

# Project Metrics

Presented to

PMI NH Chapter

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by

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# The Role of Metrics in PMO

There are 5 common PMO function groups:

- Group 1: Monitoring and controlling project performance
- Group 2: Development of PM competencies and methodologies
- Group 3: Multi-Project Management
- Group 4: Strategic Management
- Group 5: Organizational Learning

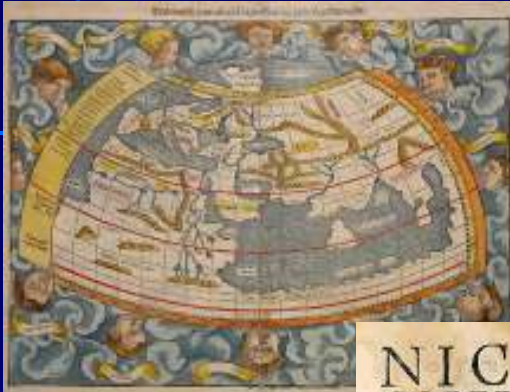
“The Multi-Project PMO” Dr. Brian Hobbs (A white paper for PMI) 2007

# Group 1: Monitoring and Controlling Project Performance

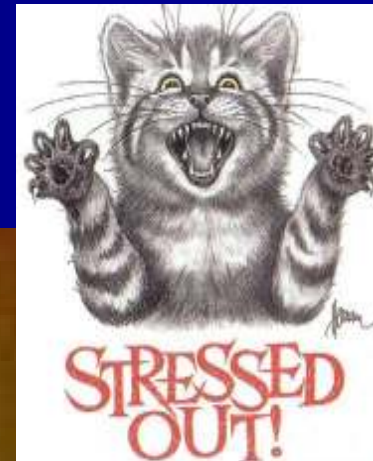
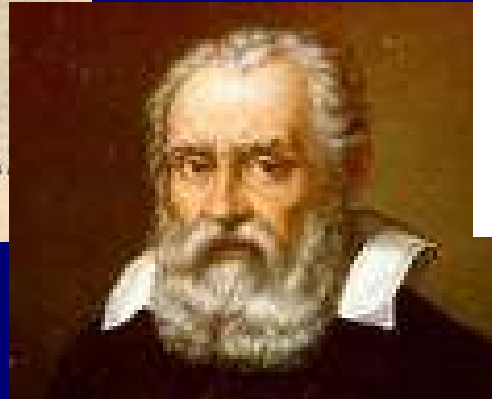
- Reporting project status to upper management
- Monitor and control project performance
- Implement and operate project information system
- Develop and maintain project scorecard

“The Multi-Project PMO” Dr. Brian Hobbs (A white paper for PMI) 2007

# The Paradigm

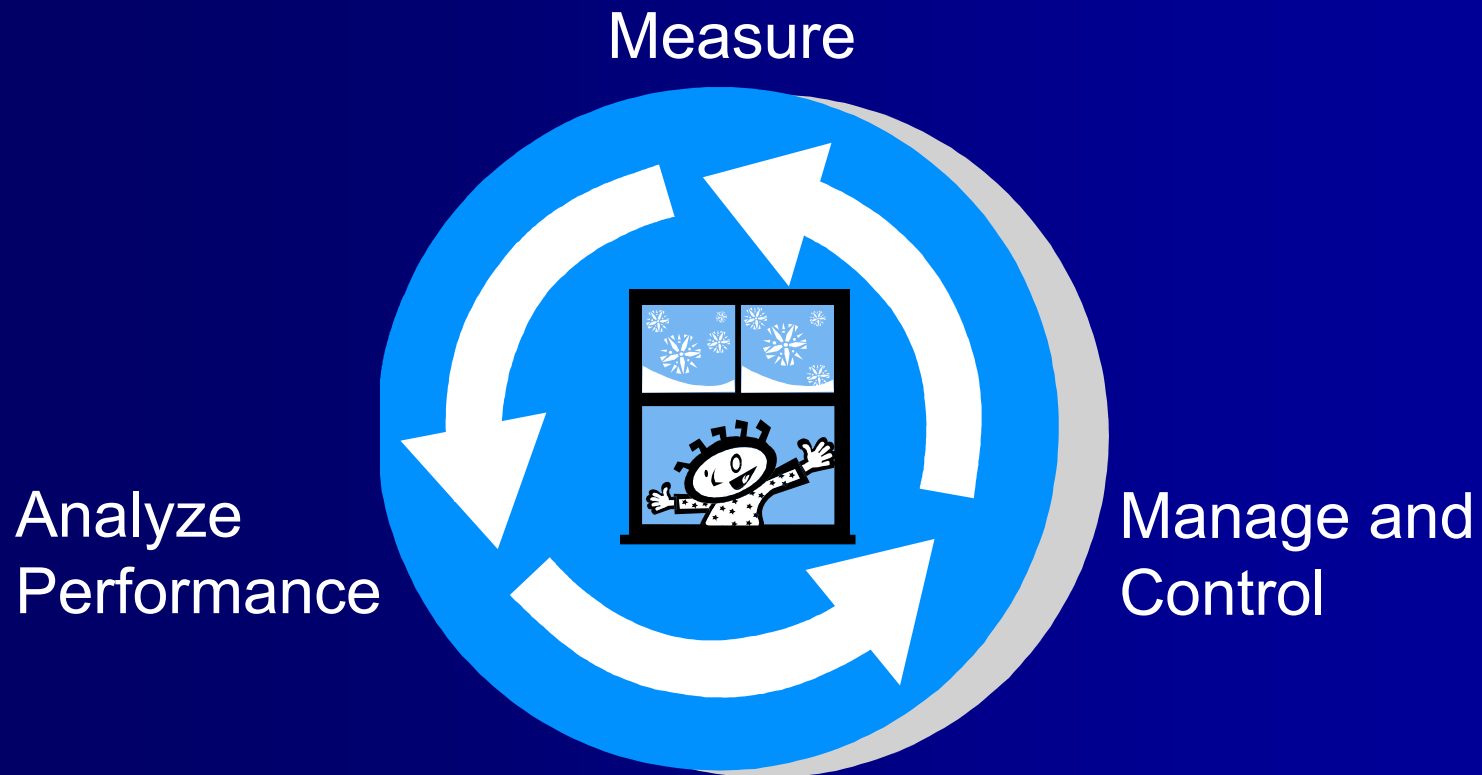


**Paradigm:** A set of assumptions, concepts, values, and practices that constitutes a way of viewing reality for the community that shares them, especially in an intellectual discipline.



Our experience shapes  
our perception

Measure is “To Know” guess is “to Miss”



# Measurement Philosophy



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- What is sufficient?
- Who owns the measure?
- What are the risks?
- What is strategic value?
- Which Executive?
- Which Sponsor?

