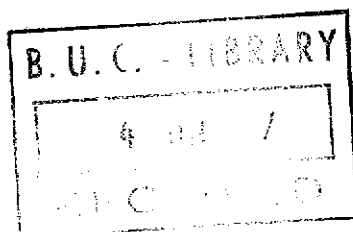# Lebanese American University

# THE ATTITUDE OF PROJECT MANAGERS TOWARD USING MICROSOFT PROJECT FOR PLANNING& SCHEDULING

By

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*To those I deeply Love*
*My Father*
*My Mother*

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# *Abstract*

With the growing and complexity world of business, anything one tries to accomplish on budget requires a thorough plan. It requires good management to identify and correct problems before they impact his/her budgets or schedule. And good communication to keep his/her team focused on the right objectives at the right time.

One tool that has become an absolutely necessary expedient in implementing project management techniques is the computer. The impact of computers and expand information capabilities has been evident within many fields. Considering information as a valuable resource and using technology to generate reliable and fast information have achieved significant cost reductions

Microsoft Project has been widely recognized for more than five years as the easiest- to- use project management software. Moreover, Microsoft Project shares data easily with other programs in Microsoft Office. Beneath this ease of use is a powerful planning , analysis, and management tool that lets one builds enterprise-wide, mission-critical project management solutions.

Based on that, the purpose of the study was to see the awareness of the Lebanese managers toward the advantages of using Microsoft Project. In addition, it was to  see the difference between the professional users and the

non professional users of Microsoft Project. Also, it discussed the factors that most likely affect on their attitude toward using it.

It is hoped that this effort will assist in furthering the studies aimed at improving level of computer usage by project manages and others. In addition, amid at investigating the factors that are most likely to play a critical role in using Microsoft Project.

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# Chapter I

# Introduction

## 1.1 Overview

Life generally is becoming more complex with faster change in all fields of life. That change, also, can apply on project management which requires an efficient management to manage that kind of change. For that, project management differs from conventional management in that a project has a more limited, narrowly focused goal than traditional management goals. Traditional management training focuses on managing an ongoing organization to assure its success and survival. Project management, on the other hand, focuses on finite deadlines and objectives. Moreover, project management is the application of management principles to plan, organize, staff, control, and direct resources of an organization in pursuit of a temporary or one-time specific goal.

Traditional project management has enabled humans to do some incredible things. For example, it provided the U.S. National Aeronautics and Space Administration (NASA) with the management capability to put men on the moon. It makes possible the construction of oil-drilling platforms in the North Sea. The traditional project management has served us well. But the problem with the traditional project management is that it is broken[1]. One deficiency is its inattention to the importance of the customers. Customer satisfaction is often treated as an

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[1] J. Davidson Frame, The new Project Management, (San Francisco: Jossy-Bass Publishers, 1994), pp.5-8.

afterthought. Most energy is directed toward satisfying the famous triple constraints of time, budget, and specifications. Another problem with the traditional approach to project amassment is its single minded focus on a fixed set of tools for dealing with scheduling, budgeting, and resources allocation. A final problem with traditional project management is its narrow definition of what it should be concerned with.

The turmoil of the 1980s and 1990s changed all that. The desire for survival required that organizations do their work differently. Three arguments are central to the new project management (1) project management becomes more customer focused; (2) it explores the use of new management; and(3) it redefines the role of the project managers

The project manager, nowadays, is responsible for coordinating and integrating activities across multiple, functional lines. In order to do this, the project manager needs strong communicative and interpersonal skills, must become familiar with the operations of each line organization, and should have a *general knowledge of the technology being used.*

## 1.2 Computer and Project Management:

One tool that has become an absolutely necessary expedient in implementing project management techniques is the computer. The impact of computers and expanded information capabilities has been evident within many fields. Considering information as a valuable resource and using technology to generate reliable and fast information have achieved significant cost reductions.

By handling routine calculations faster and with uncanny accuracy, the computer can help and analyze projects faster than manual methods. However, it can not plan or analyze a project without the logical ability of the human being

As organizations merge, split, and downsize, managers face increasing pressure to improve efficiency and to document actions taken toward that goal. And they are turning to project management software for help. Project management programs provide a single interface to track and manage all the people, resources, and decisions employed to reach a goal. While using time - honored models such as Gantt and PERT chart, the current generation of project managers also uses newer E-mail and work group concepts to involve groups of people in project tracking.

## 1.3 Microsoft Project:

In the fast paced world of business, anything one tries to accomplish on budget requires a thorough plan. It requires good management to identify and correct problems before they impact his/her budgets or schedule. And good communication to keep his/her team focused on the right objectives at the right time.

For that, looking for a project software that can be used by anyone who does not have an experience in project softwares is a difficult matter. Many specialist companies tried to test and analyze several project softwares to give a recommendation for the best efficient project software. Microsoft Project is one of the best project softwares recommended by specialists.

Microsoft Project has been widely recognized for more than five years as the easiest- to- use project management software[2]. Moreover, Microsoft Project shares data easily with other programs in Microsoft Office. Beneath this ease of use is a powerful planning , analysis, and management tool that lets one build enterprise-wide, mission-critical project management solutions. Visualize the most complex plans by splitting project into manageable steps to see in detail how the tasks are related, which are most important to ones overall schedule, where bottlenecks will be, and how much the whole project will cost. Or, consolidate several projects to assess shared resources, team workloads, and whether the projects one is planning at one time really make sense together.

One can even communicate the status of projects automatically. Built-in links to Microsoft Exchange make it easy to publish selected attributes of a project- such as when deliverables are due- without involving everyone in the details.

In addition, there are over 1.5 million users of Microsoft Project to-date. 70% of the users are "category newcomers" with no previous project management software experience. Within the current market, less than 10% of the project management market is represented by the " high- end" project management packages. Microsoft Project can be found in companies such as Hewlett Packard, AT&T, Digital Equipment, Electronic Data Systems, the US Department of the Air force and organizational solutions have been created with Microsoft Project in companies as varied as SmithKline Beecham and PacTel Cellular[3].

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[2] Microsoft Corporation, MS Project for Windows 95 Product Enhancements Guide, (1995), pp. 1-19.
[3] Ibid., p. 1.

Based on this, we selected Microsoft Project to be the base that our study will build on.

## 1.4 The Need of The Study:

*Microsoft Project* is a "powerful project management application that can help the project manager to control his project and complete it successfully. It gives the project manager flexible viewing of project information, a powerful scheduling tool, resource management capability, and quality reports. For example, one can create a simple schedule quickly by entering all his tasks and then using his one command to make each task before it finishes. Or one can create a detailed schedule, entering all the project information one has gathered including tasks, resources, costs, and detailed work information for each resource and use this schedule to track the progress of the project. Thus managers can make better decisions because they have accurate information. However, despite all these advantages of Microsoft Project, many project managers running their projects operating in Lebanon are not using any project software at all, or using them in very simple way.

Moreover, Since Microsoft Project has been designed for those who do not have previous project management software experience, the study will try to see the awareness of the Lebanese managers toward the advantages of using Microsoft Project. In addition, it will see the difference between the professional users and the non professional users of Microsoft Project. Also, we will discuss the factors that most likely affect on their attitude toward using it.

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## 1.5 Statement of Hypothesis

1. The professional respondents have positive attitude toward using Microsoft Project.

2. The non professional respondents have positive attitude toward using Microsoft Project.

3. Factors such as Friendliness, organizational and personal aspects affect the attitude of the professional and non professional respondents toward Microsoft Project.

## 1.6 The Statement of Purpose

Today's projects are operating in an environment which is quite paradoxical. On the other hand, technological resources are providing projects with the benefits of better access to information, time saving accuracy and effectiveness in work. In addition, computer software applications are available that would provide the projects with the relevant information to be obtained, analyzed, and reviewed in a timely manner. Moreover, many softwares can help in the difficult task of tracking and controlling projects.

Based on this, the study based on an experimental design that will be conducted in this study, the factors related to and the outcome resulting from the use of Microsoft Project will be identified. Such factors include personal attributes, perception, and computer knowledge. Finally, the factors that are most likely to be associated to creativity along with the relationships among the various variables will be investigated.

## 1.7 **Research Project Outline:**

As an outline of the research:

♦ Chapter II reviewer the literature around the topic.

♦ Chapter III will be a presentation for the design and the methodology to be followed in conducting the study and analyzing the findings.

♦ Chapter IV will include the results of the findings and their analysis.

♦ Chapter V summarizes the findings and presents the limitations, conclusion and recommendations of this work.

# Chapter II

# Literature Review

## 2.1 General Description of Project Management

Managing specific projects differs somewhat from conventional management in that a project is a more limited, narrowly focused goal than traditional management goals. Traditional management training focuses on managing an ongoing organization to assure the success and survival of the organization. In order to understand project management, one must begin with the definition of a project.

## 2.1.1 Definition of Project Management

A project can be considered to be any series of activities and tasks that:[1]

- Have a specific objective to be completed within a certain specification.
- Have defined start and dates.
- Have funding limits (if applicable)
- Consume resources(i.e., money, people, equipment)

Project management, on the other hand, involves project planning and project monitoring and includes such items as:

- Project planning
  - ◊ Definition of work requirement
  - ◊ Definition of quantity and quality of work
  - ◊ Definition of resources needed
- Project monitoring
  - ◊ Tracking progress

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[1] Harold Kerzner, Project Management a systems approach to planning, scheduling, and controlling, (NY: Van Nostrand Reinhold, 1995), p.2

◊   Comparing actual outcome to predicted outcome

◊   Analyzing impact

◊   Making adjustments

Successful project management can then be defined as having achieved the project objectives:

- Within time

- Within cost

- At the desired performance technology level

- While utilizing the assigned resources effectively and efficiently

The potential benefits from project management are:

- Identification of functional responsibilities to ensure that all activities are accounted for , regardless of personnel turnover.

- Minimizing the need for continuous reporting.

- Identification of time limit and scheduling.

- Identification of methodology for trade-off analysis

- Measurement of accomplishment against plans

- Early identification of problems so that corrective action may follow

- Improved estimating capability for future planning

- Knowing when objectives be met or will be exceeded

Unfortunately, the benefits cannot be achieved without overcoming obstacles such as:

- Project complexity

- Customer's special requirements

- Organizational restricting

- Project risks

- Changes in technology

- Forward planing

Project management can mean different things to different people. Quite often, people misunderstand the concept because they have ongoing projects within their company and feel that they are using project management to control these

activities. In such a case , the following might be considered an appropriate definition:

"Project management is the art of creating the illusion that any outcome is the result of series of predetermined, deliberate acts when, in fact, it was dumb luck."[2]

What we mentioned above was the definition that has pertained for the past twenty years or so. Today, the definition of project success has been modified to include completion :

- •Within the allocated time period
- •Within the budgeted cost
- •At the proper performance or specification level
- •With acceptance by the customer/user
- •Without disturbing the main work flow of the organization
- •Without changing the corporate culture

Kerzner [3]explained the last three elements further. Very few projects are completed within the original scope of the project. Scope changes are inevitable and have the potential to destroy not only the morale on a project, but the entire project itself. Scope chances must be held to a minimum and those that are required must be approved by both the project manager and the customer/user.

Project managers must be willing to manage (and make concessions/tradeoffs, if necessary) such that the company's main work flow is not altered. Most go-ahead, and would like to divorce their project from the operations of the parent organization. This is not always possible. The project manager must be willing to

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[2] Ibid., p.4

[3] Ibid., p.6

manage within the guidelines, polices, procedures, rules, and directives of the parent organization.

All corporations have corporate cultures and even though each project may be inherently different, the project manager should not expect his assigned personnel to deviate from cultural norms. If the company has a cultural standard of openness and honesty when dealing with customers, then this cultural value should remain in place for all projects, regardless of who the customer/user is or how strong the project manager's desired for success is.

As a final note it should be understood that simply because a project is a success does not mean that the company as a whole is successful in its project management endeavors. Excellence in project management is defined as continuous stream of successfully managed projects. Any project can be driven to success through formal authority and strong executive meddling. But, in order for a continuos stream of successful projects to occur, there must exist a strong corporate commitment to project management, and this commitment must be visible.

## 2.1.2 The Role of Project Management.

In   1968, a landmark study[4] of the practices of senior management in leading industrial corporations noted the responsibilities of directors for project management. The study was conducted by Paul Holden and several members of the faculty at

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[4] David I. Cleland, Project Management: Strategic Design and Implementation, (NY: McGraw-Hill, Inc., 1994), p.116

Graduate School of Business at Stanford University. Their findings established that project management was an important factor in overall enterprise management. The study further found that the high-level committee ( such as the board of directors )

widely used was valuable.

Many companies use project management techniques because of the importance of project to the company. "Managers might not want to place it in the " bureaucracy" of the organization, where it might become lost in the daily operational workings"[5]. When an ad hoc activity has high risks and uncertainty factors, then the use of project management techniques may be required. If an emerging problem or project is viewed as potential building block in the design and implementation of future strategies for enterprise, then project management techniques are required. Moreover, Cleland[6] added that an important part of an organization's policy should be a statement of the conditions under which project management will be used. Senior managers will develop these criteria when they realize the important role that projects can play in the management of the enterprise. The important thing to remember is that a project , as an ad hoc activity , cannot stand on its own ; it is interrelated to the strategic mission of the organization. A project is to complete some goals that are held by the larger organizational unit-the department, the division, or the corporate entity. The reason for using a project is to provide a focus for organizational resources to be applied against the organizational problem or opportunity so that an enterprise goal

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[5] Ibid., p.67

[6] Ibid.

can be attained.

## 2.1.3 Classification of Project Management.

The principles of project management can be applied to any type of project

and to any industry. However, the relative degree of importance of these principles

can vary from project to project and industry to industry

Kerzner summarized the degree of importance as follows:[7]

Table 2.1 CLASSIFICATION OF PROJECTS/CHARACTERISITICS

| | Type of project/Industry | | | | | |
|---|---|---|---|---|---|---|
| | In house R&D | Small Constru-tion | Large Constru-ction | Aerospa-ce/ Defense | MIS | Enginee-ring |
| Need for interpersonal skills | Low | Low | High | High | High | Low |
| Importance of organizational structure | Low | Low | Low | Low | High | Low |
| Time Management difficulties | Low | Low | High | High | High | Low |
| Number of meetings | Excessi-ve | Low | Excessi-ve | Excessi-ve | High | Medium |
| Project manager's supervisor | Middle manage-ment | Top manage-ment | Top manage-ment | Top manage-ment | Middle manage-ment | middle manage-ment |
| Project sponsor present | Yes | No | Yes | Yes | No | No |
| Conflict intensity | Low | Low | High | High | High | Low |
| Cost control level | Low | Low | High | High | Low | Low |
| Level of planning/scheduling | Milesto-nes only | Milesto-nes only | Milesto-nes only | Milesto-nes only | Milesto-nes only | Milesto-nes only |

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[7] Kerzner, Project Management a systems approach to planning, scheduling , and controlling, p.43

For those industries that are project-driven, such as aerospace and large construction, the high dollar value of projects mandates a much more rigorous project management approach. For non-project driven industries, projects may be managed more informally than formally, especially if no immediate profit is involved.

### 2.1.4 Project and Organizational Management.

Projects, goals, and objectives must fit together in synergistic fashion in supporting the enterprise mission. Project success by itself may not contribute to enterprise success. Projects might , early in their life cycle, show promise of contributing to enterprise strategy. A project that continues to support that mission should be permitted to grow in its life cycle." If the project does not provide that support, then a strategic decision faces the senior managers :Can the project be reprogrammed , re-planned, and redirected to maintain support of the enterprise mission, or should the project be abandoned?"[8]

Project managers cannot make such a strategic decision since they are likely preoccupied with bringing the project to a successful  finish, and project termination is not their responsibility. Such managers may lack an overall perspective of project's strategic support of the enterprise mission. Therefore, the decision of what to do about

the project must remain with the general manager, who is the project "owner" and has residual responsibility and accountability for the project's role in the enterprise mission and usually puts up the money for the project.

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[8] Cleland, Project Management: Strategic Design and Implementation, p.88

Project success is very dependent upon an appropriate synergy with the enterprise's success. The management of the project and the management of enterprise depend on synergistic management approach-planning, organizing, evaluation, and control tied to gather through an appropriate project enterprise leadership.

Projects are designed, developed, and produced or constructed for a customer. This customer or project owner may be an internal customer, such as business unit manager who pays for product development by the enterprise central laboratory. An external customer might be a utility that has contracted with an architectural and engineering firm to design, engineer, and build an electricity generating plant.

Senior managers, who have the responsibility to sense and set the vision for the enterprise, need a mean of marshaling the resources of the organization to seek fulfillment of that vision. "By having an active project management activity in the enterprise, an organizational design and a development strategy are available to assist senior managers in bringing about the changes and synergy to realize the organizational mission, objectives, and goals through a creative and innovative strategy. Leadership of a team of people who can bring the changes needed to the enterprise's posture is essential to the attainment of the enterprise's vision. When projects are accepted as the building blocks in the design and execution of organizational purpose, a key strategy has been set in motion to keep the enterprise competitive. Such strategy has been set in motion to keep the enterprise

competitive. Such strategies are dependent on the quality of the leadership in the enterprise"[9]

### 2.1.5 The Project Life Cycle.

Most projects go through similar stages on the path from origin to completion. "The project is born(its start-up phase) and a manager is selected, the project team and initial resources are assembled, and the work program is organized. Then work gets under way and momentum quickly builds. Progress is made. This continues until the end is in sight. But completing the final tasks seems to take an inordinate amount of time, partly because there are often a number of parts that must come together and avoid the final steps."[10] During the past few years, there has been at least partial agreement about the life-cycle phases of product. They include:[11]

- Research and development
- Market introduction
- Growth
- Maturity
- Detraction
- Death

Today, there is no agreement among industries, or even companies within the same industry , about the life-cycle phases of project. This is understandable because of the complex nature and diversity of projects.

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[9] Ibid., p.90

[10] Jack R. Meredith and Samuel J. Mantal, Project Management: A Managerial Approach, (NY: John Wiley & Sons, Inc.,1989), p.7

[11] Kerzner, Project Management a systems approach to planning, scheduling , and controlling, p.81

The theoretical definitions of the life-cycle phases of a system, as defined by Cleland and King, can be applied to a project. These phases include:

- Conceptual
- Definition
- Production
- Operational
- Divestment

The first Phase, the conceptual phase, includes the preliminary evaluation of an idea. Most important in this phase is preliminary analysis of risk and resulting impact on the time, cost, and performance requirements, together with the potential impact on company resources. The conceptual phase includes a "first cut" at the feasibility of effort.

The second phase is the definition phase. It is mainly a refinement of the elements described under the conceptual phases. The definition phase requires a firm identification of resources to be required together with the establishment of realistic time, cost, and performance parameters. This phase includes the initial preparation of all documentation necessary to support the system. For a project based on competitive bidding, the conceptual phase would include the development of total bid package (i.e., time, schedule, cost, and performance).

The third phase is production (or acquisition). This phase is predominantly at testing and final standardization effort so that operation can begin. Almost all documentation must be completed in this phase.

The forth phase is the operational phase. If the project was developed for establishment of marketable product, then this phase could include the product life-cycle phase of market introduction, growth, maturity, and portion of determination.

The final phase is divestment and includes the real location of resources. The question to be answered is, "Where should resources be reassigned?"

The divestment phase evaluates the efforts on the total system and serves as input to the conceptual phases for new projects and systems. This final phase also has an impact on other ongoing projects with regard to priority identification.

Typically, "such ideas go through a distinct life cycle, i.e., a natural and pervasive order of thought and action. In each phase of this cycle, different levels and varieties of specific thought and action are required within the organization to assess the potential efficacy of the project".[12]

Finally, "top management is responsible for the periodic review of major projects. This should be accomplished, at a minimum, at the compilation of each life-cycle phase."[13]


## 2.2 THE PROJECT MANAGER.

### 2.2.1 Project manager role and responsibility.

The project manager is responsible for coordinating and integrating activities across multiple, functional lines. In order to do this, the project manager needs strong communicative and interpersonal skills, must become familiar with the operations of each line organization, and should have a general knowledge of the technology being used.

