

SEMA Course Overview

May, 2007



Software Engineering Institute

Carnegie Mellon

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SEMA Education & Training

Measurement Courses

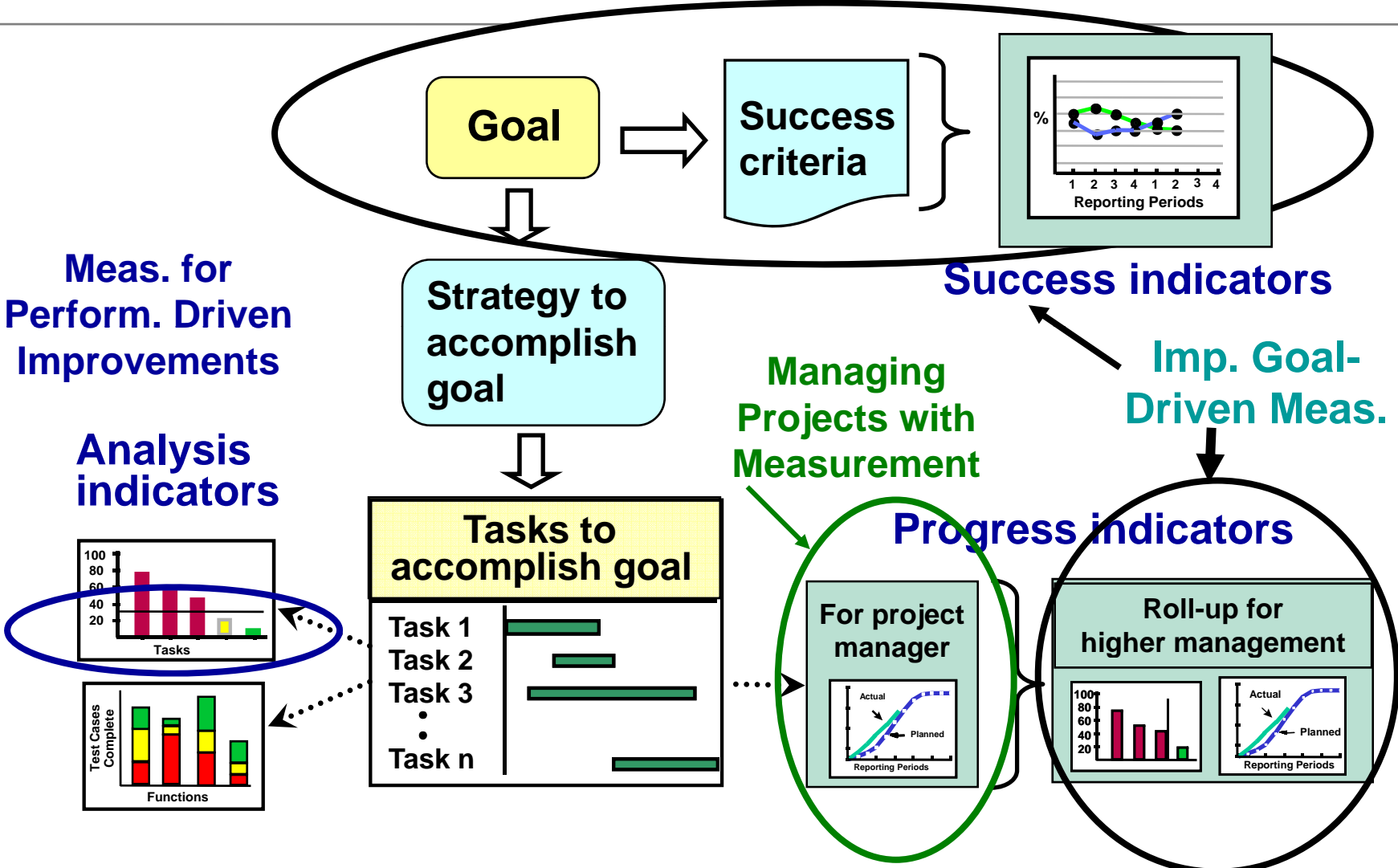
- Implementing Goal-Driven Measurement
- Managing Projects with Measurement
- Measuring for Performance-Driven Improvement - I
- Measuring for Performance-Driven Improvement – II (development)



Implementing Goal-Driven Measurement (IGDM)



SEMA Courses in Context of Measurement



Implementing Goal-Driven Measurement

Purpose

Identify and define indicators to support an organization's business goals.

