

PROJECT STRATEGIC PLANNING: A PREREQUISITE TO LEAN CONSTRUCTION

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ABSTRACT

Most of the research into lean construction practices has addressed tactical and operational issues that contribute to construction industry underperformance, however few researchers have attempted to identify the overriding strategic issues that create the productive environments that are necessary for lean practices to succeed.

This paper describes a research project that has developed a framework for the creation of such environments, one that encourages the achievement of outstanding or excellent outcomes on capital works projects for end-users and clients including the creation of additional wealth.

Twenty-eight completed projects that all project participants regarded as excellent were selected for the study. Then on the basis of in-depth interviews and analysis, those key issues within the client decision framework were identified that correlated with the achievement of the best outcomes. An analogy was developed between a road journey and project development phases/sequences resulting in a roadmap to project excellence, with turning points and drivers, which can be used to design project delivery strategies.

KEY WORDS

Project strategic planning, client involvement, project turning points, excellent project drivers.

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1. INTRODUCTION

The Australian construction industry traditionally represents 12-14% of G.D.P, is valued at about \$60billion (2003), and accounts for about 7% of the workforce. It has been estimated that a 10% increase in the construction industry's productivity would result in a 2.5% improvement in GDP (Stoeckel et al 1992).

Recent Royal Commissions (Cole 2002 and Gyles 1992), found that the construction industry substantially under-performs its potential. The Commissions criticised the industry for its fragmented nature, lack of co-ordination and communication between participants, adversarial relationships and a lack of end-user focus. Ineffective management practices have contributed to wasted effort, unnecessary cost, poor quality and defects, which have invariably resulted in increased cost and inconvenienced end-users.

Most of the research into lean construction practices has addressed tactical and operational issues that contribute to this underperformance, while social aspects have only recently emerged as potential issues. However few researchers have attempted to identify the overriding strategic issues that create the productive environments that are necessary for lean practices to succeed.

This paper describes a research project that has developed a framework for the creation of such environments, one that encourages the achievement of outstanding or excellent outcomes on capital works projects for end-users and clients including the creation of additional wealth for all stakeholders.

2. RESEARCH METHODOLOGY

Australian construction industry senior executives from 20 clients, consultant and contractor major corporations were asked to nominate projects that they considered had achieved excellence.

An excellent project was defined as a project achieving an outstanding operating outcome, as determined by end-users and stakeholders, and is considered to be equivalent to construction industry best practice.

Generally the construction industry uses the term excellence in a narrower context by referring only to the project output or the result achieved on completion of the project. This context is reflected in industry association awards for excellence by the Australian Institute of Project Managers, Royal Australian Institute of Architects, Institution of Engineers Australia, Master Builders Association and Australian Contractors Association which annually seek to recognise 'best in class' projects, the class reflecting the parochial interests of their members.

The literature uses various words in a similar context to excellence, including outstanding, extraordinary, visionary and overall success. One of the first references to an holistic meaning of the word excellence applying to business outcomes, which put customers above profits, is by Peters and Waterman (1984). This meaning was later supported by Collins and Porras (1997) and by Kaplan and Norton (2001), where a framework was developed to measure excellence in business.

A literature search provided a number of measures of excellence in projects as follows:

