

# ***Practical Software and Systems Measurement***

***A foundation for objective project management***



## ***Specification Workshop***

***Thursday, July 17, 2003***

***8:30AM – 12:00 noon***

***PSM 7<sup>th</sup> Annual Users' Group  
Conference***

***Bob MacIver, Betsy Clark***

## ***Objectives of the Workshop***

- ***Discuss and compare people's experiences in implementing PSM, focusing on methods used to improve the delivery of effective measures to decision makers***
- ***Arrive at a list of recommended best practices for expediting the implementation and use of well defined measures***

## ***Intended Output***

***List of recommendations regarding how best to:***

- ***Expedite the measurement implementation process***
- ***Generate measurement specifications in different situations and characterize those situations***
- ***Identify additional information needed for guiding the measurement implementation***

## ***Workshop Format***

- ***Agenda***
  - ***1/2 day***
  - ***Setting the context: Three real-life examples***
  - ***Discussions based on other people's experiences***
  - ***Generate recommendations***

## ***Workshop Background***

- ***PSM emphasizes precision in the definition of measures***
  - ***Information Model***
  - ***Measurement Construct***
  - ***Individual measurement specifications***
- ***While thorough, the process is often difficult and time consuming, delaying the ability to get usable measures to those who need them for business decisions***
- ***People often cannot clearly articulate their information needs and indicators***
  - ***(“I’ll know it when I see it”)***

## **Workshop Background**

- ***In many situations, it is counterproductive to spend a lot of effort in defining something that is likely to change***
  - ***Need to let people experiment and tune the measures first***
- ***Need to increase the speed of implementing measures***
  - ***Get some early successes to show the benefits***
  - ***Begin changing the culture***
- ***Some organizations have had better success by:***
  - ***concentrating first on establishing a usable set of measures***
  - ***piloting, adjusting and evaluating them prior to writing the detailed measurement specifications***

## ***3 Real Life Examples***

- ***Financial Institution***
- ***Government Organization***
- ***Government Contractor***

## *Financial Institution*

- *Well defined information needs*
  - *Construct a baseline for measuring impacts of software process improvement*
- *Simple collection mechanism*
  - *Project interviews to collect historical data (one person did all interviews)*
  - *Expert function point counter*
- *Measurement specs were written up-front using PSM template*



## **Government Organization**

- ***“Fuzzy” information needs***
  - ***Commanding Officer wanted departments to “manage with data”***
- ***Numerous discussions with each department to articulate their mission, goals, information needs***
- ***Numerous rounds of measuring, evaluating, adding/deleting measures and indicators***
- ***Trying to write detailed specs up-front would have been futile***