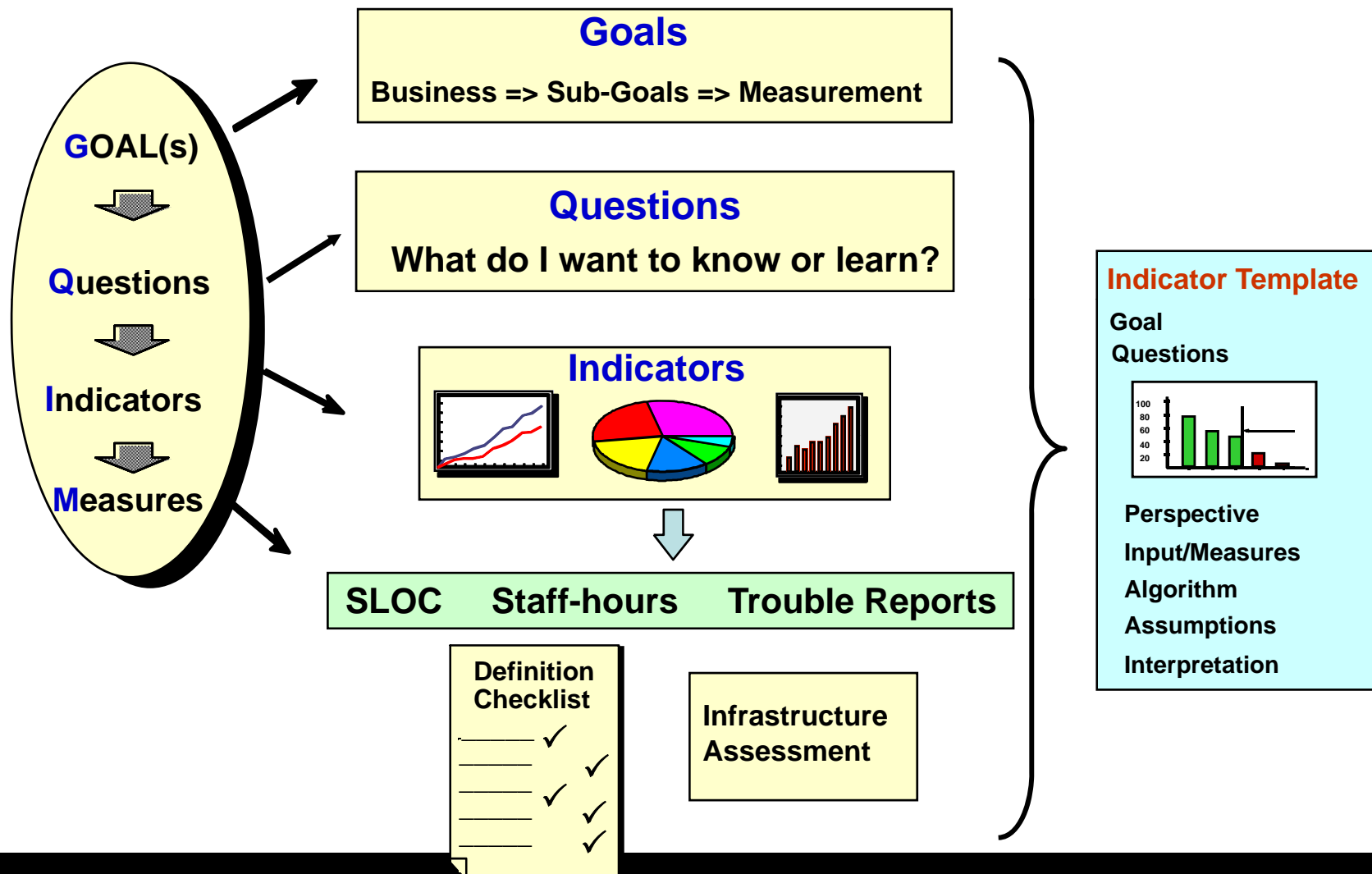
Learn how to determine *success*, *progress*, and *analysis* indicators that connect an organization's high-level business goals to the data collected.

Connect to the Measurement and Analysis process area of Capability Maturity Model® Integration (CMMI®)

“Indicators” are charts and tables of measures that tell a story.



Implementing Goal-Driven Measurement Workshop



Indicator Template

Document the why, what, who, when, where, and how

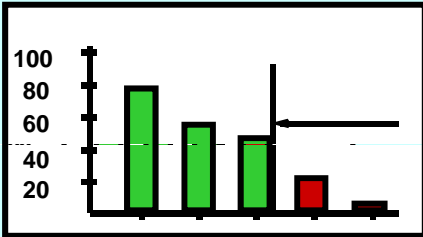
INDICATOR TEMPLATE

Measurement Goal # _____:

Objective _____

Questions _____

Visual Display



Category	Value
1	80
2	60
3	50
4	30
5	10

Perspective _____

Input(s)

