

Assigning Business Value to Software

– The Key to Project Success"

Presented by

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AGENDA

- ❑ **Software Development Challenges**
- ❑ **Solving the Software Size Issue**
- ❑ **Examples of FP Based Measurement**
- ❑ **Where Does Assigning Business Value fit?**

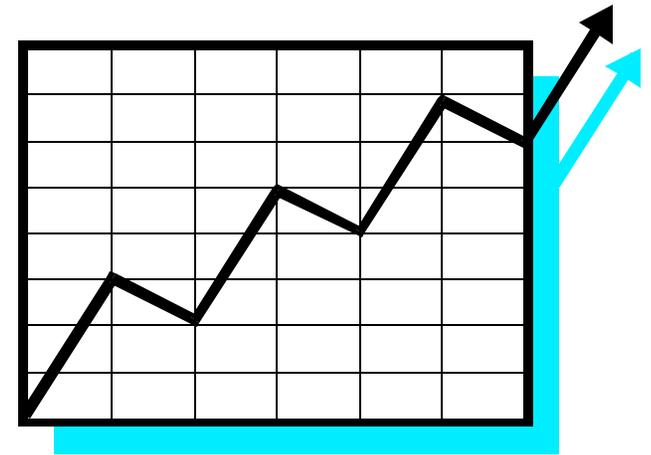


Software Development Challenges



Software Development Challenges: The Top Three

- ❑ 1. Requirements
- ❑ 2. Estimation
- ❑ 3. Change Management

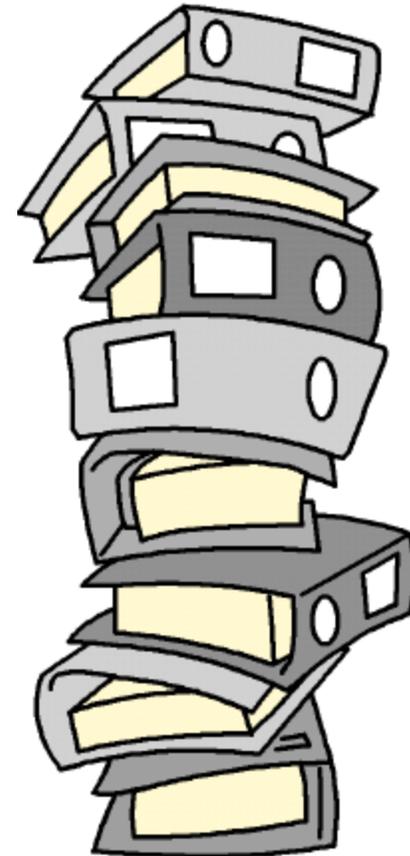


* Substantiated by writings of Bennatan (1992), Glass (1992), Putnam (1997), DeMarco (1997), others

Development Challenges

1. Requirements

- Complete
- Business Terms
- Understanding
- Documented Assumptions
- Size is a Critical Component



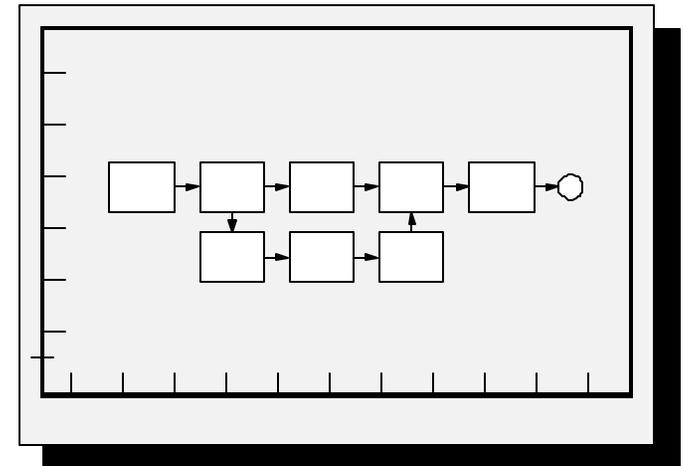
Development Challenges

2. Estimation

❑ Multiple Models

❑ Complex Weighted Inputs: Cost & Effort Depend on:

- Language
- Methodology
- Hardware
- Risk Factors
- Subject matter
- Skills
- Experience
- Size
- Platforms
- etc.



