The author has been facilitating partnering relationships in Hong Kong construction for 7 years providing more than 200 workshops that have frequently included value management and risk management to help teams leverage the benefits of cooperation and achieve optimum performance. The paper describes key aspects of building cooperative relationships and in combining the facilitation of partnering, value management and risk management to make best use of the project team’s limited availability for workshops. It includes examples, from the author’s own experience, of improvements made at the project level and poses questions about the greater gains which could be available through reform of structure and processes at the industry level.

INTRODUCTION

John Carlisle Partnerships (JCP) has provided partnering, value management and risk management consultancy services for more than 90 Hong Kong construction projects. Wherever possible these services are provided in combination because of the benefits of team working and the possibility of overlapping and integrating the subject areas, and the continuity in facilitation style. As a simple example, partnering behaviours learnt in the first workshop can be reinforced in the value management and risk management sessions that follow. New ideas surfacing in the value management workshops can be immediately reviewed for risks and included in the risk schedules and risks identified as having a positive impact on a project can be developed as a value engineering solutions.

Demanding project schedules result in project team members working long hours under stressful conditions. It is therefore incumbent upon management and facilitators to help these teams make best use of their available time. Partnering, value management and risk management are often viewed as separate disciplines but have many common features not least the use of workshops to get best results. By combining these techniques and using the same facilitator, project teams can significantly reduce the time needed to get optimum results. Starting with partnering and then moving on to value and risk management can for most projects reduce the time need for the latter two workshops and for the reviews all three techniques can be used in a single event. For small projects it is possible to cover all three topics at the outset.

There is growing evidence to show that where project teams are willing to invest time in these services, performance in terms of quality, cost and time outputs can be improved by up to 10% compared to projects where these techniques have not been used. This has been achieved by MTRC on the Tseung Kwan O Extension and other projects and is consistent with the research on project partnering undertaken by the University of Reading in the UK. For the Tseung Kwan O Extension, the return on
investment in partnering, value engineering and risk management was estimated at 3,000 percent.

Much bigger gains are possible however if there is a willingness to reform the high level processes that contain much of the waste in the delivery of Hong Kong construction projects. The traditional processes of procurement and project management and supervision offer two examples where there are significant amounts of work and duplicated effort providing questionable benefit to the end customer. It would be helpful to undertake a cost/benefit analysis for traditional competitive tender taking into account the significant sums that are spent by consultants and contractors in bidding and the lost opportunities for better value through early involvement of contractors. It would also be worth looking at the duplication of roles across the client, consultant and contractor management teams and which results in additional bureaucracy with questionable value added. If that is done, it may not be too difficult to envisage how significant improvements in quality and savings in cost and time (30 percent) can be achieved as they have in the UK alliance and strategic partnering relationships facilitated by JCP and in others studied by the University of Reading.

Such step changes require not only fundamental reforms in the structure and processes that have been used decades but also fundamental changes in mindset, the latter perhaps being the most challenging. Client organisations often have more difficulty than their suppliers in making the change because of their perceived need for ‘control’. If they can learn to ‘let go’ and trust their suppliers more, the end customers and the industry can reap the benefits of waste reduction.

RATIONAL AND EMOTIONAL MANAGEMENT

As Monk and Major explained in their paper given at the Hong Kong Institute of Value Management conference in 2005, for projects to improve in terms of their risk and value management, project managers must come to understand that these processes cannot wholly be managed by focussing on improving technical skills. While the processes are important and necessary they need to be underpinned by measures that connect with the emotional side of project life. This includes cooperative ways of working built on a foundation of mutual trust; a commitment to achieving a common aim and an enabling environment built on a spirit of continuous improvement.

The relationship between rational and emotional management is simply explained by Grinnel’s ‘House of Performance’ model where emotional management provides the foundation to rational management and all the technical project management tools that we know so well. He explained that the quality of outputs in terms of the services and products is dependent on the quality of information provided for individuals to do their job. The quality of the information received depends on the quality of relationships that in turn depend on perceptions and the underpinning beliefs of team members and organisations.