- **End-User Satisfaction**
A client's purpose in expending capital on a project is to develop an asset, which is to satisfy an end-user or customer need. Thus a project cannot be excellent if it does not have exceptional merit or is not superior to others in satisfying the needs of the end-users (Murphy et al. 1974, Bedell 1983, Schultz 1984, Pinto and Slevin 1988).
- **Financial**
The second criteria is that financiers need a financial return, or Governments need to satisfy financial criteria (e.g. cost/benefit ratios, benchmarked capital costs) in the process of delighting their end-users, otherwise the project could not proceed. This criteria of success is noted by most researchers including Humble (1994) and Atkinson (1999). Akalu (2001) also expands the traditional financial criteria to net present value and shareholder value analysis.
- **Suppliers**
The third criterion is that suppliers (consultants, contractors, trades) who create end-user delight need to be rewarded and make a business sustaining profit. This profit allows them to give attention to creativity and quality and not be concerned with making up margins reduced through unreasonable negotiation and circumstantial pressure by the client. Collins and Porras (1997) support the need for suppliers to earn a profit, but significantly rank it as only being achievable if customer service is provided.
- **Project Participants**
Recognising that it is people, not corporations, that provide the creativity to delight end-users, suggests the fourth excellence criteria. A project team needs to be happy and enjoy the experience for creativity to be present. Peters and Austin (1985) state that there are two criteria necessary to attain excellence: take exceptional care of your customers and constantly innovate. Carnegie and Butlin (1993) reinforce the key role of project team members in achieving innovation. Kaplan and Norton (2001) include 'people, learning and growth' as one of the four elements of measuring excellence in business.
- **Environment Aesthetics and Safety**
Stakeholders of projects (those not directly engaged to develop the project) are now being recognised as very influential community members in determining whether projects attain excellence. This criteria covers environmental impact, project aesthetics and safety performance (Atkinson 1999, Kagioglou et al. 2001).

These five criteria, summarised in Table 1, have been adopted by the authors for the selection of excellent projects, three involving the project outcome and two the project output, which necessarily also impacts the outcome.

Table 1: Excellence Criteria

Project Result	Excellence Criteria
Outcome	<ul style="list-style-type: none"> • End-users delighted • Stakeholders appreciate aesthetic, safety and environmental outcomes • Clients meet/exceed financial outcome over life of asset
Output	<ul style="list-style-type: none"> • Consultants/Contractors achieve sustainable margins • Project participants enjoy the experience

Both time and cost performance were excluded from being directly nominated in the definition, as these factors mean little to end-users when faced with a poor performing end product (Murphy et al. 1974). However, both time and cost performance are covered as they can directly impact the financial and supplier criteria.

The selection of case study projects proceeded through a rigorous process of pre-qualification. As the criteria for achieving excellence involves all project participants (i.e. end-users, clients and supply-chain members), and with over 200,000 organisations making up the construction industry (Barda 1995), a pre-qualification process was initiated through senior executives of the major industry organisations to determine possible excellent projects, 28 being accepted from 34 nominees. Four projects were underperformers and used as controls. Contacting the end user, if a client or contractor had nominated the project, to verify that they were delighted with the experience and financial outcome, completed prequalification. Both authors conducted interviews with end users, clients and contractors on all case study projects and with at least one consultant or supplier.

3. STUDY RESULTS

3.1 PROJECTS AND WEALTH CREATION

The study results were published by the Property Council of Australia (November 2001) in *Projects as Wealth Creators* (Barda and Crow 2001). Those *drivers of excellence* which allow some development projects to achieve significantly better outcomes relative to the normal, *'business as usual'* project, were established in the paper.

The study found that the single most significant contributor to waste and uncertainty in projects is the use of inefficient and ineffective processes to initiate, design, build, commission, operate and maintain built facilities. This requires the application of lean construction. The study found that it was only possible to remove this wasted effort if there was a trusting project environment.

The main driver of excellence common to the 28 excellent projects was a trusting and motivated project environment, created by strong client leadership from the outset.

Wealth creation was demonstrated on the 28 projects through:

- 22% of the projects achieving reduced operating costs;
- 39% achieved increased revenues;

- 50% achieved increased functionality;
- 30% experienced an improvement in the morale of operating staff.

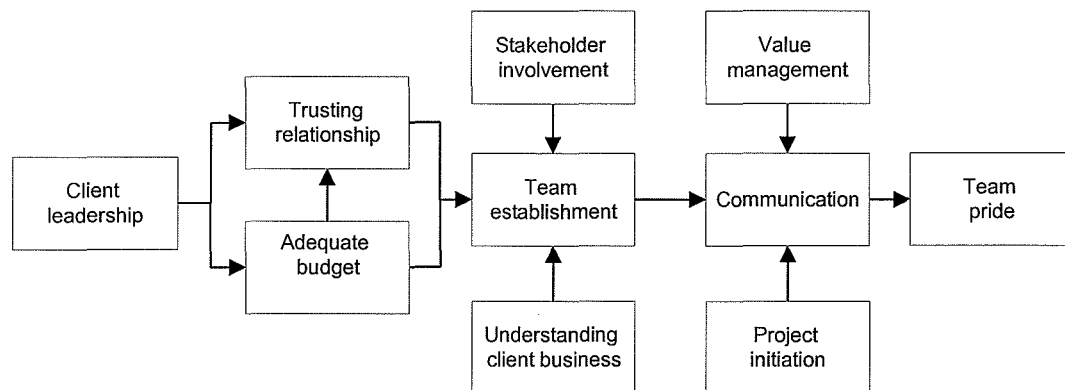
All project team members interviewed said they had at least achieved their budgeted margins and 65% exceeded those margins.

