



“RIVANS for TAM” WORKSHOP

RELATIONALLY INTEGRATED VALUE NETWORKS FOR TOTAL ASSET MANAGEMENT

Library Extension Building, HKU, Room LE2

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1 INTRODUCTION TO RIVANS FOR TAM

“Relationally Integrated Value Networks” (RIVANS), a recently completed Hong Kong Research Grants Council, General Research funded project, identified ways forward for achieving desirable integration and collaboration, together with the desired enhanced overall value by strengthening relational forces within client-led supply chain networks in Infrastructure Project Management (IPM).

With construction clients and the industry increasingly targeting end-user satisfaction, sustainable buildings, lifecycle costs, designing/constructing for maintainability and for deconstruction, interactions and relationships between IPM and Infrastructure Asset Management (IAM) teams must also necessarily increase. This current R&D exercise thus aims to extend the concept of RIVANS to encompass both IPM and IAM, i.e. to Total Asset Management (TAM). RIVANS for TAM envisages a holistic, inclusive and coordinated approach to managing infrastructure; visualising the stakeholders as one comprehensive relational network straddling the entire asset life cycle; and identifying and pursuing overall common value objectives. For this, RIVANS for TAM aims to develop a theoretical framework to underpin the core concepts and operational principles, as well as good practice guidelines to strengthen such networks for delivering and operating more sustainable infrastructure over its whole life.

2 WORKSHOP BACKGROUND AND PARTICIPANT PROFILE

2.1 Workshop Foundation & Objectives

This Workshop was organised as part of the HKU seed-funded research project entitled “Relationally Integrated Value Networks (RIVANS) for Total Asset Management (TAM)”. The Workshop brought together industry practitioners to discuss, brainstorm and formulate strategies for the industry to promote and facilitate the appropriate integration of IPM and IAM teams where useful, through bridging and synergising the Project Management supply chains (in Planning, Design & Construction) of built infrastructure with those in their Asset Management (Operations & Maintenance and possible later revitalisation).

2.2 Participants

The RIVANS for TAM workshop brought together 30 experts with substantial experience in design and construction (D&C) and/or operations and maintenance (O&M).

3 WORKSHOP FORMAT

3.1 General Format

Presentations from HKU (HK), University College London (UK) and National University of Singapore introduced concepts of RIVANS and interim findings from ongoing studies in Hong Kong, UK and Singapore. General discussions among all workshop participants were followed by a briefing and group brainstorming within three groups on specifics. The presentation of each group’s conclusions was followed by consolidation discussion, closing remarks and lunch.

3.2 Group Discussions

Participants were divided into 3 groups, with each group brainstorming for 60 minutes on a specific theme. The three themes were: i) Identifying and Pursuing Common Values between “Design & Construction” and “Operations and Maintenance” Teams; ii) Restructuring of Supply Chains and Changes Needed in Procurement Systems for Promoting Integrated Value Networks; and iii) Changing Industry Culture, Norms and Mindsets. This session aimed at isolating and developing important issues in relation to the group theme and related areas; and formulating a consensus on these issues. A chairman facilitated the group and a ‘recorder’ assisted in noting down the key points discussed and concluded. A ‘rapporteur’ presented a summary of the respective Group outputs at the ensuing combined consolidation session. The overall findings, as obtained from both the Group recorders and the combined consolidation session outputs, are summarised in the next section of this report.



4 WORKSHOP OUTPUTS SUMMARY

The following summary seeks to capture the essence and commonalities in the general and group brainstorming discussions.

4.1 Drivers

- Clients are in a good position to bring together all the parties involved. All consultants and contractors want to do a good job to satisfy their clients and establish a good reputation within the industry. For example, contractors want to build a good relationship with a client to continue winning jobs and also maintain a good portfolio to show future clients. It is important to demonstrate to clients the importance of involving all the stakeholders early, including O&M teams. Furthermore, top management dedication and support is critical in team integration. Specific examples of re-work and extra time and costs involved due to not including O&M teams were cited. Such examples or even a collective database should help alert clients to this imperative.

