(Abstract Reference: Abstract ID: #3746)

Quick Win Strategy in CMMI Transition

Angel Liu

Motorola Software Group, China

HERE

- History of Process Improvement
- Strategy of Transition
- Manage Transition
- Use OID in CMMI Transition
- Result of Transition

Quick Win Strategy in CMMI Transition

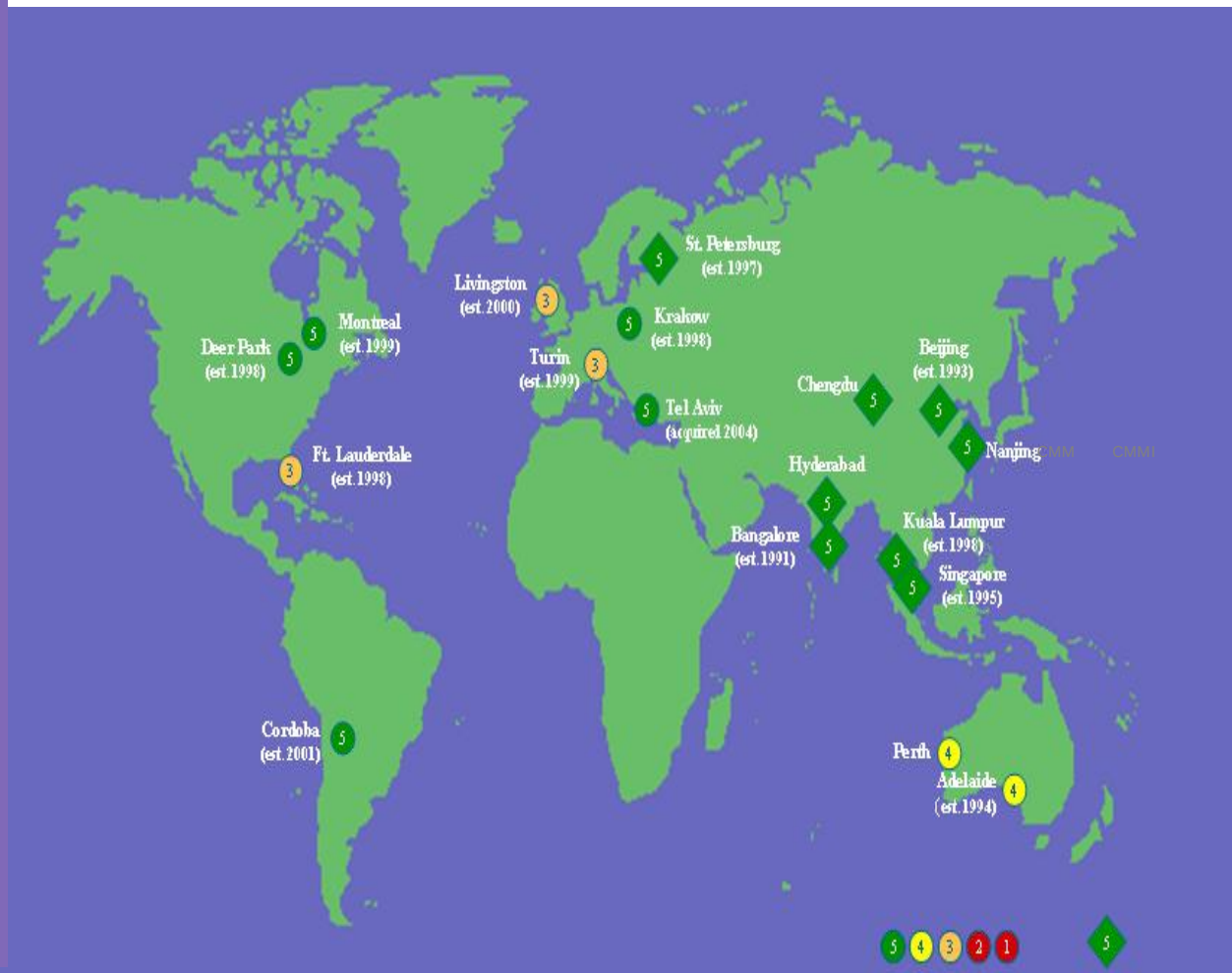
(From CMM L5 To CMMI L5)