3.2 DRIVERS OF PROJECT EXCELLENCE

On the best projects the client's team created and managed a positive project environment, shaping the project brief with a clear understanding of end-user needs, and specifically managing the supply team as a business unit focused on wealth creation. The top 10 drivers of project excellence identified were behavioural (figure1). The linkages in figure 1 reflect the ranking of drivers and from the authors' experience represent the logical sequence in which they occur and impact on the project.

While adequate budget could be seen as a technical driver, the absence of adequate budget was found to drive negative behaviours as participants sought to achieve budgets and recover margins.

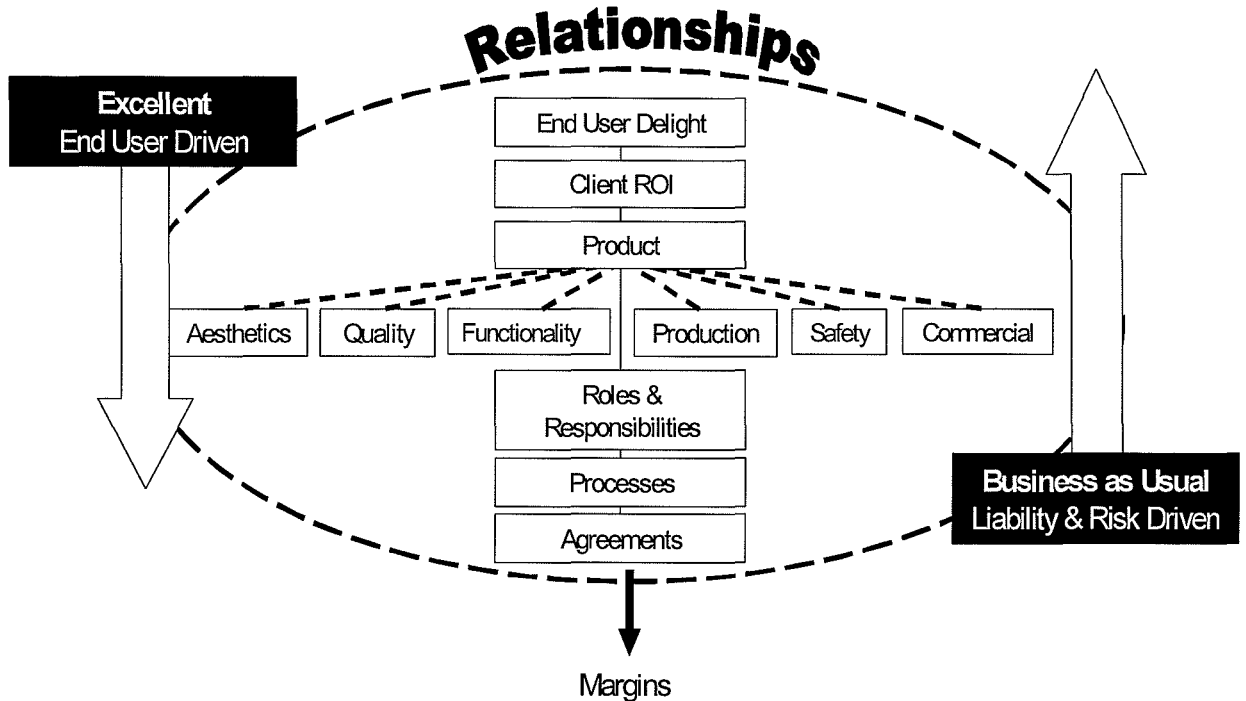
Figure 1 Drivers of Project Excellence



3.3 RELATIONSHIPS THE KEY

The study found that too often contractors, designers and suppliers focus on making a profit not on providing end user service. Yet it's delighting the end user that is the first prerequisite to achieving excellence that results in higher than budgeted margins. Further, the top 10 drivers of excellence are all behavioural with a focus on creating good relationships, which, if they don't exist, will ensure profits are eroded. The conceptual business model (figure 2) was derived from the study and suggests the choice that is available to construction industry participants.

