Automated Project Portfolio Management

Pothiraj Selvaraj

Global Computer Enterprises

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Agenda

- Background
- Challenges
- Solution: Automated Management Systems
- Automated System Toolset
  - Project Planning and Scheduling
  - Technical Performance Management
  - Earned Value Management
  - Risk Management
  - Resource Management
  - Defect management

Background

- Global Computer Enterprises (GCE)
  - Systems Integration Organization
  - Federal Government Contractor
  - CMMI
    - Level 3 Certified Organization
    - Pursuing Maturity Level 4
- Projects Managed
  - Various Government Agencies
    - General Services Administration (GSA)
    - Department of Defense (DOD)
    - United States Coast Guard (USCG)
    - Transportation Security Administration (TSA)
    - Domestic Nuclear Detection Office Organization (DNDO)
    - United States Secret Service (USSS)
  - Firm-Fixed-Price Contracts
  - Project portfolio for each Agency or program within the Agency
  - Delivering Earned Value Management for all projects

Project Portfolio Management

- Project Portfolio Management (PPM) is a management approach characterized by treating related projects as part of an overall project investment portfolio
- PPM establishes a set of values, techniques and technologies that enable visibility, standardization, measurement and process improvement across all projects

PPM	Software Development & Integration
Project Portfolio	Project / Product Release
Project Investment	Project / Deliverable

PPM Challenges

Management Process	Challenges
Project Portfolio Management	Repeatable, integrated execution of all the management processes
Project Planning and Scheduling	Work, task breakdown across overlapping projects and shared resources Keeping track of constant schedule changes
Technical Performance Management	Micro level work assignment and tracking is time consuming Status checking involves intensive floor management
Earned Value Management	Collecting EVM data is labor and time intensive Involves perusing different documents such as project plans, status reports spread across documents and excel sheets
Risk Management	Tracking cost and schedule performance while taking risks into consideration is an added complexity
Resource Management	Resource utilization to obtain real-time project costs and resource pipeline Management
Defect Management	Integrated defect detection and resolution of defects in-place during the course of the projects
Business Intelligence	Generating status reports, obtaining measures and quantitative information for a collection of projects is a tedious manual process

Solution: Automated Management Systems

Management Process	Solution
Project Portfolio Management	Automated System to implement and support these management processes
Project Planning and Scheduling	Planning with EVM emphasis in mind Predefined and customizable Work Breakdown Structure and Work Distribution Structure in the system
Technical Performance Management	Robust Management of tasks Task management and workflow to transition tasks Task Inbox for each project team member Real-time status report on overall project progress
Earned Value Management	EVM data obtained from the collective repository of projects, tasks, work-items and activities Financial Controls Early Warning mechanisms
Risk Management	Integrated Risk tracking and Risk life cycle management
Resource Management	Timesheet functionality integrated with task logging against the work Breakdown
Defect Management	Defect collection, tracking and integrated defect resolution task management
Business Intelligence	Obtained from the collective repository of project management data E.g. generate real-time EVM reports, productivity measures

