

IT and non IT Project Management: Is There a Difference?

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ABSTRACT:

Over the last decade or two, there has been an enormous embracing of the principles of project management in the rapidly expanding IT Industry. Modern project management theory and principles had a genesis in the construction engineering and aerospace industries in the 1950's. In these industries the maturity of project management has been learnt the "hard way", and some of the lessons have been learnt at great expense through the courts. The role of Contracts, Client expectations and professional responsibilities for outcome and delivery have been more clearly defined in the construction industry. Is there some parallel in the lessons learned or will it be done the "hard way" in the IT industry?

The modern concept of Project Management is that it is “generic” and is able to be utilised across a wide range of industries; that is it is a management technique not technical know-how!

However, before tackling such a contentious topic, it may be of value to trace a short history of the development of modern Project Management Theory:

Started in the 1950’s with:

The 1950s

- Bechtel’s initiative in developing embryo project management approaches, initially on the Transmountain Oil Pipeline in Canada.
- The widespread use of joint project offices in the USAF from the early 1950’s.
- Perhaps, most significantly, the development of the Critical Path Method (CPM) and the Program Evaluation and Review Technique (PERT) (Fazar 1962), and subsequent publicising of both, in the late 1950s.

The history of Australian project management has a parallel with what was occurring around the world, particularly in the Australian construction industry, there was one initiative broadly parallel to Bechtel’s.

In 1954-55, Civil & Civic, initiated an embryo project management approach to its own major subdivision development, where, by persistent analysis and investigation of design alternatives by a “project engineer”, the project was converted from a marginal development to a successful venture (Civil & Civic 1969). From that point, Civil & Civic appointed its own “project engineers” to manage the design phases of all its own development projects, and quality control of construction. By 1958 Civil & Civic began to market this service to external clients, and later offered the natural extension of this, namely full responsibility for all the phases of a construction project from inception to completion, which came to be described as its “Project Management Service”.

The 1960s

Internationally, the 1960s saw the development of the majority of tools and techniques that became central to project management. A very incomplete listing includes:

- CPM (using arrow diagramming) and PERT were being increasingly used for time management, notably in construction and defence. Fondahl published what later came to be known as PDM (Precedence Diagramming Method) in 1961 (Fondahl 1987).
- Project management was closely identified with the use of network techniques for project planning, scheduling and controlling
- Project cost management was added to project time management as distinctive techniques (e.g. PERT/Cost, C/SCSC), as was resource scheduling.

- Project management was still primarily identified with the construction, defence and aerospace industries
- Professional project management bodies were formed in Europe (Internet – now IPMA) in 1965, and in North America (PMI) in 1969.

In Australia, some of the overseas developments were adopted by varying degrees. The first known commercial use of CPM was by Civil & Civic in 1962.

The author's company, now Tracey, Brunstrom & Hammond (the TBH Group), originated in the USA, came to Australia with the U.S Defence Forces and started practicing in Australia in 1965; specialising in CPM and time control techniques. It was the first of several independent specialised project management companies to establish themselves in the construction industry in the mid-to-late 1960s.

From the mid-1960s, there was an increasingly urgent push by many government agencies and authorities to require contractors in the building and construction industry to produce and upgrade CPM networks on government funded projects. Contractually they were intended for monitoring project progress and support for entitlement for extension to time claims.

As had happened internationally, project management in Australia in the 1960s came to be associated very strongly with network techniques. This had some positive aspects, as it helped increase the awareness of clients for the need and value of project time control techniques.

The addition of cost management and resources scheduling techniques to time management, although starting, was slow to take off in Australia during the 1960s, but were increasingly used in the 1970s.

The 1970s

Internationally, this decade experienced developments in the following areas:

- Project management applications spread from construction, aerospace and defence into virtually every industry (Kerzner 1979).
- A greatly increased application of a much wider range of tools and techniques (originally developed in the 1960s), such as WBS, OBS, responsibility assignment matrices, and earned value.
- An increased interest in organisational forms to support project management.
- A concern with the management of conflict on projects.
- A significant increase of "how to do project management" in the literature, based on experience in practice. This appears to have led to what some have called the "professional definition" period.

