The Evolution of Project Management

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Importance of Project Management is an important topic because all organisations, be they small or large, at one time or other, are involved in implementing new undertakings. These undertakings may be diverse, such as, the development of a new product or service; the establishment of a new production line in a manufacturing enterprise; a public relations promotion campaign; or a major building programme. Whilst the 1980's were about quality and the 1990's were all about globalisation, the 2000's are about velocity. That is, to keep ahead of their competitors, organisations are continually faced with the development of complex products, services and processes with very short time-to-market windows combined with the need for cross-functional expertise. In this scenario, project management becomes a very important and powerful tool in the hands of organisations that understand its use and have the competencies to apply it.

The development of project management capabilities in organisations, simultaneously with the application of information management systems, allow enterprise teams to work in partnership in defining plans and managing take-to-market projects by synchronising team-oriented tasks, schedules, and resource allocations. This allows cross-functional teams to create and share project information. However, this is not sufficient, information management systems have the potential to allow project management practices to take place in a real-time environment. As a consequence of this potential project management proficiency, locally, nationally or globally dispersed users are able to concurrently view and interact with the same updated project information immediately, including project schedules, threaded discussions, and other relevant documentation. In this scenario the term dispersed user takes on a wider meaning. It not only includes the cross-functional management teams but also experts drawn from the organisation's supply chain, and business partners.

On a macro level organisations are motivated to implement project management techniques to ensure that their undertakings (small or major) are delivered on time, within the cost budget and to the stipulated quality. On a micro level, project management combined with an appropriate information management system has the objectives of: (a) reducing project overhead costs; (b) customising the project workplace to fit the operational style of the project teams and respective team members; (c) proactively informing the executive management strata of the strategic projects on a real-time basis; (d) ensuring that project team members share accurate, meaningful and timely project documents; and (e) ensuring that critical task deadlines are met. Whilst the motivation and objectives to apply project management in organisations is commendable, they do not assure project success.

However, before discussing the meaning and achievement of project success it is appropriate at this stage to provide a brief history of project management.

Brief History of Project Management

Project management has been practiced for thousands of years dating back to the Egyptian epoch, but it was in the mid-1950's that organisations commenced applying formal project management tools and techniques to complex projects. Modern project management methods had their origins in two parallel but different problems of planning and control in projects in the United States. The first case involved the U.S Navy, which at that time was concerned with the control of contracts for its Polaris Missile project. These contracts consisted of research, development work and manufacturing of parts that were unique and had never been previously undertaken.

This particular project was characterised by high uncertainty, since neither cost nor time could be accurately estimated. Hence, completion times were based on probabilities. Time estimates were based on optimistic, pessimistic and most likely. These three time scenarios were mathematically assessed to determine the probable completion date. This procedure

was called program evaluation review technique (PERT). Initially, the PERT technique did not take into consideration cost. However, the cost feature was later included using the same estimating approach as with time. Due to the three estimation scenarios, PERT was found (and still is) to be best suited for projects with a high degree of uncertainty reflecting their level of uniqueness. The second case, involved the private sector, namely, E.I du Pont de Nemours Company, which had undertaken to construct major chemical plants in U.S. Unlike the Navy Polaris project, these construction undertakings required accurate time and cost estimates. The methodology developed by this company was originally referred to as project planning and scheduling (PPS). PPS required realistic estimates of cost and time, and is thus a more definitive approach than PERT. The PPS technique was later developed into the critical path method (CPM) that became very popular with the construction industry.

During the 1960s and 1970s, both PERT and CPM increased their popularity within the private and public sectors. Defence Departments of various countries, NASA, and large engineering and construction companies world wide applied project management principles and tools to manage large budget, schedule-driven projects. The popularity in the use of these project management tools during this period coincided with the development of computers and the associated packages that specialised in project management. However, initially these computer packages were very costly and were executed only on mainframe or mini computers. The use of project management techniques in the 1980s was facilitated with the advent of the personal computer and associated low cost project management software. Hence, during this period, the manufacturing and software development sectors commenced to adopt and implement sophisticated project management practices as well. By the 1990s, project management theories, tools and techniques were widely received by different industries and organisations.

Four periods in the development of modern project management.

[1] Prior to 1958: Craft system to human relations. During this time, the evolution of technology, such as, automobiles and telecommunications shortened the project schedule. For instance, automobiles allowed effective resource allocation and mobility, whilst the telecommunication system increased the speed of communication. Furthermore, the job specification which later became the basis of developing the Work Breakdown Structure (WBS) was widely used and Henry Gantt invented the Gantt chart. Examples of projects undertaken during this period as supported by documented evidence include: (a) Building the Pacific Railroad in 1850's; (b) Construction of the Hoover Dam in 1931-1936, that employed approximately 5,200 workers and is still one of the highest gravity dams in the U.S. generating about four billion kilowatt hours a year; and (c) The Manhattan Project in 1942-1945 that was the pioneer research and development project for producing the atomic bomb, involving 125,000 workers and costing nearly $2 billion.

[2] 1958-1979: Application of Management Science. Significant technology advancement took place between 1958 and 1979, such as, the first automatic plain-paper copier by Xerox in 1959. Between 1956 and 1958 several core project management tools including CPM and PERT were introduced. However, this period was characterised by the rapid development of computer technology. The progression from the mainframe to the mini-computer in the 1970's made computers affordable to medium size companies. In 1975, Bill Gates and Paul Allen founded Microsoft. Furthermore, the evolution of computer technology facilitated the emergence of several project management software companies, including, Artemis (1977), Oracle (1977), and Scitor Corporation (1979). In the 1970's other project management tools such as Material Requirements Planning (MRP) were also introduced.

