Multi Project Management (MPM) at Project-based Companies

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Abstract

Engineering and construction contractors are typical project-based companies in which project management is undoubtedly core business competency. Project development with their clients, securing contracts for, planning, engineering and constructing industrial plants on clients' behalf require superb project management skills. However, this mandate does not necessarily translate into the fact that contractor organizations are performing satisfactory multi project management (MPM) of projects in their hands. In fact, while managers of projects have a good perspective for single projects, they quite often lack "helicopter" management capability for project operations of their divisions. If single-project management mentality is expanded to managing a group of projects, odds are that managers of projects do not do any better than a mere aggregation of project management of individual projects; that there is little consistency among management procedures adopted by individual projects; that there exist no structured divisional appraisal of projects in progress; and that resources utilization across projects is not harmonized, just to mention few substandard practices.

The Project Management Committee of the Engineering Advancement Association of Japan, the Japanese engineering and construction industry initiative, has carried out a research on the state of multi project management and crafted a proposal to capitalize on best practices in this management genre for ten months from 2004 to 2005.

This paper introduces a multi project management model and presents best practices extracted from the research in such aspects as:

- Corporate platform for effective multi project management,
- Method to build a healthy and profitable contract portfolio,
- Overview of multi project management practices and some details on MPM oriented human resources management, profitability management, project schedule management and risk management,
- Pragmatic PMO functions for contractor companies, and
- Viability of EPM tools for engineering and construction projects.

1. What and Why Multi Project Management

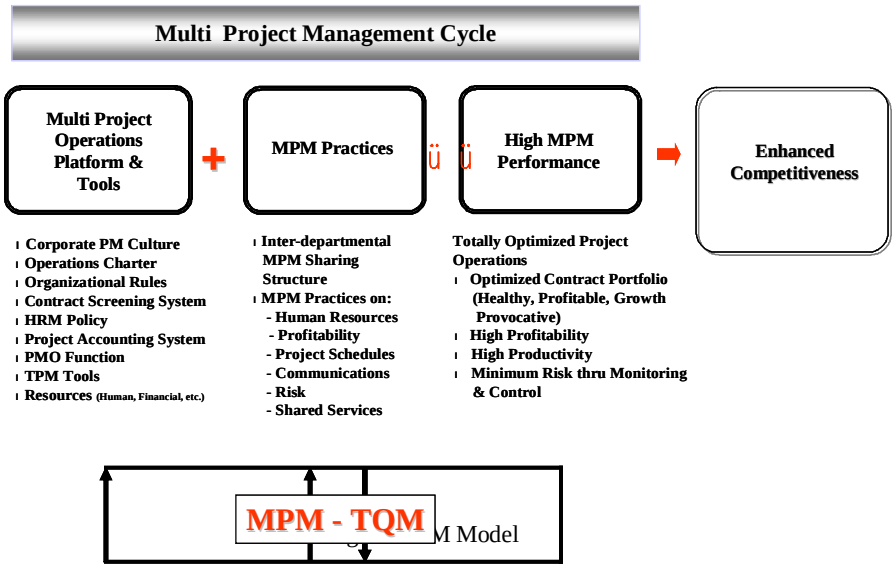
Multi Project Management (called "MPM") is the term used in this paper to mean project management and peripheral practices by which project operations divisions of contractor organizations manage a group of projects for which they are responsible as a profit center. Divisions charged with project operations may carry a variety of names in corporations but, here, are collectively referred to as the project operations division and signify the highest echelon profit center units.

This research has been initiated since:

- While the maturity level of project management at many Japanese contractor organizations is relatively high, many corporations report that divisional total management of multi projects remains to be improved,
- The management of individual projects and MPM differ in standpoints and managerial skills required,
- ENAA has no record on in-depth analysis of MPM, and
- The global project management community has witnessed a variety of research and case studies on program management but few, if not none, on MPM discussed as a system.

2. The MPM Model

Fig. 1 depicts the MPM model laid out by the Research Team.



High MPM performance is identified as the state of wholly optimized project operations in terms of a balanced contract portfolio, high profitability, high operational productivity and divisional ability to minimize risk through structured monitoring and controls of divisional operations.

High MPM performance is attained through a combination of a well established platform and tools for multi project operations, consisting of corporate PM culture, operations charter, organizational rules, contract screening system for a healthy and profitable contract portfolio, HRM policy, project-based company accounting system, PMO functions, MPM tools, and relevant resources, and a suite of tuned MPM practices such as clear inter-departmental split to share MPM functions, and MPM management practices on human resources, profitability, project schedules, communications, risk and shared services.

