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Optimizing Organizational Measurement and Analysis ROI for Small Diverse Projects

Susanna Schwab

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Introduction



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EITS Measurement Program Objective:

Define and deploy an integrated cost effective measurement program which conforms to industry standards and best practices for measurement and analysis

- CMMI (Capability Maturity Model Integrated)
- ISO 20000
- ITIL (IT Infrastructure Library)
- PMBOK (Project Management Body of Knowledge)

Introduction



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Challenges:

- Customizing measurement solutions for non-homogenous business and functional areas
- Selecting the “right” measurements to best support business goals
- Cost effective staffing of measurement activities in small short term projects with minimal resources
- Effective monitoring and control of CMMI process areas with minimal measurement resources
- Mapping CMMI model measurement best practices based on larger software development projects into small non software development projects
- Integrating and reusing measurements based on CMMI measurement practices to support implementation of other industry standards (ITIL, ISO 20000, PMBOK)

EITS Organizational Profile



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- **Division of L-3 Communications composed of diverse business units with multiple practice area**
 - EITS Mission: To provide world-class enterprise information technology solutions to the public sector
- **Government and public agency customer base**
 - NASA (National Air and Space Administration - independent verification and validation services) ; CMMI ML 3 Objective
 - Metropolitan airport authorities (business process engineering) CMMI ML 3 Objective
 - County School Systems (IT infrastructure and support) ISO 20000 Objective
 - Federal Government (staff augmentation) CMMI ML3 Objective
 - FAA (Federal Aeronautics Administration software development) CMMI ML 3 Objective
- **Many (sometimes very) small projects in**
 - software development functional area (CMMI, PMBOK)
 - managed services functional area (ISO 20000, ITIL, PMBOK)
- **Staff augmentation functional area predominates (CMMI, PMBOK)**

Measurement Program Requirements



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- **Measurement program must efficiently support CMMI and ISO 20000 (ITIL) best practices**
- **Measurement process assets must be tailorable to diverse functional areas (managed services, staff augmentation)**
- **Measurement activities must have minimum impact on limited project staff**

Measurement Program Implementation Question I



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How can common measurement practices be defined at the organizational level so as to be usefully tailorable to a diverse set of project processes and tools ?

Implementation Strategy

Integrated measurement plans



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- **Establish strategic and integrated measurement plans**
 - Integrate measurement plans at division, functional area, and project organizational levels with business objectives !
 - Measurement plans at all levels use measurements strategically (employ KISS principle)

Implementation Strategy

Tailored hierarchical assets



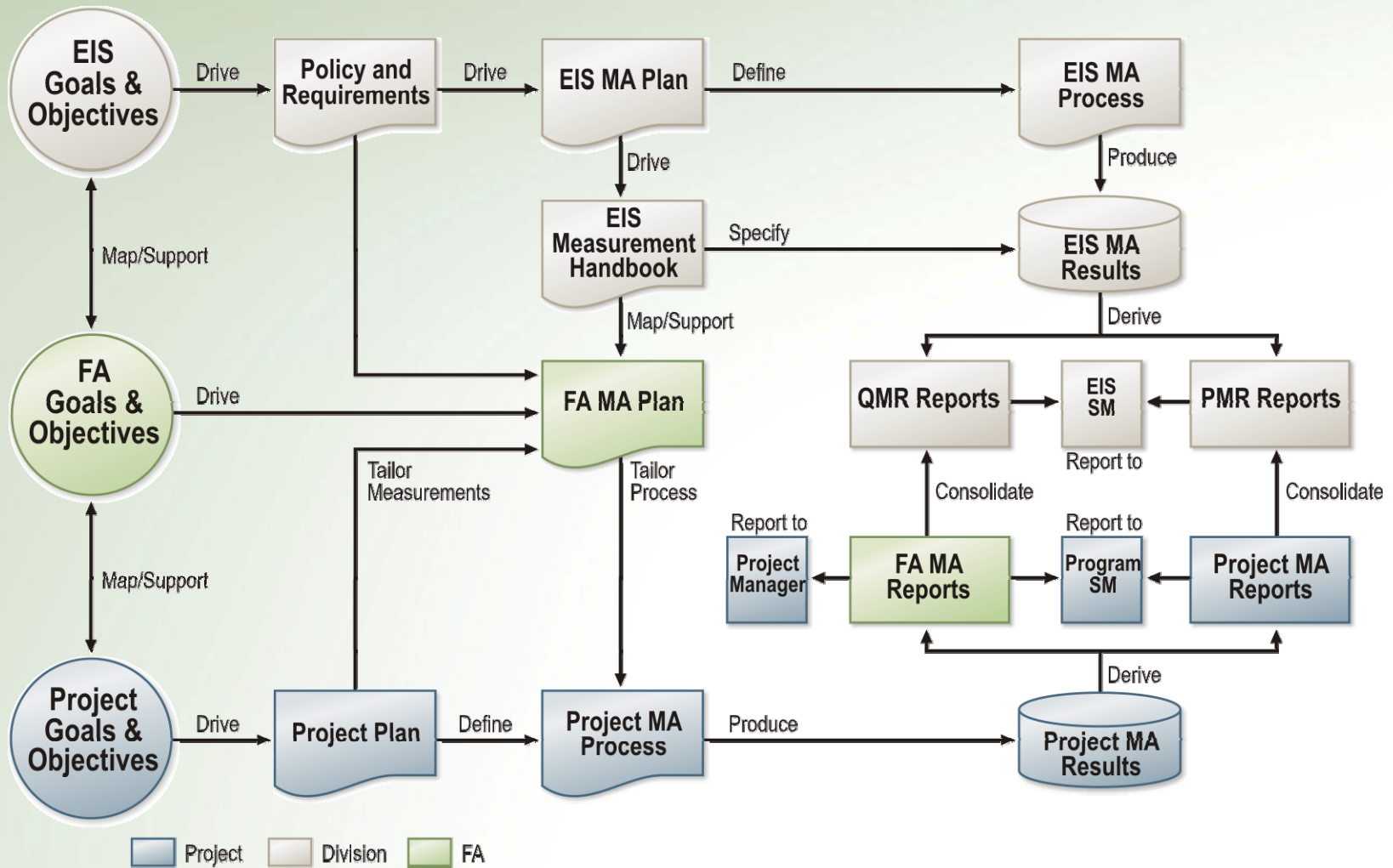
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- **Establish hierarchical measurement process assets**
 - Generic measurement set (with tailoring guidelines) defined at division level
 - Functional areas tailor and augment division generic measurements
 - Projects tailor and augment functional area measurements

