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Subject: Project Management

Causes of the failures
In Engineering projects and proper solutions

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Abstract

The aim of this thesis is to identify the route causes for the failure in the projects delivery and how the management education can help at best level and make a significant contribution to small enterprise solvency.

Research by Williams (1986) indicated that over 60% of insolvent small projects owners gave one reason as ‘a lack of business/management experience or skill’.

This implies that significant percentages of projects insolvencies were avoidable, had the project owner/managers acquired further business skill, knowledge or support. That why we suggests that increased business/management competencies may enable management blind spots within the internal activity structure of some enterprises, to be brought into focus and so controlled (Williams, 1984).

This thesis undertakes research, to identify the contribution of various management education programs to most of the projects solvency. The methodology used to test this contribution to business management knowledge, comprised surveys of management education facilitators and program participants, by education institutions from Government and private Registered Training Organizations (RTOs) and Government and private non-RTOs. The objective was to determine, with quantitative surveys, if a significant difference could be established between educational facilities offered and small project owner/manager requirements, with the intention to make this an initial exploratory research.

The thesis examined perceptions of project owner/managers participating in management education programs and whether there is a contribution to the solvency of businesses from an educational framework that gives projects

owners who lack crucial business/management skills, direction towards specific information, knowledge and abilities.

The intention was to bridge research gaps concerning levels of project solvency and skill-education available using four major types of business educational.

The study included interviews with project Engineers/managers participating in business programs to identify their perception of the contribution by courses to the solvency of their enterprises. The research examined whether there was a significant difference in certain clusters and competencies between researched management programs, to establish if completing any program affected positively

Since this, theses focusing on the effect of project Engineers skills on The project solvency, and checking the outcome positive and negative feedback of the impact of project management solvency to change there behaviors Generally, there is a positive affects on Engineering solvency, depending on the degree of the project Engineer skill and experience the in field that is why we found during the research the following important points.

Predominantly male with education levels above high school level up to University certificate, aged between 26-47 years, having enough theoretical knowledge and some skill in their solvency and management, and wanting to focus on assistance from consultants on goals and business plans.

The negative points which revealed from this study:

Predominantly female with primary school or trade qualifications, bur not having university certificate, up to 25 years old or between the ages of 48 and 55 years, are not interested in building business or management skills. And they did not focus on goal setting and the experience in project management with a little interest in working with mentors or consultants.

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Chapter 1

Introduction:

Knowledge gathering for a project management remains solvent is achieved within the current business environment and influenced by contemporary global management developments (Frey, 2001, p.38). On that premise, this review begins with a brief history of management taking particular note of the environment relating to project holder/managed business. The review continues by assessing knowledge and skill information available to owners and managers to build and develop management skills.

Exogenous and endogenous influences requiring management competencies for continued solvency follow, before general enterprise and personal management competency skill identified in the literature are then broken down with an introduction to competency education facilities in 2003. The literature relates to both general business and industry specific.

Griffin (1999) suggests management knowledge requires continuous learning. Indeed, keeping abreast of current research and information, may prevent repeating mistakes made by others in the past. In addition, root causes of under-performance are often hidden behind core management blind-spots. Organizations should therefore regularly examine the existing assumptions of their structure and management practices (Drucker, 1994).

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1.1 Thesis focus:

The focus of this study is projects management. This research examines the ability and capability contribution of management and project engineers of completing the project with fewer problems, concentrating on perceived participant requirements of the facilitating their education and experience to reach the aimed task and target

Because the important things which the managers and project Engineers should understand is that the projects always are around 50% of all work which can be carried out.

Due to that they can therefore be very important from economical view. That makes the subject of the project failures and analysis is worth studying, however it is not unusual the hear the question from some manager and engineer who are just starting there carrier (it is common sense) we can they are right to some extent because in general there is nothing in herently difficult about any concept, but the difficulties always appearing when we are phasing that in reality because the theory always different from practical from this point the reader will find the following objectives in this thesis:

- I will demonstrate the importance of project management understanding as a project Engineer specialist and how they can make there own right, not forgetting the potential for the positive contribution which can improve the project out put.
- I will demonstrate the systematic way of approaching the project management.
- The good and effective solution of progression from the starting of the project like making the plans, strategy, formulation up to execution of the project and subsequent activities.

- Explaining the correct way of using the available tools and techniques which can applicable by the project manager at different stage in the project life cycle.
- Well defining of the project manager and project engineer role in the organization and how they can be integrated.

Why all these study and research about the project management?
From the history we found it was a lot of change in the industrial behavior for example in late 18th century, national economies were dominated by feudal agriculture and, in matters of domestic and international economic trade, after that the merchants (Galbraith, 1994). The Industrial Revolution utilized application by power-driven machinery and as detailed evaluation of new business ideas and methods became known, more entrepreneurs were able to follow suit the development of cheap electricity.
In 19th century, the Modern Industrial Capitalist (MIC) age was established (Galbraith, 1994, p.1). Then from the beginning of the 20th century, studies of business structures and management procedures were carried out and business managers increased their knowledge and understanding of how to achieve results beneficial to both shareholders (owners) and employees.
The MIC system has developed with significant advances from that time, developing organizational structure, management skill and culture systems within enterprises (Daft, 1997).

This research I will try to examine the contribution of management and project Engineer education and experience to execute the aimed projects and how they can facilitate the educational out come.
As it appear from the research the small enterprises are play a major role in the industrial are where they can provide both employment and goods/services.

The rationale for this study originated from major concerns displayed by oil companies since 960s, regarding the financial stability and long-term solvency. For example the Australian Bureau of Statistics (ABS) data regarding Australian private sector solvency (2001c, Section 8127.0, pp 10), indicate that on average, over 90 000 small enterprises deregister from the Australian economic market each year, with 75% or over 67 500, having traded for less than 5 years (Berryman, 1993).

In this research also I will examine the amount if any that various management courses and how this can impact on small enterprise solvency. Initial motivation for this research was to discover if it was possible to identify whether the high failure rate of projects, was caused through business education deficiency.

Management understanding and education development since the end of the 19th century has had an important influence on management activity.
Growth in understanding offered project owner/managers opportunities to learn how to control and operate enterprises. The purpose of this section is to examine evolution of management concepts. In particular, development of management knowledge and style is reviewed, together with approaches in exercising authority.

Literature reviewed in this section, followed progress of management research leading to contemporary studies cantered on management education and management development. This comprised history of enterprise development and internal mechanisms of enterprises over the 20th century.
Whilst this study cantered on project management, research carried out for this study relates to entities of all sizes. Regardless of entity size this study

demonstrates that while each entity may be unique, there are certain common management features that is, in greater or lesser degrees, observable amongst them all (Daft, 1997).

Knowledge of organizations and management evolved, and theories espoused reflect this development. To understand contemporary theory of organizations and how perspectives evolved, Robbins and Barnwell (1994) suggested researchers should analyze the history of management styles and philosophies.

1.2. Background to the research

Robbins and Barnwell (1994, p.5) defined organization theory as: 'The discipline that studies structure and design of organizations.' To date over the last hundred years, researchers have studied the structure of organizations and suggested improvements through studying an enactment of organizational design.

To keep the research relevant, this review of organizational theory concentrated on the post-industrial revolution period that brought scientific studies into the area of management and production of goods and services (Hatch, 1997). The period under review began in the mid 19th century when thousands of people left the countryside and moved to the city. Labour was plentiful and some organizations offered workers very poor wages and facilities, which inspired Karl Marx (1888) to predict that the chasm between rich owners and poor workers would revolutionise the social status quo forever. Whilst some of his predictions were realized, for example, creation of a strong middle class, many of his conclusions were not, such as a worker's revolution (outside of Russia). However, this study is not concerned with sociological roles, influences and their consequences on industry.

This research concentrates on 'classical' management theory, which focuses on practical problems faced by owner/managers organizations and how theories then became increasingly concerned with human behaviours in organizations.

From 1900 to 1930, the first general academic theories of management began to appear. Frederick Taylor, a mechanical engineer in an American steel company, searched for the ‘one best way’ for manual work to be done in order to increase productivity (Robbins et al., 1998, p.713); this was later called “scientific management.” Taylor believed, using a standard technique or tool increased efficiency, and people were motivated primarily through financial incentives (Griffin, 1999, p41). Taylor concentrated on improving management activities through his own scientific study and calculated that with better tools, sequencing and operator movement, productivity could be improved (Robbins et al., 1998, p.714). Whilst Taylor demonstrated importance of compensation as motivation and initiated careful study of jobs and tasks, he did not consider social aspects of jobs, or the fact that people had different attributes.

Moreover, Taylor’s theory ignored individuality of workers (Daft, 1997, p.43). Insolvencies are a substantial cost to the oil companies is differ from one country to other depend on the tax revenue, increased social security benefit outgoings to redundant employees and financial losses to unpaid creditors, which may in turn affect the solvency of those creditors (Berryman, 1993).

Figure 1.2 (page 5) sets out both numbers and percentages of businesses and employees in some countries especially in small enterprise according to (ABS Cat. No 1321.0 1999b). Businesses and employees in that sector, including agriculture, forestry & fishing, number 1 051 500 or 94.55% of entities and 3 368 200 or 39.86% of employees as cited Perry & Pendleton (1990, p. 7) note that within two years of registering an entity, about 50% of enterprises de-register. Failed small enterprise projects give many causes for insolvency including lack of funds, bad management or bad leadership.

Perry & Pendleton (1990, pp. 7-8), also cite research by Professor Alan Williams (1986), who suggests major causes of insolvency as financial mismanagement (32%), management incompetence (15%), poorly kept records (12%) and sales/marketing problems (11%). Williams asserts that overall, 60.5% of insolvent owners questioned in his study, gave one of the reasons for their insolvency as, 'lack of business/management experience and skill' (Perry & Pendleton, 1990, p. 8).

And we can found a lot of books which have publications explaining how to remain solvent, for example like what been written by authors prepared to share successful strategies, (such as Hardy, 1987, Harvey-Jones, 1994, Gerber, 1995) or management and strategy scholars (such as Ohmae, 1982, Porter, 1985, Daft, 1997, Drucker, 1998, Griffin, 1999). With all this available knowledge, together with assistance from accountants, bank managers, business consultants and business courses, we have seen tens of thousands of businesses continue to become insolvent each year (Drucker, 1998).

1.3. Research problem

Every Project Manager and project Engineer has distinctive personal characteristics, individual management styles, and their own personal goals, thus making each project unique. So it is suggested in the research that the proficiency in both general and specific project Engineer competencies, required by any small or medium project owners, may be found in generic management courses (Carland & Carland, 1990). It is also suggested that these courses may remove business project holder 'blind spots', enabling small and medium project owner/managers to see clearly what is needed for their enterprise to function profitably and trade slovenly (Bureau of Industry Economics, 1990).

Essentially this thesis examines the argument that for project owners lacking business/management skills, consideration of the different styles and content of management development courses may offer guidance and direction to correct these inadequacies. In particular, this study considers the perception of course outcomes from participants and the quality and benefits resulting from androgenic and pedagogic teaching methods within available management courses for specific industry types and needs.

From the research we can identify some major project in the oil company revealed over 94% of all entities and employ more than 39% of the working population. It was also pointed out entities are "fragile" in their first five years of existence (Berryman, 1993). According to reports by Bailey and Royston (1981) Beddall (1990) and Karpin (1995), to avert this high level of early deregistration, management education is regarded as desirable. Projects owner/managers are able to access a diverse miscellany of project

management education courses delivered currently in the market place from Government and non-government facilities.

However, according to reports produced by Meredith (1984), Dawkins (1991) and Williams (1992) and noted in section 3.6.1 and Table 3.2 (page 111), the traditional pedagogic classroom based courses are largely unpopular with projects owner/managers, as they are too time consuming and too generic, in contrast to the more adult-oriented andragogic knowledge sharing project owner/manager courses, which are generally focused on the topic of interest to the participant and timed to be within the available period that a projects owner/manager can absent themselves from their enterprise (Carland & Carland, 1990).

Justifies the study of teaching constructs involved in researching management education programs and their contribution to sustaining projects solvency.
There are many project management courses and books available to deliver the information regarding necessary business skills. However, in order to ensure attendance/sales in sufficient numbers for a course/text to be viable, management courses and textbooks chosen for publishing tend to be generic and not industry specific. For that reason, using available education or reading existing literature alone, may not give projects owners a complete range of specific tools for the requirement of their unique businesses Importance to every project engineer

The academic reports such as Beddall (1990), Berryman (1993) and Perry (2001b) have identified a core reason for SE failure, as lack of appropriate management competencies. This study investigates competencies required and possible means by which project owner/managers would be able to improve their management competencies.

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Literature reviewed indicates that major projects in the oil companies are significant contributors to any national economy through job creation and the sustainable delivery of goods and services (Berryman, 1993). Since the 1970s, the oil companies are recognition that educational support was a necessary adjunct to project Managers,

Engineers and project holder's sustainability, saw the allocation of these companies resources towards various project managements development programs as beneficial (Bailey & Royston, 1981, Beddall, 1990, DEETYA, 1998, QDSD, 2000, ANTA, 2001b, DETYA, 2002).
The area where I think it needs more to be improved is to identify the difference between the perception of business management course developers' understanding of what is required by projects owner/managers and the needs and expectations of the projects Owner/managers that participate in educational programs.

National standards identify competencies required for effective management performance. Competency standards are industry-based or general business-based.

1.4- Research model

The basic of this research which I am going to follow to make the required improvement to make effective management of this programs, contribute to maintaining solvency. The provisions of this study lead to classifications of core competencies, differentiation between general and specific skill, identification of effective methods of teaching the new project engineers, and assessment of their effectiveness. A map of the model will shows sources of project management and project Engineer competencies, specific and general skill and results culminating in a conclusion relating to activities ensuring solvency. This model is created following the detailed literature review

1.5- Methodology

Research methodology will includes systematic and objective effective data gathering, recording and analyzing, then evaluating the different between concepts and theories to expand limits of knowledge. The research design method was to establish a means of knowledge transference acceptable to Engineering projects Management owner/managers while providing enhanced management and project Engineers the required education through training. The approach involved quantitative statistical analysis to draw conclusions and qualitative assessment of interviews to consider issues resulting from the conducted research.

1.6- Research process

This study proceeded through eight stages Operational steps

1- Studying and defining the a research problem
2- conceiving a research design
3- Finding an instrument for data construction
4- Selecting a practical and day to day example
5- Overall plan for research thesis
6- Collecting and analyzing the available data
7- Making all data in process
8- Finalizing and writing a report

Once the first step formulated, I will conduct appropriate investigation as mentioned above. When after the survey is ready for action. Participant choice of research was a cross-sectional design. This is ‘best suited when aimed at finding out the prevalence of a phenomenon, situation, problem, attitude or issue, by taking a cross section of a population’ (Babbie, 1989. p. 89). The result gives an overall picture of the situation as it stands at the time.

To identify the benefit of the education and practical experiences for the projects management and project Engineer to make this benefit is contribution to the task and target of the success of related medium and small projects.

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There are two surveys testing the components of the type of education which given to the project holder and project Engineer:

1- First survey carried out an assessment of management courses offered through available management educational institutions

2- Second survey using graduates who completed management courses of institutes from the first survey, was also completed to assess perceived performance and benefits in improving there type of working skill.

1.7- Data collection

Research undertaken, involved a survey of designed and delivered to Project management and Project Engineer and how to evaluate this courses defining if there is any different whether delivered in line with the perceived competency expectations of their candidates or not. In addition to that we will find the added value to the course participants make sure they have gain an insight clear picture from the point of view of project owner/managers and the impact of courses on improvement in business competencies and the solvency of their entities.

First we will try to establish if there a gap between project management training which currently available and competency-skills required. Through the second survey, comparisons and establishing reasons if any, for the gap of the parties involved was carried out. The purpose of this survey was to obtain information from defined populations, then collect data to quantitatively measure and compare results.

