DoD Software Core Measures

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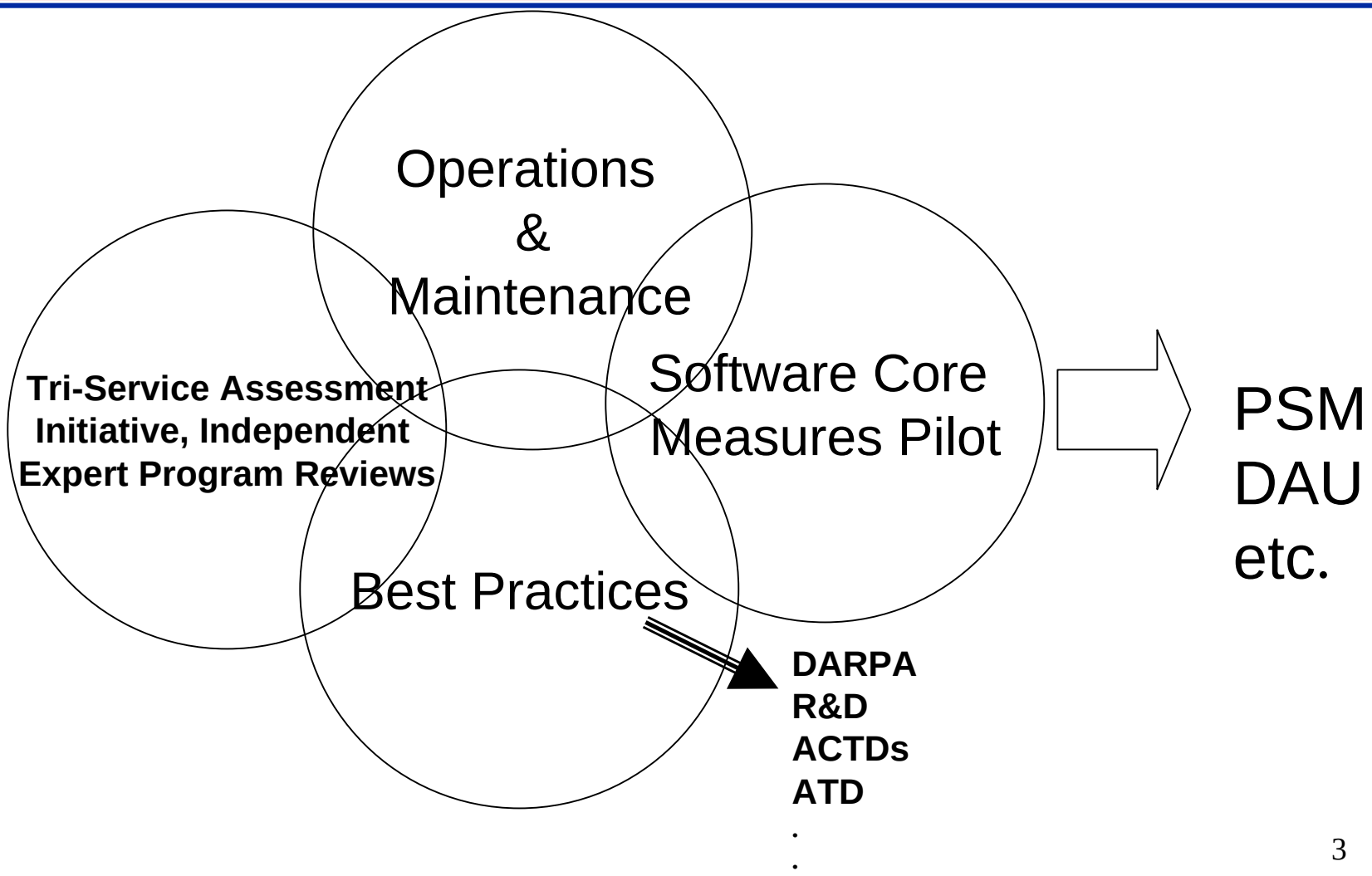
Agenda

- Software Management Measures Integrated Product Team
- PSM Approach
- Software Core Measures Pilot

