Webinar:
Estimating *before* Requirements with Function Points

June 7, 2012
with
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Quantitative Software Management, Inc.

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Carol Dekkers, CFPS, PMP

- IFPUG Past President
- ISO/IEC project editor (FPA, benchmarking)
- Expert in software metrics, FPA

Agenda

- Cost estimating basics
- Project requirements – demystified
- Estimates *before* requirements?
- Case study
- Next steps

Cost Estimating Challenges

Cost Estimating Challenges/2
(post-requirements)

Accuracy

Availability

Applicability

Completeness

Risk

Inclusions / Exclusions

Cost Estimating Challenges/3
(post-requirements)

- Pursuit of faster, better, cheaper +++
- Constraints: Fixed date or budget
- False sense of security: estimate = reality
  - Creates unfair pressure on ~~cost estimator~~ Project manager to predict future

Cost Estimating Challenges
(post-requirements)

- Weakest link
- Garbage in → Garbage out
- Comparable (?) projects

Estimating made easy

Needs

- Requirements (Functional, non-functional, technical, other)
- Assumptions (documented?) & constraints
- Floor plan + bldg code + blueprints + environment

Estimate

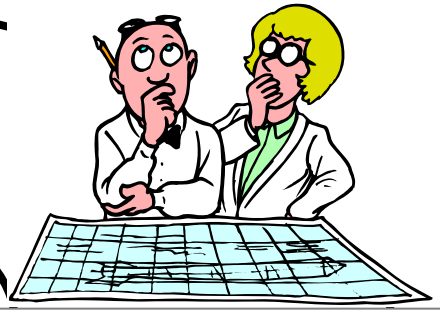
- History / Comparisons (relationships)
- Equations
- Passive (not idiot proof)

Result

- Estimates of cost, schedule, resources (+/- range?)
- Precision versus Accuracy

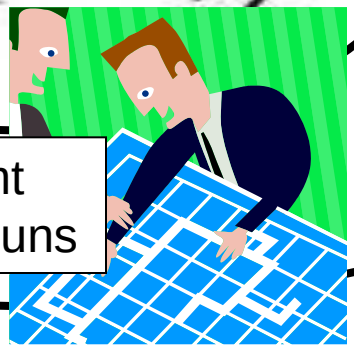
Poor→ bad→ weak → dog chasing its tail?

Poor requirements
$$ Risks



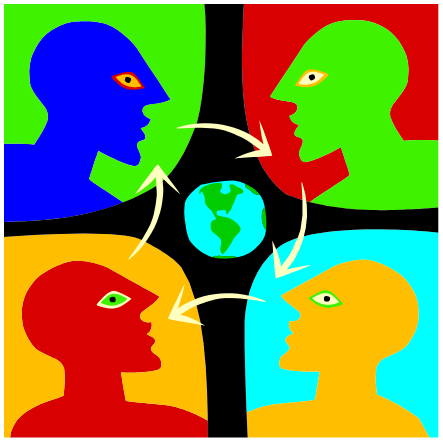
No history / experience
Bad $ and time estimates

New phase…
Enhancement !