# Personal Scorecard

Values → I'm admired, independent, and wealthy

Mission → Enjoy my life as much as possible

Vision → I'm healthy and good-looking by 1/2008

Strategies → 1. Exercise      2. Diet

Target → Weight lose of 20 lbs by 7/2007

Action Plan → Jog 5 miles/ wk  
Gym 2/wk      No ice cream, chocolate, or beer

Measuring → Heart rate, body fat, recovery      Body mass index, favorite jeans

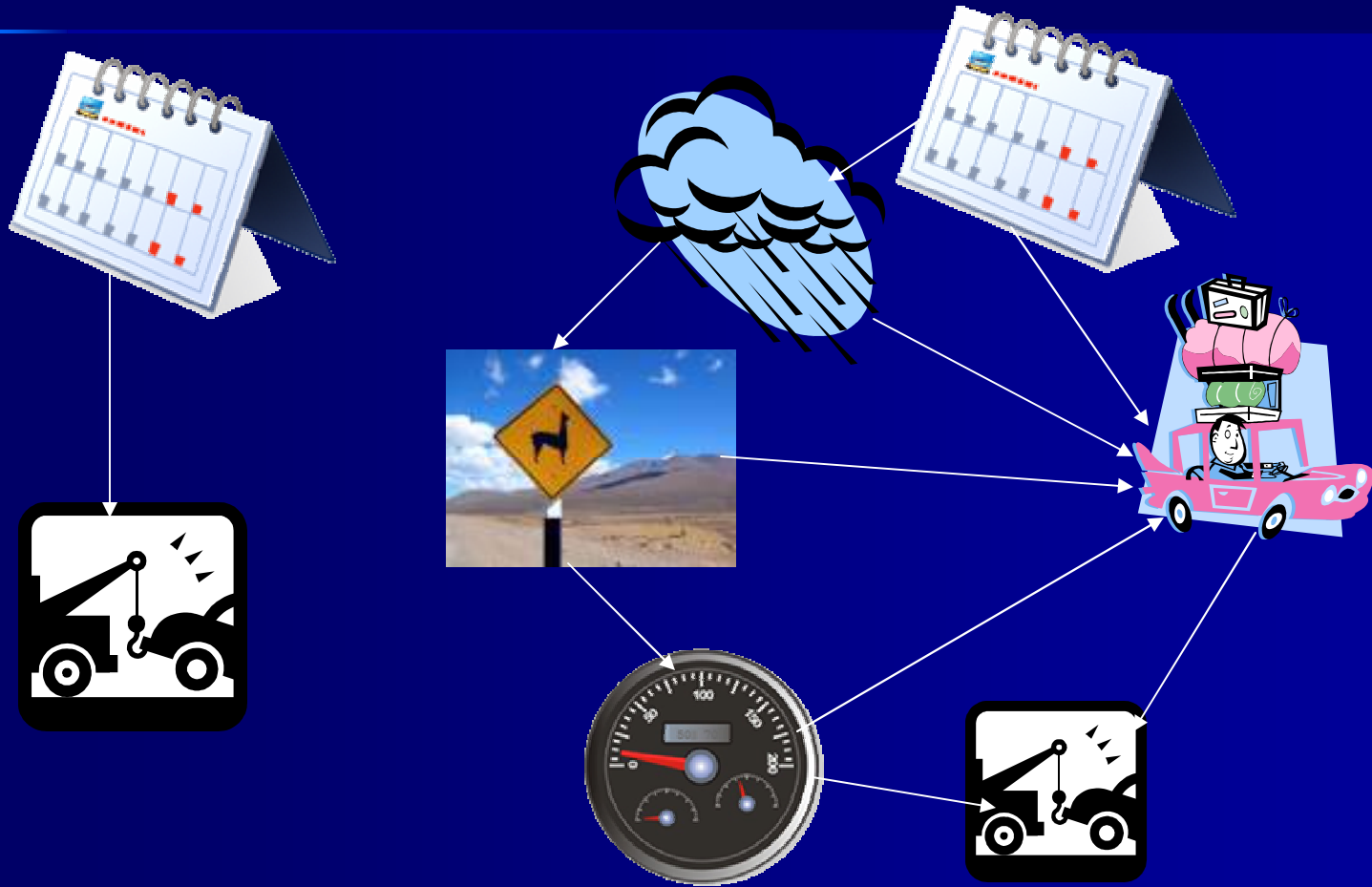
Rewards      New running gear and iPod      New clothes