Project managers on the whole are not so well equipped with the soft skills needed for effective relationship building learning them through experience rather than through any formal system of training. Partnering can provide an opportunity for this learning through the coaching of behavioural skills and accelerate progression through the team development stages of forming, storming and norming to performing, the latter being the most productive.
Hierarchal vs System Thinking

Fundamental to this learning is the understanding that behaviours are subconsciously influenced by the belief system, which is based on past experience. The belief system in Hong Kong construction is based on ‘Hierarchical Thinking’, which for historical and cultural reasons is stronger than in the UK or Australian construction industries where improvements based on cooperation have been able to move at a faster pace.

Most people view project teams as rigid, bureaucratic hierarchal structures, which is in fact a mirror image of how people view organisations. Roles and titles convey status and power; the flow of information is tightly controlled through policies, processes and procedures and decisions and instructions are typically passed down.

This leads to waste at the interfaces between organisations in the supply chain due to control measures and duplication of resources resulting from a lack of trust in others to do their job well. The low risk mentality and preference not to question existing procedures for value prevents the early involvement of suppliers that can add value in the design stages. Until recently 80% of contracts in Hong Kong were let on a lump sum basis even when there were considerable risks of design development that could lead to change. The UK industry has moved way from this form of contracting on the basis that it did not provide best value.

More recently there has been a significant increase in the use of design build contracts first by Architectural Services Department and then Highways Department and Kowloon Canton Railway Corporation. The design build approach enables more early involvement of contractors within the constraints of the Government competitive tendering procedures leading on the whole to better time and cost performance. The Castle Peak Road Improvement project from Ka Loon Tuen to Siu Lam is an excellent example of what can be achieved through a design build approach to highway construction and by a client team that is prepared to get the best out of partnering by actively encouraging the team to pursue opportunities to save time and cost.

It may not however always be the best option particularly for projects where there is a high degree of uncertainty with the prospect of change from emerging site conditions and client requirements. In this case the incentivised target cost approach being pioneered by MTRC may be the best option. It could also be worthwhile considering the use of more construction management, which is popular in the USA and is currently being used on at least one of the major casino projects in Macau.

In ‘System Thinking’ as promoted by Deming, organisations working in a supply chain are enabled by senior management to continuously improve the way they work together in pursuit of meeting the needs of the end customer and driving waste out of the system. These integrated supply chains although involving many different companies can become much more efficient than traditionally assembled teams particularly in long term relationships.

<table>
<thead>
<tr>
<th>Hierarchical Thinking</th>
<th>System Thinking</th>
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<tbody>
<tr>
<td>Preference not to trust</td>
<td>Openness and sharing of information</td>
</tr>
<tr>
<td>Emphasis on controlling others in the hierarchy and by extension in the supply chain</td>
<td>Emphasis on supporting others in achieving the mutual objectives</td>
</tr>
<tr>
<td>Focus on rules and procedures</td>
<td>Enabling management to do what is best for the project</td>
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Table 1: A comparison between hierarchical thinking and system thinking
- Avoidance of risk taking and responsibility
- Lack of willingness to share information or resources
- Primary focus on pleasing the boss
- Tendency to blame others when things go wrong
- Lowest price by competitive tender
- Short term relationship

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<tr>
<td></td>
<td>Taking a risk to bring improvement by challenging inefficient ways of working and problems solving</td>
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<tr>
<td></td>
<td>Primary focus on the needs of the end customer</td>
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<tr>
<td></td>
<td>Joint problem solving</td>
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<tr>
<td></td>
<td>Lowest cost by waste removal</td>
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<td></td>
<td>Long term relationship</td>
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The MTR team structures for Nathan Road Station Extension and the Tung Chung Cable Car are approaching the ‘system thinking’ model. Main contractors’ are also realising the benefits that that integration can bring. The Necso and VSL (5) teams for Lai Chi Kok Viaducts have eliminated duplication in this key part of the project but this could only come about by Necso taking the risk of bringing VSL in at bid stage as their partner and by not seeking competitive bids for the erection of pre-cast units.

Changing the paradigm is of course easier said than done and requires everyone to take a risk in doing things differently from how they have worked in the past. In particular senior management need to break the cycle of mistrust and reward people’s willingness to engage in improvement initiatives. The biggest challenge is to give up the practice of choosing contractors on the basis of lowest cost and applying penalties for failure and to choose them primarily on the basis of ability with incentives for success because in an integrated team this gives the best opportunity to drive out waste.

