

# Project Managers, Can We Make Them or Just Make Them Better?

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## ABSTRACT

As the documented importance of project management grows for all organizations world wide, skilled successful project managers have become a valuable asset to have in an organization. In Information Technology these project managers need a good understanding of technology, an exceptional grasp of basic project management principles, and business leadership skills to be successful. This paper will discuss the organization's need for project managers, the skills a project manager must have to be proficient and whether these skills are innate or can be imbibed overtime. This paper will also discuss, for those skills that can be learned, how best to obtain these skills in a college or university IT curriculum using results from our own experiences. With this information, colleges or universities can begin preparing students for a career as an effective project manager.

## Categories and Subject Descriptors

K.6.1 [Project and People Management]: Management techniques and system development.

## General Terms

Management, Measurement, Human Factors, Performance

**Keywords:** Project Management, Leadership, Soft skills

## 1. INTRODUCTION

As organizations are becoming more "project" based and the current number of Information Technology (IT) projects grows rapidly, the demand for better project managers has greatly increased. As project management positions become more prominent, it has become critical for organizations to place individuals in a project management role that have the skills to be successful. This paper will examine this concept as well as the necessary skills needed by an IT project manager to succeed. The paper will also examine which of these skills students can learn in an undergraduate Information Technology curriculum and how

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our program teaches them and which ones are innate and perhaps can't be taught.

This paper will also look at what type of personality would be the best to be placed in the project management role and the different tools we can use to determine what these personality types are. In conjunction with that, we will examine whether this ideal personality can be taught in a classroom, be it a college level project management course or an organizational training program. Choosing an individual that has the skills to be a good project manager is important to the ultimate success of an organization. It is necessary to understand how to assess these individuals and to know what still can be done to produce a project manager with the right skills to make each project they undertake successful.

Offering project management instruction to undergraduate students is consistent with the Information Systems (IS) model curriculum (IS'2002) supported by the Association for Computer Machinery (ACM), the Association for Information Systems (AIS), and the Association for Information Technology Professionals (AITP). The ACM Special Interest Group for IT Education (ACM/SIGITE) is in the final stages of developing a model curriculum for Information Technology programs and they too have included a section on project management learning outcomes that are required of all undergraduates.[1] [10]

## 2. NEED FOR BETTER PROJECT MANAGERS

In 1995, a study entitled "CHAOS" was conducted by the Standish Group. The study surveyed 365 information technology (IT) executive managers in the United States who managed more than 8000 IT application projects. The sample contained small, medium, and large companies across several industry segments. The results of the study showed, as the title of the study indicates, that IT projects were in total disarray (see Table 1). "A huge portion of the more that \$250 billion spent annually on IT application development is wasted because companies fail to utilize effective project management practices." Only 16.2% of projects were counted as successful and the projects were only delivering 61% of the desired features. Successful projects were defined as meeting all project objectives on time and on budget. The study concluded that project management was one of the top catalysts to ameliorate these statistics.

**Table 1: Standish Group Study Results**

	1995	2003
Successful IT Projects	16.2%	34%
Average time overruns	222%	82%
Average Cost overruns	185%	43%
Delivery of required features	61%	52%

The Standish Group repeated the study in 2001, and again in 2003 and observed some noteworthy improvements (see Table 1). Successful projects have increased to 34%, average cost overruns have decreased to 43%, and likewise average time overruns have decreased to 82%.

One of the major reasons for the improvements, mentioned in the CHAOS study, was attributed to better project management practices and better trained project managers. Wilder and Davis [20] agreed with the earlier CHAOS study stating that poor project management is a major contributing factor leading to failed IT projects. These results demonstrate the increasing importance of project management to today's organization and the significance of training and educating project managers prior to assigning them to large complex IT projects. The next section of the paper describes the skill set requirements needed by today's project manager to be successful.

