



The Software Measurements & Metrics

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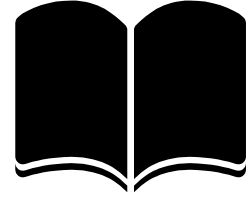
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Measurements In Industry

1.

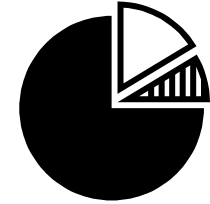
- Measurement is fundamental to many disciplines:
 - + Economics
 - + Business
 - + Medical
 - + Aerospace
 - + Engineering

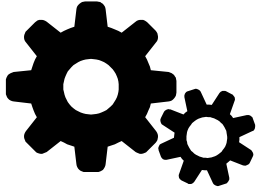
History Of Software Measurements

2.

The Early Years 1950 – 1970	Measure Line Of Code (LOC) Go-to Statements Error Counts Nesting
1970 – 1980	Complexity Structure Module Size Cohesion/Coupling

The Design Years 1980 – 1990	Measure Functions Points Graph Theoretic Complexity Process Maturity Object/Class of Object
The “Show Me” Years 1990 – 2005	Measure Functional Quality Technical Quality Quality Attributes Productivity Business Values Balance Scorecard

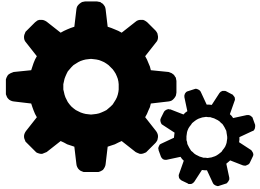




Measurements

3.

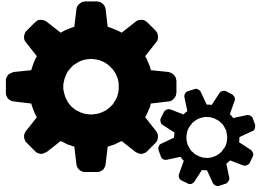
- Measurement is the first step to:
 - Understanding the software process
 - Controlling the software project
 - Predicting the quality of the software product
 - Improving the value of the software organization
 - Improving business performance
 - Maturing in the engineering of software disciplines



Definition

4.

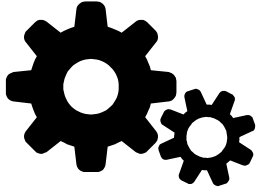
- Measure: A standard or unit of measurement - The extent dimensions, capacity, , etc. - of anything, especially as determined by a standard.
- Metrics: A calculated or composite based on two or more measures; a quantified measure of the degree to which a system, component, or process possesses given attributes.



Indicator

5.

- Indicator: A measure or combination of measures (metric) that provides insight into a software issue or concept;
- For example:
 - + Number of Defects/KSLOC
 - + Number of Defects/KSLOC indicator of customer satisfaction indicator of product quality
- Process indicators allow management to review the defined process on what works and does not work for improvement measures.



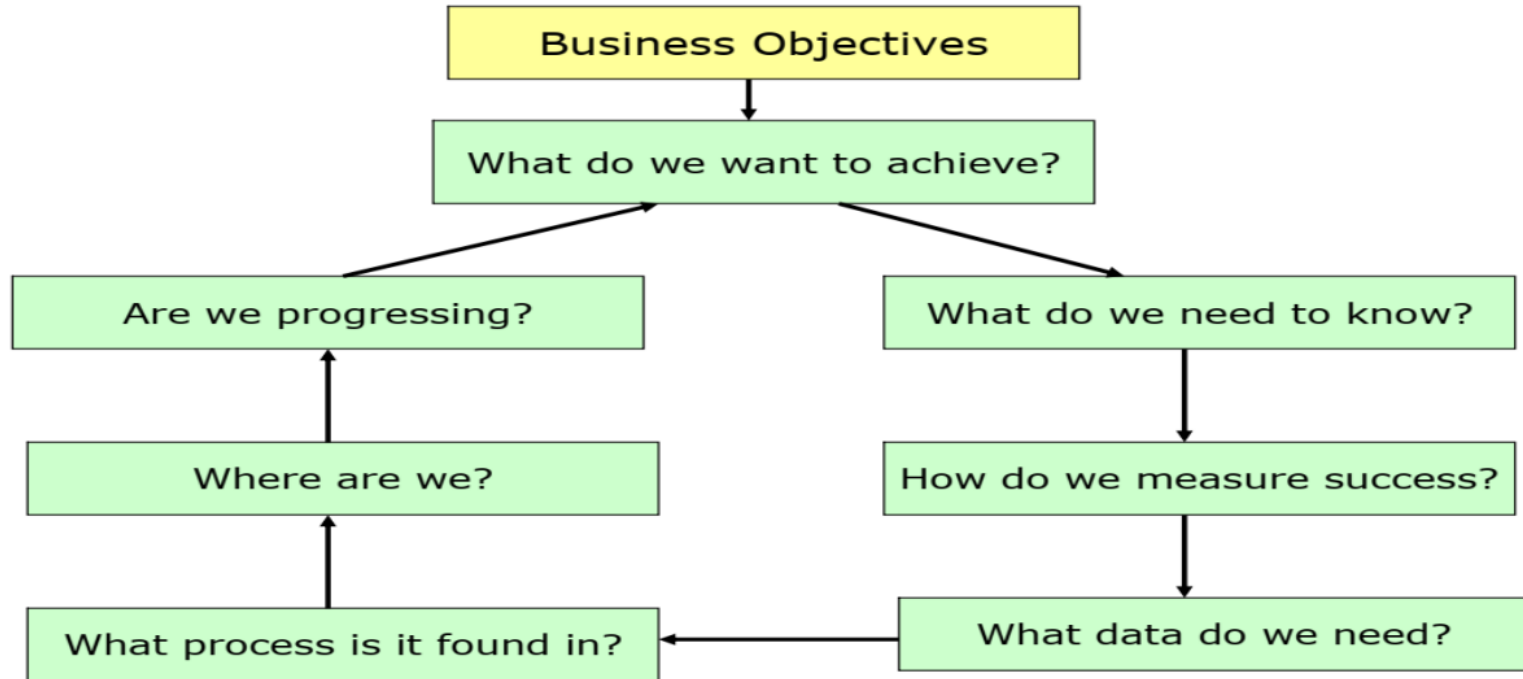
Metrics

6.