Through this, it was possible to resolve issues that were developed at commencement of the Study. In addition, this study selected across all areas of the project levels starting from project engineer up to project management - known as a cross-sectional design approach.

1.8- Quality of this research

Issues of the research quality and research findings are underpinned to type and methods used. Quality was assessed through benchmarking my work to the two questions.

1- “Will the measure and control of this research to similar results on different occasions?”
2- “Will different researchers make similar observations if they copy this method on a different occasion with different participants?”

These questions are satisfied where conclusions offer correlated proof sampled from a significant number of entities, that certain management educational courses, an appreciably higher positive attainment of management skill retention was possible.

Then we need to make sure from the validity and practically can be used in the real live by given clear and satisfied answers. Like if the new project engineers are given the right training by good institutions, the quality of the course provider was what the recipient believed they received.

In final step to generalizing the research results regarding abilities and capability for each group together depending of age and experiences from previous jobs through asking different questions it is possible that a new approach to management courses could make a significant difference that was able to be generalized.

1.9- Definitions

Definitions	What follows clarifies definitions of terms in this research
Downsizing	The systematic reduction in managers and staff to become more cost effective
Entrepreneurial revolution	The radical transformation by entrepreneurs of national economic and social structures over the last thirty years
Endogenous factors	Internal strengths and weaknesses relating to structure and culture, and resources of the entity, such as knowledge, raw materials and labor
Dependent variable	This is the main variable that is the main factor of investigation
Epistemological	Theory of method on grounds of knowledge
Benchmarking	Through research the average performance indicators of businesses in an industry. Used at gauge the position of ones company against peer companies
Ethnography	To interpret the world of the research subjects in the way in which they interpret it

Entrepreneur	A catalyst for change, optimistic, committed and purposeful with certain abilities that appear significant regarding project engineering operating success
Exogenous factors	Opportunities or threats that include elements or groups such as local and federal taxes, foreign government tariffs, changing raw materials prices, competitors and changes in customer demand
Independent variable	Cause, influence or affect outcomes of the dependent variable either positively or negatively
Competency-based skill	Clusters of related knowledge, attitudes and skill that affect a major part of one's job; that can be measured against well- accepted standards and be improved via education and development'
Case studies	Study involving details study of a small example of the subject
Competency	A combination of traits, skill, motivations, knowledge and focus which result in a performance outcome
Andragogy	Where teaching is a process of active enquiry

Adhocracy	A hierarchal project team implemented when considered suitable by organizations that wish to establish and disband project teams in an ad hoc fashion
Ethno methodology	The study of the way in which people create and construct their way of life
Inferential statistics	The methods used to find out something about a population, based on a sample
Insolvency	A firm unable to meet financial obligations
Leadership	The ability to influence people toward the attainment of goals
Locus of control	Belief in ones future accomplishment
Internal Business	Activities carried out by managers to develop their department or enterer prize.
Mechanisms	These are derived through learning how to plan, lead, organize and control their work place
Ontology	Fundamental beliefs

Organization	A consciously coordinated social entity, with a relatively identifiable boundary, that functions on a relatively continuous basis to achieve a common goal or set of goals
Moderating variable	This variable moderates the original relationship between the independent and dependent variables
Organizational behavior	The study of human behavior, attitudes and performance in organizations
Pedagogy	Indoctrination method of teaching by stating facts and spaced repetition
Organizational theory	The discipline that studies the structure and design of organizations
Phenomenology	An approach concentrating on presenting the quality of a situation rather than a statistical presentation

Organizational culture	The set of values, beliefs, behaviors, customs and attitudes that help an organization's members understand what it stands for, how it does things and what it considers important
Paradigm	A mind-set that presents a fundamental way of perceiving and understanding the world
Quality Assurance	Systemized documentation of management, production and communication procedures, designed to achieve a standardized performance or product
Positivist paradigm	An objective scientific approach, as applied to the measurement of a concept
Qualitative study	An inquiry process understanding social or human problem, based on building complex holistic picture, conducted in natural environment
Quantitative study	Consistent with the quantitative paradigm, is an inquiry into a social or human problem, based on testing a theory composed of variables, measured with numbers and analyzed with statistical procedures, In order to determine whether the predictive generalizations of the theory hold true

Variable	A discrete phenomenon that can be measured or observed in two or more categories. For example, gender, age social economic status, attitude or behavior
Total Quality Management	Continuous improvement through positive management activity and gaining of relevant knowledge
Theory Z	The application to western organizations of Japanese management approaches
Theory Y	The assumption that people can enjoy work and exercising responsibility
Theory X	The assumption that people dislike work and avoid responsibility
Statistics	The science of collecting, organizing, presenting, analyzing and interpreting numerical data for the purpose of assisting in making a more effective decision
Solvency:	A situation where a firm is able to meet its financial obligations
Reengineering:	Radical redesign of business processes to achieve dramatic improvements in cost, quality, service and efficiency

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Chapter 2

2- Research Methodology

2.1 Introduction

The literature led to five research issues to investigate the project management root causes failures and participants using combined quantitative and qualitative research methodology

The first issue related to surveys of Management Education Courses (MEC) and development program facilitators refers to the extent to which participating education institutions design and delivered for project management programs reflecting the needs of participants.

The resulting analyses of that situation led to three further issues linked to users.
These were first, to identify whether project owner/managers chose courses to develop competencies set programs.

Second task was to determine if those project owner/managers benefit from these courses.

Third, an assessment was made to see if courses developed competencies, and finally to examine whether the courses were perceived to contribute to a measurable increase in solvency.

Methodology used in this research was a systematic and objective process of gathering, recording and analyzing data. The research was conducted to

develop and evaluate concepts and theories and expand the limits of knowledge (Zikmund, 1997).

Research can be either pure research, which is conducted to verify acceptability of a given theory, or applied research undertaken to answer questions about specific problems.

Both pure and applied research use techniques or procedures that are systematic and logical to help researchers confirm or disprove prior conceptions (Zikmund, 1997). The design of this research project and the techniques used to analyze data.

2.2 Research design

Once the research objective is defined, the research design can be planned (Cavana et al., 2001), a theoretical model was developed and variables identified to find a solution for the business problem at hand, examines the elements of the research design to demonstrate how data was gathered and analyzed (Sekaran, 2003, p.117).

Research is defined by Clover and Balsley (1974, p. 1) as 'The process of methodically obtaining accurate answers to significant questions by the use of scientific and systematic gathering and interpreting information.' As the outcome of any study is influenced by the choice of research design, determining the characteristics is a significant factor in the quality of the conclusion (Miller & Salkind, 2002, p.18)

The nature of information to be surveyed was both innately quantitative, for example the percentage of projects owner/managers that were being instructed or guided in the use of and preparing business plans and the demographics of participants; and also qualitative, relating to the level of course participant satisfaction perceived greater by educational institutions.

2.2.1 Research design alternatives

Social phenomena are generally complex, therefore choosing the right design for a research project is vital when looking for answers to research questions and controlling relevant variables.

How the study goes about answering the questions will determine the outcome of the study and 'the more variability, the more likely differences between groups will be detected' (Miller & Salkind, 2002, p.19).

Research design is a master plan which specifies the methods and procedures for collecting and analyzing data (Zikmund, 1997, p.48).

There are three main types of research: exploratory, descriptive and explanatory or causal. The nature of research is a consequence of the type of or combination of studies to be carried out (Cavana et al., 2001).

2.2.2- Exploratory

Exploratory research is 'initial research conducted to clarify and define the nature of a problem' (Zikmund, 1997p. 37). Exploratory studies are a 'valuable means of finding out what is happening and gaining insights to assess phenomena in a new light' (Saunders et al., 2000, p.97).

This research does not look for conclusive evidence to determine a course of action. Rather an indication was sought, that by examining the contribution to project management solvency of management education could lead to further causal research that could be used to increase the knowledge and ability of management in projects organizations.

2.2.3- Descriptive

Descriptive research is 'designed to describe the characteristics of a population or phenomena' (Zikmund, 1997p. 38). The object is 'to portray an accurate profile of persons, events and situations' (Saunders et al., 2000, p.97). This is often carried out to describe characteristics of groups within an organization or community (Sekaran, 2003, p.121).

This research measured the management education for a target population and created a picture of its contribution to project management solvency. Although errors cannot be eliminated, the aim was precise description and results based on statistical testing.

2.2.4- Explanatory

Finally, explanatory or causal research establishes that an activity occurs as a direct consequence of a particular activity (Zikmund, 1997, p.40).
This type of study is carried out to explain the nature of relationships between variables (Saunders et al., 2000, p.98) or establish differences amongst groups, or the independence of two or more factors in a situation (Sekaran, 2003, p.124).

In this particular study, the relationship of variables considered, was the contribution of business management education to project management solvency. Thus the type of research carried out was both exploratory and descriptive.

2.2.5- A combined quantitative and qualitative study

Combined approaches within the same piece of research may be possible and often advantageous (Saunders et al., 2000, p.90). Table below summarizes some major differences between deductive and inductive approaches to research.
Differences between quantitative and qualitative approaches

Quantitative emphasizes	Qualitative emphasizes
Scientific principles	Gaining an understanding of the meanings humans attach to events
Moving from theory to data	The need to explain causal relationships between variables
A close understanding of research context	The collection of quantitative data
The collection of qualitative data	
The operating of concepts to ensure clarity of definition The application of controls to ensure validity of data	
A highly structured approach	A more flexible structure to permit changes of research emphasis as the research progresses
Researcher independent of what is being researched	A realization that the researcher is part of the research process
The necessity to select samples of sufficient size in order to generalize conclusions	Less concern with the need to generalize

Source: Adapted from Saunders, Lewis and Thornhill (2000) p.91

2.3- Research strategy

Ticehurst & Veal (2000, p2) quote Bennet's (1991) definition of research as: 'a systematic, careful inquiry or examination to discover new information or relationships and to expand / verify existing knowledge for some specific purpose'.

There are a number of ways to carry out social science research, such as experiments, surveys, case studies, action research, histories and secondary analysis (Yin, 1994, p.1).

However, exercising the spirit of Bennet's definition is important when choosing and designing the research strategy.

To determine the type of investigation being carried out, consideration is given to what result is required. If it is to discover that variable X caused variable Y, then a causal study is required. However in this study, a consideration of variables associated with the problem are under review, thus this becomes a study of correlation (Sekaran, 2003, p.126).

There are occasions when more than one strategy may be relevant (Yin, 1994, p.9).
In this study, the purpose is to generalize from a population so that inferences can be made about various characteristics, attitudes and behaviors of another population being researched (Creswell, 1994, p.118).
The first survey assesses attitudes of project owner/managers, changes to business practices as a result of courses and benefits gained by projects that affected their solvency.

2.3.1 Assessment of research quality

This section examines assessments of research quality, establishing the validity of results, reliability of data and practicality of the measurement tools (Cooper & Schindler, 2001, p.210).

The instruments are requested to measure concepts accurately and constructs measured are relevant to the tested issues (Cavana et al., 2001, p.209).

2.3.2- Validity

Validity of a measurement instrument is 'the extent to which the instrument measures what it is supposed to measure' (Leedy & Ormrod, 2001, p.31).

The criteria for judging quality issues relating to method according to Yin (1994, pp32-38) are the construct validity, establishing correct optional measures for concepts being studied. Validated measures of high quality negate the necessity to re-establish their validity for each study (Cavana et al., 2001, p.322).

To achieve this level of validity, several validity tests may be used before carrying out the survey, to test the goodness of measures. Four validity tests follow to test the goodness of measures.

They are 'face validity, content validity, criterion-related validity and construct validity' (Cavana et al., 2001 p. 212).

2.3.3- Face validity

This is an assessment of the survey in regard to it being clear and understandable to the subjects and is tested through a pilot survey (Cavana et al., 2001, p.212)

2.3.3.1- Content validity

Content validity is a function of how well the dimensions and elements of a concept have been delineated' (Sekaran, 2003, p. 206) content validity ensures the survey contains sufficient measures to represent the construct of interest (Gauld, 2002, p.112). There are three tests for this first from the literature, secondly qualitative research and finally from the judgment of a specialist panel (Cavana et al., 2001, p.213).

Criterion-related measurement

Criterion-related validity is where the measure differentiates that is either known to be distinct, or can be measured to categorise entities on a predictive basis (Sekaran, 2003, p. 206).

This may be done through concurrent validity or predictive validity (Cavana et al., 2001 p.213).

Concurrent validity is established where the scale discriminates between sets that are known to be different (Sekaran, 2003, p.206) such as competency-based RTOs and non competency-based non-RTOs.
Predictive validity indicates the ability of the measuring instrument to differentiate among individuals regarding future criterion.

2.3.3.2- Construct validity

Construct validity measures either where the data obtained using the two populations or instruments are highly correlated or highly uncorrelated (Sekaran, 2003, p. 207).

This validity testifies as to the correlation of the results to the theory from which the issues were designed.

Two forms are convergent and discriminated validity (Cavana et al., 2001 p.213).

Convergent validity is established where the results of two different instruments measuring the same concept return results that are highly correlated (Sekaran, 2003, p.207).

2.4- Data collection

The types and sources of data for the realism method of collection Saunders, Lewis and Thornhill (2000, p.224) cite the categorizes defined by Delbridge & Kirkpatrick (1994) by types of data generated through participants as ‘primary’, ‘secondary’ and ‘experiential’.

Primary observations are those activities noted as they happen. They are data specifically collected in research where the researcher is the primary user (Ticehurst & Veal, 2000, p.82).

This is the firsthand collection of data by the researcher on variables of interest for the specific purpose of the study (Sekaran, 2003, p.219).
That is information from focus groups or respondents relating to the study, whose opinions on the topic are sought.

The secondary data are sources in existence, such as company records, government publications or academic papers (Sekaran, 2003, p.219).
Secondary data could also be collected from earlier primary research but may be used a second time in current research. For this research, it was possible to approach data not fully exploited by original collectors of the data and from a different aspect.

There are a number of reasons for this, it is possible that the original study was researching a different aspect of the topic, or not in the field that the new researcher is studying, or that available data are open to alternative interpretations. It is the further analysis of this data that are referred to as secondary research (Ticehurst & Veal, 2000, p.82).

Finally, experiential data are the observations and feelings of the observer (Saunders et al., 2000, p.225). These experiential factors may be collected as a result of observations and discussions with multiple participants (Cavana et al., 2001).

An important factor in choosing a data collection method is dependent on the level of personal involvement of the researcher, rather than a desire to produce quantitative or qualitative data (McNeill, 1986, p.113)

Data analysis

The data analysis was completed in a series of steps and is explained in detail, section by section (Siegel, 1997, p.515).
These steps were first preparing for analysis, second getting a feel for the data, third testing “goodness” of data, and finally testing issues (Sekaran, 2003, p.301)

The steps covered type of data required, manner in which data are collected and how data are reported (Saunders et al., 2000, p.327). The results have been presented in table form indicating information as output, thus familiarizing the researcher with recorded data (Jankowicz, 1995, p.190).
The report then broke down results, tabulates information, and discussed the dependent and independent variables, explaining their significance (Jankowicz, 1995).

Finally the responses verified conclusions (Cunneen, 2002, p.180).
Data collection and analysis used a survey research study protocol and interview instrument. The techniques employed were designed to support statistical data analysis, for a methodology appropriate in support of a small number of cases.

2.5- Survey questionnaire design

A well-designed questionnaire will provide accurate and usable data to maximize the potential to provide accurate and usable data; the questionnaires were designed using three principles.

First careful questionnaire wording, second, applying categorization, scaling and coding of the responses and finally overall appearance of the questionnaire was of the highest quality (Cavana et al., 2001, p.227, Sekaran, 2003, p.237).

These three aspects show the breakdown of the process the purpose of each question considered the adequate measurement of that variable. The type and form of question depended on whether the information related to an objective variable

2.5.1- Interview instrument

The survey questionnaire was in two parts. The first part of the questionnaire was answered by MEC facilitators, seeking details of institutional type, background of trainers including relevant business experience, education content of courses offered and method of delivery.