Automated System Toolset

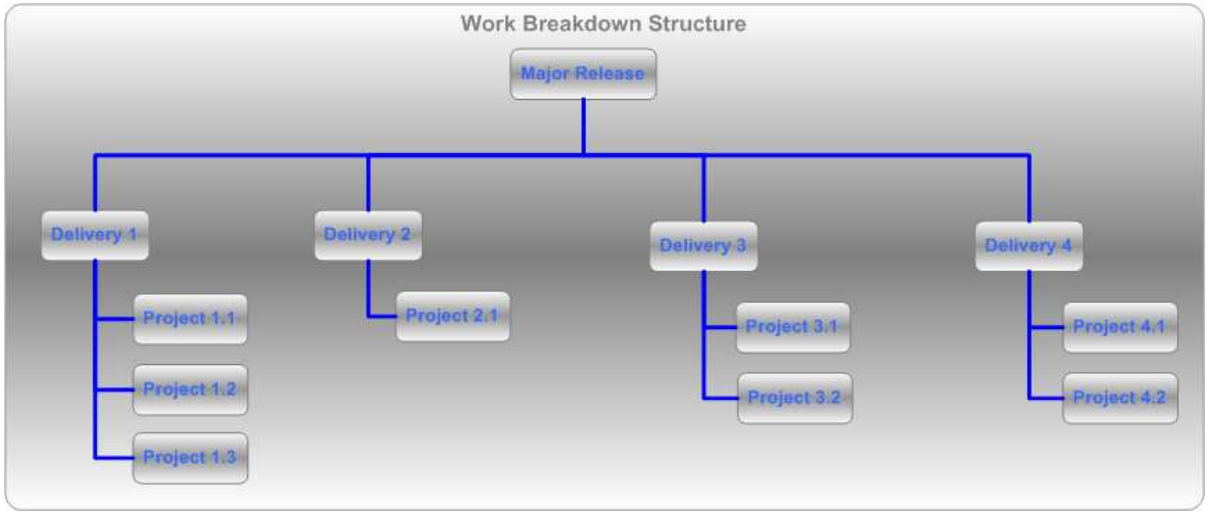
Selection Criteria

- Automated Processes
- Open Source Systems
- Integrated to manage technical, schedule, and cost performance
- Scalable, customizable and extensible

System	Tool
Schedule Management	Dotproject
Task, Cost and Timesheet Management	Dotproject
EVM Data Repository	MySQL Database
EVM Reports	Informatica
Early Warning System	Php extensions
Alerts	Postfix
Defect Management	Dotproject, JIRA

Project Planning and Scheduling

- Project plans are developed with an emphasis on EVM
- Work Breakdown structure
  - Based on PPM
  - Adopt iterative development model
  - Agile practices
  - Granularity: Estimate atomic task assignments at hourly level of detail
- Work Distribution structure
  - SDLC based
    - Distribution across SDLC phases
  - Role based
    - Resource assignment by segregation of duties
  - Dependencies recorded and tracked



Technical Performance Management

- Online Work Management System (WMS)
  - Web-based project management tool
  - Robust portfolio management of projects and micro tasks for all organization
  - Monitor and track all projects and tasks
- Real-time Tracking
  - Project actual % completion available real-time
    - Independent assessment
    - Objective evidences
  - Ability to monitor project progress in real time
  - Slice and dice data across releases, deliveries and projects
- Task Life Cycle Management
  - Online task creation, assignment and completion
  - Task status reporting of complete, pending tasks

Technical Performance: Portfolio Status

Progress	Project Name	Start Date	End Date	Owner	Status
60.0%		09/13/2007	09/21/2007		In Progress
75.0%		07/09/2007	09/30/2007		In Progress
100.0%		09/28/2007	10/01/2007		In Progress
96.9%		09/10/2007	10/05/2007		In Progress
100.0%		09/29/2007	10/05/2007		In Progress

High Level Portfolio Status view

Technical Performance: Project Status

Pin	New Log	Work	Percent Weightage	External Assesment	P	Task Name	Line Of Business	SDLC Phase	Milestone in SDLC Phase	Technology Stack
	Log	100%	0%	0%		***Service Pack*** (13)	Operation			
	Log	100%	0%	0%		***Discrepancy in Warning Message format causing issues*** (4)	Operation			
	Log	100%	0%	0%		Technical Resolution	Maintenance	Technical Resolution	Technical Draft Resolution	Business Services
	Log	100%	0%	0%		Development	Maintenance	Development	Business Logic	Business Services
	Log	100%	0%	0%		Functional Certification	Maintenance	Development	Functional Certification	Business Services
	Log	100%	0%	0%		Technical Certification	Maintenance	Development	Technical Certification	Business Services