In Australia, developments in project management began to obtain a wider acceptance and momentum. In the construction industry, project management spread beyond its more traditional areas into the vast emerging mining industry, which became a vitally important lynch-pin in Australia's economic progress as it moved from an agricultural to a mining economy. The construction of major mining infrastructure brought substantial overseas project experience to Australia.

The requirement for contractors in the building and construction industry to produce and upgrade CPM networks on government-funded projects became common practice, and often contractually required. During the 1970s most Australian Government capital works were procured through the Federal Government's Department of Works, which strongly promoted project management and time control techniques.

This approach extended to many (but by no means all) State Government departments. Included were the NSW Government Architect, the Victorian Department of Public Works, and the WA Department of Works.

The defence industry had strong associations with peer organizations in the UK and USA, and continued to place increasing emphasis on project management approaches.

There was a dramatic increase in inflation and financial interest rates in Australia in the mid-1970s, which focused attention on the escalating costs of delays in project completion. This further increased the perceived importance of time management and its integral impact on cost "blowouts", and led to additional attention on contractual conflicts and their resolution. Also, from the late 1970s much greater attention came to be given to the detailed planning and management of the design and documentation process, to control time and cost issues in this project phase. A range of advanced techniques, including management by milestone objectives were already being practically applied.

In 1976, a group of project management practitioners in NSW formed the Project Managers Forum (PMF), with the objective of providing a forum or network of individuals and organizations to compare experience and thinking on the application of project management in the Australian context. The PMF evidently fulfilled a latent need, and rapidly expanded to develop Chapters in most Australian states and territories.

The 1980s

Internationally, a number of significant developments in project management which included:

- The publication of the Project Management Institute's Project Management Body of Knowledge (PMBOK) (PMI 1987), which can be seen as an effort to represent project management as a structured discipline and approach.
- A movement towards looking at projects in their broader context, including "product" (versus project) life cycle costing
- An emerging emphasis on managing the "front end" of projects, including client needs determination, feasibility studies, value analysis, risk management, and project start-up generally.

- Increased focus on factors external to the project, particularly stakeholders and other interested parties, and environmental constraints.
- Project management increasingly seen as a means of response to, and initiating, change.
- The initiation of certification/registration programs for project managers

In Australia, project practitioners were becoming increasingly aware of overseas developments, particularly from the mid-1980s onwards. However, there was also a catch-up period. Australia followed the northern hemisphere in developing increased emphasis on the “front end” of projects, in looking towards product life cycle costing, in awareness of factors external to the project, and of the importance of projects in facilitating change. As a natural development from the financial constraints of the 1970s, during the 1980s there was a significant focus on the management of cost and its relationship to the management of time. Cash-flows and cost control systems became a more common feature on major and more complex projects.

- A significant local development was the establishment of the Warren Centre in the University of Sydney, with the support of industry, government and alumni. Its objective was to advance excellence and innovation in Australian engineering and to stimulate closer interchange between industry and academe. In 1985, the Warren Centre issued a report on “Macroprojects, Strategy Planning and Implementation”.

The emergence of PMI’s PMBOK, and its Project Management Professional (PMP) credential, persuaded the PMF that there was a need to establish a local recognition of project management as a distinctive profession, and hence to develop appropriate quality methodologies and standards.

In February 1989 (in Adelaide), the PMF re-structured and formally became the Australian Institute of Project Management (AIPM) by membership vote. The immediate priorities in the late 1980’s and early 1990’s were to establish:

- A code of Ethics (in 1990).
- Membership criteria as follows (from 1991 to 1992).
 - Associate Member
 - Member of AIPM – M.A.I.P.M.
 - Fellow of the AIPM – F.A.I.P.M.
 - Honorary Life Fellow of the AIPM

Assessment processes related to membership were developed in the 1990s.

