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Optimizing the Measurement Process

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Harris Corporation / DNV

ommunications ion: What We Do...

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Aviation electronics

Communications and information networks

Intelligence, surveillance, and reconnaissance

Space and ground satellite communications systems

Operations and support services

We innovate, integrate, and manage technology.

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- Introduction
  - Background
  - Goals and Objectives
  - Terminology
  - Approach
- Roadmap
  - Characteristics of Success
  - Measurement Analyst
  - User Viewpoints
  - Automation as an Enabler
  - Leading Indicators
- Results
  - Information Needs
  - Measurement Objectives
  - Executive Management Viewpoint
  - Indicator Improvements
  - Lessons Learned
- Summary

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- Harris CMMI® Level 3 compliant since 11/2005
- Measurements used regularly for program monitor and control
- Need for improvement still recognized
- Measurement process relies on manual input
- Perception too many measures, some measures redundant
- Management desires increased emphasis on fact based decision making

Goals

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- Improve measurement and analysis effectiveness
  - Enhance measurement infrastructure to improve
    - Efficiency & value
    - Predictability
    - Competitive advantage
  - Reduce quantity of measures to effectively manage programs and align with division objectives
  - Increase number of leading indicators
- Improve measurement foundation for advancement to CMMI® Level 4 or 5

Objectives

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- Develop simple, consistent, reliable measurements
- Reuse or modify existing measurements
- Provide rapid access to fresh, actionable information
- Examine quality and completeness of data
- Increase consistency with industry standards
- Increase predictability of program execution
- Facilitate straight-forward and objective analysis of measures
- Enable automated collection of data and creation of indicators
- Evaluate adequacy of existing data to support high maturity analysis

...inology

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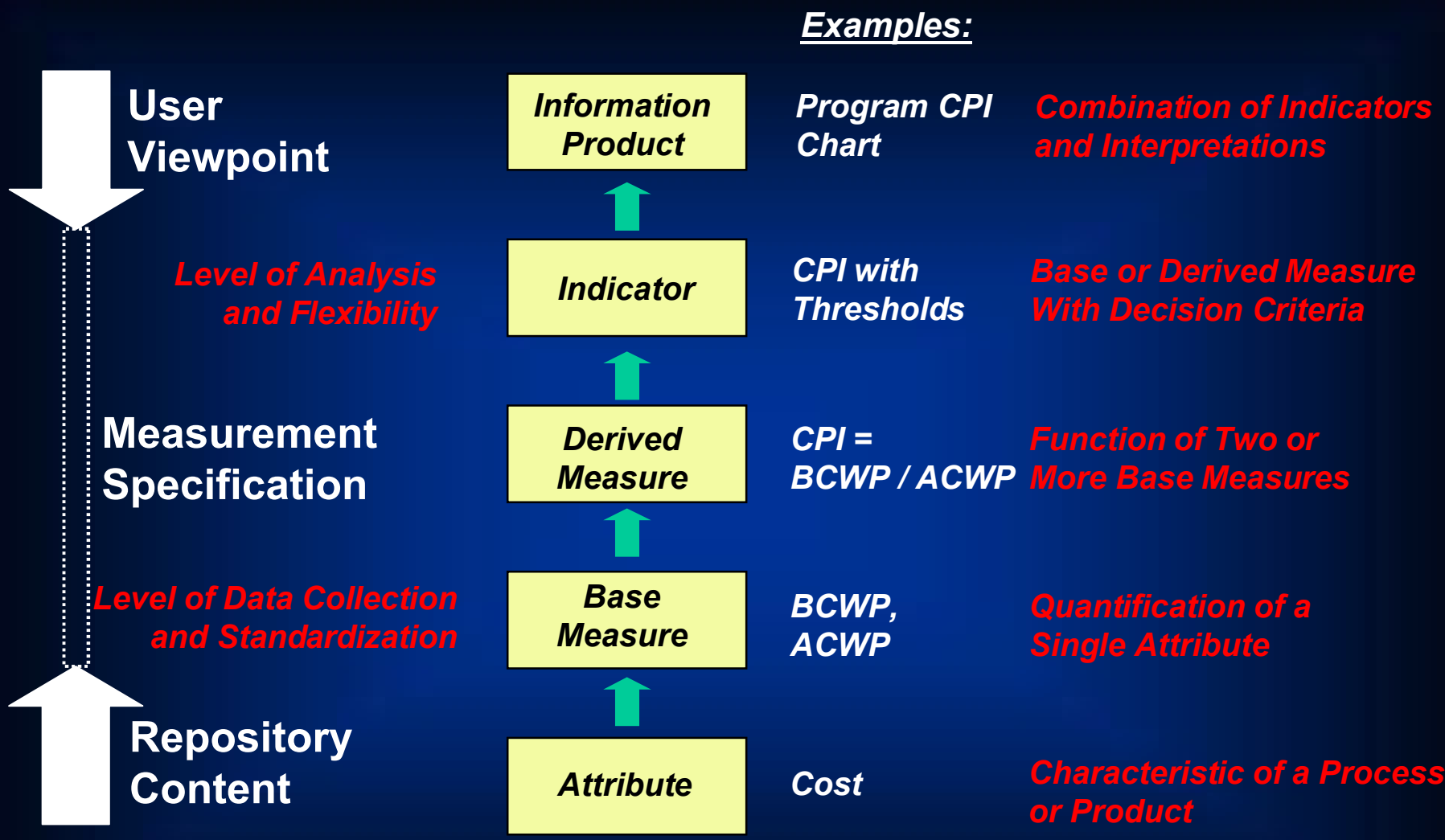