# *Practical Software and Systems Measurement*

## **Government Contractor**

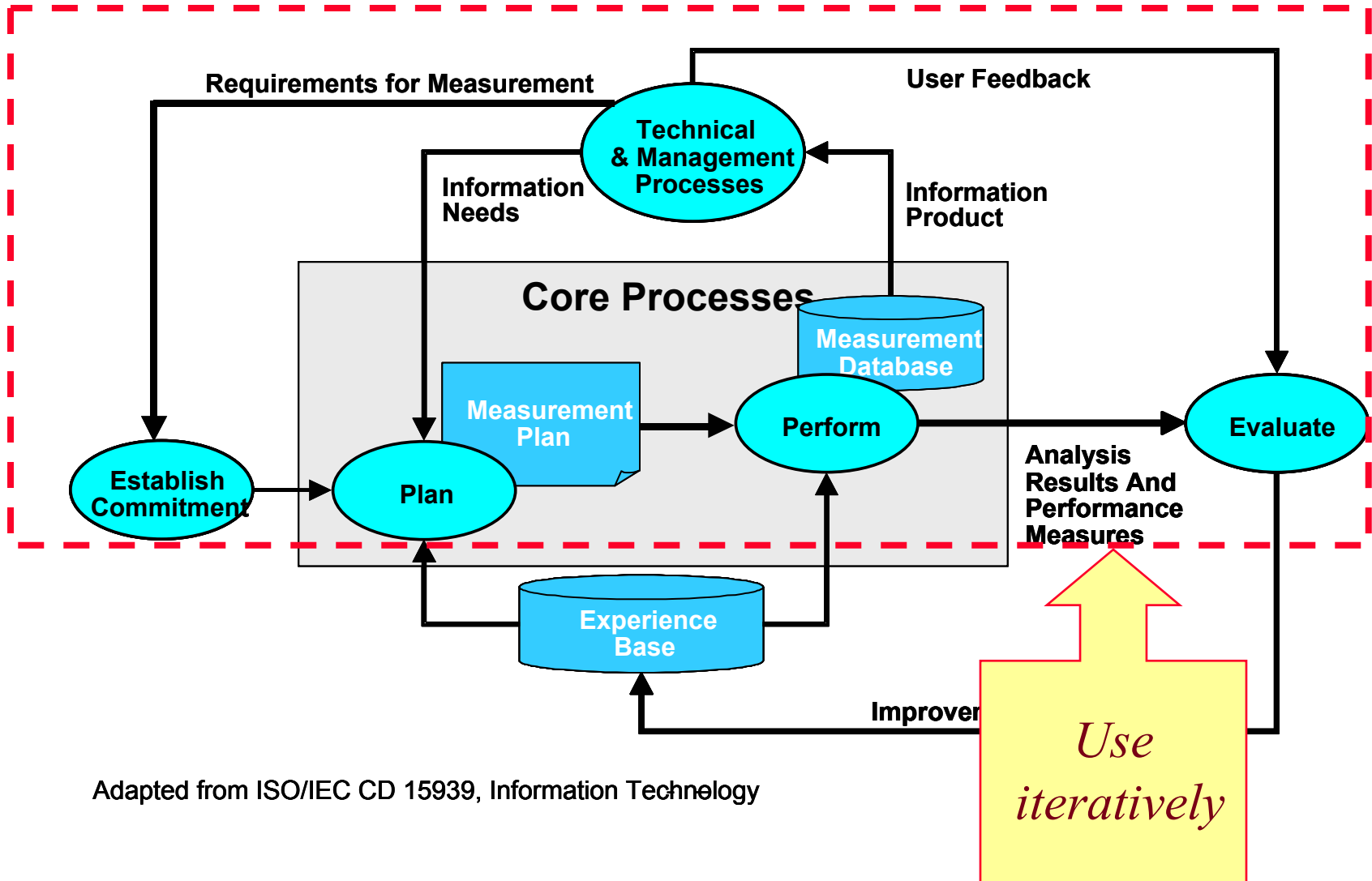
- *Excellent progress in:*
  - *Obtaining management commitment*
  - *Planning*
  - *Developing and staffing infrastructure*
- *Focus at 3 levels of decision making*
- *Management allowed adequate timeframe but wanted visible progress, milestones*
  - *Many measures and (derived) information needs existed*

## ***Workshop Purpose***

- ***Identify and characterize situations in which we can and cannot define measurement specs up-front***
- ***Identify additional information needed for guiding the measurement implementation***
- ***Share experiences and lessons learned***

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## *Use the Information Model*



Adapted from ISO/IEC CD 15939, Information Technology

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## ***Speeding up the Pace***

- 1. Select and prioritize existing measures***
- 2. Ensure alignment with business needs and clarity of purpose***
- 3. Ensure that the indicator clearly measures the intended purpose***
- 4. Exercise the measure to ensure its effectiveness, modify as needed***
  - Use Information Model's feedback loops***
- 5. If not a good measure, delete it***
- 6. If appropriate, approve the measure as a standard***
- 7. Complete the documentation per PSM standards***

## ***Factors to Consider***

- ***Maturity – (process and measurement)***
- ***Focus – (Project, Process, Enterprise)***
- ***Tailoring options***
  - ***Reuse***
  - ***Interim templates***
  - ***Other***
- ***Recommended PSM process changes***

***Discuss Spreadsheets***

## ***Workshop Output***

- ***Characterize the situation***
- ***Provide additional information and guidance to determine time and effort to stabilize measures***
- ***Recommended PSM process changes***
- ***Recommended additional specification content***



## ***Now it's your turn....***

- ***What's your experience, frustrations?***
- ***Lessons learned***
- ***Recommendations***
  - ***Templates***
    - ***How to generate measurement specifications in different situations and characterize those situations***
  - ***PSM Process changes/tailoring***
    - ***(How to expedite the measurement implementation process)***
  - ***Tools***
  - ***Identify additional information needed for guiding the measurement implementation***
    - ***Update/revise materials presented***
  - ***Next steps***

