



GTECH's Real Experiences of CMM®

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Introduction

What You Will Hear Today



The Context - GTECH Corporation Overview

The Learning Years

- Mar 2000: CMM Program Office formed and process definition and deployment commences.
- Oct 2001: Successful Level 2 CBA IPI

The Enlightened Years

- Jan 2002: Software Engineering Process Group (SEPG) formed. SEPG objectives realigned with corporate business goals.
- Aug 2003: Modified CMM Level 3 processes released.
- Aug 2004: CMM Level 4 metrics program commenced
- Feb 2004: Successful Level 3 CBA IPI

Observations



The Context

GTECH Corporation Overview

GTECH Corporate Overview

Our Profile



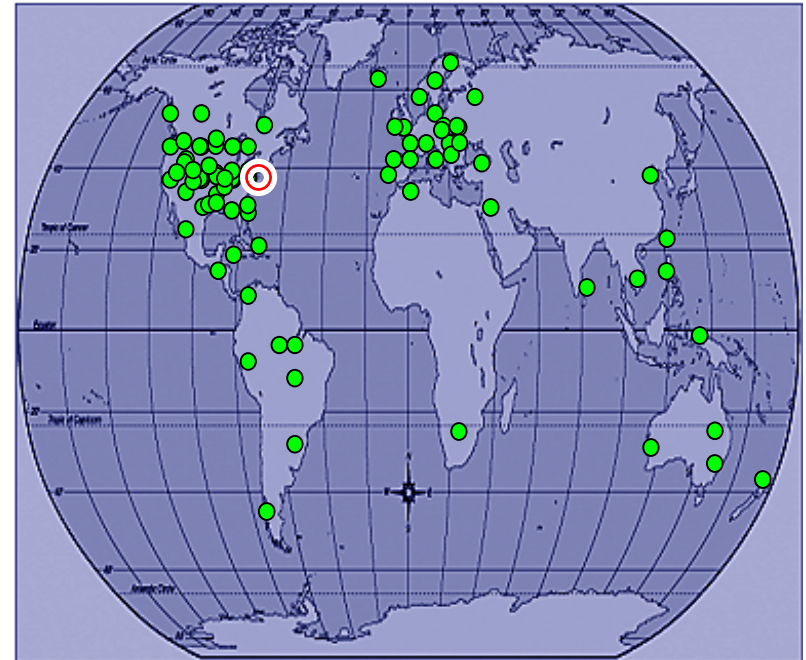
- Incorporated in 1980.
- Headquartered in West Greenwich, Rhode Island, USA.
- 5,500 employees worldwide.
- The leading provider to the world's lottery industry with market share of more than 70%.
- Implemented the world's largest online lottery in the U.K. with 10,000 terminals on start-up in 1994.
- More than \$1 billion in total revenue in FY 2004.
- GTECH website: <http://www.gtech.com>.

GTECH Corporate Overview

Our Global Presence



- **Lottery**
 - 100+ customers
 - 44 countries
 - 6 continents
- **Gaming**
 - 80+ Online customers
 - 40+ ITVM customers
- **Non-gaming**
 - Government Licensing
 - Commercial Services



- More than 340,000 point-of-sale devices in service and linked to GTECH central systems.
- Handle more transactions a year than all of the leading credit card companies – combined (50 billion transactions in FY04).



2000 to 2001

The Learning Years

Products and Services Year 2000



Organizational Overview

Terminal
Manufacturer

POS Devices

Technology
Solutions

R&D

Systems
Integration

System Delivery

Technology
Services

Maintenance

Products & Services

- Design, integrate, and maintain IT enterprise management systems and communications networks for online and instant ticket lotteries.
- Manufacture and supply point-of-sale devices.
- Manage field support services for retailers.
- Provide game innovation – IT & marketing.

Software Development Cycles

- Waterfall, Iterative, Spiral

Process Improvement at GTECH

The Beginning – March 2000

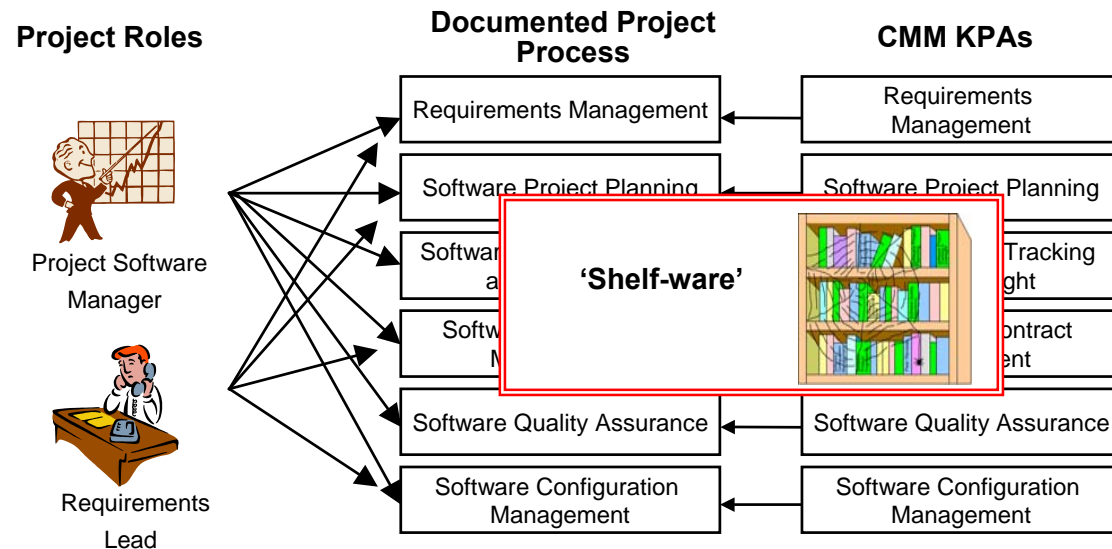


- Improvement program driven by need for quality and productivity gains rather than external market demand for CMM compliance.
- Management expectations required tangible short term success.
- CMM Program Office established with budget and staff of 12.
- SW-CMM chosen because:
 - As a software centric model it reflected the importance of software development in achieving customer satisfaction.
 - Widely used with a proven track record of yielding significant productivity and quality improvements.
 - Alternatives such as CMMI were still in their infancy.
- Whilst Level 2 was the initial focus during the pilot phase the future corporate wide implementation also required awareness of Level 3 practices.