Project Gantt view

Earned Value Management

- EVM data
  - Real-time data from WMS
  - Estimates
  - Project percent completion
  - Funds Burned
  - Schedule Burned
- Funding Variance controls
  - Automatic alerts when funding variances exceed threshold
- Uniform Spending
  - Permit task performance and work logging only within the budgeted weekly burn rate
- Task and Project Period of performance
  - permits task performance and logging only with the project period of performance of task or project
- Real-time Reports
  - Visibility into SPI and CPI
  - Accurate and timely data
  - Effective decision making

Real-time EVM Report

Project Name	Period Of Performance (in Days)	Funding Level	Scheduled Days Left	Total Funding Left	Percentage Schedule Burned	Percent Completed	Schedule Variance	Percent Funding Burned	Funding Variance	Projected Earning Per Burn Rate	Actual Earning
Project 1	91	$356.25	52	$261.75	42.86%	30.77%	-12.09%	26.53%	4.24%	$94.50	$109.62
Project 2	91	$14,207.74	52	$10,787.24	42.86%	38.46%	-4.40%	24.07%	14.39%	$3,420.50	$5,464.30
Project 3	91	$494.00	52	$458.00	42.86%	33.00%	-9.86%	7.29%	25.71%	$36.00	$163.02
Project 4	91	$15,547.12	52	$13,459.12	42.86%	25.51%	-17.35%	13.43%	12.08%	$2,088.00	$3,966.07
Project 5	91	$4,984.04	52	$3,724.04	42.86%	38.46%	-4.40%	25.28%	13.18%	$1,260.00	$1,916.86
Project 6	91	$1,004.81	52	$853.81	42.86%	38.46%	-4.40%	15.03%	23.43%	$151.00	$386.45
Project 7	91	$1,534.62	52	$702.12	42.86%	46.15%	3.29%	54.25%	-8.10%	$832.50	$708.23
Project 8	91	$2,280.00	52	$1,272.00	42.86%	46.15%	3.29%	44.21%	1.94%	$1,008.00	$1,052.22

Real-time EVM Report

Real-time EVM: Early Warning Mechanisms

- Calculate cost and schedule variances
  - Automated check on each project
  - Calculated from integrated, real-time WMS system
- Identify work variance thresholds
  - Variances exceed acceptable tolerances
    - Schedule burned
    - Funding burned
- Automated alerts when variance thresholds are exceeded
  - Program Management
  - Execution Teams
- Risk Management
  - Identify cost and schedule overrun risks at an early stage
  - Respond more quickly with mitigation strategies

Risk Management

- Risk Identification
  - Risk details such as probability and impact of risk
- Risk Analysis
  - Association with a task (Origin of risk), actual impact (number of days of effort, total dollars for equipment etc.)
- Risk Mitigation
  - Planning changes
  - Risk mitigation tasks created and assigned
- Risk Monitoring and Control
  - Resolution of the risk
  - Implement the tasks for containing the risk
  - Tracking and communication of risk mitigation tasks
  - Budget and cost automatically updated

Resource Management

- Utilization Reports
  - Overutilization
  - Underutilization
- Cumulative timesheet entries from task logs
  - Record and report time worked on a project
- Identify trends
  - Workload
  - Resource management

Users: All

Projects: All

Users	Week 40	Week 41	Week 42	Week 43	Week 44	Week 45	Week 46	Week 47	Week 48	Week 49	Week 50	Week 51	Week 52
S/W Engineer	22.79	22.79	22.79	22.79	22.79	22.79	22.79	22.79	22.79	41.21	41.21	22.42	22.42
S/W Engineer	40	40	40	40	40	40	40	40	40	40	40	40	40
S/W Engineer	40	40	40	40	40	40	40	40	40	40	40	40	40
S/W Engineer	30.86	30.86	30.86	30.86	30.86	30.86	30.86	30.86	17.33	17.33	17.33	14.73	14.73
S/W Engineer	26.71	33.17	33.17	33.17	33.17	33.17	33.17	33.17	25.32	25.32	25.32	25.32	25.32
S/W Engineer	39.57	39.57	39.57	39.57	39.57	39.57	39.57	39.57	39.57	39.57	39.57	39.57	39.57