The 1990s to 2005

Internationally, the 1990's saw the movement of project management towards a broader approach of being "a way to do business". New concepts on the potential application of project management began to emerge:

- Projects being increasingly used to implement corporate strategies.
- An increased focus on balancing the needs of all stakeholders.
- The incorporation of Total Quality Management (TQM) approaches, and ISO Quality Assurance Standards into project management.
- More cooperative alliances between organisations, through "partnering" or "strategic alliances", to manage large contracts.
- Increasing application of project management methodologies into "soft" projects from the traditional "hard" engineering type projects.
- New project management tools and techniques, associated with computer technology and accessibility through PC's.
- Increased project team empowerment, for project team members to make decisions.
- An increasing use of "simultaneous" or "concurrent" engineering.
- An increasing move towards Management by Projects, or Project-Based Management
- Developments in multi-project management techniques are seen as leading to the development of program and portfolio management concepts and techniques.

In Australia, developments in project management were by now running virtually parallel with international developments. Australian developments included the following:

- There was substantial adoption of many of the new international concepts of project management summarised above, particularly the first six.
- The concepts of "management by projects" or "project based management" were spreading into the financial and telecommunications industries.
- Risk management and a more evenly distributed allocation of risk through different project delivery methods were being actively explored. This was particularly so for Governments who were struggling with increasing demands for infrastructure with limited financial resources.
- Project Management was firmly established as an important element in the construction industry, and was being recognised in a generic format for financial projects.
- During the 1990's that the demand increased for the recognition and certification of Project Managers, but this had to be established in the framework of the Australian National Competency Standards as set out by the Australian Federal Government.

- Thus through the AIPM, the concept of the Reg. P.M. (Registered Project Manager) was developed within the Government's framework for Competency Assessment in Australia. A stringent requirement for the establishment of competencies was that it must be done in conjunction with the relevant industry representatives. AIPM were also advised that no other Institute at that stage (ie. in 1993), had endeavoured to undertake the preparation of Competency Standards for its profession.
- AIPM then prepared a strategy paper and proposal seeking and obtaining funds from Government to establish an Industry Reference Group and to undertake the development of what are now known as the National Australian Competency Standards for Project Management. These standards were prepared between 1992 and 1995, and were endorsed by the Australian Government in 1996. This is an area where Australia has led other international Project Management organisations.
- Towards the late 1990's, PMI established Chapters in Australia, instigated by project managers who were employed primarily in the IT industry. Although AIPM was primarily from the construction industry, the Competency Standards had been developed on a "generic" project management basis. However, many in the IT industry worked for larger multi-national organisations which recognised PMI's PMP certification, and therefore the Reg. PM classification was not seen as appropriately relevant in the IT industry.
- It is hoped that one day in the near future this "cultural" discrepancy can be reconciled to the benefit of Australian project management at large.

As can be seen from this history, in Australia the development of P.M. was very much aligned to the changing economy of Australia towards mining and infrastructure.

However, these industries have always had high demands on time and cost control, as the feasibility of these types of projects and the return to investors has always been vitally linked to the end cost.

As I mentioned previously, the time impact on cost became particularly evident in the mid 1970's with high interest rates. Suddenly time was real money.

As a result of the main focus being time and cost, contracts became very focussed on the Contractors taking a substantial portion of project risk, and committing to "hard money" Contracts.

What do I mean by this can probably be best illustrated by looking at some of the contractual delivery methods:

Time and Cost drive Contract and Delivery Methods

Traditional Contractual Methods

If we look at the general economic cycles of Australia, in the 1950's and 60's Australia's export industry was dominated by agriculture through wool and wheat. During these two decades, the predominant project delivery methods were what I refer to as Traditional Contractual Methods.