Process Definition Challenge



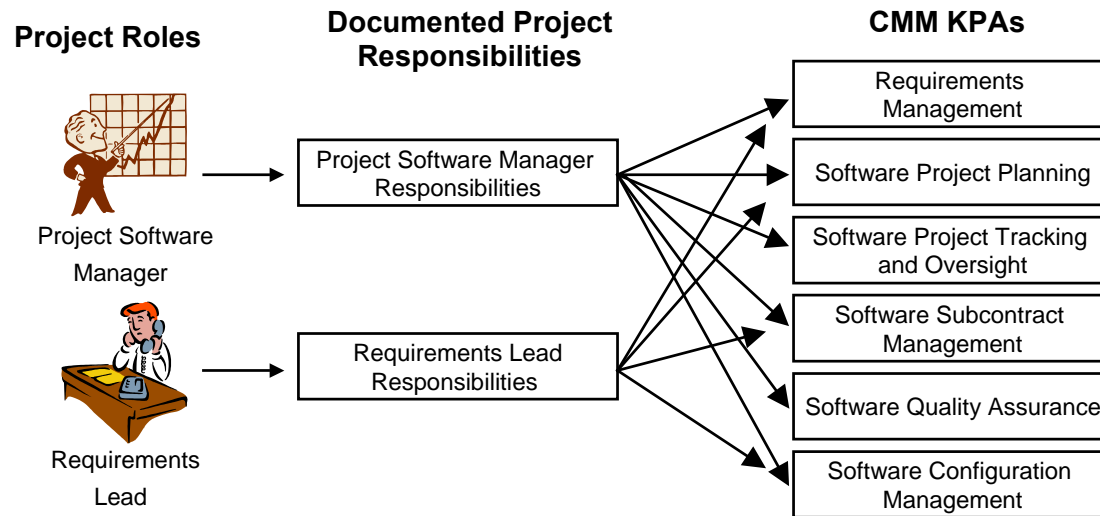
- Soon recognized that CMM is an auditors tool. It is not written to support software managers or developers in their daily activities.



Process Definition Solution Required



- Role based approach



- 'Light' process documentation. Emphasis on readability and usability.
- Intuitive to use with corporate wide visibility.
- Fast deployment.

Process Definition

Process / Procedural Documentation

Support Functions

Role

Activity

Activity Description

Required Reading

Required Personnel

Activity Input/Output

Project Software Lead - Ron Goodrich
 Conduct Project Kickoff Meeting

Conduct the meeting using the [Project Kickoff Meeting Memorandum](#).
 In the course of the meeting, review all agenda items. Record any **Decision(s)**, **Action Item(s)**, **Change Request(s)**, and **Risk(s)**, as they are identified or addressed. Enter clarifying comments in the Notes section.

Read the Required Reading and contact Required Personnel for input and support to create the Output(s). When completing the step, the Output(s) status is changed as required. Notification Rules triggered by a status change can be viewed within the associated work product's workflow.

Required Reading

- [Meeting Rules - Approved](#)
- [Project Scope Statement - Allocated to Software](#)
- [Organizational Policies](#)