Showing different aspects of a questionnaire design and administration process (Cavana et al., 2001, p.228), breaking the preparation of the survey into three steps for each population the first step of the design was to determine the wording needed to achieve the research objectives.

To accomplish this, it was developed to indicate the Constructs/relationships in the research model to the questions in the survey like:

Q 1: Please describe your own project.

Q 2: Where are they located?

Q 3: What is the subject matter being addressed?

Q 4: As a project manager what do you consider to be your main roles and responsibilities?

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Q 5: What kind of training or professional development have you undertaken in the past that fits you for this role?

Q 6: What kind of training or professional development do you think you still need?

Q 7: What techniques or processes did you use to carry out a needs analysis for your project?

Q 8: What kind of challenges or difficulties did you face in conducting the needs analysis and how did you overcome them?

Q 9: What is your experience in specifying and scoping a project with a client?

Q 10: Who was the client?

Q 11: How did you go about the scoping process?

Q 12: What difficulties emerged?

Q 13: Where these difficulties fully resolved? If, YES, how; if NO, why not?

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Q 14: What is your experience in developing a Project Proposal?

Q 15: How did you go about the process?

Q 16: What issues/subjects did it address?

Q 17: Consider your own project. What kind of risks did you anticipate?

Q 18: What actions did you take to control or allow for these risks?

Q 19: What kind of organisational structures have been used to support your projects? How effective has this been?

Q 20: What kind of skills or competencies does a project manager need to have in dealing with such structures?

Q 21: What kind of project management software have you used? What have been the advantages of using this software?

Q22: How would you go about launching future projects?

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Q23: What evidence can you provide of senior management 'buy in' to facilitate the development and integration of e-learning?

Given your experience, what advice would you give to a project manager?

Q 24: What kind of difficulties or arguments arose in selecting your development tool?

Q 25: Given your own experience, what would you advise a project manager choosing a development tool for the first time?

Q 26: Make a list of development roles and names for your project to show the extent of specialisation or use of multiple roles eg.

Lead designer or Course integrator

Q 27: What were the main issues or problems that emerged in getting the team that you wanted (e.g size of team, balance of skills, level of skills, etc?)

Q 28: How easy or difficulty was the recruitment process?

Q 29: Did you make use of trainers in the project? If so, at what stages?

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Q 30: What kind of issues or problems emerged in terms of managing your team? Did you manage to solve them and, if so, how, and with what degree of success?

2.6- Research justification

A basic justification of this study derives from the significant increase in projects in the last 10 years, the high failure rate of projects failures managers to manage their enterprise solvent and the alleged reluctance of project owner/managers to participate in management competence training
Most of reports such as Beddall (1990), Berryman (1993) and Perry (2001b), concluded that the core reason for projects failure, to be lack of appropriate management competencies.

This study investigates competencies required and possible means by which project engineer/managers would be able to upgrade their management competencies.

This research deals with the project management sector, shown earlier to be significant to the national economy. The focus is the importance of management competencies and demonstrates the impact of commercial management educational programs. This study evaluates project management education programs and providers and considers the implications for governments, advisors, academics, and individuals.

The aim of this research is to fill a gap in both project management solvency research and literature, contributing to knowledge on management competencies and increasing the chance of project management remaining solvent.

2.6.1 Benefit of this study

This study considers Modern Industrial Capitalism since the beginning of the 20th century, where researchers have analyzed enterprises; their structure, management of resources and the manner of carrying out activities.

The significance of past research shows that through the investigation of learning and teaching methods, it may be seen that there are flaws, not in the competencies but the method of knowledge and experience transference.

Large corporations developed over the 19th and 20th century, however in the late 20th century, when circumstances arose that caused higher costs of raw materials and labour, management practices encouraged ‘flatter’ management styles, removing middle management positions and ‘excess’ labour.

In addition technology developed causing manufacturing tasks to be less labour intensive and computers capability, with accounting programs becoming more sophisticated, so the number of office staff required diminished greatly (Champy, 1995).

As a result of the high level of unemployment, managements encouraged start-up project management and this may be seen by increase in numbers of enterprises one consequence of this huge proliferation of projects since the 1980s, without time to assimilate knowledge or education of the methodology required to develop a solvent entity, may be seen in the reports of high percentages of failure.

Companies however could not tolerate these high levels of unemployment, as paying unemployment benefit to 7 per cent or more of employment-aged labour was untenable.

However with all the courses, books, accountants and education programs, over the last 30 years no significant reduction can be seen in the proportion of enterprise failure.

The significance of this research was to annotate and articulate progression of activities relating to management education and education styles.

This paper shows where positive results are being felt and possible long-term benefits through certain types of programs. In addition a comparison of what was being asked for, what was offered, and finally an assessment of educational methodologies to clarify how the requirements of project management may be met and transferred, either by competent consultants or through conventional education methods.

2.6.2 Outcome of research

This study considered and evaluated activities of both privet and government programs, assessing programs and users, concluding with a new proposal to the education approach.

Programs were evaluated and the concept of continuous improvement to its systems was implemented the changing nature of business could be seen to require a mindset that accepted future managers would need to constantly upgrade their business and management knowledge.

This is considered as necessary, not only for the benefit of project owner/managers as they commence their entities, but also to keep abreast of current procedures as they progress through levels of business growth.
The intention of this research was to identify how to reduce the number of insolvencies

2.6.3 Research gap

The objective of this study was to consider the project failure and how management education can reduce this failure and enhance the project management solvency and evaluate gaps in research leading to current government and private competency and management education programs for project management, the research assessed what education programs were offered, who accessed them and why.

Finally, the research considered the perceived effect on solvency by project owner/managers, to assess the gap between what knowledge and information they require and what they receive.

It is the aim of this research to clearly indicate the gap between areas of competence required for a strong solvent position and means of developing required skill available to all project holders/ management prepared to learn and understand the study required, with appropriate comments.

2.6.4- Limitations of this study

The strategy of this research which been used in this thesis was determined by analyzing and using the available information.

Most of this information from literature, current available courses being offered in this field/ surveys / interviews with projects owner/managers

Projects that contributed to the first survey agreed to give the researcher access to graduates of their courses for the second survey.

Referred enterprises gave greater reliability as they came from identifiable groups this grouping of participating enterprises was reliable as they could be compared to similar populations.

Most of course organizers in this field have philosophies regarding strategies, and these were examined using the above methodology and you can find gaps in their intended beneficiaries attaining strong solvency skills.

The research outcomes will only result from careful preparation, the questionnaires were meticulously planned in order to reduce the possible limitations of result clarity. Data requirements were specific in the preparation and careful planning and organization of the questionnaire helped to achieve adequate results.

Quantified information was specifically focused on competency requirements and gaps in education and knowledge needed for solvency of various enterprises, in order to prepare a skill / enterprise type matrix.

Analysis in the second survey had a number of limitations, for example, all the surveys were carried our directly by the researcher, therefore the cost in terms of available time and financial loss in earnings.

Although a random sample of graduates was used, one consequence of the limited location may have caused bias in selection

Types of enterprises to be surveyed were diverse, but attitudes and work ethics were limited in different projects especially in the oil fields.

The economic and political bias of populations may have been a main drive factor However, diversity of enterprise type and national characteristics of some projects and companies where the offering courses was a positive factor helping to balance learning and experiences bias.

2.7- Chapter 2 Conclusions and Summery

The main purpose of this research is to extend the body of knowledge regarding project engineering in the oil companies through examining the contribution of management education to project engineering solvency.

In this chapter we try to establish the research problem, research issues and objectives. By giving the preliminary literature review, a gap in research outcomes reported has been noted, justifying the project.

To accomplish this, a theoretical framework was developed to examine different business competencies required and demonstrate how they are addressed through management education.

This study argues that programs should be fashioned to develop personal skills, planning activities and business competencies in which project engineering holders/managers may participate, or that an enterprise in times of growth or decline can use to work through their issues.

In general, to meet demands of viability, business management courses are generic in their coverage of business skill requirements; they do not focus on outcome requirements or individual business solvency issues.

The chapter continued with details of objectives of terms and abbreviations used, with comments on research limitations and an outline.

Further justification for the work was presented and an outline of the methodology, documented in detail, was briefly reviewed.

Thus the chapter has documented what is to be carried out, how the project will proceed, and an outline of why the research contributes to the body of knowledge.

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Chapter 3

Background to and justification of research

3.1 Introduction

The purpose of chapter 2 is to elucidate the background of the research disciplines and justify this research study. This shall be accomplished by defining and identifying the relevance of outcomes from this research into Oil companies' management courses available for projects holders/managers.

The study focuses on examining projects Engineer/Managers taking part in management education programmes and the outcomes from those courses in terms of their contribution towards engineering projects solvency.

We will try in this study the possible studies Solutions to the project failure reports, all identified the importance to the economy of project management and allude to the inadequacy of management education and development courses, in coping with projects failure.
Overview of the national management competency standards program which was initiated to assess and advance the quality of business management in order to reduce projects failure and insolvencies
The accessed information for this study was through a review of research into project management competency standards, education formats and skill development programs in Oil companies and by identifying statistical data regarding project management solvency and failure. Information regarding national engineering projects competency standards is documented and incorporation of these standards into courses offered by education institutes

3.1.1 Overview and objectives of this study

French industrialist Henri Fayol examined roles of organizational management and published General and Industrial Management in 1919, which described his management philosophy as a code of fourteen principles (Division of work, authority, discipline, unity of command, unity of direction, subordination of individual interests to general interests, remuneration, centralization, scalar chain, the unbroken line of authority, order, equity, long tenure of employees, initiative and team spirit) (Robbins & Barnwell, 1994, p.31).

These principles focused on management of an entire organization rather than individuals within one organization. Fayol also analyzed performance of managers and concluded that they perform five tasks: planning, organizing, commanding, coordinating and controlling (Robbins et al., 1998, p.5), which are considered by current management text books (such as Daft, 1997, and Griffin, 1999) to be classical management processes, focusing on administrative management and individual employee productivity.

The third key theory from this time was developed by Max Weber, a German sociologist, whose work was neglected in English speaking countries until 1947, when translated into English (Daft, 1997).

Weber's theory for an ideal form of organization was bureaucracy, which laid foundations for contemporary organisation theory. Weber was an early academic in the field of examining management and organisational behaviour from a structural perspective.

His theory of bureaucracy was in fact, a construct with all the ideal characteristics of a generic organisational hierarchy that could be related to all sizes of enterprises from small to corporate (Robbins & Barnwell, 1994).

Weber's hierarchal enterprise concepts continue to be used in 21s t century organisations, along side more contemporary structures such as adhocracy (Robbins & Barnwell, 1994, p.37).

Thus, over the last century, studies of organisational structure have enabled enterprises to understand and plan different types of hierarchy.
We will examine development of national projects management's competency standards, how competencies are converted into education programs and how programs apply to projects engineer's competencies.
Then we will reviews management education institutes and current education programs which provided to establish how education is incorporated into management programs.
And also in this chapter the documenting companies support for institutes offering competency courses and a review of whether educational institutes acknowledge international standards.
Then we will assess the significance of this study by a detailed research justification. Where the summaries, indicating an awareness of the companies regarding report outcomes relating to quality of projects engineer competency skill and action taken to benefit this important sector of the economy
The justification is extended to consider outcomes gained from the considerable sums of time and money spent by companies on competency programs.
Finally, justification of this research indicates the gaps that exist in the literature between management studies and conclusions drawn, regarding education courses that address those research findings.

3.1.1.1 Chapter 3 objectives

The objectives of this chapter are to consider:

- Project Engineering solvency and failure in the Oil companies
- Project Engineer competency standards
- Project Engineer business education providers
- Oil companies support for competency education
- Research justification
- Potential implications for this study

3.1.2- Project engineering international definitions

Agreement on an acceptable definition of a small and medium projects has proved as been indicated by elusive in his book issued (Howard, 1996, p.47), and Neck (1977) found 50 separate definitions from 75 countries.

Watson and Everett (1996) quote White, Bennett and Shipley's report (1982) that 700 definitions were presented to a Congressional Committee in the United States of America (USA).

A variety of criteria have been used in an effort to find a universal definition of a projects including total worth; relative size within an industry number of employees; value of products produced/sold; annual sales or receipts and net worth (Cochran, 1981). Areas of consensus relate to relative size in terms of influence within a firm's macro-environment (Howard, 1996). In 1953 a

definition within the Small Business Act in USA focused on a firm 'independently owned and operated and not dominant in its field of operation' (Hodgetts & Kuratko, 1989, p.3).

For example in Australia's Wiltshire Committee (1971, p.7) defined small business as 'a business in which one or two persons are required to make all critical management decisions, without the aid of internal specialists'. Section 249 of the UK Companies Act 1985, identified projects according to the following criteria (Bridge et al, 1998, p.102)

A small firm in the UK must satisfy at least two of the following criteria:
• Turnover of not more than £2.8 million
• Balance sheet totaling less than £1.4 million
• Not more than 50 employees

Watson and Everett (1996, p. 46) cite Ang (1991) who used characteristics to define small business: including not being publicly traded, involving incomplete management teams, and lack of formality in stakeholder relationships.

3.2- Project Engineer demographics

The oil companies are fully sponsored studies into all the projects which been carried out, such as Petroleum Development of Oman, OXY and Alfa all these companies which having concessions to explore and produce crude oil in Oman are concerns about project operating and as it said by ABS (CAT. No 8127.0 2001c, pp 3-4)

As persons that ‘own and run a business, ranging from proprietor to working director of an incorporated company’

These companies sponsored studies above, resulted in ABS committing itself to increasing information regarding the project management sector business.

3.2.1 Projects managements entity demographics in Oman

Number of enterprises and employees in Oman working in project sector, including agriculture, enterprises and (39.86%) employees indicated that there were a lot of project holder/managers, thus 12.36% of all Oman workers, choose to be project-employed.

For the benefit of these entities, the oil companies and governments since the 1970s, desired project management skills to be developed and transferred to project Engineer and project manager.

And we can see starting from the early 1980s, the number of small and single-operator non-employing firms increased significantly.

From 1983 to 1999, an increase in the number of small and single-operator no employing businesses averaged 2.5% per annum, resulted in a net increase of 56.9% entities in a 25 year period.

Statistics shows that new enterprises numbers with the greatest annual growth were single-operator non-employing firms, in addition, overall there has been an 0% increase in the number of projects enterprises between 1999 and 2006 with the lowest annual growth for micro enterprises, employing from 10-49 staff.

The numbers of firms employing between 31-90 employees had a significantly smaller growth rate than the average growth in numbers for projects. Social clubs, non-business entities such as personal superannuation funds and charities that do not employ anyone, have also had to register to

comply with the new regulations. This will distort future statistics, as not-for-profit and non-business entities will probably stay in the sector and appear to show that the percentage of entities deregistering is declining.

Change in annual growth of business is not equally spread over all industry sectors, indeed not all sectors increased in terms of numbers of enterprises. Agriculture declined steadily peaking in 1985-86, and the four-year period to 1989-1999 saw the number of firms in that sector drop by 4.4%. From 1994 to 2000, numbers of operating businesses in mining fell 25.7% and manufacturing industry had 13.5%

As per the location of these projects around Oman we can say:

Population size had an affect on the numerical distribution of operators across States and territories; indeed there was a mean growth of 11% nationwide. The distribution of means was spread across the nation with all projects around Oman which having an above-average growth of 10% around the Oil concession area the number of projects increased by 9%.

If we check the age of operators in these projects we will find the following:

- 23% of operators were under 30 years old

- 45% of operators were between 30 to 50 years old

- 32% of operators were over 50 years old

Whilst percentage of project Engineers between 30 to 50 is a majority, the number of operators under 30 and above 50 increased significantly in 2000 to June 2005 period.