Figure 2 Project Business Model



A project business model leading to excellent outcomes and higher margins is driven by relationships and the end user, while business as usual outcomes are driven by minimising risk and liability, reflected, too often, in draconian contracts, negative procedures and a lack of relationships.

The *Projects as Wealth Creators* study was distilled into simple, common sense decisions, which can be taken to ensure the commercial objectives of all projects, are met, regardless of size, or type. The result was a Roadmap to project Excellence.

3.4 PROJECT ROADMAP: DRIVERS AND TURNING POINTS

The opportunity to harness a driver of excellence depends on the stage of development of the project. Some drivers occur earlier than others. Decisions, which drive the direction of the project, are taken on every project, leading to one of four business outcome scenarios:

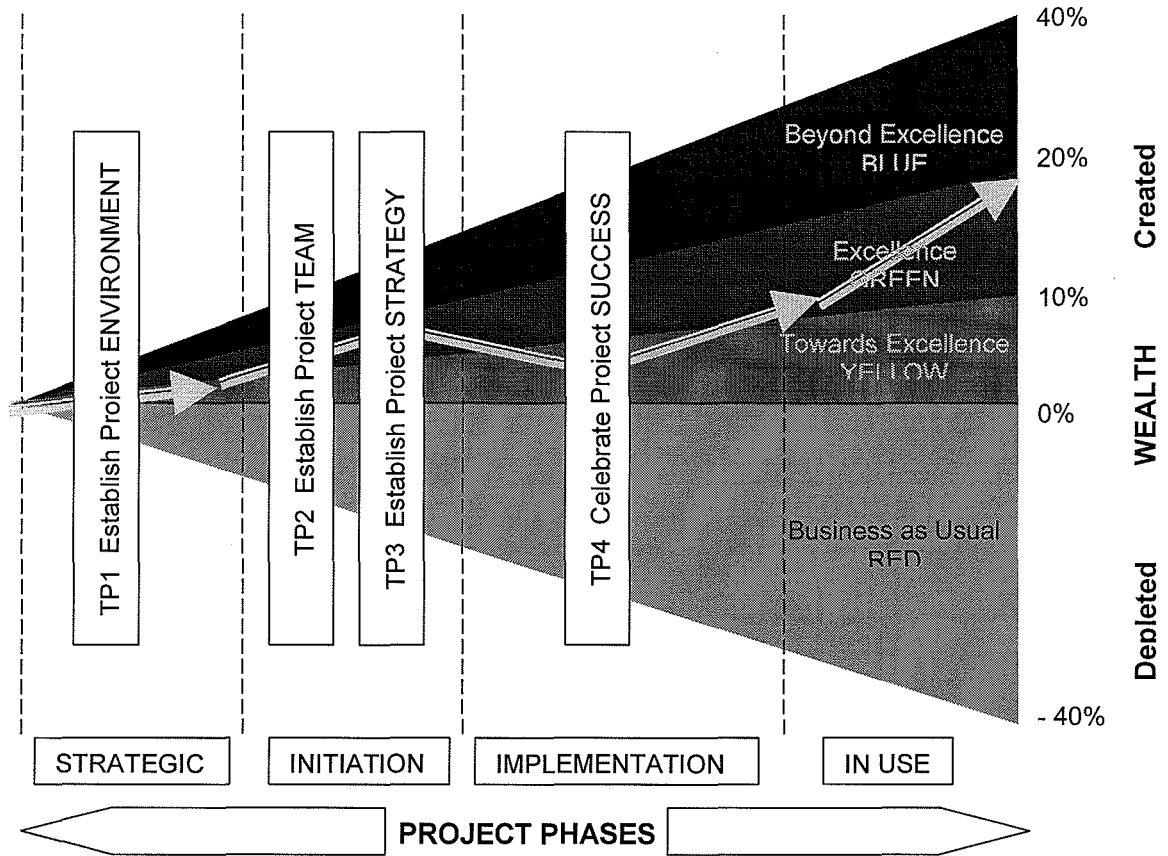
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|--------|--------------------|-------|--------------------|
| RED | Business as usual | GREEN | Excellence |
| YELLOW | Towards excellence | BLUE | Beyond excellence. |

