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The effectiveness of project management training and certification in an information technology consultancy

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The Effectiveness
of Project Management Training and Certification
in an Information Technology Consultancy

by

Nichole C. Wolfgang

A Thesis

Presented to the Graduate and Research Committee

of Lehigh University

in Candidacy for the Degree of

Masters of Science

in

Management of Technology

Lehigh University

1999

This thesis is accepted and approved in partial fulfillment of the requirements for the

Masters of Science in Management of Technology

11/29/99

Date

Approved by:

                                        Thesis Advisor   _____

                              _____
                                  Department Chairperson

ACKNOWLEDGMENTS

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ABSTRACT

This project studied the efficacy of a technology consulting firm's project management certification program. The success of the program was measured by analyzing several projects that were managed both by employees that had completed the project management certification program and by employees that had not completed the program.

The measure by which these projects were deemed successful was threefold: A successful project was within budget, was completed on time, and met the customer's requirements. The analysis of the project budget and on-time completion was quantitatively conducted on available data. The measure of meeting the customer's requirements was obtained qualitatively through client interviews.

This study analyzed 27 completed projects from with in a single department at the study company. Ten of those projects were led by certified project managers and 17 were led by uncertified project managers. For each project, the initial budget, expected profit, and duration were compared to the actual budget, profit, and duration obtained at the completion of the project. The study found that projects led by uncertified project managers were more likely to be completed with less profit than originally budgeted; while projects led by certified project managers were more likely to be complete with the anticipated or higher profit margin.

The study also found that project managers with no formal training can successfully manage a project. However, the time to competency is shorter for those who have formal training. The implementation of a formal training and certification program can reduce a company's risk of project failure.

Finally, clients benefit from consistent and repeatable service from a company that has a rigorous project management certification program. The client can expect repeatable quality of work for each project and the consulting company will benefit from a client reward of follow-on work.

THE EFFECTIVENESS
OF PROJECT MANAGEMENT TRAINING
IN AN INFORMATION TECHNOLOGY CONSULTANCY

1 Introduction

Many of today's project managers are given projects to manage without any official

training in the area of project management. By the same accord, few companies have a

rigorous process by which their projects are managed. In this study, we look at a service-

oriented, technology consultancy company who has implemented a formal methodology

for managing projects and a training program for teaching it to project managers and

certifying them in its use. How effective is a project management certification process at

helping corporations develop successful project managers? This project will compare the

effectiveness of certified project managers versus uncertified project managers. The study

will focus on the success of projects based on schedule, budget, and quality. The study

poses the following questions:

- What defines a successful project in a technology consultancy?

- Does project management certification help in completing projects
  successfully?

- Can project managers who have no formal training successfully complete
  projects?

- Do employees within a technology consultancy value project management training?

- Do clients perceive a benefit from service providers who have a rigorous project management process?

1.1 Overview of Project Management

As defined by the Project Management Institute, project management is a systematic application of knowledge, skills, tools, and techniques to manage project activities in order to meet or exceed stakeholder needs and expectations. [PMI]

Project management is becoming much more important in today's global economy. Project managers need to be generalists, while most of today's educational systems are designed to train industry specialists. As corporate demand increases for employees who can successfully lead their projects through to completion, corporations are struggling with the difficult task of finding qualified project managers. Due to the lack of trained and experienced individuals, corporations are using what employees they do have. These "accidental" project managers are not formally trained and learn most of the skills they need to manage projects on the job. Presently, few formal training processes exist to select and train project managers and even fewer organizations support their own formalized project management training processes. Pinto and Kharbanda claim this is even true of firms that specialize in project management work. [Pinto & Kharbanda]

Consulting organizations rely heavily on methodologies, or structured, reliable, and repeatable methods for performing tasks, to provide them with competitive advantage. The consulting firm on which this study is based has developed a formalized internal process for training and certifying project managers. Since each project worked on for a client requires project management to control, an expertise that was developed in managing project resulted in a commercial service that could be offered to clients. While project management is a service that can be offered to clients, most projects do not focus on project management consulting as a service. All of their projects, however, are managed by project managers who follow their project management process. This study reviews the service organization's project management training and certification process. The project management methodology, along with the software development, training, and documentation methodologies are key intellectual property elements to the company's success.

1.2   Why Do Companies Need a Project Management Process?

In today's fast paced economy, companies need to differentiate themselves from the competition. The best way to accomplish this is to provide better services and products. How can this be done? One way is to become experts in managing processes, people, and information. [Hutchins] Managing projects effectively to produce quality services or deliverables on time and within budget is essential to meeting an organization's strategic business goals.

The Software Engineering Institute (SEI) has implemented a Capability Maturity Model (CMM). The CMM is a five-level industry standard for measuring the capabilities of a systems development, or information technology (IT), organization. The five levels include:

1. Performed
2. Managed
3. Defined
4. Quantitatively Managed
5. Optimizing

The SEI maintains that project management capability is one key to moving an organization from the initial level 1 to a repeatable level 2. [SEI]

A formalized approach to managing projects should enable companies to increase the number of projects that are completed on time and within budget. Improving the management of projects may help to produce significant cost benefits by reducing unnecessary rework, allocating resources more efficiently, and reducing the number of lost opportunities when projects extend beyond their planned end dates. [Rebeck]

If project management has much to offer a company that relies on successful projects to meet its goals, how does a company ensure its project managers are up to the task? Through experience and training. But even experience has its limitations; while a good project manager may be the most important tool for successfully delivering a complex IT

project, even the most knowledgeable manager needs more than experience and gut feelings to complete complex IT implementation projects successfully. [Radosevich] It has been said that most project managers are like pilots flying without instruments; all is well until the weather turns ugly. A sound methodology and process can provide the radar instrumentation to project managers and help them through a storm without relying only on gut instinct.

Hewlett-Packard is an example of a company that has implemented a project management training program. The manager of this program, Scott Beth, believes that "for any training program to succeed, it has to have sound methodology." [*Supervisor*] HP research concluded that the most significant factor separating average from exceptional project managers was the ability to motivate, coach, support, and lead team members. A training program conveying a sound methodology can help to bring the average project manager closer to an exceptional level by teaching those skills.