Data Elements _____

Responsibility for Reporting _____

Form(s) _____

Algorithm _____

Assumptions _____

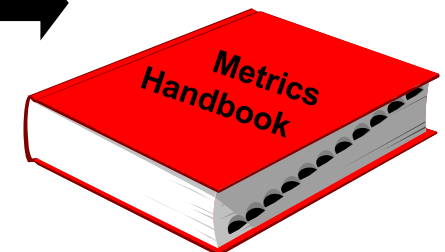
Interpretation _____

X-reference _____

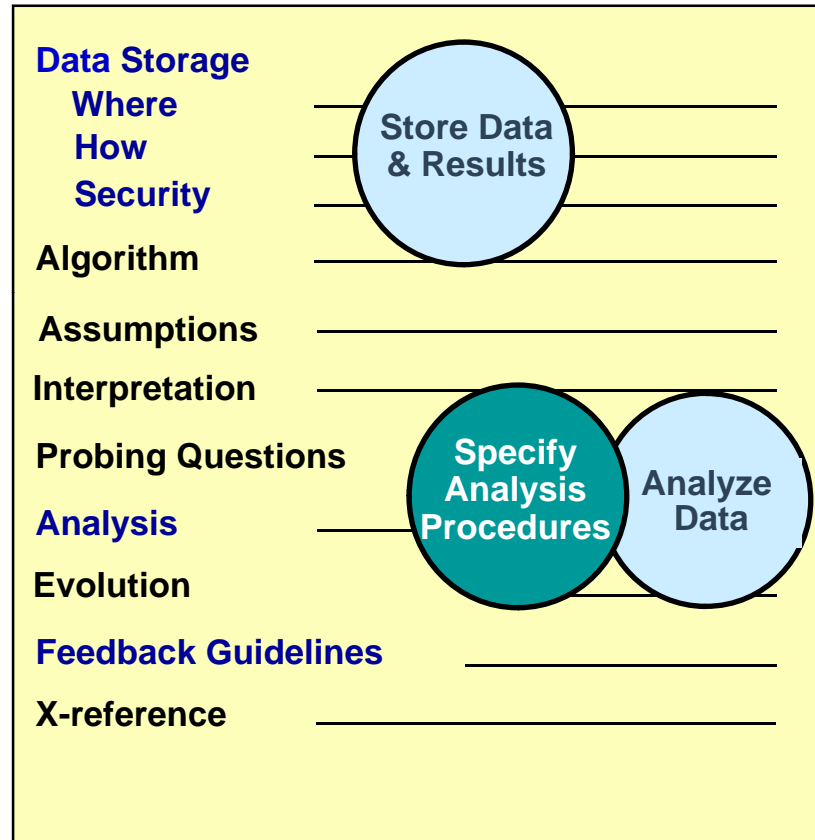
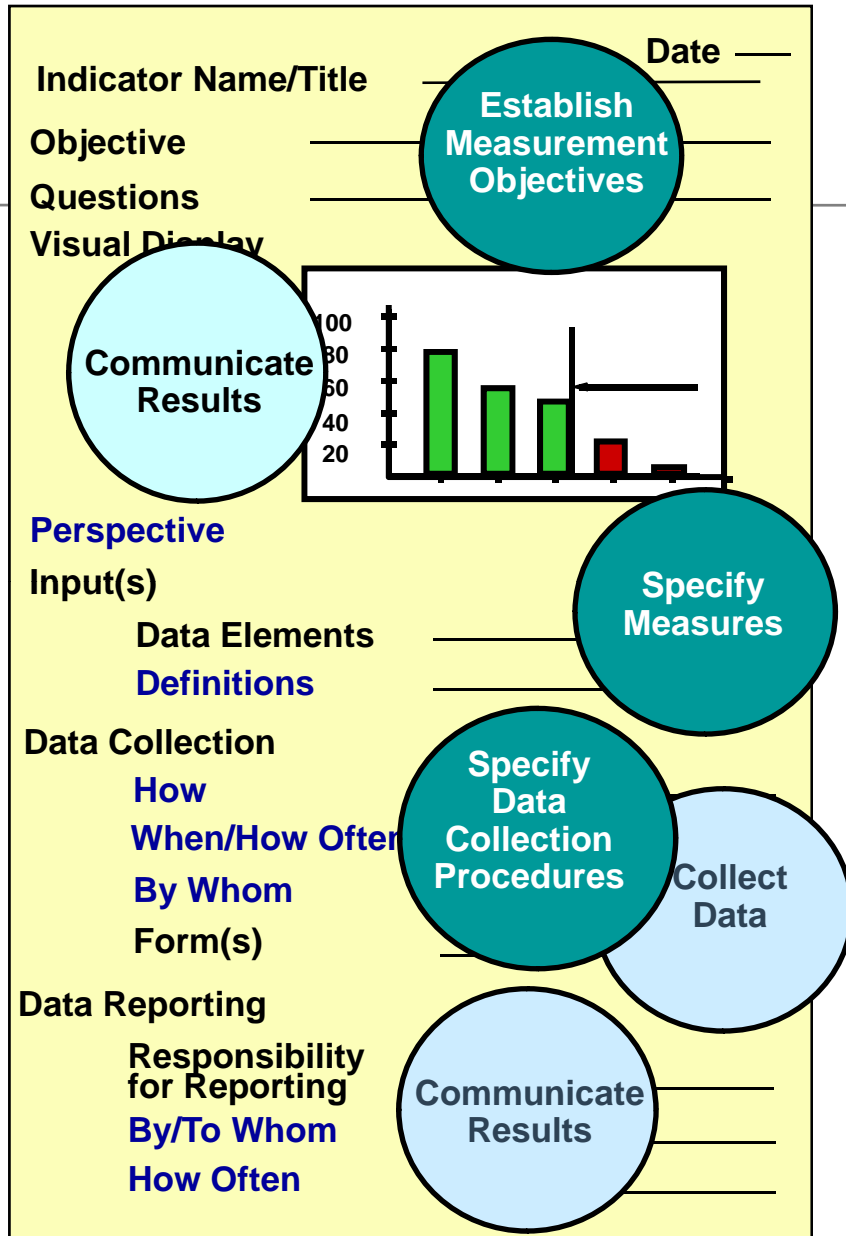
Probing Questions _____

Evolution _____

Completed Indicator Templates are the output of GQ(I)M work.



CMMI Measurement Practices Mapped to Indicator Template



Managing Projects with Metrics Course



Managing Project With Metrics

Purpose

Teach managers and practitioners **how to use measurement** as a foundation for informed decision-making

Teach participants how to use **measures and indicators to plan, track, and control** projects.