❑ Historical Base is Important

Development Challenges

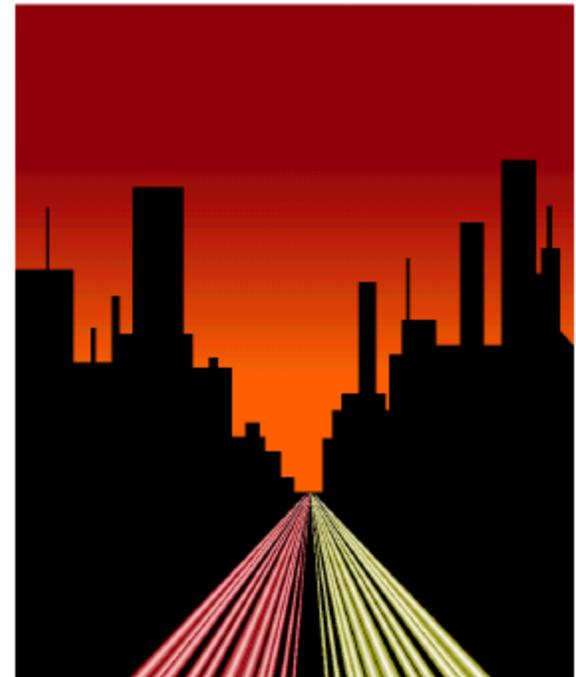
3. Change Management

- ❑ Change is Inevitable
- ❑ Trade-offs
- ❑ Customer Definition of Quality
- ❑ Corrections vs. Changes
- ❑ Rework Spirals
- ❑ Size



Software Measurement Concepts

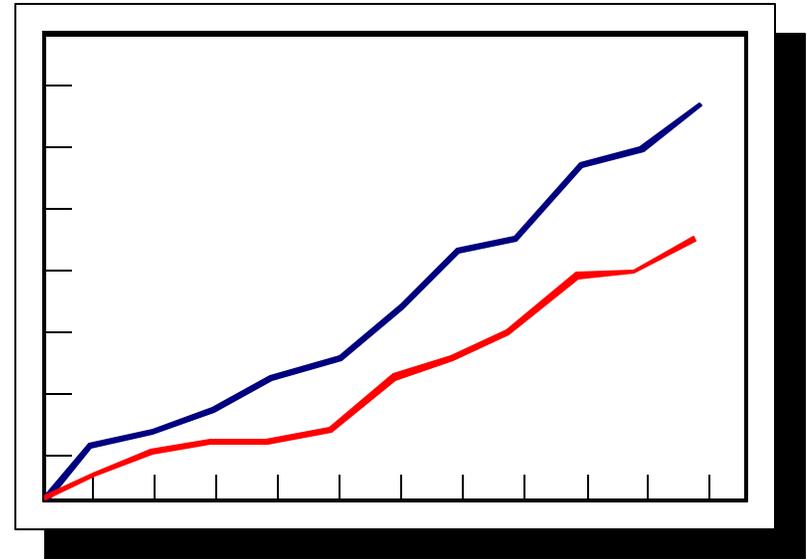
- ❑ Consistency through Repeatability
- ❑ History as a Predictor
- ❑ “Status Quo”
- ❑ Basic Building Blocks