If we compare the Education of these projects holder and engineers who are operating these projects we will find they have been classified as educated up to school level (grade 12)

39%; post-school certificate level and trade certificate 30%; and those attaining advanced diploma and above 31%

3.2.2- Projects skills and failures

The large number of new projects established, attracted most of the big companies attention due to a significantly high percentage of failures especially in implementation of these projects.

If you compare failure rates of larger companies which are executing tens of thousands of projects in each year you will find these figures are a concern to the managements in terms of effects on fluctuating unemployment rates, unpaid debts due and taxes due from failed entities.

However, keeping losses in perspective, total numbers of enterprises at any point in time remains relatively stable, as an inflow of new enterprises significantly replenishes exiting entities, while we are in this research we are not concerned directly with the number of entities registering and deregistering

It is relevant to focus on effects on the economy of tens of thousands of failed enterprises and to comment on whether some could be avoided. These failures cost these companies millions of dollars through default to creditors, banks, representing an average of $1, 56 million per enterprise in gross domestic product each year

Studies of project management ownership show that a perception of personal autonomy is a major reason potential entrepreneur establish businesses. The same studies show that whilst project management is autonomous, they are reliant on others through limitation of skill and resources, expertise and finance. Owning a small enterprise offers both benefit of individual authority

and disadvantage of personal risk. Project management are able to take advantage of opportunities available, yet are required to deal with financial and organizational threats consequent to their decisions or autonomous decisions over which they have no control.

Whilst there were a few isolated studies regarding management skill undertaken in Australia pre-1960, in 1969 F. M. Wiltshire chaired a Committee on Small Business, studying Oman project engineer sector.

The Committee released findings in 1971 concurrent with the more comprehensive UK 'Bolton Report' (Dunlop et al., 1992, p3). The consequence of Wiltshire's report was a groundswell of interest in skill requirements of small firm owners. From 1974 a National Small Business Bureau and later State advisory services and agencies, promoted, developed, and then distributed management-education programs (Dunlop et al., 1992, p.5).

During the 1980s, interest in assisting growth of skill education to project management developed around the world , particularly through business management courses delivered by both higher education sectors in addition to private education sectors.

Twenty years after the Wiltshire's report (1971), the Beddall Committee (1990) recommended an active role by government to positively identify the significance of project management for the economy and how government could benefit the project management field and internationally through appropriate action (Beddall, 1990). Beddall concluded that addressing questions relating to success factors, failure patterns and the effect of project management on the economy was and would always be, important.

The Parliamentary Committee found that two major factors inhibiting the success and growth of small firms are lack of management skill by project engineer holders/managers and low use of management education and advisory services by small business people despite the range of services available.

The Beddall Report (1990) recommended a program of information and awareness development for project management, incorporating business education into secondary education curriculum. Dunlop, Moir and Williams (1992), suggested at the time of their paper that the quantity of project holder/ managers research indicate it was still inadequate as a per capita proportion, with less than half the number of UK researchers and under a quarter of USA researchers involved.

Their investigation showed that most project management studies carried out by researchers had revealed only a peripheral interest in the small business sector.

From the middle 1980s to 2002, many studies developed relating to identification of success vs. failure prediction variables and issues.
These include: researchers Berryman (1983); Haswell and Holmes 1989 (1989); Perry and Pendleton (1990); Watson and Everett (1992); Berryman (1993); Posner (1993); Kyambalesa (1994); Aderman (1995); Eidleman (1995); Watson and Everett (1996); Cunningham (1998); Watson and Everett (1999); Lussier and Pfeifer (2000, 2001); and Perry (2001b).

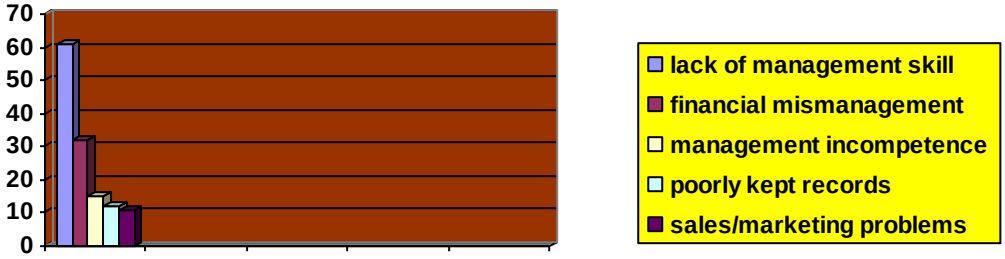
3.2.3- Project failure demographics

Insolvency by definition occurs when firms are “unable to meet their financial obligations” (Bruns Jr, 1999, p.1-57). Research has identified major causes of a significant number of failures as a lack of business/management skill (Perry & Pendleton, 1990, p.8).
This research focuses on project management skill and competencies required to prevent insolvency.

Attributes of failed project management due to a lack of appropriate management competencies, alderman’s thesis on failure processes of small business (1995, p 132), suggests business failure is a process covering apparent and/or underlying causes. Failed project reveal many causes for insolvency including lack of funds, bad management or bad luck.

Whilst many reasons can be given for failure in business, the majority of studies into project management failure, report that difficulties of small business generally return to the same basic cause: blind spots in business/management competence by project holders/managers (Posner, 1993, p.102).

Major causes of the project failure



Perry & Pendleton (1990, p.8) also cite research by Professor Alan Williams (1986), who suggests major causes of insolvency in more detail are: lack of management skill (61%) financial mismanagement (32%), management incompetence (15%), poorly kept records (12%) and sales/marketing problems (11%). Williams (1986) asserts, overall 60.5% of insolvent owners questioned in his study, included in addition to other reasons for insolvency, 'a lack of business/management experience and skill'.

Therefore it may be suggested that a significant percentage of project management insolvencies may have been averted had owner/managers known which business and management skills were required in advance of commencing business, or before a challenge became a crisis (Perry & Pendleton, 1990, p.8).

The owner/managers of that project did not have the management skill to perceive the management blind spots within the internal activity structure of their projects, required to control their projects.

Watson and Everett (1999, p 4-5), concluded, that failure can be the result of one or a number of factors: bankruptcy, discontinuance of ownership for any reason with business ceasing to operate, and 'failure to make a go of it'. However causes are overwhelmingly due to poor management (Carland & Carland, 1990, p. 29).

3.3 -National Project Management competency standards

The Crawford et al (1979), Ralph (1982) and Williams (1984) Reports, are examples of government enquiries concluding project management competencies were ‘embryonic’, ‘inadequate’ and ‘generally resulted in business failure’.

If this suggested link between failure of enterprises and lack of management competencies exists, the need for development and education in project engineer/ manager competency standards becomes apparent.

Field and Ford (1995, p. 4) cite Peter Drucker: ‘Knowledge is the only meaningful resource today and is fast being recognized as the primary resource for many of today’s enterprises’ Organizations constantly increase knowledge, learn new ideas and address educational needs (Field & Ford, 1995, p.95).

This is due to reduced time frames, international marketplaces, speed that current knowledge becomes obsolete and a need for integrated approaches to new business challenges.

The international research into business services since 1980s and investigation in 1999 of management competencies was instructed to identify management competencies required by firms in the private sector and provide relevant business service education and development opportunities for owner/managers through management competency courses.

As the lead agency for business service education and development, role was to ensure the skill of project holders/managers invested in valuable education and development by preparing suitable learning packages that were of a high quality, beneficial, interesting and cost-effective.

Holmes and Butler (1995) identified an area of concern regarding the attraction of courses to project engineer/managers.

The research found a reluctance of many project engineer/managers to avail themselves of education opportunities, as surveyed project engineer owner/managers saw structured courses as ‘irrelevant and consequently only a small number participated’. However the Holmes and Butler research (1995) concluded that ‘management education increased chances of remaining solvent’ for small enterprises and the ‘higher their education qualifications, the more likely operators were to seek education and train their staff’ (Holmes & Butler, 1995, p.287).

The programs were prepared during the early 2000s, offering courses that were to a recognized educational level in line to achieve national implementation. The aim was to have a national wide qualification, recognized by both managers and enterprises.

3.3.1 Project Management competencies

Surveys of insolvent firms showed that the apparent cause of 64% of bankruptcies was lack of adequate management skill (Crawford et al., 1979, section 7.37).
In the course of its research, Crawford et al's Study Group (1979) on 'Structural Adjustment' became aware of concerns regarding quality of management practice in national industry.

Crawford's Group concluded that management standards should be raised through 'a comprehensive program of management education that should be available to all areas of management' (Crawford et al., 1979, section 7.37). In addition it recommended that the Tertiary Education Commission (currently TAFE), should report on progress in the field.

Meredith (1984) cites Alan Williams' paper (1984), on establishment of small business management education centres, where Williams agrees with the Gibb report (1981), referring to Small Business Education and Training (SBET) study of 1980, which concluded that 'a large majority of the project owner/managers are not oriented towards conventional education and education programs'.

In addition 'management educators need to understand the process that successful managers acquire and how to develop expertise' (Meredith, 1984, p.17).

Williams asserts that these programs were ‘failing to attract projects holder/managers with little skill or knowledge in even rudiments of starting-up and running a solvent enterprise’ (Williams, 1984, p. 3).

In North America, competency standards were developed in 1982 by Richard Boyatzis with the personal qualities/characteristics approach (Boyatzis, 1982a). During 1980s and 1990s, a number of European countries, such as France, Sweden, Germany and Britain, developed their own competency standards, each in line with each country’s unique approach to business/management, which evolved from their country’s history and culture.

Key differences between European and North American aspects of competency standards approach are the European ‘aspects of people that enable them to be competent’ and North American ‘the job at which the person is competent’ (Miller, 1998, p. 4).

Beddall Report, John Dawkins, Federal Minister for Employment, Education and Training in Australia commissioned a study: ‘Australian Mission on Management Skill’ (Dawkins, 1991) to research how project managements ‘enterprise and industry management education, education and development could be further enhanced’.

In 1991 the report, subsequently known as the ‘Dawkins Report’, was presented where it discussed ‘enhancing management education through a national strategy’ (Miller, 1998).

Dawkins examined international management education in countries such as Germany, Japan, United States of America and Britain. This pointed a way Australian management courses for project managements could ‘improve

performance in areas of management development and thus compete successfully within international environments' (Dawkins, 1991, p. 3).
Findings of the 'Dawkins Report', pointed to the need to establish competency standards.

Dawkins Report' recognized a key factor in successful economies as a 'commitment to a high level of management skill within the workforce'. In addition, it was noted that where there was 'cooperation between business, industry, unions, education providers and government, opportunities and outcomes were optimized' (Dawkins, 1991).

Midgley (1995, p.35) concluded in his paper on the need for leadership and management skill, 'Managers receive low levels of education where business knowledge is increasingly the key to competitive success'.

The Department of Employment Education and Training (DEET) established a national skill curriculum in 1995 and in the same year a report from Karpin called for 'promotion of management competencies at all levels in commerce' (Miller, 1998, p. 2).

In the conclusion of an analysis into surveys regarding education needs for project management sector, Holmes and Butler (1995, p. 274), identified 'forms of education preferred by project engineer/managers are at variance with conventional approaches'.

3.3.2- Competency conversion into education programs

Competencies are the application of knowledge, experience and skills (Field & Ford, 1995, p. 100), being investigated in this research.

Competency standards are understood to be the level of knowledge, experience and skill required to be proficient in the workplace.

Training packages are a grouping together of competencies into units of education components designed to assist in achieving proficiencies for a specific industry or industry sector. Units of these components are then combined to form recognized qualifications as awards through certificates to degrees.

Key features of the National Training Framework are a staged development of nationally endorsed education packages developed to deliver workplace competency programs for a particular industry or industry function and result in nationally recognized.

Throughout the 1990s to 2003, other providers comprising public, private, association and industry specific, supplied competency education packages available.

Newly developed Training Packages for Business Services Sector, having absorbed Administration Training Package and the Frontline Management Initiative, contain specific competencies, derived from a number of sources including (BST Package, 2002b):

1. Existing business services competencies
2. Competencies from other packages, either with/without adaptation
3. New competencies that have yet to be developed or obtain a national competency standard.

Although initially adaptations of original competencies were undertaken priorities for management courses were a consequence of the above criteria and projected client demand to convert a group of competencies into a course unit, elements of each course unit contain four components (BSTA, 1999, Para. 2.1.3.1):

- Task skill
- Task management skill
- Contingency management skill
- Job/role environment skill

Standard unit format covers various issues, for example a descriptor that links a relationship with another unit and performance criteria that describes the required outcomes for each level.

Each unit of competency education considers evidence to indicate outcomes of the course and provide a clear link to other requirements such as levels of literacy (BSTA, 1999, Para 2.1.4.6).

3.3.3- Application of competencies to management education and development

Prior to preparing education programs, BSTA surveyed providers of support material, accessible course providers of existing programs and potential users of proposed programs.

In the third interim report, relating to the project's stage findings indicated a significant shortage of resources for identified courses.
This resulted in quality deficiencies and relevance of available program materials (BSTA, 2002c, p 42).
BSTA investigated gaps in education in 2002 to establish necessary education and support materials required (BSTA, 2002b, p.13). To achieve this, BSTA has worked with Industry Training Advisory Boards and initially most material was industry specific.

The BSTA team identified where support material was available and where recommendations to ANTA regarding the development of support material should be priorities (BSTA, 2002b, p.5).

All reports recognized the importance of project management studies for the economy.
The reports pointed out the apparent inadequacy of management education and development available at all levels of management, from the project engineer of any projects to CEOs of corporations.

Since the publication in 1971 of the Wiltshire report, all the major companies have been trying to encourage the use of business and management

competency programs administered through Recognized Training Organizations for all levels of management.

As a direct result of reports by (Cyert Report, 1970, Wiltshire Committee, 1971, Beddall, 1990, Karpin, 1995), major companies supported programs such as ANTA, interpreted the requirements and developed pedagogic, generic one size fits all business programs.

These were prepared as a means to increase knowledge and skill of projects owners with the intention of reducing insolvency

3.4- Management education requirement:

As established ANTA in 1994 to provide a national focus using VET qualifications, to enhance management education courses for the workplace through every aspect of business from pre-employment awareness to work practices and responsibilities of company directors (ANTA, 2001d, p.1)

The mission was to ensure 'skill of the labour force were sufficient to have internationally competitive commerce and industry' to accomplish this, A Bridge to the Future: National
Strategy for VET to 2003 was written, instituting five objectives (ANTA, 2001d).

1. Equipping managers for the world of work
2. Enhancing mobility in labour market
3. Achieving equitable outcomes in vocational education and education
4. Increasing investment in education
5. Maximizing value of public education and education expenditure.

There are currently over two thousand Registered Training Organizations (RTOs) offering courses using packages of management competency programs, for all entities from micro enterprises, through project management, to corporations

The RTOs include traditional management education organizations such as universities, adult education centres and private management education schools such as the Institute of Business Management; Russo Institute of Technology and Frontline Management Institute. Registered providers also

include many state schools and associations such as Australian Institute of Environmental Health; Construction Industry Training and Employment Association; Chambers of Commerce from every State and Territory;
National Insurance Brokers Association and the YMCA Institute of Education and Training

Small business management courses available are accessible through both government and non-government institutions, and general courses gained in one industry may be transferable for use in a project management. It was evidence of poor quality implementation of education. A review considers integrity of courses and the VET system could be questioned regarding this issue (ANTA, 2002a, p.4).

Many industry bodies offer or insist in education through organizations
Finally, all the above and hundreds more are registered business service providers to their students, clients, members or staff.

The diversity of providers indicates a desire for management knowledge, skill and experience opportunities. Through these providers, individuals can gain from hundreds of business/management skill education programs offered by business services education packages.