The Dragages and Bauer teams on East Tsing Viaducts agreed a risk-sharing package to incentivise mutual support in overcoming the typical problems that arise between main contractors and piling subcontractors.

**MAXIMISING VALUE - MINIMISING RISK**

**Value management**
It is surprising that members of construction project teams are often reluctant to organise or take part in value management workshops even when they are frequently amazed by what can be achieved. Perhaps it is the very tight programmes and subconscious belief that working harder (rather than smarter) will eventually bring success.

Bringing the key stakeholders together in a well-facilitated value management workshop enables a common understanding of the needs and constraints of each party and a crystallisation of the objectives or value drivers. Where there are alternative solutions they can be judged and compared in a logical and systematic way so that there is consensus on the best way forward.

If the project manager or lead designer attempts to do this by communicating with the stakeholders’ representatives separately or through meetings, the same process can take weeks if not months and still not provide the same level of consensus and understanding.
VALUE = \frac{\text{SUM of BENEFITS}}{\text{SUM of SACRIFICES}}

This definition of value appeals to engineers because it is a mathematical interpretation and because it includes the intangibles that a more strict focus on function can omit. A rigid interpretation of removing anything that does not contribute to function can result in a cost cutting exercise with important aesthetic and other less tangible but important benefits being stripped out and the end user being dissatisfied.

The value drivers established for Western Expansion of University of Hong Kong established during a value management workshop to review the feasibility study were as follows:

- Raise University Profile
- Enhance the University position as premier tertiary institution
- Operate the whole campus an integral and harmonious facility

It is difficult to put a monetary value to these but by using them the team were able to take out HK$200M in unnecessary cost and answer some fundamental questions about the design that the architect had been struggling to resolve for several months. The workshop took less than one day.

Interestingly the same functional analysis approach that is used to examine elements of the product can also be used to examine elements of the project management processes across the supply chain and question non-value adding activities.

For example, the team building the MTR Disney Line train reviewed and streamlined the design and material submission process, which were critical path activities, in the value management workshop. One of the ideas was to share inspection visits to production plants in Europe, only one party needed to go and inform the other of the results. This works well where there is trust and respect for each parties knowledge and ability but means taking a risk in departing from traditional practices where both parties would undertake the visit.

**Risk management**

Risk management is about forward thinking, trying to predict the uncertainties that surround a project and to mitigate their impacts and thereby reducing the amount of crisis management that can typically occur. It is important to remember that the risks identified can have a positive as well as a negative impact so the process can draw out opportunities as well as threats and the team should be encouraged to maximise the opportunities as well as minimise threats. The earlier this can done in the project cycle the better is the return on investment in time and effort. It is also important to include all key stakeholders.

Risk workshops held at feasibility or concept design stage have the benefit of:

- Clarifying objectives and establishing a common understanding of the constraints
- Pooling knowledge and awareness of threats and opportunities
- Jointly agreeing a response which will enable design and planning to minimise threats and maximise opportunities
- Agreeing ownership the risks identified
Enabling the sponsor to become better aware of the risks and better able to weigh these against the benefits when making the decision to proceed or not.

Risk workshops held at check points in the project cycle provide an opportunity for new and existing members of the team to review the risk register and take a fresh look forward taking account of risks which have passed and those which are emerging. These reviews can be usefully combined with value engineering workshops and provide an ideal opportunity to build the partnering spirit.

Cooperation and trust develops through joint problem solving and the fair allocation of risk and reward. By allocating risk within a contract to the party best able to foresee and manage the uncertainty, clients can send a strong message of their intention to cooperate. Establishing a procedure to share gains from opportunities provides an incentive for all parties to achieve the win/win outcome and build a relationship that can withstand the negative impacts.

During the design of Shatin Heights Tunnels the designers identified the risk of slope destabilisation along Tai Po Road that run above the tunnel. Vibration from blasting was specified at a level that would minimise this risk. At the time of commencement of the tunnelling, landslip preventive measures being planned by Geotechnical Office were well advanced and it was possible to reassess the risk. Within the partnering framework, Civil Engineering Department, the consultants and the contractor reviewed the specified vibration limits and worked together to persuade other Government Departments to accept an increase in the explosive charge. The result was a doubling of the excavation rate. The team caught back time lost due other negative impacts and completed on programme with virtually no outstanding claims.

