Going Global: A Practical Guide to Implementing Process Improvement Across Six Continents

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28th March, 2006

Agenda

What you will hear...

- A little about GTECH
- Our process improvement history and benefits achieved
- Gaining momentum and the inevitable resistance
- Specific techniques to:
  - Obtain sponsorship and achieve corporate alignment
  - Develop usable process documentation
  - Deal with “trouble spots” such as sizing, DAR, and quantitative analysis
  - Institutionalize the process
- Take home thoughts

GTECH Corporate Profile

GTECH is the global leader in the online lottery business and a leading provider of gaming and technology services worldwide.

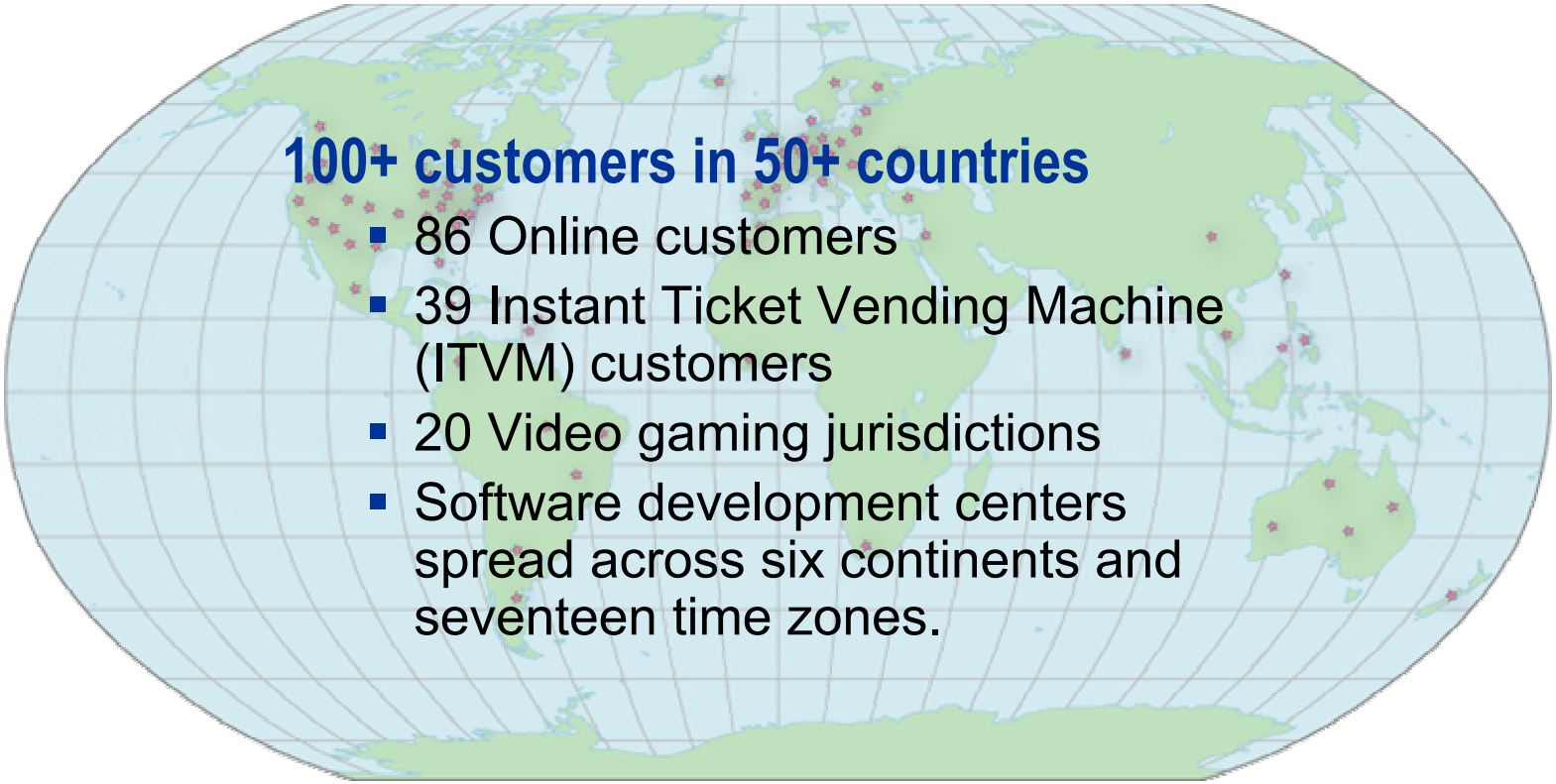
- Incorporated in 1980.
- Headquartered in Rhode Island, USA.
- 5,300 employees worldwide in more than 50 countries.
- More than $1.3 billion in total revenue in FY 2006 (Mar 2005 to Feb 2006).
- In 2006 GTECH was acquired by Lottomatica S.p.A. (Milan: LTO).

GTECH Market Focus

Lottery	Gaming Solutions	Commercial and Government Services
Supply end-to-end lottery technology and services. Design, assemble, install, operate, and maintain online lottery systems for governments and licensed operators worldwide.	Provide complete gaming systems technology to government-sponsored machine gaming programs as well as commercial and Native American gaming venues.	Deliver reliable, secure, and high-volume transaction processing solutions to commercial, financial, and governmental customers.

Our Customers

Many of the world's lotteries have selected GTECH as their technology partner.



100+ customers in 50+ countries

- 86 Online customers
- 39 Instant Ticket Vending Machine (ITVM) customers
- 20 Video gaming jurisdictions
- Software development centers spread across six continents and seventeen time zones.

GTECH's Process Improvement Journey

March 2000

Process improvement initiative commenced.

19 months

October 2001

CMM Level 2 – Ireland Development Center

29 months

February 2004

CMM Level 3 – Austin & Chennai Technology Centers

12 months

February 2005

CMM Level 3 – Austin, Chennai and Warsaw

22 months

December 2006

CMMI Level 4 – Software Engineering - Support

Total : 5 years and 10 months


SOFTWARE PRODUCTIVITY CONSORTIUM

The Software Productivity Consortium completed a CMM-Based Assessment on October 19, 2001 in accordance with the Software Engineering Institute's CMM Appraisal Framework and determined that the

GTECH Ireland Corporation

exhibited the characteristics of

SEI Level 2 Software Process Maturity

as defined by the SEI CMM version 1.1

Gene Jorgensen
SEI Authorized Lead Assessor


SOFTWARE PRODUCTIVITY CONSORTIUM

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

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


SOFTWARE PRODUCTIVITY CONSORTIUM

The Software Productivity Consortium completed a CMM-Based Assessment on February 6, 2004 in accordance with the Software Engineering Institute's CMM Appraisal Framework and determined that the

GTECH Austin Technology Center –
Technology Services

exhibited the characteristics of

SEI Level 3 Software Process Maturity

as defined by the SEI CMM version 1.1

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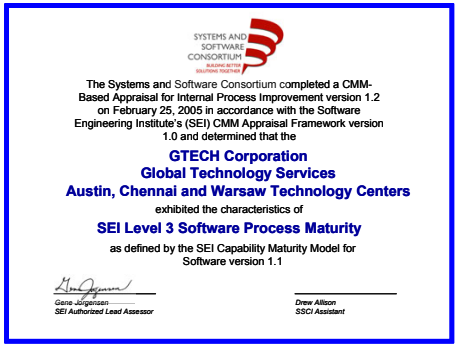

