

Comparative Study of Relationship Management in Design-Bid-Build & Design-Build Project Delivery Methods in Infrastructure Projects

1

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Outline

- Background - RM
- Objectives
- Methodology
- Results & Analysis
- Conclusions & Recommendations

Supply Chain Management

- ...integration to link process into a chain
-focusing on maximizing opportunities
- ...adding value while minimizing total cost.

Shift in mind-set toward collaboration,
teamwork & mutual benefits

Supply Chain Management

**Relationship
Management**

One of most important factors of efficient SCM

Embraces social capital

(Pryke & Smyth, 2006)

Supply Chain Management

Relationship
Management

RM in
Construction
SCM

Construction characterized by high
fragmentation

Emerging as a new CM paradigm

Relational contracts:

Collaborative procurement:

Team integration & PDMs



Supply Chain Management

Relationship
Management

RM in
Construction
SCM

Benefits:

- Time and cost savings,
- Trust,
- Motivation,
- Open communication, and
- Joint risk management

*(Bennett & Jayes 1998; Bresnen & Marshall 2000a;
Kumaraswamy & Matthews 2000; Wood & Ellis
2005; Wood et al. 2002)*

Supply Chain Management

RM as a SCM
parameter

RM in
Construction
SCM

PDM &
RM

***PDMs in construction** define relationships, roles, and responsibilities of parties and sequence of activities to deliver a facility....*

*.....while **RM** establishes & manages parties' relationships to remove barriers; encourage maximum contribution; and allow all parties to achieve success.*



Supply Chain Management

RM as a SCM
parameter

RM in
Construction
SCM

PDM &
RM

*Though dynamic nature of construction industry allowed for continuous implementation of **relationship-based systems through different PDM**, there yet remains a lot of room for improvement and development in this area....*



Supply Chain Management

RM as a SCM
parameter

RM in
Construction
SCM

PDM &
RM

Determine how RM within the construction SCM is influenced by PDM utilized in a construction project...

Three main objectives:

- (1) Identify relationship mgmt indicators to measure the relationship among project participants;
- (2) Identify parties involved in the processes and their interactions in different PDMs based on a construction supply chain perspective;
- (3) Compare RM of key suppliers based on the relationship indicators in projects with different PDMs.

Methodology

(1) Identify relationship matrix indicators to measure the relationship among project participants;

Literature Review

(2) Identify parties involved in the processes and their interactions in different PDMs based on a construction supply chain perspective;

Case Studies

2 DB & 2 DBB projects

(3) Compare RM of key suppliers based on the relationship indicators in projects with different PDMs.

Literature Review: Available RM Models

	Hines, 1994	Ellison and Miller, 1995	Jones and O'Brien, 2003	Larson, 1997	Thompson & Sanders, 1998	Strategic Forum for Construction, 2003	Meng et al., 2011
Focus	Generic customer-supplier relationship	Problem solving in construction	Partnering practice in social housing	Working relationship in construction	Partnering practice in construction	Supply chain management in construction	Supply chain relationships
Scope	Any customer-supplier relationship	Client-contractor	Whole supply chain	Client-contractor	Client-contractor	Whole supply chain	Specific relationship between supplier and customer
Type of relationship	One-to-one	One-to-one	Multiparty	One-to-one	One-to-one	Multiparty	Multiparty
Maturity levels	4	4	4	4	4	3	4