However, with changing market conditions, and increasing financial and complex technical demands, pressures started mounting to reduce overall project delivery times. Additionally, clients increasingly sought to move risk away from themselves to others better able to manage that risk. The traditional Lump Sum approach was becoming too time consuming, and other forms of contract delivery began to appear.

Thus Design Development, Document and Construct approaches, and then the Design and Construct approach, typically allowed construction to commence earlier than in the traditional Lump Sum Contract, leading to earlier overall project completion. Additionally, the earlier awarding of a contract moved the risk away from the Principal at an earlier stage

Hybrid Contractual Methods

The 1970's and 1980's saw the major export business of Australia move from agriculture to the exploration, mining and export of major minerals – particularly iron ore and coal. Additionally, oil and natural gas were discovered in Bass Strait and Western Australia. These changes dramatically increased the volume of heavy engineering/construction projects, which also had more complex technological requirements. This in turn stimulated changes in project delivery methods.

The mid 1970's also brought a sudden increase in inflation and significantly increased interest rates. This resulted in a rapid increase in project costs, and project feasibility became even more "time sensitive" to project delivery times.

In an effort to more effectively deliver (or as was called "fast-track") projects, there was a move away from the traditional Lump Sum Contracts to a range of hybrid contractual methods such as Managing Contractor, Construction Management, Partnering and Alliance Contracts. A summary review of these contractual methods follows.

Managing Contractor

This form of contract was one response to the increasing need to undertake and complete projects in a more rapid time frame. The concept is to award a contract to a contractor at a very early stage in the process, so that the contractor takes on the role of managing the design, documentation, construction and commissioning. Although

this is similar to the Design and Construct Contract referred to previously, this approach keeps the Principal involved and controlling what he wants designed. The Managing Contractor's role is to manage the complete project process from Sketch Design through to Commissioning. This approach allows the client various advantages, the main ones being:

- Control of the design, without the responsibility and risk of managing and integrating the design process.
- The contractor taking more of the risk, but providing "buildability" advice and input into the design. Although the risk is moved into the contractor's responsibility, he is probably better experienced and can manage that risk.
- A more rapid commencement to construction by overlapping design and documentation with the construction, i.e. earlier award of trade subcontracts, and earlier overall project completions.
- A "one-stop-shop" for the client.
- Tenders for a Managing Contractor were often called on Preliminaries, Overheads and fixed profit.

Construction Manager

This form of contract was similar to The Managing Contractor role, except that the contractor is essentially responsible for managing the construction phase of the project. The concept remains of an early appointment of the construction manager who becomes part of the project team and is responsible for collation of the documents into trade packages, for calling tenders and awarding trade subcontracts and managing the construction work. This restricts the contractor's risk to the construction process, but provides for the contractor to give advice on appropriate construction techniques and to integrate and assemble the documents for an efficient management of the trade subcontracts.

This approach provides:

- The client with a greater design control, but the client assumes responsibility for managing the design to achieve the Construction Manager's programme.
- Construction advice to assist the integrity of the documentation.
- The ability to commence construction earlier, and thus "fast-track" project completion.
- Tenders for a Construction Manager are usually called on fixed price and completion date (subject to extensions of time in accordance with the Contract).

Partnering

Partnering was a concept that came to Australia from the US in the 1990's, and was briefly used by some Government organisations, but it was not a concept embraced by the private sector. The essence of partnering is a cooperative management style of work, intent upon overcoming traditional adversarial and litigious relationships and directed to achieving the project objectives of all parties.

But because in practice partnering may involve principal and contractor jointly assessing actual or potential non-conformances, it can give rise to significant legal issues for project managers in areas such as a authority, delegation of powers and the establishment and documentation of on-site procedures.

The New South Wales Government partnering guidelines state,

“Partnering is not a contractual agreement, nor does it create any legally enforceable rights or duties. It is the contract that provides the legal relationship, with partnering establishing the working relationships among the stakeholders...”