# Balanced Measurements





# How to Measure



# AnyAirline - Operating Efficiency

## Financial

Increase Profitability

Fewer Planes

More Passengers

## Customers

Lowest Cost

On-Time Flights

## Internal

Fast Ground Turnaround

## Learning & Growth

Focus on Process Redesign

**What will drive operating efficiency?**

– More customers on fewer planes

**How will we do that?**

– Attract targeted customer segments who value price and on time arrivals

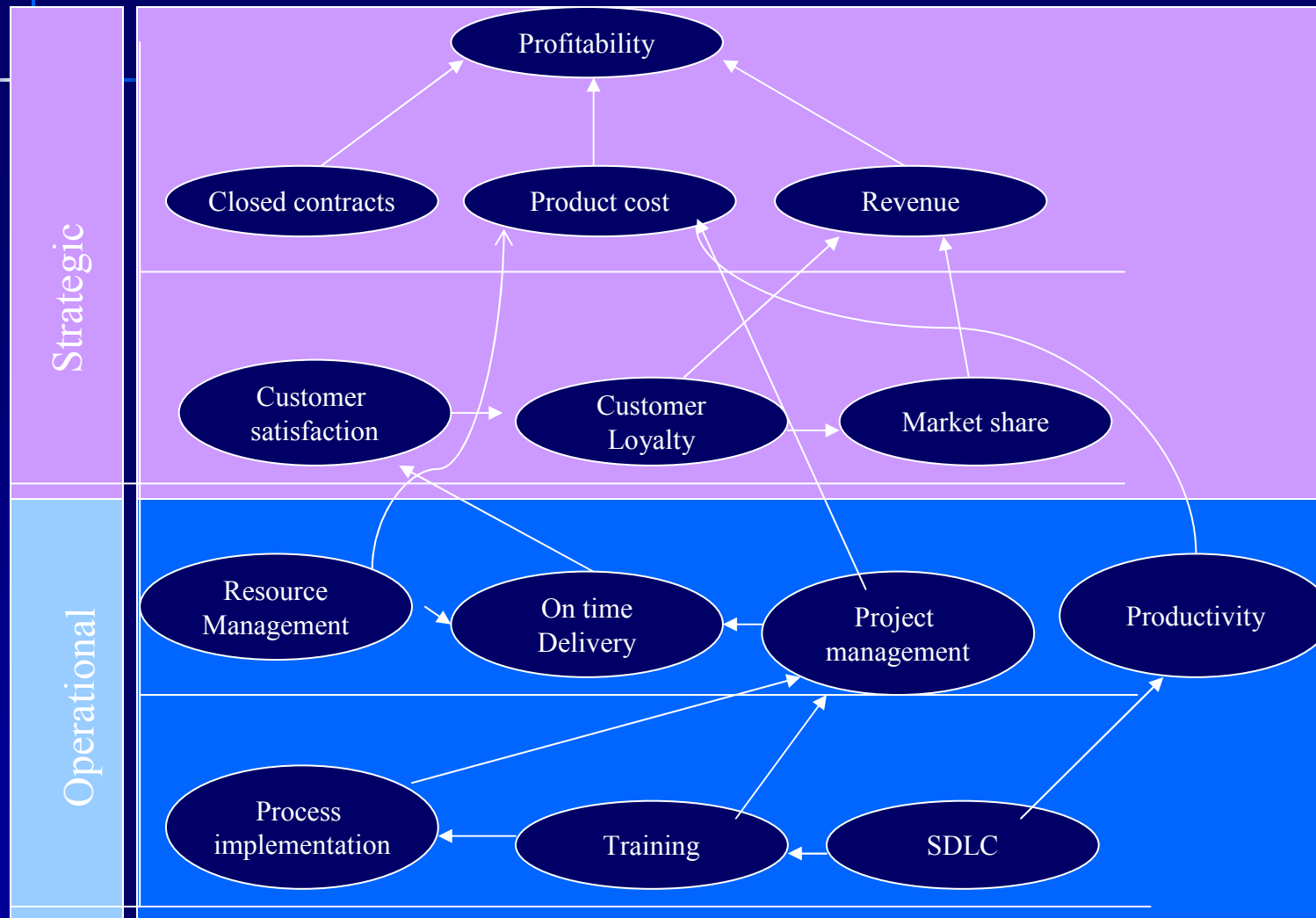
**What must the internal focus be?**

– Fast turnaround

**Will our people do that?**

– Educate and compensate personnel for cycle time reduction

# Strategic Operational Alignment

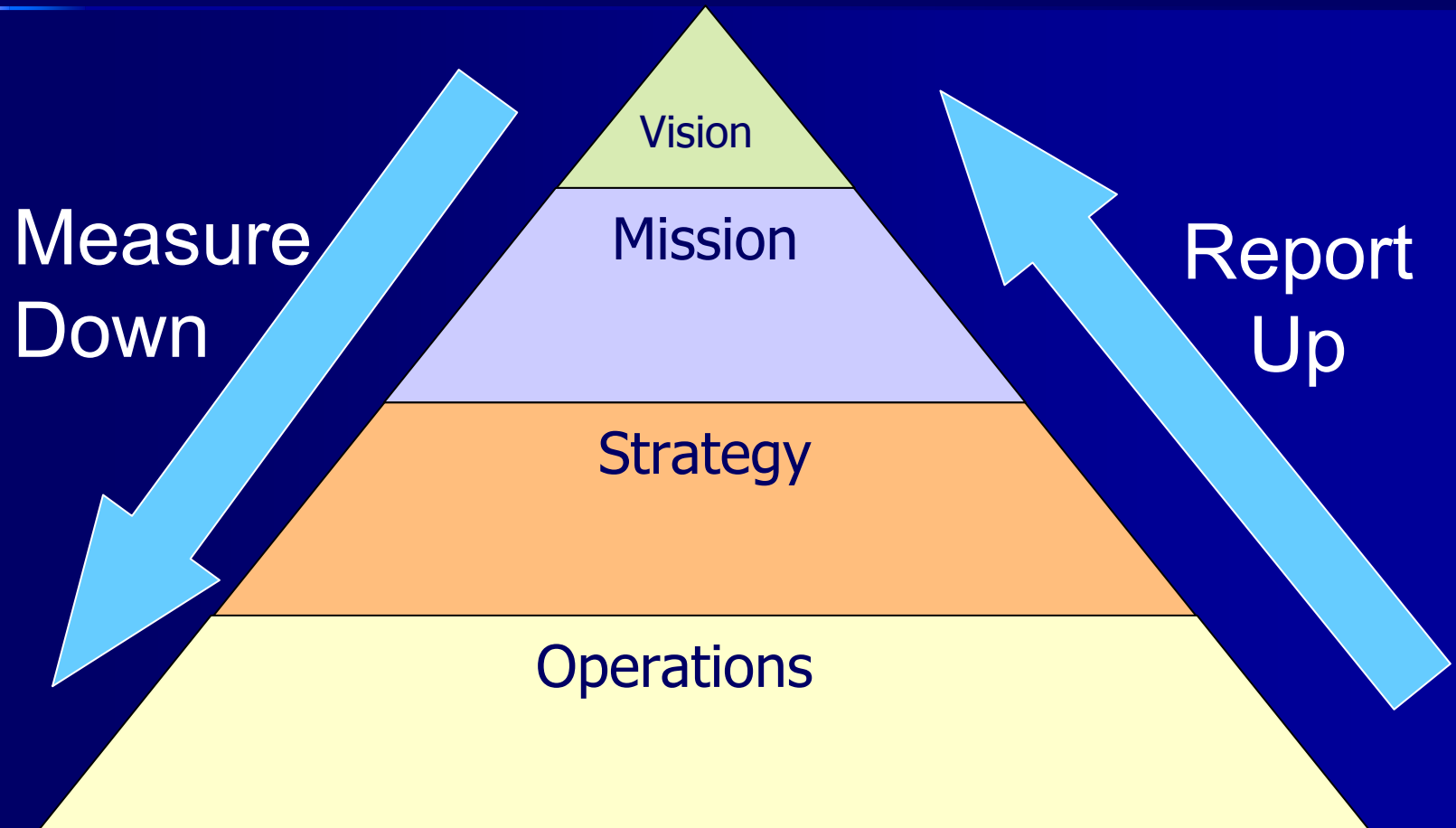


# What do we Know?

To understand what we “know”, we need to ask questions:

- Do we help our employees develop the right skill?
- Do we hire the right people?
- Do we really know what customer wants?

# Transition Strategy to Operations



# Why to Measure

- To minimize project risk
- To make decisions
- Establish performance goals
- Allocate and prioritize resources
- Inform management about needed change
- Share results of performance in pursuing those goals

# “How is your project going?”



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# Project “Health” Questions

- |   |           |
|---|-----------|
| ■ Are we on schedule?                       | TIME      |
| ■ How much \$\$\$ did we spend so far?      | COST      |
| ■ Do we have needed skills?                 | RESOURCES |
| ■ Any scope Changes?                        | SCOPE     |
| ■ Are we keeping track of quality problems? | QUALITY   |

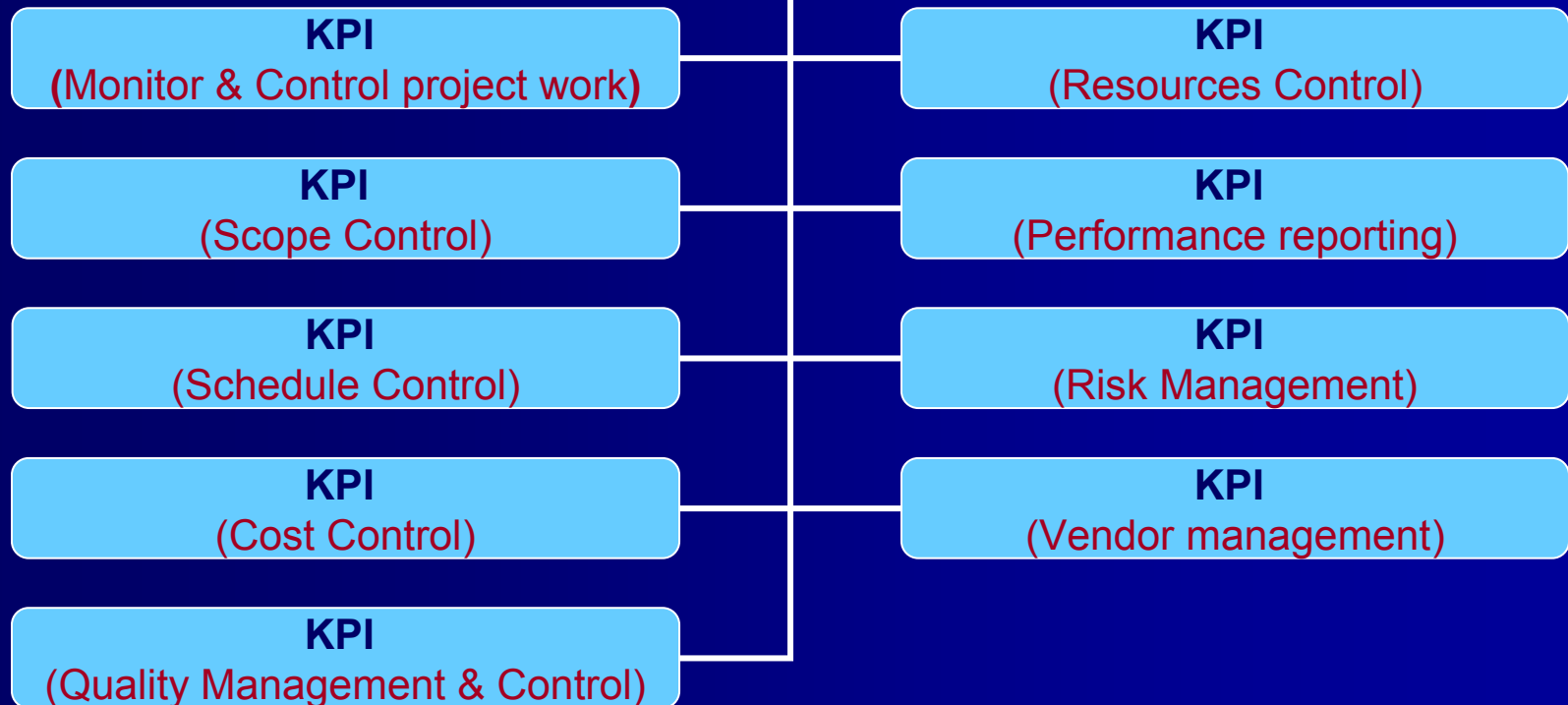


# What is a Key Performance Indicator (KPI)?

- KPI's are high-level snapshots of a business or project "health" based on specific predefined measures
- KPI's help organizations define and measure progress towards original goals
- KPI represents the rate of change or deviation from these original goals
- KPI is an indicator of a trend measuring planned versus actual process performance over time