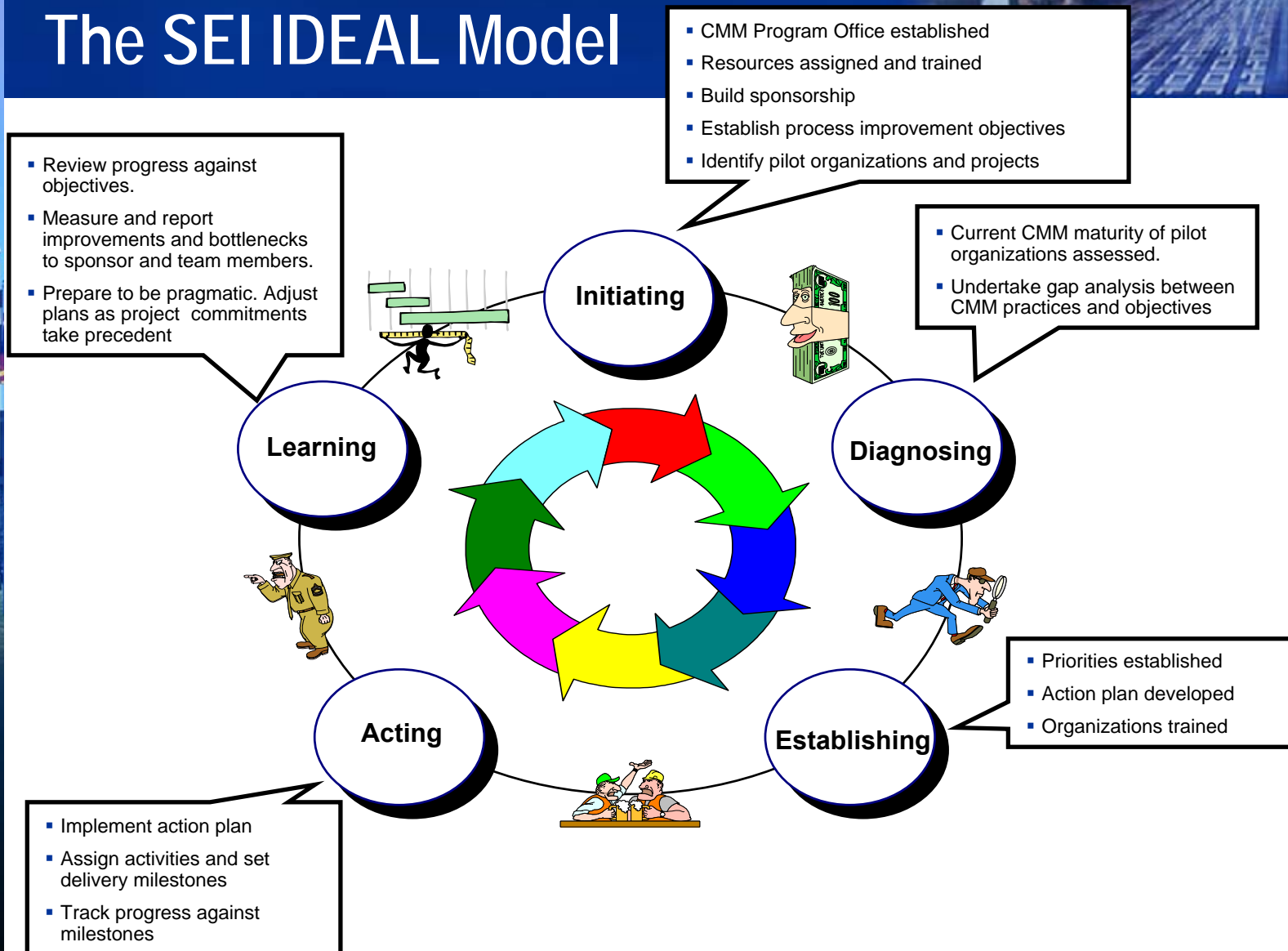
Required Personnel

- [Software Configuration Management Lead - Murray Landauer](#)
- [Standards Compliance Lead - Scott Ficarra](#)
- [Software Requirements Lead - Ron Goodrich](#)
- [Testing Lead - Murray Landauer](#)
- [Documentation Specialist](#)
- [Software Design Lead\(s\) - Jeff Gatie](#)

	Input Status	Output Status
Project Kickoff Meeting Memorandum	Agenda	Minutes

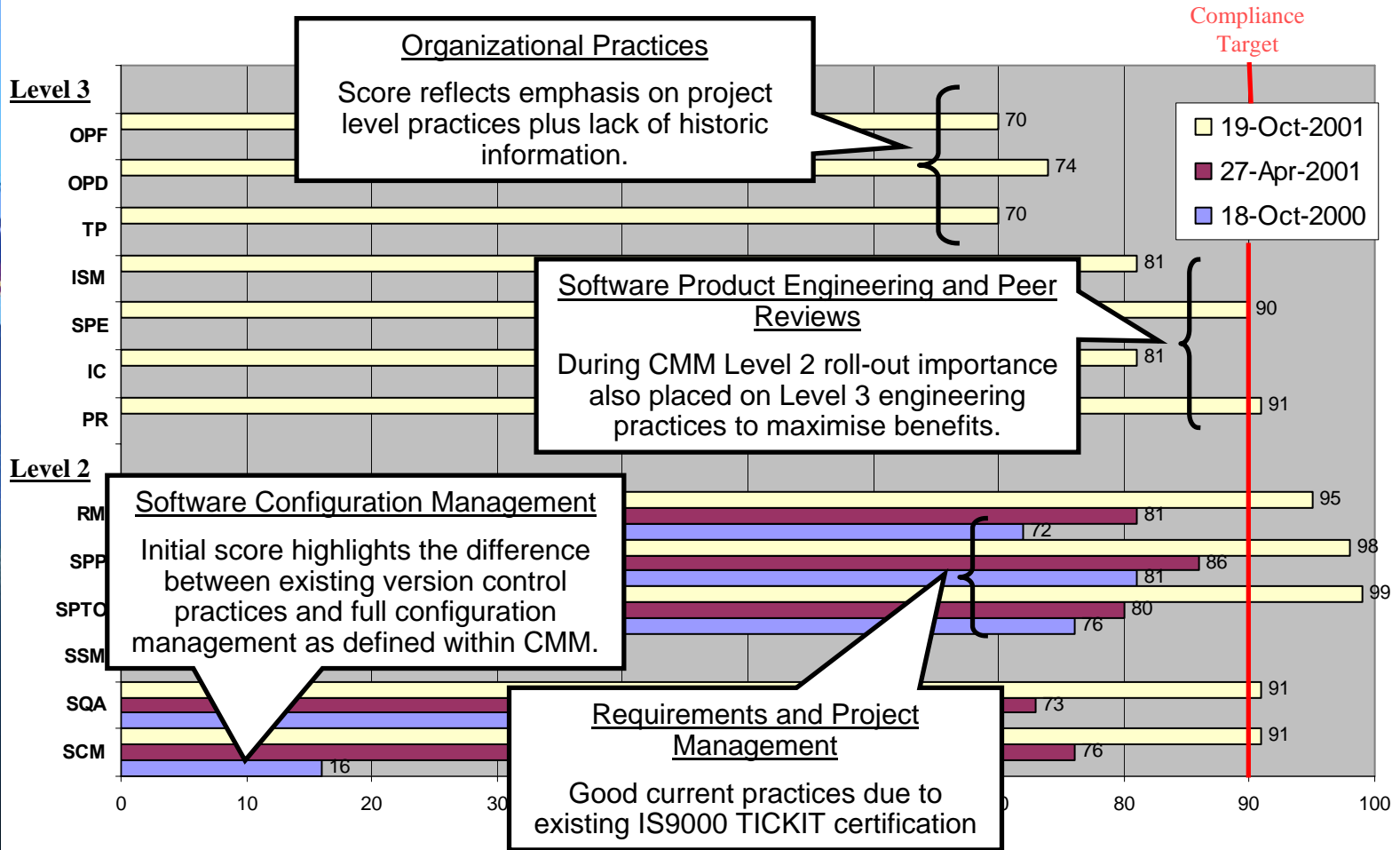
- Provides automated workflows via emails to guide and control project personnel in their activities.
- Process repository provides document management with version control, change control, and process history.

Process Deployment The SEI IDEAL Model



GTECH Ireland

Progress Towards Level 2 CBA IPI



2000 to 2001 – Lessons Learned

What Worked Well



Process Definition

- Role based process definition reduced the learning curve.
- Intranet based process deployment provided accessibility and visibility for distributed team members and greatly simplified Standards Compliance (SQA).

