

# *Measurements stories from the trenches*

UKMA/COSMIC

International Conference on Software Metrics & Estimation

London, October 27<sup>th</sup>/28<sup>th</sup> 2011

Erika Vintan

Bank of Montreal

Toronto, Canada

# Who We Are Background



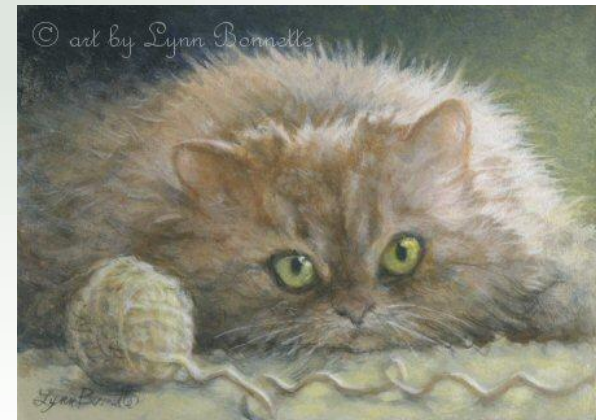
- Operational Quantitative Management Group (OQMG) – for Bank of Montreal Information Technology
- Provides measurement-related advice and services to:
  - 11 departments (>3,500 employees)
  - CMMI maturity level(0 to 5)
    - Services:
      - Full
      - Partial
      - On request
    - Engagement level
      - Development initiative
      - Department
      - Enterprise



# What we did

## Getting Attention

- Engage Leadership
  - Senior level management for sponsorship
  - Mid level management for commitment
- Ask about pain points
  - Determine area of interest
- Explain benefits
  - Show industry data



# What we did

## Focusing Attention

- Show tangible benefits for area of interest
- Give practical answers
- Define a reality based strategy



# What we did

## Maintaining Attention

- Embrace change:  
Re-design program to reflect changes
- Constantly provide feedback
- Train, train, train



# How to do it?

## INITIATE



### Successful Tips:

- Assess the current situation – understand the process in place
- Have a vision of what the desired process should be
- Create a prioritized list of issues to address
- Assign necessary resources – define roles and responsibilities

# How to do it?



## INITIATE

### Challenges:

- Tendency to discard what has been done – build on what you have
- Resistance to change
- Commitment to carry out the plan – rely not only on development resources also on management
- Focus on model (i.e. CMMI) – do what you think is best for your organization

# How to do it?

## IMPLEMENT/IMPROVE



### Successful Tips:

- Use an approach based on common tailoring
- Define, document and communicate strategic objectives that are aligned with the business vision of the organization
- Map these strategic objectives to operational objectives and to the sub-processes in your organization that are critical for achieving them
- Identify the measurements that are essential to understand how efficient and reliable these processes are



# How to do it?

## IMPLEMENT/IMPROVE



### Challenges(1):

- Lack of clear business objectives
- Too many changes at the same time
- Absence of models to assess proposed changes
- Bad experiences
- Lack of participation on the part of personnel
- Process out of control - Impossibility of predicting results from implemented changes

# How to do it?

## IMPLEMENT/IMPROVE



### Challenges(2):

- Insufficiently defined processes - No models to assess the impact of corrective actions
- Too busy fixing bugs – No time to do causal analysis
- Insufficient data or lack of data
- Process undefined – Too many special causes
- Lack of tools
- Uncontrolled changes in the process

# *What made us successfully!*

- *Sponsorship*
- The understanding of audience needs
- A vision of what is desired
- Team work, professional resources
- Flexibility in implementation
- Use of tools



*Word of caution!*

Don't start from scratch!  
Have champions; not everybody is a  
statistician!

?