Implementation Strategy Hierarchical Data Flow



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Implementation Strategy

Tailoring Standards and Governance




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- **Standards and governance for tailoring established in division measurement plan and functional area measurement plans**
- **Division measurement roles review and approve functional area measurement plans**
- **Functional area QA roles review and approve project measurement tailoring**

Example Use of Tailoring and KISS



Exert from functional area measurement plan

Generic division defined measurement	Tailored functional area measurement or alternative	Collection and analysis role	Reporting role and frequency
Actual cost compared to budget	Earned Value Cost Variance	Project Manager	Project Manager Monthly
Product defects	Number of formal customer issues	Functional area Quality System Manager	Quality System Manager Quarterly
Decision Analysis Review (DAR) scheduled versus actual	DAR performance stoplight 	Functional Area QA auditor	Quality System Manager Quarterly

Measurement Program Implementation Question II



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**How can measurement and
analysis ROI be maximized for
very small projects ?**

Implementation Strategy

Qualitative alternatives



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- **Use qualitative alternatives to measurement where appropriate**
 - Strategically use qualitative alternatives to measurement (where appropriate) to minimize overhead (e.g. for monitor and control of process areas - CMMI model GP 2.8)

Implementation Strategy

Example: Institutionalizing CMMI GP 2.8



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Measurement program preparation for CMMI ML3 appraisal of IV&V functional area

- **Generic measurements for process area monitoring and control specified at division level**
- **Existing IV&V measurements mapped to generic measurements; gaps identified**
- **Division/IV&V working team chartered to address gaps**
- **Minimal set of additional measurements and qualitative alternatives identified, reviewed, approved and implemented**

