



# *Measurement Reports*

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# Today's Journey

- **Introduction**
  - The Purpose of Measurements
  - Measurement Implementation
  - Reporting Considerations
- **Defect Measurement Report**
  - Case Study – BMO PCG (Canada)
- **Lessons Learned**
  - Do's
  - Don'ts



# The Purpose of Measurements

- **Measurements**
  - Techniques or methods that apply software measures to software engineering objects to achieve predefined goals
- **Measure**
  - Is a mapping from a set of software engineering objects to a set of mathematical objects
- **Measurement goals - vary with**
  - the software engineering object being measured
  - the purpose of measurement
  - who is interested in these measurements
  - which properties are being measured
  - the environment in which measurement is being performed

# Measurement Implementation

- **Defined and rolled out**
  - Measurement Process
  - Measurement Goals/Indicators (operational definitions)
  - Size unit – Use Case Points (UCP)
  - Training
- **Created**
  - **Measurement group (Quantitative Management Group)**
  - **Tools to facilitate measurements**
    - Relevant templates
    - Data collection – Tracking System
    - Data repository - Process Database
  - **Indicators baseline**

# Reporting Considerations

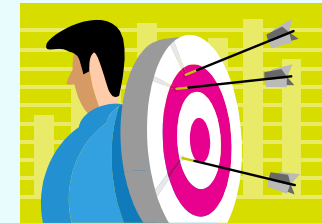
- **Why?**

- Effective Communication



- **For whom?**

- Target Audience (media/stakeholder type)