Real-time Resource Allocations view

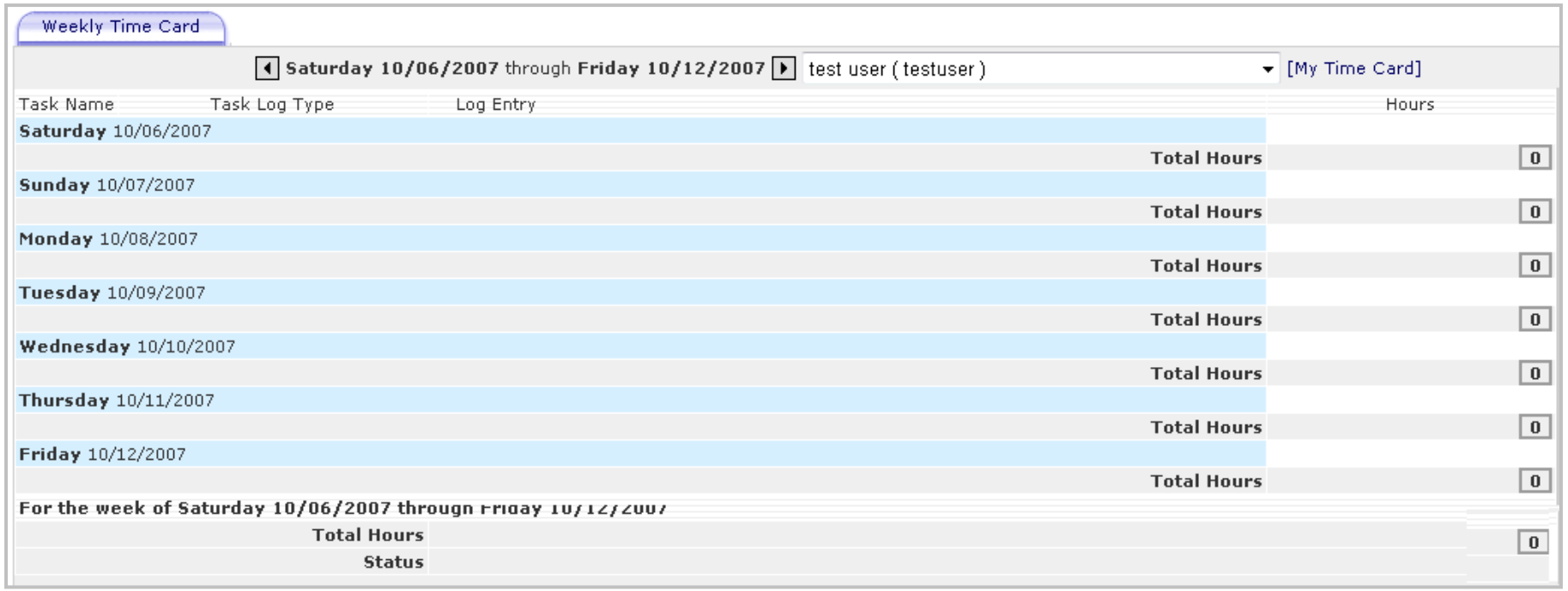
Resource Management Contd.

- Timesheet is integrated within the WMS
  - Report by hierarchical work breakdown structure
  - Report by individual user, project, division

Project/UserName	Sep 23-29	Sep 30-Oct 06	Oct 07-13
Release 1	1457.08	1481.27	1385.5
Delivery 2	1457.08	1481.27	1385.5
Project 1	91.5	84	106.8
Engineer 1	21	0	32
Engineer 2	0	0	0
Manager 1	27	40	40
Architect 1	0	0	12
QA 1	23.5	20	22.8
QA 2	20	24	0
Project 2	74	77	59.5
Manager 2	32	33	28.5
Engineer 3	17	36	21
Engineer 4	25	8	10
Project 3	78.5	91.5	76
CM 1	27	28.5	40
System Admin 2	15	32	30
DBA 3	36.5	31	6
Project 4	16	4	20

Hierarchical Task Hour Report

Resource Management Contd.