3.4.1- Management competency

Management competency educational programs relating to standards as at 2002, consist of packages composed of units designed to assist in achieving competencies for a specific industry or section of industry, such as frontline management

In early 1990s, a number of management programs. Evaluated available programs against current requirements of that time, the size of its task and has instituted a continuous improvement process to ensure that education packages are seen by the National Association of Workplace Training (AWT) as ‘relevant, current and appropriate in industry requirements and education qualifications’ (NAWT, 2002, p.1)

Prior to commencing Phase 1 ‘Businesses Services Training Package’, there were 310 recognized competency units, which gave rise to 37 qualifications. As at 5 July 2002, this was revised under Phase 1 to include other disciplines such as legal services and frontline management. These disciplines added 91 units and resulted in changes and amalgamation that gave a total of 369 units of competency endorsed

Whilst ‘continuous improvement is the key to growth’ the Packages were organized around “Fields” and “Domains”.

“Fields” are defined as ‘broad areas of activity carried out within the coverage areas’. “Domains” are ‘discrete areas of activity within each field’. Fields include common business, business administration, information and management services, human resource management, business development and e-business Continuous improvement developed programs, where “Fields” used in the first phase development program, were refined from the original

3.5- Support for education-competency development

Normally the project management have shown an interest in project managements development through reports, longitudinal studies and ongoing data collection by organizations such as national and State management education authorities working through RTO organizations, have prepared programs designed to assist project management and engineer to develop competencies to reduce the percentage of enterprise failures.

Since the 1980s and 1990s when the number of projects began to grow substantially established projects management education facilities. In 1996 DEETYA prepared a report on small business development (DEETYA, 1998) and in 1998 DETYA introduced a Small Business Professional Development program (SBPD) (DETYA, 1998).

In addition to that most of major companies began to promote the concept of sustainable development within project management through a business skill development program. This program was introduced and strategic plan was to work closely with small businesses to strengthen the economy.

Both privet sector and governments have been interested in developing competence of projects management skill for over three decades, as they are cognizant of the significance to the economy that projects represent. In addition, as large corporations continue to shed staff and redundant employees establish in these projects we are finding the privet sector and governments appreciate importance to their economies of new entities remaining solvent

3.5.1- Specific to required competencies

Not all the needs of projects owner/managers were met by the outcomes of research referred to above, in the structured and accredited, management education courses understood a ‘one size fits all’ approach to project engineer/managers would be counter-productive and alternative approaches could be appropriate.

For that reasons some countries introduced a Small Business Professional Development Best Practice Program to management education course regimes for project management and each organization found its own method of implementing these policies and continuous progress is currently encouraged with a focus on management competencies over a wide range of activities.

The concept of continuous improvement was correct and that it should evolve in Conjunction with operators themselves Strategic Plan’, with programs to provide project management with easier access to required information, department advice and comprehensive support, so the project holder/managers are given an opportunity to develop business skill at structured workshops developed to focus on specific elements of business, including customer maintenance, competitive advantage and cash flow management. In addition areas of formal management competency education are available

3.6- chapter 3 Conclusion

The government and privet sector have aimed to assist the project management through education programs and seminars, yet reports such as Meredith (1984) Williams (1984) and Holmes and Butler (1995), agreed that projects owners appeared to reject conventional education courses or skill development programs, project management that reject the conventional programs continue to use private enterprise courses, or numerous independent consultants with varying levels of competence, none of which link to the government programs.

This research therefore will investigate not only competencies and linked education provided but also a number of those institutions offering alternative services.

The literature review following in encompasses in detail, literature available to cover all aspects of competencies, government sponsored reports, management education courses and management skill development. Literature relating to education includes all aspects of project management education from conventional government courses to group and individual consultant mentoring.

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Chapter 4

Organisational culture and behaviours

4.1- introduction

The root of organisational culture is in anthropology, focusing on human behavioural norms, values and beliefs at every level of society (Cheong, 2000).

Every organisation has a culture, defined as 'the way in which that particular organisation is seen by its members to be unique' (Robbins et al., 1998, p. 562).

Organisational culture is also defined as: The set of values, beliefs, behaviours, customs and attitudes that help an organization's members understand what that organisation stands for, how things are done and what is considered important by the organisation' (Griffin, 1999, p. 168).

Owner/managers, who understand organisational culture, take appropriate action, with support of their personnel, because organisational culture guides and directs the manner in which internal activities are undertaken (Robbins et al., 1998).

As an enterprise grows, the owner/manager's job description and the organisational structure of the enterprise should evolve, affecting both management of an organisation and culture (Gerber, 1995).

Simultaneously, responsibility of owners change and seeking suitable management education is beneficial to keep momentum of the organisation moving (Schlutz, 1995).

Culture, ‘norms and shared attitudes that pervade an organisation’ (Pass et al., 2002, p119) remain constant whilst functional arrangements within might change, for example incorporating application of new technology, with contemporary organisational structures, procedures and authorities (Robbins et al., 1998), may change operating systems but not the culture.

Study of organisational culture further developed managerial understanding and increasing awareness regarding the internal workings of enterprises.
Organisational behaviour is based on relationships between individuals in organisations with a particular interest in manager/subordinate relationships (Robbins et al., 1998). An editorial in Management Today (1999, p. 8) argued that ‘managers should be analysing relationships between managers and their team, because that is where collaboration is taking place’.

Study of organisational behaviour is defined as ‘studying human behaviour, attitudes and performance in organisations’ (Hellriegel et al., 1995, p.5).
These studies are carried out to find consequences of management actions and behaviour on organisations. Motivation is defined as ‘forces that arouse enthusiasm and persistence to pursue a certain course of action’ (Daft, 1997, p.526), which achieve common goals.

Study of organisational behaviour developed during 20th century, when Maslow and McGregor introduced theories suggesting employee satisfaction as key to productivity (Griffin, 1999, p.46).

Rather than structural theories turning employees into machines, McGregor (1966) supposed that organisational behaviour of trust and teamwork could be supported and developed the polemic Theory X and Theory Y, whilst Ouchi

(1981) took this further in developing Theory Z (Daft, 1997), linking eastern and western management/staff communication philosophies.
Maslow's hierarchy of needs to understand workforce motivation (1970), i.e. psychological, safety, social, esteem and self-actualisation, may be used to recognise the culture of a workforce within an enterprise (Kotler, 1997). The entity's culture embodied in management procedures, will determine how the whole workforce is managed.

It is not possible to effectively manage people unless you have some basic understanding of what makes them tick, such as their motivation, team skill and leadership skill (Lysons, 1999, p.3).

Work has a different meaning for different groups of people. McGregor examined what he called the 'Hard or Soft Approach to management' (1966, p.42). McGregor suggested that 'hard approach' management involved coercion and threat, resulting in antagonism and subtle but effective sabotage of management activities.

Alternatively, 'soft approach' management focused on satisfying demands and achieving harmony, leading to abdication of management and taking advantage of the stance by staff. Effective management would have to lie somewhere between these two approaches (Robbins et al., 1998).

Study of organisations developed, and shows that as the 21s t century came closer, management and staff became multi-skilled and more flexible in their work practices, to accept continuous change and development within their industry and the global economy (Robbins et al., 1998, p.18).

4.1.1 - Project Management background

Most texts on small business start-ups or entrepreneurship list personal characteristics which they consider beneficial when initiating the start-up of a business (such as Newell, 1985, Hodgetts & Kuratko, 1989, Carland & Carland, 1990, Kyambalesa, 1994, English, 1998, and Trench & Judge, 2002) Identifying specific characteristics in the make up of the 'definitively successful entrepreneur is difficult as they are so varied' (Carland & Carland, 1990, p.26).

The projects management come from diverse cultures, estimated owner/managers a percentage that was growing at the rate of about 2% per year, in the States and Territories of Australia, Western Australia reported 37% of owner operators born overseas, New South Wales and Northern Territories both 33%. The lowest proportion of overseas-born operators was recorded in Tasmania with 18% of all entrepreneurs.

4.2- Parental influence

Research by Carland and Carland (1990, p.26) found that children of parents who owned their own business, were more likely to start a business and were encouraged to do so by parents. The same research indicates that progeny of non-business oriented parents are less likely to be encouraged to start an enterprise

4.2.1- Career change

Individuals dissatisfied with their work, who have been made redundant or had ideas that were ignored and want to test them, are likely to start their own enterprises where they have support from family, friends and often help from a

mentor (Carland & Carland, 1990, and English, 1998). 3.4.1 Exogenous failure for project:

Exogenous variables are outside direct control of project owner/managers.
Exogenous factors are opportunities or threats that include elements or groups such as local and federal taxes, foreign government tariffs, changing raw materials prices, competitors and customer demand.
Autonomous forces noted by the exogenous environment in significantly affect organisations and management practice.

They affect entities and their ability to change over time. These forces have a positive or negative impact on business and include activities of competitors in markets, fundamental changes within markets, and the abilities of management and staff to control actions of enterprises (Day, 1991, p.111). Enterprises are expected to facilitate learning ‘consciously transforming themselves and their context’ (Pedler et al., 1997, p.3)

The task of project owner/managers is to detect forces as early as possible and interpret their consequences (Porter, 1985). Also how they may affect business (Thompson & Strickland III, 1999), and prevent them becomes blind spots.

4.2.2- Political / Legal forces

Relationships between business and government in regard to regulations and legal requirements constantly change, and project owner/managers are required to keep up to date (Griffin, 1999, p.77), in order to have sufficient data to continue trading.

Three reasons for this are, first the legal system defines environment in which firms can work. Second government activity can affect all businesses through consequences of legislation or government activity, such as interest rate or taxation changes (Griffin, 1999, p.78).

Finally, political pressure groups could be advantageous as they focus on an agenda. For example environmental or tobacco lobbyists could increase/decrease trade and it is up to project management to take advantage of these opportunities and be aware of threats

4.2.3- Economic factors

Knowledge of consumer purchasing power, unemployment rates and bank interest rates are all useful areas of information for successful project owner/managers to recognize

There are benefits from having cognizance of important economic factors such as national or regional economic growth, inflation, changes in bank policies and the effect on consumer market numbers and their spending activities.

This knowledge is useful in order to be in a position for the project owner/manager to take advantage of a situation that is favorable to entities when it becomes appropriate.

These exogenous factors are all important indicators for project owners to help them be aware of market activity and pro-active in decisions as opposed to reactive to trends.

4.2.4- Social/competitive forces

Markets modify through changes in demand, growth in technology, or developments within industry. SE owner/managers are expected to be in a position to take advantage of the market environment (Timmons, 1999) as a part of their action to remain solvent.

Project owners are aware of dimensions relating to characteristics of their market place, consisting of geographical distribution and population density together with socio-economic mix of market places Michael Porter (1985), contends that exogenous competitive advantage is the heart of a firm's performance in the market place.

'It is at the core of success or failure for firms.' The five forces affecting competitors are seen as: the entry of new competitors, a threat of substitutes, bargaining power of buyers and bargaining power of suppliers, then finally rivalry between firms

Porter argues that these five forces influence prices and costs. These are exogenous forces within the market environment yet through monitoring closely, they may be used advantageously (Porter, 1990).

4.3- Industry forces

Project owner/managers benefit from being aware of industry driving forces, which are the major underlying influences of change, as this gives them an opportunity to make or plan positive discussions based on knowledge, these forces relate to changes such as trends, product innovation, entry or exit of major companies and changes in government regulations (Thompson & Strickland III, 1999, pp85-90).

4.3.1- Endogenous factors

Endogenous factors are internal strengths and weaknesses that relate to structure and culture as resources of the entity, such as knowledge, raw materials and labour (Kuratko & Hodgetts, 2001).

These strengths and weaknesses are components of the entity, Hodgetts and Kuratko (1989, p.31) identified the following elements as beneficial to help enterprises remain solvent: existence of a business opportunity, a sufficiency of businesses/management competency-skill, adequate capital and credit, finally knowledge of current business methods.

Crucial endogenous factors examined in this section, are competencies possessed by owner/managers and organisations affecting current operations and the level of ability to foresee future changes required to equal or exceed that of competitors (Turner & Michael, 1992, p.2).

4.3.2- Business opportunity

Endogenous factors of project management entities commence with a verifiable business opportunity, defined as something that is ‘attractive, timely and durable, in a product or service that creates or adds value for its buyer or end user’ (Timmons, 1999, p.80).

To assess what customers will purchase, active project owner/managers regularly monitor the market environment (Kotler, 1997, p.109). This results in information, which may be evaluated to assess opportunities and target the market profitably.

4.3.3- Adequate capital and credit

Adequate funding available to meet financial obligations means it is easier for an entity to trade slovenly (Kay, 1952, Newell, 1985, Kyambalesa, 1994, and English, 1998). For a greater opportunity to achieve this, complete financial plans with realistic cash flows prepare owners for future financial situations (Hodgetts & Kuratko, 1989, p.36).

Business entities have financial strategies incorporated in business plans as a means of setting goals and strategies to achieve objectives (Langfield-Smith et al., 1997, p.905). Part of organizing capital and credit is taking strategic decisions. These decisions are fundamental within business and financial plans to consider amounts of funding required, ensuring sufficient capital is available and credit facilities accessible from suppliers to meet all financial obligations (Hodgetts & Kuratko, 1989, p.35).

Established business entities have an advantage over new firms (Bridge et al., 1998, p.153), for as firms remain solvent longer, so financial credibility grows and a process of ‘due diligence’ offers better credit facilities to firms with a longer record of solvency.

4.3.4- Businesses/management competencies

Research by English (1998, p.6) reports business/management competencies fall into three categories: marketing, finance and operations covers the competencies from which project owner/managers would benefit, if acquired before commencing business, or assessing what skill are lacking and address this situation as soon as possible (English, 1998, p.7).

This may be through personally attending management education courses or employment of suitable personnel either permanently or as required, writing a complete business plan offers the opportunity to cover all the points in before establishing an entity.

Thus initial exogenous and endogenous structural and financial organization, marketing, site location, customer requirements, competitive forces and market size can all be considered with proper planning (Carland & Carland, 1990, p.31). This exercise is an opportunity of working through all aspects of organizing and operating a project management (English, 1998, p.136).

The importance of a plan cannot be overemphasized, for time taken to think through a business is of prime importance (Busch, 1997, p.3). In his paper on relationships between written business plans and failure, Perry (2001b, p.201) concluded proportionately more firms writing business plans remained solvent, than those that did not. He found the extent a business plan was used, had significant effect on company solvency. Perry's findings were 'not using a written business plan had a significant influence on the probability of enterprise failure'.

4.3.5- Project management owner personalities

Research carried out over many years has determined that due to external autonomous actions such as market or competitive activity and other extraneous activities beyond the control of management, specific personal characteristics that result in assured solvency for a project enigineering operator, has not been empirically proven.

However, it is suggested that some personal characteristics increase the chance of an entity succeeding more than others (English, 1998, p.5).
Solvency requires a well-rounded competency in management, financial and operational skill as well as technical understanding (English, 1998, p.5). This combination plus a thirst to increase knowledge, benefits of project owners in their quest for survival and success (Gerber, 1995).

A number of studies (Marshall, 1996, Vernon, 1997, Koch, 1999, Trench & Judge, 2002) have established that specific personal characteristics are consistent for entrepreneurs having a greater chance of business success. Whilst over 40 traits have been suggested,

Internal locus of control Daft (1997) advocated the internal locus of control (belief in self) displayed by an entrepreneur, was an important determinant to success or failure. Motivational and personal success researchers, such as McClelland (1976), Lumsden (1984), Newell (1985), Hardy (1987), Roberts (1989), Robbins (1992), Chu (1992), Harvey-Jones (1994), Gerber (1995), Krause (2002), claim that belief in personal future accomplishment is central to success.

4.4- High energy level

A high energy level and persistent energy is required for successful entrepreneurs to cope with stress, frustration and disappointment faced in business (Day, 1991, p.8), (International Council for Small Business,1995), (Fleck, 1999), (McGrath & MacMillan, 2000).

Need to achieve Harvard psychologist David McClelland (1976) demonstrated a primary factor in deciding to start up an enterprise is personal need for achievement. As conditions in projects are constantly changing and unpredictable, project management operators that tend to be 'risk averters' are able to make consistent decisions (Kyambalesa, 1994, p160).