Software Core Measures Initiatives Environment



Software Management Measures Integrated Product Team

- Initiated in July 2000 in response to Clinger-Cohen requirement for performance and results based management
- Purpose: Develop DoD-wide software measures:
  - Assist the acquisition oversight process
  - Provide trend analysis across programs
  - Propose recommendations for solving systemic problems
  - Increase the accuracy of projected size and schedule
  - Improve the identification and management of software risk
  - Provide a basis for measurement policy
  - Determine priorities
- Membership: ASD(C3I)/DoD CIO, AT&L (Co-Chairs), PA&E, DT&E, OT&E, representatives from PSM, OSD/C3I/I&A, and USATEC

Apply PSM Approach

- The development of the measures followed a 3-step goal-driven process based upon the PSM model
- The process consisted of defining:
  - Enterprise and program level goals
  - Information categories
  - Software core measures

Enterprise-Level Goals

- Quantify enterprise software performance
- Quantify the impact of policy on software
- Characterize enterprise software “demographics”
- Quantify specific software performance drivers
- Address enterprise level legislative requirements

Program-Level Goals

- Identify, quantify, prioritize, and evaluate program performance issues
- Quantify the feasibility of software/software intensive system development plans
- Support continuous software-related tradeoff decisions
- Address program level legislative requirements

Information Categories

- Cost
- Customer Satisfaction
- Process Performance
- Product Size/Stability
- Product Quality/Capability/Performance/Maturity
- Program Characterization
- Resources
- Schedule/Progress
- Security
- Technology Effectiveness

DoD Software Core Measures

- COTS Components Per Project
- Cumulative Number of Requirements
- Defect Profile
- Earned Value
- Effort
- Personnel Profile
- Rating Per Model/Standard Used
- Software Product Size
- Total Software Costs
- Project Characteristics

Core Measure Data Elements (1)

- COTS Components Per Project
  - List of all COTS components
  - Percent of total functionality provided by COTS components
  - Cost of integrating COTS components
- Cumulative Number of Requirements
  - Cumulative number of requirements
  - Cumulative number of deleted requirements
  - Cumulative number of modified requirements
  - Cumulative number of added requirements
- Defect Profile
  - Average number of days critical defects are open
  - Average number of days severe defects are open
  - Average number of days total defects are open
  - Age of oldest severe defect
  - Age of oldest critical defect

Core Measure Data Elements (2)

- Earned Value
  - Baseline cost
  - Budgeted cost of software work scheduled
  - Budgeted cost of software work performed
  - Actual cost of software work performed
- Effort
  - Current life cycle stage
  - Current date of project completion
  - Hours worked on the analysis phase
  - Hours worked on the software design phase
  - Hours worked on the software coding and unit test phase
  - Hours worked on the integration test and evaluation phase
  - Hours worked on the operational test and evaluation phase
  - Hours worked on the software/system integration phase
  - Hours worked on installation
  - Hours worked on maintenance