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- Utilize an independent industry measurement expert to validate and achieve maximum results
- Identify classes of measurement users
- Define information needs of users, based on
  - User role and responsibilities
  - Business and improvement objectives
- Specify indicators
  - Define leading and concurrent indicators
  - Use existing measures where possible
- Conduct reviews with stakeholders
- Update command media
- Deploy incrementally

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- Characteristics of Success
- Measurement Analyst
- User Viewpoints
- Automation as an Enabler
- Leading Indicators

cs of Success

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- Measures based on business goals
- Comprehensive measurement planning
- Measurement expertise
  - Training in defining, collecting and analyzing measures
  - Mentoring and advice
- Appropriate resources
  - Robust tool support
  - Measurement analysts
- Management support
- Broad participation

urement Analyst Role

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- Use of measurement is a part of everyoneôs job
- Additional expertise maximizes effectiveness
  - Recognize significant trends
  - Communicate with data providers and decision makers
  - Efficient & consistent execution of measurement process
- Areas of expertise
  - Design/Plan measures and process
  - Training and mentoring
  - Analysis and interpretation to support decision makers
- Often a part time job
  - Program level support
  - Organizational level support

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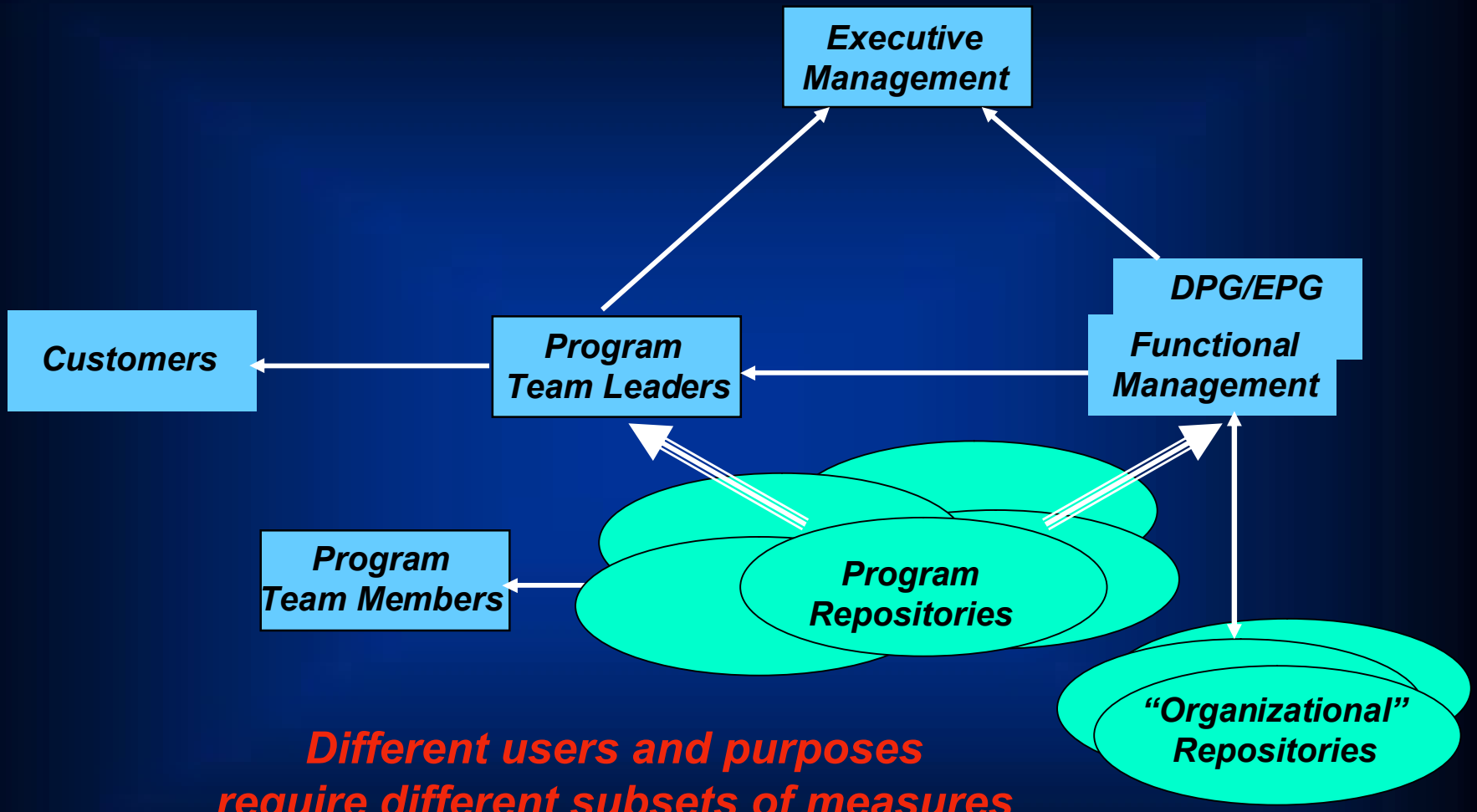

Different users and purposes require different subsets of measures

r Automation

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- More Timely Access to Data and Analysis
  - Makes data immediately available
  - Facilitates drill down to investigate anomalies
  - Makes information available in time to affect business and project outcomes
  - Facilitates gathering and analyzing data for lessons learned
  - Make data widely accessible
- Improved Data Quality
  - Ensures more complete data
  - Reduces transcription errors
  - Removes redundancy and inconsistency in data reporting
  - Easily supports users with different information needs
- Reduces effort for producing measurement reports

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- Definition
  - Has predictive value, provides early warning of trouble (in time to affect the outcome)
- Types of leading indicators
  - Observed trends predict future results of that indicator
  - Changes in one indicator predicts future results of another indicator
  - Constraints that limit performance
- Obstacles for leading indicators
  - Cumulative measures and percentages
  - Inconsistent measurement definitions
  - Delays in data collection and analysis
  - Subjective criteria and reporting