- **How?**

- Distribution channel



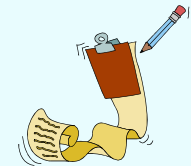
- **How often?**

- Frequency

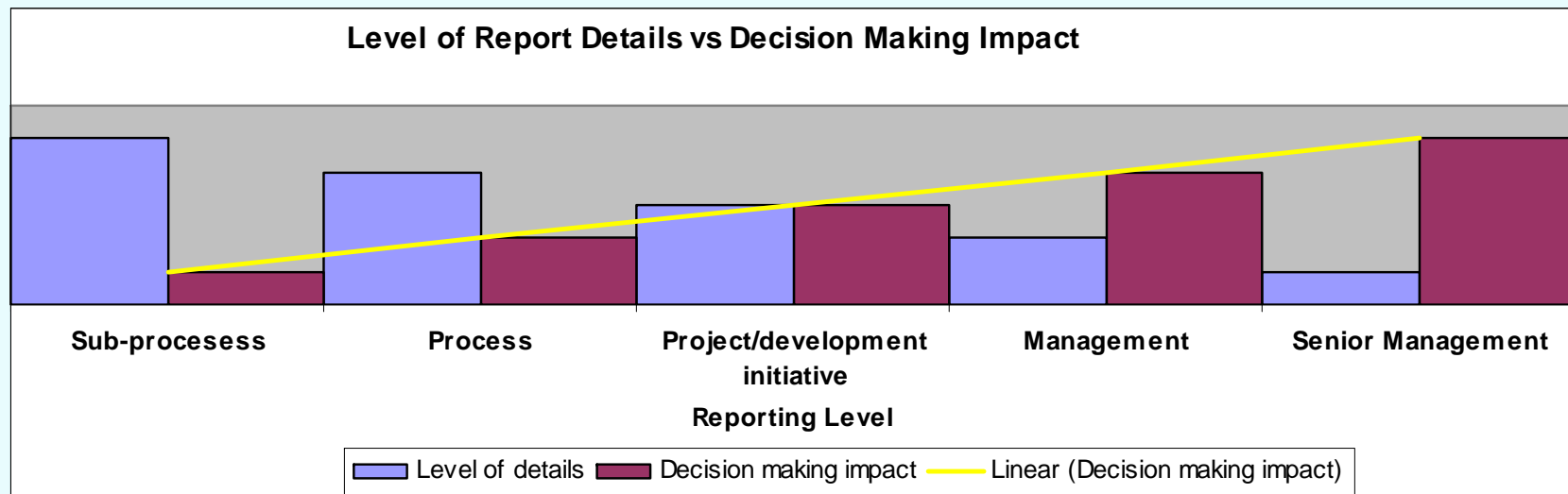


# Reporting Considerations

- **Data integrity**
  - Completeness, Accuracy, Correctness, Validity
- **Identifiable sources**
  - Works Cited, Reference List, Bibliography etc.
- **Support actions**
  - Fulfill stakeholders information needs - level of detail and classification of information support reporting requirements
- **Use Standard Definitions**
  - Pre-defined, published
- **Be adaptable**
  - Customizable based on requirements



# Reporting Considerations



**Note:** The level of details in reports shall be linear with the level of target audience

# Defect Measurement Report

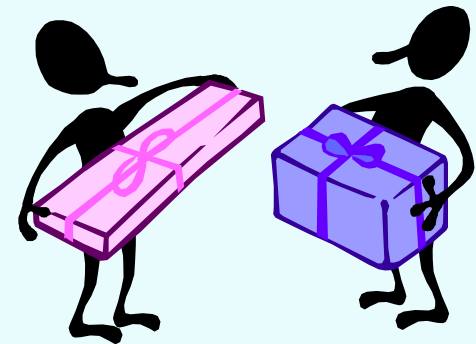
## Case Study in Defect Management

- Presents results and analysis of defects recorded during software development life cycle
- Closure Phase Mandatory deliverable
- QA Lead and the Quantitative Management Group representative responsibility
- Data reported is saved in the historical process database and used in creation/update of the indicator baselines and organizational trends
- Measurement Report recommendations are packaged with the Post Implementation Review (PIR) in order to be used for:
  - future development initiatives
  - SEPG for Process Improvement

# Defect Measurement Report

## - Contents

- Purpose
- Strategy
- Historical Data Collection
- Defect Measurement Indicators
- Analysis and Results
- Recommendations
- Defect Analysis Details
- Definitions



# Defect Measurement Report – Contents Defined

## Purpose section

- Describes the intent of the Defect Measurement Report  
E.g. summarize the analysis of the results of the defect measurement indicators
- Specified details on the type of defects the report is based  
E.g. internal development, vendor, global resourcing

## Strategy section

- Describes the strategy/approach taken  
E.g. phased implementation

# Defect Measurement Report – Historical Data Collection

Table of required information to be gathered

<b>Test Level Assessment (TLA Score)</b>	
<b>Size (UCP)</b>	
<b># of Test Plans (including UAT) *</b>	
<b># of Test Cases (including UAT) *</b>	
<b>Total number of Testing Defects (Problem Logs)</b>	
<b>Total number of Testing Defects (Problem Logs) by Severity S0</b>	
<b>Total number of Testing Defects (Problem Logs) by Severity S1</b>	
<b>Total number of Testing Defects (Problem Logs) by Severity S2</b>	
<b>Total number of Testing Defects (Problem Logs) by Severity S3</b>	

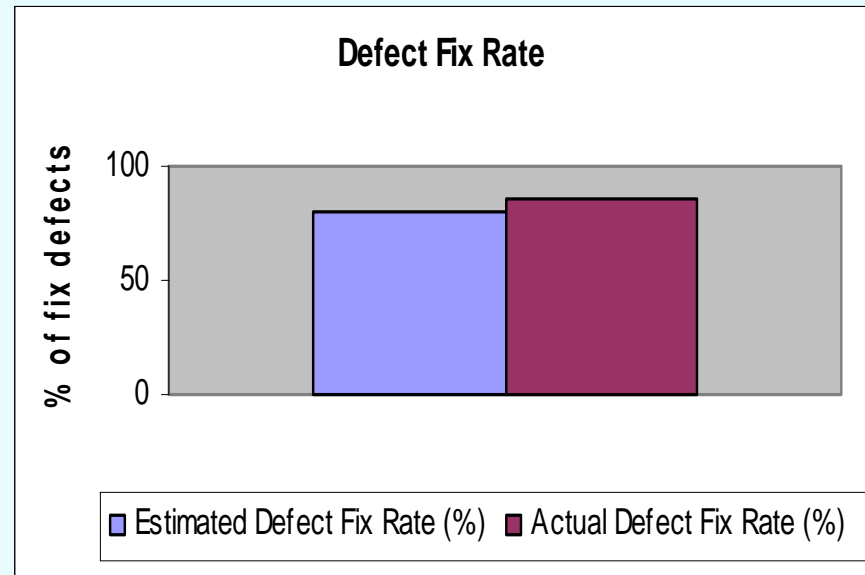
# Defect Measurement Report – Defect Fix Rate