### 3. PROJECT MANAGER SKILL SET

The basis of good project management is having the knowledge and skills necessary to perform the job. A project manager is generally defined as the person responsible for working with the project sponsor, the project team, and the other people involved in a project to meet project goals [17]. Being an IT project manager requires knowledge in the core Project Management competencies such as time management, risk management, scope management, cost budgeting and a basic knowledge of IT systems.

A project manager must have skills in addition to the basics of project management to succeed. According to David Foote, a managing partner at Foote Partners LLC, "It requires all these soft skills that have to do with getting things that you want (and) adjudicating issues between people, managers, egos and agendas. It's how to get a job done without annoying people" [13]. These soft skills can include basic leadership and team building abilities that are needed for the team to complete the designated project. Basic business skills are also needed for a project manager to be successful in the IT world. These can include the ability to communicate measurable results, utilize financial skills to keep the project cost effective, and identify and predict trends in the project.

Another important aspect of project management is the ability to communicate effectively. It is essential for project managers to have the capacity to listen and understand (technical speak) the people on their project team as well as the customers of their project. By doing so, expectations and feedback can be easily passed on to the team and it will be easier to solve problems and complete tasks within the project. A project manager will also need to be able to step outside the box and see things from a different perspective. Dennis Johnson, an Assistant vice President

at USAA states "A project manager needs the ability to question without alienating – to listen and watch people's body language and really see what's happening" [13]. This will allow the project manager to better communicate with the team and the organization.

Relationship management is a skill that is important to have while managing projects. The project manager should be capable of working with all levels within the organization. This means they should be able to communicate information to different levels of people and understand and have the ability to establish relationships with them. Relationship management can also include identifying the unique characteristics and abilities of each individual on the team and determine the most effective way to utilize them throughout the project. A project manager will also need to know how to mobilize and coach the people on their team. Another aspect of relationship management is establishing trust within the project team. "The project manager and the team must develop a level of trust and comfort with each other in single-minded pursuit of project goals" [11]. It comes down to the idea that project managers must be able to build and sustain relationships within their project team and in all levels of their organization.

There are many skills a project manager may have that are argued to be ingrained in the human spirit, the largest of these being the ability to influence others. Linda Pittinger, CEO of People3, states "It's hard to find people who can influence others and create win-win situations [13]. The project manager needs to have the ability to sell the value of the project to other people within the organization and must be able to persuade and influence team members to get their job done well and on time. A project manager also must have the confidence, credibility, and commitment to overcome the obstacles when faced with the task of running an IT project. Without these, a project manager will be more likely to fail.

There are also many skills a project manager may have that can be either learned or innate, like the ability to make decisions. It has been said that the best decision makers are the most experienced decision makers. "As a manager and leader, every step you take required decision making skills. What makes it more challenging is the pressure to make the right decision is often very high" [7]. Making the right decision often involves basing that decision on past experience and gut instinct. No project manager will have the experience if they are new to the field of project management but they will have the ability to judge based on gut instinct and other projects within the organization.

A more detailed list of skills is included in table 1. Each skill is tied to a general list of responsibilities for a project manager. This list is not comprehensive and will not pertain to every project manager in all organizations. This list is detailed in research conducted by [5], [9], [3], [19], and [13].