The project manager's job is not an easy one. Project managers may have increasing responsibility, but very little authority. This lack of authority can force

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[12] Cleland, Project Management: Strategic Design and Implementation, p.44

[13] Kerzner, Project Management a systems approach to planning, scheduling, and controlling, p.87

them to "negotiate" with upper-level management as well as functional

management for

control of company resources.

The effective project manager must have management as well as technical skills. Unfortunately, "business people sometimes find it difficult to think as business people. Executives have found that it is usually easier to train engineers rather than business people to fill project management positions. Because engineers often consider their careers limited in functional disciplines,, they look toward project management and project engineering as career path opportunities. But becoming a manager entails learning about psychology, human behavior, organizational behavior, interpersonal relations, and communication. MBA programs have come to the rescue of individuals desiring the background to be effective project managers."[14]

The project manager is actually a general manager and get to know the total operation of the company. In fact, "project managers gets to know more about the total operation of the company than executives know. That is why project management is often used as training ground to prepare future general managers who will be capable of filling top management positions."[15]

## 2.2.2 Defining the functional manager's role.

If we assume that the project and functional managers are not the same person, we can identify a specific role for the functional manager. There are two elements to this role:[16]

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[14] Ibid., p. 11
[15] Ibid., p. 13
[16] Ibid., p. 13

- The functional manager has the responsibility to define *how* the task will be done and *where* the task will be done.

- The functional manager has the responsibility to provide sufficient resources to accomplish the objective within the project's constraints(i.e., *who* will get the job done).

In other words, once the project manager identifies the requirements for the project (i.e., what work has to be done and the constraints), it becomes the line manager's responsibility to identify the technical criteria. Except perhaps in R&D efforts, the line manager should be recognized technical expert. If the line manager believes that certain technical portions of the project manager's requirements are unsound, then the line manager has the right , by virtue of his expertise, to take exception and plead his case to higher authority.

### 2.2.3 Defining the Executive role.

In a project environment there are new expectation of and for the executives, as well as new interfacing roles. Executives are expected to interface a project as follows:[17]

- In project planning and objective-setting

- In conflict resolution

- In priority-setting

- As project sponsors

Executives are expected to interface with projects very closely at project

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[17] Ibid., p.13

initiation and planning, but to remain at a distance during execution unless needed for priority-setting and conflict resolution. One reason why executives "meddle" during project execution is that they are not getting accurate information from the project manager as to project status. If project managers provide executives with meaningful reports, then the so-called meddling may be reduced or even eliminated.

## 2.2.4 Location of the project manager.

The success or failure of project management could easily depend on the location of the project manager within the organization. Two questions must be answered [18]

- What salary should a project manager earn?

- To whom should the project manager report?

Ideally, the project manager should be at the same pay grade as the individuals with whom he must negotiate on a daily basis. Using this criterion, and assuming that the project manager earns substantially more or less money than the line manager will usually create conflict.

The ultimate reporting location of the project manager(and perhaps his salary) is heavily dependent on whether the organization is project or non-project-driven, and whether or not the project manager is responsible for profit or loss. In addition, project managers can end up reporting both high and low in an organization during the life cycle of the project.. Likewise, the positioning of the

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[18] Cleland, Project Management: Strategic Design and Implementation, p.44

project manager may be dependent on the risk of the project, the size of the project, or the customer.

Finally, "it should be noted that if the project manager reports low, he should still have the right to interface with top executives during project planning although there may be two or more reporting levels between the project manager and executives. At the opposite end of the spectrum, the project manager should have the right to go directly into depth of the organization instead of having to follow the chain of command downward, especially during planning."[19]

### 2.2.5 Selecting of the Project Manager.

Selection of the project manager is one of the two or three most important decision concerning the project. For that, a project manager should have several skills in order to have a reasonable chance of success.

The following is the list of some of the most popular attributes, skills, and qualities that have been sought when selecting project managers:[20]

- A strong technical background.

- A hard-nosed manager.

- A mature individual.

- Someone who is currently available.

- Someone on good terms with senior executives.

- A person who can keep the project team happy.

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[19] Kerzner, Project Management a systems approach to planning, scheduling , and controlling, p.45

[20] Meredith and Mantal, Project Management: A Managerial Approach, p.99

- One who has worked in several different departments.

- A person who can walk on (or part) the waters.

The reasons for choosing a project manager are not so much wrong as they are "not right." They miss the key criterion. Above all, the best project manager is the one who can get the job done. As any senior manager knows, hard workers are easy to find. What is rare is the individual whose focus is on the completion of a difficult job.

Of all characteristics desirable in a project manager, this drive to complete the task is the most important. Moreover, there are three major categories of skills; that are required of the project manager and serve as the key criteria for selection, given that the candidate has a powerful bias toward task completion. [21]

*i. Credibility:*

The first skill of project manager is credibility. The project manager needs two kinds of credibility skills. First, technical skills . The project manager must be perceived by the client, senior executives, the functional department, and project team as processing sufficient technical knowledge to direct the project. "It is essential, however that the project manager understand the technology, the markets, and the environment of the business to participate effectively in the search for integrated solutions and technological innovations." [22] Quite simply, the project manager has to have a reasonable understanding of the base technologies on which

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[21] Ibid., p. 99

[22] Kerzner, Project Management a systems approach to planning, scheduling , and controlling. p.180

the project rests, must be able to interpret the technical needs and wants of the client (and senior management) to the project team.

Second, the project manager must have administrative skills. The project manager has several key administrative responsibilities that must be performed with apparently effortless skill. One of these responsibilities is to the client and senior management to keep the project on schedule and within cost and to make sure that project reports are accurate and timely. Another responsibility is that to build the team. Team building involves a whole spectrum of management skills required to identify, commit, and integrate the various tasks. To be effective, the project manager must

provide an atmosphere conductive to teamwork Moreover, the project manager must have the resource allocation skills. For that, a project manger must be sure that material, equipment, and manpower are available when needed. Still another responsibility includes having organizational skills. That is to represent the interests of all parties to the project (team, management, functional departments, and client) to one another. The project manager is truly the "person in the middle." Finally, the project manager is responsible for making the tough trade-off decision for the project, and must be perceived as a person who has the mature judgment and courage.

*ii. Sensitivity:*

The project manager needs to sense interpersonal conflict on project team or between team members and outsiders. Successful project managers are not conflict avoiders. Quite the opposite, they sense conflict very early and confront it

before it escalates into interdepartmental and interdepartmental warfare. The project manager must keep project team "cool." This is not easy. As with any group of humans, rivalries, jealousies, friendship and hostilities are sure to exist. The project manager must persuade people to cooperate irrespective of personal feelings, to set aside personal likes and dislikes and to focus on achieving project goals.

*iii. Leadership:*

According to Tannenbaum & Massarick,[23] leadership is an "interpersonal influence, exercised in situation and direct through the communication process, toward the attainment of a specified goal or goals.". Yet, its difficult to explain leadership. We tend to recognize it after the fact, rather than before. We define it anecdotally by saying that this person or that one acted like a leader. The project manager must capitalize on people's strengths, cover their weakness, know when to take over and when to "give them its head," know when to punish and when to reward, know when to communicate and when to remain silent. Above all, the project manager must know how to get others to share commitment to the project. In a word, the project manager must be a leader. Moreover, leadership skills involves the ability to integrate individual demands, requirements, and limitation into decisions that benefit overall project performance. Finally, "the effective leaderships skills depend heavily on the project manager's personal experience and credibility within the organization."[24]

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[23]Meredith and Mantal, Project Management: A Managerial Approach, p.100
[24] Kerzner, Project Management a systems approach to planning, scheduling , and controlling, p173.

## 2.3 Elements of Project Management.

### 2.3.1 Planning.

#### 2.3.1.1 General planning

Planning is determining what needs to be done, by whom, and by when, in order to fulfill one's assigned responsibility. There are nine major components of the planning phase:[25]

- Objective: a goal, target, or quota to be achieved by a certain time.

- Program: the strategy to be followed and major action to be taken in order to achieve or exceed objectives.

- Schedule: a plan showing when individual or group activities or accomplishments will be started and/or completed.

- Budget: planned expenditures required to achieve or exceed objectives.

- Forecast: a projection of what will happen by a certain time.

- Organization: design of the number and kinds of positions, along with corresponding duties and responsibilities, required to achieve or exceed objectives.

- Policy: a general guide for decision making and individual action.

- Procedure: a detailed method for carrying out a policy.

- standard: a level of individual or group performance defined as adequate or acceptable.

Planning simply does not happen by itself. Companies that have histories of successful plans also have employees who fully understand their histories of

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[25] Ibid., p.570

successful plans in the planning process. The responsibility of the major players are as follows:[26]

Table 2.2 The responsibility of the major players

| Project manger will define | Line manager will define | Senior management (project sponsor) will |
|---|---|---|
| • Goals and objectives<br>• Major milestone<br>• Requirements<br>• Ground rules and assumptions<br>• Operating procedures<br>• Administrative policy<br>• Reporting requirement | • Detailed task descriptions to implement objectives, requirements, and milestone.<br>• Detailed schedules and manpower allocations to support budget and schedule.<br>• Identification of areas of risk, uncertainty, and conflict. | • Act as the negotiator for disagreements between project and line management.<br>• Provide clarification of critical issues.<br>• Provide communication link with customer's senior management |

Successful planning requires that project, line, and senior management are in agreement with the plan.

## 2.3.1.2 Project Planning.

The most important responsibilities of a project manager are planning, integrating, and executing plans. Almost all projects, because of their relatively short duration and often prioritized control of resources, require formal, detailed planning.

Planning, in general, can best be described as "the function of selecting the enterprise objectives and establishing the policies, procedures, and programs necessary for achieving them"[27]. Planning in a project environment may be described as establishing a predetermined course of action within a forecasted environment.

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[26] Ibid., p.580
[27] Ibid., p.567

The project manager is the key to successful project planning. It is desirable that the project manager be involved from project conception through execution. Project planning must be systematic, flexible enough to handle unique activities, disciplined through reviews and controls, and capable of accepting multifunctional inputs. Successful project managers realize that project planning is an iterative process and must be performed throughout the life of the project.

One of the objectives of project planning is to completely define all work required (possibly through the development of a documented project plan) so that it will be readily identifiable to each project participant. This is a necessity in a project environment because:[28]

- If the task is well understood prior to being performed, much of the work can be preplanned.

- If the task is not understood, then during the actual task execution more knowledge is learned that, in turn, leads to changes in resource allocations, schedules, and priorities.

- The more uncertain the task, the greater the amount of information that must be processed in order to ensure effective performance.

### 2.3.1.3 Project Planning Process.

Projects often extend for many years into the future. Thus, a project plan for such projects becomes both operational (short-term) and strategic(long-term). "It follows that the project planning process requires both operational and strategic thinking. Creativity, innovation, and the ability to "think prospectively" form the

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[28]Ibid., p.568

basis for the project planning process. The real value of such a process is a framework of things to consider for a project's life cycle"[29]. Moreover, project planning may be considered a form of information development and communications. As the project team develops the project plan, the project team should learn more about the project goals, strategies, and team member roles. The project objectives then can be decided in terms of cost, schedule, and technical performance. Satisfaction of project goals is

accomplished through the completion of the project work packages. The project strategy is the plan of action with accompanying policies, procedures, and resource allocation schemes, providing general direction of how the organizational effort will be used to accomplish project goals and project objectives.

## 2.3.1.4 Project Planning Consideration.

All too often when people think of project planning, they only perceive the use of  techniques and concepts such as PERT, CPM, or networking. These techniques will be discussed in detail later. "These techniques are important to use in the development of  a  project schedule; however, project planning includes a much wider scope of activity. Such concerns as objectives and goal setting, cost estimating and budgeting, technology strategies scheduling, resource usage estimating, and specification of deliverables are key concerns. Project planning also involves a delineation of the organizational design to support the project as well as the information system and the control system which are used to model, evaluate, and reallocate resources as required during the execution of the project plan."[30]

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[29] Cleland, Project Management: Strategic Design and Implementation,p.246
[30] Ibid., p.248

However, certain key work packages and planning tools have to be addressed in the development of the project plan action. Work Breakdown Structure is one of these tools.

## 2.3.1.5 Work Breakdown Structure

The most basic consideration in project planning is the work breakdown structure (WBS). The WBS divides the overall project into work elements that represent singular work units, assigned either with the organization or to an outside agency such as a vendor.

The WBS process is carried out in the following manner: "Each project must be subdivided into tasks that can be assigned and accomplished by some organizational unit or individual. These tasks are then performed by specialized functional organizational components. The map of the project represents the collection of these units and shows the project manager many organizational and subsystem interfaces to manage."[31]

The WBS is the single most important element because it provides a common framework from which:[32]

- The total program can be described as summation of subdivided elements.

- Planning can be performed.

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[31] Ibid., p.250

[32] Kerzner, Project Management a systems approach to planning, scheduling , and controlling, p. 592

- Cost and budgets can be established.

- Time, cost, and performance can be tracked.

- Objectives can be linked to company resources in a logical manner.

- Schedules and status-reporting procedures can be established.

- Network construction and control planning can be initiated.

- The responsibility assignment for each element can be established.

The WBS acts as a vehicle for breaking the work down into smaller elements, thus providing a greater probability that every major and minor activity will be accounted for. Although a variety of work breakdown structures exist, the most common is the six-level indentured structure shown below:[33]

Table 2.3 Six-level indentured structure

|  | Level | Description |
|---|---|---|
| Managerial levels | 1 | Total program |
|  | 2 | Project |
|  | 3 | Task |
| Technical levels | 4 | Subtask |
|  | 5 | Work package |
|  | 6 | Level of effort |

Project managers normally manage at the top three levels of the WBS and prefer to provide status reports to management at these levels also. Some companies are trying to standardize reporting to management by requiring the top three levels of the WBS to be the same for every project, the only differences being in levels 4-6. For companies with a great deal of similarity among projects, this approach merit. For most companies, however, the differences between projects makes it almost impossible to standardize the top levels of the WBS. The work package is the

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[33] Ibid., p.591

critical level for managing a WBS. However, it is possible that the actual management of the work packages are supervised and performed by the line managers with status reporting provided to the project manager at higher levels of the WBS.


## 2.3.2 Scheduling.

A schedule is the conversion of a project action plan into an operating timetable. As such, it serves as a fundamental basis for monitoring and controlling project activity and, taken together with the plan itself, is probably the major tool for the management of projects. In a project environment, the scheduling function is more important than it would be in an ongoing operation because projects lack the continuity of day-today operations and often present much more complex problems of coordination. Indeed, project scheduling is so important that a detailed schedule is sometimes a customer-specified requirement.

"Not all project activities need to be scheduled at the same level of detail. In fact, there may be several schedules: the master schedule, the development and testing schedule, the assembly schedule, and so on. These schedules are typically based on the previously determined WBS, and it is good practice to create a schedule for each major task level in the WBS which will cover the work package. It is rarely necessary to list all work packages. One can focus mainly on those that need to be monitored for maintaining adequate control over the project. Such packages are usually difficult, expensive, or have a relatively short time frame for their accomplishment."[34]

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[34] Meredith and Mantal, Project Management: A Managerial Approach, p.268

The most important factor when making a schedule is that the dates and time allotments for the work packages be in precise agreement with those set forth in the project master schedule. It is also important that the work units that aggregate into work packages be in agreement with the times in the maser schedule. These times are control points for the project manager. It is the project manager's responsibility to insist on and maintain this consistency, but the actual scheduling of the task and work packages is usually done by those responsible for their accomplishment after the project manager has established and checked appropriate due dates for all tasks. This procedure ensures that the final project schedule reflects the interdependencies among all the task and departments involved in the project, and maintains consistency among them.

The basic approach of all scheduling techniques is to form an actual or implied network of activity and event relationships that graphically portrays the sequential relations between the tasks in project. Tasks that must precede or follow other tasks are then clearly identified, in time as well as function. Such a network is a powerful tool for planning and controlling a project and has the following benefits:[35]

- It is a consistent framework for planning, scheduling, monitoring, and controlling the project.

- It illustrates the interdependence of all tasks, work packages, and work units.

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[35] Ibid., p.269

- It aids in ensuring that the proper communications take place between departments and functions.

- It determines an expected project completion date.

- It identifies so-called critical activities which, if delayed, will delay the project completion time.

- It also identifies activities with slack that can be delayed for specified periods without penalty, or from which resources may be temporarily borrowed without harm.

- It determines the dates on which tasks may be started  or must be sorted if the project is to stay on schedule.

- It illustrates which tasks must be coordinated to avoid resource or timing conflicts.

- It also illustrates which tasks may be run, or must be run, in parallel to achieve the predetermined project completion date.

- It may, depending on the network from used, allow an estimate the probability of project completion by various dates, or the date corresponding to a particular a priori probability.

### 2.3.3 Project control

Project control is the third element of project management cycle, "generally consists of  continuously monitoring the progress of each project item, then, to keep the project on the planned schedule, taking the necessary action on those items shown to be "drifting.""[36]David I. Cleland[37] defines the control as the

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[36] Spinner, Elements of Project Management: Plan, Schedule, & Control, p.51
[37] Cleland, Project Management: Strategic Design and Implementation, p.285

process of monitoring, evaluating, and comparing planned results with actual results to determine the status of

the project cost schedule, and technical performance objectives. Control is also the constraining of resources through corrective action to conform to a project plan of action.

Control is focused on three elements of a project-performance, cost and time. The project manager is constantly concerned with these three aspects of the project.

### 2.3.3.1 The fundamental purpose of control.

The two fundamental objectives of control are:[38]

1- The regulation of results through the alteration of activities

2- The stewardship of organizational assets

Most discussion of the control function are focused on regulation. The project manager needs to be equally attentive to both regulation and conservation. The project manager must guard the physical assets of the organization, its human resources, and its financial resources. The processes for conserving these three different kinds of assets are different.

*i. Physical Asset Control*

Physical asset control requires control of the use of the physical assets. It is concerned with asset maintenance, whether preventive or corrective. "that issue also is the timing of maintenance or replacement as well as the quality of maintenance. If the project uses considerable amounts of physical equipment, the

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[38] Meredith and Mantal, Project Management: A Managerial Approach, p.428

project manager has the problem of setting up maintenance schedules in such a way as to keep the equipment in operating condition while minimizing interference with ongoing work"[39]

## ii. Human Resource Control

Stewardship human resources requires controlling and maintaining the growth and development of people. Because projects are unique, differing one from another in many ways, it is possible for people working on projects to gain a wide range of experience in a reasonably short time.

Measurement of physical resource conservation is accomplished through the familiar audit procedures. The measurement of human resource conservation is far more difficult. Such devices as employee appraisals, personnel performance, and screening methods for appointment, promotion, and retention are not particularly satisfactory devices for ensuring that conservation function is being properly handled.

## iii. Financial Resource Control

The techniques of financial control, both conservation and regulation   include current asset controls and project budgets as well as capital investment controls. Moreover, controlling the costs is one the most important element of financial resources control.  These controls are exercised through a series of analyses and audits conducted by accounting/controller function for the most part. "To many in management, the cost associated with a project may be more important than the

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[39] Ibid., p. 429

timing aspects, and they have a great impact on how the project is carried out. Project costs are usually concerned with the flow of cash or movement of money throughout the various groups connected with the project"[40]. The project cost status report or indicated cost outcome report is control device that is designed to ensure that project spending is contained within approved (authorized) amounts. "Specifically, the report is used to review and evaluate this spending status of projects; to determine if project commitments are in line with authorized amounts; and to determine if (and when) additional authorizations may be required."[41]

### 2.3.3.2 Performance Evaluation.

Controlling depends on the evaluation of performance standards of the project. Project performance standards are based on the project plan, including at minimum the exceptions for the project, established in the project objectives, goals, and strategies relevant to project cost, schedule, technical specifications, and strategic fit. Some key standards in project control include the following:[42]

- Scope of work

- Project specification

- Work breakdown structure

- Work packages

- Core estimates and budgets

- Master and supporting schedule

- Financial forecasts and funding plans

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[40] Spinner, Elements of Project Management: Plan, Schedule, & Control, p.64
[41] Ibid., p.73
[42] Cleland, Project Management: Strategic Design and Implementation, p.286

- Quality

- Project owner satisfaction

- Project team satisfaction

- Senior management satisfaction

- Project management

- Resources utilization

- Productivity

A project should be evaluated by using several additional key standards:[43].

