

Applying value analysis techniques to optimise the selection of project requirements in construction briefing

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The 9th International Value Management Conference (IVMC08)
InterContinental Grand Stanford Hong Kong, Hong Kong.
29 Oct – 1 Nov 2008



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SUPERCARS.net

Answers!

STOP DREAMING

Best is always is the best!

Is “the Best” **best for you?**





SCARCITY

Limited resources
to
satisfy unlimited needs



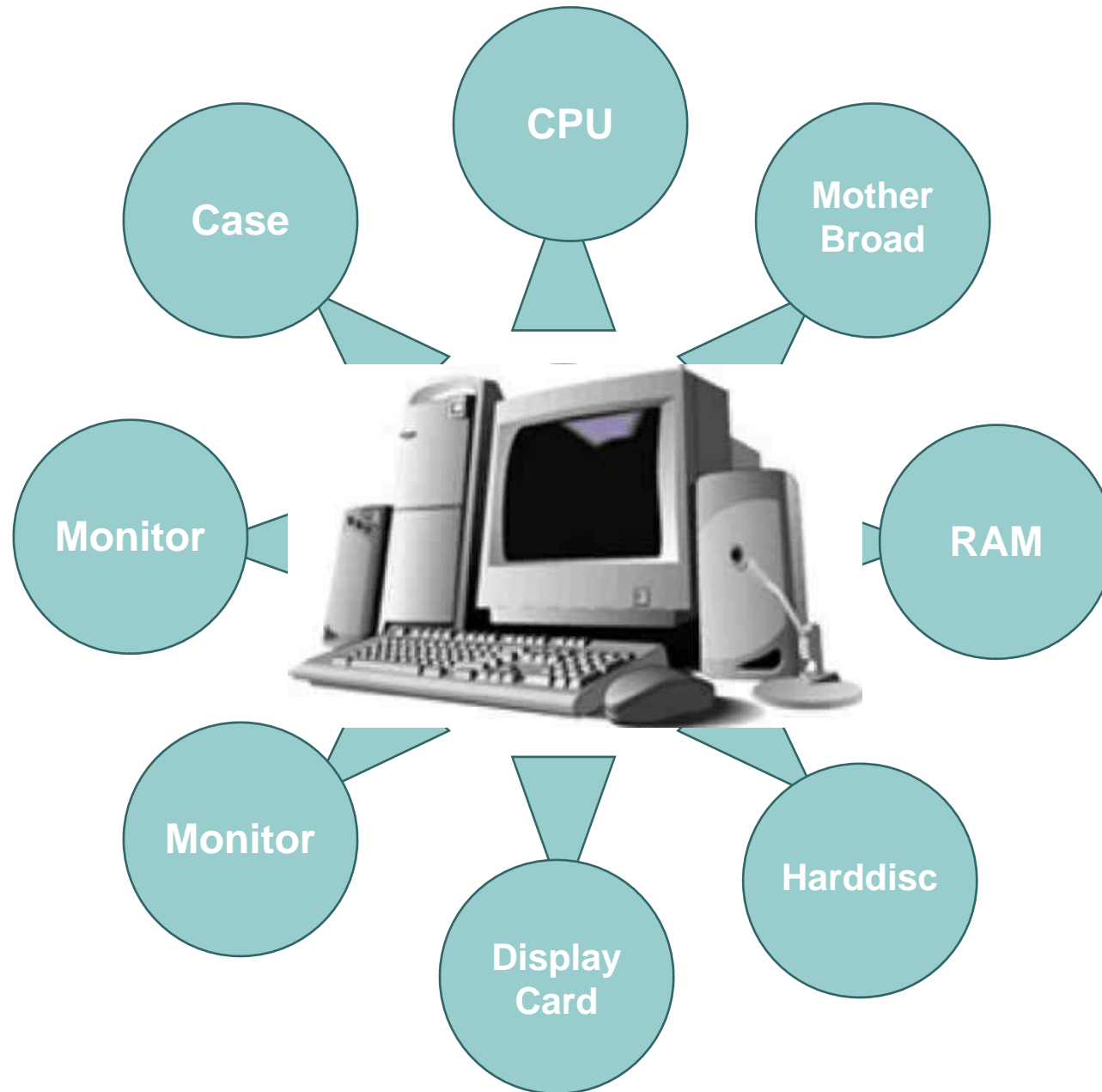
A PARADOX

The best
quality one

vs.