First half: participants learn to use measures and indicators to monitor performance, support decisions, and manage supplier agreements

Second half: measures and indicators are analyzed to diagnose problems and identify solutions during project execution



Managing SW Project With Metrics

Key Components

Identify key areas of concern and uses of measurement for project management

Define indicators based upon what a project manager would want to know

Analyze indicators to obtain insight on the project

Developing a project dashboard

Demonstrate how to use measurement to support decision making

Understand data vulnerabilities and their impact on analysis and decision making

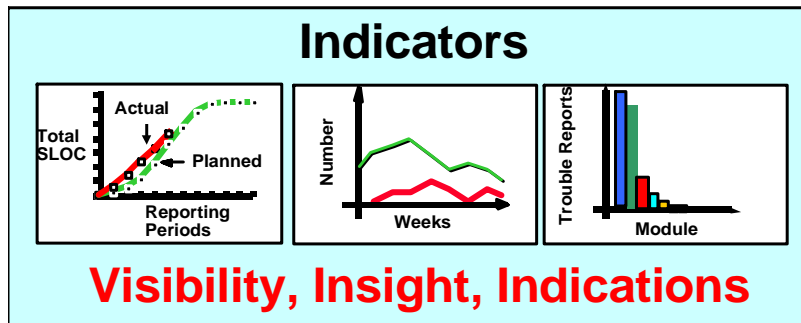


Project Management

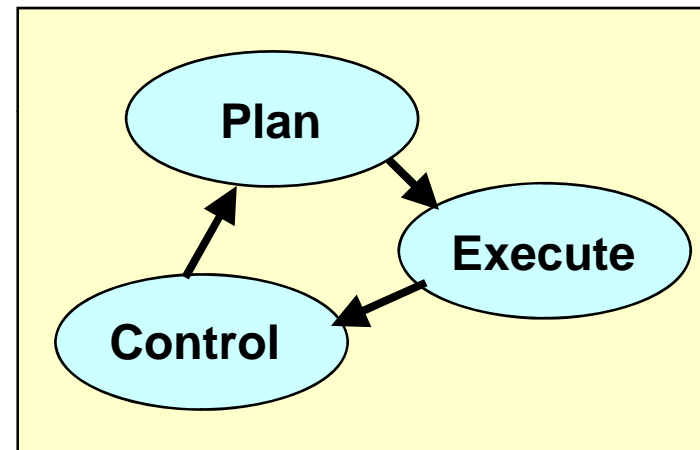
Project Managers responsibilities

Produce a project that is

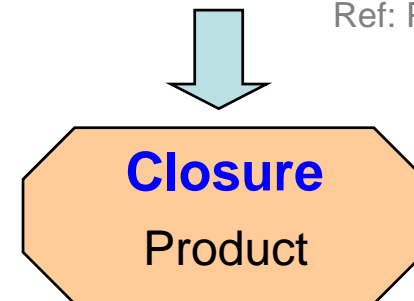
- on time
- within budget
- of acceptable quality
- does what it supposed to do
- customer likes it



Requirements
Resources
Constraints



Ref: PMBOK



Managing Project With Metrics

Potential Audience

Project managers and staffers in program offices

individuals supporting managers of software-intensive systems development, maintenance, and acquisition



Managing Project With Metrics

Delivery Mode

- lectures and class exercises,

Length

- three days

Take-aways

- class notebook filled with helpful checklists, templates, and reference materials





Measuring for Performance-Driven Improvement - I (MPDI-I) Course



Measuring for Performance-Driven Improvement - I

Purpose

Statistical methods and creative problem solving methods are applied to process problems.

Emphasize how best to apply statistical tools and which tools work.

Course ***does not*** require statistics background.

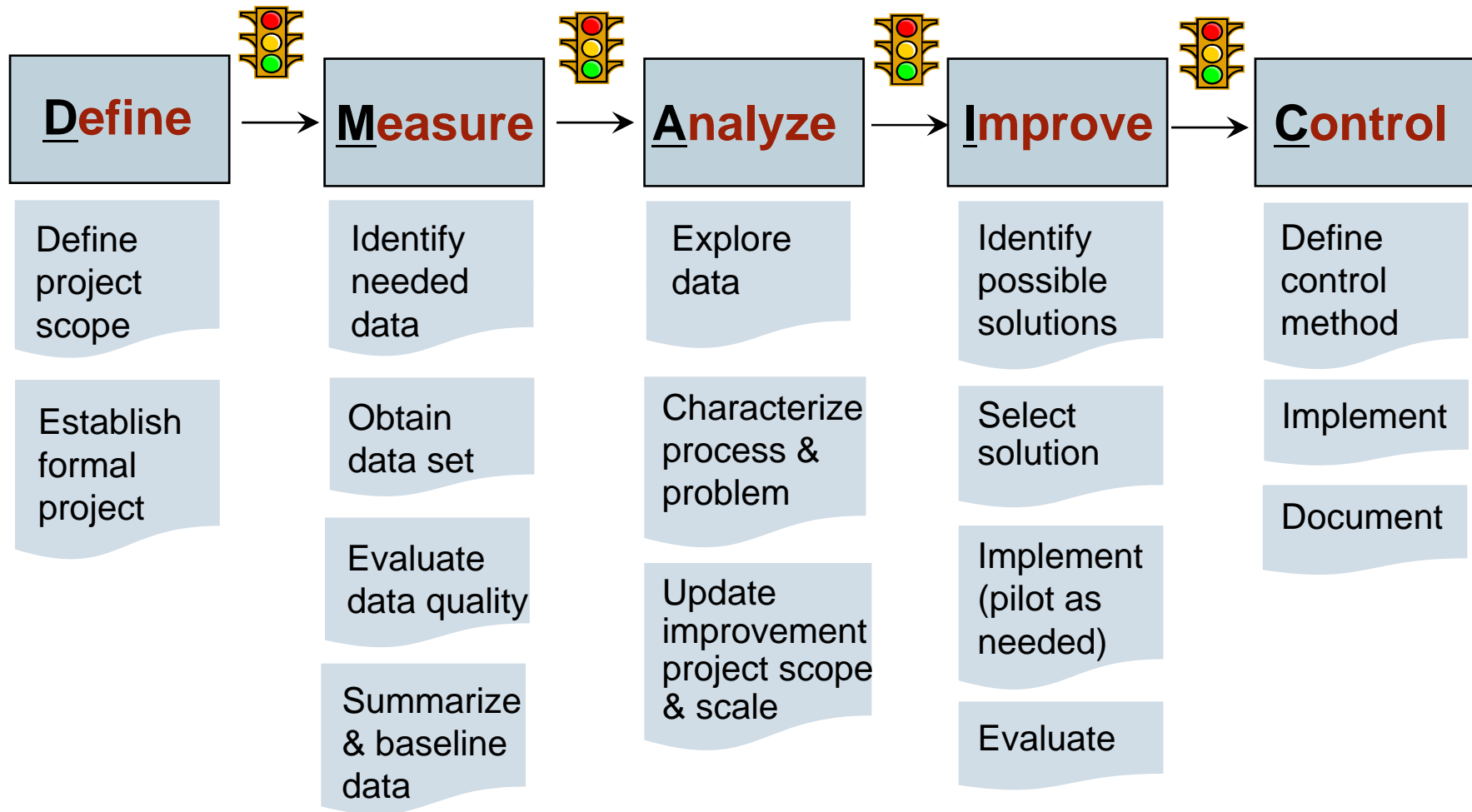
Course exercises make use of a commercial statistical package and example data from real problems.