Environment

- Strong cascading sponsorship facilitated deployment.
- Cultural change accelerated within process literate organizations.

Implementation

- Fulltime Standards Compliance (SQA) and mentoring provided early identification and resolution of issues.
- Use of external resources helped leverage knowledge and avoid 'blind spots'.
- Periodic mini-assessments were fundamental in tracking progress.
- Deploying level 3 processes even though focus was on level 2 provided strong foundation for ongoing improvement.

2000 to 2001 – Lessons Learned Opportunities for Improvement



Process Definition

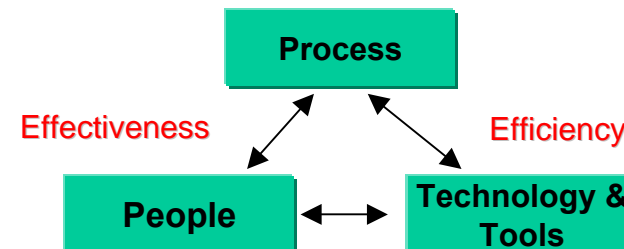
- Recognition that CMM is a model that must be interpreted to meet the specific requirements of a given environment.

Environment

- Ensure genuine sponsorship exists.
- Organizational awareness that CMM involves both management and engineering practices.
- More careful selection of pilot projects. In learning phase avoid high risk projects.

Implementation

- CMM explains ‘What’ needs to be done but the answer to ‘How’ requires the existence of underlying project management and engineering skills.
- No tool is a ‘silver bullet’.





2002 to 2004

The Enlightened Years

Process Improvement Realignment with Business Goals



The Primary Goal

Financial return and long term viability is the single most fundamental purpose for investing in process improvement

Secondary Objectives

- Improved corporate capability and support for strategies
 - Cost savings
 - More predictable schedules, shorter cycle times
 - Higher quality
 - Improved employee morale
 - Customer satisfaction
- Stronger marketing program
- Access to Federal and State Lottery Programs



Process Improvement Group Reorganization



Software Engineering Process Group (SEPG) Formed

- Focus on adding value rather than pursuit of a specific model.

SEPG Steering Group Established

- Provides sponsorship, direction, and visible endorsement of SEPG activities.
- Quarterly progress reviews provides oversight.

Project Management of SEPG Activities

- Annual SEPG Plan developed and deployment tracked via Work Breakdown Structure / Schedule
- SEPG processes under full configuration management
- SEPG activities reviewed by Standards Compliance (SQA)

Synchronized Process Deployment Strategy

- 'Big Bang' – Deployment of Level 3 process suite at selected locations.
- 'Drip Feed' – Process Action Teams (PAT's) established to address specific process needs across whole corporation

Alignment with Business Goals Development Center Consolidation

Charter

- Deploy a 'franchise' model to support the consolidation of Technology Service development centers.

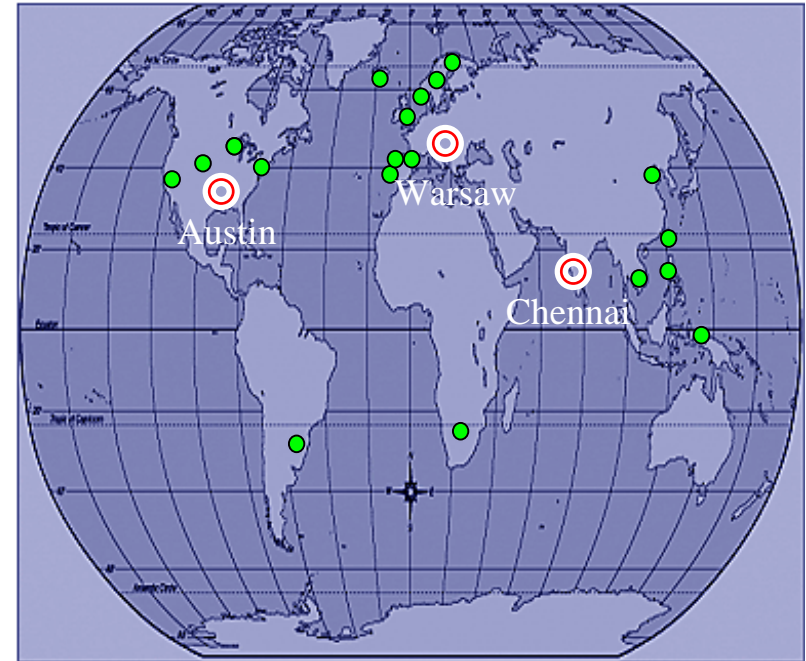
Challenge

- Institutionalization of common processes across multiple multicultural organizations that span 17 time zones.

- Deployment of processes to support a new remote development model.
- Chennai Technology Center staffed by business partner personnel.

Opportunity

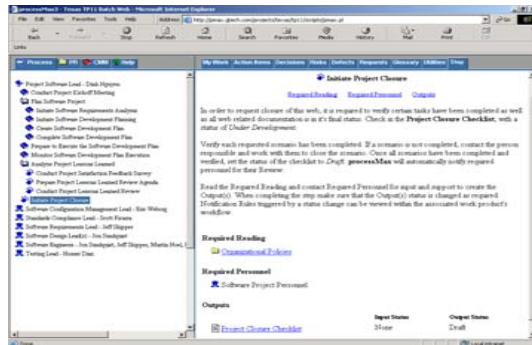
- Creation of the new Technology Centers provided the perfect catalyst for implementing change.



Development Center Consolidation New Standard Project Process (SPP)

Systems Integration Projects

- Single project per customer
- Specific start & end dates
- Combined software & hardware delivery.