- Metrics are used to measure the progress toward meeting an objective.
- Metrics must be clearly and consistently defined before used to avoid confusion or different interpretations.
- Management reviews must use metrics for decision making.

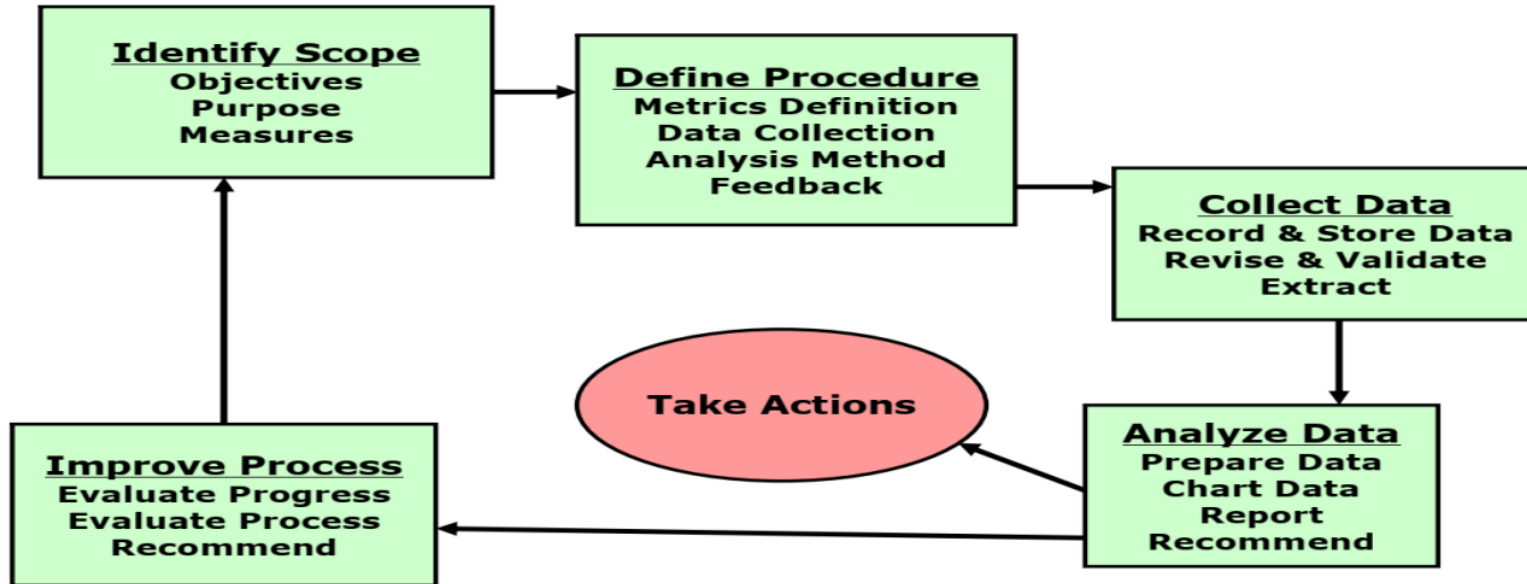
The Defined Process For Metrics

7.



Practical Metrics Implementation

8.



Identifi Scope: Project

9.

- Purpose:
 - + Management needs better insight into project's Progress
- Objectives:
 - + Manage project according to plan → Reduce defects to the customer
- Measurements:
 - + Schedule estimates vs. actuals
 - + Effort or Size (Normalizer)
 - + Project's defect
 - + Cycle Time
 - + Customer Satisfaction
 - + Number of management decisions reported based on metrics

Defind Procedure: Project Data

10.

- Project managers will collect the following project data:
 - Sizing: Volume of codes, artifacts, and Daperwork
 - Estimating: Efforts, costs, and schedulesm
 - Planning: Schedules and milestonesm
 - Tracking: Progress against plans & estimatesm
 - Quality: Errors Defects, other quality attributes
- Type of decision:
 - When to collect: Monthly, weekly, during reviews
 - Who collects: Technical lead - issues with bias, data access, cost, availability, motivation
 - How to collect: Tools available, procedures and forms used in the project

Analyze Defect Types

- Documentation: Comments, message
- Syntax: Spelling, punctuation, typos, formats
- Build/Package: Change management, version control
- Assignment: Declaration, duplicate names, scope, limits
- Interface: Procedure call or reference, I/O, user formats
- Checking: Error message, inadequate checks
- Data : Structure, content
- Function: Logic, pointers, loop, recursion, computation
- System: Configuration, timing, memory
- Environment: Design, compile, test, other support system problems

**THANK
YOU**