Functions	Skills
Recruit and manage the project team by creating an environment conducive to the delivery of the new application in the most cost-effective manner.	Personnel Management, Relationship Management, Leadership, Training, Oral and Written Communication, Mentoring, Teamwork, Staffing
Facilitate effective communication between customer, management, project sponsors, and the project team.	Written and Oral Communication, Effective Listening, Strategic Planning, Conflict Management, Teamwork, Business Writing
Create and manage project budget and perform cost estimation	Finance and Accounting, Personnel Management, Estimation and Mathematics
Negotiate, create, and maintain project charter, project requirements, and project plan by establishing its format, direction, and base lines that allow for any variance measurements and change control	Problem Solving, Persuasion, Decision Making, Forward Thinking, Vision, Organizational Alignment, Big Picture View, Sales/Marketing, Technical Writing, System and Business Analysis, Manage Uncertainty
Manage the technology, people, and change with regards to schedule, staffing, budgeting, and equipment.	Oral and Written Communication, Motivation, Positive Attitude, Flexibility, Influence, Teamwork
Oversee the implementation of standard project management practices throughout the project lifetime.	Technical Project Management Knowledge, Organization, Organizational Alignment
Track project metrics and changes in the appropriate repositories	Organization, Metrics Tracking
Provide continued project tracking and ensure acceptable work products from the project team	Discipline, Problem Solving
Develop appropriate risk management tactics, contingency plans, and problem management.	Forward Thinking, Risk Management, Problem Solving, Intuition, Change Management, Ability Manage Uncertainty
Attend project and management meetings	Oral Communication, Leadership, Meeting Skills
Prepares appropriate project management reports and powerful project presentations to convey project progress.	Relationship Management, Written Communication, Technical Writing, Business Writing
Project management software tool expertise	Technical Foundation
Partner with the end users, work with project sponsors and other management to establish progress and direction of the project by achieving goals, reaching targets, solving problems, mitigating risks.	Business and Politics, Goal Setting, Problem Solving, Teamwork

Figure 1: Detailed list of project management responsibilities and coinciding skills.

### 3.1 Leadership

When attempting to understand the qualities of a good project manager, general leadership must be examined. Leadership is thought to be one of the most critical skills a project manager can have. Pinto [14] believes that project management is the most leader intensive undertakings that occur within organizations. These "soft skill" traits noted earlier of a project manager have their foundation in good leadership skills. Artner [4] believes that one must have three skills to be a good leader:

1. Identifying the major challenges that face the organization
2. Motivating a team to meet those challenges
3. Keeping that team focused on the major challenges

These are just the beginning. A leader must have good communication skills as well as the ability to inspire others. In a study made by CIO Insight [8], leadership skills and personal characteristics were examined in terms of which would lead to effective leadership. Table 2 and 3 contain the results of the CIO study.

Table 2. Critical skills for effective leaders.

Of the following skills, which three do you feel are most critical for IT executives to be effective leaders? Which do you consider to be your strongest? Which do you most need to improve?	Most Critical	Needs Improvement	Strongest
Communication	64.5%	46.6%	31.4%
Relationship Building	52.7%	44.1%	30.7%
Strategy creation	41.7%	47.9%	23.9%
Recruiting competent people	36.8%	29.5%	21.0%
Coaching and mentoring	36.0%	43.3%	27.7%
Change management	24.7%	24.3%	30.4%
Project management	24.5%	36.9%	22.1%
Negotiating	15.7%	21.2%	50.6%

Adapted from CIO survey on effective leadership

**Table 3. Personal characteristics for effective leaders.**

Of the following personal characteristics, which three do you feel are most critical for IT executives to be effective leaders? Which do you consider to be your strongest? Which do you most need to improve?	Most Critical	Needs Improvement	Strongest
Ability to inspire others	64.2%	46.5%	37.5%
Vision of the future	63.5%	51.7%	29.0%
Integrity	51.9%	55.6%	4.7%
Creativity and innovation	31.6%	42.5%	32.2%
Willingness to take risks	26.9%	26.3%	41.5%
Intelligence	21.2%	35.9%	9.0%
Self-Confidence	19.4%	21.6%	40.6%
Maturity	12.7%	14.7%	19.2%

Adapted from CIO survey on effective leadership

#### 4. PROJECT MANAGER PERSONALITIES

A person's character and personality traits play a key role as to whether they will make an effective leader and project manager. Many IT university programs and organizations believe that this "personality" can be taught in the classroom. It was demonstrated earlier that the greatest responsibility of a project manager is leading people successfully. However, can we really teach someone how to interact with people based upon books? Within an IT project management program, can we really prepare our students for the trials of dealing with people while managing a project?