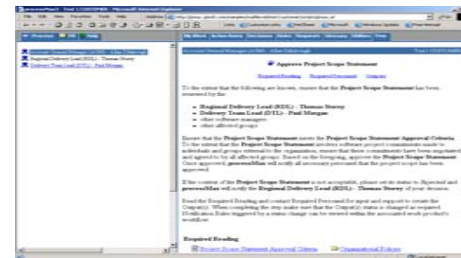


Project Web

- Single Project Web holds all roles, work products, and information required for project delivery.

Technology Services Projects (Batches)

- Multiple projects per customer
- Rolling projects (overlapping start & end dates)
- Primarily software only deliveries.



Customer Web



Multiple Batch Webs

- Single customer web containing local customer service representative roles and processes.
- Multiple batch webs per customer containing batch specific remote development roles and processes.
- Approach provides transparency between local office and remote development centers.

Process Deployment Negotiation and Agreement



Process Improvement Objectives Negotiated

- Technology Center process improvement plan agreed by all stakeholders.
- Target date set for CMM Level 3 maturity.
- Process improvement objectives linked to individual performance goals.
 - Cascading M.B.O.'s (Management By Objectives).

Measures of Success Agreed

- % of Technology Center personnel trained on new process.
- Process compliance score.
- Project level metrics.

Process Deployment Participation and Involvement



Process Design

- Practitioner involvement during process design.

Process Tailoring

- Tailoring procedure allows projects to modify standard process to meet local environmental needs on a project by project basis.
- All tailoring requests require SEPG approval so as to maintain 'franchise' model and CMM compliance.
- Quarterly historic tailoring request review conducted by SEPG. Identifies trends for purposes of customising the standard process.

Process Customisation

- Generic process changes can be requested by any personnel.
- Change requests are reviewed first by the Technology Center originating the request. Then across Technology Centers. Finally by the SEPG.

Process Waiver

- Under exceptional circumstances projects can opt out of following the standard process. Formal waiver procedure exists to provide an audit trail.

Process Deployment Facilitation and Support



General Mentoring

- Dedicated process and quality mentors located at every Technology Center.

Speciality Assistance

- Dedicated configuration management personnel employed at Technology Centers.

Standards Compliance (SQA)

- Dedicated standards compliance (SQA) resources on every project to provide early warning of potential problems:
 - Review of project process compliance.
 - Audit of project work products (internal and external deliveries).

“Got a budget for that”

- All support resources provided at no direct cost to project budgets.

Process Deployment Education



Process Training

- CMM training - Rationale for using CMM based process improvement to achieve corporate business goals.
- GTECH process overview and detailed role based training.
- 'Delta' training to accompany new process updates.

Skills Training

- Project Management (PMP)
- Configuration management
- Tools training
- Team building

Training Delivery

- Instructor led
- 'Train the Trainer' to utilize local personnel with local language skills
- Web based

Process Deployment Communication



General

- Web site: Provides overview of SEPG organization, charter, and objectives.
- Newsletter: Reports SEPG activities, success stories, announcements, and process 'hints and tips'.
- Affinity group: Email based. Available for project personnel and management to ask questions and swap ideas.
- Release Notes: Accompany process updates.

Meetings

- Weekly: Combined SEPG and Technology Center progress review.
- Monthly: Senior Management progress review
- Quarterly: SEPG Steering Group progress review

Process Deployment Management Intervention



- Despite every effort to facilitate change some people and/or teams may refuse to conform. As a last resort sponsor intervention might be required to prevent the process improvement initiative from stalling.

Process Deployment

February 2004 - Austin & Chennai CBA IPI

CMM Level 2 Journey:

- 18 months from commence of GTECH process improvement initiative.




The Software Productivity Consortium completed a CMM-Based Assessment on February 27, 2004 in accordance with the Software Engineering Institute CMM Appraisal Framework and determined that


GTECH Chennai Technology Center – Technology Services

exhibited the characteristics of

SEI Level 3 Software Process Maturity

as defined by the SEI CMM version 1.1


Gene Jorgensen
SEI Authorized Lead Assessor


Drew Allison
SPC Assistant




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GTECH Austin Technology Center – Technology Services

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SEI Authorized Lead Assessor


Drew Allison
SPC Assistant

CMM Level 3 Journey:

- 18 months from establishment of Technology Centers
- 48 months from commence of GTECH process improvement initiative.



Observations

Cost of Process Improvement



Process Definition

- Recruitment and training of process improvement personnel
- Process design and documentation

Process Deployment

- Creation of training materials
- Support of process roll-out
 - Project staff training
 - Mentoring and coaching
- Learning curve costs
- Consultancy costs
- Assessment costs

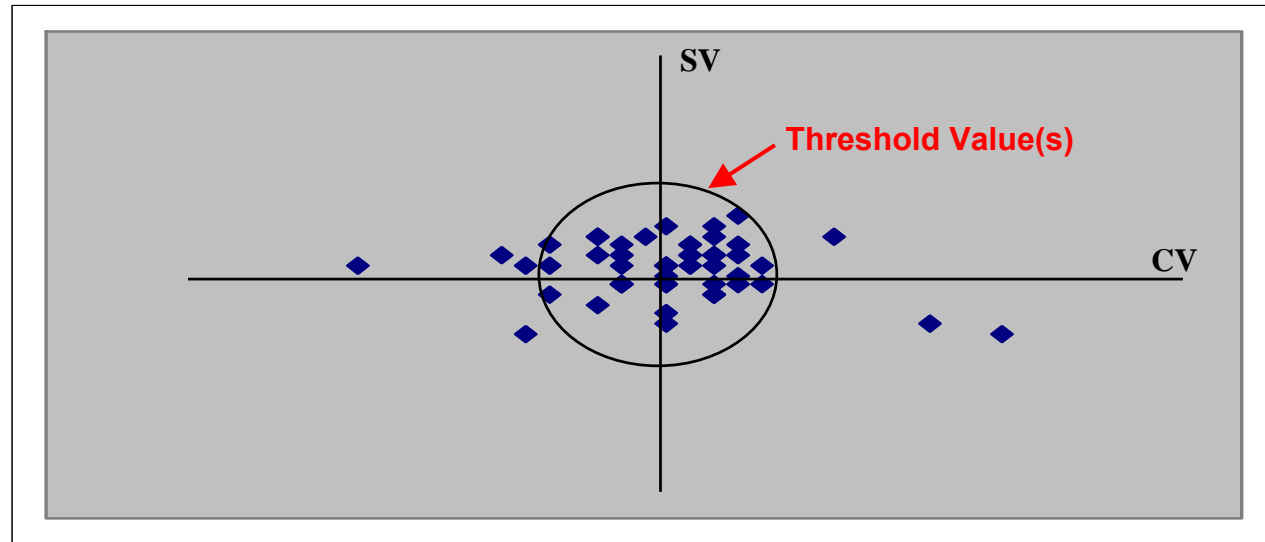
Tools

- Purchase, customization, training, deployment, and maintenance.