Essentially partnering involves a commitment on behalf of the principal; attendance by all relevant parties (and stakeholders) at a workshop to identify common goals; the drafting and signing of a partnering charter which expresses those goals; and subsequently the establishment and maintenance of communication links and procedures through the course of the project to ensure that the goals are achieved.

However, it has proved difficult to have, on the one hand, a “moral contract” and a charter which will “bind” each party to certain objectives without considering, on the other hand, whether that process creates any legitimate legal expectations and rights. In commercial relationships, much of the conduct between parties is regulated by general legal principles rather than the terms of their contract.

This goes to the very heart of the partnering debate: “whilst partnering as a process must be commended for the efficiencies and objectives it has achieved, many of its users fear that the process leaves some established contractual rights and remedies uncertain”.

As a result Australia appears to be heading away from the Partnering concept.

Alliance Contracting

This form of contract was originally more common in the mining and the oil and gas industries in Australia, but in the late 1990’s began to be used in some areas of the construction industry, a notable building project being the recent National Museum of Australia in Canberra. This form of contract is usually a joint venture arrangement between the Principal, the major contractor, the major sub-contractor/s and the designers. Each stakeholder has shared objectives, each contributes in a significant way to the project and each takes a risk on the success or failure of the project achieving the shared objectives. Profits are taken by bonus, and equally losses are shared. Great care needs to be taken with the establishment and methodology of measuring the shared objectives, or the parties may feel disadvantaged. This style of contracting can be adopted where the actual scope of the project is not clearly defined at the outset of the project, or significant change or variation is likely to occur as the project proceeds.

Engineering, Procurement, Construction Management (EPCM) Contracts

This form of contract has been virtually exclusively used in the mining and oil and gas industries, where the client is seeking specialised experience in technical design and delivery skills.

An example may be a mining company that is good at exploration and in finding markets for its product, has found a commercially viable discovery, and seeks to construct a processing plant for its minerals. Many processing methods have a proprietary processing system, and so the client seeks to have an EPCM Contractor obtain the proprietary system or process, design, document and construct the facility and then achieve the required performance output for the processing plant, which means a “fully operational” facility where the client takes over an operational facility and only has to concern itself with finding and delivering the product to its markets.

This form of delivery usually requires an extremely large (often an international) project management and engineering company that can take on the associated risks and financially support such a large scale financial investment.

Public Private Partnerships (the alliance of Government and Private Enterprise)

The 1990's and turn of the century came to be increasingly difficult for governments in Australia, because of the increasing size, complexity and cost of their projects, and significantly increased environmental demands. Infrastructure projects in particular began to exceed the financial and capability resources of both State Governments (responsible for Health, transport, education and primary services) and the Australian Federal Government (responsible for national defence and national rail projects).

Thus Australian governments, and particularly State governments, are shying away from the “direct involvement” contractual methods, and are moving towards what is called “Public Private Partnerships” (PPP).

In this type of arrangement the current most common categories are called the BOOT (Build, Own, Operate and Transfer) and the BOO (Build, Own and Operate), where the Government grants a concession to a consortium through a tendering process:

The BOOT scheme

A consortium (which usually comprises financiers, designers and contractors) bids for the right to construct a facility, to then operate and own the facility for a period of time (often 30 years), and then transfer the facility at minimal cost back to the relevant Government.

Thus the returns on the consortium's investment have to be achieved in that period, but the community has the use of that facility earlier than if it had to be funded from Government revenue. An interesting example of a BOOT scheme is described in the Sydney 2000 Olympic Games project included in this chapter, namely the Stadium Australia delivery structure.

The BOO scheme

This approach is virtually the same as the BOOT scheme process, except that the facility is not transferred back to the Government, but ownership is retained by the consortium. An example of a BOO scheme is also described in the Sydney 2000 Olympic Games project, namely the delivery structure for the Athletes' Village.

There are some other forms of PPP, whose use depends on the facility being proposed, and related circumstances. These include:

Contracting out: The private sector provides a service without assuming any financial risk.

Joint ventures: Financing, owning and operating responsibilities are shared between the two sectors.