Participants learn a framework—in the form of tools, methods, and practices—for analyzing data to make more informed business decisions.

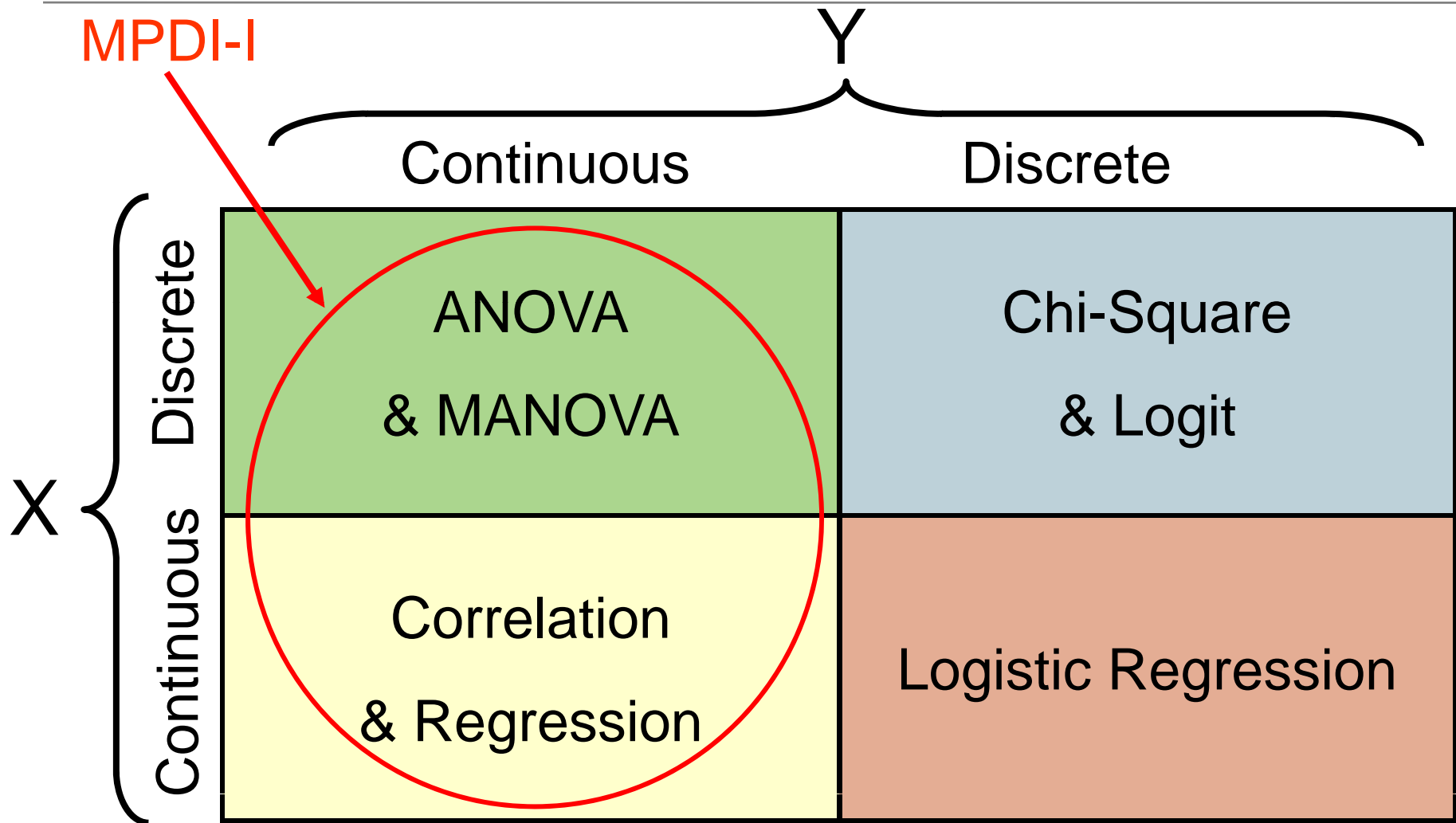


Measuring for Performance-Driven Improvement - I

DMAIC Roadmap



Basic Statistical Prediction Models



Measuring for Performance-Driven Improvement – I

Potential Audience

Professionals who need reliable quantitative information to guide acquiring, supporting, planning, or tracking software