4.4.1-Tolerance of ambiguity

This psychological characteristic prevents disorder and uncertainty being an overwhelming concern. The importance of this trait is that setting up a new entity is rarely straightforward and normally has a certain level of unknown factors linked to the enterprise that have a degree of risk and uncertainty incorporated within the entity (Daft, 1997, p.182).

4.4.2- Self-confidence

The knowledge of managerial functions such as planning, organizing, leadership and control, and technical expertise offers a degree of confidence to start an enterprise. Knowledge is usually gained through a combination of education and experience (Carland & Carland, 1990, p.31)

4.4.2.1- Awareness of passing time

Business activities take time and therefore should be planned and implemented to enable all sectors of an enterprise to be functional. How the projects owner/manager uses time can determine level of success (Kyambalesa, 1994, p170).

Researchers consider a combination of the above characteristics beneficial to start-up entrepreneurs (Daft, 1997).
Concerns regarding specific empirical constructs of these characteristics are due to permutations of project owner demographics

A range of project owner/managers characteristics have a bearing on the level of an enterprise's success (Daft, 1997).
The general conclusion of studies is that whilst some qualitative researchers such as McClelland (1976), Lumsden (1984), Newell (1985), Hardy (1987), Roberts (1989), Robbins (1992), Chu (1992), Harvey-Jones (1994), Gerber (1995), Krause (2002) determine that personal characteristics are significant, quantitative researchers such as Perry, Meredith and Cunningham (1988) consider that the statistical data of specific personal characteristics, show little or no direct bearing on either success or failure of an project enterprise.

The entrepreneur is defined by Kuratko and Hodgetts (2001) as a catalyst for change, optimistic, committed and purposeful with certain abilities that appear significant regarding project management operator success. These are technical competence, relevant education, human relations skill, and a high

drive to learn and achieve (Hodgetts & Kuratko, 1989, p.43). Therefore, people who are exceptionally good in business aren't so because of who they are, where they come from or what they know, but because of their insatiable need to know more'.

Following from the reviews studies into project failure, which became a significant area of research due to the growing role of project management within the companies economy (Watson & Everett, 1992, p.335),

Reports proportions of business failure have increased considerably, which conclude the first section of this review, indicating entrepreneurial knowledge development would be beneficial to continued solvency

4.5- Entrepreneurial business and management development:

Cole and Ulrich (1987) report that successful entrepreneurs have a high need for success and internal locus of control whilst Kuratko and Hodgetts (2001, p.30) point out that entrepreneurs are ‘agents for change; provide creative, innovative ideas for businesses and help businesses to grow and prosper’. Bridge, O’Neil and Cromie (1998) explain that experience, observation, conceptualisation and experimentation are competencies required for problem finding and solving, required for developing project management knowledge.

An article in the Journal of Management Development (Grieves, 2000, p346) noted that three central issues of management were and remains the essence of successful management focus, those of control, application of technology and organisational managerial competence.

One problem for the failure of some useful management programs such as, the use of business plans, Total Quality Management (TQM) and Quality Assurance (QA), is that these programs require a commitment to continuous improvement and are not a panacea in them (Grieves, 2000, p371).

To use business plans, TQM or QA systems, project owner/managers are expected to continuously question their actions and to increase their relevant knowledge base. For a benchmark test of action, Bhide (1996) developed a three stage sequence action question guide to focus on chosen business activities the questions included: “Are goals well defined?”, secondly, “Is strategy correct?”

Finally, “Can the owner execute this strategy?” the framework, clarifies the owner’s current goal position, then the strategies are evaluated and finally an assessment is made of capacity to execute the strategies (Bhide, 1996, p.5). At any point, action taken depends on answers to questions being ‘yes’ or ‘no’.

The hallmark of a successful project owner is a never-ending desire to learn and improve (Gerber, 1995, Isachsen, 1996, and Drucker, 1998).
Project owners know that true goal setting requires reaching for an objective that is never quite within their reach (Isachsen, 1996).

To think in this manner Ohmae (1982, p4) writes that a particular state of mind which he calls the ‘mind of the strategist’ is required. Twenty-first century strategies for project owner/managers were outlined by Kanter (1994) where entities were seen to ‘think long- term but deliver today’. To achieve this, Kanter (1994, p.130) suggests project owner/managers are to be flexible, reduce bureaucracy and act in an entrepreneurial fashion.

4.5.1- Knowledge of business methods

Product knowledge alone is not sufficient to commence trading. There are many areas of business to control and organize. Project owner/managers are required to deal with sales, stock management, accounts, production, delivery and cash flow.

Business management systems used by firms of all sizes, are implemented in order to strengthen the entity with systems such as TQM or QA (Kuratko & Hodgetts, 2001). These are people-focused management systems aimed at continuously increasing customer service and owner/manager competence. The aim of both these systems is to achieve desired results through elimination of unnecessary repetition, by ‘doing it right the first time’ (Kuratko & Hodgetts, 2001).

The aim is to produce defective-free products or services and save the preventable expense of correcting mistakes, for business management systems are based on the importance of people thinking about product, firm, customer and themselves (Kuratko & Hodgetts, 2001).

4.5.2- Project management competencies:

Influence on projects solvency competencies project owner/managers must adapt to changes when required, for it is a lack of general and personal competence and an inability to adapt as situations require, that is a principal cause of insolvency (Banfield et al., 1996, p.94).

Competence is defined by Turner and Michael (1992, p.4) as ‘a combination of traits, skill, motivations, knowledge and focus which results in a performance outcome’.
Thus competencies are ‘elements of the ability to perform’ (Cave & McKeown, 1993, p.3).

This is in contrast to the with their definition of competencies, which is more appropriate to employees than employers, being ‘an application of specific knowledge and skill to a standard required in a workplace, where competencies include ‘cleaning a kennel’ or ‘notification for not turning up for work’
Organization development has evolved over the 20th century and deduced that for change to happen, it is necessary to examine present behaviour and find alternative ways to deal with new problems (Beckhard, 1969, p.16).
Many government reports, such as Cyert (1970), Crawford (1979), Ralph (1982) and Karpin (1995) suggested establishment of accessible management education to teach competency skill. Crawford (1979), recommended that ‘the Tertiary Education Committee should report from time to time on progress’ one being the Meredith Report (1984). Meredith suggested a need for further project owner/manager education and agreed with the Bolton Report (1971).

The Bolton Report highlighted the ‘dichotomy between need and demand by project/managers, for management education courses (Banfield et al., 1996, p.94).

From 1971 to 2003, privet and governments have taken a stand to assist project by establishing educational programs through departments.

The influential factors discussed that affect abilities of project owner/managers to operate an entity and make Significant changes to operations of enterprises. As business situations develop and change, a set or range of competencies may be appropriate for current purposes, yet a different set or range may be required a decade later (Turner & Michael, 1992). This is similar to the ‘Theory of Business’ concept of Drucker (1994) competencies apply to combinations of skill that give a company a competitive advantage (Turner & Michael, 1992), such as competencies required for a competitive edge in planning, organizing or human relations

4.6- chapter 4 Summary

Given the significance as demonstrated by previous researchers of knowledge and management competencies acquired by entrepreneurs from the workplace Management research into project management entrepreneurial competencies, developed to offer a broad and deep understanding of organisations and how they operate (Daft, 1997). Further research demonstrated that management education for project owner/managers to address the lack of management competence is essential to address tens of thousands of entities exiting the economic pool each year (Robbins et al., 1998).

The elements of business influence both exogenous and endogenous that affect solvency, indicating the need for management education increases as the number of entities increase and the percentage of exits increase

Management skill requirements (Source English J, 1998, How to Organize

and Operate a Small Business 7th Edition Allen & Unwin Sydney page: 6-7

Financial competencies	
Balance sheet analysis	Advertising and promotion
Bookkeeping	Competitor evaluation
Business planning	Distribution channels
Cost control	Marketing research and strategy
Debtor control	Personal selling
Payroll	Product life cycle
Profit planning	Purchase planning
Types of finance	Sales forecasting
Banking	Choice of business location
Budgeting	Credit terms
Cash flow management	Guarantees and service
Creditor control	Packaging and presentation
Finance application	Pricing and discounts
Profit & Loss analysis	Product positioning
Tax control & planning	Quality assurance
Use of financial professionals	Shop layout
	Operating competencies
	Business planning
	Improving productivity
	Plant & equipment control
	Purchasing
	Recruitment and selection
	Scheduling and workflow
	Stock control

	Transport and freight
	Decision-making
	Negotiations
	Problem-solving
	Quality control
	Regulations and awards
	Staff education
	Supervising
	Warehousing and storage

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Chapter 5

5.1- General Project Management competencies:

Peter Drucker (1998, p.152) argued that in a fast-changing world, the concepts of Taylor's 'one right way' or a fixed set of management activities or way of dealing with people were obsolete.
He stated the 'social universe has no "natural laws" as physical sciences do and thus is subject to continuous change.

Indeed assumptions that were valid, may be invalid now or will be in the future' (Drucker, 1998, p.153). Robbins et al (1998, p.8), cite Robert Katz's assessment of essential business competences concurring with Drucker and suggesting that these are central to positive performance of key management tasks being, planning, organizing, leading and controlling.

Individuals that comprise an enterprise, determine its success through quality and joint activity of combined competencies (Likert, 1967, p.1). Company competencies, embedded in organizational characteristics, skill and knowledge, are well-established in culture, behaviour and structure of the enterprise and will persist over a period of time, to a greater or lesser extent regardless of the personnel turnover (Turner & Michael, 1992).

The project owner/manager should possess, employ or contract out a balanced competency structure covering all aspect of business (Timmons, 1999). Timmons proposed that management skill in a business affect the manner in which an entrepreneur approaches and operates that business.

Caution is well founded, with changes happening daily, ‘what worked for a firm yesterday, probably doesn’t work today’ or will not in the future (Drucker, 1998).

The result of global competitive marketing, immediate global computer communication, shorter product life together with knowledge and technical explosion, a need for project management, to be able to change and implement product or service as the market demands (Beckhard, 1969) ‘success in the marketplace increasingly depends on learning, yet most people do not know how or what to learn’ (Argyris, 1997, p.148). To succeed, a commitment of conscious action or learning was required to use and benefit from the programs (Grieves, 2000, p.368).

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5.2- Project Management Process

Planning	Organizing	Control	Leadership
1- Preparing, Organizing and implementing business plans 2- Formulation and implementation of business strategy 3-Problem solving 4 - Entrepreneurship	1- Departmentalising and coordinating internal structures 2- Organisational strategy and design 3- Dealing with organizational structure issues 4- Human resource management	1- Operational, financial, structural and strategic control 2 -Control on going standard of product or service through productivity and operations management 3 -Managing internal and external information	1- Understanding and directing people 2 -Employee motivation and performance 3- Control of influence and power 4- Communication and interpersonal ski ll 5- Working wit h groups and teams

(Pedler, Burgoyne and Boydell 1997 p.23)

Every firm is unique and requires business, human and technical competencies within the entity to remain solvent. These are found in the ability of owner/managers, or within a business team. Competencies may be in-house or outsourced, for example accounts, manufacturing and sales can all be carried out in-house or by specialist companies; however skilful management by project owner/managers, is still required to develop a successful enterprise (Banfield et al., 1996).

Encompasses processes that develop a collective flow of management (Pedler et al. 1997) and these processes link to form four fundamental management functions of an enterprise: planning, organizing, leadership and control (Griffin, 1999) Whilst logic of the flow follows the above sequence, in practice the order of engagement of these tasks by managers is unpredictable. Each component is discussed below.

5.3- Organizing

Organizing reflects how an enterprise endeavors to accomplish a planned exercise (Daft, 1997, p.9). Thus to enact planning policy, tasks are assigned, resources allocated and responsibilities awarded.

5.3.1- Planning

'Planning defines where enterprises want to be in the future and how to get there' (Daft, 1997, p8) Perry (2001b, p.201) found that 'non-failed firms did more planning than similar failed firms' and Perry cites Peter Drucker 'Everything that is planned becomes immediate work and commitment'.

5.3.2- Control

Monitoring progress towards goals and ensuring performance is achieved, is the final phase of general management competency skill (Griffin, 1999, p.11). This may be top-down management or self-management (Daft, 1997, p.12) but at all times the project owner/manager control of an entity is aimed at achieving their goals.

These goals are the entrepreneur's vision and the owner/manager cannot achieve those goals where strategy, operational and/or management control of the enterprise is abdicated (Gerber, 1995).

5.3.3- Leadership

Leadership is both the most important and challenging activity of managers (Griffin, 1999, p.11). There are many definitions of leadership, leadership may be defined as the 'processes required toget people to work together towards a common goal' (Griffin, 1999, p.11), or 'articulating visions, embodying values and creating the environment within which things may be accomplished (Yukl, 1998, p.3).

Leadership in any project is the means by which events are interpreted and the choice of objectives and strategies (Yukl, 1998, p.5) and in project management skill required for an owner/manager are considered to be technical, interpersonal, conceptual and administrative (Yukl, 1998, p.235).

5.4- Contribution of management competence in the project:

Personal characteristics, skill and knowledge will operate so long as that person remains with the enterprise (Beckhard, 1969). For project owner/managers, these include interpersonal competence, problem-solving knowledge/skill, business planning/goal setting skill and understanding the process and management of business change (Beckhard, 1969, p.41).

To carry out tasks annotated a number of fundamental managerial skills are required to implement elements within management competency requirements of planning, organizing, leadership and control. These

management skills are primary to success of enterprises (Griffin, 1999, p.18). Whether an enterprise is large or small, internal organizational structures remain constant and must not be abdicated (Gerber, 1995).

The difference between large and small entities reflects who carries out that work. There may be a full department for each task or with a project management; one person may perform all tasks. Whichever the situation, these jobs must be undertaken at some level of competency (Griffin, 1999, p.14).

5.4.1- Management skill

Interpersonal skill communicates and motivates people covering subordinates, peers, higher management or professional bodies such as accountants, solicitors and bank managers (Griffin, 1999, p.19) through effective communication skill, an owner/manager conveys and informs ideas to others (Daft, 1997, p.16).

5.4.2- Technical and Experience skill

Technical skill undertaken requires an understanding of tasks relevant to an enterprise (Griffin, 1999, p.19). This specialized knowledge and analytical abilities to solve problems, being practical skills, are required at higher management decision levels (Daft, 1997, p.16).

5.4.3 The benefit of Conceptual skill in project management:

The project owner/managers understand overall workings of enterprises. Daft argues project owner/managers think strategically and decide as a result of abstract thought (1997, p.15). The benefit their enterprises by analysing problems and symptoms to determine cause and establish resolution (Griffin, 1999, p.20)

Recognizing and defining problems and selecting an appropriate course of action to remove problems and capitalizes on opportunities is an important skill to accomplish, and this important skill allows a manager to priorities work for efficient work practices to be carried out (Griffin, 1999, p.20).

5.5- chapter 5 summery:

Project Management has a complex multidimensional job to ensure that general management competency skills are performed within the enterprise.
This requires a combination of skill, knowledge and competencies to remain solvent (Daft, 1997, p.15).

The four management functions require individual management competencies, which are specific and deal with both exogenous and endogenous aspects of the enterprise. These are dealt with the personal skill are annotated and later in light of available government and non government education available.

The organisations and personal competencies are incorporated, due to the necessity of project management entities focusing on personal and organisational development (Grieves, 2000, p.293).

There is often confusion between competence, knowledge and skill, and it is by comparison that a distinction is found. Whilst the project owner/manager may have knowledge/skill, they may not be competent in the activity. However, if an owner/manager is competent they can be expected to have knowledge/skill (Cave & McKeown, 1993, p.2).

The combination of a competent workforce, skilfully managed and a positive support climate, combines elements of required competencies and management skill (Banfield et al., 1996), which determine a return on both human and capital resources (Boyatzis, 1982b, p.1), and therefore managerial competence is a primary component of success (Banfield et al., 1996, p.95).