There is no one correct project management method for companies to adopt; each company has different strategic goals and, therefore, different needs. The basic project management methodology must be tailored to the organization, product, and industry. [Hutchins]

In another example, Kraft developed an in-house System Development Process (SDP) project management methodology with the aid of RWD Technologies. This methodology enabled Kraft to develop clear alignment objectives for its projects, which in turn helped to

curb costly scope changes after the project was underway. As a result of following this methodology, Kraft's IS department is getting better at avoiding project failures. [Gibbons Paul]

Another successful example of implementing a project management process is McInnes Steel Company. Using a 12-step process, McInnes Steel Company turned a project that, for them, often ends in failure into a success. [Zimmer] By following a standard process, firms can ensure consistency and avoid losing track of important project details.

Beyond managing individual projects, another challenge that corporations are facing today is: Even if companies have experienced project managers, how can senior management track project progress across many different functional areas, and how can they compare one project to another? Without a structured project management system, this task becomes more like comparing apples to oranges rather than apples to apples. For projects that affect all functional areas, such as a year 2000 system remediation project, senior-level management must find a way to track the effort despite diverse project management techniques at the functional level.

1.3 Where Can Companies Go Wrong if They Do Not Use a Project Management Methodology?

A survey by Sequent Computer Systems, Inc. found that 76% of the 500 IT directors surveyed had experienced a major project failure at some point in their careers and that a

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majority of projects fail simply because of lack of project management. The rate of project failure is accelerating, says Gopal Kapur, president of the Center for Project Management. "Project complexity is increasing because there are many unknowns and technology changes are faster and more severe than ever before." [Gibbons Paul]

Project managers monitor schedule, costs, and specifications. What happens if these aspects of a project are given adequate attention? Will projects still fail? The answer is "quite possibly" because one important element is missing from this equation - quality. Quality is a very multi-faceted aspect to a project; what may constitute quality to one person, may not to another. If customers are not happy, the on-time delivery and tight budget controls do not matter much. [Radosevich] Project management cannot only focus on the quantitative side of a project, but needs to focus on the qualitative side as well. The qualitative side of a project extends beyond just delivering the agreed specifications to the client to include the client's perceptions of those specifications and the deliverable itself. Dave Banko submits that people skills are very important to the discipline of project management; the ability to effectively communicate with others is a necessity.

With the integration of functional management and project management becoming more prevalent in today's corporation, attention must be given to project management as well as functional management. Good functional management must be balanced with good project management. A great idea, the best technology, and the right resources can be derailed by a lack of project management. No longer can the IT professional concentrate on only the

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technology angle of a project, as is the case in pure functional management. [McLucas]

Managing resources, schedule, budget, and user needs for each project must be within the

focus as well.

1.4 Training and Certification

Often, projects start up without proper up-front planning or training; this results in project

teams having little understanding of the specific work plans and deliverables.

Understanding client expectations, managing resources and budget, monitoring schedules,

and communicating project details to the client and team members are key to managing a

project successfully. While many employees are functionally competent, few if any have

experience managing major projects. These people need to be trained. For example, if

project managers are given the responsibility for developing a work plan when they have

not yet learned how to develop one, the time and resources required to complete the plan

can be excessive. Worse still, the plan can be incomplete, misdirected, or ineffectively

communicated. This can result in no plan being followed and the project being delayed,

over budget, or off target. However, training must be balanced with timing. If training is

done too early, teams will lose their edge before the project starts. [Pardu]

"Project failure is the inability to deliver the desired effects from new technology on time

and within budget." One of the seven deadly sins of project failure is assigning

) underskilled project managers to highly complex projects. Project managers must possess a well-rounded skill set to succeed. [Zimmer]

In a recent conversation with the division vice president of the study company, who was also the head of the Project Management Council at the time the project management methodology and certification process was implemented, he expressed the belief that "our project managers are better because of the training." After the initial implementation of the project management certification process, an informal study of projects before and after the implementation backed up the company's belief that the certification process improved their projects. This study was based on gross profit percentages. Based on his experience leading the company's project management efforts for over five years as the head of the Project Management Council, the vice president developed Figure 1.
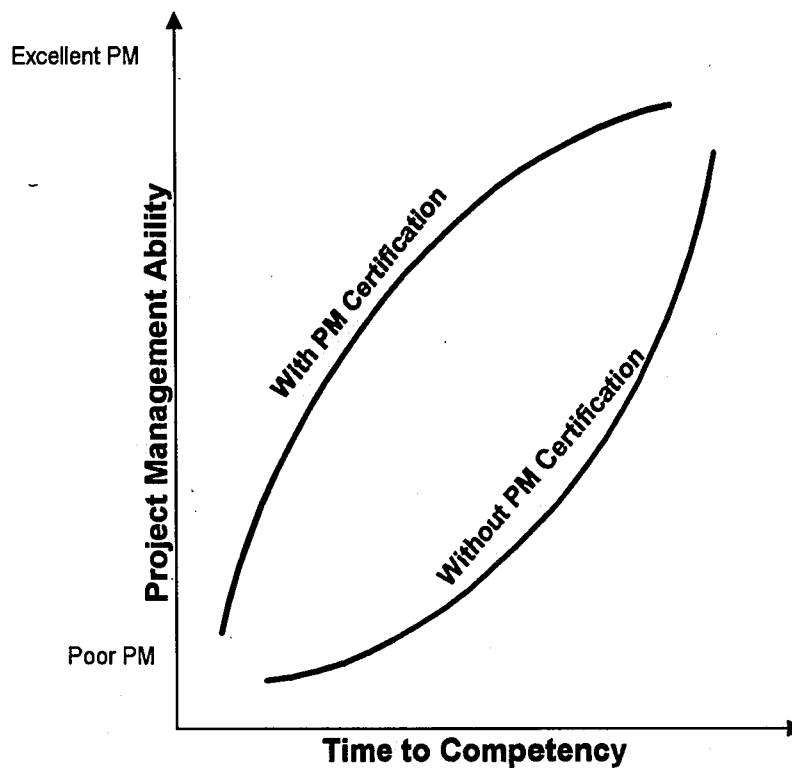
Figure 1 Time to Competency of Project Managers with vs. without Certification

Figure 1 shows that although with experience project managers may become competent at managing projects, a training and certification process can significantly decrease the time it takes to become competent.