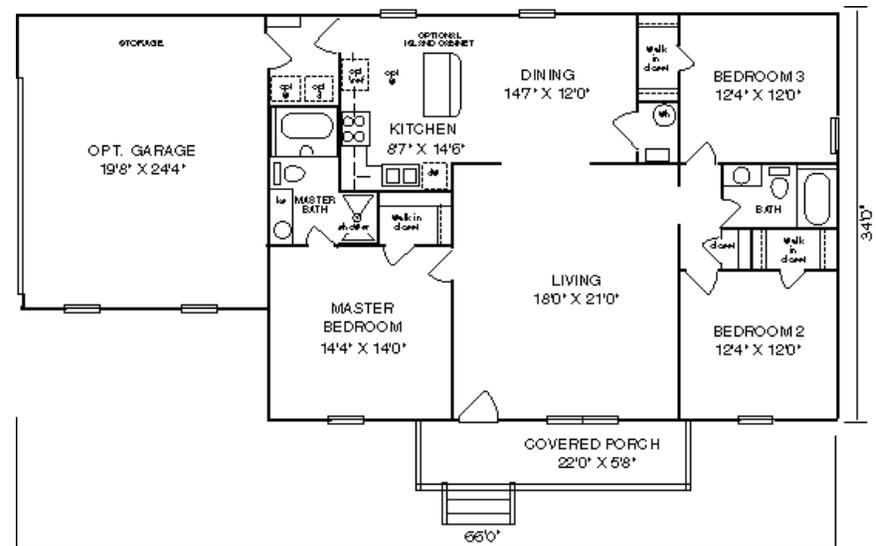
Software Measurement Concepts

□ Metrics and Measures:

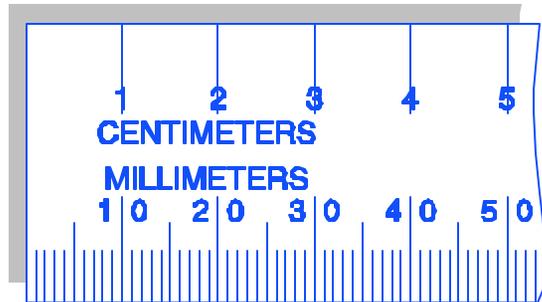
- ▼ *Passive*
- ▼ *Track Progress toward Goals*
- ▼ *Identify Differences*
- ▼ *Need a Common Objective Measure of Project Size*



Project Sizing



Software Size Options



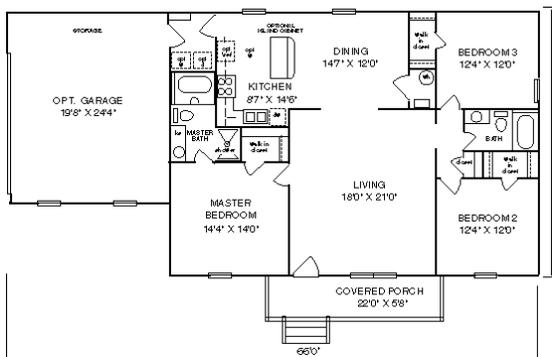
Function Points (FP)
Logical Size

Source Lines of Code (SLOC)
Physical Size

Software Size Options

Function Points

- ▼ **Function point:** A metric that describes a unit of work product suitable for quantifying application software.
- ▼ **Function point analysis:** A standard method for measuring software development and maintenance from the customer's point of view.



*The International Function Point Users Group (IFPUG)
Counting Practices Manual 4.*

Software Size Options

Function Points

□ Size of Logical User Requirements

- ▼ Similar to Floor Plan Square Feet
- ▼ Reflect size of WHAT software does in customer terms
- ▼ Business Functionality Value

□ Developers take Requirements to Installation via 100's of tasks

- ▼ Blueprints represent HOW construction is done, not WHAT
- ▼ FP are size of WHAT (Functions)



Software Size Options

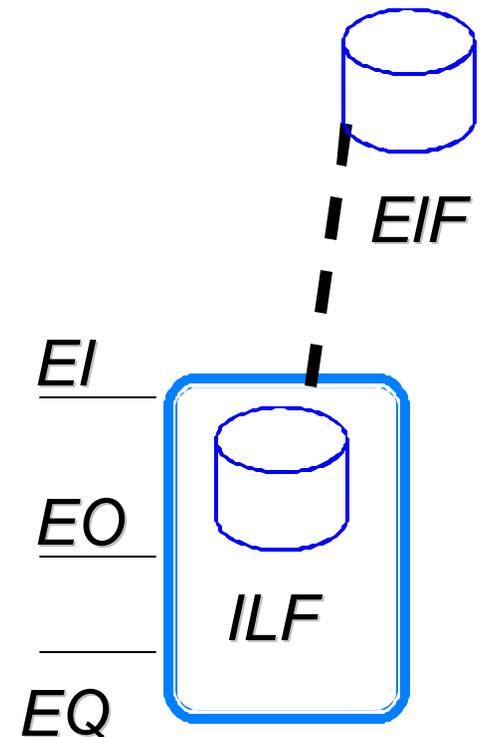
Function Points

Data Functions:

- ▼ Internal Logical File ILF
- ▼ External Interface File EIF

Transactional Functions:

- ▼ External Input EI
- ▼ External Output EO
- ▼ External Query EQ



Revisit Development Challenges: 1. Requirements

☐ Completeness

- Compare similar projects (FP Profiles)
- Historical scope creep % (>20%)
- Function Point counting process can be effective as a peer review

☐ Business Terms & Understanding

- Function Points look at software requirements from a customer viewpoint
- FP are customer focused



Revisit Development Challenges: 1. Requirements

□ Documented Assumptions

- Early FP counts clarify business need
- Can “estimate” size (FP) using incomplete or preliminary requirements
- Count and details become the software specifications (Functional).
- Document non-functional constraints (FP adjustment factor)



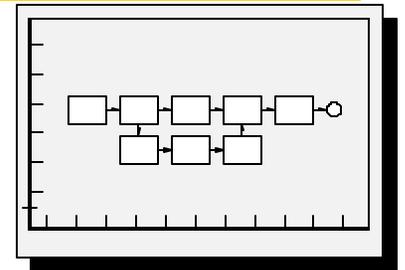
□ Size is Critical

- Objectively quantify WHAT is to be built

Revisit Development Challenges: 2. Estimation

❑ Multiple Models – FP based:

- Measurement creates a repeatable gauge
- Compare LIKE sized projects



❑ Complex Weighted Inputs:

- Quantify size independently of attributes using FP
- Dominant organizational productivity factors

❑ Historical Base

- History predicts future performance
- Build up history one project at a time -- measurable

Revisit Development Challenges: 3. Change Mgmt.

❑ Change Inevitable

- Track trends for process improvement (FP scope creep)

❑ Trade-offs

- Informed choices based on quantified impact of FP size

❑ Customer Definition of Quality

- Ask and track areas of “importance” (and base decisions on relative size)



Revisit Development Challenges: 3. Change Mgmt.

☐ Saves vs. Change

- Track costs of “Saves” vs. Delivered Defects (Cost of Quality)
- Better planning for “Unpredictable” changes (quantify size of change)
- Defect density (per size)

☐ Rework Spirals

- Size (in FP), phase, root cause analysis

☐ Size

- User accountability through impact analysis
- Quantification of scope changes (and no blame!)



Examples of Size Based Measurement



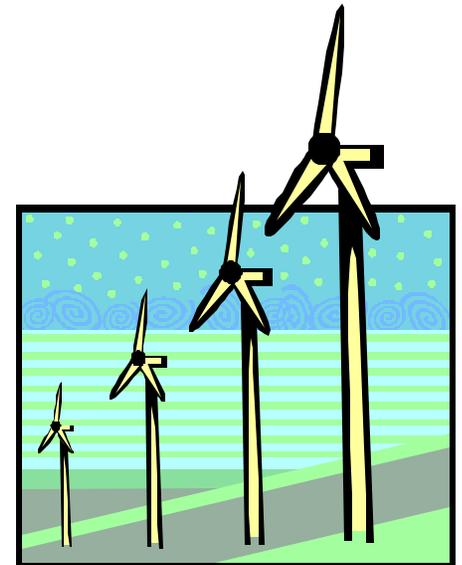
Benefits of Size Based Measurement - Example 1

☐ Utility Company: 100+ Developers

- 1 year 50% improvement in Maintenance Productivity
- Overall Cost Savings > \$100,000.
- Improved Knowledge of Systems
- Improved Processes and Reduced “Waste”
- True “Abend” Root Cause Analysis based on Defect Density

☐ Metrics:

- Productivity (FP / Hr), Defect Density (Delivered Defects / FP), Customer Satisfaction



Benefits of Size Based Measurement -- Example 2

☐ **Outsource Client: 300+ Developers**

- Reduction of “Out of Control” Projects through Formal Change Management
- Users Accountable and Signed for “Change Orders”
- Cost of Changes Attributable to Project
- Add on Services Agreed Upon (e.g., R&D During Development)
- Canceled Projects Minimized

☐ **Metrics:**

- Productivity (FP / Staff Month), Size of Changes (FP), % Completion on Canceled Projects