Implementation Strategy

Organizational consolidation



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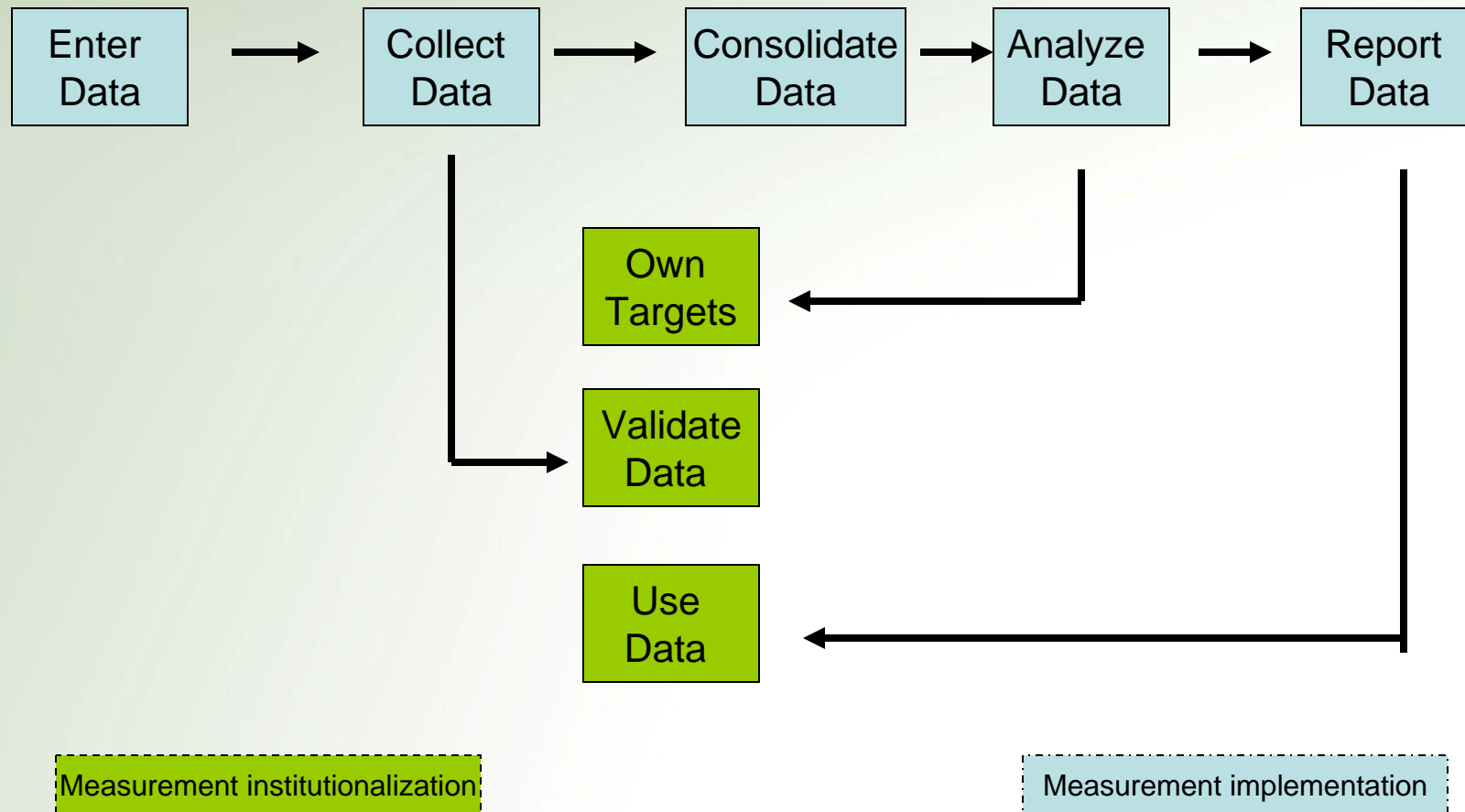
- **Collect and analyze measurements at highest possible level of organization**
 - Collect at organizational level linked to business goals
 - Measurements supporting division goals collected, analyzed, and reported by division measurement roles
 - Measurements supporting functional area goals collected, analyzed, and reported by functional area measurement roles
 - Projects collect and report only project operational measurements but may ***receive and use measurements reported by all organizational levels***

Implementation Strategy

The Measurement Life Cycle



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Implementation Strategy

Integrate measurement and QA



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- **Assign measurement collection, analysis, reporting, ownership, and usage responsibilities to appropriate roles**
 - Assign process measurement collection responsibilities to **process QA** roles
 - Senior management typically **owns** division and practice area measurement targets; other roles may collect, analyze and report the measurement data
 - Project managers **analyze, report and own** all project and project process measurements ; other roles may collect the measurement data

Lessons Learned Summary - 1



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✓ **Align measurement program with business goals**

- ✓ not all business goals need associated measurements
- ✓ if a goal cannot be measured, reevaluate the goal
- ✓ develop business goals and measurement objectives synergistically

✓ **Assign the right roles to measurement responsibilities**

Lessons Learned Summary - 2



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- ✓ **Establish infrastructure for leveraging organizational measurement resources and best practices**
- ✓ **Carefully define measurement tailoring guidelines and validate tailoring execution**
- ✓ **Measure only when its value added; consider qualitative low cost alternatives**

Measurement Program

Key Lesson Learned



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Measurement ROI is much more difficult to achieve in a diverse organization with many small, short term projects

Measurement Practice Today



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- **Progress in recent decades**
 - Better understanding of how to effectively measure process performance
 - Improved ability to do quantitative forecasting
 - Greater customer demand for quantitative product quality monitoring and control
 - Measurement best practices formally embedded in industry standards, models, and frameworks

Measurement Practice Today



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- **Current Open Issues**
 - Difficult to accurately measure ROI of measurement programs
 - Limited linkage of measurement programs to business objective achievement
 - Difficult to institutionalize quantitative decision making in organizations
 - Measurement activities still manually intensive especially for small projects

Opportunities for Improvement



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Measuring Measurement ROI

- Measurement costs typically captured in terms of tools and staff hours
- Measurement benefits typically characterized in terms of reduced costs of quality
- It is difficult to accurately measure cost of quality and also to explicitly trace improved quality to specific measurement activities

Opportunities for Improvement



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Synergy between business goal definition and measurement

- CMMI requires that business goals drive measurement program
- This should be more of a partnership – defining business goals should be done in conjunction with measurement specification
- Industry standards and models should include best practices for development of business goals that can be effectively supported by measurement

Opportunities for Improvement



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Forecasting

- Traditionally measurement used for monitor and control of process and project performance
- According to measurement consumers, greatest value lies in forecasting the future based on historical performance and performance to date on current project

Contact Information



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Susanna Schwab
Measurement Manager
Enterprise IT Solutions Division
L-3 Communications
11955 Freedom Drive
Reston, VA 20190
703-434-4796
susanna.schwab@l-3com.com