# Appendix- samples

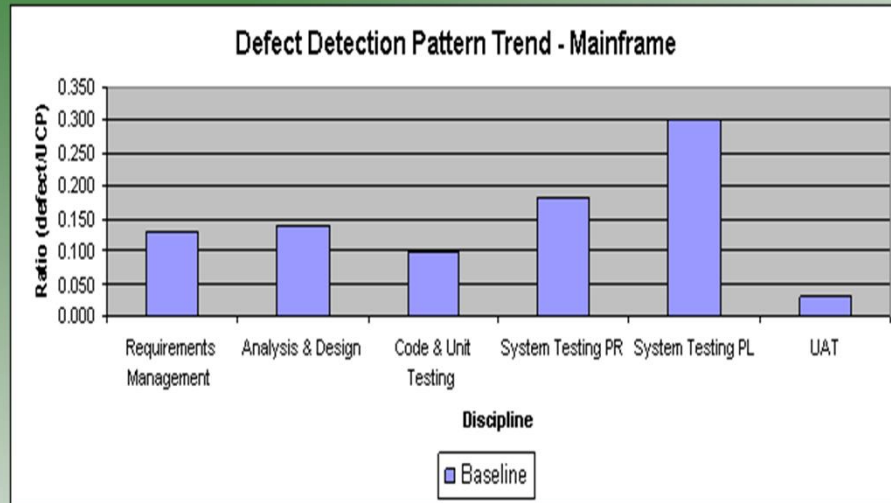
- Goals Metrics Indicator Mapping
- Data Analysis
- Models
- Tools
- Report

# Goals Metrics Indicator Mapping

Objective	Measurement Goals	Process Performance Objective	Indicators (level)	Measure to be collected
Improve Product Quality and Success Rate	Reduce the defect density (#of testing defects per UCP) in critical applications (RIS) <b>by 5%</b>	Improve Formal Review process (coding) by 15%. <b>Code defects are 33.6% out of total defects. To reduce total defects by 5% we need to reduce Code defects by 15%.</b>	1) Defect Detection Pattern (Development Initiative and Organizational) 2) Defect Root Cause (Development Initiative and Organizational) in minutes, of critical applications 3) Defect Density (Organizational)	# of testing defects found per testing discipline # of peer review defects per development discipline Total # of defects found in testing # of testing defects found per root cause Total # of defects found in testing/UCP
Maintain client satisfaction	Maintain client satisfaction <b>score &gt;4</b> Maintain > 75% initiatives On-Time, On-Budget <b>(variance 0 to + 10%)</b>	Increase the predictability of productivity level <b>A 5% improvement is the goal to improve the cost estimation process capability. Target is based on the previous Fiscal Year capability.</b>	1) Client Satisfaction (Organizational) 2) On-Time, (Organizational) 3) On-Budget (Organizational) 4) Testing Defect Life Span (Development Initiative)	Initiative's client satisfaction score Schedule variance (estimated vs actual) Cost variance (estimated vs actual) (Effort variance) Amount of time, in days, it takes to close a defect discovered in testing phase