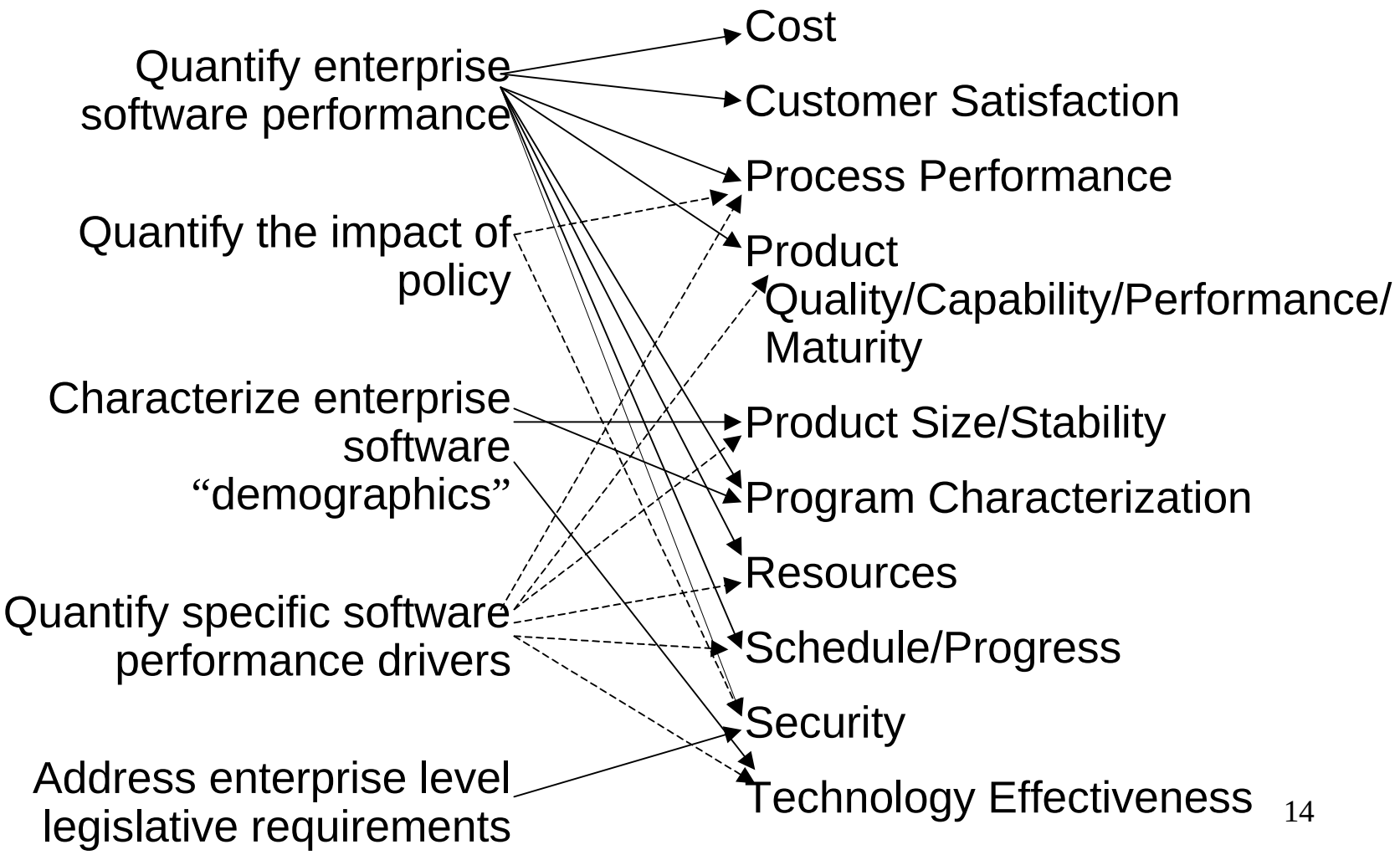
Core Measure Data Elements (3)

- Personnel Profile
  - Number of staff
  - Number of unanticipated staff changes
  - Number of system planning, research staff
  - Number of staff who have taken college level software engineering courses
  - Number of staff who have developed software for use in an operational work environment (not including application macros, spreadsheets or individually developed academic exercises)
- Rating per Standard/Model Used
  - Rating/Maturity level
  - Model/standard used
  - Externally validated (if Yes, by whom?)
- Software Product Size
  - Measurement type
  - Measurement
  - Programming Language