The best
value for you





Objectives

Introduces a new approach to applying **value analysis techniques** originating from VM, to **project briefing** so as to achieve value improvement.



Outline

What is construction briefing?

How to apply VA to select requirements?

What are the procedures?

What are the potential benefits?

Conclusions



INTRODUCTION



Construction Briefing

- **Strategic Brief** is the statement of the broad scope and purpose of the project and its key parameters including overall budget and programme (CIB, 1997).
- **Project Brief** is the full statement of the client's functional and operational requirements for the completed project (CIB, 1997)



VM Applications in Briefing

- SMART value management for building projects (Green, 1994)
- VM case study for early project development (Hamilton, 2002)
- A technique for understanding the customer's project value criteria (**Kelly** and Male, 2002)
- A functional framework for capturing client requirements (**Shen** et al., 2004)
- A how-to-guide to value briefing (**Yu** et al., 2006)



VA APPROACH TO SELECT PROJECT REQUIREMENTS



Definition of Value

$$\text{Value} = \frac{\text{Function}}{\text{Cost}}$$



Observation

- Different project requirements carry different weights in terms of value
- “The ‘equal importance’ requirements do **NOT** have equal effectiveness.” (*Same function, same cost but different effectiveness - youth and elderly center*)
- “The requirements with ‘equal effectiveness’ do **NOT** cost the same.” (*Same function, same effectiveness but different cost - galvanized mild steel balustrade vs. glass balustrade*)



Idea

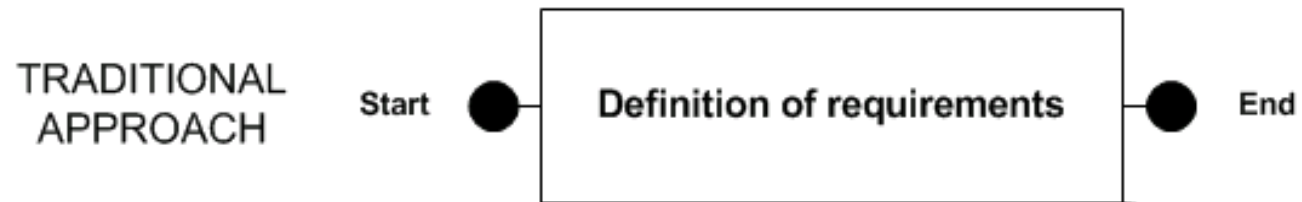
- the overall values of project requirements can be significantly **improved if the requirements with lower value can be clearly identified and downgraded** where less significant, or even removed where insignificant, after studying their relative values in detail.



A PROPOSED
VALUE METHODOLOGY



Value Improvement in Briefing



Relative Value Index

$$\text{Value} = \frac{\text{Function}}{\text{Cost}}$$

The level of “effectiveness” in achieving a specific project objective

$$= \frac{\text{The total “opportunity costs” of implementing this requirement}}{\text{The total “opportunity costs” of implementing this requirement}}$$