- Efficiency in the use of the enterprise resources supporting the project. Were the right resources used in the most productive fashion to support the project?

- Expected technical performance quality of the product or service resulting from the project. Does the project promise to provide value to the customers?

- Development cycle time. Is the project being developed in sufficient time to meet or preempt competition?

- Strategic fit in organizational purposes. Does the resulting product or service complement existing products and services being provided in the marketplace?

It is important to recognize that performance standards are derivative of project planning, as well as organizational planning, keynoting again the basic (but often forgotten) principle that proper planning facilities proper control.

## 2.4 Quantitative Method.

We will discuss the tools of managing the planning and control of major

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[43] Ibid., p.287

projects with many separate activities that require coordination. In many business situations, a number of different activities must be performed in a specified sequence in order to accomplish some major project. For a large, complex project, the complete set of activities will usually contain a combination of series and parallel elements. There are two techniques that can help in this situation, PERT & CPM. "The technique of PERT (Program Evaluation and Review Technique) was developed in 1958 by Booz, Allen, and Hamilton, a large consulting firm. CPM (Critical Path Method) was developed by Catalytic Construction Company in 1957. CPM and PERT are based on task sequence chart known as a network A few early differences between CPM and PERT mostly disappeared, and it is convenient to think of PERT and CPM as being one and the same, referred to by combined term PERT/CPM. The construction industry still calls it CPM, and the R&D people still usually call it PERT."[44]. "Both techniques are designed to aid a manager in planning and controlling such a project."[45]


### 2.4.1 CPM/PERT and Project Planning.

As mentioned previously, planning is the most important step in the project management process. Translating the jobs ( and their sequence ) into a graphical diagram (or network) needs the most time. However, this technique does not replace good judgment but, rather, relies on good judgment to be an effective management tool.

Planning starts with having a complete understanding of the objectives.

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[44] Richard J. Schonberger, Operations Management: Planning and Control of Operations and Operating Resources, ( Texas: Business Puplications, Inc., 1981), p.252
[45] Harold Bierman, Jr., Charles P. Bonini, and Warren h. Hausman, Quantitative Analysis for Business Decisions, (Boston: Richard D. Irwin, Inc., 1991), p. 580

Then the following steps need to be taken:[46]

1- Predetermine all of the activities or jobs that must be done to complete a

   project.

2- Develop a work breakdown structure.

3- Determine the sequence in which the jobs are to be done.

4- Develop the planning diagram.

If all of the steps above are performed in a reasonable manner, the diagram will

become a valuable planning tool for the personnel involved in preparing the next

phases of the project management cycle and for implementation of the project.

A graphical analysis provides a picture of the scope of the project. With this

picture, there exist a vehicle for evaluating alternative strategies and objectives, a

means of defining the interrelationships among jobs, and excellent device for

instructing personnel in the details of project.


## 2.4.2 CPM/PERT and Project Scheduling.

An important part of the project scheduling phase is time estimating, which

involves getting a time estimate for each job in the project. The time estimate

represents the amount of time an experienced person thinks the job will require

under specified conditions.

With the planning diagram, the list of critical activities, and the remainder of the

jobs with their available float, the job can be scheduled. "The schedule tabulation is

a continuation of the timing calculations using the float values. The computerized

schedule is generated by utilizing the same data as those used for calculating the

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[46] Spinner, Elements of Project Management: Plan, Schedule, & Control, p.29

manual schedule."[47] However, more detail can be developed for analysis purpose when using computer calculation.

### 2.4.3 CPM/PERT and Project Cost.

The first step is to prepare a feasible CPM/PERT plan and schedule. Next, the CPM/PERT technique requires periodic comparisons of the actual costs incurred for each activity and the actual the time observed by each activity with their original estimates. "This comparison significantly improves cost and schedule control by establishing the cost and time status of the project and identifying any potential cost overruns and schedule slippages."[48] Estimates of cost and time needed to complete work not yet started are also obtained in order to predict future slippages and cost overruns.

### 2.5 The Role of the Computer.

Project management is basically a method of planning and scheduling projects through the use of various tools that are presently available. One tool that has become

an absolutely necessary expedient in implementing project management techniques is the computer. By handling routine calculations faster and with uncanny accuracy, the computer can help and analyze projects faster than manual methods. However, it can not plan or analyze a project without the logical ability of the human being.

As we discussed previously, a manual approach to project planning and scheduling of time, cost, and personnel is possible, but it is laborious and tedious

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[47] Ibid., p.48
[48] Ibid., p.164

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even for very small projects. Once the computer approach is understood, its application becomes more desirable for all projects, especially those that are complex and relatively large. In general, when question arises as to whether a computer is required to apply project management techniques to a project, the decision is made not only on the size and complexity of the project, but also on the type of analysis required and the frequency of the updating requirements. Use of the computer will be most favored.

## 2.5.1 Computerized Project Management.

Computerized project management can provide answers to such questions as:[49]

- How will the project be impacted by limited resources?

- How will the project be impacted by a change in the requirements?

- What is the cash flow for the project ( and for each WBS element)?

- What is the impact of overtime?

- What additional resources are needed to meet the constraints of the project?

- How will a change in the priority of a certain WBS element affect the total project?

The more sophisticated packages can provide an answer to schedule and cost based on:[50]

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[49] Kerzner, Project Management a systems approach to planning, scheduling , and controlling, p.681

[50] Ibid., p.682

- Adverse weather conditions

- Weekend activities

- Unleveled manpower requirements

- Variable crew size

- Splitting of activities

- Assignment of unused resource

## 2.5.2 Understanding Project Management Software.

Efficient project management requires more than good planning, it requires that relevant information be obtained, analyzed, and reviewed in timely manner. This can provide early warning of pending problems and impact assessments on other activities, which can lead to alternate plans and management actions.

"Today, project managers have a large array of software available to help in the difficult task of tracking and controlling projects. While it is clear that even the most sophisticated software package is not a substitute for competent project leadership-and by itself does not identify or correct any task-related problems-it can be terrific aid to the project manger in tracking the many interrelated variables and tasks that come into play with a modern project."[51] Specific examples of these capabilities are given below[52]:

- Project data summary: expenditure, timing, and activity data.

- Project management and business graphics capabilities.

- Data management and reporting capabilities.

- Critical path analysis.

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[51] Ibid., p.684
[52] Ibid., p.685

- Customized, as well as standard, reporting formats

- Multiproject tracking

- Sub-networking

- Impact analysis (what if...).

- Early-warning systems.

- One line analysis of recovering alternatives.

- Graphical presentation of cost, time, and activity data.

- Resource planning and analysis.

- Cost analysis, variance analysis.

- Multiple calendars.

- Resource leveling.

## 2.5.3 Applying the computer in project management.

There are several steps to use the computer in planning, scheduling, and controlling a project using project management techniques.

### 2.5.3.1 Planning

Spinner[53] explained the steps of applying the computer in planning. The first step is to establish the objectives, which are usually influenced by company business plan and higher management directives. After identifying the objectives, the next step is to plan what is to be done. The technique used is to prepare a WBS in conjunction with determining the listing of jobs necessary to complete the job. To determine the jobs required, we have to proper listing of every step required to

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[53] Spinner, Elements of Project Management: Plan, Schedule, & Control, p.121-126

accomplish the project. It is vital that all phases of work be encompassed by the jobs listed. Description of the work should be phrased in such a way that they (1) state basic functions that can be understood by all concerned with managing the planning, scheduling, and control of the project, and (2) include all the work required in the project.

Time estimates for each job, made by knowledgeable persons. At this stage, planning the work sequence and estimating job times done on a normal time basis. After the "what has to be done" portion (planning phase) of the diagram is completed (and agreed to by all participants), computer scheduling can take place.

### 2.5.3.2 Scheduling.

After the planning model has been agreed to by project participants, duration estimates for each activity can be set. It should be emphasized that the scheduling process is highly dependent on time estimates. After preparing computer input data, one can enter the data into computer. Other input items to consider: calendar to reflect the proper 5- or 7- day-week schedule, holidays, special days off, and so on; milestone; and hammocks (summarizes path for management summary reports).

Software packages produce any number of reports, and it will be at the discretion of the user to generate those reports that best apply.

The more useful reports are the following:[54]

- *Milestone report*: lists all milestones (major events) and their calculated (or established) start or finish dates.

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[54] Ibid., p. 128

- *Work breakdown structure* (WBS): all of the reports can be stored according to departments, task responsibilities, or any listing of similar nature.

- *Bar chart report*: shows graphically the duration and time frames of the specified work items.

- *Resource availability and utilization reports*: shows in a tabular list or graphically, on a daily, weekly, or monthly basis, each critical resource and its availability and utilization.

- *Hammock (or summary) report*: summarizing a "path" of work tasks that extends from the start of the first task to the finish of the last task.

### 2.5.3.3 Project Control.

A satisfactory plan and schedule should be completed about the time the project is to be implemented. The early start schedule is the one usually used to get the project rolling. Thus as the project progresses, it is important to update both the time estimates and the network logic to indicate any changes in the plan.

The main purpose of project control is to keep the overall project on time and within budget. Use of the early-warning system technique, which allows intervention at an early date to begin correction procedures, is the standard operating procedure.

### 2.5.4 Software Classification.

For purpose of easy classification, project management software products have been divided into three categories[55] based on the type of functions and functions and features they provide.

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[55] Kerzner, Project Management a systems approach to planning, scheduling , and controlling, p.687

*Level I software.* Designed for single project planning, these software packages are simple, easy to use, and their outputs are easy to understand. They do provide, however, only a limited analysis of the data. They do not provide automatic rescheduling based on specific changes. Therefore, deviations from the original project plan require complete re-planning of the project and a complete new data input to computer.

*Level II software.* Designed for single project management, these software packages aid project leaders in the planning, tracking, and reporting of projects. They provide a comprehensive analysis of the project, progress reports, and plan revisions, based on actual performance. This type of software is designed for managing projects beyond the planning stage, and for providing semiautomatic project control.

*Level III software.* These packages feature multiproject planning, monitoring, and control by utilizing a common data base and sophisticated cross-project monitoring and reporting software.

## 2.5.5 Project Software Evaluation.

Kerzner[56] sees that from the middle 1970s to the early 1980s, companies invested heavily in mainframe project management software with costs varying between $75,000 and $125,000. Acceptance of these packages was difficult because only an elite few truly understood the jargon and were capable of using the program. Turn around of information was measured in days. Comprehensive evaluation of these programs was difficult because of the complexity of the operating instructions, most of which were not very user-friendly.

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[56] Ibid., p. 688

Today, there exists more than 200 software packages on program management ranging from the large $100,000 mainframe packages to the small $10 diskette that simply calculate the critical path. The majority of these programs are now user-friendly and capable of running on PCs. Many of the software packages priced between $500-$1000 have capabilities equivalent to earlier generation mainframe packages.

## 2.6 Microsoft Project.

### 2.6.1 Project management and Microsoft Project.

As mentioned previously, a project is a one-time set of activities that ends with a specific accomplishment. Project management, also, is the defining, planning, scheduling, and controlling of the tasks that must be completed to reach the goal of the project and allocation of the resources to perform those tasks. A project manager will be successful when he/she satisfies the requirements of the client or management, and meets the project goals on schedule and within the budget. Project management software simplifies and speeds up this process. It gives the project manager easy access to important information so he/she can make decisions while there is still time to take corrective action.

"Microsoft Project provides a single interface to track and manage all the people, resources, and decisions employed to reach a goal. While using time-honored models such as Gantt and PERT charts, the current generation of project managers also uses E-mail and work group concepts to involve groups of people in project tracking."[57]

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[57] Scott Higgs. "Project Management for Windows", *BYTE*.( April 1995).p185

## 2.6.2 Why Use Microsoft Project?

One of the project management softwares is Microsoft Project. Microsoft Project is a "powerful project management application that can help the project manager to control his project and complete it successfully. It gives the project manager flexible viewing of project information, a powerful scheduling tool, resource management capability, and quality reports. For example, one can create a simple schedule quickly by entering all his tasks and then using his one command to make each task before it finishes. Or one can create a detailed schedule, entering all the project information one has gathered including tasks, resources, costs, and detailed work information for each resource and use this schedule to track the progress of the project"[58]. Either way, Microsoft Project can give the project manager exactly what

he/she needs. Moreover, "Microsoft Project offers unusual tracking flexibility by letting one to set up six baseline schedules per project. This capability enables more efficient what-if analysis and provides alternative views of progress. The other programs maintain only one baseline per project."[59]

When selecting project management software, there are certain features important to the project manager. The following list describes some of the features of Microsoft Project:[60]

- Save the original schedule so the project manager has some thing to compare to progress; Microsoft Project saves his original schedule separately from the current schedule so he can compare the two.

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[58] G wen Lowery, Managing Projects with Microsoft Project, (NY: Van Nostrand Reinhold, 1992), p.7

[59] Higgs. "Project Management for Windows",pp.185- 187

[60] Lowery, Managing Projects with Microsoft Project p.7

- Track progress on tasks by entering actual start and finish dates, actual durations, remaining durations, actual cost, and actual work.

- Allocate resource usage so resources are available when needed for tasks, but are not assigned to too many tasks simultaneously.

- Create calendars for each project and modify the calendar for each resource; Microsoft Project uses the calendars to schedule the tasks.

- Dynamically link information between projects or between a project and another application, such as Microsoft Graphic or Microsoft Excel. When the information changes in one place, it changes everywhere.

- Change the presentation of the information, from spreadsheet like tables, to charts and graphs, showing task information or resource information according to the needs.

- Change the type of information presented about each task or resource so one can get just the information he needs at given time. For example, one can look at a list of tasks and their start and finish dates, then change the information to see the tasks and their resources and predecessors.

- Filter the information shown to display only those tasks or resources that include certain information. For example, one can list only the those tasks that use a certain resources.

- Change the order of the information, such as alphabetizing the list of resources.

## 2.6.3 Microsoft Project Vs. Other Project Softwares

According to a study[61] that has been conducted by NSTL that tested the top four "midrange" project managers: Computer Associates' CA-Super Project 3.0 for Windows, Microsoft Project for windows 4.0, Scitor's Project Scheduler 6 for windows 1.5, and Symantec's Time Line 6.1 for windows. All four programs carry price tags under $700, target nonspecialists, and support workgroups and enterprise connectivity. NSTL limited its review to products that can model complex task relationships, provide full reporting and charting capabilities, and manage resources with automatic leveling.

### i. Keeping on time

All the tested programs include fairly complete tools for scheduling tasks. One can specify duration on start and finish dates, and calculate schedules by applying either "as soon as possible" or " as late as possible" models. Task precedence relationships, calculating float (the length of time an activity can be delayed without disrupting the project) and applying resource calendars as they do so. A handful of special capabilities distinguish the programs. Project Scheduler 6 lets one assign unique calendars by activity, as well as the standard resource calendars. Time Line for windows offers more flexibility in scheduling unusual work shifts than do the other products. CA-Super Project for Windows and Project Scheduler 6 let one enter best, worst, and most likely estimates for task durations and then use these estimates to calculate probabilities for project dates.

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[61] Higgs. "Project Management for Windows",pp.185- 192

*ii. Tracking and Reporting*

Some managers use project management software simply to draft a schedule and post a chart on the wall. But increasingly, managers find that tracking and entering progress data can be worth the time. The extra effort allows printing up-to-date statues reports and graphs, identifies problems before they snowball, and creates an archive of data that can help improve the accuracy of future schedules.

All four programs tested encourage one to continue using the software throughout the project. They will calculate remaining durations and costs, compare budgeted and actual coasts, and generate profiles of resource usage. With the exception of CA-Super project for Windows (which offers only a global update), all make it relatively painless to update progress on a number of selected tasks all at once.

CA-Super project for Windows and Microsoft Project for Windows offer unusual tracking flexibility by letting one sets up six baseline schedules per project. This capability enables more efficient what- if analysis and provides alternative views of progress. The other programs maintain only one baseline per project.

All the products support extensive sorting and filtering options on reports. With the exception of CA-Super Project for Windows, all also include a generous assortment of formatting options, including extensive font control, user-specified reduction and enlargement, and  output forced to fit a page. Time Line for Windows and Microsoft Project for windows provide handy calendar reports that display task assignments and progress in a format.

*iii. Resource Management*

CA-Super Project for Windows delivers by far the most complete set of functions for modeling real- world resources. It allows one to define material resources, vary resource capacities and costs, factor overhead costs, and assign overtime based on task priority. Along with Project Scheduler 6, CA-Super Project windows stands well ahead of the rest of class with its ability to use resources leveling ( automatic reallocation of resources to better balance the workload) to optimize a schedule by splitting tasks.

Of all the specialized functions mentioned above, Microsoft Project for Windows offers overhead costing. For most other procedures, one must resort to a workaround, such as an external spreadsheet program for calculations. Project provides the tools for minimal resource management, but it has few refinements for handling complex resource situations. The other two programs fall between these extremes. Time Line for Windows is a bit stronger in letting one sets variable resources capacities, while project Scheduler 6 permits nonuniform resource use and employs a more effective leveling algorithm.


*iv. Across the Enterprise*

Vendors and managers agree that workgroup functions hold the key to the future: Almost nobody works on projects in isolation. Each vendor takes a unique approach to supporting the enhanced connectivity required for project management.

Time line for Windows emphasizes connectivity to other corporate data in a client/server model. It features a built-in a SQL database engine, permitting one to integrate Time Line data with other core business applications for reporting, model

assumes that a company has central data repository and that Time Line for windows will be just one of many specialized tools for working with subsets of that data. Project Scheduler 6 supports many of the same benefits as Time Line by virtue of its strong ODBC (Open Database Connectivity) support. Microsoft Project and CA-Super Project offer good important and export capabilities but are less suited to sharing enterprise data. Time Line and Microsoft Project provide the most complete OLE support, and all products except Project Scheduler 6 include DDE for linking with other Windows applications.

All these programs can establish central resources pools for multiple projects and generate reports and charts that represent an overview of several projects. CA-Super Project makes some of these tasks relatively awkward, requiring you to "combine" projects to generate overview charts. Microsoft Project can establish task dependencies between projects, but you must set up DDE links rather than use an internal program function ( as offered by other venders) to handle this procedure. Time Line and project scheduler 6 manage multiple project models with fewer workarounds.

Communication problems among team members can often thwart a project's success. Therefore, Microsoft Project includes unique tools to expedite communication and to minimize repetitive data entry. Managers can plan a schedule, click a button, and have all people who are assigned to task. Built-in massages (including check boxes and notes field for recipients) offer initial conformation of assignment, updates ( when schedules change), and when progress tracking. When reviewing replies, the project manager can incorporate the information received at the click of a button, automatically updating the master project file to reflect status reports received. This time-saving feature dramatically

improves the usability of project management software beyond that of the initial planning stages.

Mid-level project management software still lacks an effective architecture for managing simultaneous access by multiple users of corporate data.

*v. Roll Up*

Managers who send proposals to clients or to top management must roll up selected project data into custom-formatted charts and reports. Just as advances in spreadsheet formatting and charting have raised standards for general data presentation charting enhancements among project management programs have raised expectations for customized output. Microsoft Project sets the pace in this area, with more variations offered (including free-floating text and graphics) than in any other program.

*vi. Seeing it Through*

The programs reviewed here require matchless specialized training than those of previous generation. In the near future, planning schedules, assigning resources, and tracking progress with projects management software as using a spreadsheet has become for budgeting.