SYSTEMS AND SOFTWARE CONSORTIUM

The Systems and Software Consortium completed a CMM-Based Appraisal for Internal Process Improvement version 1.2 on February 25, 2005 in accordance with the Software Engineering Institute's (SEI) CMM Appraisal Framework version 1.0 and determined that the

GTECH Corporation
Global Technology Services
Austin, Chennai and Warsaw Technology Centers

exhibited the characteristics of

SEI Level 3 Software Process Maturity

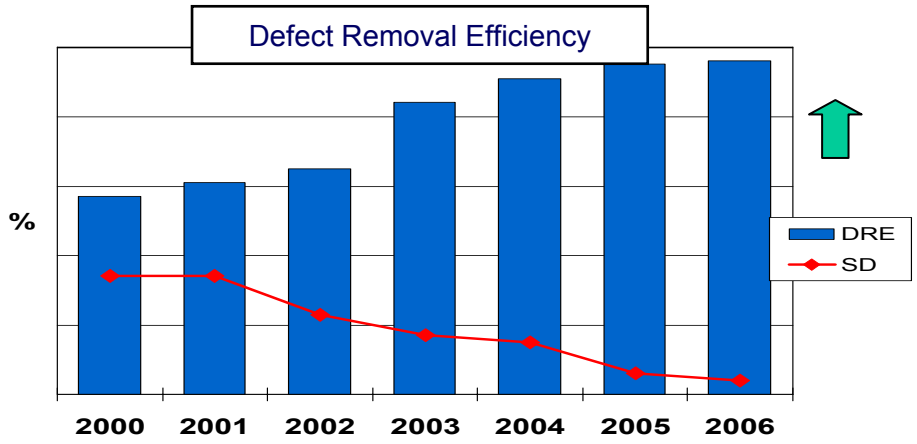
as defined by the SEI Capability Maturity Model for Software version 1.1

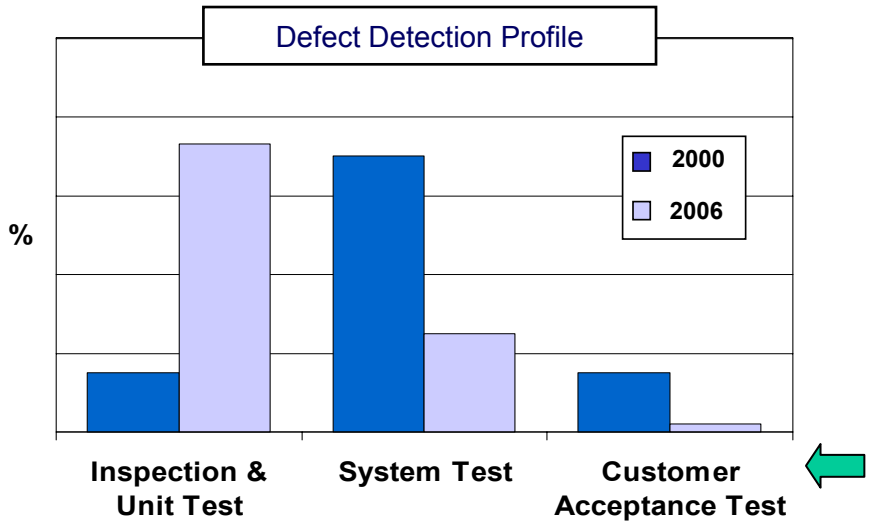
Gene Jorgensen
SEI Authorized Lead Assessor

Drew Allison
SSCI Assistant

CMMI Benefits

'Faster – Better – Cheaper'



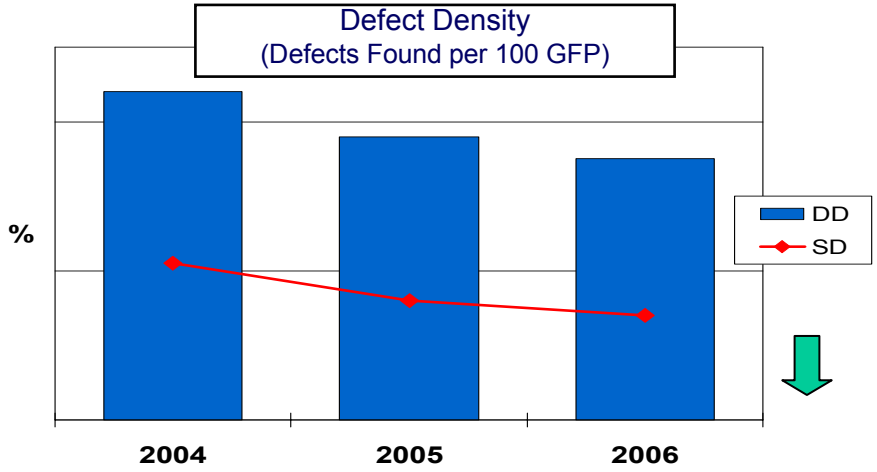


- The % of defects resolved prior to customer delivery.
- A simple, although some would say crude, indicator of product quality.
- Standard deviation is an indicator of performance repeatability.

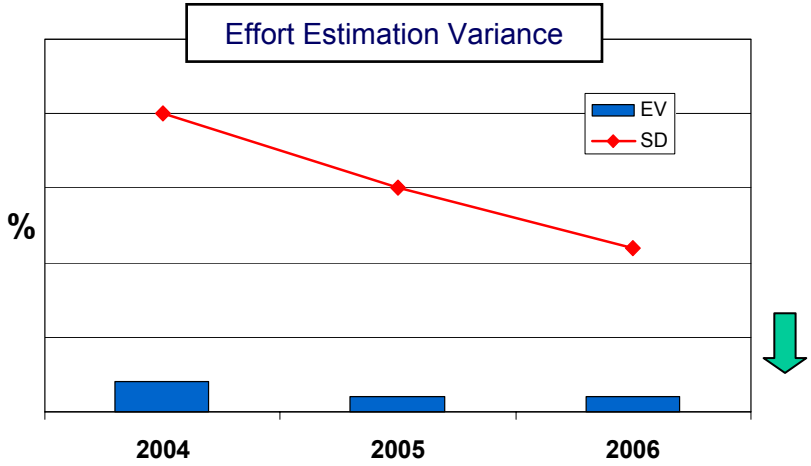
- Finding defects earlier in the development lifecycle is cheaper.
- For GTECH it is 23 times more expensive to fix defects during customer acceptance testing as opposed to the requirements phase.
- CMMI has led to a 40% reduction in rework.