# PMBOK

## Project Management



# Effective KPI's

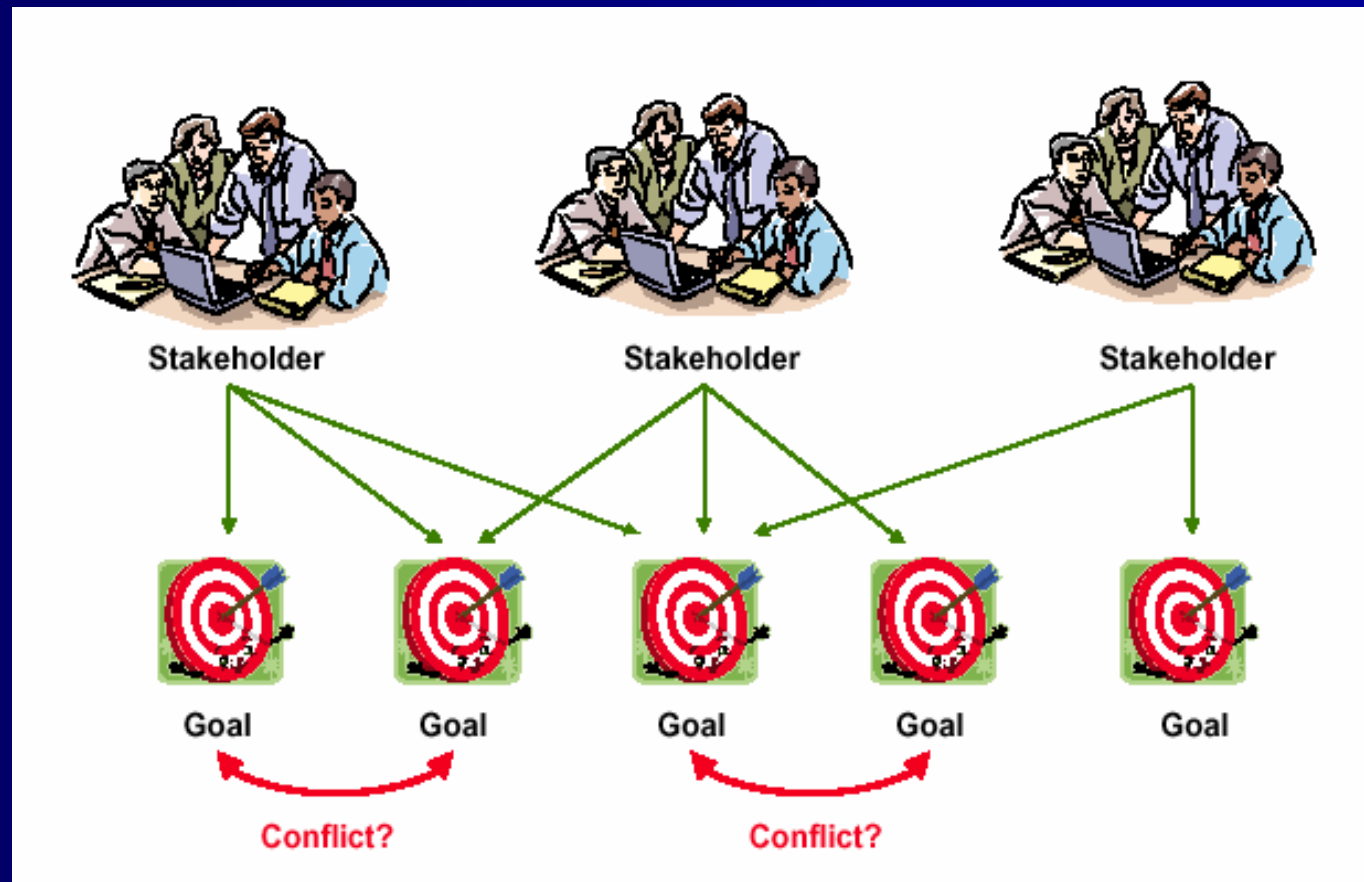
- Goal oriented
- Applied to projects, processes, and resources
- Interpreted based on understanding of the organizational context, environment, and goals
- Monitor and control changes

*Rule of Thumb: Develop your own KPI to answer your own questions*

# Key Project Performance Goals

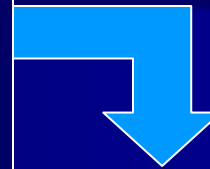
- Meet the schedule
- Stay within budget
- Improve productivity
- Control scope
- Reduce customer complaints

# Conflicts! Again..?

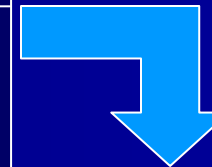


# Goals Often Conflict

Company			
Perspective	Objective	Measure	Target
Customer	Develop new markets	Growth rate in product sale	30%



R&D			
Perspective	Objective	Measure	Target
Customer	Deliver Quality product on time	Development progress	100%



Customer support			
Perspective	Objective	Measure	Target
Customer	Increase Customer Satisfaction	Reduce customer complaints	90%

# What do I **Need** to Know?



**The Question is not:**  
What metrics should I use?

**Rather:**

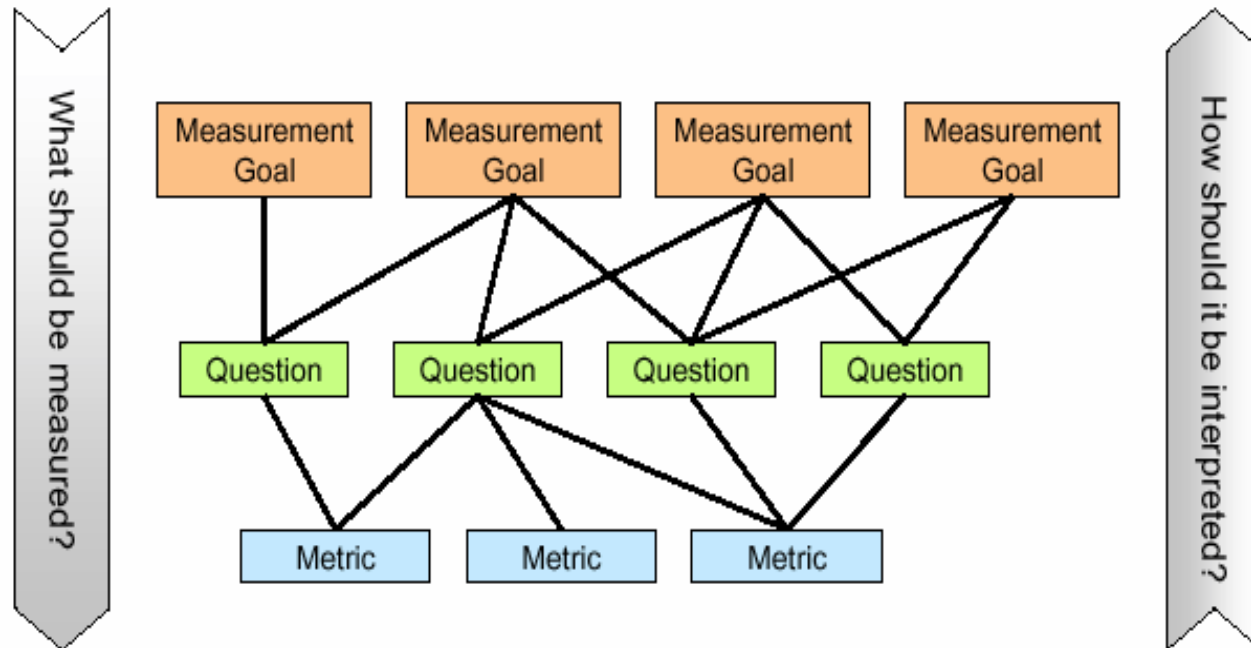
- What do I want to know?
- Why are we collecting the data?
- How do we use the data?