MOTOROLA

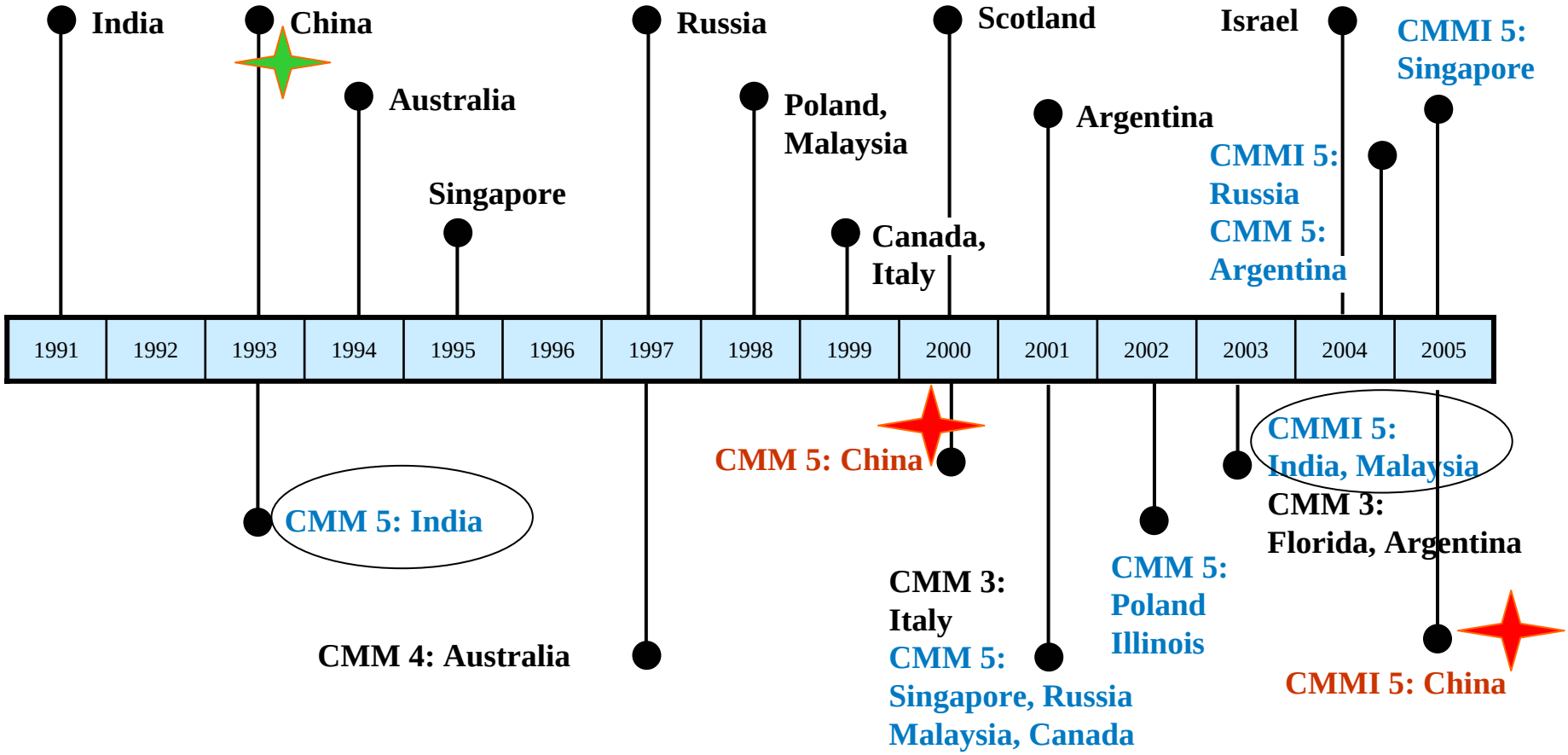
History of Process Improvement

- GSG was formed in 1991
- Funded from Motorola CEO
- 14 Centers with +5000 Engineering Talents
- GSG China established in 1993
- GSG China has 3 branch offices with 1200+ employees

Motorola Global Software Group



Motorola Global Software Group History



GSG China Software Improvement

摩托罗拉中国软件中心

1993
We are the first one in China who started to practice CMM

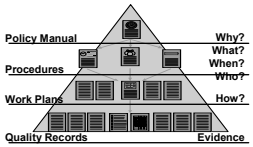
1996
Achieve CMM L4

1999
Reassessment at CMM L4

2000
We are the **FIRST** S/W organization in China assessed **SEI CMM L5**

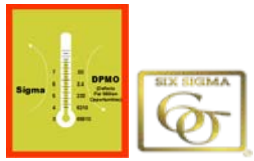
2005
CMMI L5 (SCAMPI A)

Motorola Process and Quality Initiatives



Capable Quality System

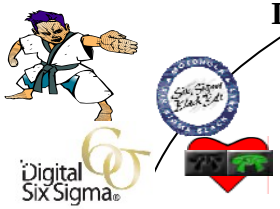
Align and Link Individual Goals,Business Goals and Motorola's Strategic Goals



Six Sigma Concept First from Motorola (1980's) and Re-launch Digital 6 Sigma (2000')

Build Quality Culture

Malcolm Baldridge Award 1988, 2002



Black Belt Initiative,Apply DMAIC Process and Tools to Projects

Total Customer Satisfaction

People

Technology

Business Process

SEI Focus

First SEI Assessment in 1980's

Start Transition to CMMI From 2001

Use QSR to Achieve Registration to ISO 9001/QS9000 Standard

MOTOROLA

- History of Process Improvement
- **Strategy of Transition**
- Manage Transition
- Use OID in CMMI Transition
- Result of Transition

Quick Win Strategy of Transition

- Sponsorship and Commitment
- Driving as one initiative linked to business goal
- Commitment and Involvement -+60% population direct involvement
- Managing the transition using project management process
- Design with Reuse
- Implementing CMMI incrementally
- Automating Process environment to reduce process overhead