To choose the most appropriate software for one's circumstances, consider the relative importance of usability, specialized project management functions, output quality, and workgroup capabilities NSTL weighted these and many other variables in calculating our overall rating based on our assessment of a typical user's needs. In the end, Microsoft Project and Project Scheduler 6 for windows both earned NSTL's second highest possible recommendation - four stars for excellent.

Table 2.4 Highlights of the Four Softwares

|  | *Strengths* | *Limitations* |
|---|---|---|
| CA-superProject3.0 for Windows | Fastest program over all<br>Summery PERT<br>Sophisticated resources leveling | No ODBC, OLE support<br>Steeps learning curve<br>less flexible chart precession |
| Microsoft Project for Windows4.0 | Customizable toolbar<br>Flexible reporting, calendaring<br>Easiest to learn and used | No task- splitting option<br>Simplest resources leveling algorithm<br>Weak tools for resource management |
| Project Scheduler 6 for Windows 1.5 | Sophisticated resource leveling<br>Unlimited undo<br>ODBC support | No OLE support<br>No macro debugging tools<br>No font mixing in PERT chart |
| Time line 6.1 for Windows | OLE and ODBC support<br>Customizable toolbar<br>Summary PERT | Sluggish performance<br>Simplistic resource-leveling algorithm<br>No simultaneous task editing |

Source: Higgs. "Project Management for Windows",p186

Table 2.5 Overview of four Softwares

| NSTL RATING | | PERFORMANCE | EASE OF USE | VERSATILITY | EASE OF LEARN | QUALITY |
|---|---|---|---|---|---|---|
| ★★★★ | Microsoft Project 4 | ▲ | ▲ | ▲ | ▲ | ■ |
| ★★★★ | Project Schedule 6 | ■ | ▲ | ▲ | ▲ | ▲ |
| ★★★ | CA-Super Project 3.0 | ▲ | ■ | ▲ | ■ | ▲ |
| ★★★ | Time line 6.1 | ▼ | ▲ | ▲ | ■ | ■ |

★★★★★ Outstanding                   Source: Higgs. "Project Management for Windows",p185
★★★★Excellent
★★★Average
★★Blow average
★Poor
▲Good
■Fair
▼Unacceptable

The above presented literature was an elaborate review. The following chapter will be a description of the design and methodology to be applied in gathering and analyzing data.

# CHAPTER III

## RESERCH DESIGN AND METHODOLOGY

### 3.1 The Basic Approach:

The basic approach of this study is to assess the attitude of project managers using Microsoft Project package. Moreover, the study intends to examine the various factors that are most likely to be associated to measure the effect of training using Microsoft on project managers.

The variables used and the type of analysis applied will be presented in the

s stated in Chapter I, the experimental design

conducted on employees working in leading

ng organizations.

to assess and provide information regarding

This, in reference to the literature review

)on using two groups, professional and non

ave positive or negative attitude toward

### 3.3  Survey Design:

The questionnaire was used as a tool to measure factors that are most likely to be associated to measure the effect of training project mangers using Microsoft Project software. This questionnaire was adopted from a previous survey[1] and it included ten sections. The first section consisted of seven questions on demographic characteristics, followed by a section on computer use consisting of questions related to computer type, extent of use, and frequency of computer use. This was proceeded by a section covering software use, and consisting of two parts, one related to the software packages being used by respondents and the extent of their use, and the other related to the various tasks in which the software packages are used. Then, the sections coming next included four questions on the kind and level of computer training, six questions on computer knowledge and experience, and eight on aspects related to Microsoft Project usage in general. These questionnaire parts were followed by sections that assess the respondent's attitudes and perceptions about certain aspects related to the Microsoft Project software used in the experiment. It is worth noting that these sections were skipped by participants who did not use this software. These included ten questions on the Microsoft Project's ease of use, twenty two items describing the extent of system's friendliness, and seventeen questions assessing the respondents' attitudes and perceptions about the Microsoft Project

software used.

The questionnaire was given to respondents after solving the problems on

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[1] Kamal Mirza, Creativity enhancing DSS, (Beirut: LAU, 1995), pp. 243-251.

the computer to investigate their attitude about Microsoft Project.

### 3.4 Experimental Design :

#### 3.4.1 Subjects:

The subjects of the experiment were selected according to their field work. For that, the first group was the professional respondents who work in project field such as engineers. The second group was named nonprofessional respondents whose work does not need high experience in managing projects but they had a knowledge in quantitative methods. Also, the users were selected with either a BS or an MS degree to ensure consistency in the educational level factor.

#### 3.4.2 Experiment Task:

A laboratory experiment was conducted in a special room. The respondents sat for the experiment at pre-determined dates.

After the respondents attended their appointments, they were directly asked to sit for the experiment. Then, they were given a case problem which included three problems concerning with project management. *Appendix B* shows a full description of the problem. After that, they were asked to solve the problems by using Microsoft Project.

The respondents were given a training session where they read a manual and applied its instructions *Appendix C* shows a copy of the manual. This manual was prepared in a way so as to cover some of the tools provided by the Microsoft Project.

When the experimental task began, no additional guidance or assistance was offered to the subjects. They were just told they had approximately fifty minutes for the completion of the tasks.

Upon task completion, subjects were asked to fill out the questionnaire concerning the software used and other categories.

## 3.5 Variables of the Study:

The study has two kinds of variables which were adopted from the literature review and previous works in the same field area. These were applied to measure the attitude of the users of Microsoft Project.

### 3.5.1 Experiment Variables:

Two major variables were included in the experimental design. These are: (1) Time needed to complete the task fifty minutes;(2) The Software that has been used in the experiment was Microsoft Project.

The two variables were discussed in previous sections.

### 3.5.2 Survey Variables:

There are different variables included in the study to measure the attitude of the respondent toward using Microsoft Project. The variables are :

### 3.5.2.1 Computer Use

The dimension of computer usage included in this study are the following:

1- _Actual Daily Use of Computer_: This dimension was considered as an important one in determining computer use. The extent of use was measured on a six point scale ranging " almost never" to "more than 3 hours per day"

2- _Frequency of use_: This dimension was measured on a six-point scale ranging from "less than once a month" to several times a day."

3- _Software Use:_ This variable was included in the study to determine the number of software the subject is familiar with and the extent of his/her knowledge in using the software mentioned. Ten software packages were included which are, Spreadsheets, Word processing, Data Management packages, Modeling systems, Statistical Packages, Graphical Packages, Communications or E-Mail packages, 4th Generation Languages, 3 rd Generation Languages, and other software. The scale built ranges from "Not at all" to "To great Extent".

4- _Inclusion of Computer Analysis in User Tasks_ : The emphasis would be on the inclusion of computer facilities and analysis in job tasks and the variety of tasks performed on the computer was analyzed using a scale that was developed for measuring thirteen tasks: Looking for Trend, Finding problems, Alternatives, Planning, Budgeting, Taking actions, Communicating with Others, Controlling and Guiding Activities/Performance, Aiding in Adequately Reporting to Superiors, Aiding in Increasing Productivity, and Aiding in Cutting Cost. Five ordinal answers were listed ranging from " Not at all" to "To a great extent" .

### 3.5.2.2 Computer Experience and Training:

Computer experience was assessed by asking subjects to indicate whether they had knowledge and experience in using computers, information systems, involvement in analysis and design of information systems, and use of various kinds

of models. Responses were coded 0 for no experience, and 1 for some or more experience. The total that the respondents reported was used as a measure. Computer training was measured by individuals' response to questions which asked them to report the extent of training they have received from four sources: College or University Courses, Vendor Training, In-Hose Training, and self Study.

### 3.5.2.3 Beliefs and Attitudes About Computer Usage

This measure reflects the general attitude of subjects about using computers in their jobs. The instrument asked the participants to indicate their agreement and disagreement with 12 statements reflecting the beliefs of users about the advantages and disadvantages of using computers. The response options in this scale range from 1 (Strongly Agree) to 5 (Strongly Disagree). The mean of the responses was used as a measure for this variable.

### 3.5.2.4 Microsoft Usage

This part of the survey included 8 items. Questions were listed to measure the extent to which the participant is familiar with Microsoft project's concept and usage. These questions intended to investigate participants' level of Microsoft Project usage (if any), whether he/she was involved in any of a Microsoft Project stages, the levels of satisfaction reached with the results of the Microsoft Project usually used (if any), and whether the effectiveness of decisions made could be attributed to the Microsoft Project being used (if it is used).

### 3.5.2.5 Ease of use:

The ease of use construct was used in this study as an instrument to measure whether Microsoft Project being used in the experiment was seen as an easy system to use. The instrument included items pertinent to confusion, understanding, mental effort needed, type of system on-line help provided, ease of remembering, flexibility, and others.

### 3.5.2.6 System Friendliness:

This study included the computer friendliness. The instrument includes 22 adjectives for which the subjects would indicate their level of agreement using a 5-Likert type scale ranging from 1 ( Strongly Agree) to 5 (Strongly Disagree).

### 3.5.2.7 Attitude Towards Microsoft Project :

This variable was used to assess the attitude and perceptions of the experimental group subjects about the Microsoft Project.. This instrument included 17 items for which the subjects indicated their agreement or disagreement using 5-Likert type scale. These items were intended to get the opinions of the respondent regarding the usefulness of the system for decision making and problem solving for various problem areas faced by the different management levels.

### 3.5.2.8 Demographic Variables:

Single item questions were used to get information about respondents' gender, age, educational level, years of employment, number of subordinates, and organizational level, position, and task performed. The levels in the organization hierarchy consisted of four categories: professional staff, first level supervisor.,

middle management, and strategic management. As to functional area, 8 categories were used: Accounting, Finance, Marketing, General Management, Personnel and HRD, MIS/Computer, Engineering, and others.

### 3.6 Data Analysis

The data gathered from the questionnaires that were filled out by the respondents after completing the experimental tasks were all analyzed by means of the statistical package ASP[*] . The facilities used and the type of analysis performed

were as follows:

1. A descriptive analysis was performed to study the characteristics of respondents, investigate their responses, and study the various aspects related to computer use and beliefs about computer use in general.

2. Item and reliability analysis was performed on the question items forming up variables such as Beliefs about Computer Usage, Ease of Use, Friendliness, and

3. The $t$-test was used to test experiment hypotheses.

Having identified the design and methodology of this research, the variables included, and the analysis tools used, it is an important step now to list the findings and the implications of the study and to evaluate them in the light of the hypotheses to be tested. This is in fact the objectives of the following chapter.

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[*] ASP : A statistical Packages for Business, Economies, and Social  Sciences . DMC software, Inc. 6169 Pebblishire Dr., Grand Blanc, MI 48438.

# Chapter IV

# Research Findings and Analysis

## 4.1 The profile of respondents:

The respondents included in the study as mentioned in chapter three were 24 respondents who work in different companies in Lebanon. Respondents were divided into two groups. 50% of them were considered as professional group, those who use quantitative methods to plan and schedule their jobs. The other group was non- professional, who do not use quantitative methods in their work.

The result of the study was as follows. In terms of the functional area (91.7% )of professional were engineers and the remaining 8.3% were from other functional areas like Medical doctor . Those belonging to the organizational levels were divided as follows: professional staff(50%), first level supervision (41.7), and strategic management (8.3%). Most of the respondents of the professional group have been employed in their organization 7.18 years. Moreover, the average of the number of subordinates reporting to them was 10 subordinates. In addition, the level of education was seen to be: (75%) with a Bachelor's degree, (16.7%)having some graduate or professional study and( 8.3%) obtained Graduate or professional degree. Finally, the average age of the professional respondents was 28 years(25-34).

Non-professional respondents reflected the following characteristics. The functional areas to which they belong are: Accounting (16.7%), Finance (16.7%), Marketing (33.3%), General management (8.3%), MIS/Computer (16.7%) and others (8.3%). They belong to different organizational levels: professional staff (25%), first level supervisor (25%), middle management (33.3%), strategic management (8.3%) and other (8.3%). The average number of years of employment in their organization was 6.16 years. The level of education was : Bachelors degree (50%), some graduate or professional study (25%) and graduate or professional study degree (25%). The average number of subordinate was (6.75). Finally, Their average age was 28 years (25-34).

From the previous results we can conclude that since subject of the first group are professional respondents, the functional area of most of them was engineering. On the other side the functional area of t non professionals included several functional areas. Moreover, most of the organizational level of the professional respondents were professional and first level supervision, while the non professional were professional staff( 25%), first level (25 %), middle management (33.3%), strategic management (8.3%). That difference between two groups could be a result to the nature of their jobs. Finally, the average number of subordinates of the professional(10) was more than non professional (6. 75).Table 4.1 summarize the demographic characteristics of the subjects.

_Table4.1 Demographic Characteristics of Respondents_

| | Professional | | Non professional | |
|---|---|---|---|---|
| | Frequency | Percentages | Frequency | Percentages |
| **Functional area** | | | | |
| Accounting | 0 | 0 | 2 | 16.7 |
| Finance | 0 | 0 | 2 | 16.7 |
| Marketing | 0 | 0 | 4 | 33.3 |
| General management | 0 | 0 | 1 | 8.3 |
| HRD | 0 | 0 | 0 | 0 |
| MIS | 0 | 0 | 2 | 16.7 |
| Engineering | 11 | 91.7 | 0 | 0 |
| Other | 1 | 8.3 | 1 | 8.3 |
| | _12_ | | _12_ | |
| **Level** | | | | |
| Prof. staff | 6 | 50 | 3 | 25 |
| First Level supervisor | 5 | 41.7 | 3 | 25 |
| Middle mgt. | 0 | 0 | 4 | 33.3 |
| Strategic mgt. | 1 | 8.3 | 1 | 8.3 |
| Other | 0 | 0 | 1 | 8.3 |
| | _12_ | | _12_ | |
| **Level education** | | | | |
| Some college | 0 | 0 | 1 | 8.3 |
| Bachelor degree | 9 | 75 | 5 | 71.7 |
| Some graduate | 2 | 16.7 | 3 | 25 |
| Graduate/Prof. degree | 1 | 8.3 | 3 | 25 |
| | _12_ | | _12_ | |
| **Age** | | | | |
| Under 25 | 0 | 0 | 3 | 25 |
| 25-34 | 7 | 58.3 | 5 | 41.7 |
| 35-44 | 4 | 33.3 | 4 | 33.3 |
| 45-54 | 1 | 8.3 | 0 | 0 |
| 55-64 | 0 | 0 | 0 | 0 |
| | _12_ | | _12_ | |
| **Gender** | | | | |
| Male | 11 | 91.6 | 12 | 100 |
| Female | 1 | 8.3 | 0 | 0 |
| | _12_ | | _12_ | |

## 4.2 Computer Use

This variable was studied along four dimensions: (1) extent of use, (2) frequency of use, (3) software use, and (4) task inclusion in computer use. A descriptive analysis was used to study the computer system use along these four dimensions, and to investigate its relationship to the other study variables. Results are shown next.

### 4.2.1 <u>Extent of use.</u>

The frequency distribution of this dimension is shown in *Table(4.2 )* . As noticed, most of the professional respondents (66.7%) reported using the computer for 1-2 hours. (25%) of them using the computer 2-3 hours daily. Moreover, (8.3%) of them using the computer less than ½ hour daily. In comparison, (41.7%)of the non- professional respondents use the computer more than 3 hours daily. (25%) of them using the computer 2-3 hours daily. (16.7%) of them using the computer 1-2 hours daily. Also, (16.7%) using the computer 1-1/2 hour daily.

From those results we can conclude that the professional respondents use the computer more than the non professional respondents in the 1-3 hours category . The( heavy ) use of computers by professionals could be attributed to the fact that the major part of their work involves the quantitative analysis. However, non professionals show heavy use in the > 3 hours probably because most of them belong to Accounting, Finance, and Marketing (66.6%)

*Table: 4.2    Frequency Distribution: Extent of Computer Use.*

| Value | Frequency | | Percentage % | | Cumulative Percentage | |
|---|---|---|---|---|---|---|
| | *Prof.* | *Non-Pro.* | *Prof.* | *Non-Pro.* | *Prof.* | *Non-Pro.* |
| Never | 0 | 0 | 0 | 0 | 0 | 0 |
| <1/2 hour | 1 | 0 | 8.3 | 0 | 8.3 | 0 |
| 1/2- 1 hour | 0 | 2 | 0 | 16.7 | 8.3 | 16.7 |
| 1-2 hours | 8 | 2 | 66.7 | 16.7 | 75 | 33.3 |
| 2-3 hours | 3 | 3 | 25 | 25 | 100 | 58.3 |
| > 3 hours | 0 | 5 | 0 | 41.7 | 100 | 100 |
| Total | 12 | 12 | 100 | 100 | | |

## 4.2.2 Frequency of Use:

This is the second dimension of the computer use. Table 4.3and Figure 4.1 present the distribution of these results. The results show that 33.3% of the professional subjects reported using the computer few times a week. Also, 33.3% of them use the computer once a day, and 33.3% of them using it several times a day.

The results of non-professional subjects show that 16.7%of them use the computer few times a week. 19.7% of them using the computer once a day. Finally, 66.7 of them using the computer several times a day.

The above findings imply a (heavy) use of computer by non professional respondents as since their jobs involve using the computer several times a day. Moreover, the nature of the jobs of professional respondents do not require working on the computer several times a day.

*Table 4.3 Frequency of Use.*

| Value | Frequency | | Percentage % | | Cumulative | |
|---|---|---|---|---|---|---|
| | Prof. | Non- | Prof. | Non- | Prof. | Non-Pro. |
| < once a month | 0 | 0 | 0 | 0 | 0 | 0 |
| once a month | 0 | 0 | 0 | 0 | 0 | 0 |
| few times a month | 0 | 0 | 0 | 0 | 0 | 0 |
| few times a week | 4 | 2 | 33.3 | 16.7 | 33.3 | 16.7 |
| once a day | 4 | 2 | 33.3 | 19.7 | 66.7 | 33.3 |
| several times a day | 4 | 8 | 33.3 | 66.7 | 100 | 100 |
| Total | 12 | 12 | 100 | 100 | | |

*Figure 4.1 Frequency of Use.*
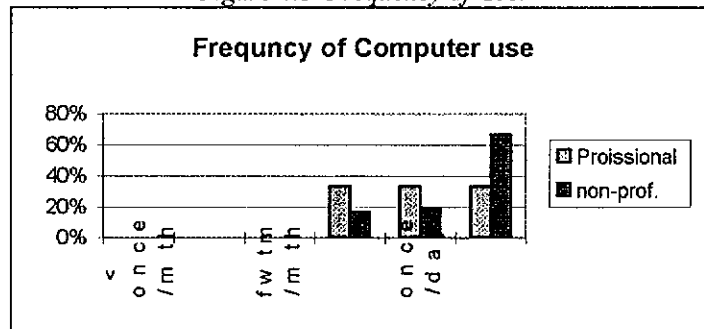


### 4.2.3 Software Use:

A good indication of the overall computer system use and the tasks performed on the computer can be provided by measuring the number of packages used and the type of software applied by the user.

As to the extent of software use, the majority of the professional respondents (75%) reported using Word Processing software packages to some extent or to a great extent. This was followed by Statistical Packages, Graphical Packages and Communication Packages ( 58.33% each). Other packages category and Spreadsheet record (50%)each, while Third Generation Language and Modeling System(41.66%each), Fourth Generation Language, and Data Management ( 8.33%).

On the other hand, the majority of non-professional respondents (75%) reported using Spreadsheets and Word Processing. This was followed by Communication Packages (66.66%), Graphical Packages(58.33%), Statistical Packages (50%), and other packages category (41.66%). Third and Fourth Generation Languages record (16.66% each), Data Management (25%). The results are shown in Table 4.4 and Figure 4.2.

In fact, such results show that professional respondents are using computers for Word Processing and Spreadsheets ( documenting, reporting,....). In addition, they use Statistical and Graphical packages since these are part of their duties. Also, communication packages are being used to send and receive massages and reports. Also, software such as Primavera and AutoCad are used in their technical part of their jobs. Very few reported using Data management and fourth generation languages .