Each scenario leads to varying wealth outcomes, from creating up to 40% wealth to depleting up to at least 40% wealth. The Roadmap (figure 3) forecasts the outcome of the project journey within one of those scenarios. Those decisions ‘cluster’ around four *Turning Points* (TP), which occur primarily at the beginning of projects during strategic planning and

initiation. The wealth created/depleted scale (figure 3) was derived from project outcomes achieved on the case study projects and subsequently validated on three completed projects

- TP 1. Establish project environment
- TP 2. Establish project team and strategies
- TP 3. Establish project business plan
- TP 4. Celebrate and reinforce project success.

Figure 3 Project Roadmap

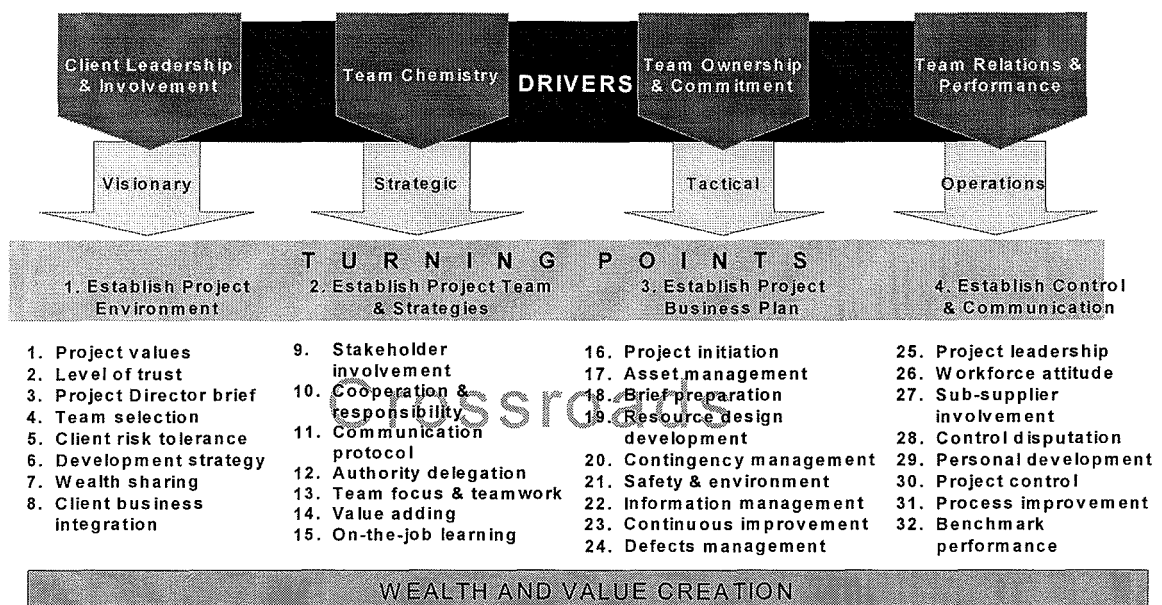


3.5 ROADMAP TURNING POINTS AND CROSSROADS

The roadmap Turning Points and crossroads are shown in figure 4 with a summation of drivers having most impact on each turning point. The direction from the four Turning Points is determined at 32 *crossroads*. At each crossroad, a decision must be made which determines the business scenario the project is likely to realise, and thus whether wealth is to be created or eroded.

For instance at the first Turning Point the client faces crossroad decisions on establishing the project value system, appointing the client representative, and determining a risk tolerance level.