Weekly Time Card

◄ **Saturday 10/06/2007** through **Friday 10/12/2007** ► test user (testuser) [My Time Card]

Task Name	Task Log Type	Log Entry	Hours
Saturday 10/06/2007			
		Total Hours	0
Sunday 10/07/2007			
		Total Hours	0
Monday 10/08/2007			
		Total Hours	0
Tuesday 10/09/2007			
		Total Hours	0
Wednesday 10/10/2007			
		Total Hours	0
Thursday 10/11/2007			
		Total Hours	0
Friday 10/12/2007			
		Total Hours	0
For the week of Saturday 10/06/2007 through Friday 10/12/2007			
		Total Hours	0
		Status	

Weekly Timesheet Report

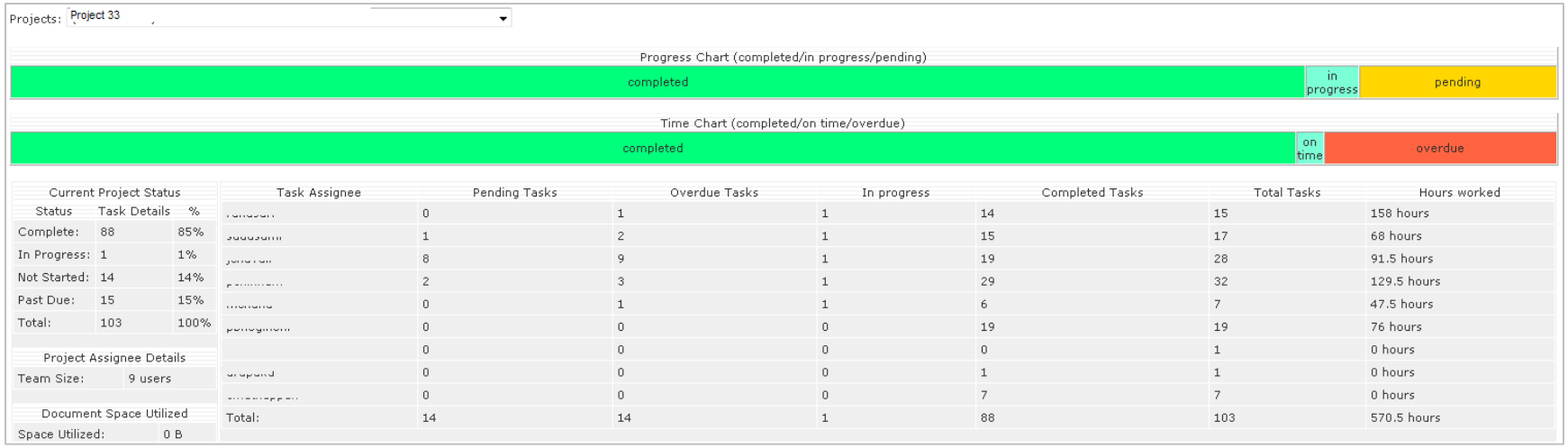
Defect Management

- Integrated with the projects and tasks in the WMS system
- Defect Tracking
  - Originating task
  - SPR number created in JIRA
  - Task is executed through phases of SDLC
- Task Performance Measurement
  - Software defects
  - Document issues
  - Meeting attendance
- Reports
  - Defect density
  - Defects per KSLOC
  - Defect statistics by origin, project, resource

Business Intelligence

- Task Management
  - Task tracking reports
  - Task status reporting of complete, pending tasks
- Risk Management Measures
- Defect Measures
- Resource Utilization Measures

Business Intelligence Contd.