# The Goal Question Metric Methodology (GQM)

- GQM is a goal oriented approach that helps to define why and what to measure
- GQM is a top-down approach for the selection, development, and tailoring of measures
- This paradigm ensures the purpose for collecting each measure
- Provides information for decision making and actions

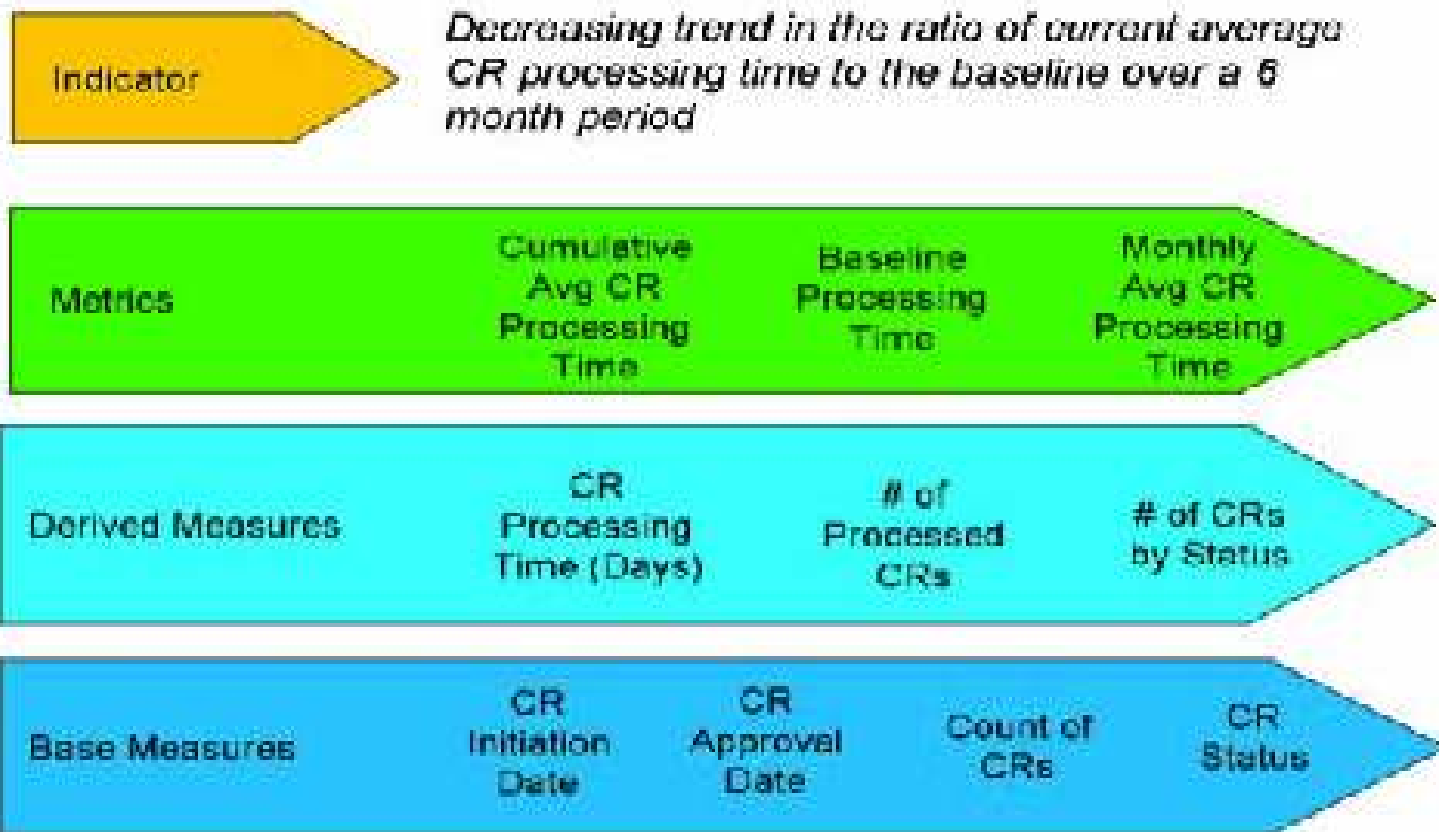


# GQM Structure

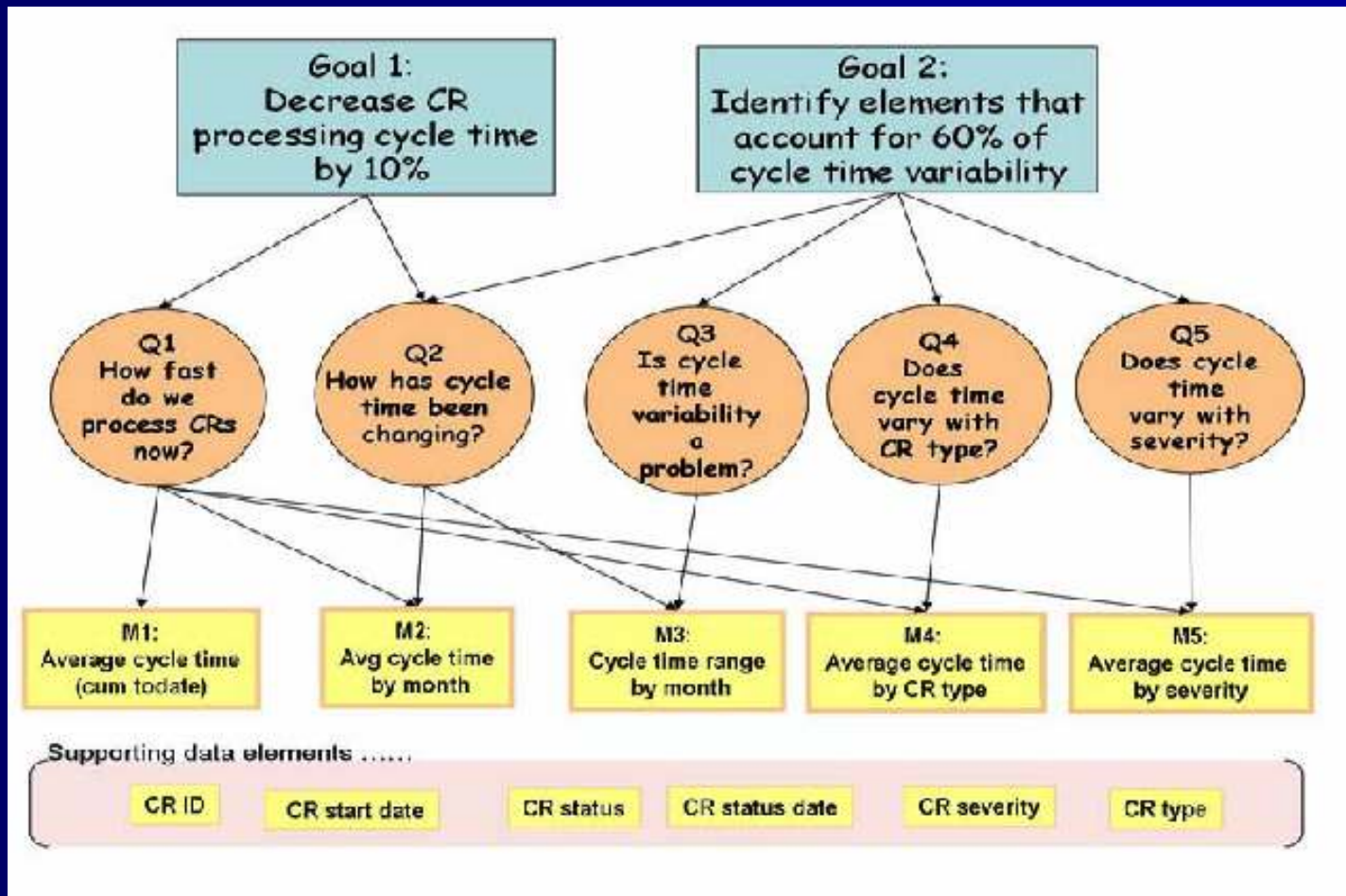


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# Hierarchy of Measurement Terms (Customer Requests)