3. MPM Culture

One of the classical issues on project management research at ENAA is the project management culture of contractor companies which greatly influences their project management maturity. Except for the few Japanese global engineering and construction companies, many contracting units in large conglomerates or specialized contracting organizations are largely influenced by corporations' original manufacturing culture, which often affects full incorporation of project-based systems and management methods.

Therefore, in the MPM model, project management culture is addressed as a fundamental building block. The basic questions asked are:

- Is the project operations division committed to operating as an independent profit center, supported by company or divisional project management culture? Is MPM, or any way project operations management, based on chartered rules and practices, to avoid individual projects' arbitrary operations?
- Are organizational responsibility and accountability description, project based accounting systems and incentive schemes for project related employees in place?
- Are methods to perform MPM or organically manage multi projects specified?
- Does MPM utilize commercial methods and tools available in the project management market to take advantage of off-the-shelf efficiency?

4. Building A Healthy Contract Portfolio

Any portfolio of contracts entertained by contractor organizations should be configured based on the following criteria:

- Health of business
- Profitability
- Growth in terms of new areas of expertise, unique project development structures and capability building of employees

A contract portfolio profile is given below; this is a case with a global engineering and construction company.

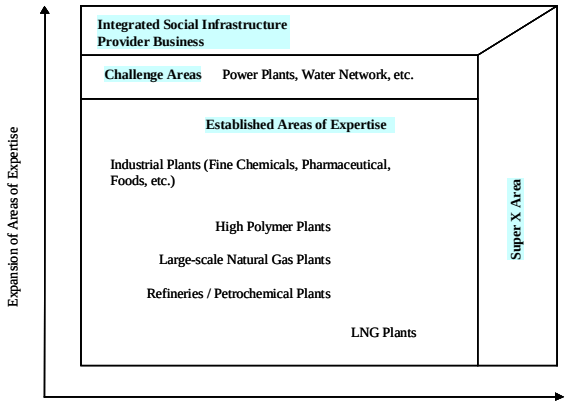


Fig. 2 - A Profile of Contract Portfolio

MPM starts with adopting a rational approach to the selection of target contracts. Most of the time, contractor companies find it difficult to develop negotiated business based on their own specialty and strength and are forced to struggle through competitive biddings; thus, it is hard to intentionally build an optimum portfolio of contracts. Marketing usually insists that marketing is not a theoretical game but is a game of adapting to fast moving markets. Yet, the Research Team is of the views that business development by way of the screening of potential contracts based on a set of company strategies takes companies a long way in pursuit of building a healthy contract portfolio. Fig. 3 shows a sample potential contract screening sheet that can be used to:

- Understand a total framework of company strategies on business acquisition,
- Comprehend that any contract screening should look into alignment to company's business strategy (do not pursue those potential business items that do not fit company strategy), maturity of proposed projects (projects go through stages of owners' investment decision, government permits and fund security), and contractor company's relative competitiveness in a variety of measures; all in all, use marketing intelligence and resources smartly, and
- Navigate though pre-contract operations as objectively as possible.