CMMI Benefits

'Faster – Better – Cheaper'



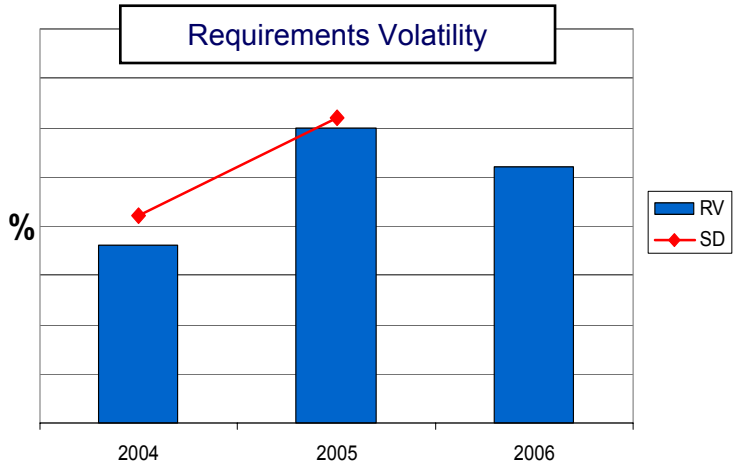
- The % of defects resolved as a function of the size of the delivery.
- A good indicator of the effectiveness of your development practices.



- Historically GTECH's mean estimation results have been good.
- CMMI has added repeatability and predictability by reducing the range of estimates.

CMMI Benefits

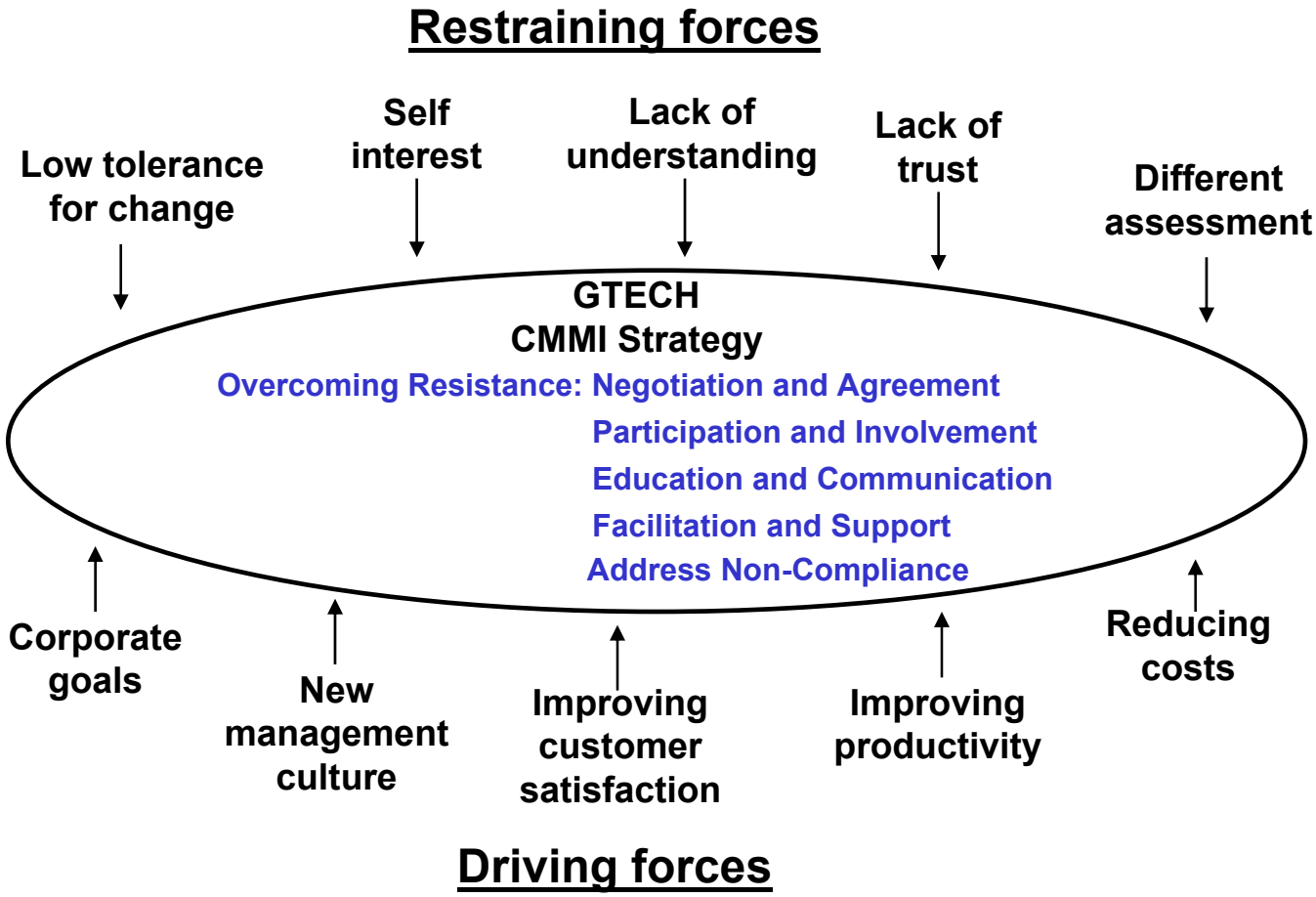
'Faster – Better – Cheaper'



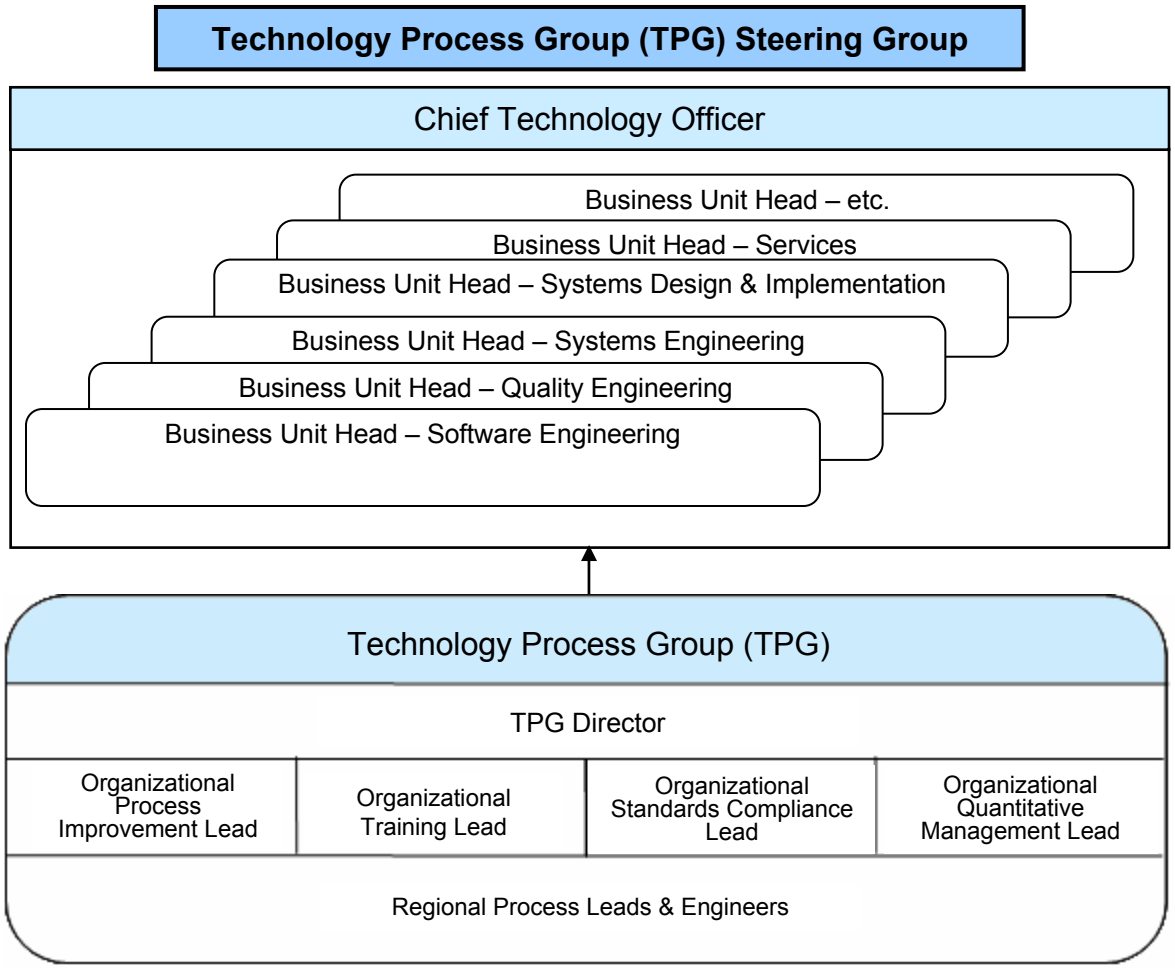
- Requirement changes are driven by external customer factors.
- Historically not every requirement change was documented, which skewed our original metrics.
- CMMI validation activities have helped to reverse the negative trend.