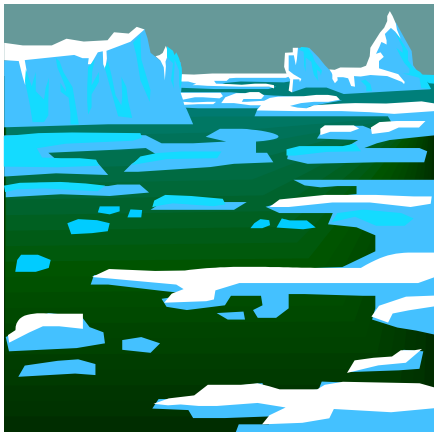


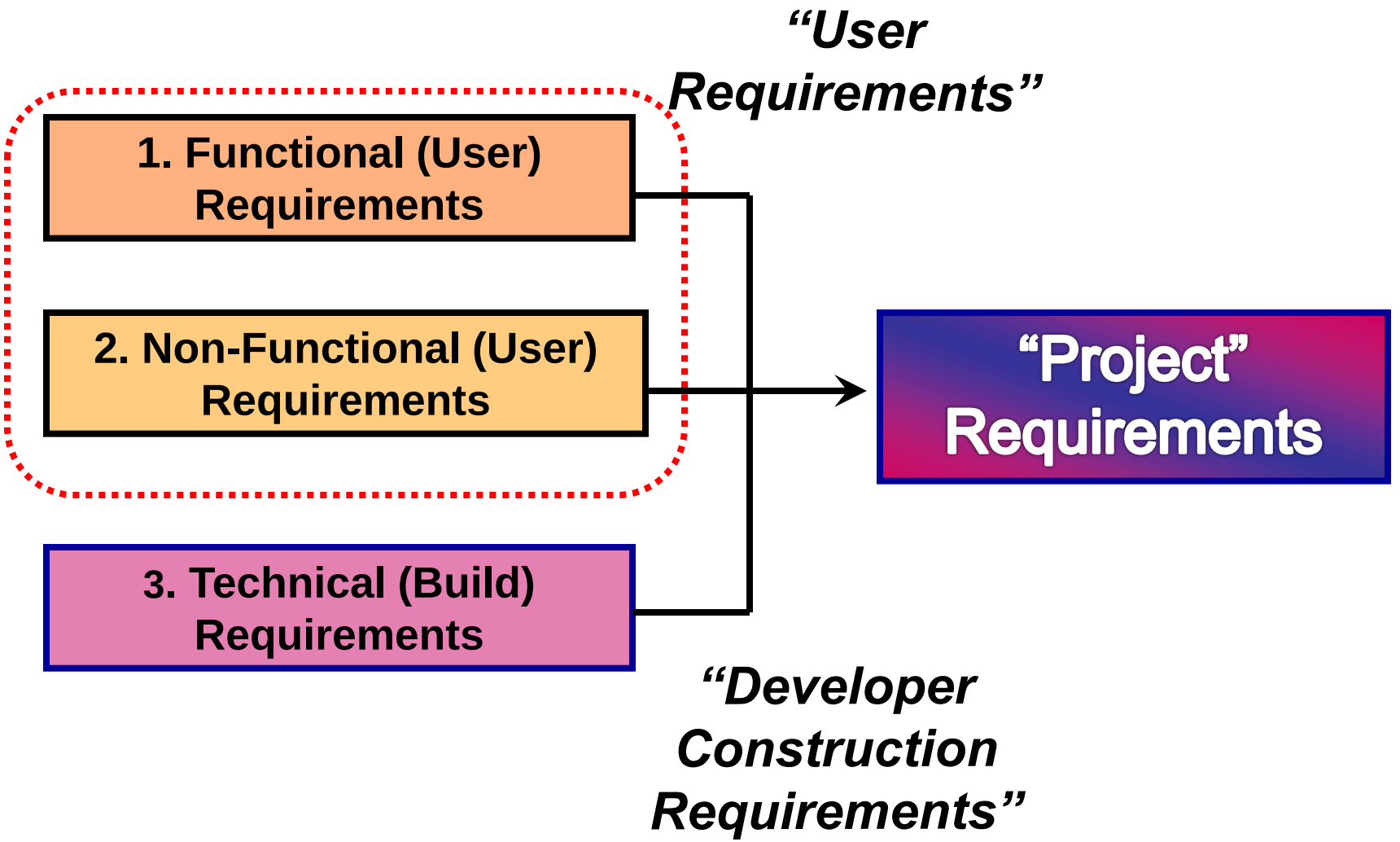
Weak chg mgmt
Late and $$ overruns

Project Requirements

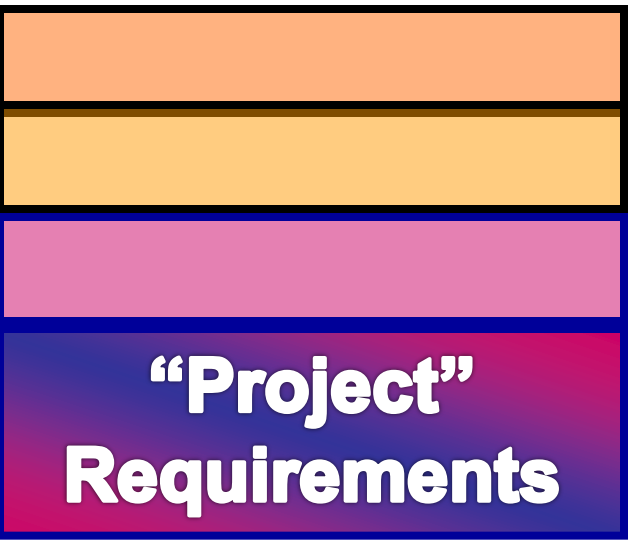


- **Requirements “Iceberg”**
  - Known Knowns $
  - Known Unknowns $$$
  - Unknown Unknowns $$$$$
- **Project Goals**
  - ↑ Knowns
  - ↓ Unknowns (Risk)