	Principal Crieria	Must Criteria	Point Scale Criteria	5	4	3	2	1
	Significance to Company ûiNot Scoredûj		Market Share	Yes				No
			Turnover/Profit	Yes				No
			New Technology/Client/Country/Region)	Yes				No
	Contribution to Business Expansion		Expandability of Relevant Market	Rapidly growing	Growing	Stagnant	Shrinking	Fading
			Expect Repeat Order?	Yes		Unknown		No
			Experience Acquisition	Yes		Unknown		No
			Possibility of Copy Plant	Large		Medium		Small
	Manpower Capacity		Is manpower available?	Yes		Yes, but		Hard to no
			Is technology available in-house?	Yes		Yes in similar technology		No
Alignment to Strategy	Risk		Country Risk (where applicable)	Small		Medium		Large
			Owner Risk	Small		Medium		Large
			Foreign Exchange Risk (where applicable)	Small		Medium		Large
			Technology Risk	Small		Medium		Large
			Delivery Time Risk	Small		Medium		Large
			Cost Risk	Small		Medium		Large
	Severity		Client Severity	Friendly	Largely friendly	Average	Pretty tough	Tough
			Severity of Contract Terms	Favorable	Largely favorable	Average	Tough	Onerous
			Severity of Project Execution Conditions	Low	Low to average	Average	Average to high	High (should retreat)
	Contract Value		Expected Contract Value = A	Aû ǹ00K$	né ñ00K$û ǹA > n2 100K$	n2 100K$û ǹA > n 3 100K$	n3 100K$û ǹA > n4 100K$	n4 100K$û ǹA > n5 100K$
	Profit Margin		Profit Margin = B	Bû ǹ1%	né ñ%û ǹB >n2%	n2%û ǹB >n 3%	n 3%û ǹB >n 4%	n 4%û ǹB >n5%
	Seriousness		Eagerness at Marketing Division	Highest priority	High priority	Average priority	Average to low priority	Low priority
			Eagerness at Project Division	Highest priority	High priority	Average priority	Average to low priority	Low priority
Maturity	Specific Maturity of Venture Plans		Maturity of Client Plans	Ready to issue IT/RFP	Marketability secured	Venture principal defined	é é rCompleted	é é rin Progress
			Government Permit (where applicable)	Granted with high priority	Granted	Under application	Ready for application	Meeting conditions
			Fund Sourcing Confidence	Finance closed/secured		Finance solicited		No finance prospects
Win Confidence	Status of Competition		Competitive Bidding or Negotiated	Negotiated	Most prospective			Completely competitive
			Number of Competitors	No	1 to 3	4 to 7		8 and larger
			Preferred Contractor?	Yes		Unknown		No
	Track Record		Previous Experience of Client Contact	Abundant		Low		None
			Project Experience with the Client	Abundant		Low		None
			Our Track Record on Technology	Superior	Slightly superior	Average	Slightly inferior	Inferior
	Our Rating		Market Share	High	High to medium	Medium	Medium to low	Low
			Our Reputation to Client	High	High to medium	Medium	Medium to low	Low
			Competitive Position	Superior	Slightly superior	Average	Slightly inferior	Inferior

Fig. 3 Potential Contract Screening Sheet

5. MPM Practices

5.1 Overview of MPM Practices

The research identified the practices of MPM as consisting essentially of the following components:

(1) Sharing of MPM Functions between Division General Management and Functional Project Management Supporting Departments

Undoubtedly, the general management of the division should assume the ultimate responsibility for MPM, however, it is not realistic to expect the divisional general management to physically take on the total responsibility where the project division is responsible for hundreds of contracts in progress plus tens of prospective new business projects; thus, how effectively and efficiently contractor organizations can distribute part of MPM functions to supporting units is absolutely the key to MPM success. It is warned, however, that any divisional management, if it delegated leadership role in MPM, would abandon success in MPM.

(2) Standardization of Project Management Methods and Tools

Unlike organizations which have introduced modern project management for the past five to ten years such as information technology/services (IT/IS) companies, contractor organizations mostly utilize a variety of field grown project management methods and tools. Yet, back to the basics standardization efforts have proven to pay dividend, if they are to enjoy benefits of MPM.

(3) Total Optimization through Check & Balance between Line Project Management and PMO

Project managers of individual projects are not motivated to contribute to total optimization of divisional project management performance as doing so is not a paradigm for single project management and quite often general management of a project division is

not willing to intervene in individual projects in terms of total optimization. Then this task can better be attained by means of an empowered project management organization (PMO).

(4) Utilization of Organizational Knowledge
Knowledge management (KM) has proven to be a powerful performance booster in engineering and construction business. Many of the Japanese contractors endeavor to combine KM and a Japanese competitiveness weapon, TQM.

(5) Management by Priority
Experienced project managers smartly utilize such managerial techniques as management by exception or management by priority. This principle can be expanded into divisional project management. Criteria for prioritization includes major-sized projects, technologically challenging projects, projects with no or slim margin and projects by less experienced project managers.

(6) Cold-eye Review for Enhanced Project Performance and Early Risk Impact Identification
Project management has long tended to be self-sufficient and has not let somebody intervene in its managerial process. However, the relatively tough project execution environment over the recent years and an increasing number of substandard project performance cases have triggered the introduction of cold-eye project review, or periodical or project milestone based overall appraisal, of projects by senior management, divisional management, PMO managers and other in-house experts, which provide objective identification of problem areas and establish a quick escalation mechanism for areas of concern to higher management.

(7) Efficient Human Resources Deployment via Centralized HRM Function
HRM functions, handling both technical employees and outside technical manpower, should be centralized for the sake of excluding self-centered manpower utilization by individual projects and propelling optimum HR utilization across projects.