Time and cost contingencies derived from a rigorous risk analysis offer a much more logical basis for budgeting and control than the old ‘rule of thumb approach’ to allocating percentages according to the stage of design development. With some lateral thinking they can also be used to provide incentives. The idea of creating a shared risk fund on some of the MTR Tseung Kwan O Extension projects was highly motivating to the contractors and MTR teams.

VALUE ENGINEERING THE WORKSHOPS

Most construction project teams work very hard and very long hours. The partnering, risk and value management processes can bring considerable benefits but only if they are used as a sequence of activities starting as early as possible in the project cycle and then reviewed at each stage. It is therefore incumbent on the facilitator to value engineer these processes to make best use of the project team’s valuable time. The relationship between these activities can be viewed as follows:

<table>
<thead>
<tr>
<th>Technique</th>
<th>Area of application</th>
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<tbody>
<tr>
<td>Common to all three</td>
<td>Establish common understanding and agreement of the project objectives and constraints. Identify key performance measures and link these to incentives.</td>
</tr>
<tr>
<td>Partnering</td>
<td>Build the relationships; develop leadership and behavioural skills to enable the early development of cooperation and trust.</td>
</tr>
<tr>
<td>Value management</td>
<td>Systematic examination of the product and the processes to</td>
</tr>
</tbody>
</table>
and value engineering | maximise benefits and minimise sacrifices.
---|---
Risk management | Systematic prediction of uncertainties. Planning to mitigate threats and exploit opportunities.

Depending on the size of the project it can be possible to cover two or three of the subject areas in a single workshop particularly at the review stages when productive relationships have been established across the team and with key stakeholders. A suggested starting point is partnering to establish the mutual objectives, a common understanding of the constraints and a common understanding of how the team intend to work together. Establishing KPI’s for these objectives and linking these to incentives is good for teams with experience in partnering. Having built an understanding of the skills needed for success in a partnering relationship, the team can follow with value management or risk management depending on the needs of the project. Value management will be used to systematically examine and compare possible solutions against the objectives (value drivers) and where possible systematically examine the delivery processes to remove non-value adding activities. The facilitator needs to keep reminding the team of partnering skills, in particular those concerned with listening and understanding the needs of others, joint problem solving and helping others to exploit opportunities to save time or cost. Using risk management process to look ahead and predict uncertainties as a team ensures a common understanding of the risks and enables joint problem solving in the development of strategies for risk mitigation or exploitation opportunities.

The benefits at each stage of a project can be summarised as follows:

Table 3: Benefits of Partnering, Value Management and Risk Management at each Stage of a Project

<table>
<thead>
<tr>
<th>Project Stage</th>
<th>Benefits for the Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
<td>Common understanding of the business case and the associated risks.</td>
</tr>
<tr>
<td>Concept</td>
<td>Identification of the high level option to be developed to meet the project objectives, delivery strategy and performance measures.</td>
</tr>
<tr>
<td>Procurement</td>
<td>Selection of optimum procurement route</td>
</tr>
<tr>
<td>Preliminary Design</td>
<td>Maximum value and minimum risk for the project options</td>
</tr>
<tr>
<td>Detailed Design</td>
<td>Maximum value and minimum risk for the design details</td>
</tr>
<tr>
<td>Delivery</td>
<td>Incentives for management, designers and trade contractors</td>
</tr>
<tr>
<td>Project Completion</td>
<td>Performance review, evaluation and feedback</td>
</tr>
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CONCLUSIONS
Partnering, value management and risk management can bring significant benefit. Hong Kong project teams work very hard to meet demanding schedules and it is difficult for teams to give the time and effort necessary to follow to implement each of
these processes properly. There are however many common features to each of these processes and they can be combined and used to compliment each other to minimise the team inputs but maximise the gains.

A similar approach can be used to improve processes that have been traditionally used but result in waste through duplication of effort or non-value adding activities across the supply chain. Clients need to take the lead but this involves taking risk in changing procurement and supervisions processes amongst others and trusting the supply chain to provide the better value and performance that is possible.

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