If this is something that we choose to teach in our classrooms, it would be an ultimate goal for us as educators to attempt to identify those that are ideal for project management and encourage them to pursue it as a career. This can be done by using personality tests, such as the Myers-Briggs Type Indicator, to assess whether someone will make a good project manager. By taking those types of assessments, an individual can analyze their personality and connect their personality type with career and jobs.

The Myers-Briggs Type Indicator (MBTI) assessment is incredibly popular for doing just this. "The MBTI descriptions of personality did what no other personality instrument has done before, be able to give most people some insight into themselves and others" [18]. After taking the MBTI, an individual will be given four letters that will match with their personality type: Extrovert v. Introvert, Sensing v. Intuitive, Thinking v. Feeling, and Judging v. Perceiving.

Once we know this information, we can consult the research database of MBTI that connects personality types with careers. By doing this, it can be shown that leaders most fall into the ENTJ category (extrovert, intuitive, thinking, and judging). "ENTJ's are especially well-suited to be leaders and organization builders.

They have the ability to clearly identify problems and innovative solutions for the short and long term well-being of an organization" [6]. Possible career paths are computer consultants, business administrators, personnel manager, management trainer, corporate team trainer, financial planner, and network integration to name a few. Taking a look at the previous careers, a project manager needs to play all these roles to be successful.

A project manager could also fall into the category of ESTJ. "They are good at a lot of different things, because they put forth a tremendous amount of effort towards doing things the right way. They will be happiest in leadership positions, however, because they have a natural drive to be in charge. They are best suited for jobs which require creating order and structure" [6]. Possible career paths for someone who is an ESTJ include business administrator, manager, budget analyst, project manager, computer systems analyst, and teacher.

The Keirsey Temperament Sorter has often been compared to the Myers-Briggs Type indicator. "The Temperament Sorter was created to help people gain new understanding of their traits, motivations, and behaviors" [2]. The temperament sorter is an assessment to analyze one specific aspect of one's personality: temperament. "Temperament is a set of inclinations that each of us is born with, it's a predisposition to certain attitudes and actions" [2].

The four temperaments that people will fall into are artisans, guardians, idealists, and rationals. AdvisorTeam [2] designates each temperament as the following:

- Artisans value freedom and spontaneity. They want to be without constraint, at liberty to act on their impulses, play and create.
- Guardians value belonging to a group or community. They maintain stability through responsible, conservative, traditional behavior.
- Idealists value personal growth, authenticity, and integrity. They yearn to develop themselves fully as individuals and to facilitate growth in others.
- Rationals value competence and intelligence. They strive to learn, know, predict, and control the resources in their environment.

It has been shown through research that project managers and leaders will most likely fall into the category of either Rational or Guardian. A Rational tends to be pragmatic and organized. "Their organizational and coordinating skills tend to be highly developed, which means that they are likely to be good at systematizing, ordering priorities, generalizing, summarizing, and demonstrating their ideas" [15].

Guardians tend to be very concrete in their communication and reliable when it comes to completing tasks. They also are very cooperative with implementing goals and are often good at supervision and protecting. The Supervisor Guardian is the type that most fits the personality of the project manager. Supervisor Guardians "go by experience, not speculation and experimentation, and certainly not fantasy. They keep their feet firmly on the ground and make sure that those under their supervision do the same" [15].

The Fundamental Interpersonal Relations Orientation-Behavior (FIRO-B) instrument can also be used to assess one's personality and behavior. The FIRO-B "measures the extent to which people attempt to satisfy three basic social needs: Inclusion, Control, and Affection" [16]. The FIRO-B measures how often an individual initiates each type of behavior as well as how often an individual wants others to initiate these behaviors towards them. The FIRO-B assessment helps to describe the compatibility of individuals towards the teams they work with as well as team atmosphere or culture. The project manager will have a high number when describing the initiation of each type of behavior.

