식스시그마와 PM의 비교
(Comparision of Six Sigma and PM)

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Abstract

This paper discusses the relationship between project management and six sigma and the derivation of overall related table. This paper proposes an integrated approach by blending CMM project management and six sigma to meet business goals.

Keywords : Six Sigma, PM, CMM

1. Introduction

1.1 History of PM

Traditional PM : 1960s
- Time, Cost Management
- Critical Path Scheduling
- One Single, Mega Project

Modern PM : Mid of 1980
- PMBOK from PMI
- More Time, Cost Management
- Human Resource, Communication, Risk Management

Enterprise PM : 1990~
- Many, Small Project
- Virtual Team, Global Project
- Enterprise PM Methodology

1.2 Progress In Efforts For Performance Improvement [3]

T&I: Testing and inspection
SPC: Statistical process control
SS: Six Sigma
DFSS: Design for Six Sigma

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Methodology	T&I	SPC	Six Sigma	DFSS
· Approach	Defect detection	Defect prevention	Defect prevention	Value creation
· Method	Samplings plans	Control charts	DMAIC	DIDOV
· Focus	Product	Process	Project	System
· Infomation	Static	Dynamic	Varied	Uncertatinties
· Medium	Observation	Data	Knowledge	Perspectives
· Nature	Passive	Defensive	Active	Pre-emptive
· Deployment	Exit point	Downstream	Midstream	Upstream
· Application	Isolated	On-line	Off-line	Organization wide
· Format	As needed	Continuous	Project by project	Subject by subject
· Operation	Single location	Single function	Cross function	Business wide
· Execution	Prescriptive	Rule-based	Needs driven	Proactive
· Criterion	Conformance	Stability	Optimality	Predictability
· Improvemet	Irrelevant	Absent	Incremental	Fundamental
· Problems	Unsolved	contained	understood	Anticipated
· Solutions	Unavailable	Ad hoc	Remedial	Built-in
· Result	Damage control	Capability	Sigma level	Robustness
· Framework	Instantaneous	Short term	Long term	Life cycle
· Customer reacion	Acceptance	Satisfaction	Appreciaiton	Trust
· Gains	None	Confidence	Savings	Profit
· Enhancement	Production	Engineering	Bottom line	Market share
· Requirements	Unsophisticated	Procedural	Organizational	Cultural
· Core skills	Procedures	Analysis	Communication	Synthesis
· Leaders	Technicians	Engineers	Managers	Chief executives
· Applicability	Traditional	Modern	Contemporary	Current
· Start	1940s	1970s	1990s	2000s
COMMONALITY: MANAGEMENT OF VARIABILITIES WITH STATISTICAL THINKING				

2. Six Sigma Project Selection Rule [5]

Project Selection Rule = Project Score * PPI Priority
* RDI Priority * Throughput Priority

2.1 Project Score

Project Name:	Date of Assessment:
Black Belt:	Master Black Belt:
Weighted Overall Project Score:	Project Number:

Criteria	Score	Weight	Weighted Score
1.Sponsorship		0.23	
2.Benefits(Specify main beneficiary) 2.1 External customer: CS, CTQ 2.2 Shareholder: FB, CTR, RE 2.3 Employee or internal customrmer: ES 2.4 Other(e.g., supplier, environment): SS	Overall Benefit Score	0.19	
3.Availability of resources other than team		0.16	
4.Scope in terms of Black Belt Effort		0.12	
5.Deliverable(Scope)		0.09	
6.Time to Complete		0.09	
7.Team Membership		0.07	
8.Project Charter		0.03	
9.Value of Six Sigma Approach(DMAIC, DMADV, DLDOV)		0.02	
TOTAL(sum of weighted score column)		1.00	
Note: Any criterion scores of zero must be addressed before project is approved.			

2.2 Prioritizing Projects With The Pareto Priority Index

$$PPI = \frac{Savings \times probability\,of\,success}{Cost \times time\,to\,completion\,(years)}$$

2.3 ROI Priority

· 화폐의 시간가치를 고려한 방법

-순현재 가치법(NPV, Net Present Value)

-내부 수익률법(IRR, Internal Rate of Return)

-경제적 부가가치(EVA, Economic Value Added)

· 화폐의 시간가치를 고려하지 않는 방법

-Payback Period(PP)

-Benefit Cost Ratio(BCR)

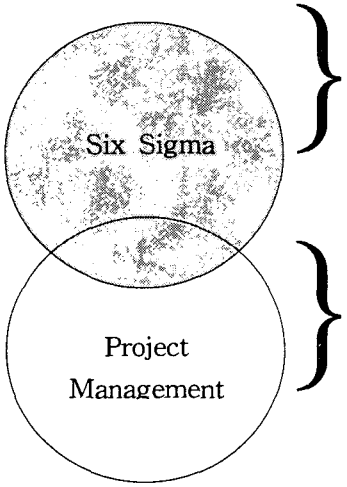
2.4 Project Throughput Priority Versus Project Focus

