that will be analyzed and evaluated by the ANP. The purposes, evaluation factors, and knowledge management factors should be defined in advance in order to establish a clear picture of what is important to the transfer of knowledge. Defining in detail the decisive factors, expectations, objectives and relevant determining influences to the criteria

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chosen should be evaluated and documented as part of the process in order to ensure the method is consistent and valid. Typically the purposes for information transfer include activating information, improving performance, and promoting innovation. Evaluation criteria are generally expressed as management support, communication, culture and people, incentives, time, and cost. In general, the benefits, opportunities, costs, and risks associated with each of the criteria made should be established. The alternative knowledge management criteria are typically drawn from three different styles, the system-oriented style, the human-oriented style, and the dynamic style (Wu and Lee, 2007). The system-oriented style focusses on the explicit knowledge gained from knowledge and the application of that knowledge in day to day technical abilities. The human-oriented style focusses on the tacit knowledge that is gained from experiences, social interaction, and the acquisition of reliable gut feelings, intuition, and feelings of correct directions. The dynamic style takes into consideration both perspectives and encourages a balance of each.

6.3 Discussion of results

The goals for the development of a potential technical manager/technical team leader began with the definition of the decision goals in which the executive team determined to be the most beneficial. Once set evaluation clusters are utilized in order to determine the effect of the three guiding knowledge management principles: Activating information, improving performance, and promoting innovation. In addition, there are six other important factors that should be included as a mandatory part of the developmental phase, these are: communication, culture and people, incentives, time organization, and cost analysis. The ANP is used to determine the most critical items and their relative importance to each other. This method is similar to the analytic hierarchy process with the exception that it is used for more broadly scoped analysis. In this particular case it utilized to discover the interdependence of the knowledge based attributes that are considered in the framework of the analysis. In addition, the ANP does not require the rigid hierarchical structuring that the analytic hierarchy process requires. Lastly, the ANP model "can capture effectively the complex effects of interplay in human society, especially when risk and uncertainty are involved (Saaty, 2003)." The approach used by the ANP method is represented graphically in Figure 2.

A super-matrix is used, which is a partitioned matrix where each subcomponent represents the relationship between two clusters. In addition each of the criteria are weighted resulting in an overall priority of elements. The resulting optimal knowledge to be transferred to the technical manager/technical team leader candidate is determined to be those elements with the highest results, along with the most important overall factor associated with the sub criteria, and the best alternative that should be used. Once this background knowledge is transferred to the employee strict

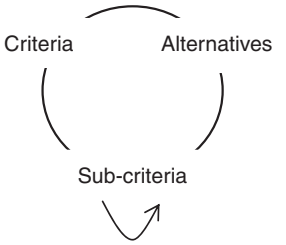

Figure 2.
The feedback system of the analytic network process

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management training can begin to ensure that the new member is contributing and successful in developing and exploiting competitive advantages.

7. Technical management/technical team leader position

The technical manager/technical team leader position uses the personnel management techniques discussed in Process 2 in order to perform employee coaching, development, and advancement. They must use the knowledge management techniques presented in Process 3 in order to perform project prioritization, strategic planning, budgeting, problem solving, and barrier removal. The success of the technical manager/technical team leader will lead to a greater contribution to corporate profitability and prepare the technical manager/technical team leader for a future management position. Management level projects drive more profitability by changing the corporate landscape to create more efficient and more profitable processes. The development of the managerial candidate is completed by using the relative experiences and knowledge base from existing managers and managed knowledge which is passed down. The importance of this interactive managerial training is that recorded knowledge may be out of date culturally, socially, and technically. In addition, seeing managers in action is an important part of the learning experience.

7.1 Background

"Initially the new managers had no real idea of what they had gotten themselves into. They could not believe the complexity and breadth of their new role (Hill, 2003)." The ability to manage personnel does not solely rest in the educational background, networking skills, and experiences of the individual, but must also include the ability to show both passive and active adaption. The adaptive process precipitates the ability to control trial and error based experimentation that provides an evolutionary knowledge base as well as the ability to structure a range of alternatives to an active hypothesis. A passive adaption is the ability to take already existing information and be able to form a best estimate or model (Walters and Holling, 1990). The goal of this adaption is to provide guidance to the relative style (system, human, oriented, dynamic) that is clear and effective in the use of gained knowledge.