The three personality assessments described above are good tools to examine an individual's personality type and compare it to that of the typical project manager career. Each assessment can be used separately or they can be used in conjunction to get the best results. Using these evaluations, we can examine a person based on the skills required to be a good project manager, and decide whether to put them in that role, whether they would need further training to be successful in the project manager role, or whether they would be best placed in a different career altogether.

#### 4.1 Knowledge vs. Behavior

"Is it better to hone natural ability occurring in some people (personality styles) rather than teaching the results achieved even when following techniques" [12]? If you had to choose an IT project manager (PM), which would you choose: one that has PM skills and lacks PM personality or a project manager that has the PM personality and lacks the PM skills?

It has been proven that it is not difficult to learn new skills. Students taking classes are proving that everyday. "After all, what is so difficult in the PM process? To develop a project charter – defining objectives and scope, considering strategies to achieve the objectives, setting the ground rules – aren't these fairly natural management functions? Building schedules and budgets, managing the workforce, tracking progress, reporting and communicating – these should not be foreign to managers" [12]. These skills can also be easily acquired by those that have no management experience at all.

If we can teach project management skills and technology skills, why can't we take someone who has the skills and train them in the methods of leading people? We do some of this in terms of raising awareness of the issues associated with some aspects of leading a project team. However, this comes down to being much more than a training issue. "It is not knowledge that we are trying to add to, but personalities that we are trying to change" [12]. Personalities can change, but over time. Individuals can take behavior modification training to refine their behavior to match that of a project manager. It has been shown that this training tends to have a very short half-life because people don't make the effort, once they get back into the comfortable environment, to enforce what they learned and practiced during training. Now ask yourself, which choice would be a better one. It should be somewhat obvious that given the choice to add to one's knowledge and skills, or to change one's behavior, the former would be a better choice. The latter is more likely to fail.

#### 5. CURRICULUM MATCH TO SKILL

To reach the ultimate goal of prepared students, each skill described in the previous section needs to be found within the courses available in an IT curriculum. Figure 2 outlines each skill and the learning outcomes that prepare our students for a role as an information technology project manager.

Skill	Learning Outcomes
Finance and Accounting	3 hrs. Basic Accounting models, concepts and procedures, Analyzing financial statements
Oral Communication	3 hrs. Communication theories as applied to speech Practical communicative experiences such as interpersonal communication, small group process, and informative and persuasive speaking.
Conflict Management	3 hrs. Theoretical and practical aspects of conflict assessment, negotiation, problem solving, mediation, and arbitration.
Written Communication	4 hrs. Recognize multiple genres, effectively read and understand scholarly articles, and contribute insight to a topic in his/her major. Enhance comprehension of various texts, critical thinking skills, and analysis.
Technical Writing	3 hrs. Contextual research, analysis, and writing. Effective strategies for communicating with other people about and with technology. Collaborate with colleagues in project teams. Teaches the rhetorical principles that help students shape their technical writing to suit a range of readers in a variety of technical situations.
Technical Project Management Knowledge	3 hrs. Application of knowledge, skills, tools, and techniques that project managers use to plan, staff, estimate, and manage information technology projects. Managing scope, risk, budget, time, expectations, quality, people, communications, procurement, and externally provided services.
Risk Management	
Metrics Tracking	
Business Writing	3 hrs. Rhetorical principles and writing practices necessary for producing effective business letters, memos, reports, and collaborative projects in professional contexts.
Sales/Marketing	3 hrs. Overview of the functional area of marketing. Focus on inputs to the marketing decision-making process, the process itself, and its results.
Training	3 hrs. Systematic training program design, development, and evaluation. Principles, practices, and variations of basic methods of training, employee development, and mentoring