Benefits of Size Based Measurement -- Example 3

☐ Insurance Company

- Process Improvements (every year for past 5 years) in Quality, Productivity, Duration Delivery Rate
- Quantifiable Increases Based on Tool Acquisition, Training and Other Process Improvements
- Able to Track and Monitor Impact of Actions(Not all Positive)

☐ Metrics:

- Delivery Rate (Hr /FP), Quality (Incidences /1000 FP), Duration Delivery Rate (Calendar Days / FP)



Return On Investment for Software Measurement

□ Annual ROI for S/W Measurement*

▼ Year 1

→Quality Measurement	\$1.15
→Productivity Measurement	\$1.50

▼ Year 5

→Quality Measurement	\$20.00
→Productivity Measurement	\$12.00

* As presented by Capers Jones at the 1995 ASM Conference, October 1995, Orlando FL

Return On Investment for Software Measurement

- ❑ **Actual ROI Depends on Your Goals**
- ❑ **Tangible plus Intangible Returns**
- ❑ **Measurement Is Passive and Reports the Results of Your Improvement Actions**
- ❑ **What Gets Measured, Gets Done**

Where Does Assigning Business Value fit?



Assigning Business Value: Select, Control, Evaluate

□ Select / Initiate

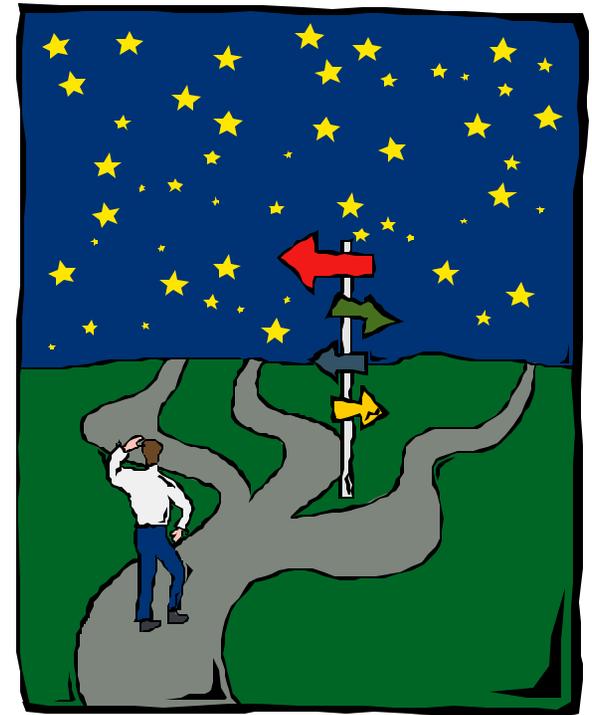
- ▼ Early size estimates
- ▼ Alternatives evaluated based on common functional size (cost, effort)
- ▼ IT acquisition decisions based on quantified size
- ▼ Fact based decisions
- ▼ \$ / FP comparisons can be *part* of decisions



Assigning Business Value: Select, Control, Evaluate

☐ Control

- ▼ Objective Size based cost and effort estimates
- ▼ Deliver software based on finite, self-contained projects with defined functionality
- ▼ Control duration and effort
- ▼ Fact based Management of scope changes / growth



Assigning Business Value: Select, Control, Evaluate

□ Evaluate

- ▼ Life cycle costing
- ▼ Post-implementation reviews (PIR):
 - *Track ROI (\$ / FP)*
 - *Quality (defects / FP)*
 - *Payback periods*
- ▼ Determine required process changes
- ▼ Portfolio Analysis



Assigning Business Value: Select, Control, Evaluate

Measuring Business Value:

- ▼ Bridges Requirements Generation with Program office
- ▼ Can manage overall IT portfolio by fact
- ▼ Facilitates budgeting, progress evaluation, cost/benefit analysis



First Steps to Assigning Business Value

- ▼ **Begin estimating, measuring and tracking based on project functional size**
- ▼ **Collect objective FP size data & attributes for comparison across diverse projects**
- ▼ **Ensure Business Value Focus fits into a GQM (Goal/Question/Metric) framework**
- ▼ **Engage qualified professional assistance (saves you time & money)**
- ▼ **Assess changes using FP based estimating**



Measurement Articles, Upcoming Training, Products

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