Non professional respondents use the computer system on their job majorly for Word Processing and Spreadsheet ( typing, documenting, reporting, charting, ...). They also use communication packages to send and receive reports and messages. Other software such as accounting systems are being used. Very few reported using Data management and Fourth generation languages. Such packages proved to be highly important for business applications.

*Table 4.4 Software Use*

| Application Name | Professional | | Non-Professional | |
|---|---|---|---|---|
| | Frequency | Percentages % | Frequency | Percentages % |
| Spreadsheets | 6 | 50 | 9 | 75 |
| Word Processing | 9 | 75 | 9 | 75 |
| Data Management | 1 | 8.33 | 3 | 25 |
| Modeling Systems | 5 | 41.66 | 4 | 33.33 |
| Statistical Packages | 7 | 58.33 | 6 | 50 |
| Graphical Packages | 7 | 58.33 | 7 | 58.33 |
| Communication Packages | 7 | 58.33 | 8 | 66.66 |
| Fourth Generation Languages | 3 | 25 | 2 | 16.66 |
| Third Generation Languages | 5 | 41.66 | 2 | 16.66 |
| Other | 6 | 50 | 5 | 41.66 |

*Figure 4.2 Software Use*
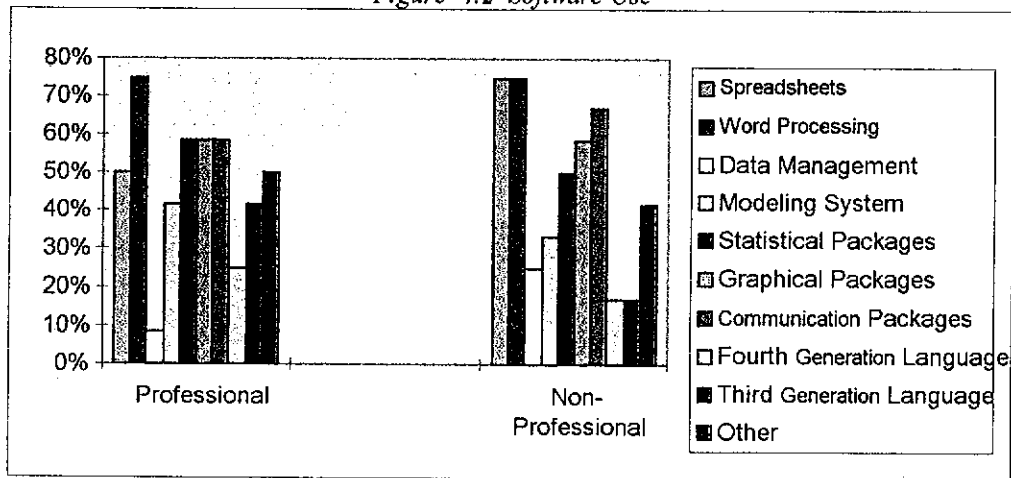


### 4.2.4 Task Inclusion in Computer Use

This final dimension of computer use was analyzed, and it showed that the majority of the professional respondents (66.66%) use computers for budgeting, taking actions, making decisions, and aiding them in adequately reporting to superiors. This was followed by (58.33%)using the computer for planning, communicating with others, and controlling and giving activities. (50%) use the computer for finding problems/ alternatives, historical reference and to keep them up-to-date on activities/performance. Also, (41.66%) use it to look for trends, aid them in increasing productivity of their areas, and aid them in cutting cost in their areas.

All of the non-professional respondents (100%) use the computer to help and support their decision making as well as historical reference. This was followed by (83.33%) using it for taking actions and aiding them in adequately

reporting to superiors. In addition, (75%) use it to look for trend, (66.66%) using it for planning, ommunicating, and keeping them up-to-date on activities/performance and aiding them in increasing productivity of their areas. Finally, (58.33%) use it for budgeting, (50%) aid them to cut cost in their areas, and (41.66%) use it for finding problems/ alternatives. Results are shown in Table 4.5 and Figure 4.3 .

In fact such findings support what previously mentioned that the type of tasks performed on the computer depend on the nature of their job and software used by them. Primavera and Autocad software can well support taking action, planning, budgeting, finding problems/ alternatives looking for trends and keeping them up -to- date on activities performance. The word processing and communication packages can support well the tasks of reporting to superiors and communicating with others. Finally, such computer use in their jobs will aid increasing productivity and in cutting costs.

The tasks done by the non professional respondents depend on the software used by them. The word processing and communication packages can support well the task of reporting to superiors and to communicate with them. Software like Accounting system can help them to plan, budget, take action, make decisions, and historical reference. Finally, such use of the computer in their jobs will aid increasing productivity and cutting costs.

Table  4.5 Task Inclusion in Computer Use

| | Professional | | Non-Professional | |
|---|---|---|---|---|
| | Frequency | Percentages | Frequency | Percentages |
| Looking for trend | 5 | 41.66 | 9 | 75 |
| Finding problems/ alternatives | 6 | 50 | 5 | 41.66 |
| Planning | 7 | 58.33 | 8 | 66.66 |
| Budgeting | 7 | 58.33 | 7 | 58.33 |
| Taking actions | 8 | 66.66 | 10 | 83.33 |
| Communicating with others | 8 | 66.66 | 8 | 66.66 |
| Controlling and giving activities | 7 | 58.33 | 10 | 83.33 |
| Making decisions | 7 | 58.33 | 12 | 100 |
| Historical reference | 8 | 66.66 | 12 | 100 |
| Keeping me up-to-date on activities/performance | 6 | 50 | 8 | 66.66 |
| Aiding me in adequately reporting to superiors | 8 | 66.66 | 10 | 83.33 |
| Aiding me in increasing productivity of my area | 5 | 41.66 | 8 | 66.66 |
| Aiding me in cutting cost in my area | 5 | 41.66 | 6 | 50 |

Figure 4.3 Task Inclusion in Computer Use
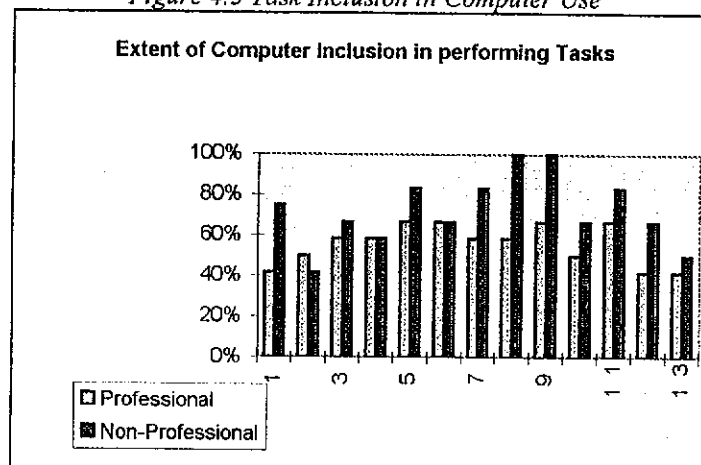


## 4.3  Computer Training:

The following results in Table  4 .6 and Figure 4.4 show the level of training the respondents had in the use of computers.

(91.66%) of professional respondents have had  computer training by  self study, (83.333%) by general courses at a college or university,  (41.666%) in house company courses, and  (33.333%) by training provided by vendors.

On the other side, (91.666%) of non professional respondents reported that they have had extremely extensive and extensive training by general courses at a college or university and through self study, (58.333%) by training provided by vendors, and (41.666%) in house company courses.

Based on that, since all of the professional and non professional respondents have BS and above, most of them reported that they had extensive training at college or universities. We can, also, notice that training provided by vendors to professional respondents were more than that provided to non professional. That difference could be a result of the fact that most of the professional respondents use specific softwares in their jobs which require specific training provided by vendors.

*Table 4.6 computer training*

| | Professional | | Non- Professional | |
|---|---|---|---|---|
| | Frequency | Percentages % | Frequency | Percentages % |
| General Courses at a college or university | 10 | 83.333 | 11 | 91.666 |
| Training Provided by vendors | 4 | 33.333 | 7 | 58.333 |
| In house company courses | 5 | 41.666 | 5 | 41.666 |
| Through self study | 11 | 91.666 | 11 | 91.666 |

*Figure 4.4 computer training*
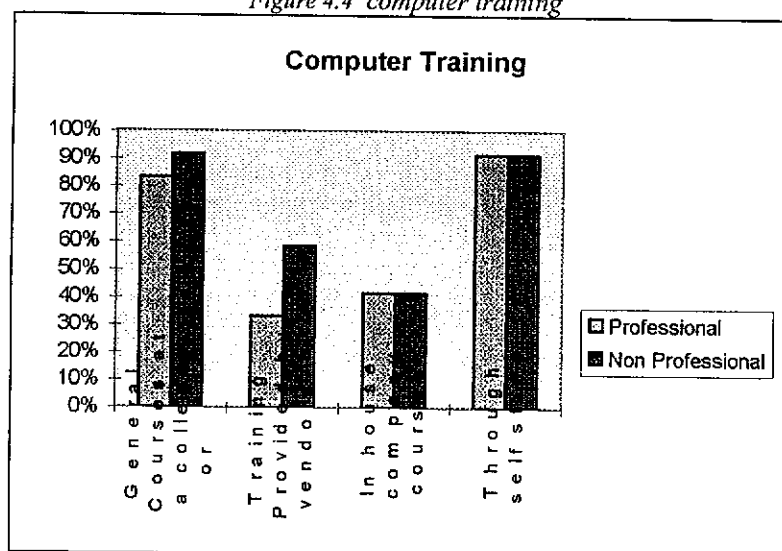
## 4.4 Computer Knowledge and Experience:

This part of the survey included the actual experience taken with computers and knowledge about computers in general.

The results show that the professional respondents took an average 4.33 courses, while non professional respondents averaged 5.833 courses.

Moreover, the mean of courses taken in information systems was .916 course by the professional and 2.916 by non professional. Again, such difference could be explained on the basis of the functional areas declared.

In the dimension of years of experience, the results were as follow: the time mean of the Personal computer use was 7.66 years for professional respondents and 8.583 for non professional respondents . The mean time of using a computer in general was 9 years of professional respondents and 10.416 for non professional. In addition, the time mean of periods spent by participating in technical analysis and design of information systems was .666 years for professional respondents and 3.333 years for non professional respondents. Finally, the time mean of using financial, statistical, or other models on microcomputer or mainframe system was 4 years for non professional respondents, while 1.25 years for professional respondents.

Most of the non professional respondents had more courses in computer and information system than professional respondents. In addition, the time spent by participating in technical analysis, design of information systems, and using financial, statistical or other models was longer for non professional respondents. That difference could be highly attributed to the variety of declared majors of the subjects participating in the experiment .

## 4.5 Microsoft Project Usage

This part of the survey is concerned with identifying the experience of the respondents in Microsoft Project usage.

*This part of the survey showed two things:*

*a)*   *that 41.66% of the professional respondents use Microsoft Project, out of whom 80% use it on the long-run.*

*b)*   *and that 50% of the non professional respondents use Microsoft Project, out of whom 33.33% use it in the same period of time.*

Moreover, Table 4.7 shows that most of the professional respondents have used Microsoft Project within the past 4 years, while most of non professional respondents have used it for less than 1 year. That could be due to the nature of professionals job which requires more involvement in project planning and implementation.

Also, most of the non professional respondents use Microsoft Project weekly, while most of the professional respondents use it daily and weekly. That could be due to the reason stated above. In addition, from Table 4.7 we can notice that most of the respondents belonging to both categories used Microsoft Project for implementation. This finding is in good agreement with the declared purpose of using Microsoft Project which is implementation.

Table 4.7 also shows that most of the professional respondents reported that the results provided by Microsoft Project were on the average very

satisfactory , while the results of most of the non professional respondents were categorized on the average to be satisfactory.

Also, results expected from the Microsoft Project, like for example, the satisfaction with it, training received in how to use it and decision making improvement showed average satisfaction for professional respondents. The reason for that is that most of the professional respondents might use other sophisticated project softwares which require more knowledge and experience in project softwares comparing with the simplicity of the Microsoft Project. Therefore, an overall satisfaction can be achieved.

_Table 4.7Microsoft Project Usage_

| | Professional | Non Professional |
|---|---|---|
| | Frequency% | Frequency % |
| **Used M.P. within past** | | |
| Less than 1 year | 20 | 66.66 |
| 1 to 2 years | 60 | 16.66 |
| 3 to 4 years | 20 | 16.66 |
| 5 years or more | 0 | 0 |
| N/A | 0 | 0 |
| | | |
| **Use M.P** | | |
| Daily | 40 | 0 |
| Weekly | 60 | 83.33 |
| Once a Month | 0 | 16.66 |
| Never | 0 | 0 |
| | | |
| **Was involved in the following** | | |
| Design | 0 | 16.66 |
| Development | 20 | 16.66 |
| Implementation | 80 | 66.66 |
| Not involved | 0 | 0 |
| | | |
| **Result by M.P** | | |
| Excellent | 20 | 33.33 |
| Satisfactory | 40 | 50 |
| Poor | 40 | 16.66 |
| N/A | 0 | |
| | | |
| **Satisfy with M.P** | | |
| All the time | 20 | 0 |
| Most of the time | 20 | 66.66 |
| Some of the time | 40 | 0 |
| Rarely | 20 | 33.33 |
| Never | 0 | 0 |
| N/A | 0 | 0 |
| | | |
| **Effective decision because** | | |
| All the time | 20 | 0 |
| Most of the time | 20 | 50 |
| Some of the time | 60 | 33.33 |
| Never | 0 | 16.66 |
| N/A | 0 | 0 |
| | | |
| **Turning received on M.P.** | | |
| Excellent | 20 | 0 |
| Adequate | 40 | 33.33 |
| Poor | 20 | 33.33 |
| Not available | 20 | 33.33 |

## 4.6 Beliefs about Computer Usage

In this part we found out what the respondents believe if using computers
in their job. Results are shown in Table 4.6 and Figure 4.5. (91.7%) of the
professional and non professional agreed and strongly agreed that using a computer

could provide them with information that would lead to better decisions. (75%) of professional respondents and (66.7%) of non professional agreed and strongly agreed that Using a computer allowed them to be more independent in performing their jobs. (25%) of both groups of respondents agreed and strongly agreed that using a computer exposed them to vulnerability of computer breakdown and loss of data. (58.3%) of professional respondents and (83.3%) agreed and strongly agreed that using a computer allowed them to be more innovative by providing the opportunities for more creative analysis and outputs. (75%) of both groups agreed and strongly agreed that using a computer improved their productivity on the job. (25%) of professional respondents and (75%) non professional respondents agreed and strongly agreed that using a computer gave them the opportunity to enhance their image in the company. (33.3%) of professional respondents and (16.7%) of non professional agreed and strongly agreed that they would hesitate to use a computer because of the difficulty of integrating it with existing information systems in their work. (58.3%) of professional respondents and (33.33%) of non professional respondents agreed and strongly agreed that using a computer could take up too much of their time in performing many tasks. (25%) of professional respondents and (16.7%) on non professional agreed and strongly agreed that using a computer would involve too much time doing mechanical operations to allow sufficient time for managerial analysis.(91.7%)of professional respondents and(58.3%) of professional respondents agreed and strongly agreed that using a computer allowed them to get exposed to various games-entertainment and educational. (75%) of professional respondents and (83.3%) non professional respondents agreed and strongly agreed that using a computer allowed them to access, store and retrieve information easily without difficulties. (16.66%) of

professional respondents and (50%) of non professional respondents agreed and strongly agreed that they are using a computer because their supervisors wanted them to use it.

Moreover, to test the statistical difference between the two groups in term of their beliefs in computer usage we will test the hypothesis that there is a major difference between professionals and non professionals in their perception on how a computer affects their jobs.

Results in Table 4.7 show that the only dimensions showing significant difference in beliefs while testing the hypothesis that both groups, professionals and non professionals, believe that computers will affect their jobs are the following:

1- Using a computer allows them to be more innovative by providing the opportunities for more creative analysis and outputs .

2- Using a computer gives them the opportunity to enhance their image in the company.

In both cases, $t$-tests show that $t > 2.0$ with probabilities $P_{sig.} < 5\%$ meaning that we reject the hypothesis that both have the same perception with computer usage.

This difference is highly related to the specificity of jobs carried out by each group. Professionals believe that computers will not enhances their status, work efficiency, and analytical dimensions of their work; rather, it is simply a tool to complete the job. While non professionals believe that a computer enhance their job image, improves their options for decision making and increases their use of the data and information related to their works.

**Table 4.8** Beliefs About Computer Usage

| | Professional | | Non- Professional | |
|---|---|---|---|---|
| | Frequency | Percentages | Frequency | Percentages |
| Using a computer could provide them with information that would lead to better decisions. | 11 | 91.7 | 11 | 91.7 |
| Using a computer allows them to be more independent in performing my job. | 9 | 75 | 8 | 66.7 |
| Using a computer exposes them to vulnerability of computer breakdown and loss of data. | 3 | 25 | 3 | 25 |
| Using a computer allows them to be more innovative by providing the opportunities for more creative analysis and outputs. | 7 | 58.3 | 10 | 83.3 |
| Using a computer improves their productivity on the job. | 9 | 75 | 9 | 75 |
| Using a computer gives them the opportunity to enhance their image in the company. | 3 | 25 | 9 | 75 |
| They would hesitate to use a computer because of the difficulty of integrating it with existing information systems in their work. | 4 | 33.3 | 2 | 16.7 |
| Using a computer can take up too much of their time in performing many tasks. | 7 | 58.3 | 4 | 33.3 |
| Using a computer would involve too much time doing mechanical operations to allow sufficient time for managerial analysis. | 3 | 25 | 2 | 16.7 |
| Using a computer allows them to get exposed to various games-entertainment and educational. | 11 | 91.7 | 7 | 58.3 |
| Using a computer allows them to access, store and retrieve information easily without difficulties. | 9 | 75 | 10 | 83.3 |
| Using a computer because their supervisors want them to use it. | 2 | 16.66 | 6 | 50 |