# Goal- Metric Connection



# GQM Example

Goal	Question	Metric
Improve employee productivity	What activities compose the process?	Process activities by category
	What are employee process training needs by category?	<ul style="list-style-type: none"> <li>➤ Number of employees by category</li> <li>➤ Number of employees that require training</li> <li>➤ % of trained employees</li> </ul>
	What is the total process cost per trained versus untrained employee by category?	<ul style="list-style-type: none"> <li>➤ Cost per trained employee</li> <li>➤ Cost per untrained</li> <li>➤ Process cost per trained</li> <li>➤ Cost of materials used</li> </ul>

# Requirements Management Example

Goal	Question	Metric
Keep product requirements under control	What is the level of requirement volatility?	# of initial requirements # of final requirements # of changes per requirement
	Why are the requirements changed?	Type of change Reason for change Project phase in which the change was requested
	Is the number of changes manageable?	Number of requirements rejected Number of changes approved

# Define Measures

What is the strategy and critical success factors?

How do we track strategy execution?

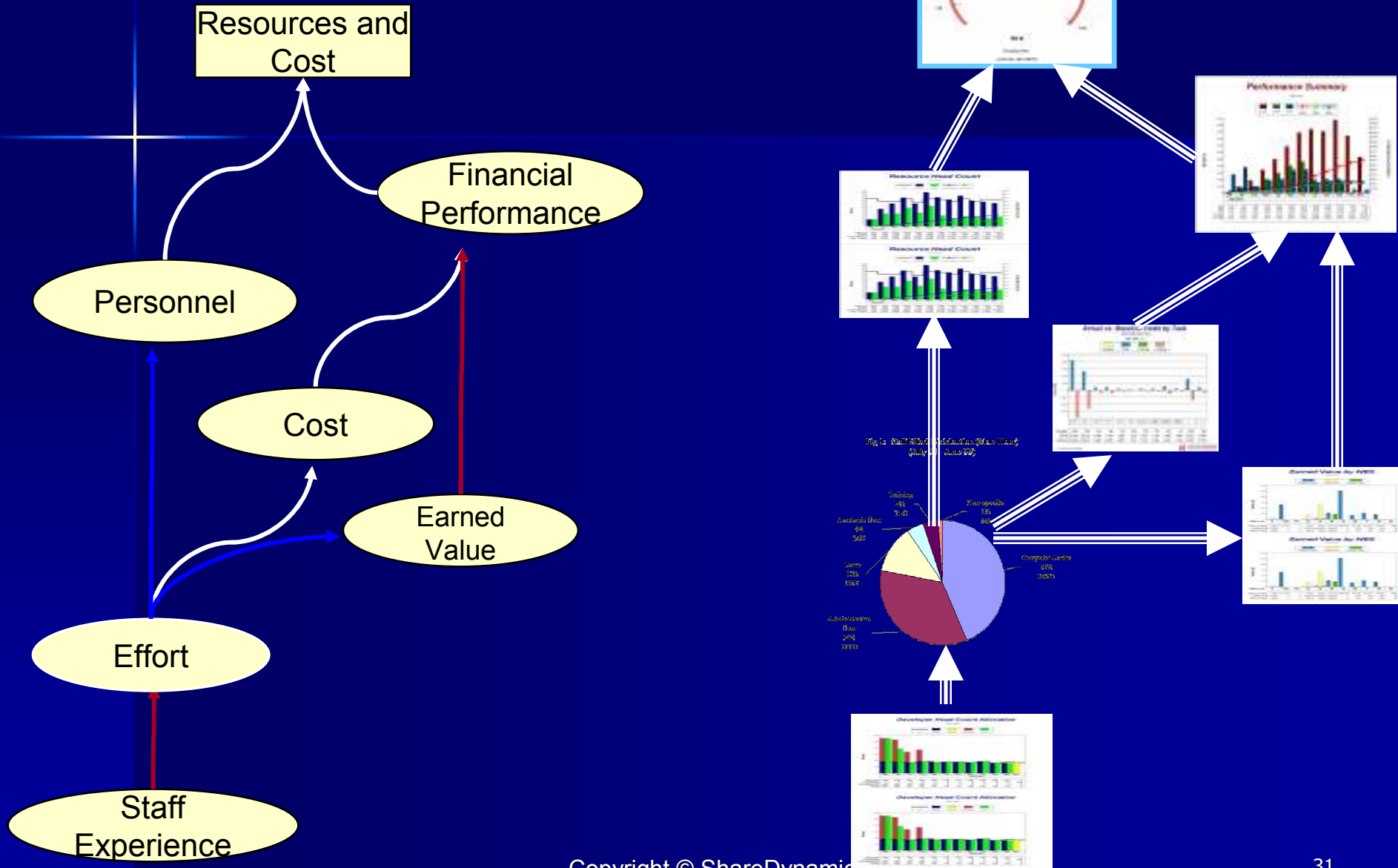
What is our Target?

What are the key action plans to achieve the target?



Strategic Objective	Measure	Target	Action Plans
Organizational Learning	Number of employees to train	100	Marketing campaign for trainings
	How many % have a job 3 months after the training?	60%	Focus training content for manufacturing

# Resources and Cost Indicators



# Project Measures Used to:

- Monitor and control project performance
- Achieve alignment of organizational goals and objectives with project objectives
- Drive process improvements
- Maximize the effectiveness of project effort
- Improve cross-functional collaboration