1.5 Definitions

To ensure that the readers of this study understand the author's intent, a few terms must be defined.

1.5.1 Project Management Process

As previously stated, project management is defined as the systematic application of knowledge, skills, tools, and techniques to project activities in order to meet or exceed stakeholder needs and expectations from a project [PMI]. Following this definition, a project management process comprises an organizational structure, practices and procedures, and tools that enable consistent project management within an organization. Figure 2 illustrates the study company's process.

Project Management Process Flow

Market	CPP → Proposal → Contract Award → Marketing Turnover
Plan	WBS → Detailed Schedule → Budget Spreadsheet → Risk Assessment → Initial Baseline → Alignment & Launch → Project Plan

Manage

Monthly JCR | Weighted WBS

Invoice Client	Monthly PPR	Review Performance Indicators

Monitor Project ----- Client Satisfaction Call

Client Scope Change	No Scope Change	Internal Change of Cost and Revenue
New CPP	Update Spreadsheets with Actuals	Revise Budget Spreadsheet
Revise Budget Spreadsheet	Issue Invoice	Rebudget
Rebaseline	Continue Performance Metrics Review/PPRs	
	Conduct Project Reviews	
	Project Continuation	

Close

Project Completion → Client Closeout → Lessons Learned → Internal Closeout

Figure 2 Project Management Process

1.5.2   Project Management Training and Certification

For the purpose of this study, project management training is the actual course taken by the project management candidates. The course is intended to teach candidates the project management process followed by the organization, as well as the basic skills necessary to follow the process. The course is not designed to teach students the fundamentals of project management, but rather the customized approach the company follows. The project management certification process is the process that begins with identifying project management candidates and ends with the certification of those project management candidates as project managers. As shown in Figure 3, the certification process includes project management training (through the PM course) followed by practical application of the skills taught via a certification checklist. The final step to obtaining certification includes an oral examination. The oral examination is intended to test the candidate's knowledge and skills in a formal, unstructured format. The project management process focuses on the rather formulaic budgeting process as well as the softer skills of dealing with team members and clients in a variety of situations.

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┌─────────────────────────────────────────┐
│               Step 1                     │
│  Division Management  SelectsProject     │
│         Manager Candidates               │
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                    ▼
┌─────────────────────────────────────────┐
│               Step 2                     │
│          Candidates Attend               │
│   Project Management (PM) Course         │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│               Step 3                     │
│    Employee Completes Part I of the      │
│         Certification Checklist          │
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│               Step 4                     │
│    Receive Certificate for Completion    │
│           of the PM Course               │
└─────────────────────────────────────────┘
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                    ▼
┌─────────────────────────────────────────┐
│               Step 5                     │
│     Obtain Division Director/VP          │
│    Endorsement to Begin Part II          │
└─────────────────────────────────────────┘
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│               Step 6                     │
│   Complete Part II of the Certification  │
│   Checklist by Managing an Project       │
└─────────────────────────────────────────┘
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                    ▼
┌─────────────────────────────────────────┐
│               Step 7                     │
│  Pass Pre-Board Oral Exam by Division    │
│  PM Representatives and Management        │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│               Step 8                     │
│ Obtain Division Director/VP Endorsement  │
│ to Schedule an Oral Certification Board  │
└─────────────────────────────────────────┘
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│               Step 9                     │
│       Pass Certification Board           │
│          by the PM Council               │
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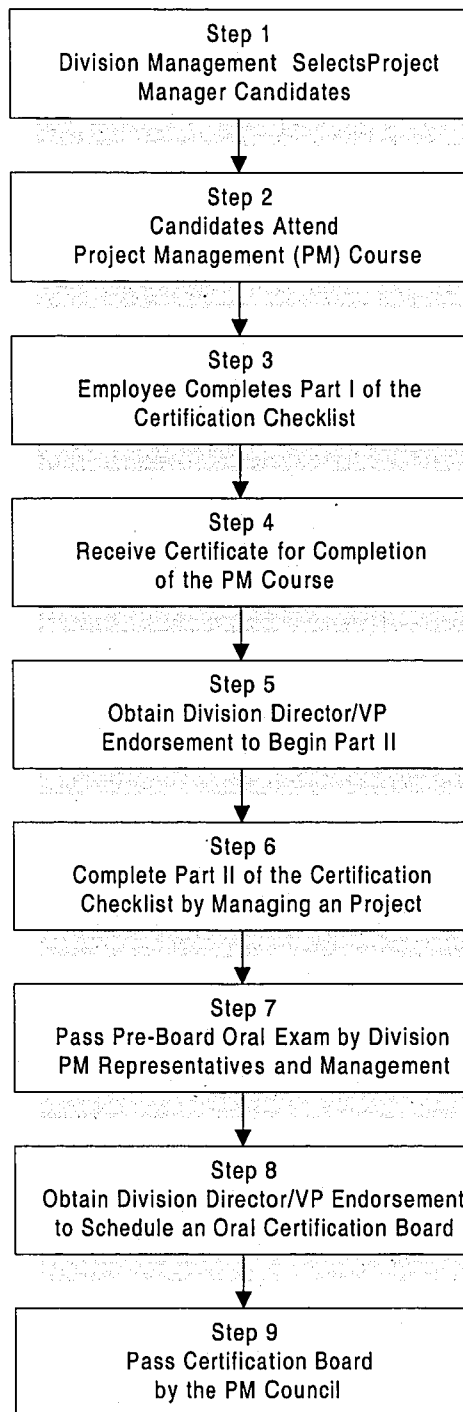
Figure 3 Project Management Certification Process

1.6   Description of the Project Management Certification Process Being Studied

The study company has a matrix organization with a functional management chain and a project management chain. The project management organization consists of three layers: project team members, project managers, and project directors. Within the project management chain, only the project manager layer has a training and certification process; however, project directors must also complete the project management certification process.. Figure 3 outlines the project management certification approach. This approach has not been strictly followed by the department in question; the nine-step process as outlined in Figure 3 has been modified so that Step 3 is conducted in parallel to Steps 5 and 6. This modification resulted from the department not being a headquarters based department and only recently growing to a size of greater than 40 employees. As a regional department, there were fewer projects in which the project management candidates could participate in to obtain their certification. There is no indication that this has reduced the quality of the certification process, but this is not the focus of the study.