Leasing: The private sector funds, develops and operates and maintains a facility, and the public sector leases it.

Such schemes involve large amounts of finance and long pay-back periods. As with any form of project finance, a sophisticated approach to risk management is an important aspect. The main risk categories are:

Completion risk: The risk that the project will not be completed, or will be completed sufficiently late to affect the viability of the project.

Market risk: The risk that sufficient cashflow will not be generated by the completed facility.

Operating risk: The risk that the facility will not operate within design specification.

Political risk: The risk that a change in Government or in taxation legislation will affect the return on the investment.

Force Majeure: The risk that events entirely outside of the control of the consortium will stop the completion of the project.

Some examples of major infrastructure projects undertaken on the basis of private finance include a number of elements of the Sydney 2000 Olympic Games, the Sydney Harbour Tunnel, the M2, M4 and M5 Motorways in NSW, the Melbourne City Link Motorway; and there are a number of other projects currently underway or planned in the near future.

The main advantages of private sector involvement over traditional public sector procurement are that:

- More infrastructure projects can be built.
- Projects can be built faster as they are not subject to the constraints of Government handouts.

- Such projects encourage a “user pays” approach to services which results in greater efficiencies on the part of users. This in turn reduces the need for expensive new infrastructure.
- Having part of the utility privatised allows “competition by comparison” to arise. This results in a general improvement in the efficiency of the utility.
- Maintenance of facilities may also be higher due to the requirements set by lenders.

The main disadvantages are:

- The public sector can borrow funds more cheaply than the private sector.
- Such projects generally involve difficult and expensive tender processes.
- The long term nature of the investment, which generally involving low cash flows in the early years and a lack of liquidity, can make investment unattractive.
- The full risks of long term contracts (generally between 20 and 30 years) are not known.
- There is a possibility that “inefficient” projects are developed which will need to be heavily subsidised by Governments.

Even at this time, there is significant social and political discussion regarding the commitment of State and Federal Governments towards Public Private Partnerships, and the long term benefits for the Australian public. The demand for substantial infrastructure development is ever increasing in a large geographical country, with a limited human and financial resource base.

Where do Things Go Wrong in Hard Projects

All these approaches are fine, except what happens when the risk to the Contractor was suddenly starting to go wrong. How does he recover money, what were the vulnerable “risk” areas in the contracts. The classic areas were changes or “variations” by the Principal, lack of “decision” by the Principal and often caused by lack of scope definition at the amount of the contract, or changing needs of the project due to technology changes (hospitals are a good example of this).

All of these provide opportunities for the Contractor to seek recompense through

- Variation clauses,
- Extension of Time claims.----- True EOT entitlement
Disruption
Potential acceleration
= Additional Cost

All assuming the Contractor does “mitigate” delay
Smart “Alec” Contractors often take advantage of poor scope definition at the time of tender.

What I have discussed to date, is what I refer to as “hard” projects, but what are the lessons learned.

- Clear definition of scope
- Minimise variations
- Ensure required decisions are made in time
- Ensure appropriate contracts and risk allocation are used
- Practice proper and fair Contract Administration
- Resolve issues as they arise, do not let the “fester”
- Have a proper and appropriate quality project plan and programme in place, and monitor regularly.

But what about “soft” projects.

What do I mean by a “soft” project.