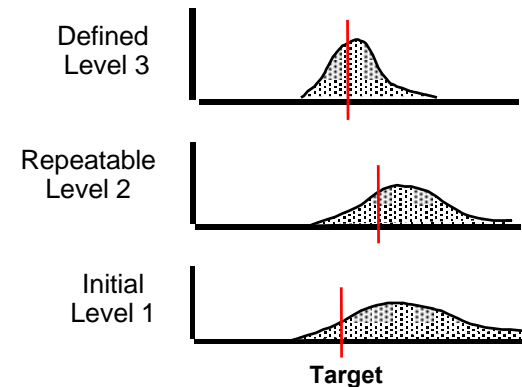
Industry Data (Source: Software Productivity Consortium - 2002)

- Cost to move to a new level in 12 months: 10% engineering labor costs
- Cost to move to a new level in 24 months: 5% engineering labor costs
- Cost to maintain level: 2.5% engineering labor costs

Benefits of Process Improvement Cost and Schedule Variance (CV and SV)

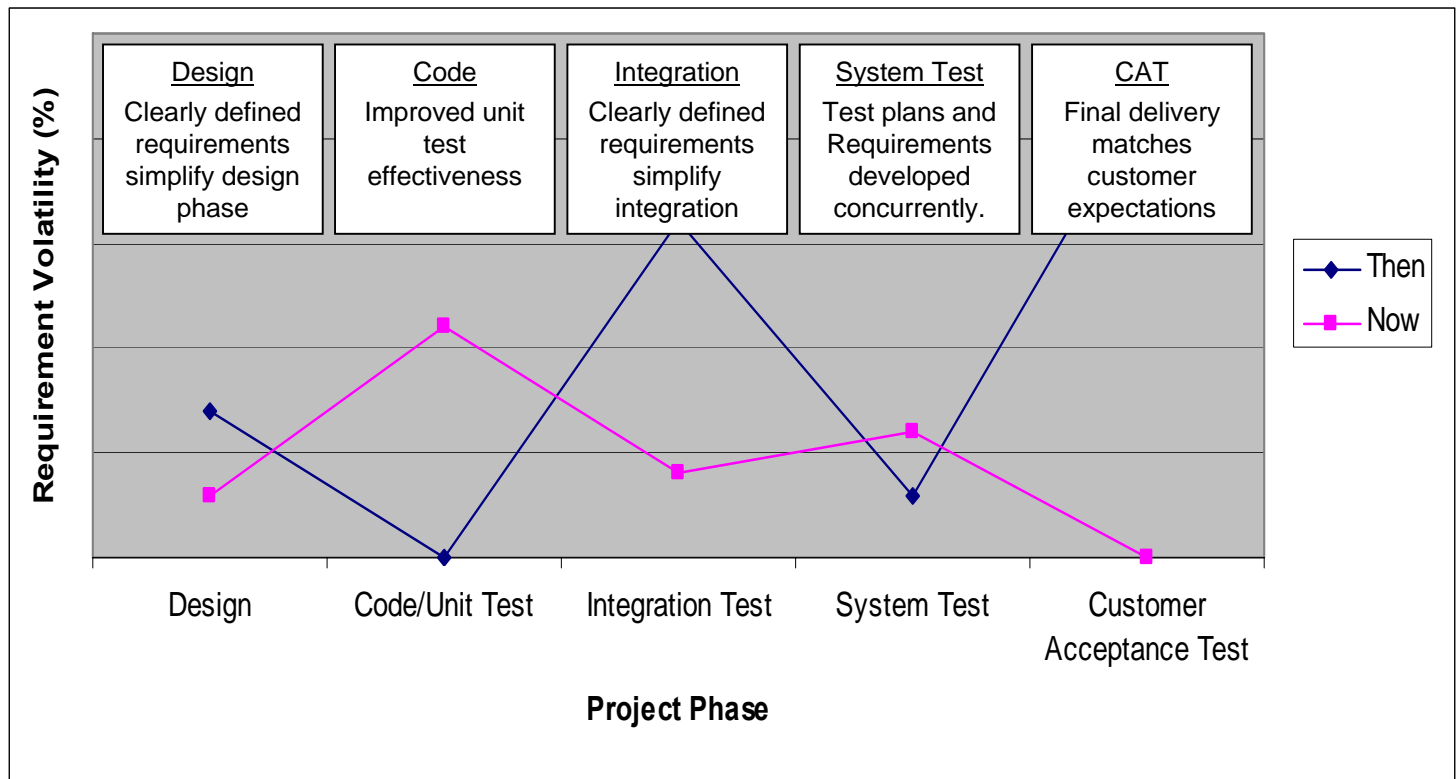


- Accuracy of estimates (Cost and Schedule) increased by 88%.
- Predictability improved by 80%.