2   Research Method

To begin this study, a literature review was conducted. The primary sources of information were periodicals and journals that focused on project management and employee training methods. IT periodicals were reviewed to focus on the current need of the IT industry for qualified project managers. The Project Management Institute (PMI) Web site and

members also provided a wealth of information and background, as one of PMI's main goals is to promote project management as a profession and implement a certification process similar to that of the certified public accountant.

A quantitative analysis was conducted on 27 completed projects within a single department of the study company. The focus of the quantitative analysis was to determine if projects were successful or not based on their budgets and schedules. A qualitative aspect to project ranking was achieved through client interviews.

Surveys were sent to all thirteen employees in the department who were taking part in the project management certification process. In addition, two employees were interviewed who were at the end of the certification process, and therefore had a broad experience as project managers before training and certification.

2.1 Project Evaluation

For this study, 27 completed projects from within one department of the study company were analyzed quantitatively. The projects were conducted between 1997 and 1999. For each project, the budget and schedule were reviewed in an effort to develop a project ranking system. For this research, the level of project success was to be measured using:

- Budget - percent variance from original profit margin expected

- Schedule - percent variance from original schedule

- Quality - based on interviews of clients

2.1.1 Budget

Those projects whose gross profit came in at or above the budgeted gross profit were considered successful with respect to budget. That is, at the onset of the project based on budget labor, travel, and other costs, a project figure for gross profit was determined and monitored. Gross profit is the revenues collected from the project minus the project costs. Factors affecting gross profit include:

- **Change in Scope** - additional funding may be necessary

- **Change in Personnel** - employees may be replaced with others at differing pay scales

- **Change in Travel** - more or less travel may be required

2.1.2 Schedule

For each project, an expected duration based on the timeline and milestones was recorded at the onset of the project. The expected duration was then compared to the actual length of the project, which was calculated using the invoicing information. The actual number used for this study was the percentage difference between the expected duration and the actual duration. The factors affecting the project duration include:

- **Change in Scope** - more or less time may be needed to complete the changed scope

- **Client Availability** - project where much client input was required may be affected by the changing priorities of the client. Projects are occasionally put on hold while other client projects take precedence.

2.1.3 Quality

Quality was much more difficult to quantify. In the normal project management process of the study company, a client satisfaction call is held at the close of each project. The purpose of this call or meeting is to determine whether or not the client was pleased with the work and to identify any areas for improvement for either the consulting company or the individuals who worked on the project. The client satisfaction call is conducted by upper management, not the project managers. Unfortunately, the results of these meetings for each project were not recorded in the available database. For a few of the projects, the author was able to interview the clients herself or be involved in the client satisfaction call, but there was not a complete set of data for all 27 projects.

Two client interviews were held during this study by the author. These were unstructured interviews. The two interviewees were long-standing clients of this department. The main question of the interviews, without mentioning the focus of this paper, was: Why do you continue to use our services? The results of the interviews are provided in Section 3.3.3 of this document.

2.2 Project Manager Surveys and Interviews

Surveys were sent to all thirteen employees within the department that were involved in the PM process. These included employees who were just beginning the certification process

(that is, had recently attended the training), to those who are certified and currently

managing projects. The surveys were intended to determine the employees':

- Educational background

- Previous project management training

- Previous project management experiences

- Level within the project management certification process being studied

- Impressions of training and certification processes

- Impressions of the project management certification process at the study
  company

- Experience managing projects within the project management process

Appendix A contains the survey as it was distributed to the respondents. Prior to

distribution, the survey was reviewed and edited for comprehension by two independent

observers who are familiar with the project management experience. Of the 27 projects, 10

were lead by certified project managers, and 17 were lead by uncertified project managers.

Two of the project managers surveyed were interviewed one-on-one.

3   Results

The first formal project management training course was held in 1990. In that year, three

employees were certified; since then, an increasing number of employees have been

certified each year. Figure 4 shows the number of project managers that were certified

each year from 1990 through 1996. Over those same years, as the number of certified

project managers increased, the dispersion between actual and budgeted gross profit tended

to decrease as the overall gross profit on the projects increased in current dollars (see

Figure 5).

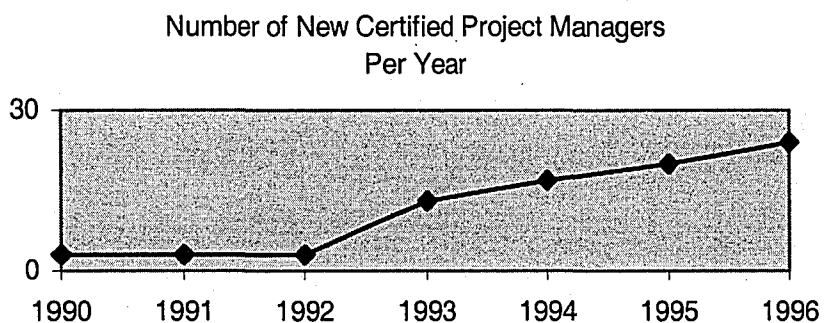Number of New Certified Project Managers
Per Year

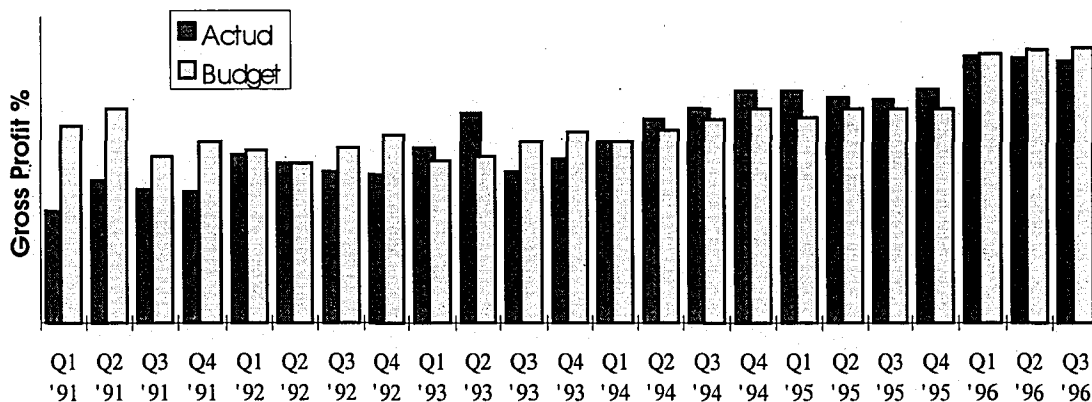Figure 4 Growth of Certified Project Managers 1990 through 1996