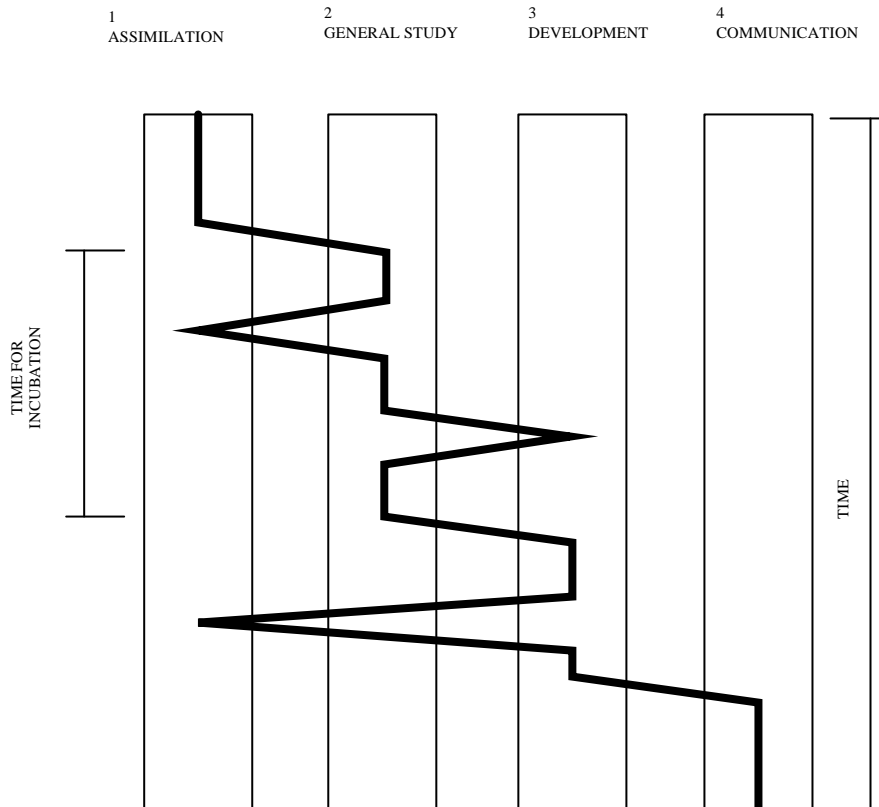
- Difficult if not impossible to fix scope definition, this results in a lack of a defined outcome.
- High level of variation of changes during project progress.

It may come as a surprise to many of you that there is a soft area of construction and infrastructure projects.

That soft area is the design and design development area of a contractor project.

Why is it soft, because it is all difficult in scope, and is an extremely iterative process,. i.e. 3 steps forward and then 2 steps back

THE PROCESS OF DESIGN



THIS DIAGRAM SHOWS THE UNPREDICATABLE JUMPS THAT ARE MADE WITHIN THE MAJOR PLAN PROGRESS

(Refer slide number 13)

This is often the case when “CREATIVE” tasks are being undertaken, it is the stage of lack of scope definition.