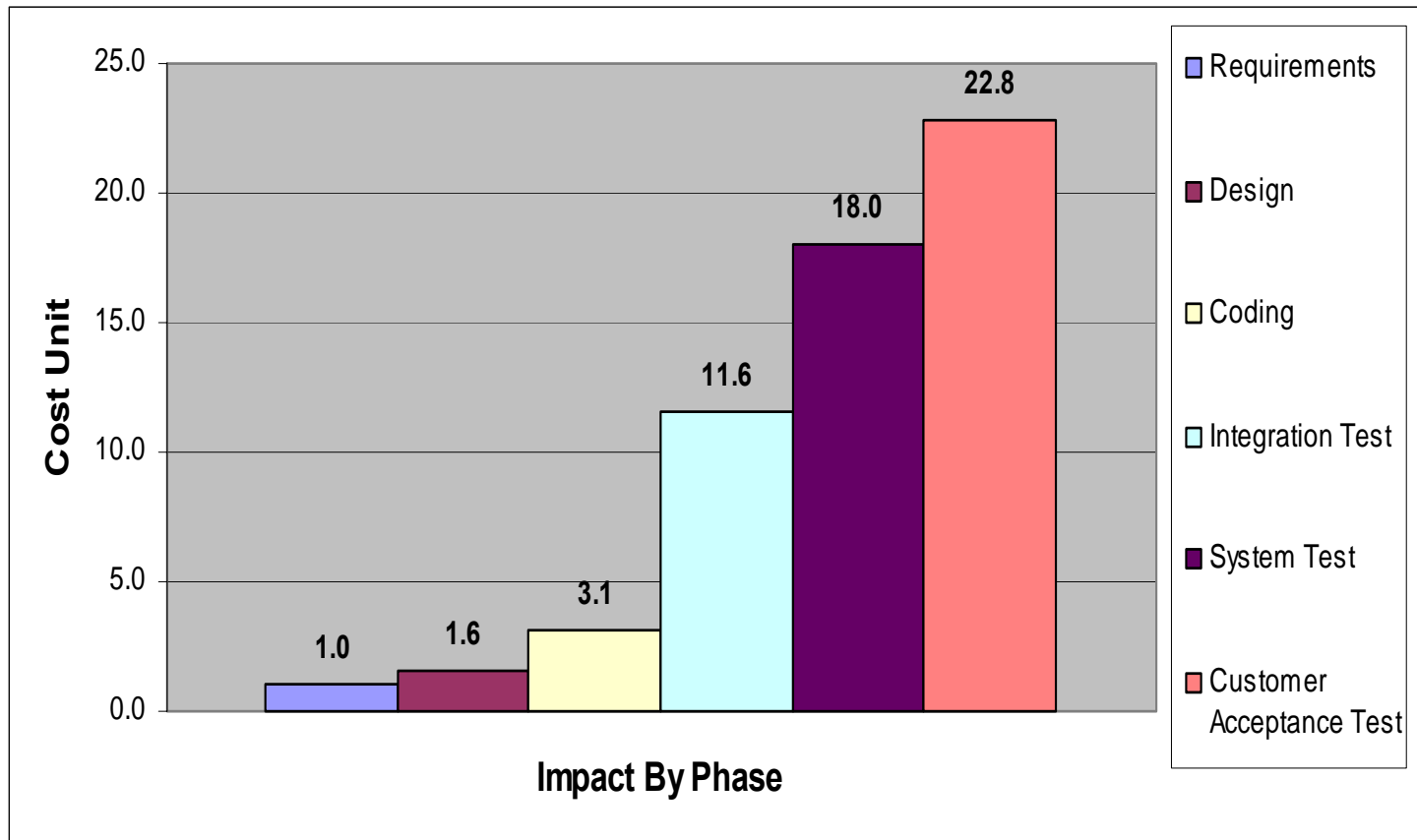
Benefits of Process Improvement Requirements Volatility & Profile