"User Requirements"
1. Functional (User) Requirements
2. Non-Functional (User) Requirements
3. Technical (Build) Requirements
"Project" Requirements
"Developer Construction Requirements"

How not to present requirements to users



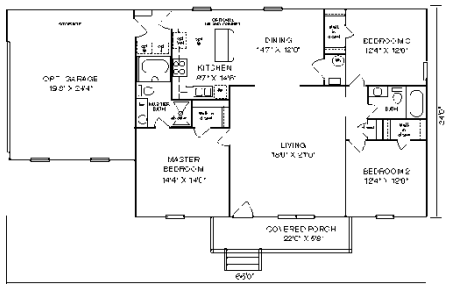
Functional Requirements

→ **<u>What</u> will software do (business processes)**

→ **Written: use cases, user stories, SRS**

→ Examples: input air temperature, reserve hotel room, show flight schedule

→ **Input to estimation (Size = FP)**



Non-functional Requirements

→ **How does software perform: "ILITIES" :**
(Suitability, Accuracy, Interoperability, Compliance, Security, Reliability, Efficiency, Maintainability, Portability, Quality in Use)

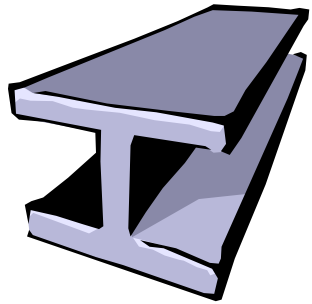
→ **Written: supplementary specs, nfr's**

→ Examples: bilingual, open system, web enabled

→ **Input to estimation (ans to quality ?)**

Technical Requirements

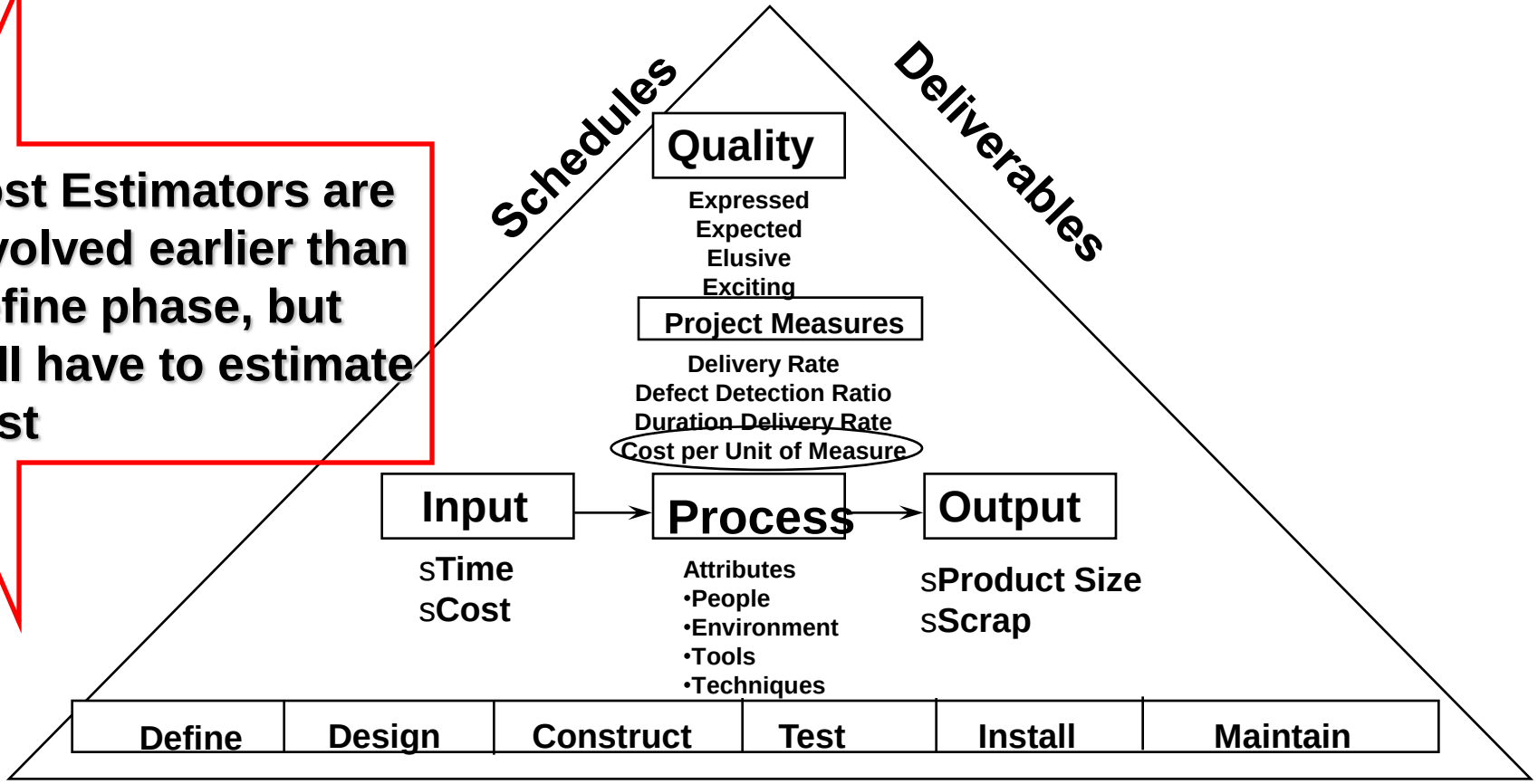
- → **How will we create software**
- → **Written by developers**
- → Examples: tools, methods, skills, language, WBS tasks, platforms, software, type of project, etc.
- → **Input to estimation: technical ?**