Software engineering process group members

Process improvement working group members

Software measurement team members

Six Sigma black belts, green belts, or belt candidates

People who are willing to learn and need knowledge of statistics for analysis purposes



Measuring for Performance-Driven Improvement – I

Delivery Characteristics

Delivery Mode

- lectures and class exercises with hands-on use of job aids and a statistical package
- series of 1-day follow-on workshops on each of the DMAIC phases

Length

- five days

Take-aways

- class notebook filled with helpful checklists, templates, and reference materials; Toolkit of analysis methods including a decision job aid on when to use each statistical test or method, hands on experience using a statistics package





Measuring for Performance-Driven Improvement - II (MPDI-II) Course



Measuring for Performance-Driven Improvement – II

Purpose

Hands-on, problem-solving approach to using advanced data analysis in direct support of product and process development, with themes taken directly from the Design-For-Six-Sigma (DFSS) methodology

Emphasis is on the “what”, “when” and “why” of advanced statistical analysis tools and techniques

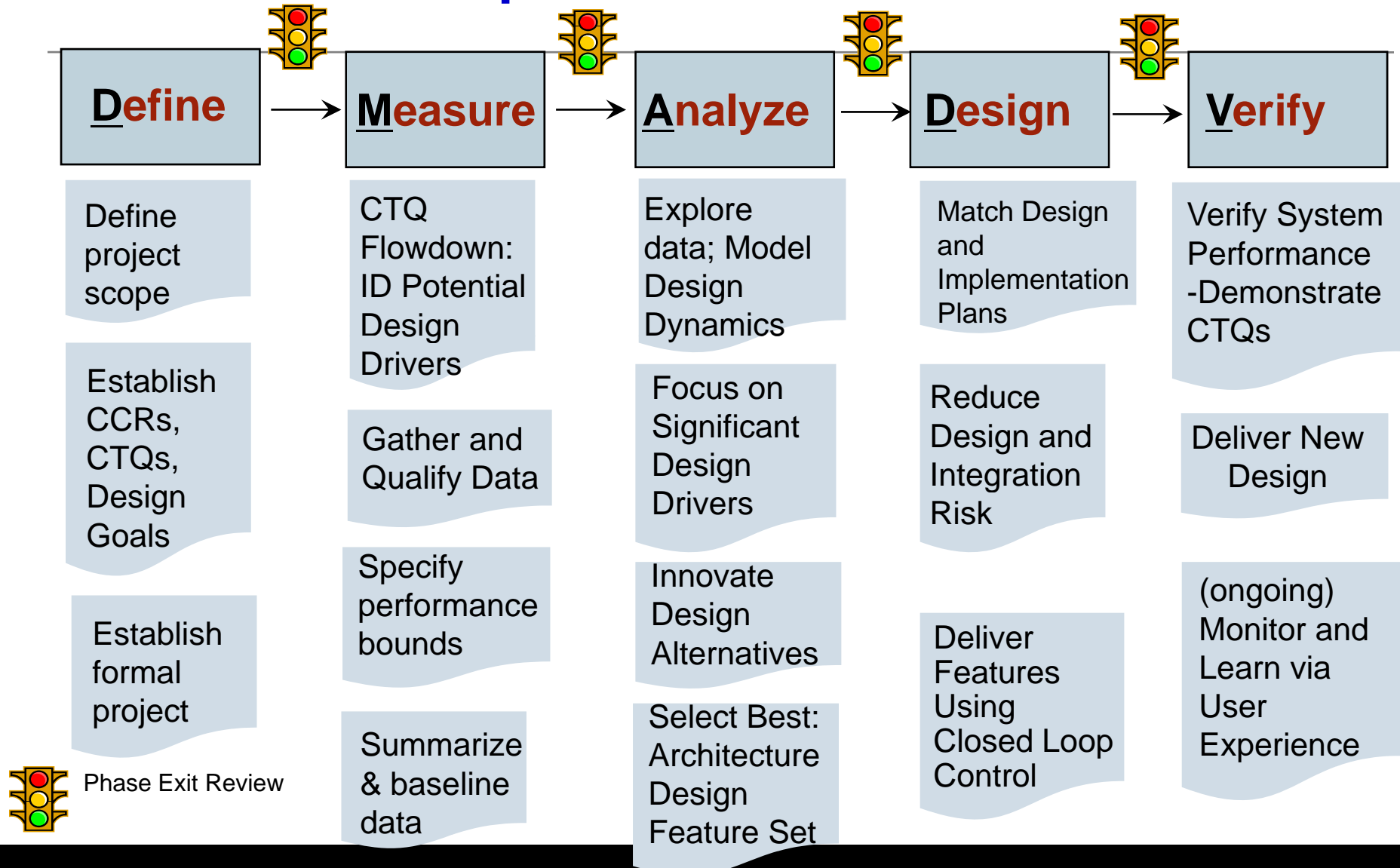
Class ***does presuppose*** statistical knowledge and statistical tool expertise gained from the Measuring for Performance-Driven Improvement – I class