Core values in Relationship Management

13

Procurement

Objectives

Trust

Communication

Collaboration/joint working

Risk allocation

Continuous improvement

Problem solving

Variables for successful RM-- Meng 2011

	Sub criteria	Level 1	Level 2	Level 3	Level 4
Procurement	Selection criteria	The lowest price	Cost and quality	Multi-criteria from short-term perspective	Multi-criteria from long-term Perspective
	Procurement route	Single-stage tendering	Two-stage tendering	Negotiation or tendering	Direct negotiation
	Form of contract	JCT	JCT/NEC	NEC/PPC 2000/JCT CE	NEC/TPC 2005/JCT CE/ Bespoke contract
Objectives	Objectives alignment	Only self-objectives	Mainly self-objectives	Mutual objectives in a project	Mutual objectives in the long-term
	Benefits	Win-lose	Win-partial win	Win-win in a single project	Win-win in the long-term
	Continuity of work	No continuity of Work	Prospect of future work through tendering	Preferred suppliers	Guarantee for future work
Trust	Type of trust	Contractual trust	Competence trust	Short-term goodwill trust	Long-term goodwill trust
	Confidence in others' behavior	Little confidence	Some confidence	Much confidence	Full confidence
	Monitoring others' work	Checking and double Checking	Checking somewhat reduced	Checking greatly reduced	Checking almost unnecessary
Collaboration	Working relationship	Confrontation or arm's length	Limited cooperation	Collaboration	Close collaboration
	Culture	Mutual blame	Self defense	Abandon of blame culture	Problem solving focused culture

PRICE

QUALITY

PARTNERING

**STRATEGIC
PARTNERING/
ALLIANCE**

Variables for successful RM-- Meng 2011

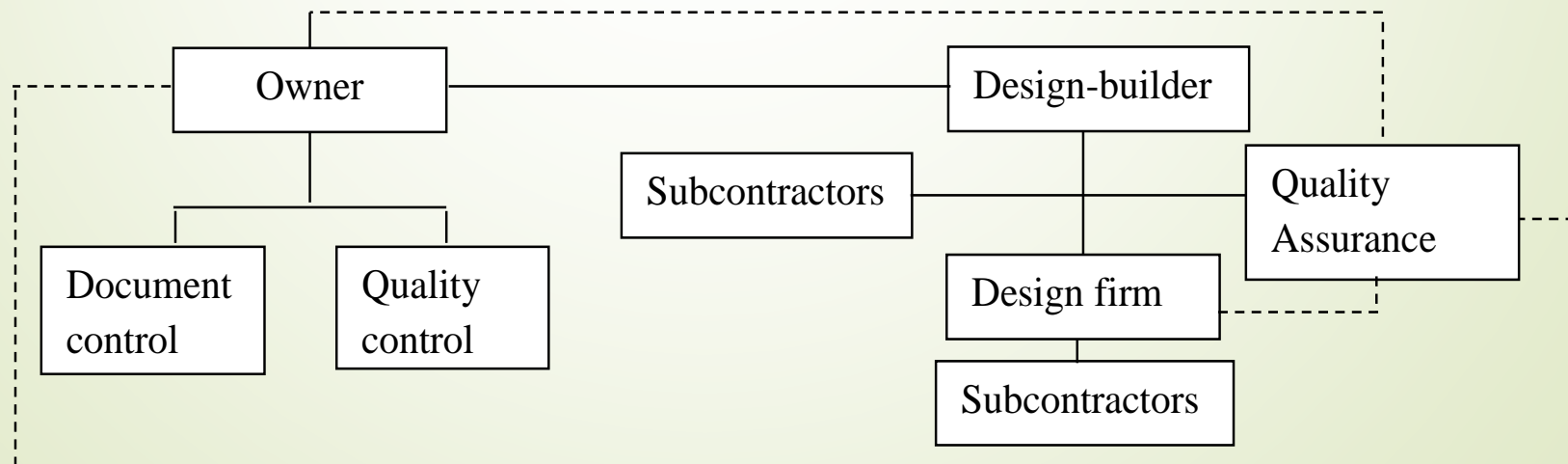
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	Culture	Mutual blame	Self defense	Abandon of blame culture	Problem solving focused culture
	Mutual help	No support for the weaker	Support only with issues related to self-interest	Often support for a weak partner	Always support for a weak Partner

Cases Studied

	Project	PDM	Schedule	Location
Case I	Oil refinery	Multiprime DBB	Sep 2013 - Oct 2014	Toledo, OH
Case II	Gas compressor	Multiprime DBB	Jan 2012- Sept 2014	Toledo, OH
Case III	Educational complex	DB	May 2012- August 2014	Toledo, OH
Case IV	Transportation	DB	Ongoing	Columbus, OH

Case I: DB Project

Pre-design	Design	Development of construction documents	Bid process	Construction	Occupancy
Owner					
			Design/builder		
			Quality control		
		Document control		Document control	
		Quality assurance			
Architect/engineer					
			Subcontractors		



Core Values (Variables)	Case I Scores		
	Prime	Owner	Variable average
Procurement	2.7	3	2.8
Objectives	3.1	2.5	2.8
Trust	2.6	2.3	2.4
Communication	2.7	3	2.8
Collaboration/joint working	3	2.7	2.8
Risk allocation	2.4	2.6	2.5
Continuous improvement	2.7	3.1	2.8
Problem solving	3.6	2.6	3.1
Respondent Average	2.8	2.7	
Case Average	2.8		

Summary Findings

DBB

vs.