- History of Process Improvement
- Strategy of Transition
- **Manage Transition Project**
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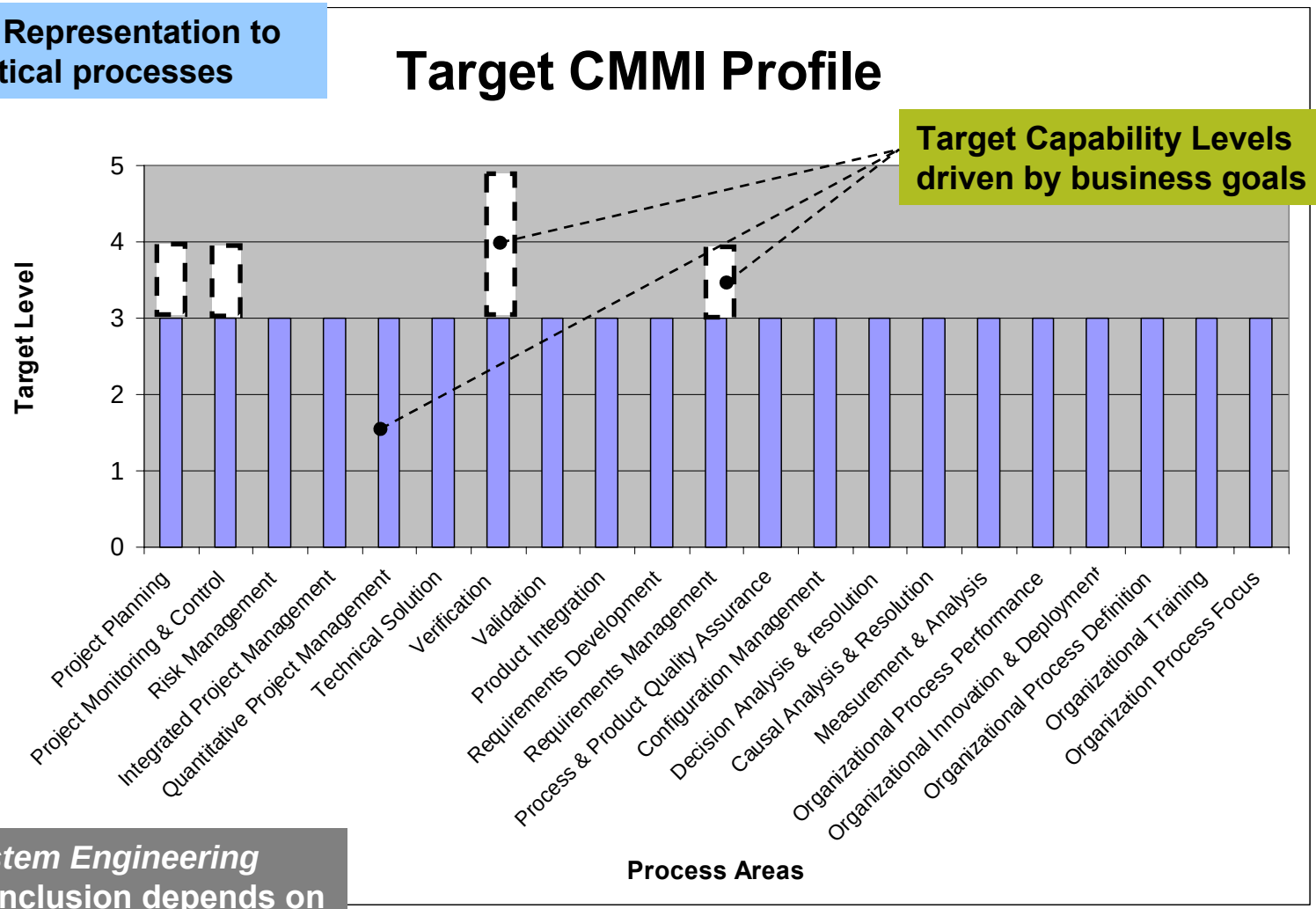
Transition Planning

- **Sponsor from Senior Management of CMMI adoption**
  - **Understand the business value of transition and setup as business goal**
- **Establish Target Profile based on organization needs**
- **Develop CMMI experts to drive the transition**
- **Reinforce SEPG and re-organize SME team better support CMMI structure**
- **Identify gaps using SCAMPI C**