Figure 4.5 *Beliefs About Computer Usage*



83
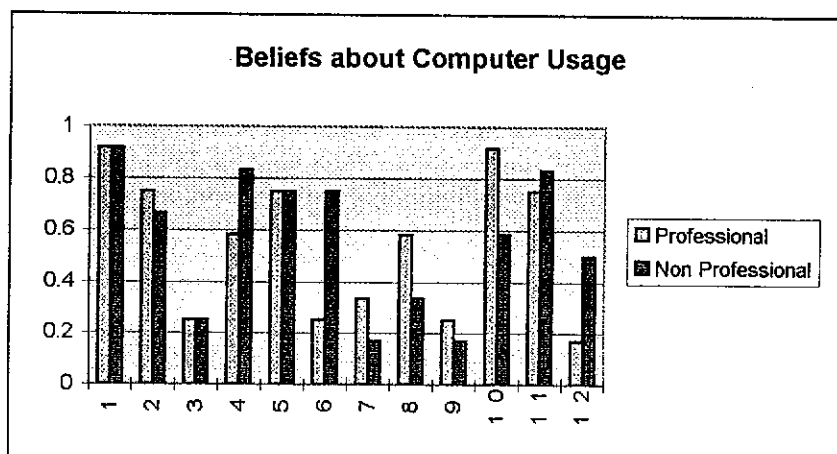
Table 4.9 Beliefs About Computer Usage

| | Professional | | Non-Professional | | Hypothesis Check $H_0\ \chi_1=\chi_2$ | | |
|---|---|---|---|---|---|---|---|
| | Mean | Variance | Mean | Variance | t | P-Val. | Std.Err. |
| 1-Using a computer could provide them with information that would lead to better decisions. | 1.66667 | .424242 | 1.58333 | .810606 | .259799 | .797435 | .320787 |
| 2- Using a computer allows them to be more independent in performing my job. | 1.91667 | .992424 | 2 | 1.09091 | -.199992 | .843324 | .416667 |
| 3-Using a computer exposes them to vulnerability of computer breakdown and loss of data. | 2.91667 | .810606 | 3.33333 | .0787879 | -1.53047 | .140153 | .272243 |
| 4-Using a computer allows them to be more innovative by providing the opportunities for more creative analysis and outputs. | 2.5 | .818182 | 1.75 | .5611.2 | 2.2065 | .0380831 | .33969 |
| 5-Using a computer improves their productivity on the job. | 2.25 | .931818 | 1.91667 | .992424 | .832406 | .414125 | .400442 |
| 6-Using a computer gives them the opportunity to enhance their image in the company. | 3.08333 | .992424 | 1.91667 | .628788 | 3.17406 | 4.39222E-3 | .367567 |
| 7-They would hesitate to use a computer because of the difficulty of integrating it with existing information systems in their work. | 3.41667 | 1.7197 | 4.0333 | 1.17424 | -1.35753 | .188375 | .491082 |
| 8-Using a computer can take up too much of their time in performing many tasks. | 2.75 | 1.29545 | 3.58333 | 1.53788 | -1.71498 | .100403 | .485912 |
| 9-Using a computer would involve too much time doing mechanical operations to allow sufficient time for managerial analysis. | 3.08333 | .992424 | 3.4167 | .992424 | -.819624 | .4212222 | .406699 |
| 10- Using a computer allows them to get exposed to various games-entertainment and educational. | 2.66667 | 1.23091 | 2.41667 | 1.53788 | .520458 | .607943 | .480346 |
| 11- Using a computer allows them to access, store and retrieve information easily without difficulties. | 2.25 | 1.29545 | 1.91667 | 2.26515 | .611932 | .546855 | .544717 |
| 13-Using a computer because their supervisors want them to use it. | 3.58333 | 1.90152 | 3.08333 | 2.62879 | .813761 | .424503 | .614431 |

## 4.7 Ease of Use:

The results of this part reflect the attitude of tested subjects toward the ease of use the Microsoft Project provides. Table 4.8 and Figure 4.6 show the results. (16.7%) of the professional respondents and (33.3%) of the non professional respondents felt confused while using the computer system.(25%) of the professional respondents and (33.3%) of the non professional respondents made a lot of errors when using this computer system. (8.3%) of the professional respondents and (16.7%) of the non professional thought that such information systems were frustrating. (75%) of the professional respondents and (58.3%) of the non professional respondents could often pressed the on-line help and/or consult the user manual while using the computer system. (8.3%) of the

professional respondents and (16.7%) of the non professional respondents reported that the system they used was inflexible and rigid to react with.(58.8%) of the professional respondents and (41.7%) believed that the manipulation of such computer systems required a lot of their mental efforts. (91.7%) of the professional respondents and (66.7%) of the non professional respondents believed that the system was designed in a way that made it easy for them to remember how to perform a given task. (83.3%) of the professional respondents and (66.7%) of the non professional respondents believed that the on-line help provided helpful guidance about how to perform a given task.(16.7%) of the professional respondents and (25%) of the non professional respondents believed that the system sometimes behaved in unexpected ways. (83.33%) of the professional respondents and (66.7%) found this information system easy to use.

Again a $t$-test was run to test the hypothesis that Microsoft Project package was used easily by both groups.

Based on the results of Table 4.9 one can conclude that professional and non professional respondents had the same attitude when they were asked about the easiness of using Microsoft Project. Yet, $t$-test results relating to the following hypothesis:

" Overall, they found this information system easy to use ", supported a rejection to the hypothesis since $t > 2.5$ with $P_{sig.} < 5\%$.

Probably each group is basing its arguments on the specific technical background; therefore, not reflecting the effect of the software features themselves. This can be seen easily in the professional and non professional attitudes toward the ease of use dimensions presented in Table 4.8.

Table 4.10 Ease of Use

| | Professional | | Non professional | |
|---|---|---|---|---|
| | Frequency | Percentages % | Frequency | Percentages % |
| Felt confused while using the computer system | 2 | 16.7 | 4 | 33.3 |
| Made a lot of errors when they used this computer system. | 3 | 25 | 4 | 33.3 |
| Think that such information systems were frustrating. | 1 | 8.3 | 2 | 16.7 |
| Could often pressed the on-line help and/or consult the user manual while using the computer system. | 9 | 75 | 7 | 58.3 |
| The system they used was inflexible and rigid to react with. | 1 | 8.3 | 2 | 16.7 |
| believe that the manipulation of such computer systems required a lot of my mental effort. | 7 | 58.3 | 5 | 41.7 |
| The system was designed in a way that made it easy for them to remember how to perform a given task. | 11 | 91.7 | 5 | 66.7 |
| The on-line help provided helpful guidance about how to perform a given task. | 10 | 83.3 | 8 | 66.7 |
| The system sometimes behaved in unexpected ways. | 2 | 16.7 | 3 | 25 |
| Overall, they found this information system easy to use. | 10 | 83.33 | 8 | 66.7 |

Figure 4.6 Ease of Use
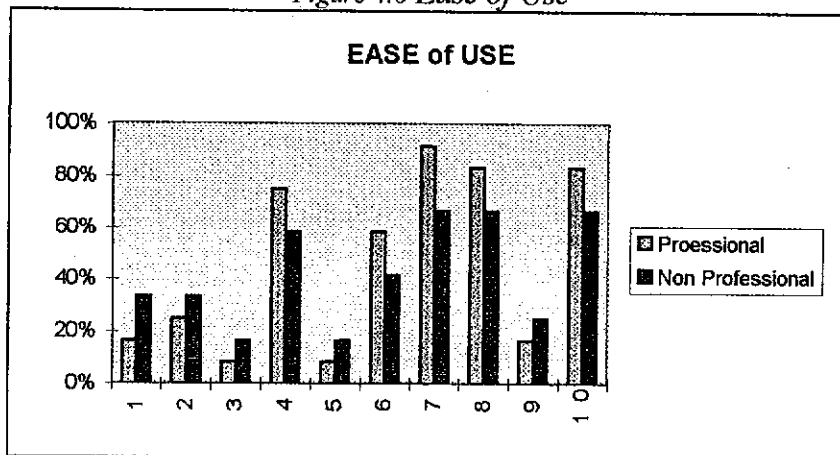
*Table 4.11 Ease of Use*

| | Professional | | Non-Professional | | Hypothesis Check $Ho : \chi_1 = \chi_2$ | | |
|---|---|---|---|---|---|---|---|
| | Mean | Variance | Mean | Variance | t | P-Val. | Std.Err. |
| 1-Felt confused while using the computer system | 3.66667 | .969697 | 3.41667 | 1.35606 | .567869 | .575874 | .440242 |
| 2-Made a lot of errors when they used this computer system. | 3.5 | 1.18182 | 3.41667 | 1.17424 | .188061 | .852553 | .443101 |
| 3-Think that such information systems were frustrating. | 3.33333 | .969697 | 3.66667 | .969697 | -.829173 | .415913 | .402015 |
| 4-Could often pressed the on-line help and/or consult the user manual while using the computer system. | 1.83333 | .333333 | 2.5 | 1.36364 | -1.77282 | .0901068 | .376051 |
| 5-The system they used was inflexible and rigid to react with. | 3.6667 | .787879 | 3.58333 | .810606 | .228426 | .821425 | .364975 |
| 6-Believe that the manipulation of such computer systems required a lot of my mental effort. | 2.5 | .818182 | 2.83333 | .69697 | -.938074 | .358392 | .55335 |
| 7-The system was designed in a way that made it easy for them to remember how to perform a given task. | 1.5 | .454545 | 2.3333 | 1.51515 | -2.05688 | .0517469 | .405143 |
| 8-The on-line help provided helpful guidance about how to perform a given task. | 2 | .727273 | 2.5 | 1.72727 | -1.10554 | .280869 | .452267 |
| 9-The system sometimes behaved in unexpected ways. | 3.25 | 1.11364 | 3.33333 | 1.15152 | -.191797 | .84966 | .434469 |
| 10-Felt they found the information system easy to use. | 2.75 | .636364 | 2.5 | 1.18182 | -2.56904 | .0176031 | .38925 |

## 4.8 Beliefs about Computer Friendliness:

Table 4.10 shows the results as reflected by the two selected groups on their beliefs about the computer friendliness when they used Microsoft Project. Both groups agreed when they characterized themselves as bored, creative, constrained, examining....etc.

Computer friendliness was measured using 22 dimensions expressed in specific words. Respondents had to answer based on a 5 point Likert scale. Table 4.10 reflects the overall scheme of responses of both groups. Professionals and non professionals reflected their overall agreement on the friendliness of the system. However, an exception was found dealing with the mechanical dimension.

Running a *t*-test to test the hypothesis stating that both groups of respondents agree that the Microsoft Project software was friendly on 22 dimensions, only one

dimension failed. This dimension "system being mechanical" resulted in $t > 2$ with

$P_{sig.} < 5\%$. Professionals agreed that software is mechanical while non professionals

disagreed. Probably the frequency of using the software creates such a feeling.

Professionals use Project softwares more frequently and for long times.

Table 4.12 _Belief about Computer Friendliness_

| | Professional | | Non- Professional | | Hypothesis Check $Ho : \chi_1 = \chi_2$ | | |
|---|---|---|---|---|---|---|---|
| | Mean | Variance | Mean | Variance | t | P-Val. | Std.Err. |
| 1- Spontaneous | 2.08333 | .265152 | 2 | 1.09091 | .247886 | .806522 | .336162 |
| 2- Conscientious | 1.75 | .386364 | 1.5 | .272727 | 1.06674 | .297657 | .234359 |
| 3- Unimaginative | 3.33333 | 1.69697 | 3.58333 | 1.69697 | -.470087 | .642919 | .531816 |
| 4- Experimenting | 2 | .545455 | 2 | .727273 | 0 | 1 | .32567 |
| 5- Serious | 2 | 1.09091 | 1.91667 | .628788 | .220123 | .827805 | .378561 |
| 6- Bored | 3 | 1.45455 | 3.58333 | 1.90152 | -1.10304 | .281932 | .528841 |
| 7- Flexible | 2.25 | .386364 | 2.66667 | .969697 | -1.23949 | .228224 | .336162 |
| 8- Mechanical | 2.66667 | .78789 | 3.5 | .636364 | -2.41889 | .0242878 | .34451 |
| 9- Creative | 2.25 | .931818 | 2.75 | 1.47727 | -1.11592 | .276496 | .44806 |
| 10- Inconsistent | 3.08333 | .265152 | 3.5 | .818182 | -1.38676 | .179407 | .300463 |
| 11- Curious | 2.75 | .568182 | 2.66667 | 1.33333 | .209335 | .836113 | .39807 |
| 12- Intellectually inactive | 3.66667 | 1.33333 | 3.5 | 1.36364 | .351569 | .728507 | .474075 |
| 13- Inquiring | 2.91667 | .992424 | 3 | 2 | -.166871 | .868996 | .499368 |
| 14- Routine | 3.5 | 1.36364 | 3.25 | 1.11364 | .550229 | .587706 | .454357 |
| 15- Playful | 4 | 1.81818 | 3 | 2 | 1.77281 | .090108 | .564076 |
| 16- Investigative | 2.08333 | .992424 | 2.33333 | 1.15152 | -.591458 | .560243 | .422684 |
| 17- Constrained | 2.83333 | 1.06061 | 3.16667 | .69697 | -.871005 | .393157 | .382707 |
| 18- Unoriginal | 2.75 | .75 | 3.16667 | 1.06061 | -1.07268 | .295041 | .388438 |
| 19- Examining | 2.1667 | .333333 | 2.16667 | .515152 | 1.12821E-4 | .999911 | .265908 |
| 20- Uninventive | 3.5 | .285571 | 3.75 | .931818 | -.784903 | .440881 | .318511 |
| 21- Inquisitive | 2.25 | .568182 | 2.08333 | .628788 | .527723 | .602974 | .315828 |
| 22- Questioning | 2.25 | .568182 | 2.08333 | .992424 | .46217 | .648498 | .360625 |

## 4.9 Attitude Towards Microsoft Project:

Results in Table 4.11 and Figure 4.7 show the following responses .

(66.7%) of the professional respondents and ( 75%) of non professional

respondents agreed that Microsoft Project  majorly supports highly structured

decisions.(75%) of the professional respondents and (41.7%) of non professional

respondents agreed that Microsoft Project majorly supports semi-structured

decisions.(83%) of the professional respondents and (41.7) of non professional

respondents agreed that Microsoft Project majorly supports unstructured decisions.

(91.7%) of the professional respondents and (75%) of non professional

respondents agreed that Microsoft Project provides support for upper management.(25%) of the professional respondents and (83.3%) of non professional respondents agreed that Microsoft Project provides support for middle management.(75%) of the professional respondents and (91.7%) of non professional respondents agreed that Microsoft Project provides support for lower management.(66.7%) of the professional respondents and (75%) of non professional respondents agreed that Microsoft Project helps in identifying potential problems. (66.7%) of both the professional and non professional respondents agreed that Microsoft Project helps in identifying opportunities.(33.3%) of the professional respondents and (91.7%) of non professional respondents agreed that Microsoft Project is useful for analyzing alternatives.(66.7%) of both the professional and non professional respondents agreed that Microsoft Project is useful for choosing among alternatives. (25%) of the professional respondents and (33.33%) of non professional respondents thought that their usage of Microsoft Project is interactive.(66.7%) of the professional respondents and (75%) of non professional respondents greed that Microsoft Project supports the area of decision making. (66.7%) of the professional respondents and (91.7%) of non professional respondents greed that Microsoft Project provides supports for many diverse problem areas. (58.3%) of the professional respondents and (25%) of non professional respondents greed that Microsoft Project supports only one specific type of problem. (83.3%) of the professional respondents and (50%) of non professional respondents greed that the user interface subsystem provided by this Microsoft Project is flexible.(91.7%) of the professional respondents and (83.3%) of non professional respondents greed that this Microsoft Project helps users with findings new directions or strategies for

solving a problem. (100%) of the professional respondents and (91.7%) of non professional respondents greed that This Microsoft Project provides users with meaningful, helpful and encouraging responses that would increase task motivation.

To test the statistical difference between the attitudes of the both groups, we will discuss the following hypothesis.

Our hypothesis is that:

*Both professionals and non professionals believe that Microsoft Project is useful for analyzing alternatives.*

$$H_0 : \chi_1 = \chi_2$$

*Both professionals and non professionals believe that Microsoft Project supports for many divers problem areas.*

$$H_0 : \chi_1 = \chi_2$$

*Both professionals and non professionals believe that The user interface subsystem provided by this Microsoft Project is flexible.*

$$H_0 : \chi_1 = \chi_2$$

Based on $t$-test results presented in Table 4.12 we can conclude that we will accept the null hypothesis for most dimensions except for the three specific hypothesis presented above. This means that answers of the professional respondents and those of the non professional are not different in their treatment of Microsoft Project .

Therefore, as mentioned above we reject the null hypotheses stated in three dimensions. The rejection is based on the following data:

| | Professionals | | Non Professionals | | Hypothesis check | | |
|---|---|---|---|---|---|---|---|
| | Mean | Variance | Mean | Variance | t | P-Val. | Std. Err. |
| This MICROSOFT PROJECT is useful for analyzing alternatives. | 3.08333 | .810606 | 1.83333 | .333333 | 4.04855 | 5.3581E-4 | .308753 |
| This MICROSOFT PROJECT provides supports for many diverse problem areas. | 2.41667 | .44697 | 1.83333 | .333333 | 2.2876 | .0321392 | .255 |
| The user interface subsystem provided by this MICROSOFT PROJECT is flexible. | 1.75 | .568182 | 2.58333 | 1.35606 | -2.08103 | .0492806 | .400442 |

In the above data we find that $t>2$ with $P_{sig.}< 5\%$ for the three dimensions. In the first dimension, the different attitudes of professionals and non professionals is related to the different backgrounds of the two groups , and the fact that professionals use the software as a tool to execute solutions while non professionals use it for decision alternatives. As for the second dimension, the difference in attitudes is due to the background professionals have, that is, their specialization, while nonprofessionals perceive the support based on their different background. Therefore, professionals perceive. the benefits of the software only in the specific areas in which they use it. In the third dimension, the perception of the software was different because professionals are acquainted with the use of that software in addition to using other sophisticated project management softwares.

*Table 4.13  Attitude Towards Microsoft Project*

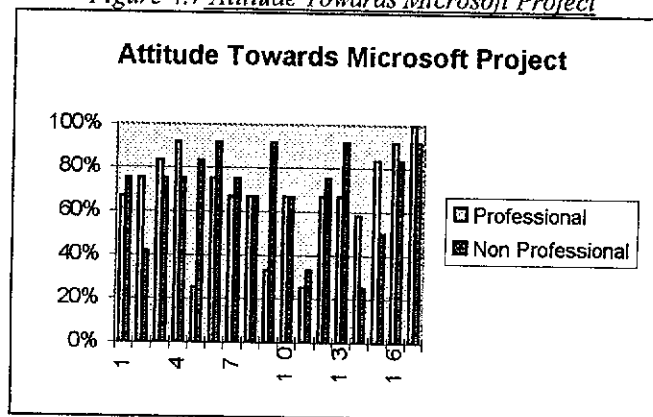| | Professional | | Non professional | |
|---|---|---|---|---|
| | Frequency | Percentages % | Frequency | Percentages % |
| 1-This MICROSOFT PROJECT majorly supports highly structured decisions. | 8 | 66.7 | 9 | 75 |
| 2-This MICROSOFT PROJECT majorly supports semi-structured decisions. | 9 | 75 | 10 | 41.7 |
| 3-This MICROSOFT PROJECT majorly supports unstructured decisions. | 10 | 83.3 | 9 | 75 |
| 4-This MICROSOFT PROJECT provides support for upper management. | 11 | 91.7 | 9 | 75 |
| 5-This MICROSOFT PROJECT provides support for middle management. | 3 | 25 | 10 | 83.3 |
| 6-This MICROSOFT PROJECT provides support for lower management. | 9 | 75 | 11 | 91.7 |
| 7-This MICROSOFT PROJECT helps in identifying potential problems. | 8 | 66.7 | 9 | 75 |
| 8-This MICROSOFT PROJECT helps in identifying opportunities. | 8 | 66.7 | 8 | 66.7 |
| 9-This MICROSOFT PROJECT is useful for analyzing alternatives. | 4 | 33.3 | 11 | 91.7 |
| 10-This MICROSOFT PROJECT is useful for choosing among alternatives. | 8 | 66.7 | 8 | 66.7 |
| 11-I think that my usage of MICROSOFT PROJECT is interactive. | 3 | 25 | 4 | 33.3 |
| 12-This MICROSOFT PROJECT supports the area of decision making. | 8 | 66.7 | 9 | 75 |
| 13-This MICROSOFT PROJECT provides supports for many diverse problem areas. | 8 | 66.7 | 11 | 91.7 |
| 14-This MICROSOFT PROJECT supports only one specific type of problem. | 7 | 58.3 | 3 | 25 |
| 15-The user interface subsystem provided by this MICROSOFT PROJECT is flexible. | 10 | 83.3 | 6 | 50 |
| 16-This MICROSOFT PROJECT helps users with findings new directions or strategies for solving a problem. | 11 | 91.7 | 10 | 83.3 |
| 17-This MICROSOFT PROJECT provides users with meaningful, helpful and encouraging responses that would increase task motivation. | 12 | 100 | 11 | 91.7 |