Relationship and Personnel Management, Influence, Effective Listening, Leadership, Positive Attitude, Flexibility, Motivation	3 hrs. Organizational behavioral concepts and principles Individual and group behavior in organizations. Typical interpersonal and leadership behaviors. Applied leadership in the context of organizational functions, structures, and operations.
Estimation and Mathematics	3 hrs. Differential calculus with applications to management and economics.
Problem Solving	3 hrs. Develop reasoning skills and analytic abilities, based on an understanding of the rules or forms as well as the content of good reasoning.
Organizational Alignment Big Picture View Strategic Planning	3 hrs. Enterprise view of the organizational impact of IT and includes both a descriptive component (describing how IT is affecting organizations) and a prescriptive component (exploring and evaluating effective methods of applying IT for organizational benefit).
System and Business Analysis	3 hrs. Comprehensive introduction to information systems development. The systems development life cycle, methodologies, development technology, systems planning, systems analysis, systems design, systems implementation, and systems support.
Change Management	3 hrs. Leadership and its relationship to the management of organizational change Managing the human side of quality improvement.
Metrics Tracking	3 hrs. Statistical methods with applications to diverse fields. Understanding and interpreting standard techniques in data analysis

Figure 2. Cross reference skill to course learning outcomes

In addition to the skills mentioned in Figure 2, a project manager must have the appropriate technical foundation to be able to communicate with their team successfully and have an appreciation for the unique difficulties in the execution of IT related projects. Our curriculum has a minimum requirement of 53 credit hours of IT based course work.

## 6. CONCLUSION

This paper has explained the need for project managers, what it takes to be a project manager and the personalities that most match that of a project manager. The paper also discussed the conflicting issue of changing behavior vs. changing knowledge. By looking at these factors, many still have differing opinions as to whether you can teach (make) someone to be a project manager or whether that person has to have the "gift" of project management. CIO magazine completed research that indicated that 81% of CIO's believe that leadership can be taught. "People can go to school to learn the technical things, and they can learn the business over time. The behavioral competencies are the ones people are least able to learn. They're intuitive" [13]. There is also

a large group of people that their beliefs lay on the other side of the line. We can see that there is a very fine line as to what attitude you take on; the one that claims that you can teach everything a project manager will need to know including changing their personality; or it's the one that declares that either a project manager has it or they don't, and trying to teach them the "soft skills" necessary is just a waste of time.

There are good points to both sides of the debate. However, from all of the information provided, I would have to conclude that a great project manager is born with the skills necessary to succeed. Learning the behaviors and soft skills might give someone the ability to survive as a project manager in the project management world. However, I don't think that this person would be as successful as one with the behavioral skills they were born with. Research done by Wideman [19] would agree that not all individuals are suited for the project management role. He goes on to say that many are not even suited to work in a project based environment.

In addition, I believe that making the attempt to teach the IT project management personality in the classroom would be futile. If a person doesn't have the gut instincts and ability to operate as a project manager under stress, they will not survive in the field. Understanding this concept, I believe that attempting to teach this in the classroom would result in failure.

If I were asked to choose my ideal project manager, I would want someone who not only had the technical skills of project management taught through an IT based curriculum or learned on the job, but would also prefer someone who had the ability to lead people and teams. You must also have someone with the ability to communicate effectively with different types of people and inspire them to work to their utmost potential. I would want the project manager to rate as an ENTJ on the Myers Briggs Type Indicator or a Supervisor Guardian on the Temperament Sorter. Those two types are indicated to be ideal for project management careers. This would ensure the fact that when in important decision making situations, they will rely on what they know and make a sage decision. In addition, I would attempt to determine whether the person has the ability to make decisions, as well as influence others to work to their optimum potential. The ability to influence and motivate others is ideal for a project's completion within its constraints.

If I were asked to choose, I would opt for someone who fits the project manager mold with all the previous qualifications. A project manager with the technical, behavioral, and instinctive skills it takes to complete projects within their constraints would be my choice no matter how many times I had to face that choice. Ultimately it is necessary for project based organizations to decipher and employ project managers that will have the ability to succeed in managing their projects and utilize their talents to optimize organizational gain and profit.

In future research, we will be following up with our graduates who entered the job market in some form of a project leader position and assess their success. How did they rate on the Myers Briggs Type Indicator or the Temperament Sorter and were these good indicators of IT project manager success. What tools did the students not have which would have made them more successful.