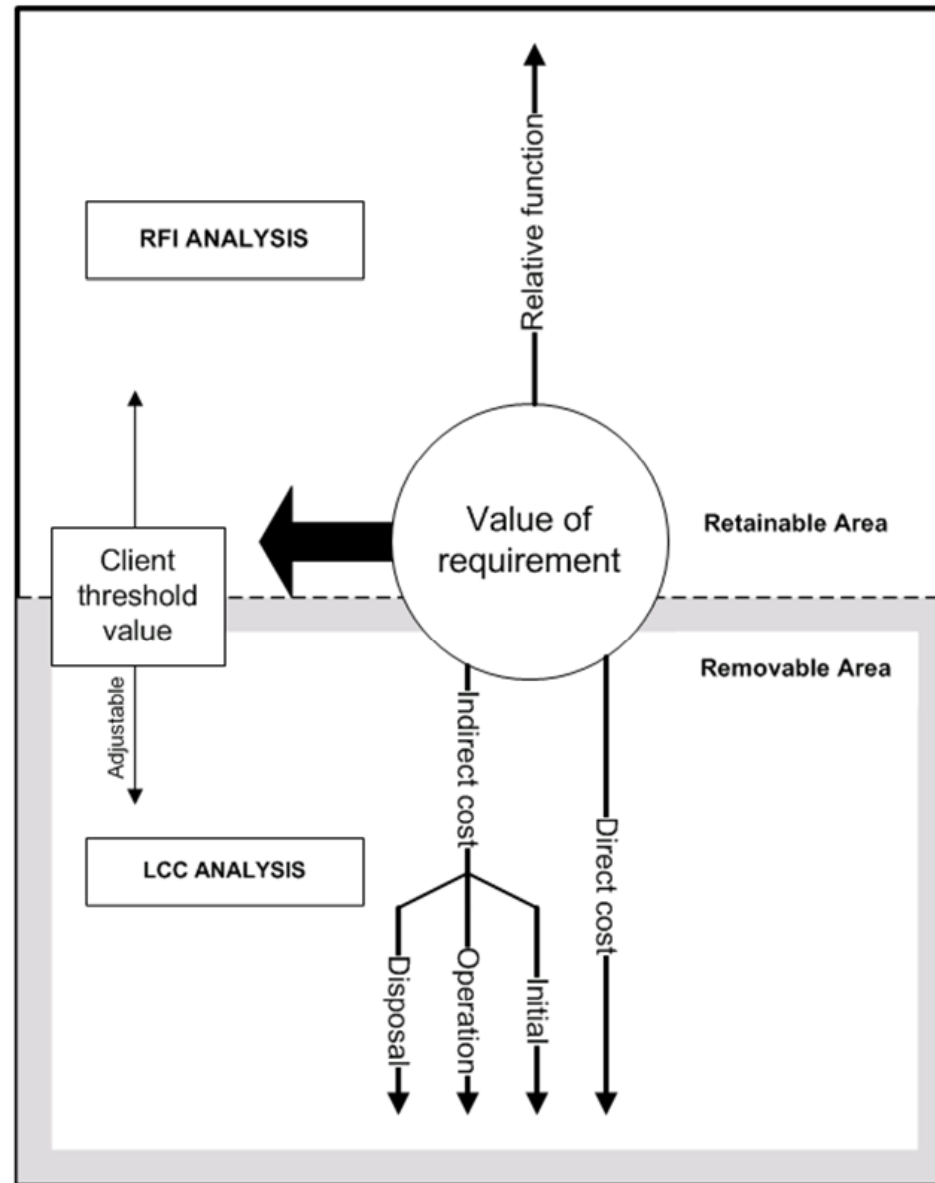


Figure 2 : A conceptual evaluation framework of project requirements



A. Relative Function Index

$$\text{Relative value index (RVI)} = \frac{\text{Relative function index (RFI)}}{\text{Life cycle cost index (LCI)}}$$

- Defining common objectives
- Rating of the requirements



(i) Common Objectives


Table 1 : Pairwise Comparison Matrix for common objectives

| Objective | A Time | B. Quality | C. Safety | D. Environmentally friendly | |
|--|--------|------------|-----------|-----------------------------|--|
| A Time | - | | | | |
| B Quality | - | - | | | |
| C Safety | - | - | - | | |
| D Environmentally friendly | - | - | - | - | |
| Total | | | | | |
| 4: Major preference, 3: Medium preference, 2: Minor preference, 1: Slight preference, 0: No preference | | | | | |



(ii) Scoring

Table 2 : Scoring table of the requirements



| ADOPT THE USE OF LOW ENERGY CONSUMPTION LIGHTING UNITS | |
|---|--------------|
| Objective | Score |
| A Time | NA |
| B Quality | 8 |
| C Safety | 5 |
| D Environmentally friendly | 8 |

1: Poor performance, 5: Fair performance, 10: Excellent performance,
NA: Not applicable



(iii) Weighting Evaluation

Table 3 : Weighting Evaluation Matrix for the RFI

| Factor | Score | Adjusted relative weighting | Weighted score | Total score (RFI) |
|----------------------------|-------|-----------------------------|----------------|-------------------|
| A Time | NA | 0.07 | - | 5.93 |
| B Quality | 8 | 0.36 | 2.86 | |
| C Safety | 5 | 0.50 | 2.50 | |
| D Environmentally friendly | 8 | 0.07 | 0.57 | |

Table 1

Table 2



B. Life Cycle Cost Index

$$\text{Relative value index (RVI)} = \frac{\text{Relative function index (RFI)}}{\text{Life cycle cost index (LCI)}}$$