DB

- Parties with no repeat business >> low levels of trust.
- No incentives to take risk at all levels - no risk sharing
- Problem solving - problems reoccur
- Communication - average low by owner.
- Trust - low levels by both owner and prime contractor.

- Procurement scored highest
- Core values mostly lie in level 4 >> project focused on long-term relationship.
- Relationship built on collaboration/joint working

Summary Findings (cont'd)

22

CORE VALUE	RM Level			
	DBB		DB	
	Case I	Case II	Case III	Case IV
Procurement	3	3	4	4
Objectives	3	3	4	3
Trust	3	3	4	3
Communication	3	3	4	4
Collaboration/joint working	3	4	4	4
Risk allocation	3	3	4	4
Continuous improvement	3	4	4	4
Problem solving	4	4	4	4
CASE OVERALL LEVEL	3	3	4	4

Summary Findings (cont'd)

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Continuous improvement	3	4	4	4
Problem solving	4	4	4	4
CASE OVERALL LEVEL	3	3	4	4

Summary Findings (cont'd)

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Trust	3	3	4	3
Communication	3	3	4	4
Collaboration/joint working	3	4	4	4
Risk allocation	3	3	4	4
Continuous improvement	3	4	4	4
Problem solving	4	4	4	4
CASE OVERALL LEVEL	3	3	4	4

CONCLUSIONS

- **All core values average scores were lower in DBB**
- **Highest difference between DB & DBB >>>
trust, communication, collaboration, & risk taking**
- **Subcontractors scored lowest in Trust**
- **Owner rated consultants at high RM levels**
- **Benefits of cSCM implementation**

Limitations & Recommendations

- ▶ Focused on contractor/owner perspectives only
 - >> design team, suppliers, vendors, etc...
- ▶ More projects
 - >> statistical evidence
- ▶ Different types of construction projects

THANKS!



	Sub criteria	Level 1	Level 2	Level 3	Level 4
Communication	Information exchange	Little information is exchanged openly	Some information is exchanged openly	Much information is exchanged openly	Most information is exchanged openly
	Sharing learning	No sharing learning and innovation	Little sharing learning and innovation	Sharing learning and innovation	Continuous sharing learning and innovation
	Cost data transparency	No cost transparency	Little cost transparency	Open book costing between two parties	Open book costing throughout the whole chain
Problem solving	Early warning	No risk identification, no early warning	Informal risk identific., no early warning	Early warning between two parties	Early warning throughout the whole chain
	Effectiveness	Problems often lead to disputes	Problems sometimes lead to disputes	Many problems are timely resolved at lowest level	Most problems are timely resolved at the lowest level
	Avoidance of recurrence	Problems often recur	Sometimes problems Recur	Few problems are repeated	Rare problems are repeated
Risk allocation	Risk sharing	No risk sharing	Limited risk sharing	Risk sharing greatly increased	Common practice for risk sharing
	Allocation principle	Risk is always allocated to the weak party	Risk is often allocated to the weak party	Risk is allocated to party best able to manage it	Risk is allocated to the party best able to manage it in long-term
	Balance of risk and reward	No rewards for party taking the risk	Some rewards for the party taking the risk	Often appropriate rewards for party taking risk	Always appropriate rewards for party taking risk
Continuous improvement	Joint effort	No joint effort for improvement	Limited joint effort for improvement	Joint effort for better ways of working	Continuous effort for better ways of working
	Performance measurement & feedback	No common measures; No formal feedback	Limited common measures; irregular but formal feedback	Common measures; regular and formal feedback in a project	Common measures; formal, regular, and continuous feedback
	Incentives	No incentive	Informal incentive	Single incentive	Multiple incentives