Figure 5 Gross Profit Trend 1990 through 1996

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project managers increased, the dispersion between actual and budgeted gross profit tended

to decrease as the overall gross profit on the projects increased in current dollars (see
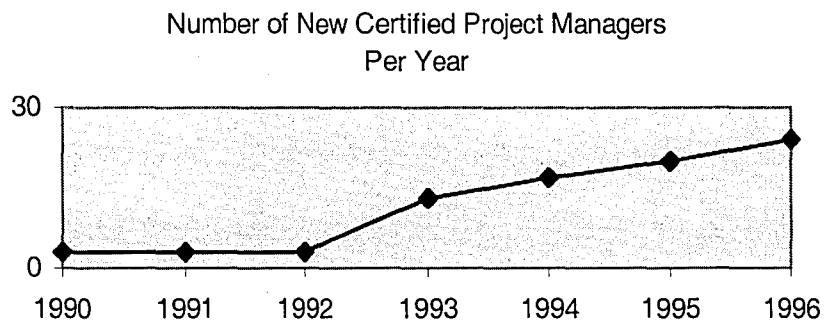
Figure 5).

Number of New Certified Project Managers
Per Year

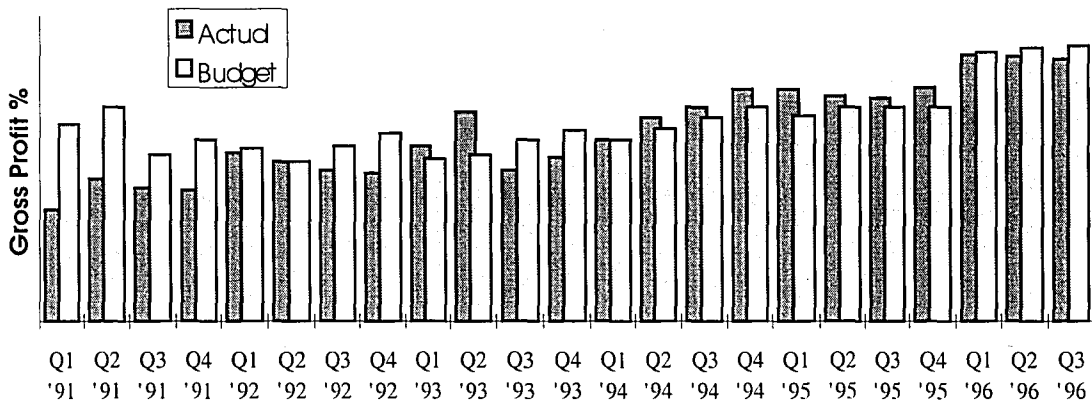**Figure 4 Growth of Certified Project Managers 1990 through 1996**

Figure 5 Gross Profit Trend 1990 through 1996

These figures suggest that the increased number of certified project managers enabled the company to be come more accurate in its ability to estimate budgets and profit level. Also, project management certification may have had an impact on the company's overall profitability, because as project managers became more professional and more consistent in their approach the company may have been able to offer higher quality to clients and therefore able to raise their rates.

3.1 Project Evaluation

In this study, 27 projects were reviewed. The projects were a mix of IT development projects, process improvement projects, and documentation projects. Figure 6 depicts the change in budgeted revenue and the change in project duration as percentages. The projects were assigned arbitrary numbers for the purpose of comparison. It was noted that the projects with greatest variation in revenue also tended to be the projects that varied the greatest in duration. Project 18, for example, was one in which the project scope varied and additional funding and time were permitted. Projects such as 19 and 2, which came in under budget, but later than scheduled, were most like projects that relied on client data. Most often when client input is required, via interviews or reviews, scheduling becomes difficult and can push off a project deadline by days or weeks to accommodate client schedules. When information is required from clients, revenue is budgeted to anticipate client input; less input will cause the project to come in under budget.
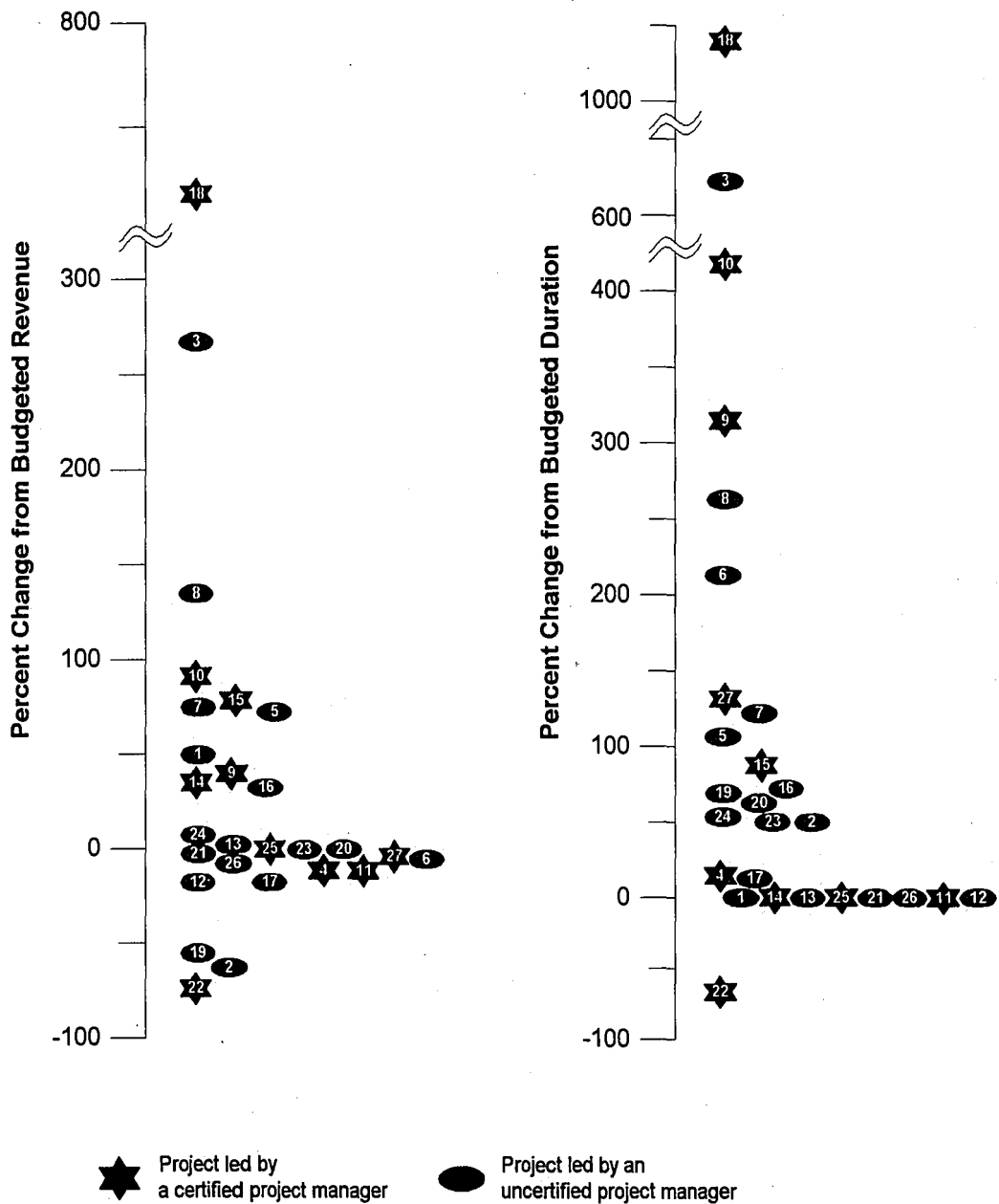
Figure 6 Change in Revenue and Duration for the 27 Study Projects