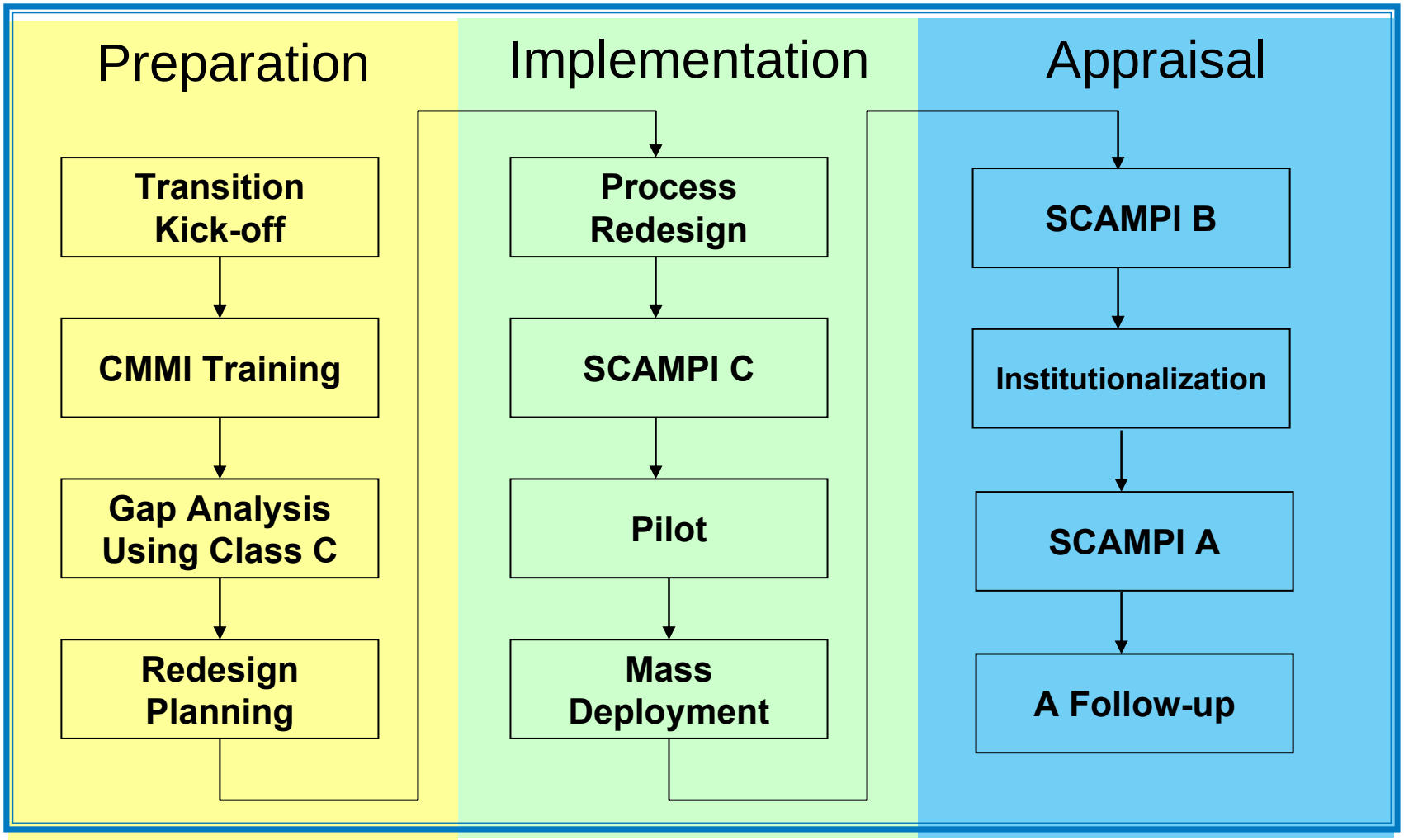
Defining the Target Profile

Continuous Representation to focus on critical processes

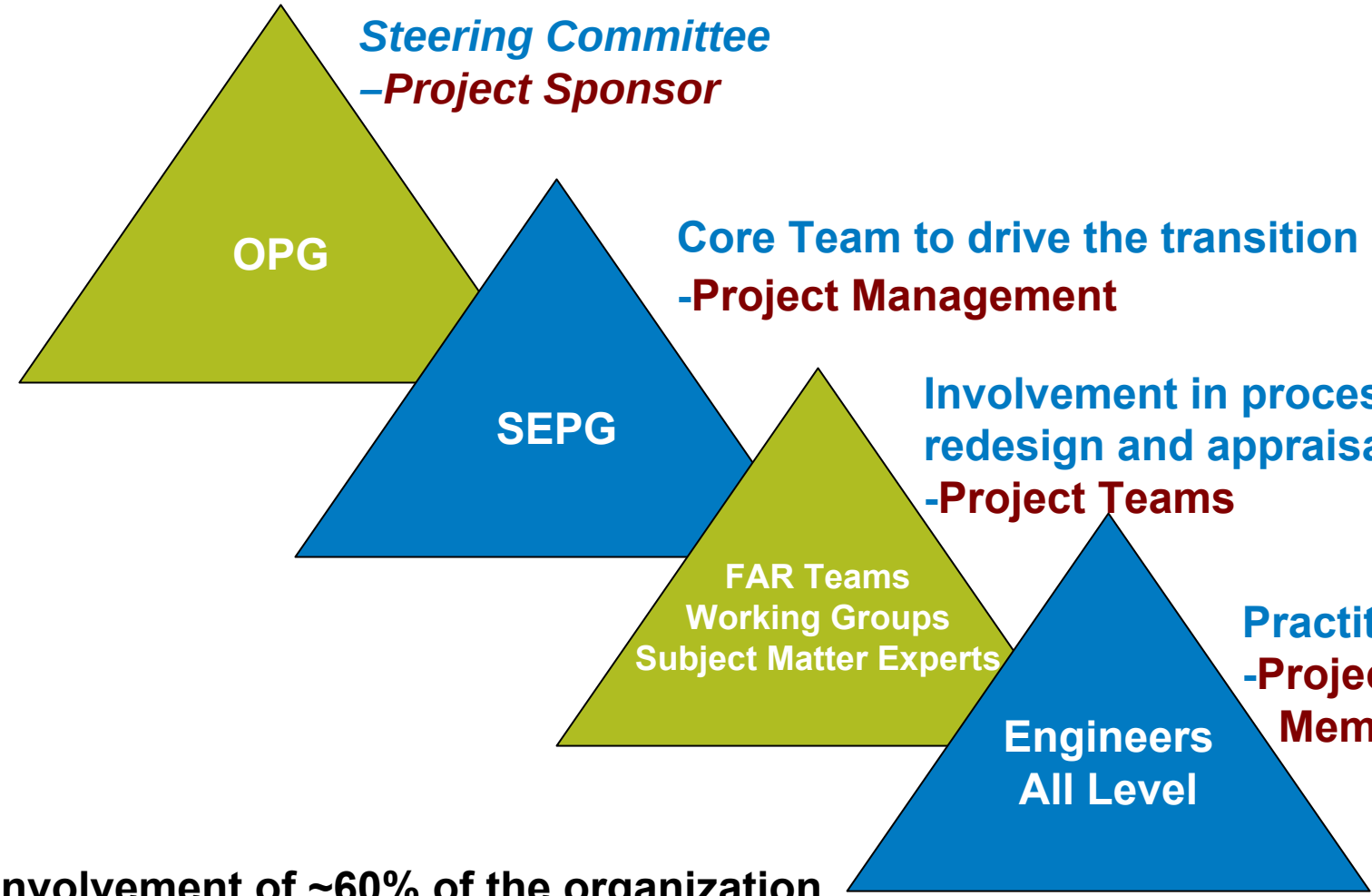


IPPD & System Engineering
Discipline inclusion depends on project nature

Transition Life Cycle

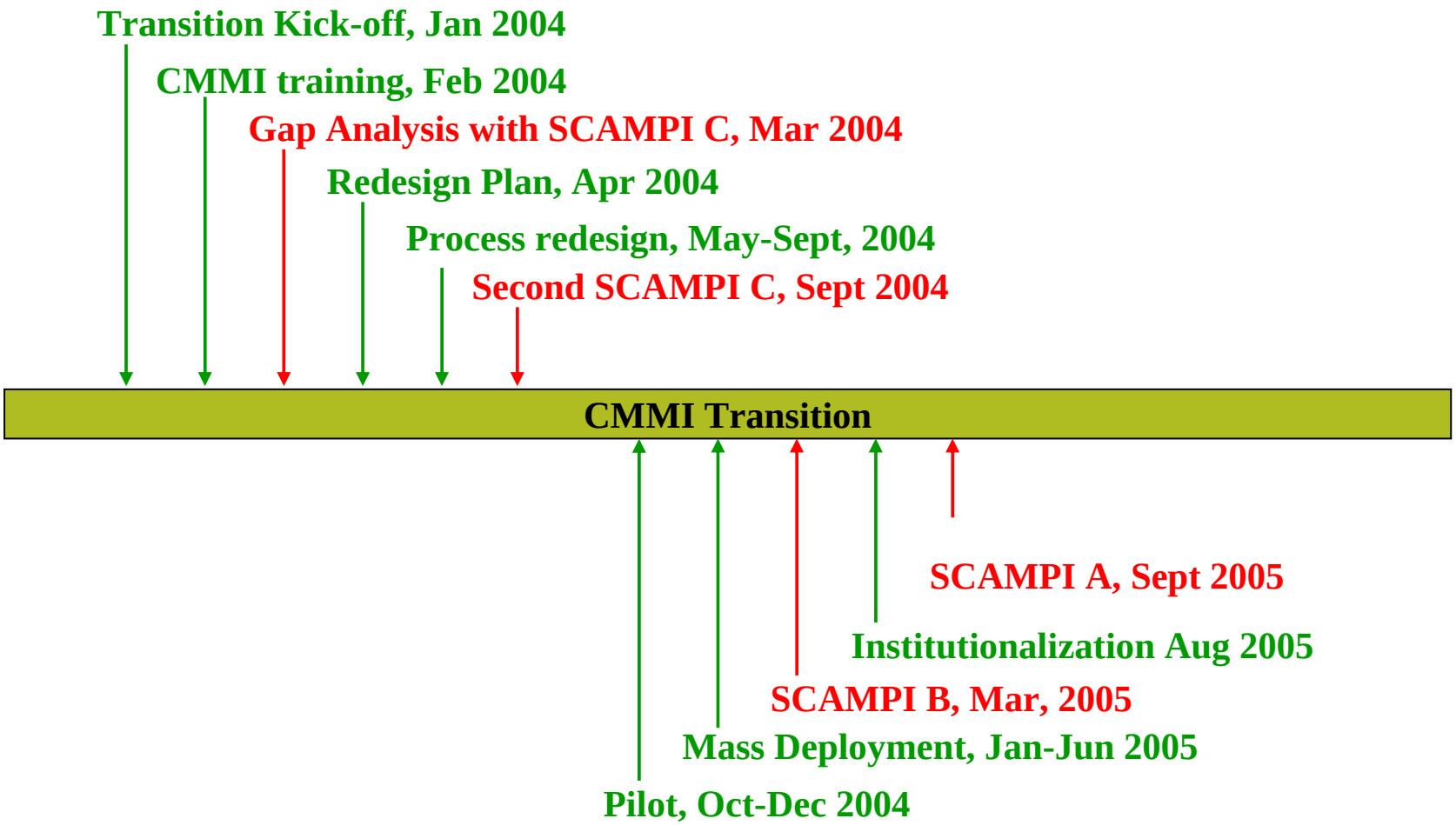


Transition Teams



Direct involvement of ~60% of the organization

Sample Transition Timeline*



TOTAL: 1 year and 8 months

*** Based on GSG-China data**

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Planning &Req Analysis

☞ **Formal CMMI Transition Plan-**Taking advantage from disciplined project management

☞ **Estimates, milestones, dependencies, risks etc.**

☞ **Define transition process and setup quality control gate**

☞**Progress tracking within teams and by senior management**

☞ **Group team using PA categories. Each PA has PA 2 owners plus a support SME team.**

☞ **Understand Transition Requirement**

- ***Take SCAMPI C result as the input of requirement***
- ***Take Target Profile as the input of requirement***
- ***Process Opportunity Request Database***

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Process Design Strategy

- Use OPD as guide to design Process and Process Asset
- Develop template to provide the guide on how to develop process asset
- Review and refine Process Architecture before process asset design
- Design the process asset as an integrity system
  - *How to present GP in OUR system*
  - *How to design support PA in OUR system*
  - *Interface design and control*
- Design with quick-win strategies (fast, practical, easy, cheap, tool support, etc)
- Inspections, SCM ,Audits & Quality control.