- Establishing standards to be followed irrespective of where software development work takes place also ensures:
  - More effective resource utilization.
  - Faster project start-up and less re-training.
  - Improved teamwork and employee morale.
  - Increased customer confidence.
- Formal process definition is also recognition that software development practices are valuable business assets that must be defined, documented and secured.

Now The Bad News - Resistance To Change



Sponsorship – Establishing a Dedicated Process Group



Technology Process Group

- 20 people located globally.
- >100 person years of process improvement experience.

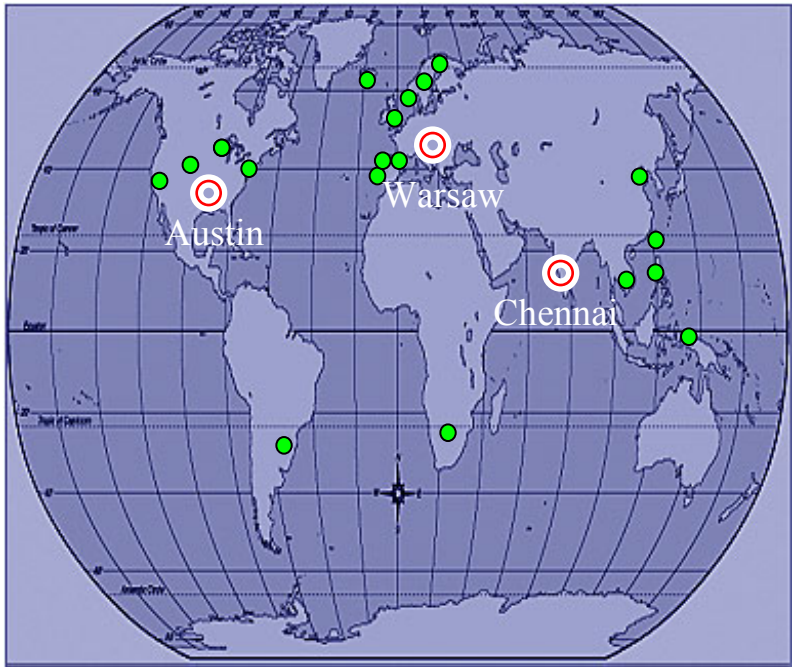
Aligning with Corporate Goals

Charter

- Deploy a ‘franchise’ model to support the consolidation of development centers.

Challenge

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



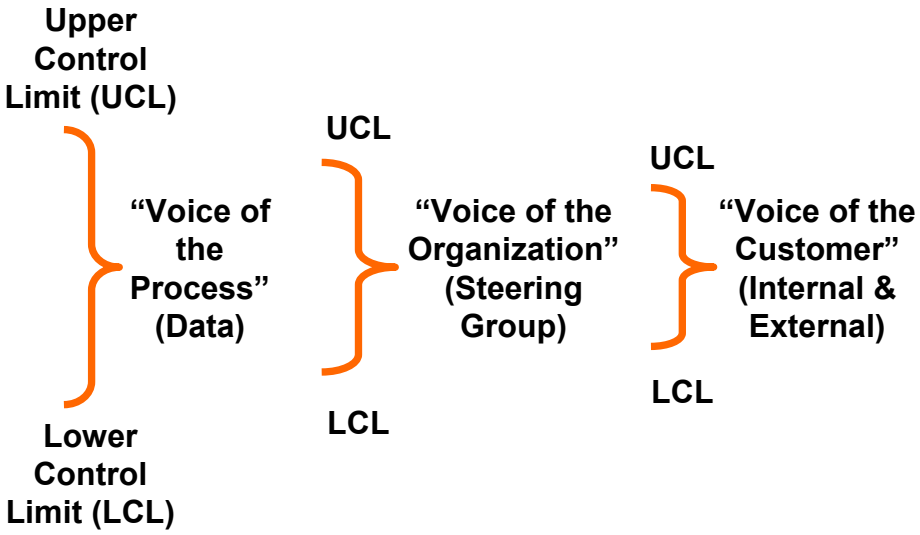
Opportunity

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

Aligning with Corporate Goals - Metrics

Business Goals	Process/Product Goals	Objectives	Measures	Metric Type	Usage
Reduce Cost of Operations	Improve Effort Estimation Capability	Software project effort estimates will be accurate to within plus or minus X%	Effort Variance	Process	Mandatory
		Software project cost estimates will be accurate to within plus X% or minus X%	Cost Variance	Process	Mandatory
	Increase Productivity	Software project size estimates will be tracked and monitored throughout the project lifecycle	Size Variance	Process	Mandatory
		Productivity rates will increase by 10% from the FY 05 baseline.	Productivity	Process	Mandatory
	Reduce Rework	Identify and remove more than X% of the total amount of project defects before BTC/Integration Testing.	Defect Distribution	Process	Mandatory
		Become more effective at identifying defects during the formal inspection.	Inspection Effectiveness	Process	Optional
		Gain an understanding of the amount of time expended fixing defects introduced by the project team	Rework	Process	Optional *(To be finalised)*
Increase Quality and Reliability	Reduce Defects Delivered to the Customer	Identify and correct X% of all software defects prior to customer delivery	Defect Removal Efficiency	Product	Mandatory
	Reduce Project Defects	Reduce the overall number of defects introduced by the project team relative to product size by X% from the FY 05 baseline.	Defect Density	Product	Mandatory
		Monitor and track the number of changes to the original requirements, and understand how the changes can affect the project.	Requirements Volatility (Total and by Phase)	Process	Mandatory
	Ensure Process Compliance	All services projects will receive a process compliance score of not less than X%.	Process Compliance	Process	Mandatory
	Improve Customer Satisfaction	Gain an understanding of the customer's satisfaction of the software deliverable.	Customer Satisfaction Survey	Product	Optional

