

The "IRON TRIANGLE" of Project Controls

Time

Cost

Quality

A presentation to the Australian Cost Engineering Society
On 16th February, 2010
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What happens in the Real World?

60 % of projects completed within cost
60 % were completed within schedule
45 – 50 % of projects achieved underruns in both time and cost
80 % of projects were completed within the upper accuracy range of the budget

Maddock Committee Report for the Victorian Government - published in 1989

Conversely:
40% of projects are late and exceed budget !

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Software development is even worse

- 15% of projects are cancelled before they deliver a system. And
- 51% of projects are severely over budget and/or late
- Average cost underrun 43%

Arlene Minkiewicz "Respect the Triangle" AACE "Cost Engineering" Vol. 51/No. 11 November 2009

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For major projects there is a great deal of knowledge, experience and a wide range of tools available.

So how can we get it so wrong?

Negative stakeholder attitudes:

- Confrontational
- Risk Averse
- Untrusting
- Rigid/demonic
- Intangibles treated as known fact
- 20/20 hindsight vision
- Too slow to act
- Inappropriate action
- "Blame Game"

Sometimes the Client can be their own worst enemy.

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Phases of Development of a Project

Broad sequence of activities –

- Client identifies a requirement (or problem) - the Project
- Client appoints a person(s) to be responsible for Project
- Responsible person appoints a group (groups) to undertake the Project
- Group determines an approach to meet the Project requirements
- Client (or representative) approves the approach
- Group executes the Project
- Group completes the Project and transfers product to the Client

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Project Contract Contexts

Most projects are defined and executed under a sequential - time frame. i.e. 'Traditional Method' – Design, Tender (fixed price), Construct, Handover.

This leads to the classic
"IRON TRIANGLE" of Project Controls

*There is a close relationship between these four criteria, as illustrated by this triangle–

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What transpired?

Client/Owner:

- Called frequent meetings with stakeholders to move project along.
- Imported coated strip product (at a loss) to meet sales contract deadline.
- Frustrated by delay and obstructions by Construction Manager

Project/Construction Manager:

- Went to extraordinary lengths to try to entirely blame the contractor. (Even though they set the line tensions, which clearly exceeded the design loads).

Contractor 'A':

- Completed the extra work and rebuilt the accumulators.
- Resolved all claims with the Construction manager except that for the collapse and repair of the accumulators.
- Some 18 months later achieved resolution by direct consultation with Client/Owner of claim for accumulator repairs.

Example #2 Longford Gas Explosion

On Friday 25 September 1998 a vessel at the Longford gas plant fractured, releasing hydrocarbon vapours and liquid. Explosions and a fire followed.



Two Esso employees were killed. Eight others were injured. Supplies of natural gas to domestic and industrial users were halted.

Longford Gas Explosion

The Task

- Repair the damage in time to restore adequate supplies for the following winter peak

Problem Solving

- Outcome regarded as uncertain
- State government took a number of measures to secure additional gas supplies.
- One measure was to add gas compression facilities on existing low capacity gas pipeline joining the substantially separate NSW and Victorian gas transmission systems.

Longford Gas Explosion

Added Gas Compression Facilities Project

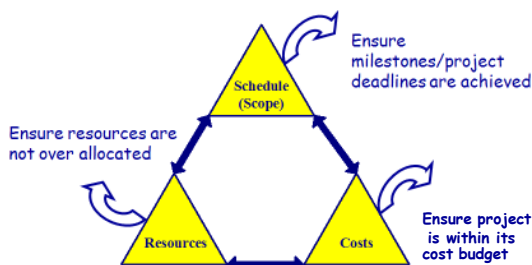
Delivery and installation/commissioning of this project was achieved to meet the following winter peak.

Success was due to:

1. Relationships developed between the people in the team (Client/Supplier/Contractor)
2. Project control adopted specifically for this project
3. Capability of the organisations involved

In Pfeifer's view, effective implementation of project controls together with effective relationships and a common dedication to a single purpose by all parties were the key.

Analyzing the Project



Change in any one criteria will change at least one other –

- Increase the defined scope
 - increases the capital cost, and
 - probably the time

(in practice, trading off time increase for a cost increase may be possible)
- Increase the specified quality
 - results in increased capital cost, and
 - (usually) time to complete
- Reduced time to perform the works (acceleration)
 - (normally) increase cost to complete
- Reduce the cost
 - reduce the scope, or
 - required quality

(Note: reduction in quality generally not an option, as specifications usually based on Australian Standards' minimums)

Planning Aims

- Make best use of time available to complete the project
- Optimize use of labour and material resources
- Provide timely warning of potential problems
- Enable actions to be taken to avoid or alleviate problems
- Avoid contractual disputes



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Understanding Your Customer (Client/Owner):

- what happened during the contract negotiation (sales process)?
- what formal and possibly informal agreements were reached?
- who's who in the customers organisation?
- what is the style of management adopted by the customer and/or customer's representative.



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What is driving your customer?

Get to understand;

- **Company** - political
 - **Senior Management** - successful completion/promotion
 - **Project Team** - engineering excellence
 - **Operators** - functionality, maintainability
- Understand what is most important to each one of these groups.

Identify the needs;

- Then take the opportunity to understand them,
- Relate to and identify with them,
- Always be aware of these needs during the course of the project.



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Avoid the Pitfalls

- understand what the customer requires
- articulate his understanding to the customer's satisfaction.
- put it into a contract to ensure that the desired outcome is delivered to both parties' satisfaction.

Essentials:

- concise definition of the project scope
- involve all major stakeholders
- commitment not to change the project definition
- avoid discussions on the "Nice to Have's"



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Stakeholders, Customers and Success

What makes for Project Success?

Key factors in achieving the goals are:

- Effective implementation of project controls
- Communication between stakeholders
- Effective relationships and
- Common dedication to a single purpose by all parties to the project.



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Thank you for your attention.

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