The initial implementation of knowledge involves both learning before doing, and learning by doing. Learning before doing is typically the training, seminars, education, and communications that are received about a position or project before implementation is required. Once this knowledge is transferred the remaining learning aspects become revealed when the task or project becomes hands on. The goal of managerial training is to prepare the potential technical manager/technical team leader with the skills and information necessary to ensure their contributions are successful and avoid mistakes that will be attributed to learning-by-doing, since "[…] experience can be an inefficient and harsh teacher (Hill, 2003)."

7.2 Discussion of results

The key elements of the technical manager/technical team leader position include understand employees resistance to change, obtaining managerial support, team formation and development, and project planning. Projects are generally obtained from the business critical items which have been shown to have financial significance within the organization. The systems and structures that managers must put into place represent the interactions between the people and the conceptual work that must be

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completed in order to achieve sustainable, profitable results; this is represented graphically in Figure 3.

Typically these projects create significant changes to the way current processes work, the way employees interact with their environment and with each other, and how management maintains control over these processes. In order to obtain the acceptance of a major change there are five key elements that must be developed: Establishing the need for change, designing change to meet the business need, identification of the impacts of the planned change, plans on how the change will be implemented, and who will be implementing the changes. Clear communication, early personnel involvement, clear objectives and goals, and a focus on business and employee satisfaction lead to change acceptance and successful, sustained projects. Since a team will be utilized for large scale projects additional confidences must be built in order to appeal to their work ethic. A clear orientation and sense of purpose for each individual member is important in defining an identity and responsibility within the group, trust building and commitments is derived from knowledge and leadership developed from leading projects and time spent in technical starting positions. In addition, recognizing and rewarding the expertise of others in the team will drive them to participate in the planning and implementation activities. By implementing personnel management techniques using a Mata analysis approach, knowledge management techniques using an ANP approach, and successfully completing managerial projects the technical manager/technical team leader can more effectively increase profitability for the corporation.

8. Conclusion

This purpose of this proposed process is to discuss the need for the use of statistical processes in the development of a technical manager/technical team leader. By developing a holistic approach to management which creates a link between the initiation of the employee's career, their future job positioning, team working skills, leadership attributes, and later development of management skills it leads to the qualitative increase in profitability of a corporation.

It begins with the overall philosophy that managerial influences in the organization are important to consider and greatly affect the profitability of a corporation. This was accomplished by validating the strategic management methodology through the use of

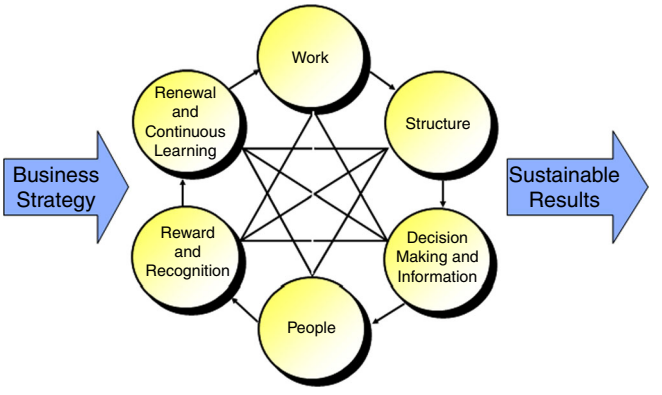

Figure 3.
The elements of a managerial project

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an *F*-statistic utilizing a deductive approach, which justifies employees in their pursuit of a technical manager/technical team leader's position.

Through the use of personnel management techniques a meta-analysis can be performed within the corporation on the employees to determine motivation and commitment. The result qualitatively indicates the likelihood that an employee will stay throughout the starting and development processes in order to achieve a greater level of profitability within the corporation.

Knowledge management techniques are used in conjunction with the analytical networking process in order to determine key metrics required in the development stage of an employee's career. These metrics, once establishes allow the technical employee to develop corporate advantage, increasing profitability.

The technical manager/technical team leader position utilizes the techniques of personnel management (Process 2) and knowledge management (Process 3) in order to develop employees who are aspiring to become technical manager/technical team leaders. In addition, as a managerial candidate the technical manager/technical team leader must gain profitability through direct reports and managerial projects. Current managers pass down managerial insights into profitability, establishing a management lifecycle in which is shown in Figure 1; dramatically improving corporate profitability.

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