Aligning with Corporate Goals - Setting Targets

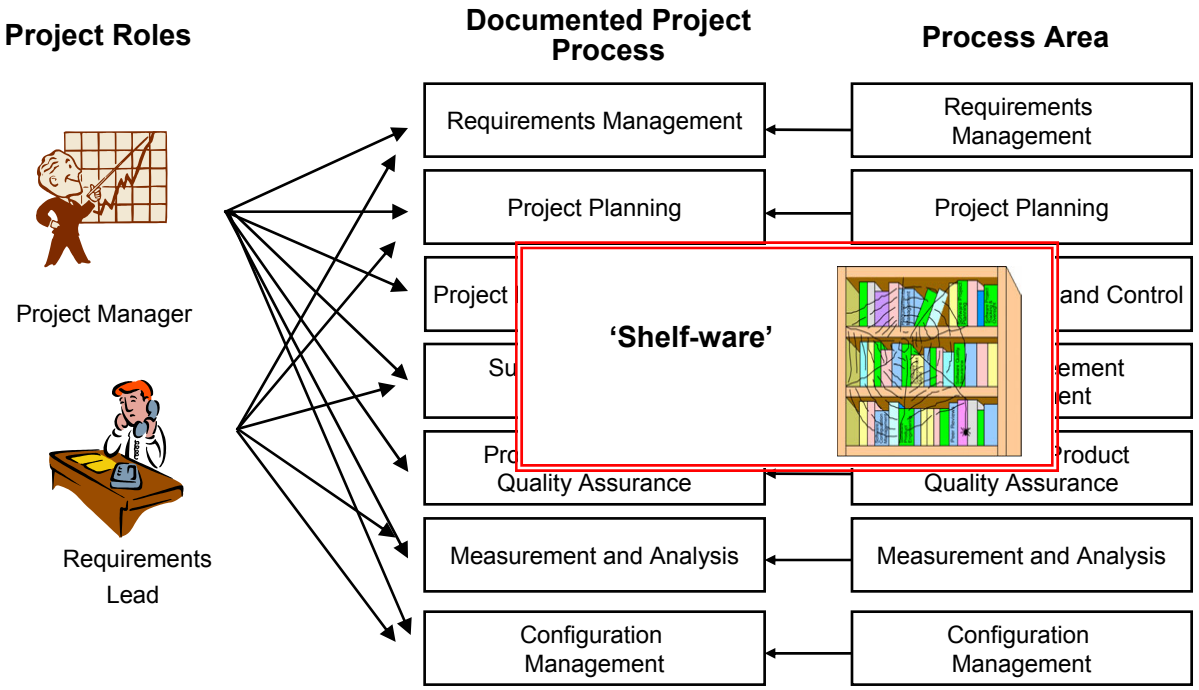


Metrics Definition

Defect Removal Efficiency	Mandatory
Description	Measures the number of defects found after the Customer Acceptance Test (CAT) date relative to the total number of defects associated with a project.
Objective	Improve the quality and reliability of the software deliverable
Target Value/Range and Goals	Please refer to Organization Quantitative Management Targets.
Benefits	• Indication of the quality of a software deliverable • Provides insight on the Quality Assurance activities of the project
Data Items	• **Total Number of Medium and High Inspection Defects** • **Total Number of Low, Medium and High Test TIRs**
Data Source	• **Total Number of Medium and High Inspection Defects**: processMax® • **Total Number of Low, Medium and High Test TIRs**: MUTT
Computation	[(Total Number of Medium and High Inspection Defects + Total Number of Low, Medium and High Test TIRs For Entire Project) - (Total Number of Medium and High Inspection Defects + Total Number of Low, Medium and High Test TIRs Found After CAT Date)] ÷ (Total Number of Medium and High Inspection Defects + Total Number of Low, Medium and High Test TIRs For Entire Project)
Collected	Initially collected by Organizational Quantitative Measurement Analyst prior to project lessons learned meeting. Metric finalized when batch is closed.
Reported	**Process Capability Baseline Report**
Stored	Quantitative Management Data Repository
Analysis Technique	Control Chart
Interpretation	DRE scores should rise as quality practices improve. Additionally, a drop in the standard deviation indicates that the quality practices are becoming more consistent.
Considerations	Analysis will be made to identify correlations between process compliance, requirements stability, and cost variance. Note: The DRE score is driven by the CAT date. The metric assumes that the required customer solution is completed and able to meet the customer requirements without fault by the CAT date established in the WBS.

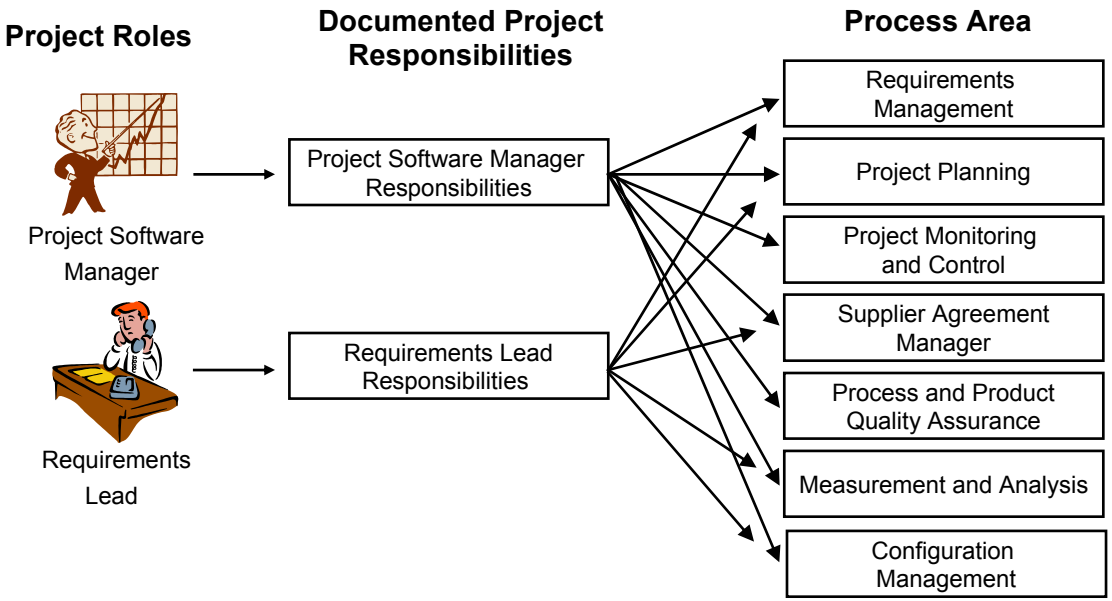
Usable Processes – The Challenge

- Process models are auditor's tools. They are not written to easily support project managers or developers in their daily activities.



