

Agile Estimating: My DPS Dissertation

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Presentation Outline



- **Agility**
- **Estimation**
 - **Estimating Software Size**
 - **Estimating Effort and Schedule**
- **Estimating with Agile Principles**
 - **Composing an Estimating Process**
 - **ELFE and Estimating Poker**
- **Estimating with Agile COCOMO II**

Understanding Agile

<i>Barry Boehm and Richard Turner</i>	Agile	Planned
Application	<i>Changeable</i>	<i>Larger Teams & Projects</i>
Management	<i>Customer Part of Team</i>	<i>Document Plans & Requirements</i>
Technical	<i>Short Increments Many Releases</i>	<i>Voluminous Test Cases and Plans</i>
Personnel	<i>Highly Capable Thrive on Chaos</i>	<i>Specialists who Thrive on Order</i>

Agile Values & Principles



o Agile Values

- Individual and interactions over processes and tools,
- Working software over comprehensive documentation,
- Customer collaboration over contract negotiation,
- Responding to change over following a plan.

o Agile Principles

- The Agile Manifesto outlines 12 principles.
- For example, “At regular intervals, the team reflects on how to become more effective, then tues and adjusts its behavior accordingly.”
- These principles are adapted by each agile methodology.

Agile Methodologies and their Developers



- **eXtreme Programming – Kent Beck, Ward Cunningham and Ron Jeffries**
- **Scrum – Ken Schwaber and Jeff Sutherland**
- **Crystal – Alistair Cockburn**
- **Adaptive Software Development – Jim Highsmith and Sam Bayer**

Stories – A Pervasive Agile Technique

- **One thing the customer wants the system to do.**
- **Beck says they should be estimable at 1-5 ideal programming weeks.**
- **Bill Wake says they should be independent, negotiable, valuable, estimable, small and testable. (INVEST)**
- **Mike Cohen wrote User Stories Applied for Agile Software Development.**

Why Agile Estimating?

- **In 2000, Barry Boehm explains estimating problems**
 - **Increasing domain understanding results in increased productivity and estimation error.**
 - **Innovation and change in software development practices also results in increased productivity and estimation error.**
- **In 2004, Jim Highsmith wrote about agile problems**
 - **Agile has not improved budget performance**
 - **“Managers are freaking out” over differences between agile development and traditional project management**