Figure 4 Project Drivers, Turning Points and Crossroads



Primary responsibility for decisions varies at each Turning Point (TP).

At TP 1, the *client leadership team* (eg Board of Directors, head of Department) will determine the project environment, and usually hand over day to day responsibility for the project to its Project Director (or Client Representative), the person who is perceived by the supply team to be the most senior client representative involved in the project.

As the Client Project Director appoints the supply team, strategic decisions at TP 2 are taken by that person and the senior management of the appointed supply team, primarily design consultants, external project managers, and construction contractors.

The detailed design, planning and construction programming decisions involved at TP 3 are the responsibility of the *project managers* of the design consultants, head and trade contractors.

Implementation of decisions at TP's 2 and 3, and those involved in TP 4, are the responsibility of the supply team project managers, but cannot be effectively made without the involvement of *supply team supervisors* e.g. foremen, leading hands, project architects and draftsmen.

3.6 USING THE PROJECT ROADMAP

The Roadmap allows clients, constructors and designers to replicate excellence and create more wealth. Facilitated workshops are used to:

- Develop project service delivery strategies;
- Assist in choosing between short-listed contractors and consultants;
- Develop project business plans.

The *Projects as Wealth Creators* study demonstrated that trust, values, equity and risk assignment are key determinants of the project environment created by the client, which is the first Turning Point of a project journey. Once that project environment has been established it is vital that as team members are selected, lack of trust, inconsistent values and differing approaches to equity and risk management should be avoided or corrected from the outset to ensure the required project environment is maintained.

To optimise asset service delivery strategies, and team selection, all members of the existing client team must be able to articulate a clear and consistent description of the attributes of the project environment, i.e. the values and approaches which will drive them, and the project.

This is best achieved by the client team being briefed on the decisions at Turning Point 1 as a group, including a briefing on the roadmap concept and how it is used to select the contractor.

Two examples of the choices confronting project teams at Turning Point 1 are shown in figure 5.

It is acknowledged that using the roadmap to design a project delivery strategy is only the first step and that if project team members do not 'walk the talk' then performance improvements will not eventuate. Since completing the roadmap post-completion reviews of 6 lesser performing projects have been undertaken which validated the 'business as usual' crossroads decisions.

Figure 5 Crossroad Examples

CROSSROADS	ALTERNATIVE DECISIONS
Client risk tolerance	<div data-bbox="671 495 820 696" style="text-align: center;"> </div> <hr/> Risk management shared by all team members regardless of contracted responsibility. <hr/> Risk allocated to supplier only if able to control it. Formal risk management workshop held. <hr/> Price negotiations consider risk allocation responsibility. Risks are identified. <hr/> All risks are contracted out (risk averse).
Project director brief	<div data-bbox="671 725 820 927" style="text-align: center;"> </div> <hr/> Inspire visionary achievements <hr/> Provide equitable leadership <hr/> Contract limits relationship development. <hr/> Provide inequitable leadership

A workshop simulation of the decisions required at TP 2 (Establishing Project Team and Strategies) is then used to determine the optimum asset service delivery strategy, and matching consultant and contractor team selection. The roadmap provides a detailed framework against which:

- Attitudes, values and approaches of potential project team members can be assessed,
- The extent of alignment (or misalignment) with client team members' attitudes, values and approaches can be tested.

The Turning Points pose decisions and dilemmas at strategic crossroads, which can be tested in a workshop, rather than on the project when the team has been selected, and it is difficult, costly or impossible to change the team.

The real-world nature of crossroad decisions enhances the relevance of the workshop, reinforcing the 'stickiness' of the decisions made and relationships forged during the workshop.

4. CONCLUSION

This research has demonstrated that a project delivery strategy can be designed using the Roadmap to replicate excellence in project outcomes. Such strategies create a trusting project environment, which allows lean construction techniques to be more effectively and efficiently applied. This is currently being demonstrated on an A\$80 million project being developed by one of Australia's oldest contractors which has previously resisted applying lean construction techniques. The trusting project environment, created through applying the

roadmap, has been credited with being the 'trigger' for applying lean construction during both design and construction, resulting in significant cost savings.

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