# Data Analysis

## Product Quality



**Were**

### Defect Distribution

Highest defect density is in System Testing

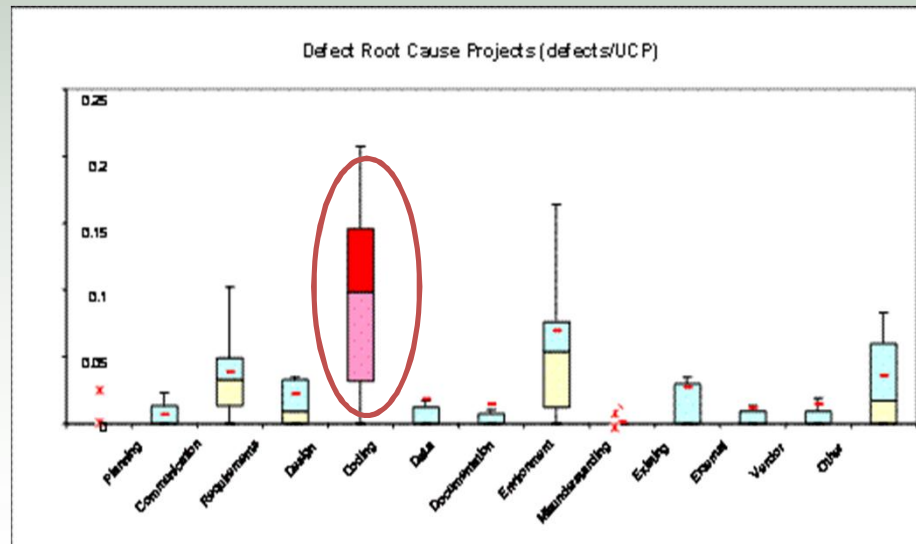
**Why**

### Defect Root Cause

Biggest “culprit” in the defects found during the Testing Phase is **coding**.