4.2 Diverging Goals/Objectives

- Consultants may wish to design unique showcase projects to build their image and reputation, while contractors may wish to finish the job on time and save money. For the operators, maintenance and facilities management teams, they are focused on issues like business continuity and safety so they will try to slow things down and think more about the consequences of decisions. In general, the performances of D&C teams are measured by speedy delivery of a project so they see the O&M teams as slowing them down. These repelling forces will make it difficult for these respective parties to come together.

4.3 Value, Classification of Assets and Evaluation Criteria

- The type of asset must be defined before the type of value can be discussed and ideally, this should be clearly stated together with other details of the business in the “Facility Brief”. After this definition has been outlined, we can then think of how to break down into the details and components, and the value associated with these parts.
- “Usability” should be included as part of the evaluation criteria when talking about value (e.g. airport – there is still a need to break down into usability for different types of end users: retailers, travellers, airline staff, security personnel, etc.).
- The mindset should be for D&C and O&M teams to think about how to unlock existing value together. For example, the location of an E&M control room can be shifted to a more convenient location on site to enable easier access and greater efficiency of O&M staff. D&C teams need to think more about how to improve facility management.



4.4 Life Cycle Assessment

- The parties that own a stake in the Return on Investment (RoI) of the whole project are crucial in bringing together the various stakeholders, and they would be the ones accountable for the whole life cycle of the project.
- When assessing the life cycle of a project, it is important to categorize or differentiate various sectors. For example, the life cycle for retail building interiors (~5 years) would be much shorter than that of most general infrastructure. Therefore, the RoI for infrastructure would be much longer.
- Clients and designers need to be aware of future technological trends and associated costs for upgrades. It is often difficult to convince a client to adopt/use/purchase equipment or components that are not widely used at the time of design but will become more popular several years after project completion.

4.5 Knowledge/Information Management and Building Information Modelling (BIM)

- The value for maintaining relevant knowledge bases is evident. For example, when there is doubt about the original thinking or interpretation on a particular element, it would be useful to revisit the BIM system. There has been experience in past projects where misinterpretation of project information led to consultants having to redesign the layout for a part of the project after directly involving O&M staff (early involvement of the O&M team would have avoided the problem). It can also help when additions to existing buildings need to be made or have been planned. This can be achieved more easily and effectively if records from early on in the project are made available.
- It is important to capture knowledge and lessons learned after project completion to more effectively make use of resources, as opposed to reinvesting in the system for different projects as some of the information is repetitive and recurring. Having D&C and O&M each developing and using their own BIM systems (albeit in a thereby limited way), would be a waste of time and resources. It would be ideal for the client to commission and own an integrated BIM which should also be valuable after the project, but the cost of which has to be built into the contract.

4.6 Procurement, Contracts and Selection Criteria

- The alignment of objectives among various stakeholders is constrained by contractual agreements, which generally protects the client, while contracts in general are not geared towards end-users. Furthermore, current procurement systems do not encourage cooperation since tender price is still the key determinant of the tender assessment. It was proposed that design contracts can be extended to cover the operations and maintenance stage to encourage better consideration of O&M needs. Similar 'carrot / stick' (incentives / penalties) type responsibility 'extensions' to other phases of the life cycle may be needed to motivate other stakeholders too.



- The tendering strategy can be used to balance capital and maintenance costs. For example, the first contracted package would be for capital works, while a separate maintenance contract can be signed by the facilities management department for maintenance, operation and information technology works.
- NEC is one of the increasingly promoted contractual partnering approaches to building non-contractual relationships. NEC is predominantly used in D&C contracts, but not yet adopted in O&M.
- It was proposed that new requirements and corresponding criteria for selecting consultants can be introduced (e.g. in Whole Life Value Management proposals and Operations and Maintenance proposals).
- Previous experiences from the UK and elsewhere on Private Finance Initiative (PFI) and Public Private Partnerships (PPP), which involve design and build, as well as operations, can serve as a good backdrop for RIVANS for TAM, since the concepts, practices and lessons learned may be adaptable to the non-PPP scenarios as well. In PPP, the process is necessarily and contractually integrated, complex and involves many stakeholders, thus making team integration a critical success factor.