Estimating before Requirements

Project Process Model

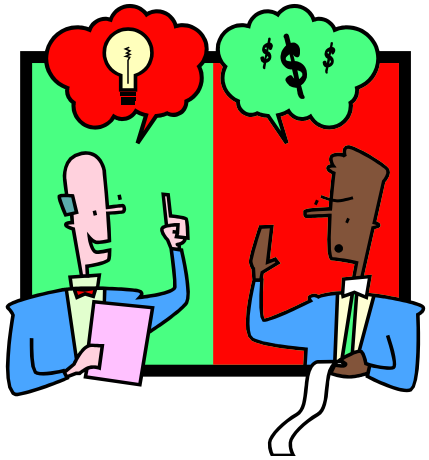
Cost Estimators are involved earlier than Define phase, but still have to estimate cost



1.Pre-functional Requirements

Guesses of WHAT the software will do:

- ⇨ **Napkin drawings**
- ⇨ **“Kind of sort of like” some other system**
- ⇨ **Rough “ideas”**
- ⇨ **Conceptual at best**



2. Pre-non-Functional Requirements

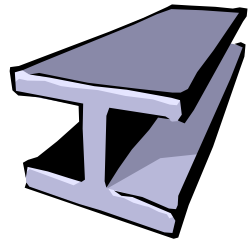
HOW software must perform: “ILITIES” :

- ⇨ “Standard” Business constraints for subject area
- ⇨ Unless critical, not considered important at this point
- ⇨ Quality = System will run

3. Pre-Technical (Build) Requirements

How software will be developed / 'built': often assumed same as:

- ⇨ "usual" development tool suite (environment already in place)
- ⇨ Build versus buy increases/ decreases cost



Case study: "I need an estimate in 10 minutes…"

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Client info: New customer account software, web-enabled, JAVA, 8 sites

Your options:

- ✘ Refuse to do estimate (too early)
- ✘ S.W.A.G.
- ✘ Use actuals from prior project (Hope it is similar)
- ✘ Cite "professional" ethics and hide out
- ☑ Document assumptions (line in the sand)…

Client info: New customer account software, web-enabled, JAVA, 8 sites

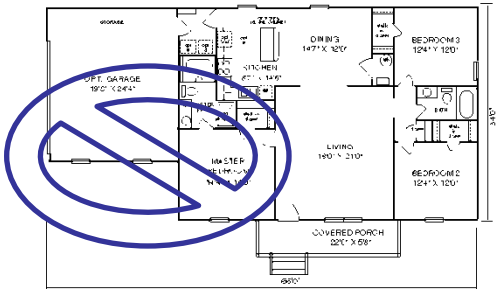
Functional requirements →What (size = FP)

- ⇨ "One File Model" (# entities * 31 FP each)
- ⇨ Profile of "similar" projects by FP component → % breakdown

- ⇨ **We assumed 5 types of data** (account, customer, purchases, credit card usage, +1) = approx. **150-160 FP**