- Requirements volatility reduce by 60%



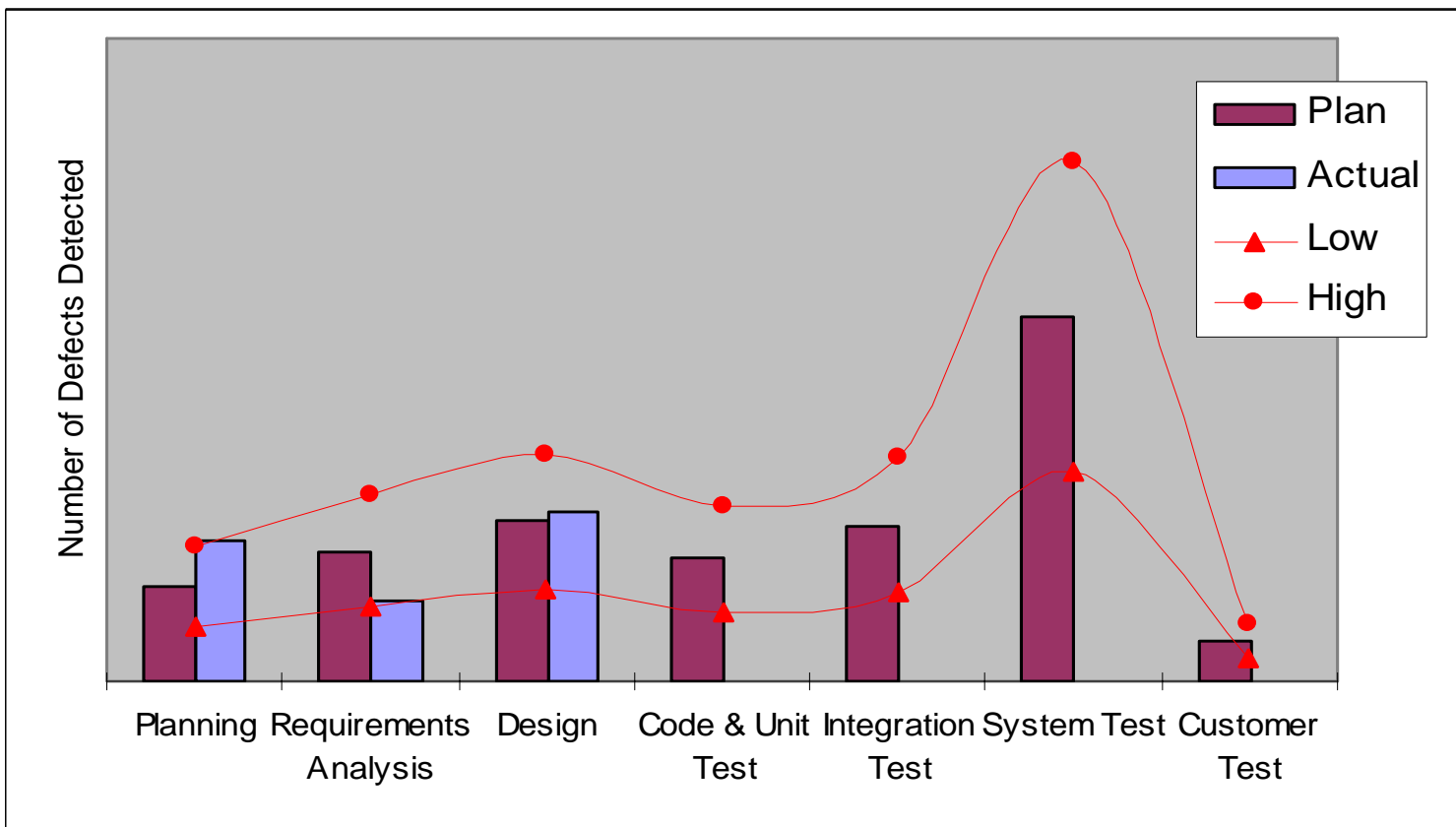
Benefits of Process Improvement

Cost of Defects



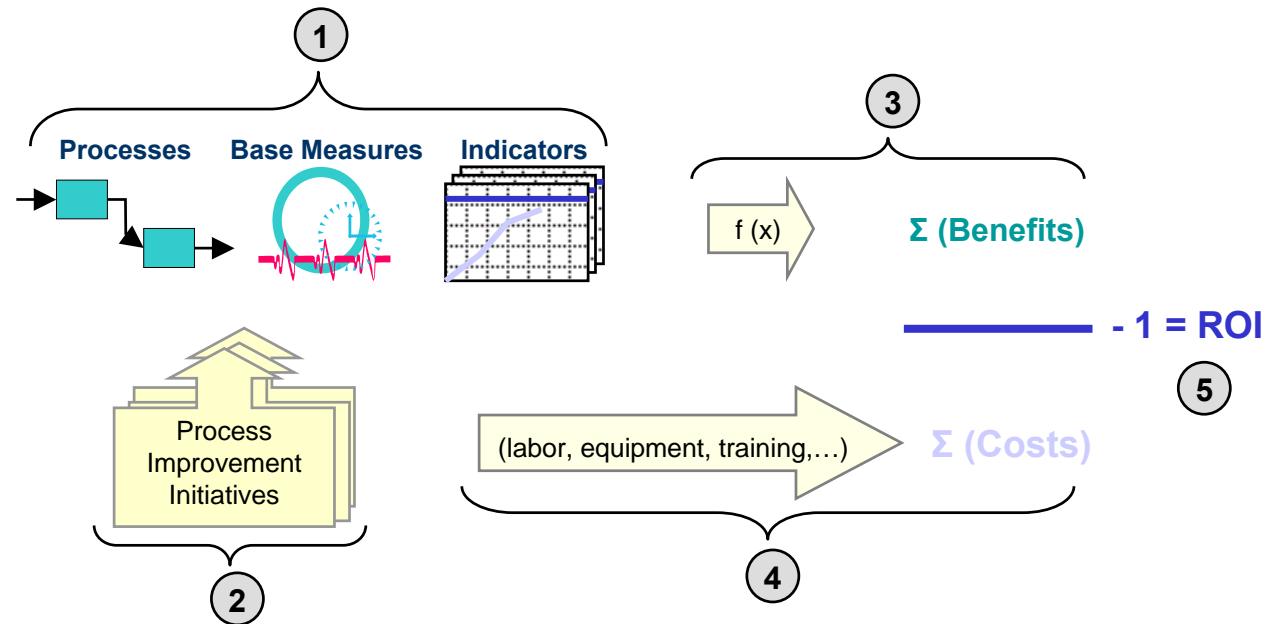
Benefits of Process Improvement

Defect Detection Profile



Benefits of Process Improvement Return on Investment (ROI)

- Currently GTECH is working with the Software Productivity Consortium (SPC) on piloting a process improvement ROI workshop.



- ROI in excess of 6:1 calculated as rework avoided per hour spent in inspections
- Benefits usually lag investment by months or years. Greater returns accrue as experience of operating as a level 3 organization increases.

Other Benefits of Process Improvement

- The standard process is recognition that GTECH's software development practices are valuable business assets that must be defined, documented and secured.
- Standard for all GTECH employees to follow irrespective of where software development work takes place.
- Historic 'information' repository provides a knowledge base facilitating reuse of project artefacts.
- The defined and documented processes make project successes repeatable.
- Faster project start-up and less re-training.
- Visibility afforded by intranet based process facilitates management decision making.
- Improved teamwork and employee morale.
- Increased customer confidence.

GTECH Process Improvement Overview

Keys To Success

- Obtain executive sponsorship. The time to achieve CMM compliance entirely depends upon Senior Management commitment.
- Early involvement and education of all stakeholders in the supply change, both internal and external.
- Staff the SEPG with recognized leaders and discipline experts.
- Treat the process improvement initiative as a high priority project with enforced accountability and high-visibility status reporting.
- Do not adopt the CMM as your process. Better to interpret it based upon the specific requirements of your business.
- Use the best technology to deploy the process.
- Ensure accountability via standards compliance and periodic assessments with results reported to all.
- Build a good working relationship with your external assessor and keep them involved in your ongoing process improvement initiative.

GTECH Process Improvement An Alternative Perspective....

Here is Edward Bear,
coming downstairs now,
bump, bump, on the back
of his head behind
Christopher Robin.
It is, as far as he knows, the
only way of coming
downstairs, but sometimes
he feels there really is
another way, if only
he could stop bumping for
a moment and think of it.

A A Milne
Winnie the Pooh



GTECH Process Improvement

Thank You

Any Questions

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