Agile Estimation Using Functional Metrics

Tom Cagley, CFPS
VP, Director, Process Improvement & Software Measurement
Immediate Past President IFPUG
t.cagley@davidconsultinggroup.com
440.668.5717

Podcast: www.spamcast.libsyn.com
What Agile Manifesto Doesn’t Mean

- Ad hoc
- Code and run
- No documentation
- No discipline
- No process
- No planning
- Just SCRUM
The Proposed Solution

- Quick and Early Function Points
- Parametric Estimation

- Business Need
- Cohesion (grouping)

- Planning Poker
- Task / activity management
Why Estimate Better and Faster

• Improved ability to provide status
• Higher quality (better behavior)
• Better coordination between teams
• Better long term budgeting
• Early warning risk information
• Indicates we have mismatches between targets, estimate and commitments
• Better than guessing
External Impact of Ineffective Estimating

• Impact of major schedule slippage is often dramatic:
  1. Unrecoverable revenue losses
  2. Not first to market
  3. Public failure
  4. Possible legal repercussions

• Corporations are more significantly impacted by schedule pressures than any other factor.
Estimation v Planning v Budgeting

Budgeting
- Defines how much we have to spend and influences scope
- Tends to ignore the cone of uncertainty

Estimation
- Rough or approximate size extent or nature
- Focused by the cone of uncertainty

Planning
- Definition of tasks and allocation of resources
- Focused on the narrow part of the cone of uncertainty
Effective Estimating

• The Software Engineering Institute (SEI) requirements for good estimating:
  • Corporate historical database
  • Structured processes for estimating product size and reuse
  • Mechanisms for extrapolating benchmark characteristics of past projects
  • Audit trails
  • Integrity in dealing with dictated costs and schedules
  • Data collection and feedback processes foster correct data interpretation
What Defines Good

• Hitting the midpoint of the original range?
• Making your stakeholders happy?
• Assuring a correct profit margin?

• A good estimate is an estimate that provides a clear enough view of the project reality to allow the project leadership to make good decisions about how to control the project so that it hits its target. McConnell
Basics: Inputs and Outputs

- Inputs
  - Sized Requirements
  - Skills
  - People
  - Equipment
  
  All data should be leveraged when planning

- Estimate Outputs
  - Effort
  - Cost

- Planning Outputs
  - Schedules
  - Resource Allocation
Basic Estimation Model

What

Functional Size
- Function Points
- Use Case Points
- Story Points
- Tee Shirt Sizing

How

Behavioral Attributes
- Process Disciplines
- Sourcing Model
- Skills

With What

Technical Complexity
- Security
- Languages
- Architecture

Productivity and Duration Signatures
What Are Your Options

Time

Resources

Functionality
So Why Doesn’t This Stuff **Always** Work?

- Uncertainty
- Self Knowledge
- Consistency of Method
Uncertainty

- You start projects knowing very little (as compared to when a project is implemented)

- Words are the only thing typically known before a project is initiated (usually not very many)
Johari Window

- Known to Self
  - Open
- Not Known to Self
  - Blind

- Known to Others
  - Hidden
- Not Known to Others
  - Unknown
Basic Methods of Estimating

- Analogy
- Bottom Up
- Parametric
- Iteration Planning
Planning Onion and Timing

Mike Cohn’s Planning Onion

- Budgeting Analogy
- Estimating Parametric - Light
- Planning Integration
- Planning Standup Meetings
The estimate is based on the best available information. A poor requirements document will result in a poor estimate.

Accurate estimating is a function of using historical data with an effective estimating process.
A Proposed Solution

- Quick and Early Function Points
- Parametric Estimation
- Business Need
- Cohesion (grouping)
- Planning Poker
- Task / activity management
The Logical View

Application Boundary

External Input

External Output

External Inquiry

Internal Logical File

Internal Logical File

External Interface File

Other Applications

Other Applications
Revisiting Grade School English

• Sentence Diagramming

In case you forgot - a predicate is an expression that can be true of something (the car is yellow)
The goal is not to diagram the whole requirement sentence but rather to use the logic of the diagramming process to get to the measureable component.
Translation Tool: Trigger Words

Nouns
- Data Functions
  - ILF
  - EIF

Verbs
- Transactions Functions
  - EI
  - EO
  - EQ

Function Points
A Proposed Solution

- Generate Initial Backlog
- Size Backlog
- Sprint Planning
- Owner Prioritization
- Iteration Planning
- Planning Poker
- Task / activity management

- Quick and Early Function Points
- Parametric Estimation
- Business Need
- Cohesion (grouping)
Translating Size Into An Estimate

Input: Sized Backlog

Disaggregation and Resize

Planning Poker (factor in attributes and technical)

Sprint Planning (Productivity or Commitment Driven)

Estimation Worksheet
Sprint Planning In This Environment

Product Owner Prioritizes
Teams Sequence
Apply Planning Estimates
Team Commits
Case One

Large software development firm, hierarchical culture and one very large project and many smaller

Mixed SCRUM/XP (recent addition) and Plan Based project environment

Strenuous budgeting process with tax accruals

Significant discovery was required to define, design and develop the large project

Experienced based estimation based on bottom up task planning – questionable on the large project!
The Answer

Techniques Used

- QEFP for sizing backlog
- QEFP for sizing items added during sprint planning
- Planning Poker

Impact

- Improved product owner satisfaction
- Increased perception of consistency
- Reduced number of stories escaping sprints
Large consumer product firm, hierarchical culture and many very large projects and many, many smaller

Outsourced Plan Based project environment

Strenuous budgeting process with tax accruals

Difficult to determine whether they are getting value for their money

Experienced based estimation based on bottom up task planning
Solution

Inputs
- Requirements
- Project Price
- Internal Effort

Consumed
- Vendor Effort
- Duration

Outputs
- Functionality
- Defects

Core Estimates
- Cost
- Duration
- Size
  - Function Points
  - Story Points
- Knowledge Gap

©2007 David Consulting Group

www.davidconsultinggroup.com
Your Turn

Questions?

**Agile Techniques Workshop**

**Agile Practical Techniques Workshop**

**Training**

- Agile Techniques
- Agile Practical Techniques
- Agile Estimation
- Measurement and Roadmap Workshops
- Intro to CMMI (SEI)
- Estimation Seminar
- Workshop
- PSM Estimation
- Function Point Fundamentals
- Advanced FPA
- Prep for CFPS
- Reviews and Inspections

**Estimating in an Agile World**

**Estimation Methods for Agile**

**Agile Estimation**

This course will increase an Agile Team Leader’s understanding of the principles and methods of estimating in an Agile environment.

DCG’s two day Agile Estimation Class is designed to help you learn the multiple options available to size and estimate your team workloads and provide better predictions as to productivity and time to delivery.

*Available exclusively as a 2 day on-site course*

From the Agile Manifesto: We are uncovering better ways of developing software by doing it and helping others do it. Through this work we have come to value:

---

**Read a client’s own words on the impact of this class on their plans...**

**UNIVERSITY STATES DEPARTMENT OF VETERANS AFFAIRS**

---

www.davidconsultinggroup.com