As shown in Figure 6, the results from the 27 projects for the department being studied did

not show any obvious relationship between projects led by certified project managers and

projects led by uncertified project managers. Projects led by certified project managers

were dispersed along the revenue and duration axis in a bell curve, as were those projects

led by uncertified project managers. It did appear, however, that projects led by certified

project managers generally had a higher rate of positive gain in gross profit as compared

with projects led by uncertified project mangers (see Figure 7).

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       ┌─────────────────────────────────────────────────┐
       │ Projects led by certified project managers        │
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   │   Projects led by uncertified project managers        │
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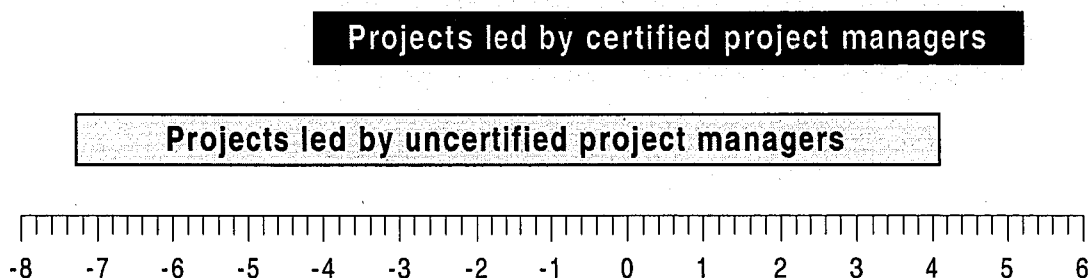
Figure 7 Percent Change in Gross Profit (Certified versus Uncertified Project

Managers)

Projects led by certified project managers tend to balance around the targeted gross profit,

while those projects lead by uncertified project managers tend show a decrease in project

profitability compared to the initial plan.

3.2 Surveys

The survey response rate was 77%. Of the ten surveys returned, three respondents were

just beginning the project management certification process, three were almost complete

with the project management certification process, and four were certified. The

respondents varied in background with the majority (>50%) of respondents having an engineering background. Greater than 50% of respondents had at least one masters degree. Several respondents had no prior project management experience, while others had managed "lots" of projects.

Of those respondents who had prior project management experience, but no formal training, all felt that formal training would have helped them manage their projects differently. One respondent commented that because of the lack of formal training, "I repeated mistakes and missed opportunities to maximize value versus available budget." One respondent felt that training was especially important since every company she had worked within managed projects differently.

Those respondents who had not previously managed projects felt there was a performance improvement after taking the class, while with one exception (he answered "N/A") those who had managed projects before did not feel that their performance improved after training.

All four certified respondents had prior project management experience and none of them felt there was a significant improvement in performance after certification. One certified respondent did, however, feel that her understanding of "what was required of me financially" improved. The result of experienced project managers not feeling that performance improved after attending the training course is most likely because they had

already learned the basics of project management from previous experience. In contrast, inexperienced project managers had a "blank slate" on which to start their learning.

The questionnaire asked respondents about training and certification in general and as it related to the study company. This allowed the respondents to voice whether they felt training and certification were useful. The large majority felt that training was useful for the following reasons:

- Training helps to familiarize students with the accepted process.
- Training allows a company to focus on the specifics of their project management process.
- Training provides a basis for developing skills through the certification process.

Certification allowed the students of the training course to apply their newly learned skills in a practical situation. A certification process is valued for promoting project management consistency within a company. While certification got generally positive marks through the surveys, one respondent pointed out that certification is particularly valuable in work processes for which there is a high cost of failure.

Several respondents focused on the shadow project manager and mentoring process as being very effective training techniques. A shadow project manager assumes the responsibility of managing a project under the guidance of a certified project manager. Being a shadow project manager allows one "to use the tools, make decisions, and have [those] decisions assessed" while not exposing the company to risk. One particular

respondent advocated the use of a project management process, because it allows the project manager to focus on managing a project without spending countless hours wrapped up in details. The training allows project managers to identify and focus on key project indicators such a budget, schedule, and client acceptance of the deliverables.