- History of Process Improvement
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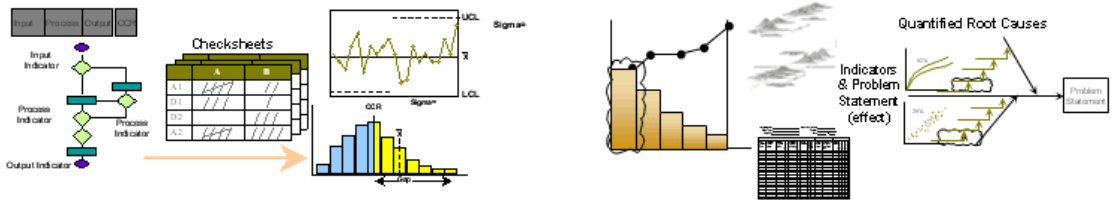
Process Design Focus

- **Engineering Process Improvement**
- **Process integrity and process interface**
  (eg how Support Pas support the Prj &Engineering Pas)
- **High Maturity Pas (QPM, CAR, OID, etc) and the critical sub-processes (PP,RM,VER)**
- **Guideline on process tailoring and measuring**
- **Tool Support planning synchronous with process design**

Using High Maturity Level Process Area

Using of Support Process Area

Techniques &Tools in Digital Six Sigma



1. Provide analysis techniques
2. Provide statistical method to understand variation

SPC method and tool to support baseline and model establishment

1. Quantitatively identify improvement opportunities
2. Cost-benefit analysis
3. Measure improvement effect by performance analysis

1. Provide analysis techniques
2. Provide statistical method to understand variation

QPM

CAR

OPP

OID

Goals, baselines, models

POR

POR

Project Data

POR

Defects and other problems

Project Management & Engineering

Using of High Level Process Area

GSG Process Measurement Environment

Business Partner Environment

Defect Tracking

EPMS Proj Mgmt

Inspection/Review DB

Change Mgmt

Asset Characterization

Beijing Team

Australia
Dev Team

Project Metrics Data

Project Metrics Database

PMBOOK

Project Record

Center Goals/Baselines

Center Metrics Database

Site Metrics Database

Global Central
Metrics Database

G SG Metrics Database

SMSC

Manage By Data

- History of Process Improvement
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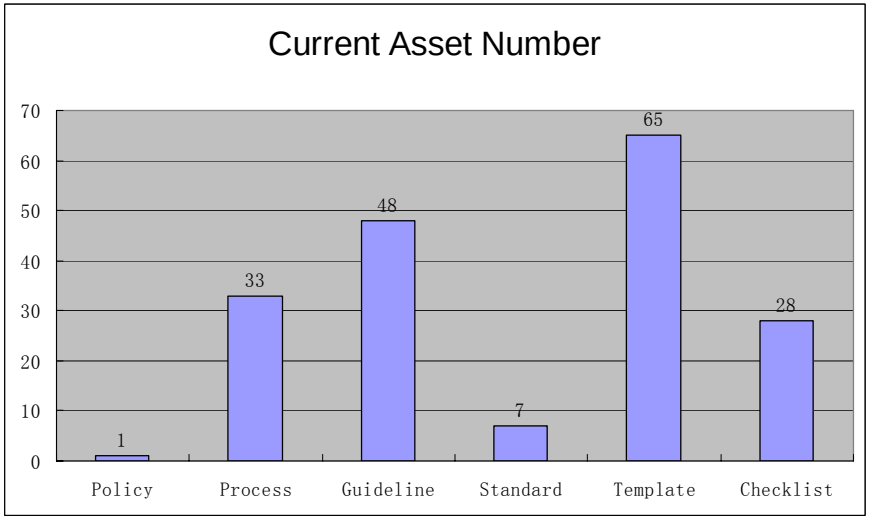
Implementation

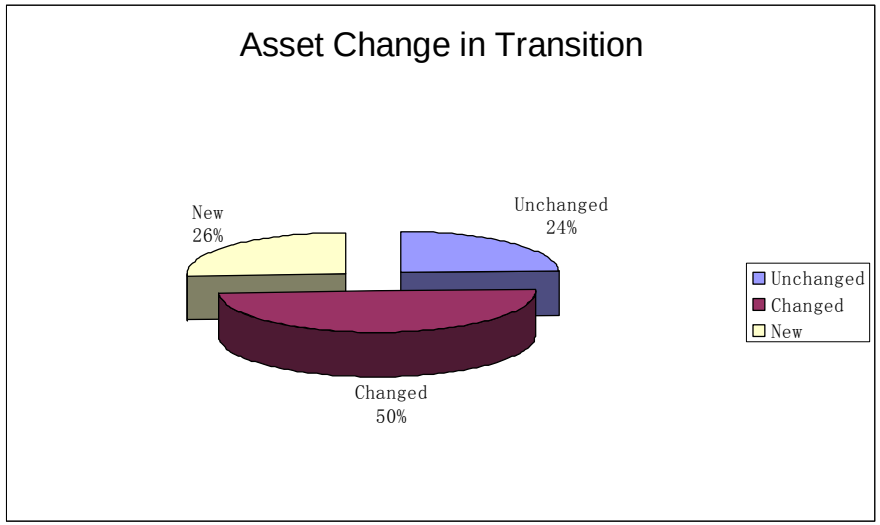
- **Plan the training at the early phase and deliver training incremental based on role**
- **Using OID as guide to transfer the process change into organization**
- **Using OPF/POR system to track the process change during transition**
- **Monitor the overall change status and trend.**
- **Assess and control the major change**
- **Pilot, Controlled deployment and mass deployment based on the risk assessment and business cases.**