(8) Pooled Procurement and Shared Services
Some project services and procurement operations could better be shared among projects.

5.2 Sharing MPM Functions

Fig. 4 delineates a typical sample of sharing of MPM functions among organizational units.

MPM Sharing Units □ ˜	GM Projects	PM Supporting Units		
MPM Functions □ «		Administrative	PMO	Specialty
Business Direction	□ ›			
Project Management	□ ›			
Manpower Assignment	□ ›	□ ›		
Manpower Procurement				□ ›
Contract Administration		□ ›		
Profitability Management	□ ›			
Productivity Management		□ ›		
Schedule Management	□ ›		□ ›	
Cost Estimating				□ ›
Cost Management	□ ›			□ ›
Project Review	□ ›		□ ›	
Total Risk Management	□ ›		□ ›	
PM Technology			□ ›	
PM Training			□ ›	
PM Standardization			□ ›	

Fig.4 Indicative Sharing of MPM Functions among Organizational Units

5.3 Typical MPM Practices

Essential points of MPM practices are summarized as follows regarding four critical management areas.

[MPM Resources Management]

MPM Tips	How to Implement
Do not jump to idealistic HR utilization plans	- Pragmatic HR utilization patters - Differentiate management of person-specific professionals and skill pools
Avoid self-centered outside manpower utilization by individual projects	- Establish a centralized outside manpower procurement unit for optimum MP utilization and uniform commercial terms
Attain smart HR utilization by little extra	- Invest in manpower database

[MPM Profit Management]

MPM Tips	How to Implement
Build philosophy and a framework for maximizing divisional cost performance	- Introduce total optimization views (stop excessive emphasis on cost management of individual projects) - Invest in standardization of methods and tools for operational transparency and productivity
Compose a balanced portfolio of profitable contracts	- Deploy a quantified contract screening guide - Target profitable contracts while pursuing a healthy contract portfolio in mind
Enhance cost estimating capabilities	- Invest in cost estimating system for both high accuracies and proposal cost cutting
Maintain cost performance visibility	- Conduct check estimates - Conduct structured project reviews
Focus on troubled projects that require divisional attention	- By monthly monitoring of cost performance by cost engineering department

[MPM Schedule Management]

MPM Tips	How to Implement
Enhance divisional capability to develop quality, realistic project schedules	- Formulate divisional schedule management policy and validate methods - Pool planning and scheduling professionals to collectively support projects - Maintain standard schedules, progress milestones/patterns
Maintain visibility of schedule performance division wide	- Deploy company standard WBS and progress measurement methods (restrict project arbitral methods) - Structured project review (general management/PMO)
Focus on troubled projects that require divisional attention	- Conduct project reviews with the project schedule placed as the center piece to assess program progress
Conduct division-integrated project planning and scheduling where applicable in pursuit of total optimization of resources utilization, man-hour savings and enhanced visibility	- Use EPM tools

[MPM Risk Management]

MPM Tips	How to Implement
Build divisional risk management infrastructure	- Establish corporate risk policy - Provide risk management methodologies and tools - Maintain database for risk identification and risk assessment - Store risk management cases
Prioritize projects for cross-divisional risk management	- By project review board (general management/PMO)
Carry out periodical follow-up on risk sensitive projects	- By project review board (general management/PMO)

6. MPM Vehicles and Tools

As vehicles and tools for MPM, the Research Team looked into project management organizations (PMOs) as a staff unit dedicated to corporate wide project management promotion and seconding to line project managers; project IT systems supporting MPM; and enterprise project management (EPM) tools. Some of the important findings are given below.

6.1 PMO to Gain Citizenship

In project management literature published recently, topics on PMOs are most often

highlighted. Where the PMO functions properly, it facilitates the organizational acceptance of project management, standardization of project management methods and tools, higher efficiency of project management deployment in organizational operations, consistent project management training, benchmarking and all in all strategic support to divisional management in planning and assessing project management operations. PMOs, however, are not a magic stick and their viability has been challenged in tough business environment. Fig. 5 shows results of survey into practicing PMO functions at research member companies.