Approx

160 FP



Client info: New customer account software, web-enabled, JAVA, 8 sites

Non-functional Requirements →HOW

software must perform: “ILITIES” :

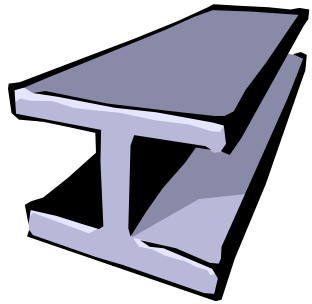
- ⇨ Corporate history last 3 years: FP VAF >= 1.0
- ⇨ Review major quality attributes (reliability, accuracy…)
- ⇨ Overestimate (seldom less complex) → check history

- ⇨ **Web-enabled = fast, user friendly, 24 x 7 access**
- ⇨ **8 sites (some in Canada, bilingual) – high volumes**
- ⇨ **VAF = approx. 1.2, quality factors ↑**

Client info: New customer account software, web-enabled, JAVA, 8 sites

Technical requirements: How to build the software

- **Standard JAVA toolset** (SLIM, own history)
- **Agile development approach (JAVA team)**
- **Interfaces to SAP system**
- **No unusual circumstances**



Before requirements

Estimating made easy

Client info: New customer account software, web-enabled, JAVA, 8 sites

Needs

- **160 FP, VAF = 1.2, technical info**
- **Documented our assumptions**

Estimate

- **QSM database (similar projects) → avg hours per FP**

10 minutes!!!

Result

- Estimated **hours** → **schedule** (avg 5 per team)
- Estimated **cost (labor)** → hours * $ xx / hour

Next steps…

Next steps/2

- **Document** assumptions
- **Separate requirements** into 3 types
- Range of “guesstimates” (+/- %)
- Fact based quick estimates → workshops on **SLIM and FP-based** estimating

Summary

- Despite intentions cost estimators cannot create estimates out of "ether"
- BUT… (gu)estimates based on **facts, FP, and SLIM** are a step forward.

Basic Costing Formulas

Metric	Units	Formula
Project Cost Ratio	$ / FP (or SLOC)	$\frac{(\text{Total Hours} * \text{Hourly Cost}) + \text{Other Costs}}{\text{Project Functional Size}}$
Support Cost Ratio	$ / 1000 FP (or FTE / app)	$\frac{(\text{Support Hours} * \text{Hourly Cost}) + \text{Other Costs}}{\text{Application Functional Size}}$
Repair Cost Ratio	$ / FP (or per fix)	$\frac{(\text{Repair hours} * \text{Hourly Cost})}{\text{Functional Size of Repair}}$

The IT Measurement Compendium

ISBN 978-3-540-68187-8

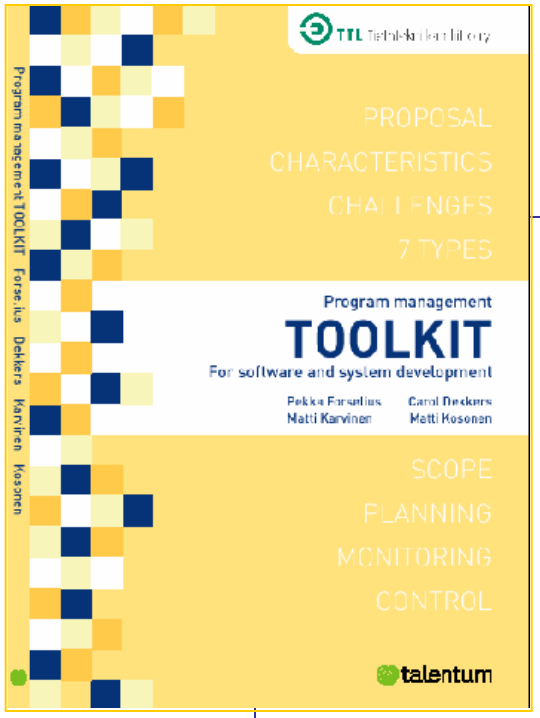
The IT Measurement Compendium -Estimating and Benchmarking Success with Functional Size Measurement

By Manfred Bundschuh
and Carol Dekkers
September 2008

Program Management Toolkit - for Software & systems development

By Pekka Forselius,
Carol Dekkers,
Matti Karvinen,
Matti Kosonen
April 2008

ISBN 978-952-14-1338-4



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-- Dennis Bolles, PMP DLB Associates, LLC Project Business Management Consulting

Thank you!

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