Projects: Project 33

Progress Chart (completed/in progress/pending)

completed | in progress | pending

Time Chart (completed/on time/overdue)

completed | on time | overdue

Current Project Status

Status	Task Details	%
Complete:	88	85%
In Progress:	1	1%
Not Started:	14	14%
Past Due:	15	15%
Total:	103	100%

Project Assignee Details

Team Size:	9 users

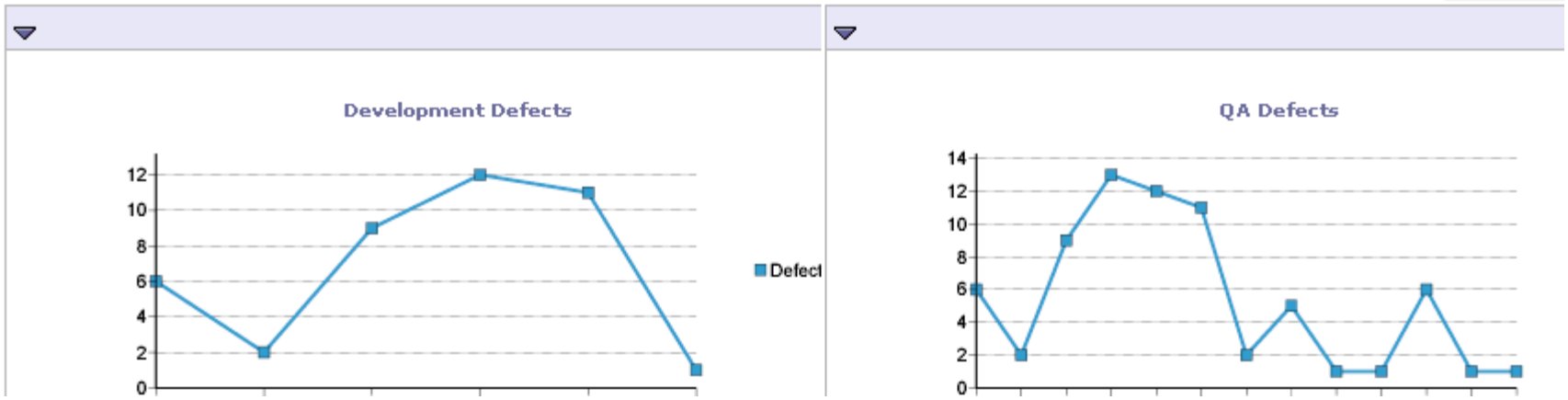
Document Space Utilized

Space Utilized:	0 B

Task Assignee	Pending Tasks	Overdue Tasks	In progress	Completed Tasks	Total Tasks	Hours worked
[illegible]	0	1	1	14	15	158 hours
[illegible]	1	2	1	15	17	68 hours
[illegible]	8	9	1	19	28	91.5 hours
[illegible]	2	3	1	29	32	129.5 hours
[illegible]	0	1	1	6	7	47.5 hours
[illegible]	0	0	0	19	19	76 hours
	0	0	0	0	1	0 hours
[illegible]	0	0	0	1	1	0 hours
[illegible]	0	0	0	7	7	0 hours
Total:	14	14	1	88	103	570.5 hours