Participants learn methods specific to satisfying customer and user needs via efficient development processes and optimal product designs

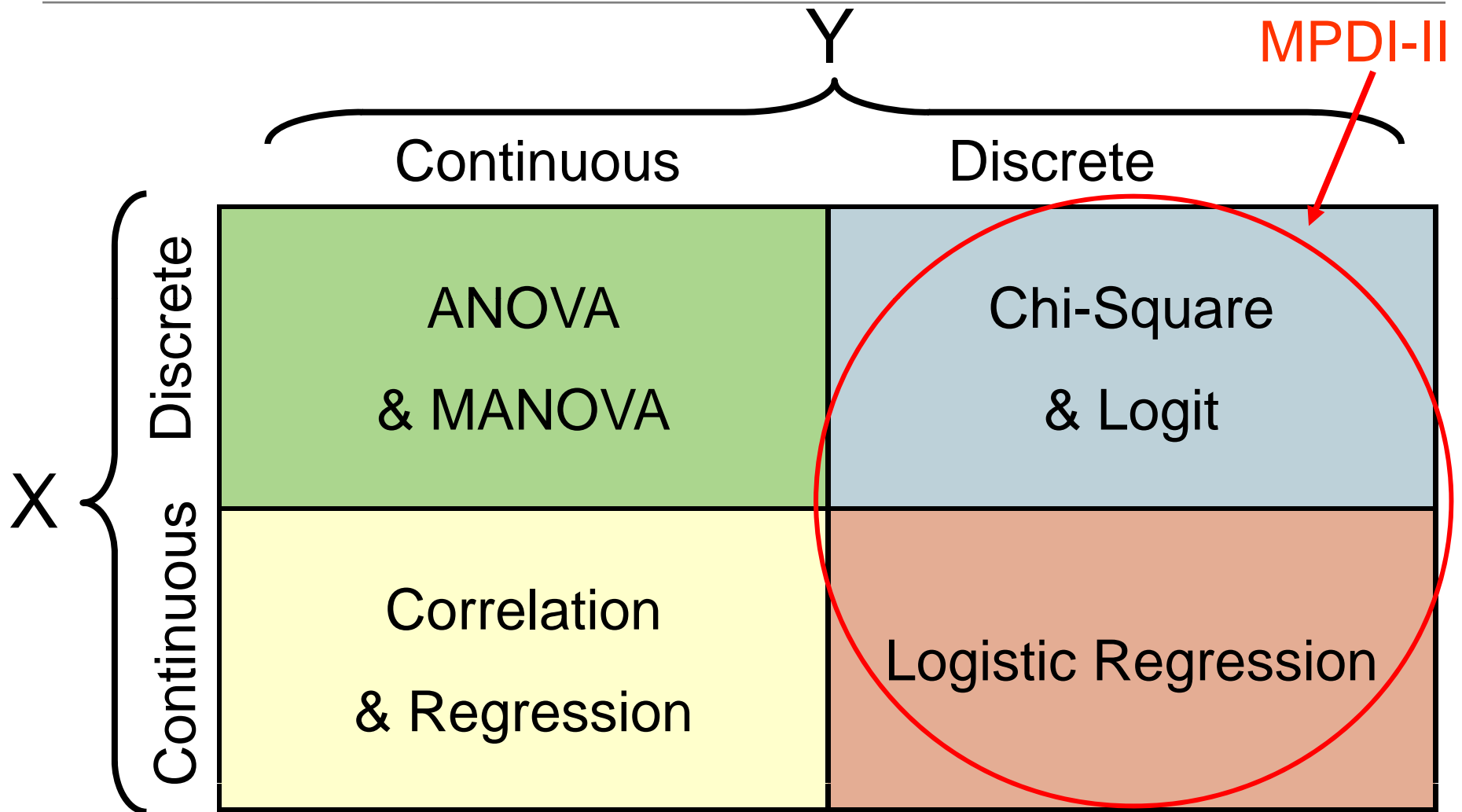


Measuring for Performance-Driven Improvement - II

DMADV Roadmap



Basic Statistical Prediction Models



Measuring for Performance-Driven Improvement – II

Key Components

Six Sigma Define-Measure-Analyze-Design-Verify (DMADV) methodology for new product development

A single, hybrid case study used to demonstrate various advanced methods

Analytical methods

- Additional CMMI Process Performance Modeling statistical methods including: Chi-Square, Logit, Logistic Regression, and Dummy Variable Regression
- Monte Carlo simulation for modeling business cases and schedule uncertainty
- Discrete Event process modeling and simulation
- Voice of Customer techniques such as KJ and Kano analysis, and Quality Function Deployment
- Prioritization methods including the Analytic Hierarchy Process (AHP)
- Design of Experiments for optimal process and product design solutions



Measuring for Performance-Driven Improvement – II

Potential Audience

Professionals who need reliable quantitative information to guide acquiring, supporting, planning, or tracking software

Software, Hardware and Systems Engineers driving radical improvement

Engineering process group members

Measurement team members

Six Sigma Black belts, Green belts, or Belt candidates

Individuals implementing CMMI High Maturity practices

People who have basic education and training in statistics and a statistical package



Measuring for Performance-Driven Improvement – II

Logistics

Delivery Mode

Lectures and class exercises with hands-on use of job aids and tools such as: a statistical package, a process modeling and simulation tool, an add-on to MS Excel for Monte Carlo simulation, an MS Excel tool for Analytic Hierarchy Process, and a reliability growth modeling tool