The above literature has shown researchers' agreement that both general and specific personal competencies are necessary for project management. The relevance and importance of business competencies to the project management

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Chapter 6

6.1- Management competency and education

Inclusion of business competencies is justified, as project management requires these competencies and skills, to deal with influences affecting the enterprise. The following section introduces literature that identifies project management education.

Learning is an ongoing process of gaining knowledge and experience, whilst training is the flow of information from one to another (Field & Ford, 1995, p.95
Learning comes from a combination of education, experience and knowledge (Field & Ford, 1995, p96) teaching was originally androgenic, where it was accepted that students were adults and should be respected as such (Knowles, 1990, p.27).

Hebrew prophets used case methodology, describing situations in parable form, exploring characteristics and solutions. Greek teachers taught through Socratic dialogue, where leaders posed a question or dilemma for the group to work together to find a solution, while Roman's preferred a confrontational method, where groups stated a position and then defended it.

Hundreds of years later, monks were taught to write by rote and since then teachers have continued to educate through pedagogic indoctrination, stating facts and using a methodology of continuous spaced repetition (Knowles, 1990, p.28).

As noted above, some theorists contend the majority of project owner/managers are not enthusiastic about school-room conventional rote pedagogic learning (Meredith, 1984, Dawkins, 1991, Christie, 1992, and Williams, 1992).

Indeed when working with business mentors or executive coaches, using an androgenic methodology, a process where project managements are able to become aware of and evaluate their experience, their business competencies are enhanced. The teacher in this instance is not the “guru”, but a guide who participates in the learning experience (Knowles, 1990, p.30). As per Holmes and Butler. (1995), p. 282

Conventional approach	Entrepreneurial approach ery
Focus in on content	Focus is on process of delivery
Trainer dominated	Training expert hands down knowledge
Emphasis on ‘know that’	Trainer as fellow learner/participant
Participants to receive knowledge passively	Emphasis on ‘know how’
Sessions heavily programmed to needs Sessions	Participants generate knowledge
Learning objectives imposed	flexible and responsive
Mistakes looked down upon	Learning objectives negotiated
Emphasis on theory	Mistakes to be learned from
Subject/functional focus	Emphasis on practice
Ownership of learning by participant	Problem/multi-disciplinary focus

6.2- How to improve the project management learning?

This can be achieved by many ways and the following are playing the main role:

6.2.1- Self-help information dissemination

Project Management required to have advanced management skill for the benefit of any project on a large scale as it was expensive and did not offer sufficient value to the participants to make it worth their while to continue.

6.2.2- Adviser-assisted information

Entrepreneurs did not generally feel confident in using unknown advisors were used. This resulted in a lack of interest in the concepts and the participants felt that the content was not appropriate.

6.2.3- Education practitioner development.

Education providers were able to direct the project owner/managers to suitable education programs for them and their staff in this program and therefore this project had a positive response. This was only a short term trial and it remains to be established if it will have long term effects, however it was considered positive. In general, little interest was shown by project management to co-operate and share experiences as they believed this could compromise their unique methodology, therefore whilst this system may be beneficial to certain types of business and entrepreneurs

6.2.4- Expert-driven general business management

The project owner/managers should be an aware of the gap in their skill matrix, the conventional education method acceptable. However, it was inflexible therefore project owner/managers with little interest in a formal learning culture did not find this method appealing.

6.2.5- Business management

The consultancy had mixed results depending on the consultant's methodology to address the particular situation of the firm a consultant will work on a particular problem, therefore the benefit is not always sustainable as the environment changes and a new solution is then required.

Whilst this method is generally accepted as a reasonable method of knowledge transference, it is not considered a route for any education as the requirement is problem specific and not sufficiently generic to warrant placing this type of learning in the educational context of general business management co-operative general business management improvement of mentoring by experienced businesses to under-performing firms, focused on the 'sharing' of experiences, information and growth knowledge.

It received a positive response as less experienced project engineers were open to specific pertinent advice and were not opposed to discussing their firm with senior project engineer.

6.3- Improving on competencies

The competencies in any project management can be improved by making major and substantial changes especially in financial basics, cash flow forecasts against profit and loss statements, customer service and business planning, which offered a generic business approach but do not deal with their specific or individual in each situations.

These are generic to all of type of projects, and it was determined in the survey for these studies, that as the knowledge were short and aimed at offering pertinent information to project owner/managers at a time they were open to receive the information, attending, perceived a quantifiable benefit for their organizations.

In 2003, the companies are looking to find a course that can be assessed for both content and beneficial results
In 2004 there are over 2,000 private companies offering a variety of services and courses to cover curriculum relating particular subject maters. Some within industries offer courses that train and direct their members of staff focusing on problems and situations that may be unique to that industry or institution.
These cover enterprises such as McDonalds or industry specific groups such as construction associations or the armed forces education of engineers, drivers or pilots in careers that may be used on the job or may be transferred to other jobs.
There are also many firms or individuals that offer help and assistance to project owner/managers on basis, such as accountants, business trainers, financial advisors, bank managers or specialist business coaches system with a significant impact on reducing the proportion of insolvencies.

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6.4- Chapter 6 Summery and review:

‘Doubt was cast on the key assumption of vocational education policy makers. Indeed the assumption that formal conventional education will meet the nation’s needs appears to disregard the views of project management as a result; the Government and privet sector are still exploring approaches that could positively advance the business/management competencies of project management.

This quest is global as well as Government and privet sector are concerned to help, as a reduced insolvency rate offer significant financial benefits nationally.

The business education programs cover every aspect of skill at work, from answering the telephone to senior bookkeeping diplomas
Competencies cover all features of activities within an enterprise those discussed in this section relate solely to management education methods appropriate for any project.

The management education commences by reviewing different teaching methods for mature students then discusses methods adopted by government and non-government bodies to deliver the programs, showing the general response by project owner/managers.

Needs and objectives of project management were established through what topics or skills should be offered to cover needs? How should they be presented to achieve their objective (Kirkpatrick, 1994, p.11)?

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The quality of management education in has been critically reviewed by dependent reports internationally, nationally and locally since 1971, where the findings have generally shown a low standard of achievement (Karpin, 1995, Miller, 1998).

As a result of the Crawford report (1979), the Ralph report (1982) was commissioned to examine available management education, assess course effectiveness, look at the funding of those courses, consider project management special needs and make recommendations.

The report noted that project owner/managers should go to accountants, solicitors and bank managers for advice' and that additional research into small business management considered a special area separate from corporate activities (Ralph et al., 1982, p.19)

It was through the Karpin report (1995, p.38) that generic project management education was recommended generic management competency standards to be set out and delivered to project owner/managers.

Courses were not generally welcomed by project owner/managers as a teaching method, for classical teaching methods were found to be an anathema to entrepreneurs (Meredith, 1984, Dawkins, 1991, Christie, 1992, and Williams, 1992).

A consequence of the use of pedagogic teaching methods resulted in the majority of owner/managers having 'grossly inadequate knowledge of management before starting a business (Williams, 1992, p.142).

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Few small businesses participate in structured education, with research showing 5% of project management considered conventional education relevant, yet 65% believed in the benefit of building their own knowledge through experience and the use of support groups such as management coaching, as they value hands-on practical and relevant to their business management education (DEETYA, 1998, p.2).

Methodology is the main difference between various types of education associated with delivery.

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Chapter 7

Effect of project management education

7.1- Pedagogic approach

Both the small business professional development program or government agencies acknowledged that the rigid pedagogic approach was unmarketable to the project management sector

However, most of the Oil companies continue to focus on the easier to access employee pool than the difficult to attract the project manager the result is that comprising the vast majority of employers, but are not prepared to accept standard education.

7.2- Androgenic approach

Literature shows confidence that the number of project owner/managers prepared to work with non-government business coaches is increasing (Holmes & Butler, 1995, p.274) and can boast of a high success rate in 1995 accounting firm Coopers and Lybrand, who have amalgamated with price Waterhouse since 1997 and are now Pricewaterhouse Coopers, were commissioned by the Industry Task Force on Leadership and Management skill to prepare a report on project management education needs and extant literature (Holmes & Butler, 1995, p.277).

The report indicated that project owner/managers' preferred method of formal learning, was in line with the entrepreneurial approach is important that management educators understand the processes of the acquisition and

development of expertise by successful project owner/managers'. This view is supported by Meredith (1984) and Gibbs (1995).

Project owner/managers often use their own resources of family, friends, industry associations and peers for advice due to the perceived inappropriateness of courses offered and the high price of non-government providers (Holmes & Butler, 1995, p.281).

7.3- Result of available education

Demonstrate that significant lack of suitable education is available for project management this review has indicated that education methods offered to project managements are inappropriate and consequences are that the proportion of project owner/ managers failing remains undiminished over the last 30 years

The literature has shown that this continues due to the manner in which focus on rigid one size fits all inflexible programs for small enterprises and focusing their education efforts on employees.

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Chapter 8

8.1- The research finding

The literature review examined modern industrial capitalist management from its inception at the industrial revolution to the entrepreneurial revolution of the 21s t century.

In addition, the various characteristics of Projects entrepreneurs and the factors influencing insolvency as a consequence of management research, the knowledge of project owner/managers and the competencies they require became apparent and studies were able to annotate the exogenous and endogenous influences on projects that required action.

The review continued with an evaluation of project management competencies both general and specific and then considered competency education offered by government and privet education bodies, organizations and consultants.

Finally the literature discussing consequences of these education methods was considered the literature review leads to the model framework of this research developed throughout the literature review, where the study considered organization and management of the industrial capitalist age.

Against this model is the outcome of research with reports that have found repeated, the same results as summarized by Meredith (1984):

Despite the dominance of the small business sector, both in terms of enterprise numbers and employment, the bulk of management education and education resources were directed outside the sector.

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What is called for is the availability of qualified and experienced presenters and the need for market segmentation in the delivery of project management education.

The design of research around the topic relating to establishing whether tangible evidence exists to support the proposal that management competency education has a significant effect on the solvency potential of a project management business enterprise.

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8.2- The survey result:

Construction industry executives were asked about the performance of their project managers and their practices in four main areas:

1- Technology use
2- Personnel
3- Operations
4- Project coordination.

Some key findings from the survey include:

- Experience and communication skills (written and verbal) are the most highly important traits in project manager candidates.
- Financial management tops the skills most lacking in new project manager candidates.
- Client/customer relations and building skills are the strongest skill sets for current project managers.
- Among the weakest skill sets of current project managers are cost-to complete and profit projections.
- Only 21% of respondents rated their project managers' effectiveness in the area of documentation as “efficient, concise, and well documented."
- The project manager is the primary contact and project leader from the customer's perspective, according to 80% of respondents.
- Better integration and coordination of trades, according to 85% of executives responding to the survey, could result in an improvement in schedule of 5% or more.
- Only 11% cited construction experience as a concern, mostly because that's the area on which they focus

- When they hire project managers. Correspondingly, schools of construction management teach technical skills more than business management.
- Separated out a group of top performers, only 6.6% of the survey respondents who said they finished on time and on budget all of the time. Many more respondents said they finish either on time or on budget but not both a lot of the time.
- Of the on time/on budget group, 46% of the contractors said their project managers do a thorough job planning, and 54% said the Project Managers do a moderately good job planning. In planning skills with leadership, with a job plan being a leadership tool for directing people and material. Many respondents complained that their Project Managements don't lead.

"We see this scenario a lot in our work with a contractor which is why we say that project managers should be project leaders not project witnesses or project secretaries."

In the survey, 53% of the contractors said their project managers play some role in estimating, and 35% said the Project Managers contribute more than 50%. Of the on time/on budget group, however, 50% of the projects managers contribute more than 50% of the estimating process. The trade contractors tend to get their project managers involved in estimating more than general contractors.

Processes more important Project management performance can make or break the profitability of a construction company

The focus for improving project management performance should be on the company's project engagement processes and practices. While most help-

wanted advertisements focus on finding the perfect project manager, the better headline for such ads might read "Wanted, the Perfect Project Manager to Work in the Perfect Project Management System,"

8.3- Recommendation to reduce the Project failures

Form all above we can say the all study aim is how to provide an integrated framework for project organization, planning and control which is designed to ensure the following:

1- The timely and cost-effective production of all the end-products
2- Maintain acceptable standards of quality
3- To achieve for the enterprise the benefit for which the investment in the project has been made.

And that can be achieved by making the right and effective decisions especially in the following:

8.3.1- Project Initiation

At the start of any project, there will be a variety of ideas and opinions about the purpose and scope of the project, what the final product of the project will be, and how the project will be carried out. The Project Initiation Stage is concerned with taking these ideas and intentions and developing them into a formal, planned, resourced and funded project.

In order to define a project in this way, it is first necessary to clearly and explicitly define what the project is intended to achieve and what its scope of interest will be. By defining this first, a benchmark is created for assessing the quality of what is actually produced at the end of the project.

It is also necessary to develop a process by which the project objectives can be achieved this process will typically involve carrying out a number of tasks and producing a number of products during the course of the project.

The tasks produce the products. For clarity of purpose and for control reasons

- It is useful to arrange these tasks in a top down structure, which progressively specify the required work in more detail.
- The Project Initiation Stage must also define what resources and associated time commitment are required to carry out the project.
- The work breakdown structure provides a basis from which this estimation can be carried out.

- The resource and time commitment can be used to calculate an end date for the project and an estimate of its cost.
- This information is key input into the establishment of a business case for the intended project.
- The way the project is managed and executed is the key to its success.
- The involvement of the right people for data capture and decision making is also crucial.
- It is necessary to identify and recruit these people at the start of the project and to define the project organization structure.
- It is also necessary to establish the procedures that will be used by the people in the Project Organization Structure to carry out and control the project work.

8.3.2- Project pre start:

The project pre start step is concerned with carrying out a high level review of the background to the project and of related initiatives, recruiting the involvement of those senior people who will be the ultimate customers and sponsors of the project, reviewing and customizing the standard work breakdown structure for the Project Initiation Stage and setting up a small team to carry out the Project Initiation Stage.

The manager for the Project Initiation stage may be different to the manager of subsequent stages

When scheduling the Project Initiation activities, understand that there is great deal of interdependency between the steps. Project pre start should be carried out quickly. If Project Initiation Stage takes four weeks Review the outline of the Project Initiation Report and determine the number and sequence of interviews, workshops and investigations that are required to create it.

It is possible that the stage schedule is not at a sufficient level of detail to manage and control the project on a day to day basis. This level of control may be achieved using a commitment calendar, which details each person's work on the project for a rolling four week window.

This is initiated at stage start up and updated regularly as the project progresses

The end result of the this step will be a Project Initiation listing deliverables, techniques, committed resources and timescales for the Project Initiation Stage. There is a great deal of interdependency between the Project Initiation

steps and tasks. However it is important to define the project objective and scope first before attempting the remaining steps.

Attempts to create a detailed Project Initiation plan with estimates for each and every task will take far too long. The WBS should be considered more of a checklist. It is important to apply JAD to gather high quality information in a reduced time frame. Review the activities in the Project Initiation stage and the outline of the Project Initiation Report.

The steps equate to the sections of the report. It is recommended that the work be organized around producing the sections of the report. Determine what information is needed and assess the best means of gathering it. This may be in the form of research, interviews and workshops. Identify the number of workshops. For each one, specify the objective, deliverables and participants.

Identify and recruit additional resources to perform the Project Initiation stage. Business Analysts will be involved in defining objective and scope, determining organization, requirements, approach and costs, coordinating other resources, preparing the recommendation and ensuring the successful completion of the Project Initiation stage. Clients will be primarily involved in determining requirements and preparing the business justification. Systems Analysts may be involved in determining the project approach and selecting the appropriate template.

Identify resources that will be required to review and approve the Project

8.3.3- Initiation Report.

Estimate the effort and elapsed time for the remaining activities.