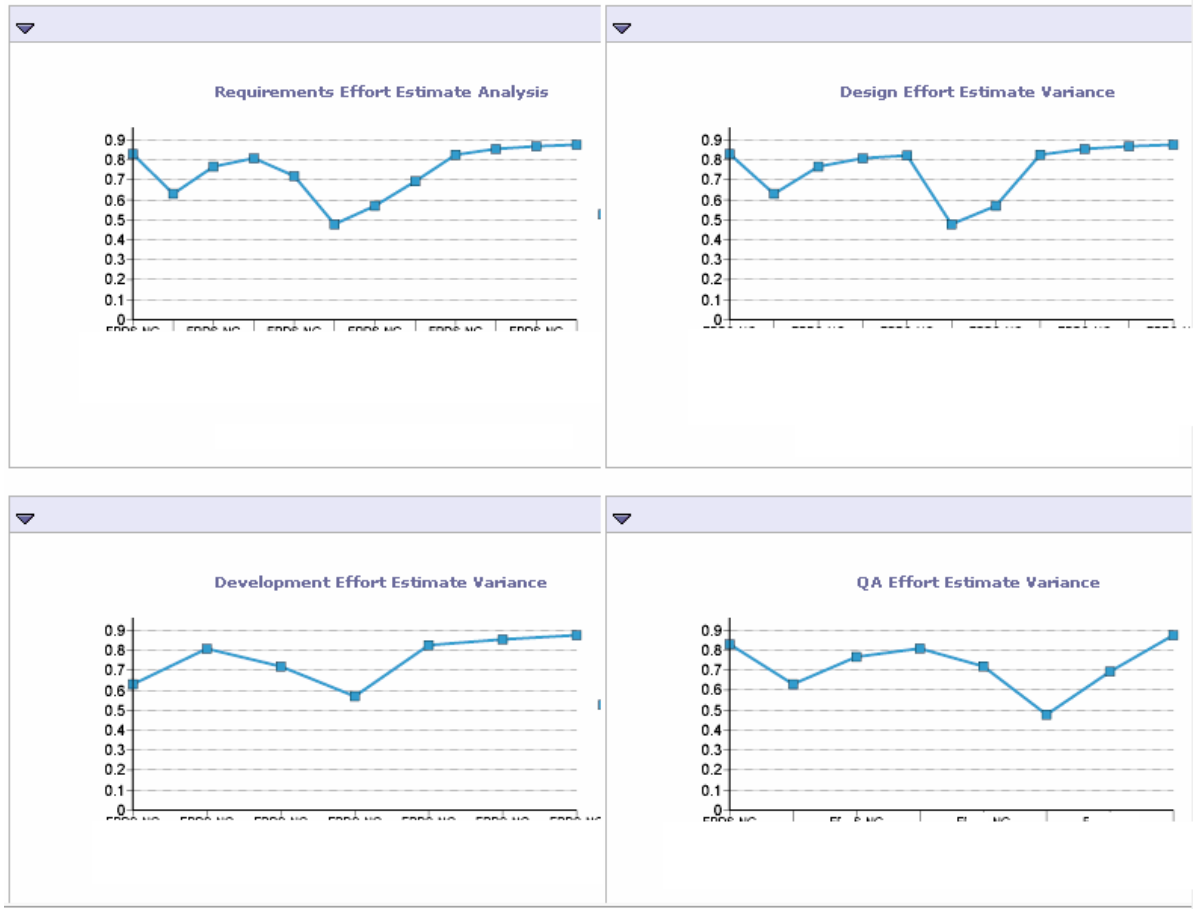
Project Statistics Dashboard

Business Intelligence Contd.



Project Defects Dashboard

Business Intelligence Contd.



Project Effort Estimate Variance Dashboard

Tying it back to CMMI

PPM Processes	CMMI Process Areas	Maturity Level
Project Portfolio Management	Integrated Project Management (IPM)	3
Project Planning and Scheduling	Project Planning (PP)	2
Technical Performance Management	Project Monitoring and Control (PMC)	2
Earned Value Management	Integrated Project Management (IPM)	3
Risk Management	Project Monitoring and Control (PMC)	2
	Risk Management (RSKM)	3
Defect management	Validation (VAL)	3
	Verification (VER)	3
Resource Management	Project Planning (PP)	2
Business Intelligence Reports and Dashboards	Measurement and Analysis (M&A)	3
	Quantitative Project Management	4
	Organizational Process Performance (OPP)	4

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Summary

- Automation leading to PPM approach easily implemented by a smaller organization
- Solution for common PPM challenges across all organizations
- Automated PPM provided the foundation
  - Easier CMMI adoption
  - Level 3 Appraisal
- Intention to approach ML4 activities in a similar fashion
- Thoughts
  - Real-time introspective management vs. retrospective management
  - Emphasis on forecasting for tomorrow rather than project instances

Thank you