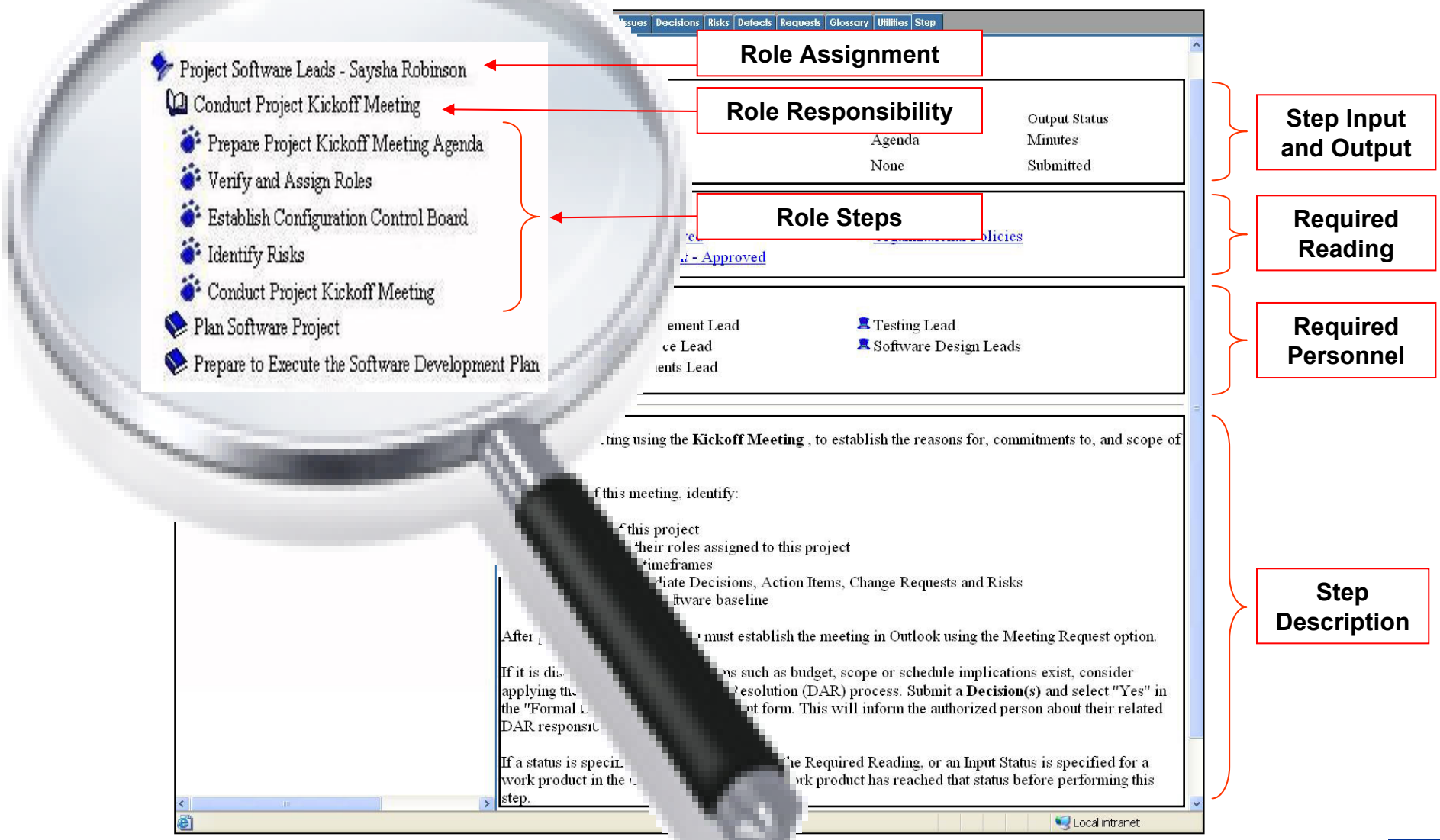
Usable Processes - Solution

- Role based approach



- 'Light' process documentation designed for ease of use.
- Intranet based to provide corporate wide accessibility and management visibility.
- A historic 'information' repository to provide a knowledge base facilitating reuse of project artefacts.

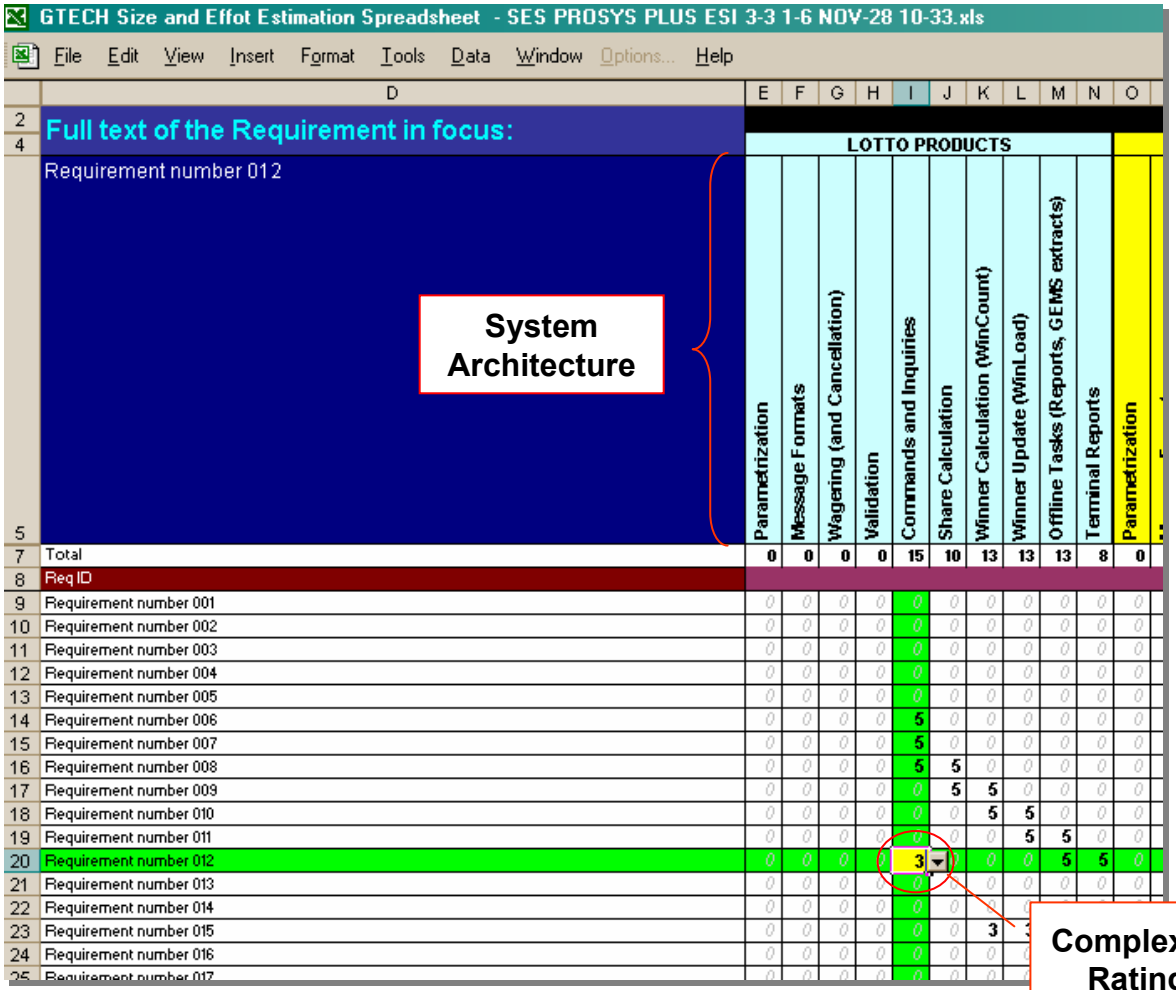
Usable Processes - Documentation



Trouble Spots - Sizing

- GTECH Function Points (GFP) based upon a simple Excel spreadsheet.
- Approach has served us well and only now are we investigating a more sophisticated and scaleable solution.