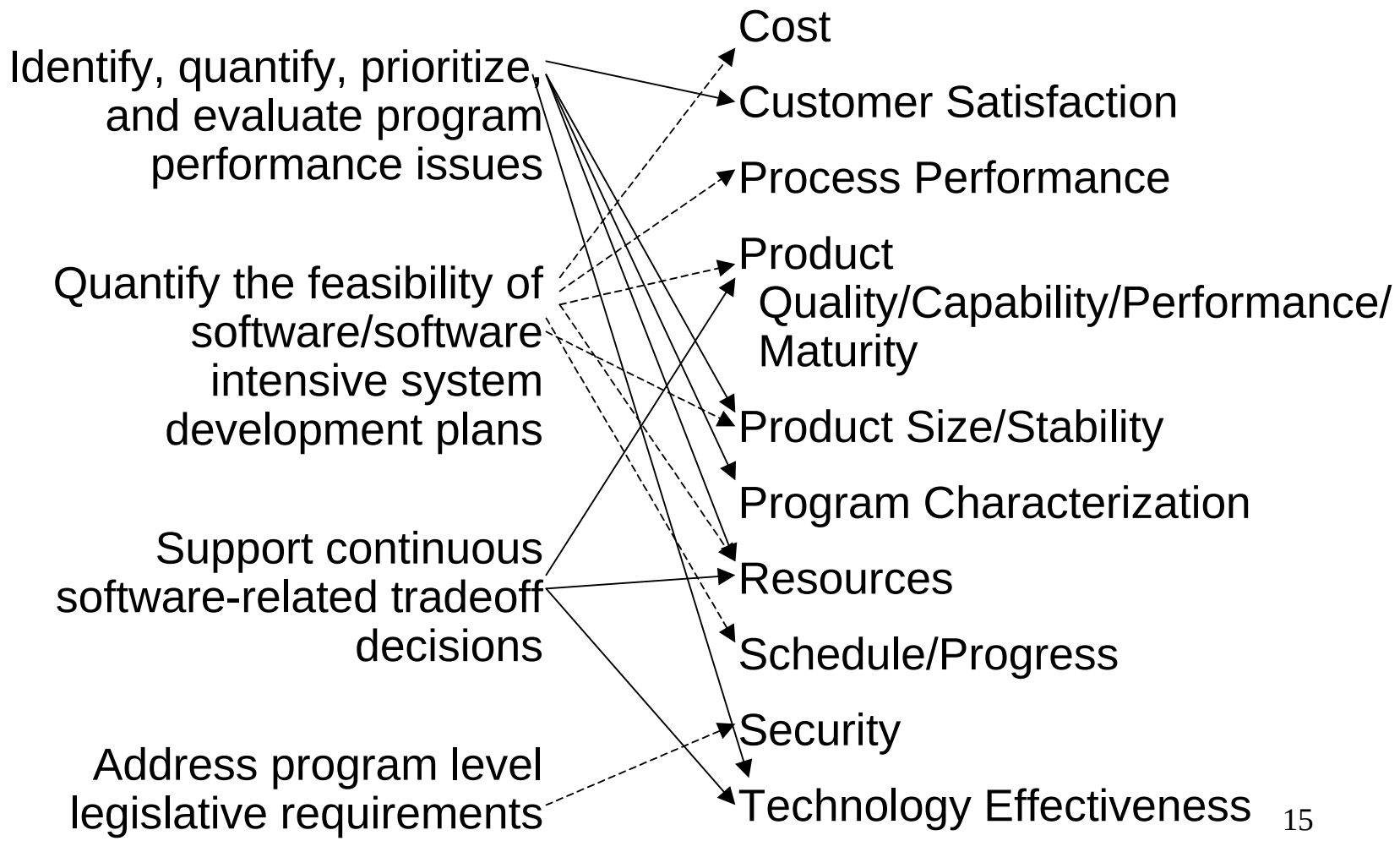
Core Measure Data Elements (4)

- Total Software Cost
  - Cost of analysis
  - Cost of software design
  - Cost of software coding and unit test
  - Cost of integration test and evaluation
  - Cost of operational test and evaluation
  - Cost of software/system integration
  - Cost of installation
  - Cost of maintenance
- Project Characteristics
  - Project Name
  - Project Manager
  - Contractor developing the software
  - Project start date
  - Initial software size estimate
  - Initial software cost estimate
  - Original date of project completion
  - Development method
  - Lifecycle used
  - Original budget allowance for project
  - Original requirements baseline
  - Number of interfaces
  - Do staff have appropriate clearances?
  - Do staff include foreign nationals?
  - DITSCAP certified?
  - DODD certified?