*Figure 4.7 Attitude Towards Microsoft Project*

*Table4.14 Attitude Towards Microsoft Project*

| | Professional | | Non-Professional | | Hypothesis Check $H_0 : \chi_1 = \chi_2$ | | |
|---|---|---|---|---|---|---|---|
| | Mean | Variance | Mean | Variance | t | P-Val. | Std. Err. |
| 1-This MICROSOFT PROJECT majorly supports highly structured decisions. | 2.41667 | 0.992424 | 2.33333 | 1.33333 | .189298 | .851595 | .440242 |
| 2-This MICROSOFT PROJECT majorly supports semi-structured decisions. | 2.16667 | 0.69697 | 1.75 | 0.0568182 | 1.25325 | .2212758 | .324699 |
| 3-This MICROSOFT PROJECT majorly supports unstructured decisions. | 2.16667 | 0.515152 | 2.16667 | .0601 | 0 | 1 | .2190444 |
| 4-This MICROSOFT PROJECT provides support for upper management. | 1.83333 | .333333 | 1.91667 | .992424 | -.250733 | .804347 | .332385 |
| 5-This MICROSOFT PROJECT provides support for middle management. | 1.83333 | .333333 | 1.75 | .931818 | .256638 | .799843 | .324699 |
| 6-This MICROSOFT PROJECT provides support for lower management. | 2.08333 | .810606 | 1.75 | .75 | .924312 | .365352 | .36062 |
| 7-This MICROSOFT PROJECT helps in identifying potential problems. | 2.16667 | .515152 | 1.91667 | .628788 | .809709 | .426779 | .308753 |
| 8-This MICROSOFT PROJECT helps in identifying opportunities. | 2.5 | .636364 | 2.41667 | .44697 | .277339 | .784109 | .300463 |
| 9-This MICROSOFT PROJECT is useful for analyzing alternatives. | 3.08333 | .810606 | 1.83333 | .333333 | 4.04855 | .358184 | .308753 |
| 10-This MICROSOFT PROJECT is useful for choosing among alternatives. | 2.41667 | .810606 | 2.16667 | .878788 | .666293 | .512151 | .37521 |
| 11-I think that my usage of MICROSOFT PROJECT is interactive. | 2.83333 | .333333 | 2.66667 | .606061 | .59566 | .557482 | .279791 |
| 12-This MICROSOFT PROJECT supports the area of decision making. | 2.33333 | .606061 | 2.166667 | 1.24242 | .4246634 | .675228 | .392479 |
| 13-This MICROSOFT PROJECT provides support for many diverse problem areas. | 2.41667 | .44697 | 1.83333 | .333333 | 2.2876 | .0321392 | .255 |
| 14-This MICROSOFT PROJECT supports only one specific type of problem. | 2.58333 | 1.7197 | 3.08333 | 1.90152 | -.910192 | .372586 | .549334 |
| 15-The user interface subsystem provided by this MICROSOFT PROJECT is flexible. | 1.75 | .568182 | 2.58333 | 1.35606 | -2.08103 | .0492806 | .400442 |
| 16-This MICROSOFT PROJECT helps users with finding new directions or strategies for solving a problem. | 1.91667 | .265152 | 1.91667 | .44697 | 0 | 1 | .243605 |
| 17-This MICROSOFT PROJECT provides users with meaningful, helpful and encouraging responses that would increase task motivation. | 1.83333 | .151515 | 1.83333 | .69697 | 0 | 1 | .265908 |

This chapter presented a detailed description of all the findings obtained from the survey conducted. As noticed, some of the findings were consistent with other researchers' findings of surveys within the same field, and other findings were new in this field of study.

# Chapter V

# Conclusion and Recommendations

## 5.1 Overview:

As data processing managers come up through the ranks, project management will be a way of life. It could even be said that computer technology in the seventies and eighties has boosted the development of project management. This is so, primarily, because of the cross-functional involvement of complex and systematized computer systems.

If computer systems are to be successfully installed for individual projects by the year 2000, functional departments must cooperate and trade information to one another so that the desired results are reachable. Data processing projects management will become a strong driving force by the year 2000 because the overlap of computerization will force functional organizations within a company to become more structured under matrix management than currently exists. Project management will evolve into a way of life.

Large, complex projects will have to include major social programs, energy related programs, and continuing defense programs. Financial, human, and raw material resources will have become more limited by the year 2000. This will mean increased controls, especially in setting priorities, more sophisticated methods of trade-off analysis, and improved overall project control. Computers will become more extensively used in all areas of control.

There seems to be sufficient evidence that even a more revolutionary growth era could be forthcoming. With technological breakthroughs and reduced cost, microprocessors and "smart terminals" will provide mechanisms for this growth. Software project planning models will become more evident in the offices of the future. It is also conceivable that more and more project managers will work out of their homes. If the current trend continues and accelerates, by the year 2000 the (two- dimensional) traditional and matrix organizations as we know them may not physically exist at all[1]. Individuals functioning from their homes would rely totally on a telecommunications center as communication vehicle. However, the strategic decision center and organizational centers will still remain within the parent organization. Hosts of computers could control large conglomerate projects, all linked together by a massive interdependent system.

The computer itself will become increasingly important and eventually may take the place of many middle managers, operational employees, and clerks. The CEO, computer hardware, and systems personnel are likely to be centralized within the executive decision -making group. If so, this group will ultimately function as a manager of project managers and will dictate work flow plans based on project plans and master production schedule.

"Smart terminals" will play an ever-increasing role in project control. Terminal screens will be color-coded to provide an up-to-the-minute accounting for all assigned resources as well as for cost control. Corrective action and trade-off analysis can be taken instantaneously from these terminals. Inventory control problems will become a thing of the past. Project managers will have a complete

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[1] Harold Kerzner, Project Management a systems approach to planning, scheduling and controlling, (NY: Van Nostrand Reinhold,1995), p.1001

picture of their own projects as well as other projects that are sharing common resources.

### 5.2 Major Conclusions:

The major purpose of this research is to assess the attitude of the professional and non professional respondents toward using Microsoft Project package.

The sample used was made up of 24 respondents. 50% of them were professionals while the other were non professionals. In selecting this sample, certain factors were controlled -namely, educational level, experience in quantitative methods to attain and keep validity of the study findings.

Non professional respondents use the computer more than the professional respondents. The( heavy ) use of computers by non professional could be attributed to the fact that the major part of their work involves the computer. In addition to the nature of their jobs which requires them to work on the computer several times a day. Moreover, in the dimension of years of experience, the results were as follow: the time mean of using Personal computer was 7.66 years for professional respondents and 8.583 for non professional respondents.

Another conclusion was that (41.66%) of professional respondents use Microsoft Project, while (50%) of non professional respondents use Microsoft Project. However, most of the professional respondents have used Microsoft Project within the past (1 to 2) and (3 to 4) years categories, while the most non professional respondents have used less than 1 year.

The professionals and non professionals agreed that the Microsoft Project was easy to use. As for computer usage, professionals and non professionals generally had similar beliefs concerning the benefits of computer to their job performance.

Finally, the attitudes of professionals and non professionals toward Microsoft Project in general were similar. Yet, there are some differences in some perspectives toward the Microsoft Project. That difference is related to several factors. Firstly, each group has a different background. Moreover, professionals use the software as a tool to execute solutions, while non professionals use it for decision alternatives. Also, professionals perceive the software differently because they are acquainted with the use of that specific software in addition to using other sophisticated project management softwares.

Based on these results, we will accept the first hypothesis of the study which is that professional respondents have positive attitude toward using Microsoft Project. Moreover, we will accept the second hypothesis of the study which is that non professional respondents have positive attitude toward using Microsoft Project. Finally, there are several factors other than the Microsoft Project that could affect the respondents whether professionals or non professionals, such as the nature of the jobs of each group and the training on the software.

## 5.3 Limitation of the Study:

There are several major limitations in the study. First, the task ( Case Problem) that was given to solve was not a general one. For example, the network is fairly simple and the total number of resources was limited.

The second one is that respondents were not told about the real purpose of the study. This was done in order to avoid the effect of external noise on how the subjects would address and handle the task.

Moreover, the sample that could be dealt with for data gathering and analysis was relatively a small one. That was a result of the nature of the study which was an experimental study. That required to prepare an appointment with each respondent that could be convenience to his/her circumstances.

## 5.4 Recommendations:

Based on the results reported in Chapter IV, and the above mentioned limitations, the following recommendations could be drawn:

- Professional users of other softwares should be aware of the efficiency of Microsoft Project or other software that has been design for non professional people.

- Firms should conduct extensive training sessions on project management software especially Microsoft Project. These sessions should be given to professionals and non professionals in the area of planning and scheduling.

- Top management in firms where project planning and scheduling is an essential  part of its operations, should enhance the awareness dimension of their of professionals involved in planning and scheduling.

Such awareness will be obtained through orientation sessions which explain the benefits of using Microsoft Project in their work and its effect on decision making efficiency.

- Universities should attempt to train their students on project management softwares that make project management easier to use in planning ,scheduling , budgeting, and controlling. Business schools should assure leadership in this dimension.

Finally, further research is recommended that will take into consideration the previously mentioned limitations and that will investigate factors that are most likely to be associated with attitude of the project managers toward Microsoft Project or any other project softwares of interest to the working community.

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# APPENDICES:

# APPENDIX <u>A</u>

# <u>**SURVEY DESIGN**</u>

# LAU

## BUSINESS DEVISION
## MASTER PROGRAM

Dear sir,

I AM A MASTER STUDENT AT THE LEBANESE AMERICAN UNIVERSITY. THIS SURVEY IS CONDUCTED TO FINALIZE MY PROJECT ON: THE ATTITUDE OF PROJECT MANAGERS TOWARD USING MICROSOFT PROJECT FOR PLANNING, SCHEDULING, AND CHARTING PROJECT INFORMATION. THE FOLLOWING IS A QUESTIONAIRE, WHICH I HOPE YOU WOULD ANSWER, AND WHICH IS OF GREAT IMPORTANCE TO THE PROJECT.

YOUR COOPERATION WILL BE OF GREAT HELP, HIGHLY APPPRECIATED AND KEPT CONFIDENTIAL

        THANK YOU IN ADVANCE.

                       SINCERELY YOURS,

                       KHALIL YAFAWI

## DEMOGRAPHIC CHARACTERISTICS

This part of the survey is concerned with your background and work experience. This information will help identify trends in the data for different groups of managers or users. Please remember that your responses are completely confidential.

1. What is your functional area?

   \_\_\_ 1. Accounting         \_\_\_ 6. MIS/Computer
   \_\_\_ 2. Finance            \_\_\_ 7. Engineering
   \_\_\_ 3. Marketing         \_\_\_ 8. Others (Pls. specify):

   \_\_\_ 4. General Management
   \_\_\_ 5. Personnel and HRD

2. What is your level in the organization hierarchy?

   \_\_\_ 1. Professional staff.
   \_\_\_ 2. First level supervisor.
   \_\_\_ 3. Middle Management (Departmental Head)
   \_\_\_ 4. Strategic Management (Executive)
   \_\_\_ 5. Other (Specify) _____ .

3. For how many years have you been employed in this organization? _____ year(s)

4. Number of subordinate(s) reporting to you: _____ subordinate(s)

5. What is the highest level of education you have completed?

   \_\_\_ 1. Some high school or less     \_\_\_ 4. Bachelor's degree
   \_\_\_ 2. High School             \_\_\_ 5. Some graduate or professional
study
   \_\_\_ 3. Some College           \_\_\_ Graduate or professional degree

6. Age:
   \_\_\_ Under 25     \_\_\_ 45-54
   \_\_\_ 25-34        \_\_\_ 55-64
   \_\_\_ 35-44        \_\_\_ 65 and over

7. Gender:
   _____ 1. Male
   _____ 2. Female

## COMPUTER USE

Please answer the next set of questions with regard to the computer that you are currently using at work.

**Part A.**

1. Personal Computer Type:
   a. Stand alone
   b. Connected to other computers or networks

2. Is it your own computer? ____ 1. Yes ____ 2. No

3. Do you have free access? ____ 1. Yes ____ 2. No

**Part B.**

Are you using non-PC (Mainframe or minicomputer)?
____ 1. Yes ____ 2. No

**Part C.**

1. On an <u>average working day</u> that you use a computer, how much time do you spend

on the system?

| | |
|---|---|
| 1. Almost never | 4. 1-2 hours |
| 2. Less than 1/2 hour | 5. 2-3 hours |
| 3. From 1/2 hour to 1 hour | 6. More than 3 hours |

2. On the average, how frequently do you use a computer?

| | |
|---|---|
| 1. Less than once a month | 4. A few times a week |
| 2. Once a month | 5. About once a day |
| 3. A few times a month | 6. Several times a day |

3. How long have you been using this system?

____ months ____ years

## SOFTWARE USE

Please respond to the next group of questions with regard to software packages and use. Please indicate your extent of usage and your level of expertise in the use of computer packages

| Application Name | Extent of Usage | | | | |
|---|---|---|---|---|---|
| | Not at all | | | To a great Extent | |
| 1-Spreadsheets (e.g. Excel, Lotus 123, Quattro Pro..) | 1 | 2 | 3 | 4 | 5 |
| 2- Word Processing (e.g. Word Perfect, Winword,...) | 1 | 2 | 3 | 4 | 5 |
| 3- Data Management Packages (e.g. DbaseIII+ or IV, Access, Foxpro, Paradox,...) | 1 | 2 | 3 | 4 | 5 |
| 4- Modeling Systems (e.g. IFPS),MICROSOFT PROJECT | 1 | 2 | 3 | 4 | 5 |
| 5- Statistical Packages (e.g. SPSS, Minitab, Statistica, Edu-Stat, SAS-PC, STATPAK,...) | 1 | 2 | 3 | 4 | 5 |
| 6- Graphical Packages (Energraphics, Chartmaster,...) | 1 | 2 | 3 | 4 | 5 |
| 7- Communication Packages or Electronic Mail | 1 | 2 | 3 | 4 | 5 |
| 8- Fourth Generation Language (e.g. FOCUS) | 1 | 2 | 3 | 4 | 5 |
| 9- Third Generation Language (e.g. Pascal, C) | 1 | 2 | 3 | 4 | 5 |
| 10- Other (please specify) _____ | 1 | 2 | 3 | 4 | 5 |

With respect to the requirements of your current job, please indicate to what extent do you use the computer to perform the following tasks.

| Job Requirements | Extent of Usage | | | | |
|---|---|---|---|---|---|
| | Not at all | | | To a great Extent | |
| 1- Looking for trend | 1 | 2 | 3 | 4 | 5 |
| 2- Finding problems/ alternatives | 1 | 2 | 3 | 4 | 5 |
| 3- Planning | 1 | 2 | 3 | 4 | 5 |
| 4- Budgeting | 1 | 2 | 3 | 4 | 5 |
| 5- Taking actions | 1 | 2 | 3 | 4 | 5 |
| 6- Communicating with others | 1 | 2 | 3 | 4 | 5 |
| 7- Controlling and giving activities | 1 | 2 | 3 | 4 | 5 |
| 8- Making decisions | 1 | 2 | 3 | 4 | 5 |
| 9- Historical reference | 1 | 2 | 3 | 4 | 5 |
| 10- Keeping me up-to-date on activities/performance | 1 | 2 | 3 | 4 | 5 |
| 11- Aiding me in adequately reporting to superiors | 1 | 2 | 3 | 4 | 5 |
| 12- Aiding me in increasing productivity of my area | 1 | 2 | 3 | 4 | 5 |
| 13- Aiding me in cutting cost in my area | 1 | 2 | 3 | 4 | 5 |

## COMPUTER TRAINING

Which of the following categories best describes the level of training you have had in the use of computers, both mainframe and/or microcomputers.

| | None | | | | Extremely extensive |
|---|---|---|---|---|---|
| 1- General courses at a college or university | 1 | 2 | 3 | 4 | 5 |
| 2- Training provided by vendors | 1 | 2 | 3 | 4 | 5 |
| 3- In house company courses | 1 | 2 | 3 | 4 | 5 |
| 4- Through self study | 1 | 2 | 3 | 4 | 5 |

## COMPUTER KNOWLEDGE & EXPERIENCE

The next set of questions assesses the actual experience you have working with computers and you knowledge about computer in general.

1. How many course have you taken in computers? _____ .

2. How many course have taken in information systems? _____ .

3. How long have you used Personal computers? _____ years.

4. How long have you used computers in general? _____ years.

5. How long have you participated in technical analysis and design of information systems?

_____ years.

6. How long have you used financial, statistical or other models on a microcomputer or mainframe system? _____ years.

## BELIEFS ABOUT COMPUTER USAGE

In this section, we would like to find out what you believe are the advantages and disadvantages of your using computers in your job.

1 = Strongly Agree
2 = Agree
3 = Uncertain
4 = Disagree
5 = Strongly Disagree

| | | | | | |
|---|---|---|---|---|---|
| 1- Using a computer could provide me with information that would lead to better decisions. | 1 | 2 | 3 | 4 | 5 |
| 2- Using a computer allows me to be more independent in performing my job. | 1 | 2 | 3 | 4 | 5 |
| 3- Using a computer exposes me to vulnerability of computer breakdown and loss of data. | 1 | 2 | 3 | 4 | 5 |
| 4- Using a computer allows me to be more innovative by providing the opportunities for more creative analysis and outputs. | 1 | 2 | 3 | 4 | 5 |
| 5- Using a computer improves my productivity on the job. | 1 | 2 | 3 | 4 | 5 |
| 6- Using a computer gives me the opportunity to enhance my image in the company. | 1 | 2 | 3 | 4 | 5 |
| 7- I would hesitate to use a computer because of the difficulty of integrating it with existing information systems in my work. | 1 | 2 | 3 | 4 | 5 |
| 8- Using a computer can take up too much of my time in performing many tasks. | 1 | 2 | 3 | 4 | 5 |
| 9- Using a computer would involve too much time doing mechanical operations to allow sufficient time for managerial analysis. | 1 | 2 | 3 | 4 | 5 |
| 10- Using a computer allows me to get exposed to various games-entertainment and educational. | 1 | 2 | 3 | 4 | 5 |
| 11- Using a computer allows me to access, store and retrieve information easily without difficulties. | 1 | 2 | 3 | 4 | 5 |
| 12- I use a computer because my supervisor wants me to use it. | 1 | 2 | 3 | 4 | 5 |

## MICROSOFT PROJECT USAGE

This part of the survey is concerned with identifying the experience of the respondent in MICROSOFT PROJECT usage.