Process Assets after Transition



☞ Total 182 assets, including 33 processes, 48 guidelines and 93 templates & checklists.

☞ Among the 47 new assets, there're 6 processes. Others are guidelines, templates and checklists that better facilitate the implementation of our process.



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Pilot

- Select pilot projects and prioritize the pilot package
- Design the pilot package for pilot projects during different development phase to reduce pilot cycle time (product integrity and coverage)
- Define Pilot successful criteria, goal and their measurement
- Leverage pilot cost, cycle time, pilot coverage and quality
- Formal plan and kickoff to get commitment
- Timely pilot feedback via POR &SQE
- Organizing SCAMPI C to check “Approach”

- ◆History of Process Improvement
- ◆Strategy of Transition
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Deployment

☞Plan the training at the early phase and deliver training incremental

- ☝ Role-Based
- ☝ Focus on the CHANGE and new process
- ☝ Interactive workshop vs “teaching”

☞ Define different deployment approach to new project and “on the way” project

☞Develop deployment handbook to facilitate the usage to process

- ☝Understand process from perspective of life cycle
- ☝Understand process from perspective of PA
- ☝ Use of process asset type

☞ Process Handbook to build mapping between CMMI, Organization process and practice.

☞ Manager review and Audit

- History of Process Improvement
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Institutionalization

- Upgrade new hire entry training to CMMI and SPP++
- Plan the training at the early phase and deliver training incremental
  - Role-Based
  - Focus on the CHANGE and new process
  - Interactive workshop vs “teaching”
- Define different deployment approach to new project and “on the way” project
- Develop and maintain PIIDs
- Use sample project as “role model” for sharing

- History of Process Improvement
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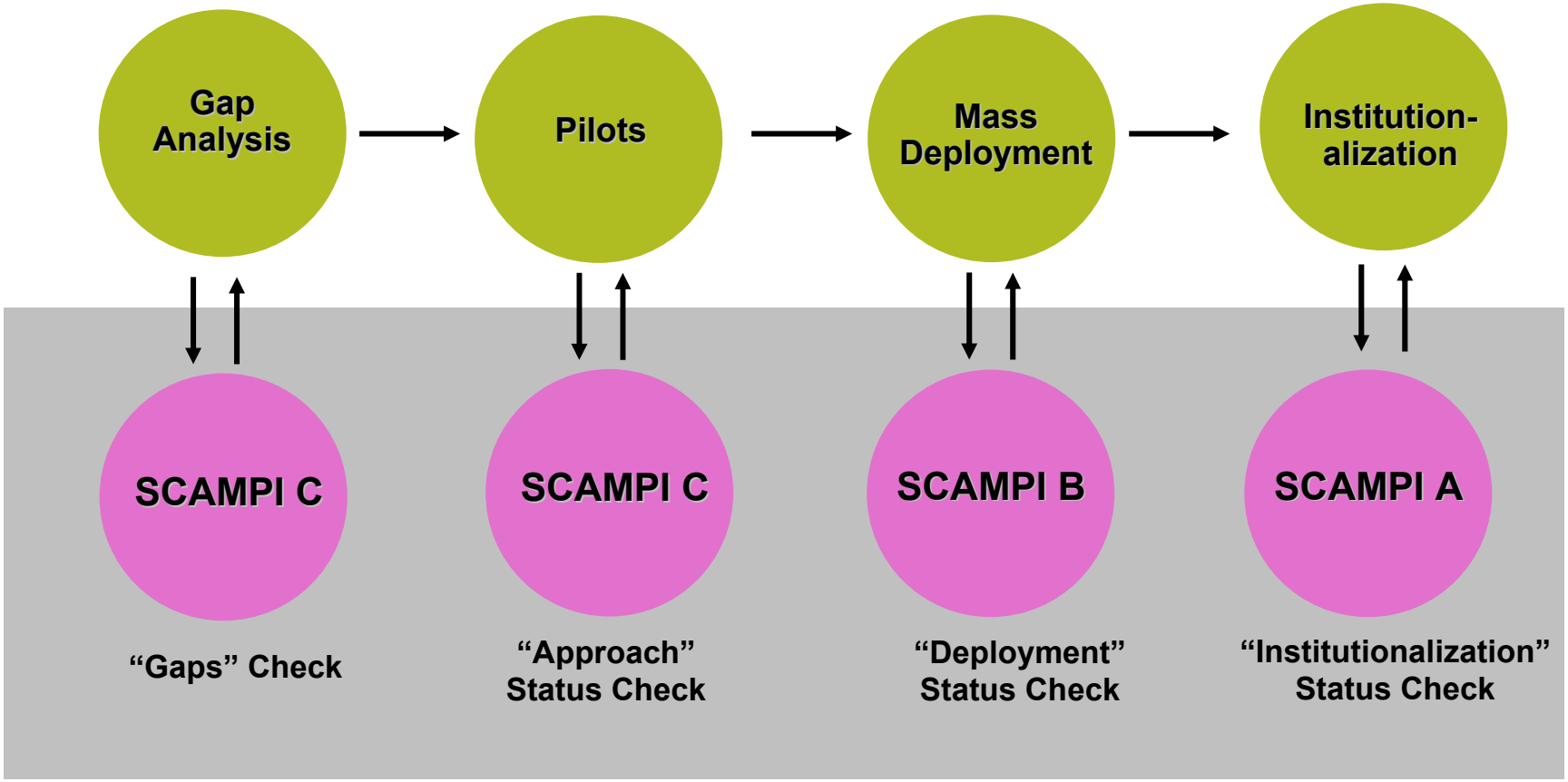
Appraisal Planning