Focus of Six Sigma Project				
CTX: Characteristic addressed is critical to...		Before the constraint	At the constraint	After the constraint
	Quality(CTQ)	△	⊙	⊙
	Cost(CTC)	○	△	○
	Schedule(CTS)	△	⊙	○

△ Low throughput priority
○ Moderate throughput priority
⊙ High throughput priority

3. PM and Six Sigma [2]

3.1 Conceptual Comparison

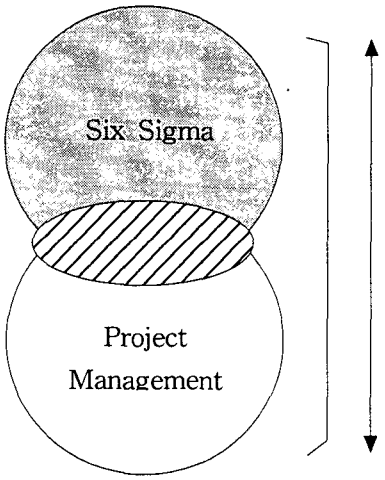


- Small project orientation
- Focused on results
- Systematic data-driven methods
- Incorporates project management concepts

- Large project orientation
- Focused on coordination and management
- Data-driven and management processes
- Provides a foundation for organizing, planning, managing and controlling projects

3.2 Pragmatic Comparison

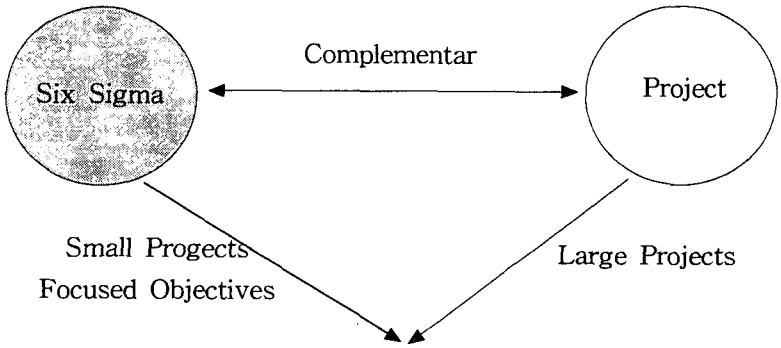
A Synergistic Relationship



· Six Sigma leverages Project Management concepts

· Project Management leverages Six Sigma's data-driven techniques
  · Improved scope management
  · Reduced schedule pressure
  · Improved quality planning and control

3.3 Implications



Intergrated Environment

▷ Leverages the strengths of both
▷ Allows sharing of best practices
▷ Provides comprehensive support for a wide range

3.4 CM and PMBOK

구분	품질	일정	비용	비고
CMM	- 품질관리 - 구성관리 - 측정 및 분석	- 계획수립 - 진행관리	- 요구사항관리 - 협력업체관리	프로세스 관리측면 중심
PMBOK	- 품질관리 - 리스크 관리	- 일정관리 - 의사소통관리	- 범위관리 - 자원관리	프로젝트 관리측면 중심

4. CMM and Six Sigma [1][4]

4.1 Significant Differences

Six Sigma	CMM/CMMI
Assumes processes have been identified and defined	Focus on defining management and technial processes early
Doesn't distinguish organizational standard and project processes	Organizational process definition used to capture best practices
Emphasis on training to motivate and communicate skills	Emphsis on infrastructure to ensure key processes addressed
Reliance on statistical methods to manage performance	Statistical approach intended often not implemented
Focus on learning from internal experience and data	Additional mechanisms to leverage external technology
Prioritization of efforts based on business payoff	Link to strategic planning weak and often ignored
Certification of individual practitioners, not organizations	Certification of assessors and organizations, not practitioners

4.2 Elements of Six Sigma Throughout CMMI

4.3 Integration Benefit[6]

• While Six Sigma relies on analytical tools and statistical methods to drive its performance improvement, these methods are only implied as an intention that is associated with the CMM approach to measurement, and

5 Optimaizing	Continuous Process Improvement	Organizational Process Technology
4 Quantitatively managed	Quantitative management	Organizational Process Performance
3 Defined	Process standardization	Organizational Process Focus Organizational Process Definition Organizational Training Integrated Project Management Risk Management Decision Analysis and Resolution Requirements Development Technical Solution Product Integration Verification Validation
2 Managed	Basic project management	Requirements Management Project Planning Project Monitoring and Control Supplier Agreement Management Measurement and Analysis Process and Product Quality Assurance Configuration Management
1 Performed		

is most often not well implemented.

- While Six Sigma begins by building process capability using DMAIC as the method for improving business, CMM emphasis is on technology application that is more consistent with application of the DFSS method of Six Sigma.
- While Six Sigma improvement projects should be drawn from a protfolio of problems that are identified during strategic planning by business leaders, the CMM linkage to strategy is weak and often ignored.
- While Six Sigma emphasizes the development and certification of the

Black Belts, CMM emphasizes development of CMM assessors and certification of organizations.

5. Summary

- Six Sigma Project Selection Rule
- PM and Six Sigma
- CMM and Six Sigma

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