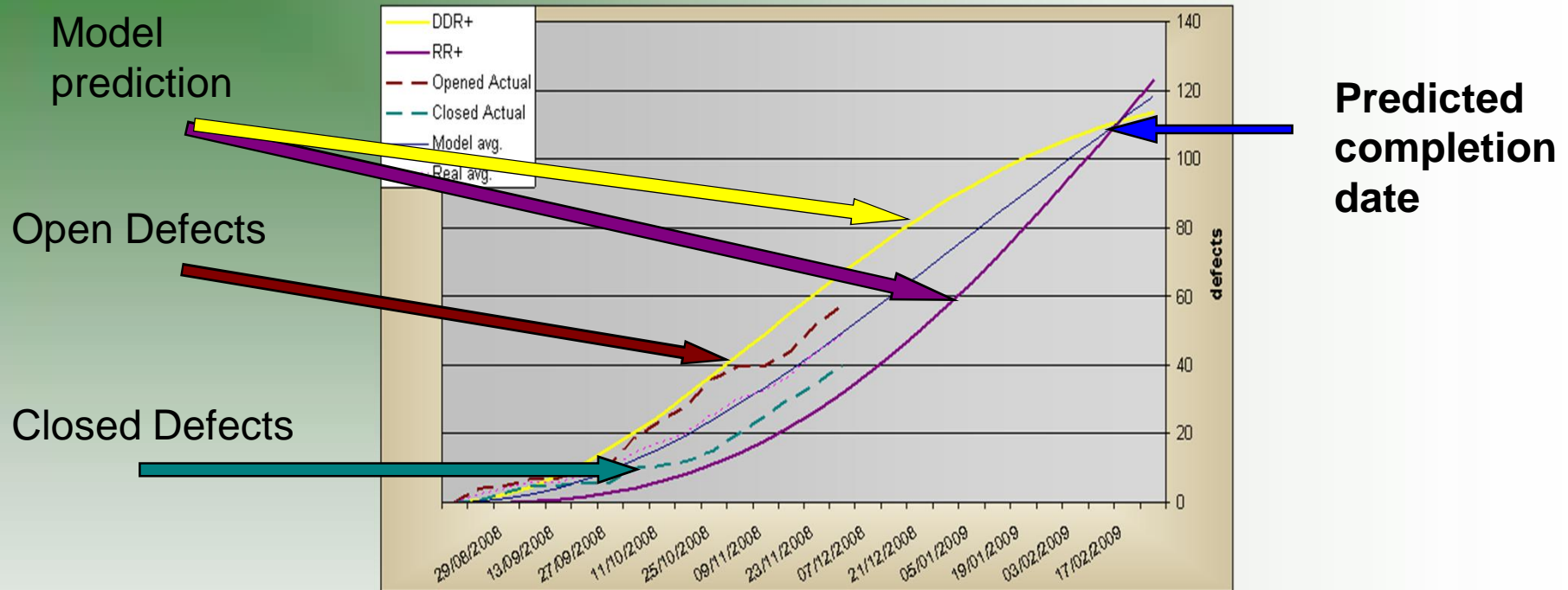
**What**

**Perform more code review**



# Models

## Schedule prediction



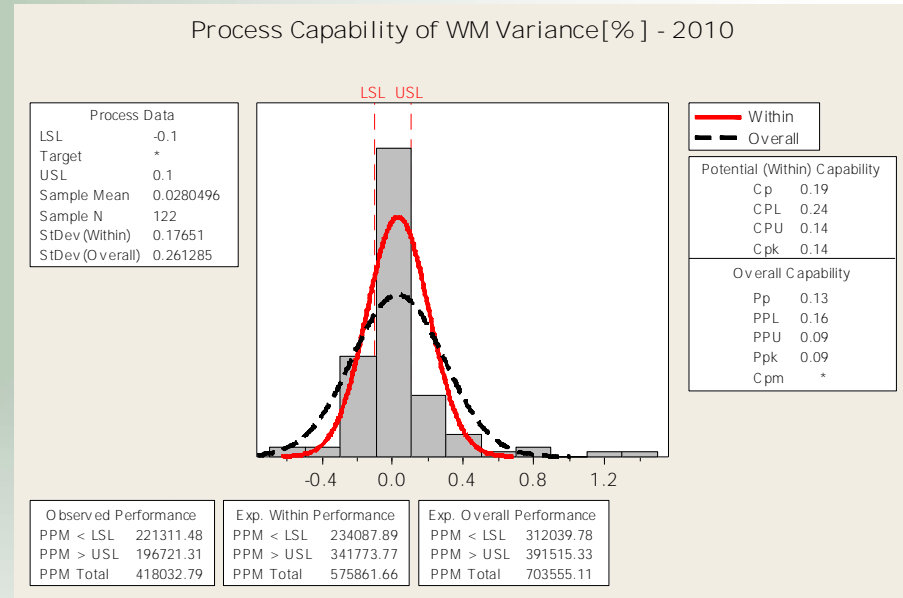
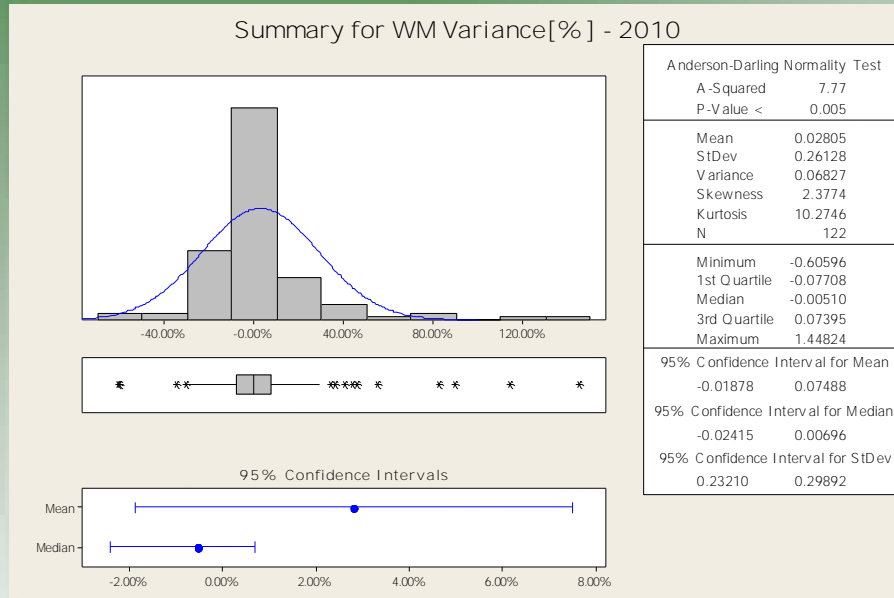
### Interpretation:

- Model estimates the Initiative **completion date** by predicting the rate of opening and closing defects and sets the boundary lines.
- The actual Initiative's rates should fall between these lines if the completion date is to be met