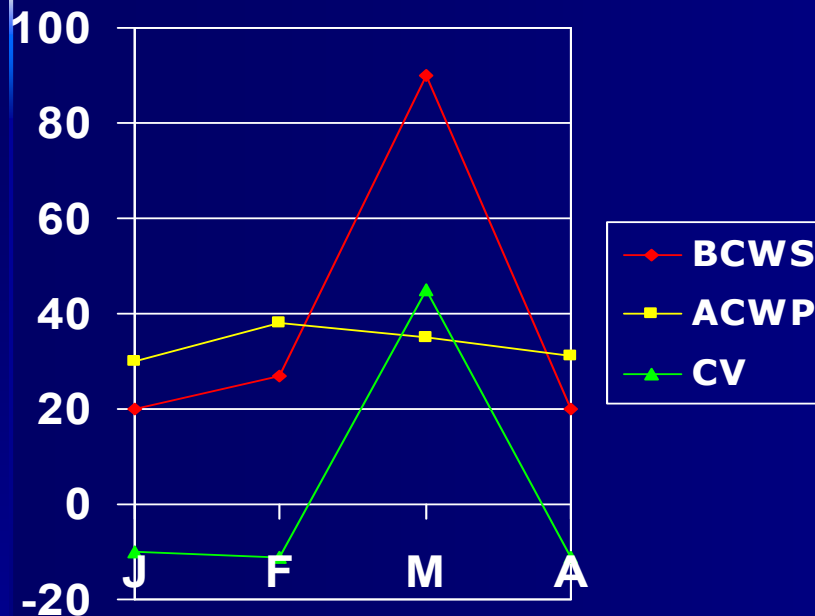
# Project Management Board



# Project Progress

- Cost
- Earned Value
- Productivity
- Task Completion

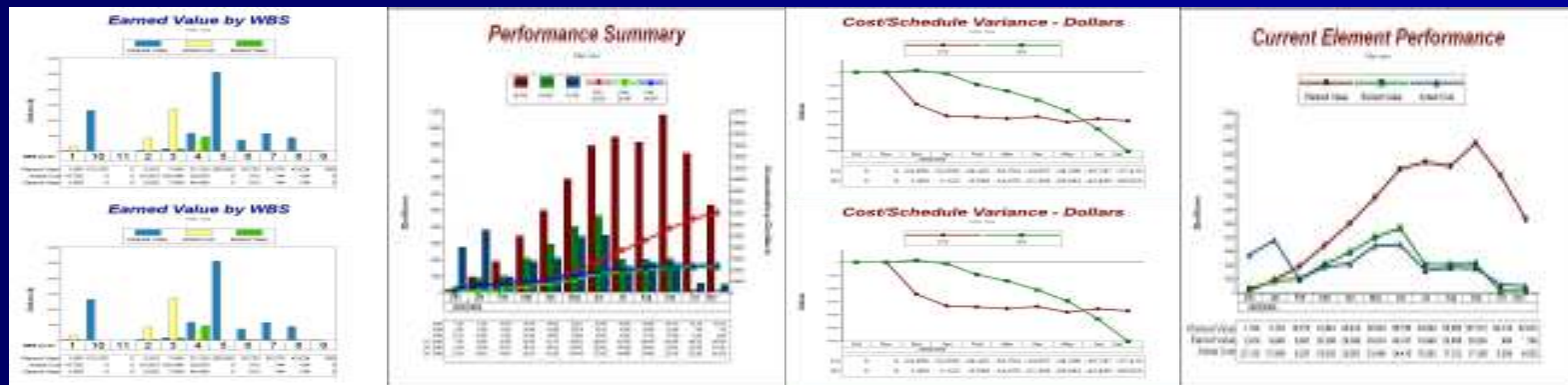
# Cost Metric



- Provides insight for project managers into the actual cost
- Compares actual versus planned
- Metric Relation:
  - Requirements Stability
  - Development Progress
  - Fault Profile
  - Schedule Performance
  - Cost Performance

# Earned Value

- Cost Performance Index =  $BCWP/ACWP$   
*(Historical measure of average productivity over the life of the project)*
- Schedule Performance Index =  $BCWP/BCWS$



# Task Completion

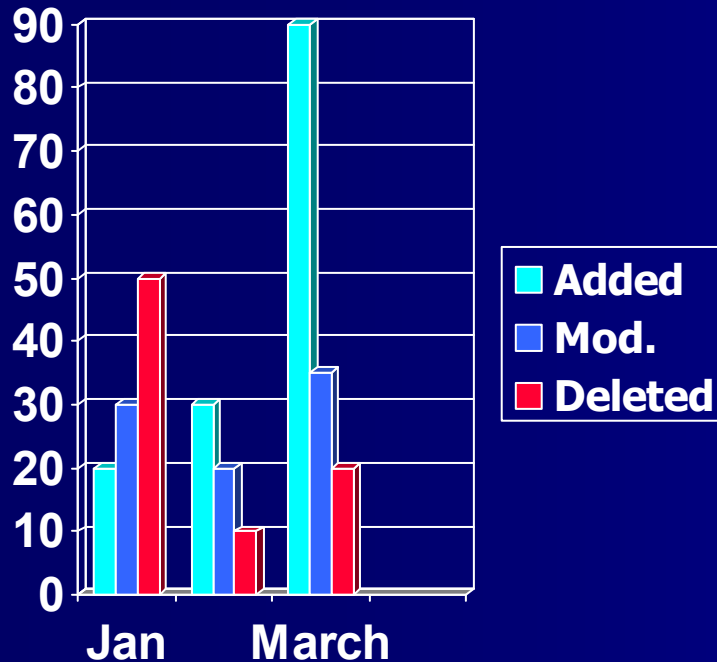
Completion of tasks during the current reporting period:

- Total Due
- Completed on Time
- Completed Late
- Total Overdue = Total Due – (Completed on Time + Completed late)



# Scope Change

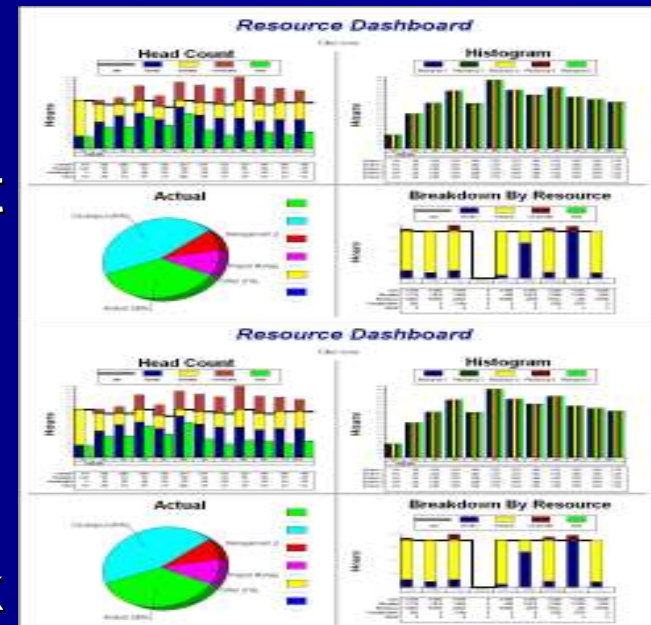
## Requirements Volatility Metric (RVM)



- **Requirements Volatility Metric** represents the level of change in the approved requirements baseline
- **Requirements Stability Metric** allows project manager to determine the cause and source of requirements changes
- **Metric Relation**
  - Requirements Traceability
  - Cost/Schedule
  - Design Stability
  - Breadth of Testing

# Personnel

- Turnover per Month
  - Measure for risk assessment
- Overtime per Month
  - Overtime Hr../Base Hrs.
  - Target ~ 10%
  - More than 20% - adds to risk



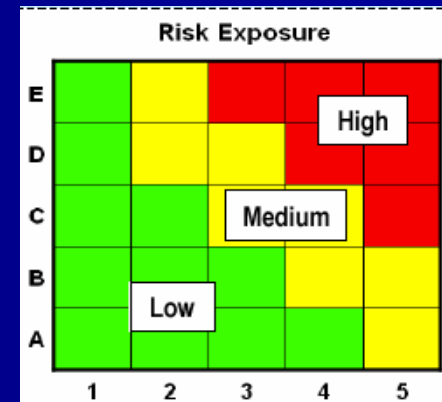
# Risk Measures

## The Risk Exposure

- Shows each risk plotted by its cost consequence and probability

## Risk Reserve

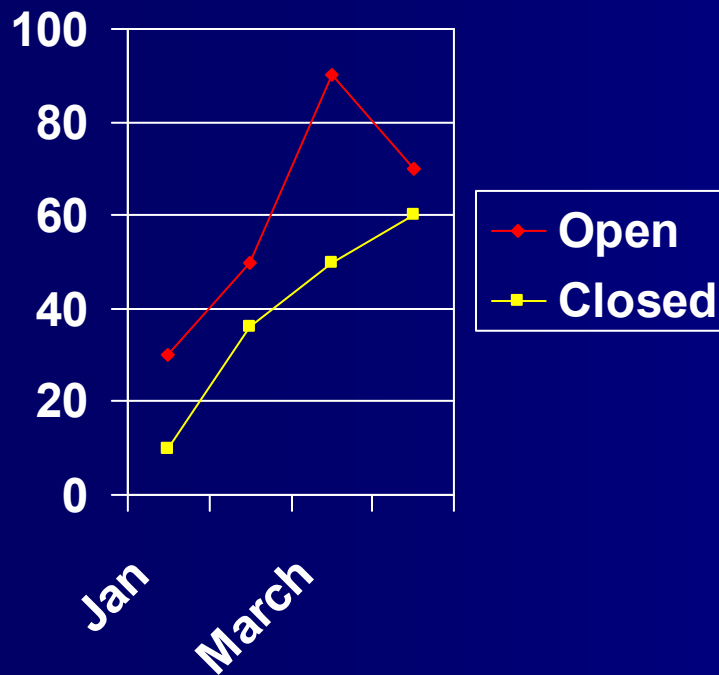
- Shows total risk exposure for cost and schedule compared with the current cost and time risk reserves