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- Information Needs
- Measurement Objectives
- Executive Management Viewpoint
- Indicator Improvements
- Lessons Learned

tion Needs

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- Program Team Members
  - Implement processes effectively
  - Produce quality products
  - Complete tasks on-time
- Program Team Leaders
  - Estimate and plan
  - Monitor and control
- Customer
  - Monitor product quality
  - Monitor performance to plan
  - Verify appropriate capability delivered to field
- Functional Management
  - Develop improvement plans with measurable objectives
  - Improve functional processes across projects
  - Develop staff within functions
  - Provide historical data for estimating
- Executive Management
  - Provide program oversight (project by project)
  - Ensure overall process/organizational health (across projects)
  - Achieve organizational financial performance (across projects)

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nt Objectives

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- Provide program oversight (program by program)
  - Meet customer expectations & satisfy the customer
  - Produce a high quality compliant product
  - Perform in accordance with the agreed to cost & schedule
  - Meet program objectives
- Ensure overall process/organizational health (across programs)
  - Increase productivity in all functions (increase effectiveness)
  - Reduce program rework (early & effective removal of defects across the product life cycle)
  - Increase predictability of program performance
  - Increase accuracy of program estimates
  - Maintain CMMI Level 3 maturity rating
  - Foster a rewarding & satisfying work experience for Harris employees
- Achieve organizational financial performance (across programs)
  - Meet Annual Operating Plan (AOP) objectives

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- Provide program oversight (project by project)
  - Meet customer expectations and satisfy the customer.
    - Technical Performance Measures
    - Risk Summary þ
    - Award Fee Graphs
    - Customer Satisfaction Data
  - Produce a high quality compliant product.
    - Defects by Phase þ
    - Defects Currently Open and Total Closed
    - Defect Severity Tracking
    - Technical Performance Measures
    - Process Compliance Data þ

þ indicates leading indicator

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- Provide program oversight (project by project)
  - Perform in accordance with the agreed to cost and schedule.
    - Milestone Progress
    - Staffing Tracking
    - Requirements Tracking
    - EVMS Tracking
  - Deliver the expected Return on Sales (ROS) on the project.
    - Investment Profile
    - Financial Objectives
    - Sales, Order, Profit Tracking

nagement 3 of 5

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- Ensure overall process/organizational health (across programs)
  - Increase productivity in all functions
    - Efficiency Measures
  - Reduce project rework
    - Rework Effort Tracking
    - Defect Phase Containment Tracking
  - Increase predictability of project performance
    - Earned Value Management System (EVMS) Reports
  - Increase accuracy of project estimates
    - Project Characterization Worksheet Analysis by Function

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- Ensure overall process/organizational health (across programs)
  - Maintain CMMI® Level 3 maturity rating
    - Process Compliance Data
  - Foster a rewarding and satisfying work experience for Harris employees
    - Organizational Training Reports
    - Employee Engagement Surveys

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- Achieve organizational financial performance (across programs)
  - Meet AOP objectives
    - Investment Profile
    - Financial Objectives
    - Award Fee Tracking
    - Sales, Order, Profit Tracking

rovements

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- Number of overall Indicators needed was reduced
- Number of leading indicators was increased
- Some objective indicators added to balance subjective indicators

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- Using a systematic framework helps organize the process
- Measurement process needs to evolve with the organization
- Tool considerations can't be ignored
- Objective, external advice helps validate
- Expect resistance to change
- Efficiency measures should be determined by the functional organizations

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- CMMI® compliance doesnôt ensure and efficient and effective measurement program
- A systematic approach is essential to balancing user measurement needs
- Next Steps
  - Develop Executive Management viewpoint first
    - Set expectations for leadership & program teams
    - Refine business objectives
  - Develop other user viewpoints over time
  - Measurement & Analysis training
  - Develop a Business Intelligence (BI) architecture, design and deployment plan

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