1. I am a current/past user of MICROSOFT PROJECT.
   _____ Yes. _____ No.

2. I have used a MICROSOFT PROJECT within the past:
   _____ less than 1 year           _____ 5 years or more
   _____ 1 to 2 years               _____ N/A
   _____ 3 to 4 years

3. I use the MICROSOFT PROJECT:
   _____ daily                     _____ once a month
   _____ weekly                  _____ never

4. I was involved in the following phases of MICROSOFT PROJECT development:
   _____ design                  _____ implementation
   _____ development         _____ not involved

5. The results provided by the MICROSOFT PROJECT with which I work are:
   _____ excellent               _____ poor
   _____ satisfactory          _____ N/A

6. I am satisfied with the MICROSOFT PROJECT:
   _____ all the time           _____ rarely
   _____ most of the time      _____ never
   _____ some of the time      _____ N/A

7. I make more effective decisions because of the MICROSOFT PROJECT:
   _____ all the time           _____ never
   _____ most of the time      _____ N/A
   _____ some of the time

8. The training I receive in how to use the MICROSOFT PROJECT was:
   _____ excellent               _____ poor
   _____ adequate            _____ not available

_____

## EASE OF USE

Please answer the following questions regarding the system that you have just used by choosing one of the following answers:

1 = Strongly Agree
2 = Agree
3 = Uncertain
4 = Disagree
5 = Strongly Disagree

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1- I felt confused while using the computer system | 1 | 2 | 3 | 4 | 5 |
| 2- I made a lot of errors when I used this computer system. | 1 | 2 | 3 | 4 | 5 |
| 3- I think that such information systems are frustrating. | 1 | 2 | 3 | 4 | 5 |
| 4- I could often pressed the on-line help and/or consult the user manual while using the computer system. | 1 | 2 | 3 | 4 | 5 |
| 5- The system I used is inflexible and rigid to react with. | 1 | 2 | 3 | 4 | 5 |
| 6- I believe that the manipulation of such computer systems requires a lot of my mental effort. | 1 | 2 | 3 | 4 | 5 |
| 7- The system is designed in a way that made it easy for me to remember how to perform a given task. | 1 | 2 | 3 | 4 | 5 |
| 8- The on-line help provides helpful guidance about how to perform a given task. | 1 | 2 | 3 | 4 | 5 |
| 9- The system sometimes behaves in unexpected ways. | 1 | 2 | 3 | 4 | 5 |
| 10- Overall, I found this information system easy to use. | 1 | 2 | 3 | 4 | 5 |

## BELIEFS ABOUT COMPUTER FRIENDLINESS

The following questions ask you how you would characterize yourself when you used this software. Please respond by using one of the following answers:

1 = Strongly Agree
2 = Agree
3 = Uncertain
4 = Disagree
5 = Strongly Disagree

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1- Spontaneous | 1 | 2 | 3 | 4 | 5 |
| 2- Conscientious | 1 | 2 | 3 | 4 | 5 |
| 3- Unimaginative | 1 | 2 | 3 | 4 | 5 |
| 4- Experimenting | 1 | 2 | 3 | 4 | 5 |
| 5- Serious | 1 | 2 | 3 | 4 | 5 |
| 6- Bored | 1 | 2 | 3 | 4 | 5 |
| 7- Flexible | 1 | 2 | 3 | 4 | 5 |
| 8- Mechanical | 1 | 2 | 3 | 4 | 5 |
| 9- Creative | 1 | 2 | 3 | 4 | 5 |
| 10- Inconsistent | 1 | 2 | 3 | 4 | 5 |
| 11- Curious | 1 | 2 | 3 | 4 | 5 |
| 12- Intellectually inactive | 1 | 2 | 3 | 4 | 5 |
| 13- Inquiring | 1 | 2 | 3 | 4 | 5 |
| 14- Routine | 1 | 2 | 3 | 4 | 5 |
| 15- Playful | 1 | 2 | 3 | 4 | 5 |
| 16- Investigative | 1 | 2 | 3 | 4 | 5 |
| 17- Constrained | 1 | 2 | 3 | 4 | 5 |
| 18- Unoriginal | 1 | 2 | 3 | 4 | 5 |
| 19- Examining | 1 | 2 | 3 | 4 | 5 |
| 20- Uninventive | 1 | 2 | 3 | 4 | 5 |
| 21- Inquisitive | 1 | 2 | 3 | 4 | 5 |
| 22- Questioning | 1 | 2 | 3 | 4 | 5 |

## ATTITUDE TOWARDS MICROSOFT PROJECT

Please consider the following descriptive statements regarding you and (MICROSOFT PROJECT) that you just used. Please circle the number that best matches with your response.

1 = Strongly Agree
2 = Agree
3 = Uncertain
4 = Disagree
5 = Strongly Disagree

| | | | | | |
|---|---|---|---|---|---|
| 1-This MICROSOFT PROJECT majorly supports highly structured decisions. | 1 | 2 | 3 | 4 | 5 |
| 2-This MICROSOFT PROJECT majorly supports semi-structured decisions. | 1 | 2 | 3 | 4 | 5 |
| 3-This MICROSOFT PROJECT majorly supports unstructured decisions. | 1 | 2 | 3 | 4 | 5 |
| 4-This MICROSOFT PROJECT provides support for upper management. | 1 | 2 | 3 | 4 | 5 |
| 5-This MICROSOFT PROJECT provides support for middle management. | 1 | 2 | 3 | 4 | 5 |
| 6-This MICROSOFT PROJECT provides support for lower management. | 1 | 2 | 3 | 4 | 5 |
| 7-This MICROSOFT PROJECT helps in identifying potential problems. | 1 | 2 | 3 | 4 | 5 |
| 8-This MICROSOFT PROJECT helps in identifying opportunities. | 1 | 2 | 3 | 4 | 5 |
| 9-This MICROSOFT PROJECT is useful for analyzing alternatives. | 1 | 2 | 3 | 4 | 5 |
| 10-This MICROSOFT PROJECT is useful for choosing among alternatives. | 1 | 2 | 3 | 4 | 5 |
| 11-I think that my usage of MICROSOFT PROJECT is interactive. | 1 | 2 | 3 | 4 | 5 |
| 12-This MICROSOFT PROJECT supports the area of decision making. | 1 | 2 | 3 | 4 | 5 |
| 13-This MICROSOFT PROJECT provides supports for many diverse problem areas. | 1 | 2 | 3 | 4 | 5 |
| 14-This MICROSOFT PROJECT supports only one specific type of problem. | 1 | 2 | 3 | 4 | 5 |
| 15-The user interface subsystem provided by this MICROSOFT PROJECT is flexible. | 1 | 2 | 3 | 4 | 5 |
| 16-This MICROSOFT PROJECT helps users with findings new directions or strategies for solving a problem. | 1 | 2 | 3 | 4 | 5 |
| 17-This MICROSOFT PROJECT provides users with meaningful, helpful and encouraging responses that would increase task motivation. | 1 | 2 | 3 | 4 | 5 |

# APPENDIX B

# CASE PROBLEM

Dear sir,

You are selected to manage a construction project. This honor is given to you as a result of appraising your performance in previous tasks. However, you need to learn new skills best manifested using a specialized project software.
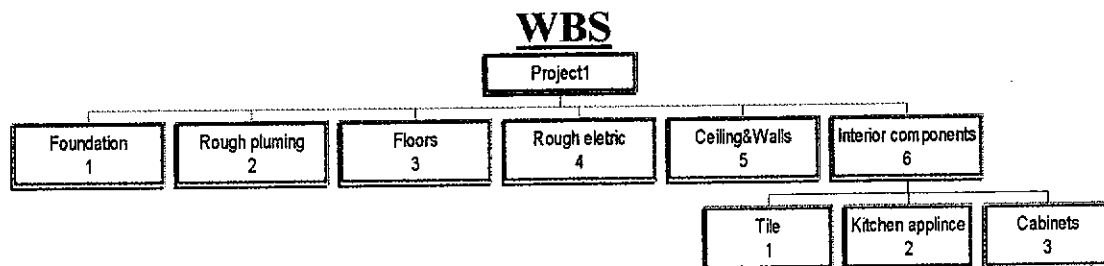
Here in this exercise, you are to learn the basics of Microsoft Project to manage the solution to the problem on hand.

Good luck.
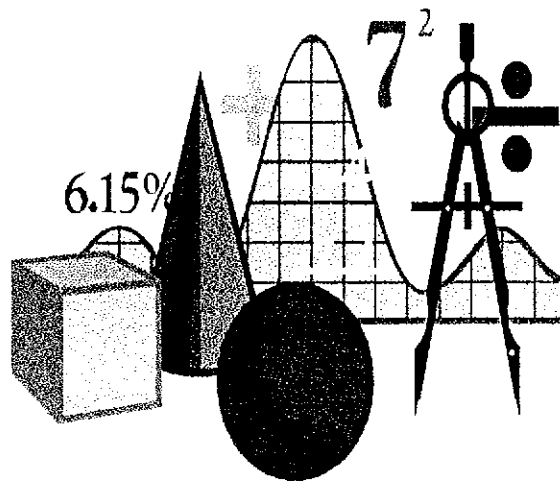
| Act. | Act. Name | Preceding Act. | Duration | Resources |
|------|-----------|----------------|----------|-----------|
| A | Foundation | - | 10 | Equipment, Engineer, Workers[3] |
| B | Rough plumbing | A | 5 | Plumber ,Workers[2] |
| C | Floors | B | 10 | Workers[10] |
| D | Rough electric | C | 4 | Electrician ,Workers[2] |
| E | Ceilings &walls | D | 5 | Workers[10] |
|   | Interior components |   | 8 |   |
| F | Tile | E | 5 | Workers[6] |
| G | Kitchen appliance | F | 3 | Carpenter ,Workers[2] |
| H | Cabinets | F | 3 | Plumber ,Workers[2] |

Fixed cost for each task is $100.

# WBS

Project1

| Foundation 1 | Rough pluming 2 | Floors 3 | Rough eletric 4 | Ceiling&Walls 5 | Interior components 6 |

| Tile 1 | Kitchen applince 2 | Cabinets 3 |

# Resources

| Name | Level | Cost/unit | Over time/unit |
|------|-------|-----------|----------------|
| Equipment | 1 | 50 | 60 |
| Engineer | 1 | 30 | 40 |
| Workers | 10 | 5 | 7 |
| Carpenter | 1 | 8 | 10 |
| Plumber | 1 | 9 | 11 |
| Electrician | 1 | 8 | 10 |

# Instructions Sheet

## SUPPOSE THAT:

☞ *1)*   *Your boss ask you to prepare the schedule with needed resources and the budget of the project.*

☞ *2)*   *After two weeks he called you asking "....What is the actual cost of the project at this moment?"*

☞ *3)*   *One week later he told you that ".... Since we will have another big project, we have to reduce the duration of your project 5 days"*

## As a project manager how will you deal with those tasks ????

# APPENDIX C

# MICROSOFT PROJECT

# MANUAL

# Dealing With Microsoft Project Management

A- Enter a task in a sheet view

    1. In a Task Name field, type a task name.

    2. In the Duration field, type the task duration.

    3. If you want to link specific tasks using finish-to-start relationships, select the tasks you want to link(high light them by the mouse ) , and then click the Link Tasks ⌗ button on the Standard toolbar.

    Note: When you reach to group tasks (7),(8)&(9) under the title "Interior components", highlight 7,8,9, then click the button ⊟ on the standard toolbar.
Unlink 8,9 by first highlight them, then by clicking on the button

Click the "Mouse" while on the Gantt Chart starting at task "7" and keep button down trace a line to task "9". Unclick. Tasks will be dependent.

B- Assign a rate to a resource

    1. From the View menu, choose Resource Sheet.

    2. In the Resource name , Max. Units (Level),Std. Rate, Ovt. Rate, or Cost/Use field for the resource, type the rate.

    3. Click the enter button or press ENTER

    4. Go to view menu

    5. Select Gantt Chart

C- Assign a resource to a task

    1. Select a task.

    2. Click the Resource Assignment button ⌗ on the Standard toolbar. Or choose Resource Assignment from the Insert

    3. Select a resource name. Or type a new resource name from the project description chart and look at resources related per task then assign the required number or units.

    Note: Each time you are done assigning resources for a task. Select another task and repeat the process. When done, click "close" in resources assignment menu.

D- Assign a fixed cost to a task

    1. From the View menu, choose Gantt Chart.

**2.** From the View menu, choose Table, and then choose Cost.( Costs are specified in the project description cheat)

**3.** In the Fixed Cost field for the task, type the cost.

**4.** Click the enter button or press ENTER.

*Go to the instruction sheet and read point No. 2. Keep in mind that task (1)&(2) are* <u>*exacted 100%.*</u>
*Now, read item "E"*

E- Enter the work completed on a task
    **1.** From the View menu, choose Gantt Chart.

    **2.** From View menu, choose Table Entry.

    **3.** From the Window menu, choose Split.

    **4.** Choose the task.

    **5.** Click the Task Form in the lower pane.



    **6.** From the Format menu, choose Details, and then choose Resource Work.

    **7.** In the upper pane, contains the main tasks select the task for which you want to update the actual work value.

    **8.** In the lower pane, click on percent complete" and fill the value for the tasks completed.

    **9.** Go to "Window" menu and remove split   .

F- Print a report
    **1.** From the View menu, choose Reports.

    **2.** Click on "cost", then select.

    **3.** Click on "weekly cash flow", then select.

    **4.** You may print the report ( after clicking on it).

5.  Click on cancel and you will go back to Gannt chart

G- Shorten my schedule by assigning overtime work
1.  From the View menu, choose Gantt Chart.

2.  From the Window menu, choose Split.

3.  Click the lower pane.

4.  From the Format menu, choose Details, and then choose Resource Work.

5.  In the upper pane, select the task for which you want to assign overtime work.

6.  In the lower pane, type the new number of hours in the Ovt. Work column for each   driving resource. (You may cut all 5days/ overtime from one task)

7.  Go to window & Click remove split.

8.  Go to " File" & chose project information for actual cost.

# APPENDIX D

# SURVEY VARIABLES

| Name | Long Name |
|------|-----------|
| FUNCTAREA | functional area |
| HIERARCHY | level in the organization hierarchy |
| YRSEMPLOYMNT | years of employment |
| NOSUBORDINT | Number of subordinate(s) reporting |
| EDUCATION | level of education |
| AGE | Age |
| GENDER | Gender |
| PCTYPE | Personal Computer Type |
| OWNERSHIP | own computer |
| FREEAACCESS | have free access |
| NONPC | using non-PC (Mainframe or minicomputer) |
| AVEWORKTIME | time spend on the system |
| FREQUSE | how frequently use a computer |
| SYSTEMUSE | long of using this system |
| APP1 | Spreadsheets(e.g. Excel,Lotus 123,) |
| APP2 | Word Processing (e.g. Winword,...) |
| APP3 | Data Management Packages (DbaseIII+...) |
| APP4 | Modeling Systems(e.g., MICROSOFT PROJECT |
| APP5 | Statistical Packages (e.g. SPSS, Minitab, satistical,...) |
| APP6 | Graphical Packages(Energraphics, Chartmaster,...) |
| APP7 | Communication Packages or Electronic Mail |
| APP8 | Fourth Generation Language (e.g. FOCUS) |
| APP9 | Third Generation Language (e.g. Pascal, C) |
| APP10 | Other(please specify) |
| JR1 | Looking for trend |
| JR2 | Finding problems/ alternatives |
| JR3 | Planning |
| JR4 | Budgeting |
| JR5 | Taking actions |
| JR6 | Communicating with others |
| JR7 | Controlling and giving activities |
| JR8 | Making decisions |
| JR9 | Historical reference |
| JR10 | Keeping me up-to-date on activities /performance |
| JR11 | Aiding me in adequately reporting to superiors |
| JR12 | Aiding me in increasing productivity of my area |
| JR13 | Aiding me in cutting cost in my area |
| COMPTR1 | General courses at a college or university |
| COMPTR2 | Training provided by vendors |
| COMPTR3 | In house company courses |
| COMPTR4 | Through self study |
| KNOWEXP1 | course taken in computers |
| KNOWEXP2 | course taken in information systems |
| KNOWEXP3 | long using Personal computers |
| KNOWEXP4 | long of using computers in general |
| KNOWEXP5 | long of participating in technical analysis and design of information systems |
| KNOWEXP6 | long of using financial, statistical or other models on a microcomputer or mainframe system |
| BELIFE1 | Using a computer could provide me with information that would lead to better decisions. |
| BELIFE2 | Using a computer allows me to be more independent in performing my job. |
| BELIFE3 | Using a computer exposes me to vulnerability of computer breakdown and loss of data. |
| BELIFE4 | Using a computer allows me to be more innovative by providing the opportunities for more creative analysis and outputs. |
| BELIFE5 | Using a computer improves my productivity on the job. |
| BELIFE6 | Using a computer gives me the opportunity to enhance my image in the company. |
| BELIFE7 | I would hesitate to use a computer because of the difficulty of integrating it with existing information systems in my work. |
| BELIFE8 | Using a computer can take up too much of my time in performing many tasks. |
| BELIFE9 | Using a computer would involve too much time doing mechanical operations to allow sufficient time for |

| | |
|---|---|
| | managerial analysis. |
| BELIFE10 | Using a computer allows me to get exposed to various games-entertainment and educational. |
| BELIFE11 | Using a computer allows me to access, store and etrieve information easily without difficulties. |
| BELIFE12 | I use a computer because my supervisor wants me to use it. |
| MICSOFTPRUSE1 | I am a current/past user of MICROSOFT PROJECT. |
| MICSOFTPRUSE2 | I used a MICROSOFT PROJECT within the past |
| MICSOFTPRUSE3 | I use the MICROSOFT PROJECT |
| MICSOFTPRUSE4 | I was involved in the following phases of MICROSOFT PROJECT development |
| MICSOFTPRUSE5 | The results provided by the MICROSOFT PROJECT with which I work are |
| MICSOFTPRUSE6 | I am satisfied with the MICROSOFT PROJECT |
| MICSOFTPRUSE7 | I make more effective decisions because of the MICROSOFT PROJECT |
| MICSOFTPRUSE8 | The training I receive in how to use the MICROSOFT PROJECT was |
| EASEUSE1 | I felt confused while using the computer system |
| EASEUSE2 | I made a lot of errors when I used this computer system. |
| EASEUSE3 | I think that such information systems are frustrating. |
| EASEUSE4 | I could often pressed the on-line help and/or consult the user manual while using the computer system. |
| EASEUSE5 | The system I used is inflexible and rigid to react with. |
| EASEUSE6 | I believe that the manipulation of such computer systems requires a lot of my mental effort. |
| EASEUSE7 | The system is designed in a way that made it easy for me to remember how to perform a given task. |
| EASEUSE8 | The on-line help provides helpful guidance about how to perform a given task. |
| EASEUSE9 | The system sometimes behaves in unexpected ways. |
| EASEUSE10 | Overall, I found this information system easy to use. |
| BELIFEFCPFR1 | Spontaneous |
| BELIFEFCPFR2 | Conscientious |
| BELIFEFCPFR3 | Unimaginative |
| BELIFEFCPFR4 | Experimenting |
| BELIFEFCPFR5 | Serious |
| BELIFEFCPFR6 | Bored |
| BELIFEFCPFR7 | Flexible |
| BELIFEFCPFR8 | Mechanical |
| BELIFEFCPFR9 | Creative |
| BELIFEFCPFR10 | Inconsistent |
| BELIFEFCPFR11 | Curious |
| BELIFEFCPFR12 | Intellectually inactive |
| BELIFEFCPFR13 | Inquiring |
| BELIFEFCPFR14 | Routine |
| BELIFEFCPFR15 | Playful |
| BELIFEFCPFR16 | Investigative |
| BELIFEFCPFR17 | Constrained |
| BELIFEFCPFR18 | Unoriginal |
| BELIFEFCPFR19 | Examining |
| BELIFEFCPFR20 | Uninventive |
| BELIFEFCPFR21 | Inquisitive |
| BELIFEFCPFR22 | Questioning |
| ATTMICSOFPR1 | This MICROSOFT PROJECT majorly supports highly structured decisions. |
| ATTMICSOFPR2 | This MICROSOFT PROJECT majorly supports semi-structured decisions. |
| ATTMICSOFPR3 | This MICROSOFT PROJECT majorly supports unstructured decisions. |
| ATTMICSOFPR4 | This MICROSOFT PROJECT provides support for upper management. |
| ATTMICSOFPR5 | This MICROSOFT PROJECT provides support for middle management. |
| ATTMICSOFPR6 | This MICROSOFT PROJECT provides support for lower management. |
| ATTMICSOFPR7 | This MICROSOFT PROJECT helps in identifying potential problems. |
| ATTMICSOFPR8 | This MICROSOFT PROJECT helps in identifying opportunities. |
| ATTMICSOFPR9 | This MICROSOFT PROJECT is useful for analyzing alternatives. |
| ATTMICSOFPR10 | This MICROSOFT PROJECT is useful for choosing among alternatives. |
| ATTMICSOFPR11 | I think that my usage of MICROSOFT PROJECT is interactive. |
| ATTMICSOFPR12 | This MICROSOFT PROJECT supports the area of decision making. |
| ATTMICSOFPR13 | This MICROSOFT PROJECT provides supports for many diverse problem areas. |
| ATTMICSOFPR14 | This MICROSOFT PROJECT supports only one specific type of problem. |
| ATTMICSOFPR15 | The user interface subsystem provided by this MICROSOFT PROJECT is flexible. |
| ATTMICSOFPR16 | This MICROSOFT PROJECT helps users with findings new directions or strategies for solving a problem. |
| ATTMICSOFPR17 | This MICROSOFT PROJECT provides users with meaningful, helpful and encouraging responses that would increase task motivation. |