Project Requirements

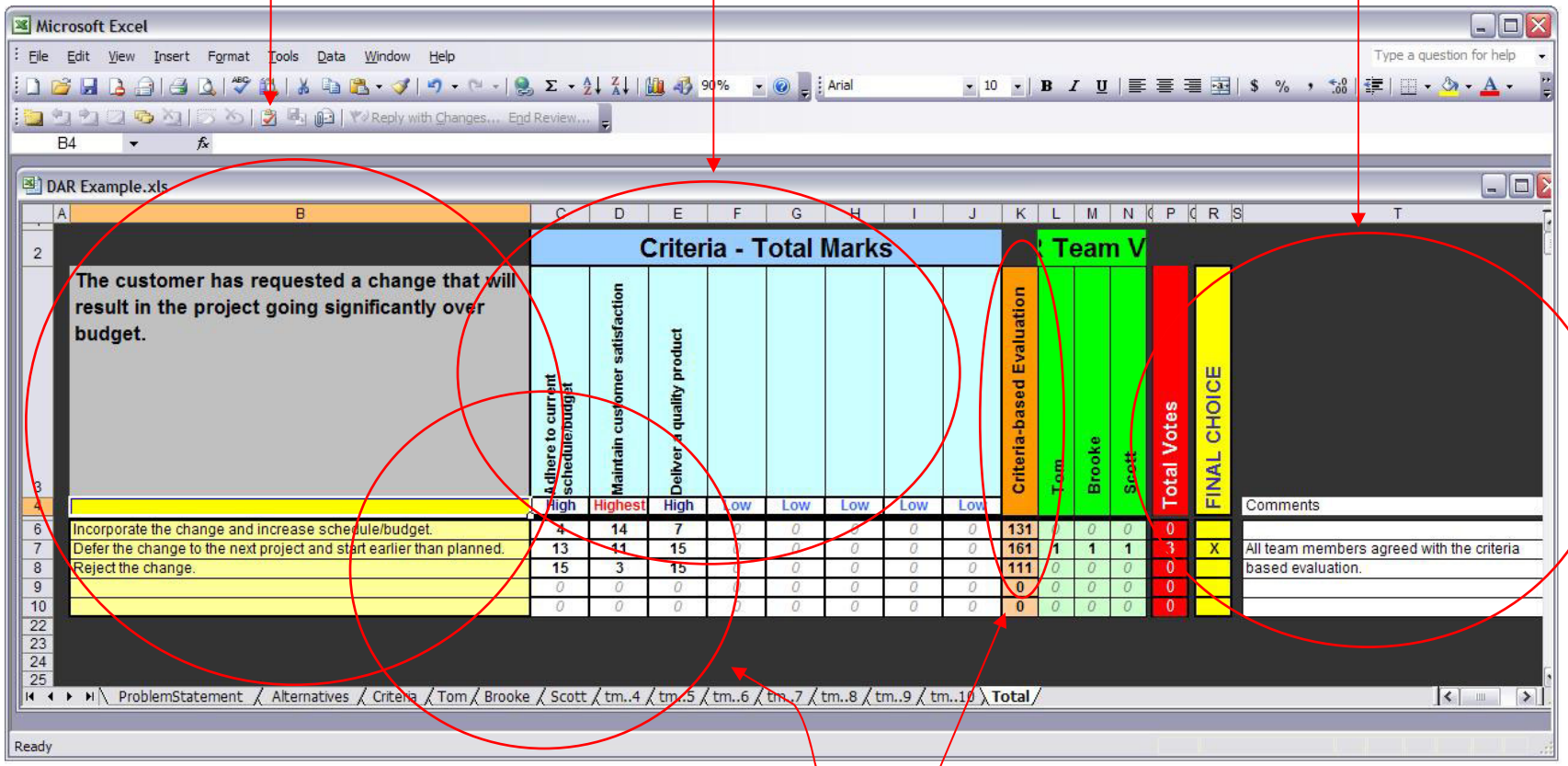


Trouble Spots - Decision Analysis and Resolution (DAR)