4.7 Public Accountability

- Public consultation has become more common in public projects, and public accountability is a key concern. Because of this, there is less willingness to take risks with new ideas or innovative approaches without explicit approval from senior management. This leads to a lack of creativity and innovation. To further complicate matters, cross-departmental issues are a significant barrier in public projects. It was proposed that end-users should be more actively involved in the project inception stage.

4.8 Organisations Engaged in both D&C and O&M Works

- Organizations engaged in both D&C and O&M works serve as good examples for the rest of the industry when it comes to integration of teams because both teams are working with the same common goals and understand the overall budget. The major focus and concern in these organizations is “function” and the ability of the built infrastructure to serve the intended purpose(s). O&M staff in this type of organization can provide practical, constructive design input as well as help to provide a more accurate estimate of the O&M costs after the project has been completed and goes into service. Such organisations can serve as a test bed for this type of feedback mechanism.
- Despite the advantages of having D&C and O&M under the same roof, one participant from an organization with such a structure reflected that challenges remain in the need to reconcile conflicts between the D&C team (who aim to move faster with the project) and the O&M team (who wish to inject more items/provisions into the design). This highlights the probability of even greater challenges and difficulties in resolving conflicts between the two teams when they are not part of the same organisation.



- Some public bodies may prefer to even spend somewhat more on capital works (CAPEX) due to uncertain budgets for later recurrent expenditure (e.g. government departments are less certain of money available for later maintenance works; in public transport, there is an uncertainty of whether future/planned fare increases will be approved by the legislative council). On the other hand, this focus on reducing maintenance costs could lead to good practices, and possibly innovative and more sustainable designs, which may translate into useful lessons learned, for the private sector as well.

4.9 Human Resources Capacities and Mindsets – Redefining and Universalising 'Whole Life Systems Engineering'

- Clients in general are concerned about the functional integration of IPM and IAM. However, clear demarcation exists between IPM and IAM teams, with insufficient linkages between the two.
- Cross training and rotational schemes (wherever appropriate and suitable) would be helpful in helping IPM and IAM teams better understand each other (i.e. allocating D&C personnel to work in O&M for a given period and vice versa).
- The specialization of professionals in a project leads to these professionals focusing on their respective key concerns, rather than the wider scope of the project. In current procurement modes, there is insufficient time and incentive or professionals to take actions to look after the needs of other professions involved in other phases of the project. To address this, a new discipline/position was proposed by one group to facilitate the desired overview, such as: Value Management Engineer, Integration Engineer or Life Cycle Engineer. At the consolidation session, it was asked if a 'systems engineer' could serve this expanded function, especially if his/her scope was suitably re-defined to span the life-cycle. It was also added that everyone on the team should develop this 'whole life systems' mindset, so that everyone could effectively be such an 'integration', 'life cycle' or 'whole life systems' engineer in whatever they do.



5 FUTURE DIRECTIONS & POTENTIAL COLLABORATION

Suggestions and comments are welcome, especially those based on similar experiences and/or initiatives that may be compared. Please send suggestions or expressions of interest (for comparisons or participation), to Prof. Mohan Kumaraswamy: mohan@hku.hk

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CENTRE FOR INFRASTRUCTURE & CONSTRUCTION INDUSTRY DEVELOPMENT

The Centre for Infrastructure & Construction Industry Development (CICID) is based in the Department of Civil Engineering of The University of Hong Kong, and was established in November 2002. The aims include fostering continuous improvements, while targeting excellence in the construction industry in general and infrastructure development in particular, through the development of innovative strategies and techniques. The Centre aims to establish close links with the industry and other research institutes through collaborative research and consultancy. Those interested in joining CICID activities may contact:

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