Measuring Software Size

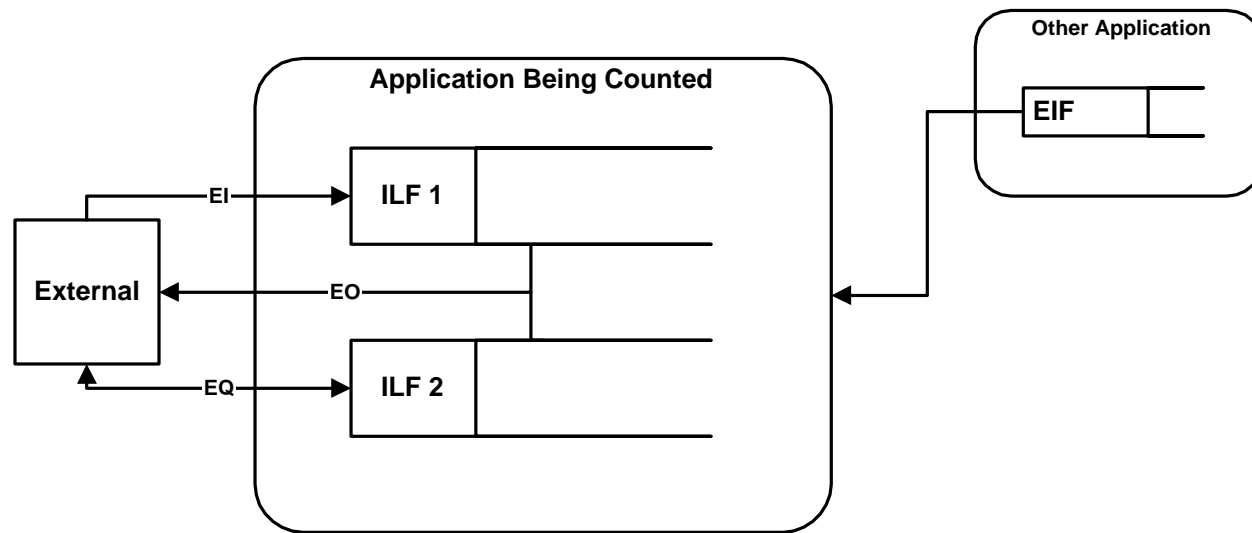
o **Functional**

- **Function Points**
- **Use Case Points**
- **Object Oriented Measures (Class Points)**
- **Object/Application Points**
- **Web Related Measures**

o **Non-Functional**

- **Lines of Code**
- **Bangs**
- **Story Points**
- **Ideal Time**

IFPUG Function Points



Estimating Effort and Schedule

- **Top-down**
 - Analogy
 - SLIM
 - Basic and Intermediate Product Level COCOMO 81
- **Bi-directional**
 - COCOMO II
 - Expert Judgment
 - SPQR, CheckPoint and KnowledgePlan
- **Bottom-up**
 - Intermediate Component and Detailed COCOMO 81
 - XP Planning
 - Task-Unit Approach

Composing an Estimating Process

- **General Methods Employed**
 - **Theoretical Synthesis or Paradigmatic Integration**
 - **Data Mining**
 - **Statistics**
- **Specific Procedures to be Employed**
 - **Select Measures**
 - **Design Sizing Methodology**
 - **Analyze Project Data**
 - **Analyze Project Artifacts**
 - **Design Data Capture Procedure**
 - **Gauge Reliability and Validity**

Early Lifecycle Functionality Estimating

- **Draft Scope and Boundary**
- **Analyze Business Areas**
- **Calculate Unadjusted Function Points**
 - **Identify Locations**
 - **Identify Roles**
 - **Identify Transactions**
 - **Identify Data**
 - **Recognize File Maintenance**
 - **Check Functional Ratios**
 - **Refine Complexity**
- **Calculate Value Adjustment Factor**
- **Complete Projection**

Estimating Poker

- **Set Up**
 - **Dealer (Estimator)**
 - **2-10 Players (Customers)**
 - **3 or 4 Sessions – Each 1-3 Hours Long**
- **Objective Is to Develop Stories to Estimate, Not Develop the Estimate Itself**
- **Play**
 - **The Initial Rounds – Business Areas, Locations & Roles**
 - **The Story Rounds – Write Estimable Stories**
 - **The Dealer (Estimator) Has Between Session Tasks**
 - **The VAF Rounds – Establish Value Adjustment Factor**
 - **The Scope Creep Rounds – Lets Customers Evaluate**


Agile COCOMO II



Agile COCOMO II is a web-based software cost estimation tool that enables you to adjust your estimates by analogy through identifying the factors that will be changing and by how much.

Step 1

Estimate Cost: Estimate Effort:

Analogy Parameter: Productivity in Function Points / Person-Months 

Project Name:

Baseline Value: (Function Points / Person-Months)

Current Project Function Points

Estimation History:

#	Driver/Factor	Current	New	Estimated Effort (In PM)	Command
0	N/A	N/A	N/A	17.15	(starting)
1	Cost Driver (Product-Required Software Reliability)	H (1.1)	VL (0.82)	12.78	Update Delete

Further Information



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- **<http://www.ifpug.org> – Function Points**
- **<http://sunset.usc.edu/cse/pub/research/AgileCOCOMO/AgileCOCOMOI/Main.html>**
- **<http://support.csis.pace.edu/dps/public/welcome/> - Pace University's DPS in Computing**