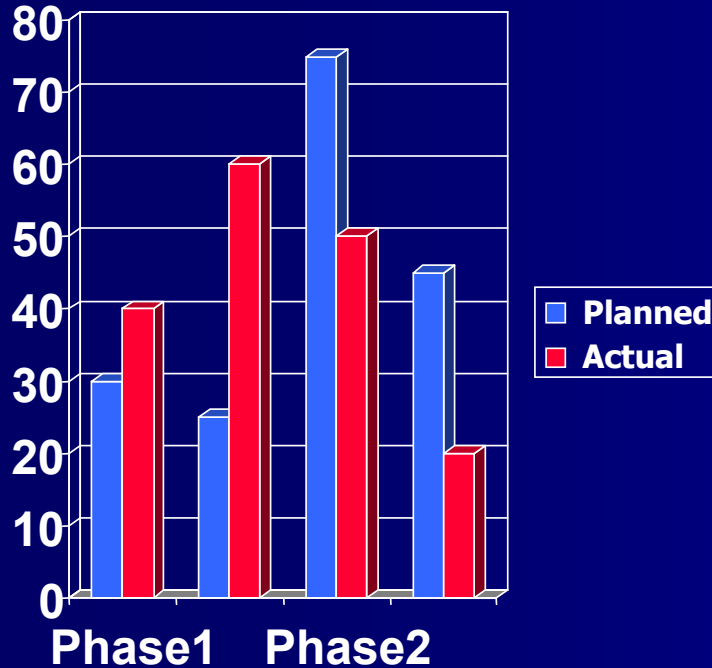
# Quality Measures

## Fault Profile Metric



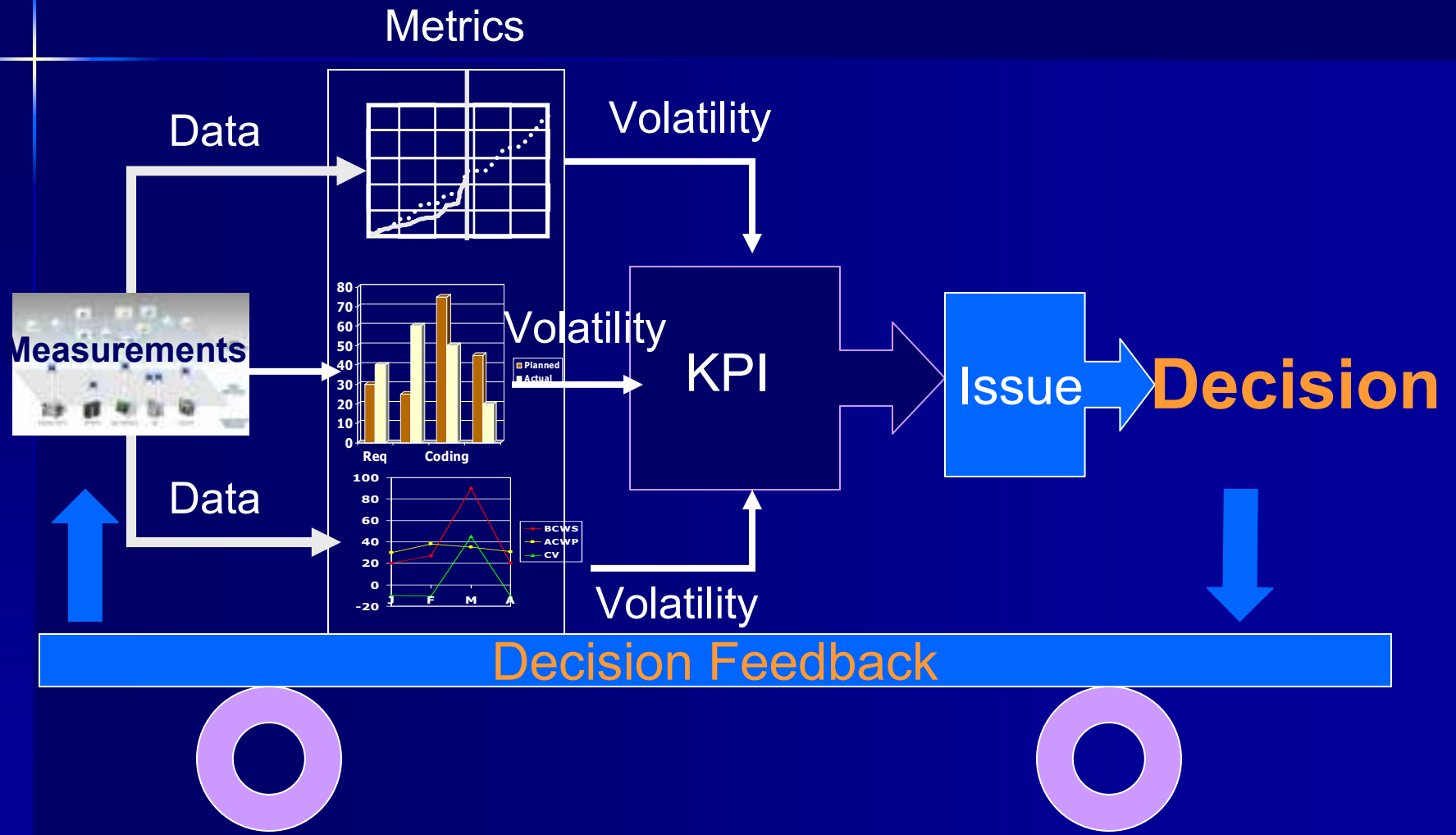
- **Fault Profile Metric** provides a summary of problems & change data
- **Fault Profile Metric** provides insight into the number and type of problems and the ability to fix known faults
- **Metric Relation**
  - Cost/Schedule
  - Requirements Traceability
  - Requirements Stability
  - Breadth of Testing
  - Depth of Testing

# Schedule Metric (Phase Duration)



- Reports actual project progress in relation to the original schedule
- Measures the degree of completeness of development effort and readiness to proceed to the next stage
- Metric Relation
  - Requirements Stability
  - Development Progress
  - Fault Profile
  - Cost Performance

# KPI as a Decision Tool



# Types of Dashboards



## Strategic

- ✓ Monitors the execution of strategic goals
- ✓ Uses cascading score cards
- ✓ Emphasizes collaboration

## Tactical

- ✓ Tracks processes and projects
- ✓ Emphasizes analysis

## Operational

- ✓ Tracks mission critical processes
- ✓ Emphasizes monitoring

# Why to use Dashboards

- For presentations or on-screen access by your team
- Keep your stakeholders informed without meetings
- Streamline your meetings by ONLY focusing on those areas needing attention
- Communicate to a wide range of stakeholders with confidence that everyone will understand
- Align your organization with key performance indicators by using a hierarchy of dashboards that measure an objective at all levels of the organization
- Analyze the key success metrics through time phased analysis, drill down components, and root cause graphics

# Summary

- Establish clear strategy, goals and targets
- Establish relationship between internal goals and environmental inputs
  - influence of outside environment
- Set quantitative measurement goals to compare with actual results
- Construct KPI's to achieve and maintain stability in dynamic internal and external environment

*Questions???*

# About the Speaker

Joseph Raynus, Founder and Principal Consultant at ShareDynamics, Inc. has over 25 years of providing vision and strategic direction in the areas of Corporate Quality, Information Technology, and Software Lifecycle Management to his clients that include Sun Microsystems, Oracle, US Air Force, and Us Marine Corp among others.

Joseph is a certified SEI CMM assessor. He also participated as a non-Government advisor to the Source Selection Evaluation Board (SSEB) during a major US Air Force acquisition.



## Publications:

“Software Process Improvement with CMM”.  
Artech House, 1999. The book is sold by all  
major book sellers and translated into  
Japanese and Chinese languages

Joseph is currently working on a new book  
titled “Quantitative Business Performance  
Management: Challenge, Change, and Dashboard”,  
Taylor & Francis Publishers. Due out Sept. 1,  
2008.

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