From either prior training courses or the current company's training, respondents felt that training often lacked the rigorous focus on people issues from both a team and client perspective.

3.3 Interviews

In addition to distributing surveys, the author conducted detailed interviews with two of the respondents: one with an individual who only recently became a certified project manager (Candidate A) and the other with an individual who is at the end of the process and will be scheduling a final board soon (Candidate B).

3.3.1 Candidate A

Candidate A had previously worked on the financial side of managing projects. She had attended a formal project management training program at an engineering firm, but she felt the project management process itself was lacking in a standard set of tools in support of the process.

From her experience at the current company and at previous companies, she felt that one of the hardest things for people to do as project managers is focus on the scope of a project. "It seems simple, but people have a hard time doing it." A saying that she had picked up during her previous work had stuck: "Plan the work, work the plan."

Candidate A felt that a certification process should help instill a sense of responsibility for the work product and the resulting financial and marketing impact. It should promote confidence of a project manager's ability to have a positive impact, and should provide easy-to-use tools with the training to support them. In order for a project management process to be effective she felt that the certification should be tied to a reward and incentives program. The training should clearly show employees what role their projects play in the health of the department and the company as a whole. She did not feel, however, that there was a difference in her performance either after taking the training at the study company or after becoming certified.

One specific project, which Candidate A managed prior to her certification, was a six-month documentation project with clearly defined deliverables, budget, and schedule. That is, the project did not undergo changes in scope. This particular project came in 1.6% over budget and produced a gross profit of 1.3% less than expected, and was an average size (in terms of dollar amount and staff number) project for the department being studied. Candidate A had not taken the course at the onset of the project and found herself focusing on client relations. She did feel that there was good management support available to her.

After taking the course, she felt her role as a project manager was more clearly defined and the role of her management (project director) was also clearly defined.

Similar to many other projects studied, this project had specific client requests that were not specific to the project management process, but the process itself was flexible enough to accommodate them. The client wanted weekly reports; the process requires monthly reports, but weekly reports were created for the client. Mid-way through the project it was determined that more effort was being spent on a deliverable than anticipated. To react to this, an internal project review was held (which is built into the process) and the impact and alternatives were discussed and then presented to the client.

3.3.2 Candidate B

Candidate B also had previous work experience managing projects, but not in a consulting environment. Upon joining the study company, he believed that becoming certified would be easy with his previous experience, but found that the financials in a consulting environment are extremely complex. Budgets and costs are much more important in such an environment.

Candidate B feels that a certification process can give management confidence in their employees and allow management to evaluate employees in order to determine what size project or how much risk a project manager can take on. Specifically, the study company's

certification process contained "well-defined methodologies with distinct tools" which cover a lot of problems that can occur within projects.

3.3.3 Summary and Comparison of Candidate Interviews

Both candidates had started managing projects in the study company before they had taken the course. Although Candidate A had a financial background, both candidates found that they initially focused on client relations and project scope while not fully understanding the study company's financial methods.

Both candidates also felt that their previous companies would have benefited from a certification process. It was agreed by all, including some survey respondents, that soft skills (or people skills) are very difficult to teach but are very important to project management. Candidate B felt that this is where a project director can add value, helping to manage a variety of people with different styles by providing a check and balance.

Both candidates also felt that the oral examination for certification is a bit overwhelming, but it helps management to assess how employees will behave under stressful situations.

3.3.4 Client Interviews

Two clients were interviewed. Both were very brief interviews with one specific question: Why do you continue to choose our company to work with?

While one client specifically stated that she values the study company's rigorous project management process, the second client listed the following reasons:

- The study company continually exceeded her expectations

- The study company delivered on time

- The study company delivered within budget

- The study company understood and fit into her company's culture

Though she did not directly state that our project management process influenced her choice to keep us as a vendor, three out of four of her responses are a direct result of good project management as defined by this study.

4 Discussion

A potential new hire, who had previously managed projects, was asked during her interview how she would feel about joining an organization with a well-defined project management process, her response was: "That would be great. For years I have been struggling with the task of figuring out how to manage projects on my own." By having to focus on developing her own unique methodology on the job, the candidate's efforts were diverted from focusing on the project. She was constantly learning from mistakes that she was sure others had already experienced in her organization. This sentiment was supported by the survey results from this study.

In order for corporate training to be effective, it should focus on the corporation's specific process. Ideally the fundamentals of project management should be taught before the corporate training through either a graduate-level course or by reading the many books

available on project management (such as On Time/On Budget by Baker & Baker or The Little Black Book of Project Management by Thomsett). Corporate project management training should focus on the specific application of project management within the company's environment, the specific tools the company uses, and the expectations that upper management has of its projects and project managers. The organizational structure that a company has in place to support project management should be clearly communicated through training to the perspective project managers.

Certification can be a very useful method to ensure a consistently high level of project management, but it is not necessary for all companies or all areas within a corporation. As was brought out in the surveys, a certification process should be in place in those companies or corporate areas where there is a high cost of failure. Companies which regularly undertake large information technology projects or new product development efforts may wish to implement a certification process. At a very minimum, to maximize project effectiveness companies should have a consistent and defined project management process. This has been demonstrated through several industries. Consulting companies whose entire business revolves around delivering quality products on time and within budget need to have a repeatable approach to ensure requirements are met on a variety of projects.

For training to be effective, it should:

- Consistently communicate the company-specific project management process

- Clearly tie the process to the overall corporate strategy .

- Be delivered in a timely manner (early on in an employee's career as a project manager, but not too soon before the employee can apply the knowledge and tools)

- Teach the employees how to use the tools that support the process

- Clearly define the project manager, team member, and upper management roles

While a certification process offers the students an opportunity to apply those skills on real projects and in real situations, a certification process also offers a company the ability to readily ensure their employees have the skills necessary to be a project manager. Taken even further, companies may choose to use a certification process as a means by which employees can be rated and assigned to projects with a degree of risk that matches their skills.

Both training and certification have much to offer a company, but only if they are implemented effectively. Much investment goes into developing a standard process and the training curriculum that goes along with it and therefore companies do not want to lose their trained and certified employees. In order not to lose those employees that have been successfully certified, as with any valued skill, a company needs to support the certification process with a rewards based system that ties the achievement of being certified into an appropriate reward for the employee.