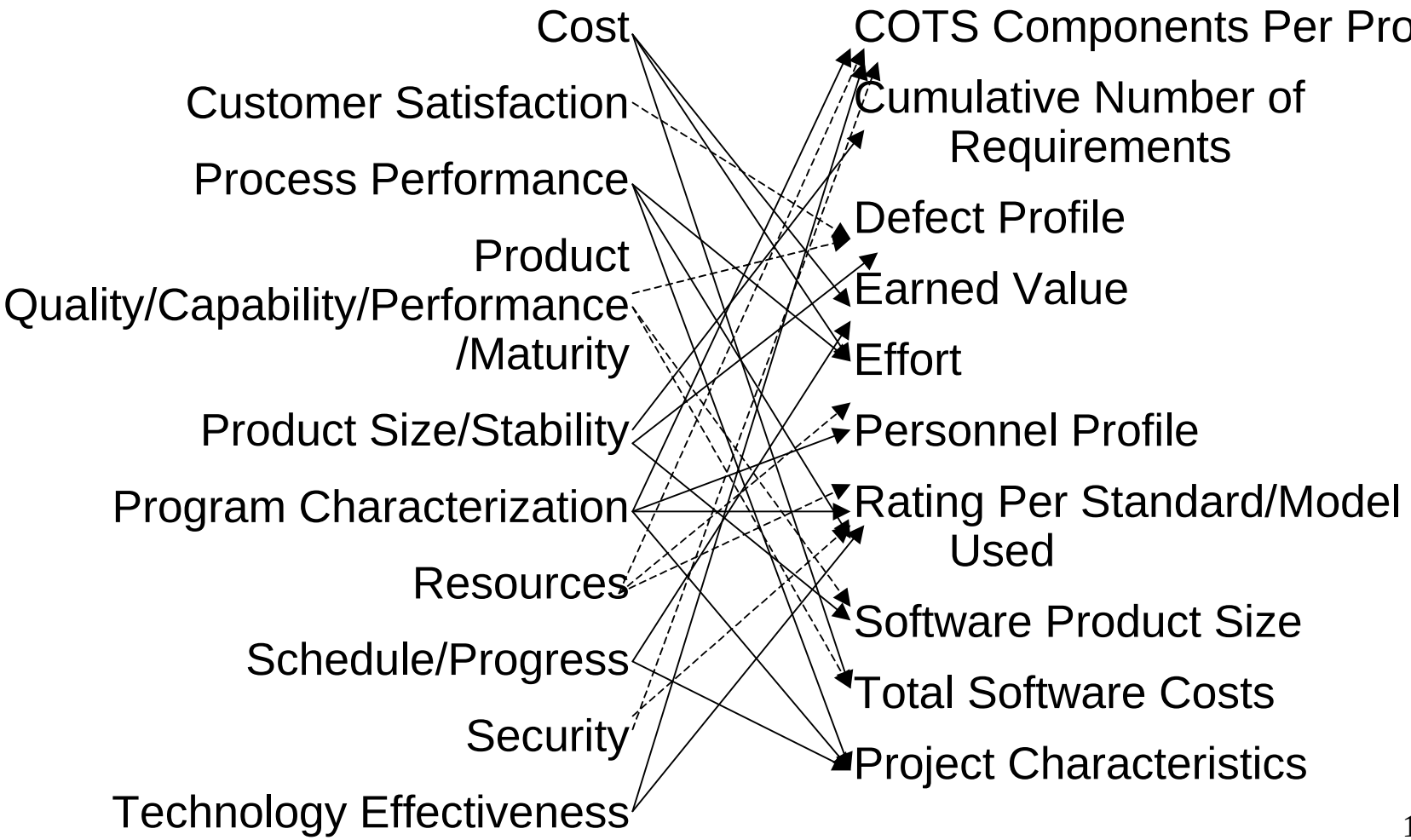
Enterprise Goals to Information Categories



Program Goals to Information Categories



Information Categories to Measures



Software Core Measures Pilot

- The objective is to determine:
  - If OSD proposed core software measures are compatible with existing Program Managers' measures programs
  - What the resource impacts are to fill the gaps

Pilot Approach

- Phase I – Mapping
- Phase II – Gap Resolution
- Phase III – Institutionalizing the Software Core Measures

Pilot Phase I – Mapping

- Identify PMs who have a good software measures program
- Validate the software core measures
  - Do the PMs have the DoD software core measures as part of their set?
  - Do the PMs use the same terminology?
  - Are data elements and definitions the same?
- Perform a comparative analysis of how the PM measures map to the OSD software core measures.
- Report the results.

Pilot Phase II – Gap Resolution

- Determine the effort required to resolve any discrepancies
- Determine the effort required to add any of the software core set measures
- Collect information on what OSD should consider.
- Brief out on findings and make recommendations.

Pilot Phase III – Institutionalization

- Propose modifications to policy (e.g., the 5000 series).
- Incorporate into Defense Acquisition Evaluation System (DAES) acquisition oversight process.
- Include in applicable training vehicles (PSM, DSMC, DAU) and other software measures efforts.

Status

- Contacted several PMs
- Received data from several
- Initial results:
  - Earned value core measure mapped to PM set
  - PM also tracking CPI, SPI and schedule
- Continuing to collect and analyze data

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