# Tools

## Minitab - Sample Process Capability Analysis



### Results interpretation:

Statistical Analysis of the data shows:

At Level 2, approximately 75% of projects fall within the +/- 40% range

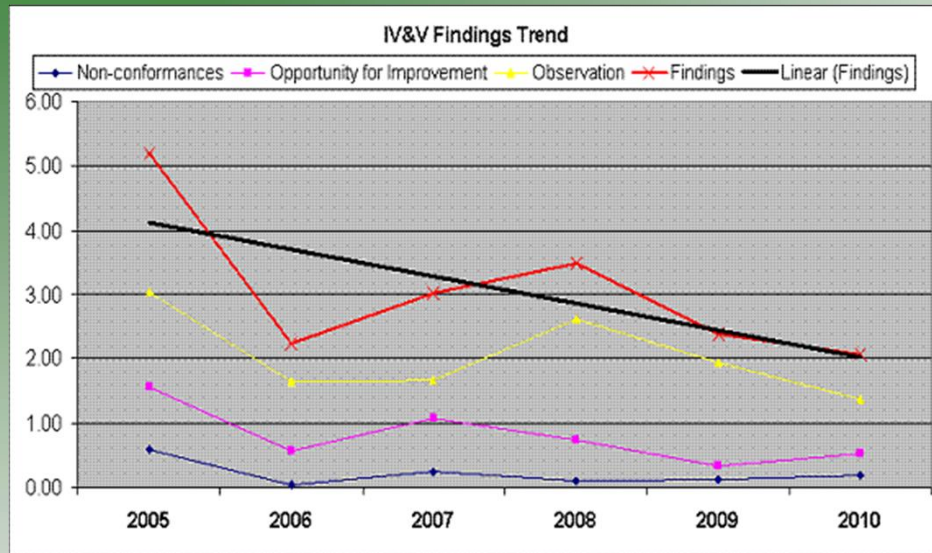
The current estimation processes performs (i.e. within LSL and USL) at the following levels:

WM estimation: -50% to + 56%; Cost estimation: -40% to +39%

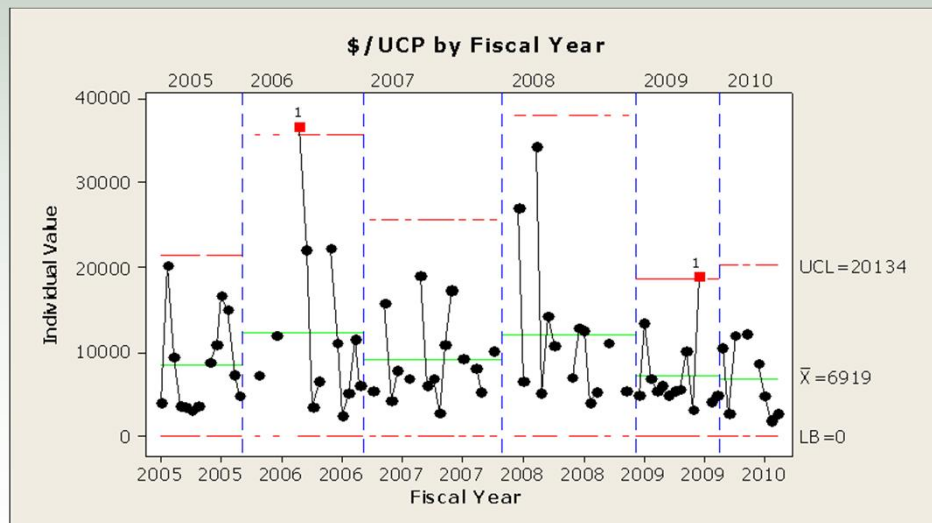
The target range of +/- 10% is impossible to achieve with the current process

If we use LSL and USL of +/- 10%, Cpk is 0.14. It must be > 1.0 to show process control

# Reports



Process compliance trend  
(findings/#of audits)



Delivery Rate trend  
(cost/size)