## 7. References

- [1] ACM/SIGITE. Computing Curricula Information Technology Volume. Retrieved May 15, 2005 from <http://sigite.acm.org/activities/curriculum/downloads/IT20Volume-April202005.pdf?sigite=00814c86ad7b8ff504d3ab7acfe182d4>
- [2] AdvisorTeam. (2003). What is the temperament sorter. Retrieved October 29, 2003, from [http://www.advisorsteam.com/temperament\\_sorter/about/](http://www.advisorsteam.com/temperament_sorter/about/).
- [3] Anonymous (2000). Basic skills for project managers. Retrieved September 13, 2004, from <http://www.informit.com/content/images/0130219142/samplechapter/0130219142.pdf>.
- [4] Artner, B. (2001). Looking for leaders in all the wrong places. Retrieved October 22, 2003, from <http://techrepublic.com.com/5102-6314-1033951.html>.
- [5] Bigelow, D. (2000). What makes a good project manager. Retrieved July 12, 2004 from <http://www.pmsolutions.com>.
- [6] BSM Consulting. (2000). Common careers for personality types. Retrieved October 29, 2003, from <http://www.personalitypage.com/careers.html>.
- [7] Canterucci, J. (2003). Leaders are made, not born. Columbus Business First: September 29. Retrieved November 30, 2003, from <http://www.bizjournals.com/columbus/stories/2003/09/29/smallb2.html>.
- [8] CIO Insight. (2003). The CIO Insight research study: Leadership. Retrieved November 11, 2003, from [http://www.ciointer.com/print\\_article/0,3668,a=108886,0.asp](http://www.ciointer.com/print_article/0,3668,a=108886,0.asp).
- [9] Crawford, K. (2002). Keys to success: Staffing an enterprise-level project office. Retrieved July 12, 2004, from <http://www.pmsolutions.com>.
- [10] IS 2002. Model curriculum and guidelines for undergraduate degree programs in information systems. Retrieved April 2, 2005, from <http://www.acm.org/education/is2002.pdf>
- [11] Kharbada, O, P. (2003). Project managers: Generalists not specialists. Retrieved October 25, 2003, from <http://www.gantthead.com/article/1,1380,164104,00.html>.
- [12] Levine, H, A. (2003). Choosing project managers knowledge is easier to acquire than changing behavior. Retrieved October 22, 2003, from [http://www.sciforma.com/resources/white\\_papers/choosing\\_project\\_managers.htm](http://www.sciforma.com/resources/white_papers/choosing_project_managers.htm).
- [13] Melymuka, K. (2000). Born to lead projects. Computer World: March 27. Retrieved October 31, 2003, from <http://www.computerworld.com/printthis/2000/0,4814,44218,00.html>.
- [14] Pinto, J., Thoms, P., Traylor, J., Palmer, T., Govekar, M. (1998). Project leadership: from theory to practice. Newtown Square, PA: Project Management Institute.
- [15] Prometheus Nemesis Book Company. (1998). The four temperaments. Retrieved November 11, 2003, from <http://keirse.com/matrix.html>.
- [16] Schnell, J. (1998). The leadership report using FIRO-B and MBTI. Retrieved October 27, 2003, from <http://transdellassociates.com/sampleReports/leadershipReportUsingFIROBandMBTI.pdf>
- [17] Schwalbe, K. (2004). Information technology project management: Third Edition. Canada: Thomson Course Technology.
- [18] Viawest. (2003). Keirse temperament versus myers-briggs types. Retrieved October 29, 2003, from <http://users.viawest.net/~keirse/difference.html>.
- [19] Wideman, Max. "Dominant Personality Traits Suited to Running Projects Successfully". Retrieved December 2, 2003 from <http://www.maxwideman.com/papers/personality/intro.htm>
- [20] Wilder, C. & Davis, B. (1998). False start, strong finishes. Information Week, November 30, 1998.