Length

Five days

Take-aways

Class notebook filled with helpful checklists, templates, and reference materials; Toolkit of analysis methods including a decision job aid on when to use each statistical test or method



Types of Customer Engagements



Typical Customer Engagements

Public Offering

Attend course
at SEI

Tailored On-site Workshop

Tailor course
material

Present tailored
course at
customers
location

Follow-up support

Consulting

Consulting

Need for measurement
related training

Attend public
offering at SEI

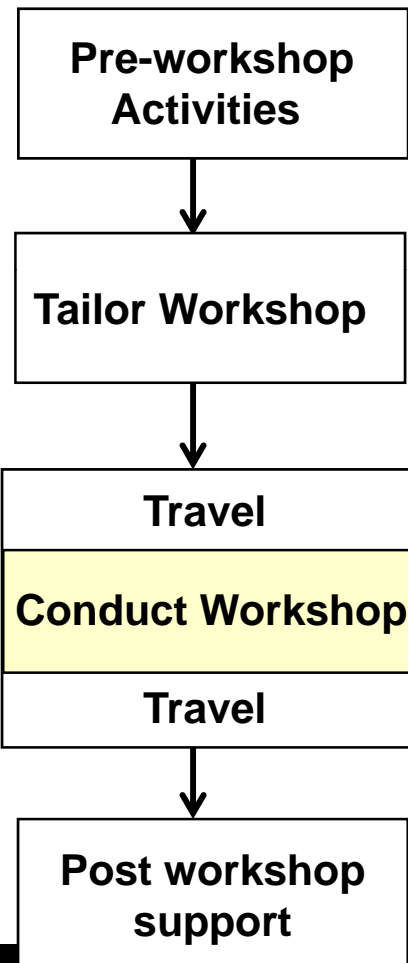
Tailored
workshop at
customer's
site

Follow-up support

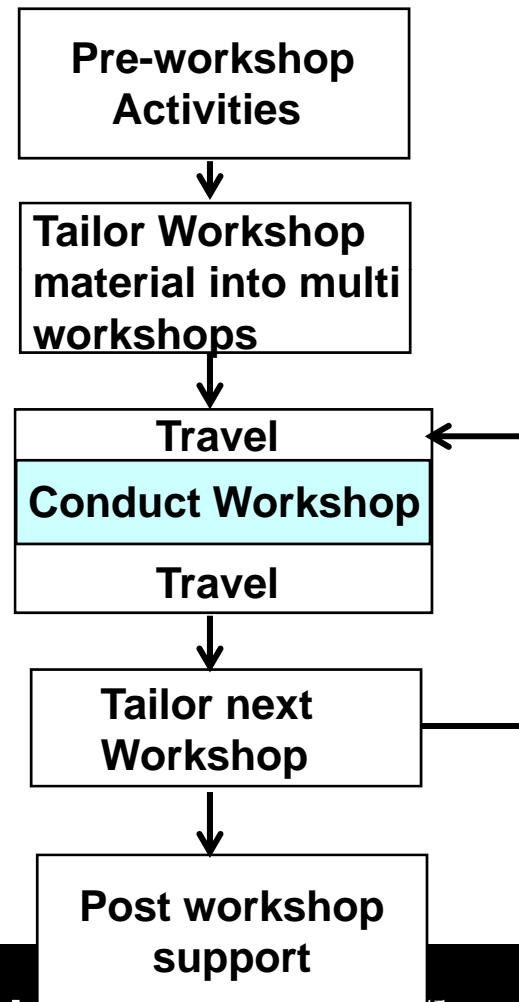


Customer Engagements - Workshops

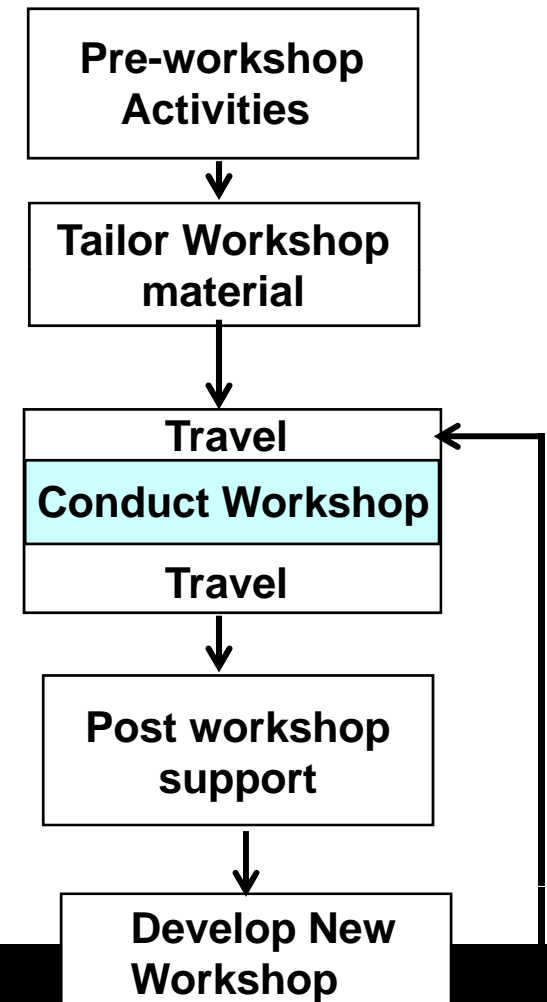
Tailored Workshop



GQ(I)M material split into Multi Workshops



Multi Workshops New Material





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