- Defining cost items
- Rating of cost items



(i) Identification of Cost Items

Table 4 : A summary table of cost items

| | Direct cost | | | |
|----------|-------------|--|--|--|
| Examples | | | | |



(ii) Rating of Cost Items

Table 5 : Weighting evaluation matrix for LCI(BSI, 1995)

| Category | W1 | Type | W2 | Item | W3 |
|----------|-----|-------------|-----|-------------------|------|
| Direct | 0.8 | Initial | 0.4 | Installation cost | 0.3 |
| | | | | Time cost | 0.1 |
| | | Operational | 0.3 | Running cost | 0.2 |
| | | | | Maintenance cost | 0.1 |
| | | Disposal | 0.1 | Dismantle cost | 0.05 |
| | | | | Disposal cost | 0.05 |
| Indirect | 0.2 | - | 0.2 | Social cost | 0.2 |

10: Cost is extremely high. 5: Fair cost, 1: Cost is extremely low



C. Relative Value Index

$$\text{Relative value index (RVI)} = \frac{\text{Relative function index (RFI)}}{\text{Life cycle cost index (LCI)}}$$



C. Selection of Requirements

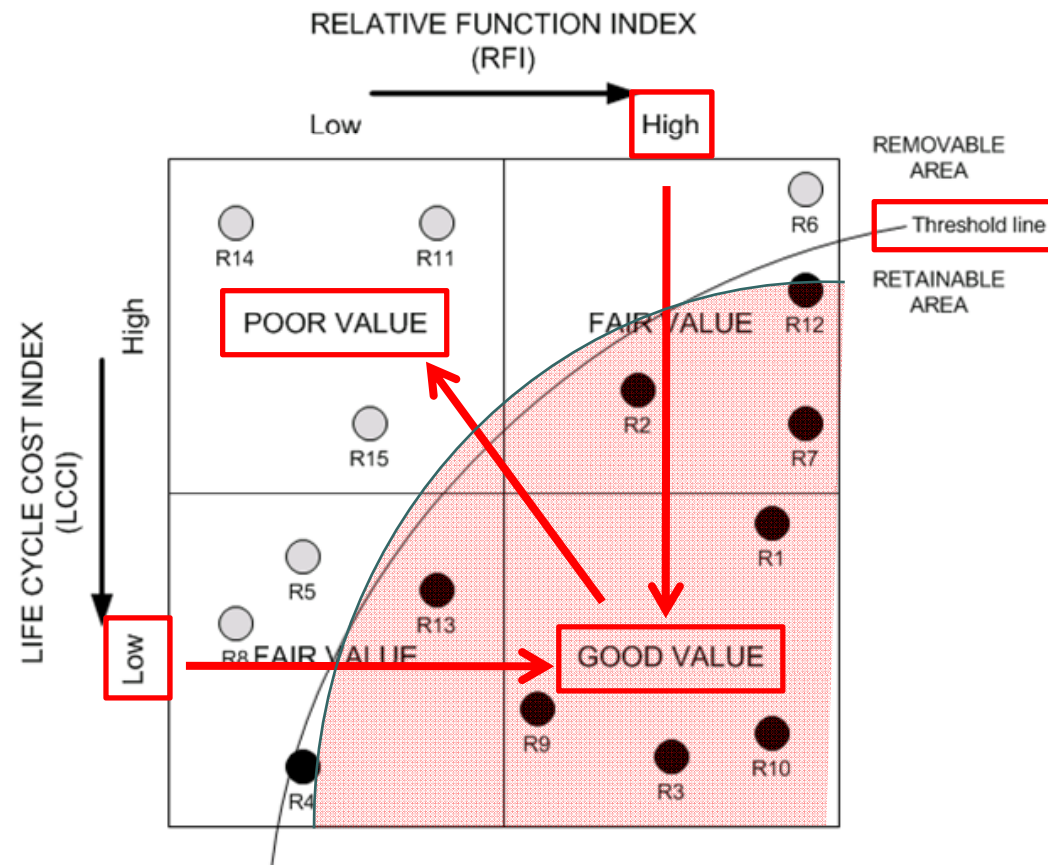


Figure 3 : Relative value index matrix



DISCUSSION



Key Benefits

- standardized value concept
- a step-by-step guideline
- the life cycle cost index
- a professional judgment approach



CONCLUSIONS



Conclusions

- introduces an **innovative concept** of ‘relative value index’ by comparing the ratio between a function index and a cost index to achieve value enhancements
- helps to capture comprehensive weighted **inputs of clients, designers and other stakeholders** which is expected to result in significant value enhancements in project briefs.



Further information

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Thank
You

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