# ***Practical Software and Systems Measurement***

## ***Lessons learned***

# ***Practical Software and Systems Measurement Problems***

- ***Specifying too much detail at once***
- ***Poor understanding of effort involved/commitment required***
- ***Lack of commitment below top level***
- ***You're the measurement expert; You tell us what we should collect***
- ***What are your information needs?***
  - ***"I don't know"***
  - ***"I don't need to do this"***
- ***How to sell measurement to middle management***
- ***Collect data/develop relationships with managers; Share with them first***

# ***Practical Software and Systems Measurement Problems (continued)***

- ***Show them how measurement can help them e.g. obtain resources***
- ***As measurement person, you have power to embarrass or not; Share first and avoid embarrassment***
- ***Culture => Lowest level: we don't need indicators and if senior managers start using them, we'll change the data***
- ***How to better elicit information needs; What happens when people are mute?***
- ***½ marketing, ½ training in introducing PSM***
- ***What is an appropriate balance of charts/ indicators; When do you show them? vs. having people articulate information needs***

# ***Practical Software and Systems Measurement Problems (continued)***

- ***Ideally information needs flow from the top (decision makers)***
- ***Regular reviews showing indicators; no data = gray chart***
- ***Information needs can flow from bottom up (clarify information needs at top)***
- ***Tools help/hinder***
- ***Look at/ leverage existing data, especially data collected automatically***
- ***Lots of existing data, but not defined/collected to support future information needs***
- ***Information model is important for normalizing data collected across enterprise***

# ***Practical Software and Systems Measurement Problems (continued)***

- ***There is information in measurement specifications you don't compromise to get quickly (for standardization)***
- ***Managers lose interest if don't see problems***
- ***Tailor PSM terminology to the organization and the decision maker***
- ***Provide (numerous) effective examples of entities, attributes, base measures***
- ***Focus on "customer outcome" so we measure what matters to our customers***
- ***If people can't understand information model, needs to be simplified***
- ***Catch people doing something right; Point out good things with measures***

# ***Practical Software and Systems Measurement Problems (continued)***

- ***Linking measures, weighting factors and making sure they are consistent***

# ***Practical Software and Systems Measurement Recommendations***

## ***Templates***



## ***Focus for remainder:***

- ***Solutions related to specification***
- ***What information helps drive effective implementation?***

# ***Practical Software and Systems Measurement Recommendations***

- ***Resolve measurement templates***
  - ***Version 4, Book, Insight, RUP PSM plug-in***
- ***Specification templates are useful***
- ***Goal: Measure right kinds of things in right way so we can trust data***
- ***Don't want to fill in template all at once – evolutionary adding of detail***
- ***Tailor/automate guidance on how to fill in templates***
- ***Start with existing data, link to business/information needs***
  - ***Iterate gradually filling in table***

# ***Practical Software and Systems Measurement***

## ***More Recommendations***

- ***Could provide guidance about what to fill in on first iteration, what on second... so specification guides implementation (follow up activity)***
- ***Address how to get PSM implemented successfully***
  - ***Senior management support/involvement***
  - ***How to justify measurement***
  - ***Middle management, supervisors***
  - ***Change management***
  - ***Stories/examples of classic problems and solutions and how to categorize them***
  - ***Set of generic specifications and indicators for PM***
- ***Get decision maker to list attributes of a good information product***

# ***Practical Software and Systems Measurement Recommendations - continued***

- ***Issue -> When using existing data***
  - ***Can you trust it?***
- ***“Middle-out” implementation***
  - ***Not really top-down or bottom-up***
  - ***Start with what you have***

# ***Practical Software and Systems Measurement Recommendations***

***additional information needed***

# ***Practical Software and Systems Measurement***

## ***Next steps***

# ***Practical Software and Systems Measurement***

## ***Validating Existing Measures***

- Consistent with purpose:
  - –Is it aligned with business case?
  - –Does it measure the right thing?
  - –Does it measure correctly (e.g. consistent terms, accurate formulas, use correct, timely data)?
  - –Does it support higher level/related indicators where appropriate?
- Source is automated
- Source is automated
- Source is clearly understood
- –How is it calculated or produced by the source system or tool?
- Base measures and derived measures are documented to an acceptable level

# ***Practical Software and Systems Measurement***

## ***Validating Existing Measures***

- Base measures and derived measures are documented to an acceptable level
- Proper validation provided by collector/owner
- –On time
- –Complete
- –Correct
- Collection procedures/tools exist, are understood and consistent
- Collected data are supported by clearly defined database architecture and data base management
- Analysis and reporting processes are documented and validated
- Approved by appropriate representatives of management and/or projects