This study has shown that a service organization can better manage its projects and secure follow-on work with clients through effective project management. Furthermore, an effective training and certification program can help an organization achieve a more consistent level of project management.

5 Conclusion

This paper set out to answer the questions posed in the introduction. In conclusion, the following answers were derived through the study:

- **What defines a successful project in a technology consultancy?** From both a client perspective and a service provider perspective, a successful project is one in which a quality deliverable or service is provided on time and with in budget. While quality is subjective, it is agreed that the deliverables must meet the client's expectations without jeopardizing the scope.

- **Does project management certification help in completing projects successfully?** Yes. A certification process with a strong project management process as its basis allows firms to ensure a consistent process is being followed providing for a better approach to tracking project progress. It provides employees with a relatively risk free environment in which to hone their project management skills.

- **Can project managers who have no formal training successfully complete projects?** Yes, as many of the project managers in this study have proven. However, a

training program can help bring project managers up to a higher level of competency more quickly than learning it on the job and ensure consistency through an organization. Also, certified project managers were able to complete their projects successfully with higher profits.

- **Do employees within technology consultancy value project management training?** Yes. Each employee either surveyed or interviewed valued the project management training they received. According to the respondents, there were several areas of the training process that could use improvement, but the overall rating was high.

- **Do clients perceive a benefit from service providers who have a rigorous project management process?** Yes. A repeatable process offers assurance of consistent results to clients. The two interviews held with clients, as well as numerous client satisfaction calls show that clients value on-time, under-budget delivery of products that meet their requirements. Project management provided managers with the tools and knowledge to monitor and manage to those aspects of a project.

6   Lessons Learned

Study fewer, more similar projects in more detail. Compare similar projects managed by certified versus uncertified project managers. While the projects within the study division were interesting, the focus of each was relatively unique. This study would have been more effective if I had focused on all software development projects, or enterprise resource

planning implementation projects. While those areas also present unique projects there would have been more similarities by which to compare.

If time permits, I would recommend studying a corporation who is planning to implement a project management process through training and/or certification process, analyzing the current pre-process projects and compare those to similar post-implementation projects. Such a study should produce more measurable results. While I feel there is a difference between projects managed by trained and certified project managers, a larger data set would likely produce a more detailed comparison and clearer results.

7 Continuous Improvement

Currently the study company has an effort underway to improve their training program. The following suggestions resulting from this study will be submitted:

- Include more information on the financial system (and thus the calculations a project manager must make) being used at the company
- Provide a more thorough review of the tools being used at the company

An effort is also underway to implement a more formal project mentor process. Mentoring has been occurring throughout the company, informally and as needed. The company hopes to develop a more formal process in which project management candidates are assigned a mentor.

Appendix A   Project Management Questionnaire

Name:

Project Management Level: Just Beginning   ☐

                                Almost Complete   ☐

                                Certified   ☐

Date of Certification (if applicable):

Educational Background:

Did you manage projects before coming to the study company?   Yes ☐   No ☐

If "Yes," how many?

How large were the projects? (Please expound on scope, number of deliverables, size of team, skill set of team members, and budget.)

Did you have any formal project management training?   ☐ Yes

                                                             ☐ No

If "Yes," please provide some details, such as: Who gave the course? What did it cover? How effective did you feel it was?

If no, do you feel formal training would have helped you manage the project differently?

How many projects have you managed at the study company...

As a Certified PM?   As a shadow PM?   Prior to PM training?

Project Management Training and Certification Thoughts

What are your thoughts on PM training in general?

What are your thoughts on a certification process?

What are your thoughts on the study company's training and certification process?

Did you feel there was a difference in your performance...

Before vs. after taking the   Before vs. after being
training course?   certified?

What (if anything) did you value in the training program?

What (if anything) did you value in the certification process?

What (if anything) was missing from the training program?

What (if anything) was missing from the certification process?

How would you describe the purpose of the study company's PM training?

How would you describe the purpose of the study company's PM certification?

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RÈSUMÈ

Education   BS, Chemical Engineering (minors: Chemistry; German), Drexel University

Licenses and   • RWD Certified Project Manager   **Language**   German
Certifications   **Proficiency**

                • Engineer in Training

Experience   **RWD Technologies**
1995 - Present

Ms. Wolfgang is a team leader in the Pharmaceutical/Biotech Industry Center of Excellence. She presently serves as the Princeton Office Web development process mentor. Ms. Wolfgang also serves as a mentor for the RWD project management certification process, working closely with employees to develop and achieve their goals within the process. She is currently working with SmithKline Beecham to help implement a project tracking process in an information systems organization.

In addition, she has worked on and managed several projects for Merck:

♦ Ms. Wolfgang managed a project that involved the design of an Intranet site that incorporated User Manuals for clinical trial software developed in Word 97 and delivered in HTML.

♦ Ms. Wolfgang worked with a team of RWD employees to conduct a process improvement study of the Merck Clinical Trial Software Development process. From information gathered through extensive client interviews and focus groups, she developed reference and training manuals on the process. She conducted Train-the-Trainer sessions on

the materials.

- ◆ Ms. Wolfgang developed unit and integration test plans for an applications interface system for Merck Manufacturing Division.

- ◆ Ms. Wolfgang developed system documentation for several modules of a large-scale client/server system for Merck Research Laboratories. The documentation includes system administration, user, and programmer guides.

1994   **Centre for Management and Environmental Resources - INSEAD**

Ms. Wolfgang created a database of unit processes to be used in the study of life cycle analysis. She published two papers, including one that documented the simulation process used in the development of the database.

1993   **Wieland Edelmetalle, GmbH**

In southern Germany, Ms. Wolfgang worked in several departments in the precious metal factory, including the preparations laboratory, analytical laboratory, and the waste water department. In the metalography laboratory, Ms. Wolfgang developed dental alloys for the new product line.

1992   **PQ Corporation**

Ms. Wolfgang created a custom data collection system that was implemented to record and calculate process information during the production of sodium and potassium silicates. She also analyzed historical data to improve quality control and to chart standard operating conditions.

END OF TITLE