Problem Statement and Alternatives

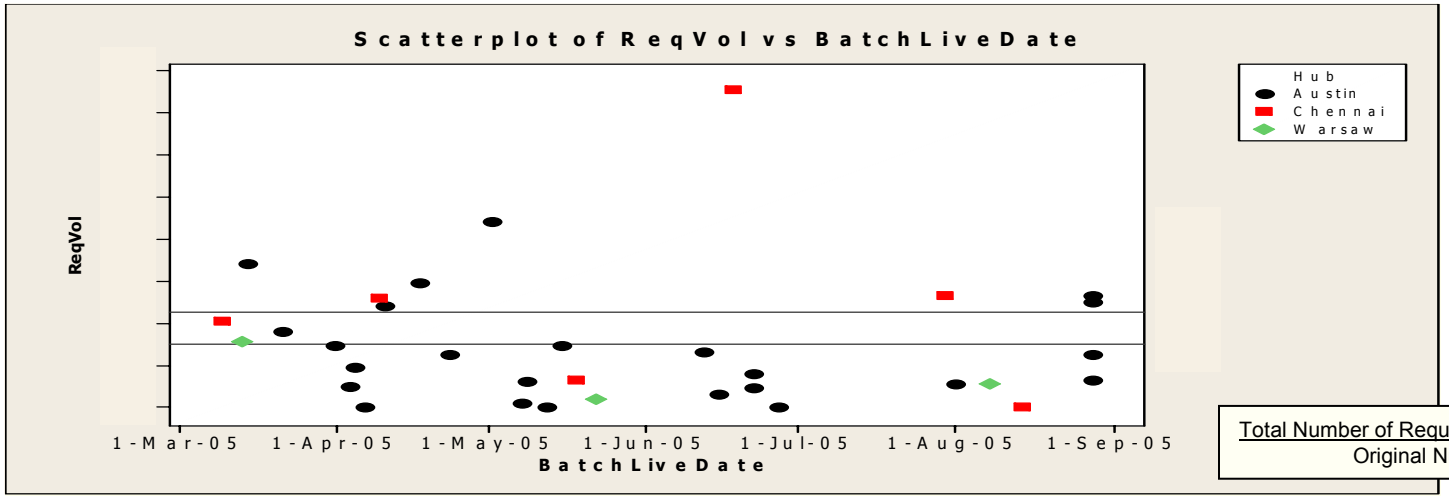
Weighted Criteria

Final Selection and Comments



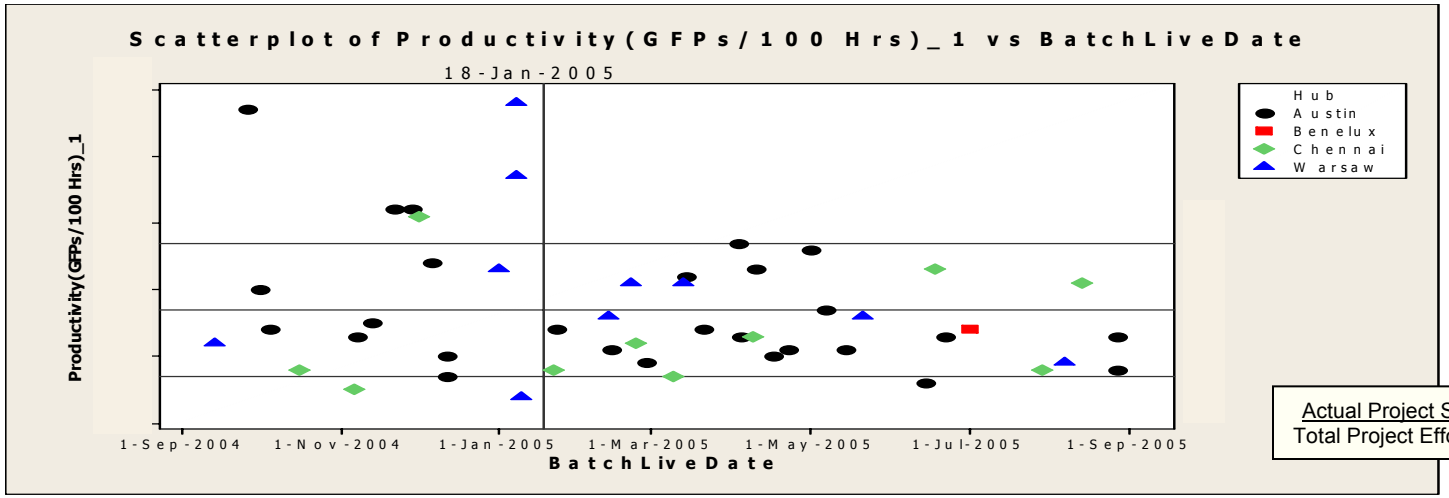
Team Member Evaluations Against Criteria

Is All What It Seems? Institutionalization



Process is Not Stable and Not Capable

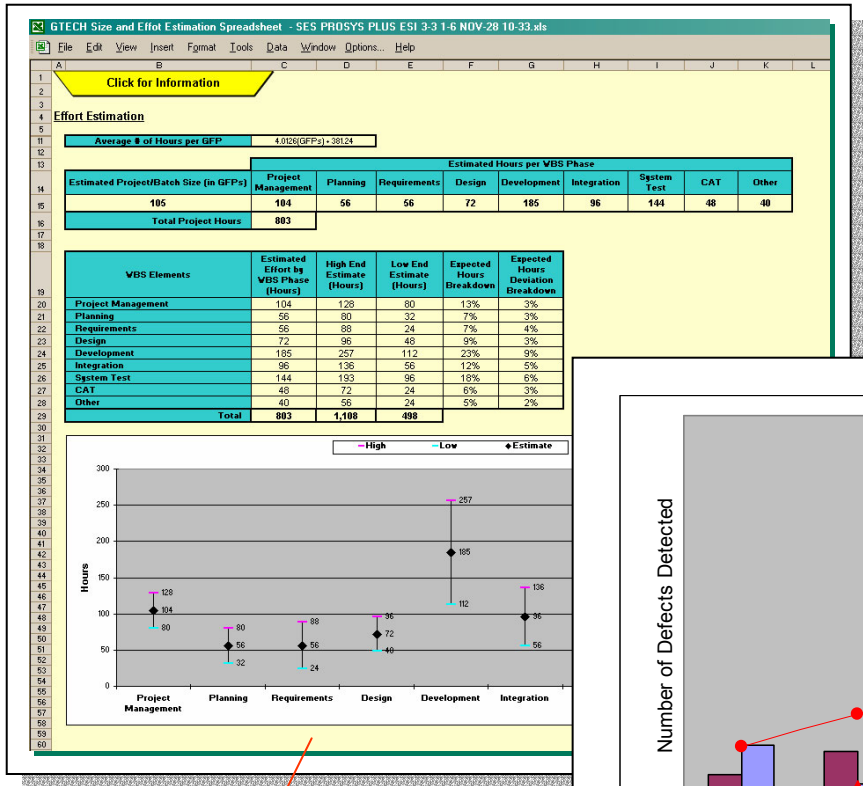
Total Number of Requirements Changed, Added, Deleted
Original Number of Requirements



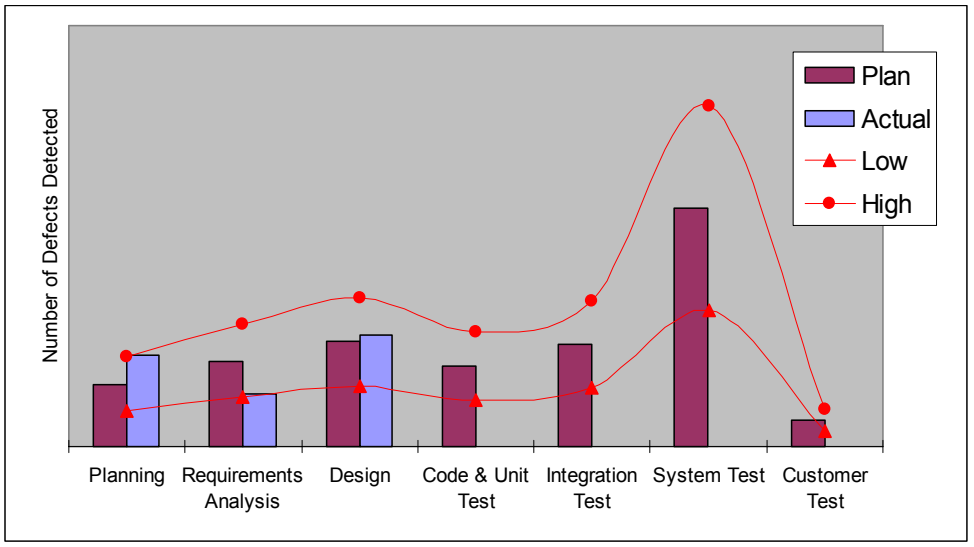
Process has become Stable and Capable

Actual Project Size (GFPs)
Total Project Effort (100 Hrs)

Institutionalization - Information Feedback Loops



- New version of our Standard Project Process (SPP) released in November 2004 and contained for the first time size based estimation utilities.



Effort Estimation

Defect Profile

Take Home Thoughts

- The time to achieve a maturity level entirely depends upon the level of Senior Management commitment and sponsorship.
- Staff the Process Improvement Group with recognized leaders and discipline experts.
- Manage the initiative as the company's highest priority project with an adequate budget, enforced accountability, and high-visibility status reporting.
- Do not adopt the maturity model as your process. Interpret it based upon the specific needs of your business.
- CMMI provides the 'What' but not the 'How.' Expect to find missing project management and technical skills within the delivery teams.
- Use the best technology available to deploy the process.

More Take Home Thoughts

- Plan ahead. Establish the foundations for future maturity levels higher than your current objective:
  - Work towards establishing a defined organizational process even if your initial objective is level 2.
  - Establish an organizational metrics program early with dedicated resources even if your objective is level 2 or 3. This will help build a baseline for future use and simplify the transition to level 4.
- To institutionalize change, the use of effective feedback loops is essential:
  - Develop models/utilities/tools for use by project personnel. These can be enhanced to support statistical analysis when moving to level 4.
  - Provide training and ongoing mentoring to project personnel on how to use and analyze the data and statistical models.
- Ensure accountability via standards compliance and periodic assessments (internal and external). Report the results to all and follow through with an action plan.

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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