	Company	A	B	C	D	E	F
	Affiliation	Global E&C	Global E&C	General Construction	Manufacturing/ E&C	Manufacturing/ E&C	Manufacturing/ E&C
Classified PMO Functions Entertained							
Project Managtement Infrastrucure Building							
1	Standardization of PM Methods	ü ¢	ü ¢	ü ó	ü ó	ü ¢	ü ¢
2	PM Training	ü ¢	ü ¢	ü ¢	ü ¢	ü ¢	ü ¢
3	Project Information Center	ü ¢	ü ¢	ü ¢	ü ó	ü ¢	ü ¢
4	PM Inprovement Initiatives	ü ¢	ü ¢	ü ¢	ü ¢	ü ¢	ü ¢
Support to Individual Projects							
5	Coaching in Integrated Project Plans	X	ü ó	ü ¢	ü ó	ü ¢	ü ¢
6	Secondment to Project Scheduling	ü ¢	ü ¢	ü ó	ü ¢	ü ¢	ü ¢
7	Project Controls Secondment	ü ¢	ü ¢	ü ¢	ü ó	ü ¢	ü ¢
8	EVM Analysis	X	X	X	X	X	X
9	Problem Solving	ü ó	ü ó	ü ¢	X	ü ó	ü ó
10	Coaching in Schedule Catch-up	ü ó	ü ¢	ü ¢	ü ¢	ü ó	ü ó
11	Administrative Support	X	ü ó	ü ¢	ü ¢	ü ¢	ü ¢
Divisional Project Surveillance							
12	Independent Project Review	ü ¢	ü ¢	ü ¢	ü ó	ü ¢	ü ¢
13	Compliance to Company Standards	X	ü ó	ü ¢	X	X	X
14	Cross-project Risk Management	X	ü ó	ü ¢	ü ó	X	X
Project Administration							
15	Operations Management	X	X	X	X	X	X
16	Manpower Management	X	X	ü ¢	X	X	X

Fig. 5 PMO Benchmarking Results among Research Member Companies

The Research Team has identified the following steps for PMOs to stay viable.

- Tactical PMO teaming
  - Assign high-caliber members during start-up and build-up
  - Operate "mixed" when a PMO has reached a cruising altitude
  - Define a critical service chain and staff accordingly
  - Rotate staff-members with line project management pools
  - Let future ace project managers experience PMO work
  - Do not fix PMO team members for many years to avoid bureaucracy and loss of for-the-project mindset
- PMO not to be influenced by fluctuations in business cycle; gain a solid and specific PMO charter with senior management
- Maintain optimum balancing with line project management units, seeking a win-win relationship

6.2 Applicability of EPM Tools

The project management software vendors are competing for customers through their top bleed enterprise project management (EPM) suites of products. EPM tools are certainly efficient when they are applied to a program or a group of projects where individual projects are not large in size (less than 10,000 person-hours), contain many similar or repetitive work patterns, or utilize human resources that can be pooled by skill levels (not person specific). However, the research has revealed that in the operations of engineering and construction projects, EPM tools are not yet in common use since most projects that sustain contractor organizations are medium to large sized projects (50,000 to several million person-hours) that require stand-alone planning and scheduling and resources utilization is, in most cases, too extensive and diversified in sources to be planned and controlled in pools but hopes that with

the further enhancement of EPM features, schedule roll-up would become readily available and sorting of schedule information for divisional management purposes be provided.

7. Conclusion

The research has produced the following results:

- Has formulated a framework on research and development for multi-project management by identifying fundamental tasks and providing initial output, thus opening new horizon for ENAA project management research,
- Has identified or proposed the following ready-for-use methods:
  - MPM model for task mapping
  - Model of intra-organizational sharing of MPM duties
  - Method for potential contract screening
  - MPM-based criteria for project management processes
  - Guideline for a functioning PMO
- Has distilled the consciousness that success in project management of individual projects does not guarantee high performance in MPM.

Finally, the style of MPM differs from that of single project management in the following way where the latter description pertains to MPM:

- Project manager vs. manager of projects
- "For the project" vs. "for the division"
- Bulldozer capability vs. helicopter capability
- Self-centered optimization vs. cross-divisional overall optimization
- All rounded management vs. management by priority and focus
- Project management skills vs. hybrid skill of project management skills and general management skills.

Hiroshi (Hiro) Tanaka, PMP, is the a founder and the National President of the Japan Project Management Forum (JPMF), fellow and special project management delegate of ENAA, Japan and is one of the distinguished leaders of the global PM community. He was an invited speaker at PM conferences in 15 countries. Hiro is also a member of PMI, IPMA-PMA (India; fellow), IPMA-SOVNET (Russia), AIPM, PMCC (Japan) and SPM (Japan).