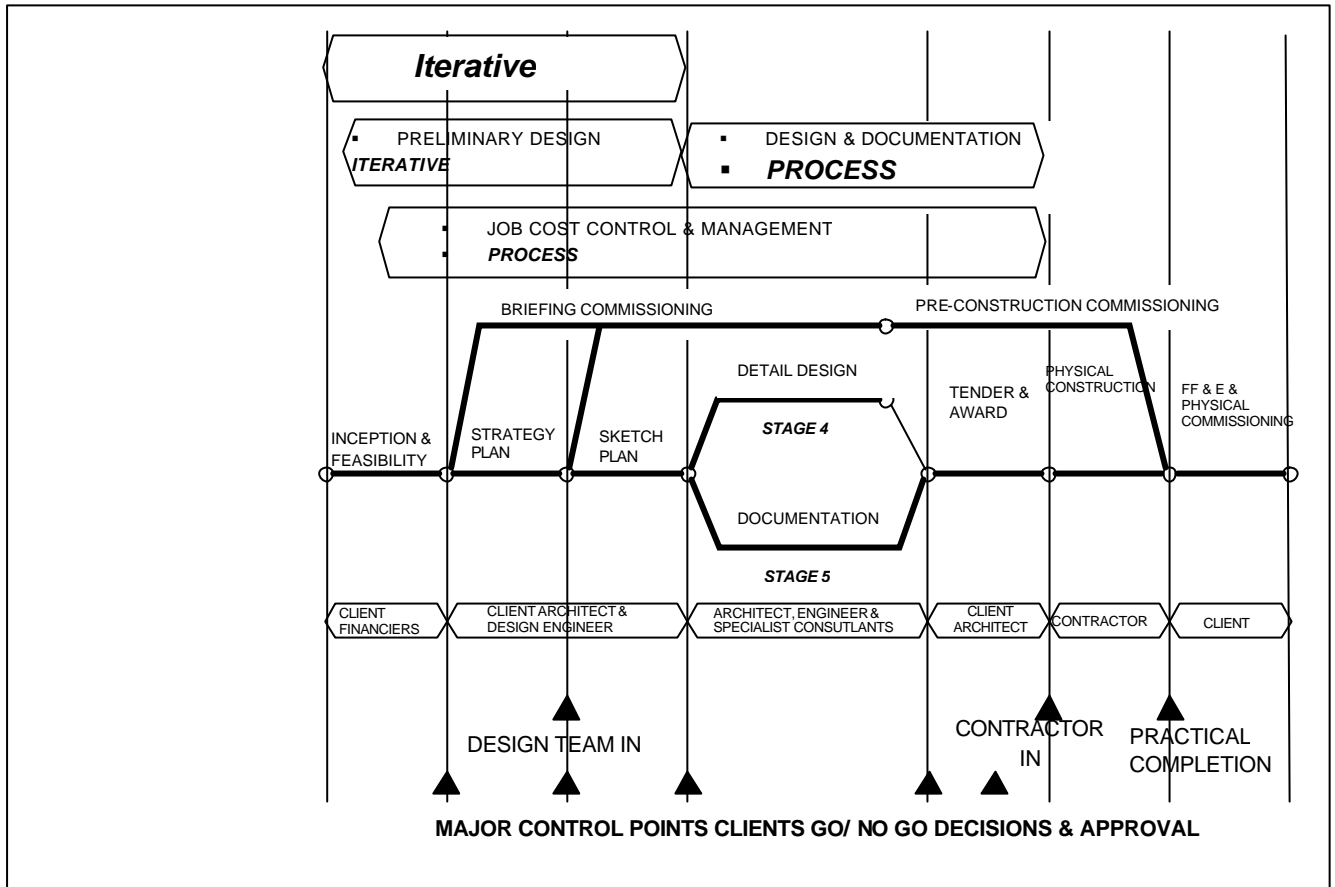
So how has this been impact delivered in the construction industries.

Planning/Scheduling is established by what I call milestone objectives.

(Refer Slide number 14)

What is also important is the management of early warnings i.e. sub milestones towards major milestones.

In the construction/engineering industry a classic diagram of the phases if a project is



(Refer slide number 15)

Process is a series of tasks that are perhaps described as more mechanical and is therefore more readily controlled and managed with recognised P.M. techniques.

The iterative or creative area is much less process orientated and therefore much more difficult to manage and control.

What is important is the management of early warnings i.e. sub milestones and means of assessing progress towards major milestones.

Refer Telstra presentation (slides numbers 16 to 24)

Delivery Options

As I mentioned earlier, contracts are very definitive and obligatory documents; often EOT entitlements require the critical path of a project to be delayed. However contracts also require the Contractor to "MITIGATE" delay, which means that where logic of activities can be changed (implying no cost to the Contractor) such that the Critical Path can be moved to an area of work and from the area being delayed, then the contractor has a contractual obligation to do so.

This is probably a common occurrence in IT projects, and thus this obligation becomes a very real problem for the contractor – His only recourse of claim or delay hours based a Disruption – which is very hard to establish and prove, let alone quantify.

This risk profile of projects, based on scope definition and potential variation/change is an important factor when determining the most appropriate delivery strategy and thus appropriate contractual arrangements.

Some contract methods I have presented referred to in lack of scope definition in

- Construction Management (Cost Plus/Open Book)
- Partnering
- Alliance Contracts

THANK YOU!!!!