## Defect Fix Rate - % of defects open vs closed

Estimated Defect Fix Rate is the goal set up in project initiation phase based on PCG organizational baseline

Data is collected from the Tracking System

# of Defects (PLs)		Estimated Defect Fix Rate (%)	Actual Defect Fix Rate (%)
Open	Fixed		
195	167	80	85.64

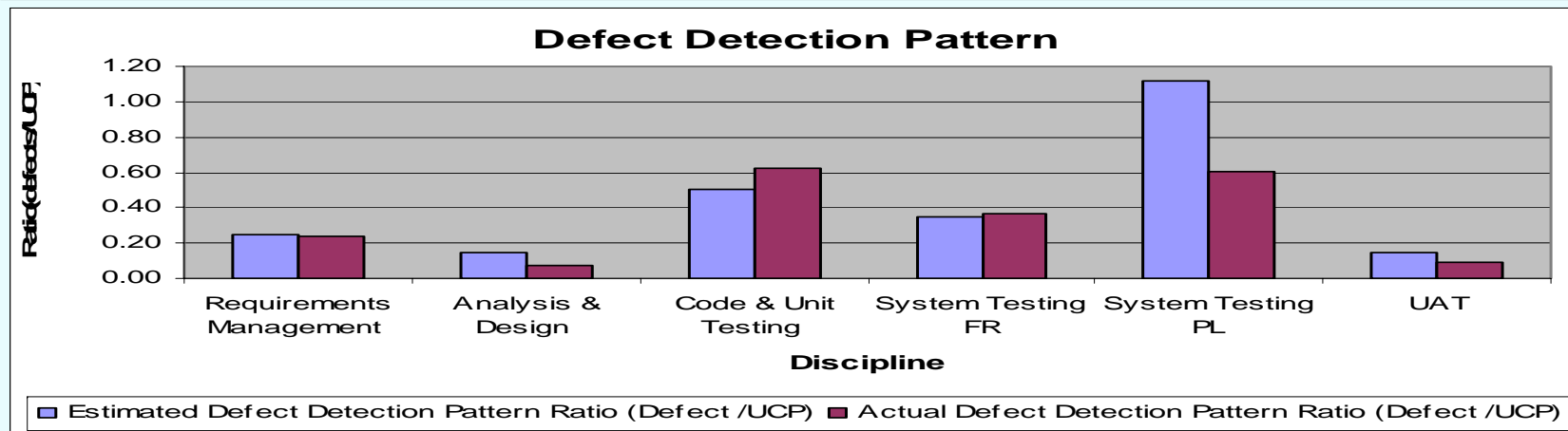


# Defect Measurement Report - Defect Detection Pattern

## Distribution of defects (formal review and testing) per discipline

Estimated defect ratio is the goal set up in project initiation phase using Defect Detection Model and Monte Carlo Simulation. Data is collected from the PCG Canada Tracking System.