Examples of projects undertaken during this period and which influenced the development of modem project management as we know it today include: (a) Polaris missile project initiated in 1956 that had the objective of delivering nuclear missiles carried by submarines, known as Fleet Ballistic Missile for the U.S Navy. The project successfully launched its first Polaris missile in 1961; (b) Apollo project initiated in 1960 with the objective of sending man to the moon; and (c) E.I du Pont de Nemours chemical plant project commencing in 1958, that had the objective of building major chemical production plants across the U.S.

[3] 1980-1994: Production Centre Human Resources. The 1980s and 1990's are characterised by the revolutionary development in the information management sector with the introduction of the personal computer (PC) and associated computer communications networking facilities. This development resulted in having low cost multitasking PCs that had high efficiency in managing and controlling complex project schedules. During this period low cost project management software for PCs became widely available that made project management techniques more easily accessible.

Examples of major projects undertaken during this period that illustrate the application of high technology, and project management tools and practices include: (a) England France Channel project, 1989 to1991. This project was an international project that involved two governments, several financial institutions, engineering construction companies, and other various organisations from the two countries. The language, use of standard metrics, and other communication differences needed to be closely coordinated; (b) Space Shuttle Challenger project, 1983 to 1986. The disaster of the Challenger space shuttle focused attention on risk management, group dynamics, and quality management; and (c) xv Calgary Winter Olympic of 1988, which successfully applied project management practices to event management.

[4] 1995-Present: Creating a New Environment. This period is dominated by the developments related to the Internet that changed dramatically business practices in the mid 1990's. The Internet has provided fast, interactive, and customised new medium that allows people to browse, purchase, and track products and services online instantly. This has resulted in making firms more productive, more efficient, and more client oriented. Furthermore, many of today's project management software have an Internet connectivity feature. This allows automatic uploading of data so that anyone around the globe with a standard browser can: (a) input the most recent status of their assigned tasks; (b) find out how the overall project is doing; (c) be informed of any delays or advances in the schedule; and (d) stay "in the loop" for their project role, while working independently at a remote site.

An example of a major project undertaken during this period is the Year 2000 (Y2K) project. The Y2K Project, known as the millennium bug referred to the problem that computers may not function correctly on January lst, 2000 at 12 AM. This was a global phenomenon and was highly problematic because resolving the problem at one's organisation did not guarantee immunity, since a breakdown in the organisation's supply chain could affect the organisation's operating capability. Many organisations set up a project office to control and comply with their stakeholders regarding the Y2K issue. Furthermore, use of the Internet was common practice that led to the establishment of the virtual project office. The goal of this virtual project office was: (a) to deliver uninterrupted turn-of-the-century; (b) monitor Y2K project efforts; (c) provide coordination; (d) develop a risk management plan; and (e) communicate Y2K compliance efforts with various stakeholders. Thus, the virtual project office was a focal point for all the project works, and it increased the awareness and importance of risk management practices to numerous organisations.

Why Project Management?

There is no doubt that organisations today face more aggressive competition than in the past and the business environment they operate in is a highly turbulent one. This scenario has increased the need for organisational accountability for the private and public sectors, leading to a greater focus and demand for operational effectiveness and efficiency.

Effectiveness and efficiency may be facilitated through the introduction of best practices that are able to optimise the management of organisational resources. It has been shown that operations and projects are dissimilar with each requiring different management techniques. Hence, in a project environment, project management can: (a) support the achievement of project and organisational goals; and (b) provide a greater assurance to stakeholders that resources are being managed effectively.

Research by Roberts and Furlonger in a study of information systems projects show that using a reasonably detailed project management methodology, as compared to a loose methodology, improves productivity by 20 to 30 percent. Furthermore, the use of a formalised project management structure to projects can facilitate: (a) the clarification of project scope; (b) agreement of objectives and goals; (c) identifying resources needed; (d) ensuring accountability for results and performance; (e) and encouraging the project team to focus on the final benefits to be achieved. Moreover, the research indicates that 85-90% of projects fail to deliver on time, on budget and to the quality of performance expected. The major causes identified for this situation include:

a. Lack of a valid business case justifying the project;
b. Objectives not properly defined and agreed;
c. Lack of communication and stakeholder management;
d. Outcomes and/or benefits not properly defined in measurable terms;
e. Lack of quality control;
f. Poor estimation of duration and cost;
g. Inadequate definition and acceptance of roles (governance);
h. Insufficient planning and coordination of resources.

It should be emphasised that the causes for the failure to deliver on time, on budget and to the quality of performance expected could be addressed by the application of project management practices. Furthermore, the failure to deliver on time, on budget and to the quality of performance expected does not necessarily mean that the project was itself a failure. At this stage what is being discussed is the effectiveness and efficiency of project execution and not whether a project is a success or failure.

Conclusion

Project management should be viewed as a tool that helps organisations to execute designated projects effectively and efficiently. The use of this tool does not automatically guarantee project success. (project success will be discussed in a subsequent issue). However, in preparation for the next issue, I would like you to think about the distinction between project success and project management success. This distinction will provide further insight to the questions: Why are some projects perceived as failures when they have met all the traditional standards of success, namely, completed on time, completed within budget, and meeting all the technical specifications? Why are some projects perceived to be successful when they have failed to meet two important criteria that are traditionally associated with success, namely, not completed on time and not completed within budget?

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