- **Plan SCAMPI C (2), B,C**
- **Using SCAMPI as a tool to identify the process improvement opportunities and milestones in transition**
- **PIIDs development and maintenance paralleled with process development and deployment**
- **SCM control and PIIDs Tool**
- **SME Team focus on driving the deployment of high maturity practice especially in critical sub-process areas**
- **Good practice in critical process areas traceability monitoring at organization level**

Controlling deployment via successive SCAMPIs



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Appraisal Planning

- Sample Project Selection
  - Overall Coverage
  - Applicability
  - Representative from location, business, domain, project category, current phase,etc

- Pre-site Preparation.
- Overview of organization
- Overview of Process System , Projects for Appraisal team
- Demo of Process Environment &Tool for FAR team

- Pre-site Document Review and data collection request tracking

Lessons in Transition Project

- ◆History of Process Improvement
- ◆Strategy of Transition
- ◆Manage Transition
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☞ **Develop CMM expert and understand SCAMPI method and process at early phase**

☞ **Develop, maintain PIIDs at the early phase.**

☞ **Understand PIIDs and provide right information at first time**

☞ **Multi-site team overhead could be reduced through more effective coordination.**

Transition Statistics

	A	B	C	China
Overall Transition Effort (staff*months)	**124**	**51**	**83**	**211**
Overall Duration	**2Y 2M**	**1Y 11M**	**1Y 7M**	**1Y 8M**
System Engineeringin included the scope	Y	N	Y	N
IPPD included in the scope	Y	N	N	N
SAM included in the scope	Y	N	N	N
Sw Population during transition period	~1200	~300	~220	~900
# of sites appraised	2	1	1	3
Number of PAs in SCAMPI C scope	25	15	n/a	21
Number of PAs in SCAMPI B scope	25	15	21	21
Number of PAs in SCAMPI A scope	25	21	21	21

Factors impacting data variance

CMMI Transition Approach Summary

Elements of CMMI Transition Approach	Faster	Better	Cheaper
Organizing transition like a project	✖	✖	✖
Focus on key PAs during SCAMPI C&B	✖		✖
PIIs preparation/update during SCAMPI C&B (up to 1.5 effort reduction)		✖	✖
Early feedback on process deployment (SCAMPI C&B) & Removal of significant weaknesses before Class A		✖	
Extensive training	✖	✖	
Balanced team membership (GSG and Businesses)		✖	
Keeping Core Appraisal team throughout a series of SCAMPIs	✖	✖	
Several rounds of Redesigned Process review		✖	✖

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Major Improvement After CMMI

☞**QPM processes were modified to focus more on critical processes aligned with business objectives**

☞ **Using QPM,CAR,OID process and techniques to support critical process effectiveness**

☞**Shifted its focus on CAR processes from DP to the broader problem prevention focus in CMMI**

☞**Use Enterprise Project Management System as a common project management platform while use Project Pamphlet as a supply of EPMS**

☞**The Engineering processes, particularly for RM,UT,VAL now provide more practical guidelines, templates, techniques, and tools.**

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Major Improvement After CMMI

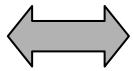
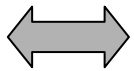
☞ CAR and OID-based processes were used to improve VER process effectiveness without compromising quality in specific classes of cases.

☞ The RM/RD process was improved. Late additions and changes to requirements are measured.

☝ Setup Organizational Baseline to quantitative manage requirements volatility.

☝The measured and estimated impact of changes led to new project re-plan, estimation, and a factual basis for negotiation with customers.

CMMI Performance Results of GSG China

Metrics	Trend	Improvements
Cost of Quality		33%
Fault Density		40%
Effort Estimation Accuracies		31%
Schedule Estimation Accuracies		84%
Requirement Phase Containment		Sustains at 90%
Design Phase Containment		8%
Code Phase Containment		12%
Customer Satisfaction		Sustains +9/10

Process Excellence to Business Excellence

- ***Consistently exceed customer satisfaction with outstanding satisfaction score 9 out of 10***
- ***40% business growth and 30% margin every year since 2003***
- ***100% on time delivery of all programs with high quality***

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Conclusion

- Transition to CMMI requires substantial effort and strong commitment
- Disciplined project management is one of important success factor for transition
- From GSG experience, the iterative CMMI transition path with successive application of various SCAMPI appraisal types is proved to be effective mechanism for identifying gaps and controlling the CMMI deployment

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