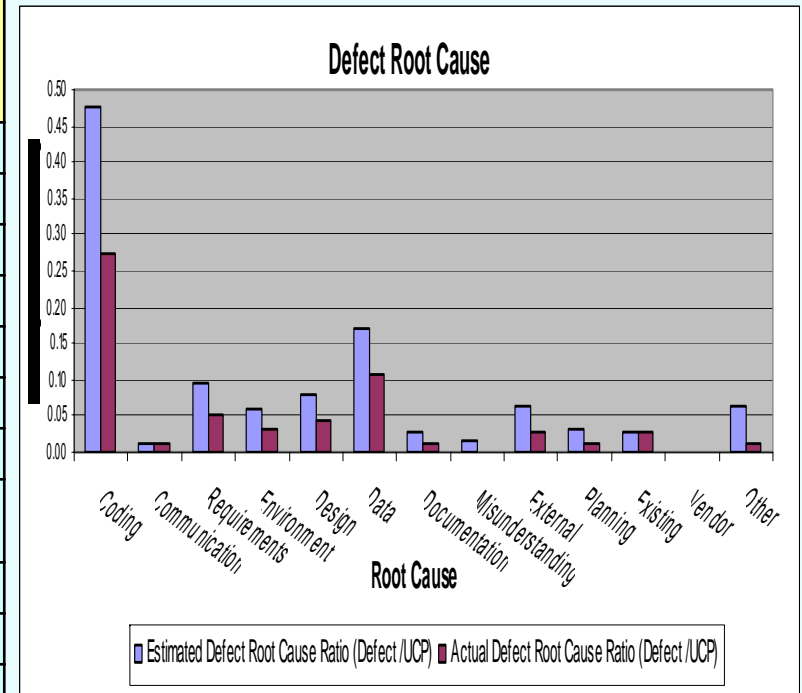
Project Size		189 UCP		
Discipline	Estimated # of Defects (formal review + testing)	Estimated Defect Detection Pattern Ratio (Defect /UCP)	Actual # of Defects (formal review + testing)	Actual Defect Detection Pattern Ratio (Defect /UCP)
Requirements Management	47	0.25	45	0.24
Analysis & Design	28	0.15	14	0.07
Code & Unit Testing	95	0.50	117	0.62
System Testing PR	66	0.35	70	0.37
System Testing PL	211	1.12	114	0.60
UAT	28	0.15	17	0.09



# Defect Measurement Report - Defect Root Cause

**Distribution of testing defects per root cause** - Estimated defect ratio is the goal set up in project initiation phase using Defect Detection Model and Monte Carlo Simulation. Data is collected from the PCG Cda Tracking System.

Project Size		189	UCP	
Root Cause Category	Estimated # of defects	Estimated Ratio (Defect /UCP)	Actual # of Defects	Actual Ratio (Defect /UCP)
Coding	90	0.48	52	0.28
Communication	2	0.01	2	0.01
Requirements	18	0.10	10	0.05
Environment	11	0.06	6	0.03
Design	15	0.08	8	0.04
Data	32	0.17	20	0.11
Documentation	5	0.03	2	0.01
Misunderstanding	3	0.02	0	0.00
External	12	0.06	5	0.03
Planning	6	0.03	2	0.01
Existing	5	0.03	5	0.03
Vendor	0	0.00	0	0.00
Other	12	0.06	2	0.01



# Defect Measurement Report – Contents/cont'd

- **Analysis and Results**



This section contains a description of the analysis from the defect measurement goals to the actuals produced during the project.

- **Recommendations**



This section contains recommendations derived as result of the analysis that could prevent the same problems from occurring in the future.

- **Statistical Testing Defect Analysis Details**



This section contains all of the detailed Testing Defects (Problem Logs) information used and analyzed for input into previous sections. If the project contained multiple phases, this section is broken down by phase.

- **Definitions**

This section contains detailed descriptions for data collected



## Lessons Learned – Do's

- **Understand audience needs**
- **Select metrics based on goals**
- **Focus on processes, products and services**
- **Support actions**
- **Validate data**
- **Use Tools**
- **Use size unit to normalize data**
- **Be concise, flexible**
- **Monitor reports usage**



# Lessons Learned – Don'ts

- **Report on individuals**
- **Compare data collected by different methods**
- **Report invalid data**
- **Use exclusively contractors for reports creation**
- **Mask unfavourable results**



# ***Measurement Reports***

## Questions

# ?