Create the Project Initiation Kick off Plan listing deliverables, technique, committed resources, start and end dates.

8.3.4- Project Outset:

It is important to establish at the outset of a project, a precise definition of the purpose and scope of the project to ensure that both Business Partners and Technical personnel are clear about the field of reference.

Any project carried out by an organization should be addressing one or more of the Business Objectives of the organization. If it does not, why is the project being carried out?

Therefore to establish the objectives and scope of the project, it is first necessary to identify the overall reason for the project by relating it to one or more objectives of the organization.

This will put the project into context for the organization as a whole. It is vital that the project objective be clearly stated and agreed before proceeding with the rest of Project Initiation. If this is not possible, then do not continue.

The project objective can then be further defined in terms of scope. There are two aspects to project scope, the scope of the investigation, and the scope of the solution.

At the start of the project it is unlikely that the problems and requirements will be fully understood. However, in order to avoid wasting time by analyzing irrelevant areas, the scope of investigation will help focus on those areas thought most likely to be impacted by the project. Therefore the scope of

investigation may well expand as a better understanding of the problems is achieved.

The problems and requirements must be fully understood before a range of cost justified solutions can be proposed. This will avoid the risk of focusing on preconceived solutions, which may well be constrained by current practices, and facilitate creative solutions.

The clients will choose a solution based upon cost justification criteria which may exclude some of the original requirements. This scope of solution will be more closely defined and will determine the design and build stages of the project.

8.3.5- Project Schedule and Budgeting:

It is necessary to determine what activities are required to be carried out to meet the objective. The dependencies between these activities can then be determined, which in turn allows resources and timescales to be estimated.
A Stage End Assessment should be held at the end of every stage in the project. The project Manager and Project Team report their progress and recommendations to the Project Board to gain the Board's approval to either to proceed with the next stage, or to confirm that project has been satisfactorily completed.

This assessment reviews the overall progress of the project and the plan for continuing the project.
In the same way that a detailed schedule for the next stage of the project is developed in Project Initiation, a detailed schedule for the next stage of the project is developed in every other stage, except the last.

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The overall project schedule provides an overview of the activities in each stage. These activities need to be further defined for the next stage to the point where all necessary tasks have been identified.

This should use the same approach as for developing the overall project schedule. That is, using a proven process, or developing the process if one does not exist.
This needs to be done for the whole project (project plan), and then in more detail for the next stage of the project (stage plan). This step is concerned with the overall project. The project schedule is not intended to direct resources to specific activities on certain dates.

The ideal situation is to have a proven process on which to base the tasks for the project. This may be a standard IT process or an outside process
Once a process is chosen, this should then be customized to the particular needs of the project if a proven process is not available, it will be necessary to develop a process for use on the project which conforms to the stage, step, task construct once this has been done, it is necessary to estimate the resources, both client and technical, required for the project.

This should be expressed by resource type or role rather than by individual. It should cover all personnel resources required, both full and part time.
The requirements for other types of resource, such as office space and equipment, should also be determined a time line and cost estimate for the project can then be developed the development of the project schedule is an iterative activity during Project Initiation. The other steps carried out in Project Initiation will affect the schedule.

8.3.6- Stage and Step Product Workflow

Chart the sequence of stages and steps to reflect the intrinsic and architectural dependencies inherent in the project.
An output of one step will be the input to another. Some inputs may be sourced from outside the project.
These External Inputs (e.g., Standards, Project Initiation report of another project, etc.) must be identified. The project products and external inputs will primarily determine the step dependencies.
Define the dependencies, and dependency type, between the steps.

Steps within a stage are not necessarily finish-start, but may be in parallel or phased. Stages may also run in parallel with one another. Do not specify dependencies at the stage level.

Ensure that all dependencies with other projects are identified. Examine other Project Initiation Reports to assess inter-project dependencies.

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8.4- Project Organization

An important step in this planning is to identify the required roles and responsibilities. This methodology provides a standard set of roles and responsibilities for a project and it is necessary to review this list and customize it for the particular project clearly identifies roles and responsibilities,

- Ensures that the best individuals to fulfill roles and responsibilities are selected,
- Identifies training required to enable individuals to fulfill their roles and responsibilities on the project,
- Gains the appropriate allocation of resource time to the project,
- Ensures that all major interest groups are appropriately represented,
- Updates the project and stage schedules in line with available resources,

8.4.1- The Project Board

Is the most senior level of Project Organization and has the responsibility of ensuring the continued integrity of the project from all points of view. The structure of the Project Board reflects the tripartite responsibility that exists in any project, namely the Business, Customer, and Technical interests. The Board should be prepared to recommend termination of the project if necessary.

8.4.2- Project Manager

Is recruited by the Project Board to ensure the successful completion of the stage products, on time, within budget and to the specified quality standards within an agreed tolerance

8.4.3- Project Engineer

May be recruited from any area concerned with the project, or may be from outside the immediate organization. The Project Engineer may need help with the business, customer, or technical aspects of the project. This help is provided by appointing a coordinator for each of these areas. This ensures that the main interests being served by the project are properly represented at the working level, e.g. through participation in quality reviews. This also provides continuity in the day to day coordination of the project especially where there are to be changes of project engineer.

The time commitment required for the project will vary for each role and responsibility identified. It is important that the individuals selected to carry out the various roles can devote the time that the project requires.

Once the roles, responsibilities, and time requirements for each activity are defined, it is possible to assign individuals to perform the activities. It will often be necessary to assign individuals to the project who do not have all the skills required to perform their roles. Therefore, it is necessary to identify what additional training these individuals require.

8.4.4- Project Coordinators

Identify the need for coordination and control activities throughout the project. These are supporting roles to the Stage Manager. They may be filled by the Stage Manager if the project is relatively small. They may also be filled by Key resources.

8.4.5- Planning coordinator:

- Who will help the stage manager create the plans, capture actual work and costs, update plans, etc.
- Who is experienced with using the project scheduling tools?
- Who has strong administrative skills?
- Who has a detailed knowledge of the development project management standards?

8.4.6- Client Coordinator:

Who will assist in obtaining detailed information about how a client area works?

- Who knows how the client area is organized?
- Who can assist in identifying the best Key Resource from a particular client area?

8.4.8- Technical Coordinator:

- Who can facilitate the identification of project tasks required to produce the required products?
- Who is skilled in the techniques used to create products?
- Who can ensure the technical quality of products?
- Who can assist in identifying the best Key Resource for a particular technical issue?

8.5- Determine Training Requirements

Assess the capabilities and skills of all those identified as part of the Project Organization
Based upon this assessment establish a training plan to acquaint the project team members with the methodologies, technologies, and business areas under study.

It may the first time that some clients have been involved in a development project so it is important that they are adequately briefed as to the project management and development process, and especially their roles and responsibilities.

The Project Organization step is intended to ensure that the clients, development and operations are working as a single team on the project, and that artificial organizational barriers are removed.

8.5.1- Project Control

During a project stage, the focus should be on carrying out the work planned for the stage. However, there are many project management activities that need to be carried out in addition to the project work itself. In this methodology, these activities are arranged into a series of steps

Most of these activities are planned for in the project and stage planning. The procedures that are defined during Project Initiation, and are revised during further stage planning, are followed in these steps. The Project Management activities include:

- Monitoring and controlling project progress, through the use of regular checkpoints involving the project team and formal reviews with the Project Board,
- Controlling the quality of products,
- Controlling the way changes to baseline products are implemented,
- Controlling and resolving issues that arise during the course of the project.

Several of the activities will result in changes to the stage schedule. The Project Engineer should ensure that these changes are made smoothly, and that these changes are communicated to all concerned. Any changes made to individual work assignments should be confirmed in the regular checkpoint meetings.

In the event of a stage tolerance being exceeded, an exception situation will arise. The Stage Plan will be replaced by an Exception Situation Report which will explain how the exception arose, the options examined, and the proposed actions.

8.5.2- Allocate Resources:

Assign roles and their associated responsibility to each task. In order to avoid overwhelming the plan with complexity focus on the "produce", "consult" and "review" responsibilities. The "approve" responsibility will generally apply only to the Project Board. The responsibilities are defined as follows:

Produce: to create the product of the task. Usually applies to Project Team Members like Business Analysts, Systems Analysts and Programmers. The schedule will be simpler to balance if only a single role is assigned per task.

Consult: provide information required to produce the task. Usually applies Coordinators and Key Resources.

Review: review the product for correctness, accuracy and completeness. Usually applies Coordinators and Key Resources.

Approve: official signoff. Usually applies to the Project Board.

Assign resources to the roles and responsibilities. Apportion the total task effort estimate to the resources.
As a tip, the schedule will be much easier to balance if the task effort estimate is apportioned entirely to a single "produce" resource.

Therefore this estimate should include time for the other "consult" and "review" resources, e.g., Client review, DBA review. Although this is a simplification, it is still applicable if the non-project team costs are excluded from the plan, since the estimates are primarily for the Project Team.

The "consult", "review" and "approve" resources still need to be assigned to tasks, albeit at zero work, in order for them to be included in the schedule.

It should be clearly established control procedures for any piece of work. A Project is not an exception to this rule, but due to the nature of projects, these procedures are often not readily available. It is therefore necessary to identify what procedures are required and to define these procedures.

Any established project control procedures that an organization has in place should be incorporated into the project plan.

To ensure that all procedures required to carry out and control project work are established, so all project work is carried out as effectively as possible. Identifies all necessary procedures defines appropriate standards defines necessary performance levels and tolerances

Any existing procedures should be modified if necessary for the project. Additional procedures may be required, depending on the nature of the project.

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8.6- Analyze the Risk in the project

Determine the risks associated with conducting the project. Risks tend to be factors which are not within the control of the project manager, but which could nevertheless result in the failure to achieve the project success criteria.

Conduct a Risk Analysis.

Risks can be categorized as:

External Dependencies, Organizational, Planning, Business Case and Technical

Evaluate each risk factor within these categories and determine a value. Aggregate the risk values by category to determine low, medium and high risk areas.

The real benefit of this exercise is not in determining a numeric value, but in identifying areas of the project which are exposed to risk.

Identify the medium and high risk factors and determine appropriate countermeasures to reduce, mitigate or eliminate the risks. Where appropriate include these countermeasures as steps and tasks in the project and stage plans. Document the assumptions in the task descriptions and cross reference them back to the project risk factors.

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Chapter 9

Conclusion and recommendation from this study:

- The mission of this study is to promote effective, efficient, and economical operations of project management through audits, inspections, investigations, and other reviews. The outcome the important need for the project managers and engineers to utilize all available recourses which affecting project performance

- Recent reports have noted problems in the development and use of performance measures in various management contracts to establish performance milestones until the contractor had completed the work because contract administration has many weaknesses established mechanisms for controlling changes in the costs, schedules, and scope of projects. Some projects were constructed without a full assessment of alternatives, changes to the mission, or realistic budgets.

- Cost estimate is a prediction about a future event, namely the final project cost, and because future events are uncertain, they ought to be described probabilistically. Cost estimates ought to reflect the uncertainties and risks inherent in the project at the time the estimates are made. Confidence factors or ranges should be included with all cost estimates at all stages of a project, to give proponents, participants, and sponsors a realistic idea of the risks and uncertainties related to cost and schedule overruns. Point estimates should be avoided because they give a misleading impression of precision, especially when the reliability of the estimate is low.

Allowances for cost uncertainties and unknown cost factors can be developed through risk assessments, scenario analyses, contingency assessments, sensitivity analyses, and related methods. Sensitivity analyses and independent external reviews of the assumptions used in the cost and duration estimates should be used to assure that cost and duration estimates are robust against changes in assumptions.

- Projects took an average of three times longer to complete them comparable projects by industry and other government agencies, and the original schedules slipped an average of "about 22 months, or 52 percent" (IPA, 1996, p. 80), compared to an average of 17 percent in industry. Thus, even though initial project schedules were very long compared to similar projects done by others, they nevertheless slipped more. The Project Performance Study Update of April 1996, Thus, the 1996 Update expected some improvements in costs and durations compared to the previous studies, but these were extrapolations because the projects in the study had not yet been completed. No follow-up study has been made since April 1996 to determine whether these expectations were realized, but even with these projected improvements, project costs and schedules two basic types of uncertainties may be identified. One type is internal to the project and the other external.

- The internal uncertainties or unknowns relate to such estimating factors as labour rates or productivity, unexpected foundation conditions, prices and quantities of commodities, such as concrete, steel, etc. Best estimates of these factors must be included in the initial estimated cost of the project, and allowances for changes to the estimated values should be included in the contingency.

External uncertainties are related to external influences and externally-mandated changes beyond the control of the project. They include the effects of political change, Congressional actions and changes in general policies, local, state, or tribal influences, and all changes in cost or schedule originating outside the project for reasons unrelated to the project's purpose or objectives.

- The different types of uncertainties have often been treated differently, and estimates often do not include external unknowns, uncertainties, or risks because cost estimators did not know how to estimate them and because they are externally controlled, hence deemed not to be the responsibility of the project. But not allowing for external risks is the same as estimating them to be zero. This practice may be acceptable in projects for which the external uncertainties are very small, but this is not usually the case for DOE projects. DOE cannot apply conventional thinking to unconventional situations. DOE should estimate both classes of uncertainty and include all uncertainties in the contingencies would be very much higher than for comparable projects in industry.

- The stronger the culture that is, the more pervasive it is in the organization the more inertia it generates. Strong cultures are more resistant to managerial intervention than weak ones. The levers creating strong cultures therefore lead to both effectiveness and ineffectiveness in organizations. Strong cultures, on one hand, can lead an organization to the "success breeds failure" syndrome in which organizations refuse, or are unable, to adapt to changing environmental demands

- In addition to the outcomes or dependent variables (project costs, overruns, durations, and slippages) The cost growth of these projects is distorted by the frequent use of scope as a contingency scope adjustments are likely to bias project costs upward, on the average, even if the original cost estimates were unbiased because its easier to add reasons to spend any under runs

- Those projects without good owner control perform distinctly worse as a class than those with strong owner control. projects are usually led by a project manager from the contractor organization and often have little or no project owner representation on the project team

- Enhance preconstruction planning, so that scope definition, baselines, budgets, contingencies, and schedules are realistic, and everyone involved understands what will be done, and when. After budgets are fixed, design and construct the project to meet the budget.
- Engage user managers early and require that users be committed to project scope, requirements, budget, and schedule.
- Ensure that user/client decisions are made in a timely manner to avoid project delays.

- Provide objective, standard methods for assessing project risks and uncertainties, and assign realistic budgets, schedules, and contingencies. The momentum toward improved project management was attributable to the efforts undertaken by a number of influential persons within department in various critical management roles. And

also the new leaders or whether the remaining leaders are or will become strong and visible champions of project management issues in the project

- The committee has previously taken the position that project management should be expanded and professionalized through the training of project directors and supporting staff. Nevertheless, there has been internal opposition to project manager training and professional certification, and funding for the training courses, project management workshops.
- Give the assigned project manager authority to control the project budget and schedule (including contingencies).
- Institute contracting methods that select contractors who are committed to the goals of the project and the organization. Develop contract management procedures that hold contractors accountable for performance without creating a counterproductive adversarial atmosphere.
- Institute rigorous identification and control of changes, especially changes in
- Create a culture of excellence in project management and execution.
- Establish the goal of becoming a leader in project management skills, methodology, technology, systems, and performance.
- Promulgate clear directions on project management policy, stressing that completion of projects to scope, on time, and on budget is of the highest priority.
- Provide clear definitions of responsibility, authority, and accountability for all personnel involved in projects. Prohibit interference from outside the chain of responsibility. Clarify contractor roles, responsibilities, authorities, and relationships.

- Scope. Make it clear that scope, budget, and schedule are inextricably linked and prohibit changes in scope that cannot be accommodated in the assigned budget.
- Provide consistent, uniform methods for tracking projects (e.g., earned value analysis) and disseminate this information so that all parties

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