How to apply sizing and agile to complex heterogeneous solutions?

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- Member of IFPUG
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- A Canadian Global information technology (IT) company
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- Headquartered in Montreal, Quebec, Canada
- 68,000 employees, $10B Revenue, 40 Countries, 400 Locations

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Problem statement
Complex solutions are often heterogeneous and not homogeneous while most metrics driven estimation methods assume homogeneity. Combining this with an Agile deliver model makes it even more complex to determine how to apply size based estimation correctly.
Introduction

• How to apply size based estimation to heterogeneous solutions?

• Agile deliveries were mainly small and controlled on sprint level

• Larger contracts require a Scaled Agile delivery

• How to apply estimation for a Scaled Agile delivery?
Estimation in an (Agile) delivery lifecycle

- Value streams
- Releases
- Sprints

- Collection and analysis of actual data
  - Size
  - Velocity
  - Productivity
  - Maintain data as input for new estimates

- Scoping
  - EPICs
  - Features / Enablers
  - User Stories

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- EPICs
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- User Stories

- Sizing
- Effort Estimation
- Cost Estimation
- Duration Estimation

- Metrics collection
- Delivery control
- E&M

- Solution

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The solution will consist of different solution elements that can all have different technologies, different sizes and different productivity.
Complex solutions are Heterogeneous

- Applications
- Databases
- Data warehouse
- Security software
- Interfaces
- ...

Metrics-based estimation techniques assume homogeneity
Solution Based Estimate (SBE) - 1

1. Interfaces
2. Datawarehouse
3. Application
   3.1 Module
   3.2 Module
   3.3 Module
   3.2 Sub-Module
   3.3 Sub-Module
4. Application Maintenance
Solution Based Estimate (SBE) - 2

Solution

- Interfaces
  - Functional sizing
    - Functional sizing / average productivity
  - LOC sizing
  - Plug-in
    - Functional sizing / higher complexity

- Datawarehouse
  - Functional sizing / average productivity

- Application
  - LOC sizing
  - Plug-in
    - Functional sizing / higher complexity

- Application Maintenance
  - Functional sizing / average productivity
Example: Package Implementation

1. Configuration
2. Custom built functionality
3. Core module(s) / standard functionality
4. External interfaces
5. Internal interfaces
6. Data

[Diagram of packaged software with labeled components]
Example: SBE - Package Implementation

- Elements will have a different size
- Elements can have a different productivity
- Determine effort / costs on element level
Large programs with a complex solution in combination with an Agile delivery, require a agile management framework like the Scaled Agile Framework (SAFe)
What is the Scaled Agile Framework (SAFe®)

• SAFe® is a freely revealed knowledge base of integrated, proven patterns for enterprise Lean-Agile development
• Synchronizes alignment, collaboration, and delivery for large numbers of teams

Core values:
1. Built-In Quality
2. Program execution
3. Alignment
4. Transparency
Scaled Agile Framework (SAFe®)
Relative sizing (e.g. story points) is mostly applied on team level. To manage agile contracts often a more objective size estimation method will be required.
Estimation of a Scaled Agile delivery

Portfolio EPICS are assigned to programs

Portfolio Backlog

- EPICS with business needs
- Sizing based on EPICS
- Use of relative sizing methods
- e.g. Analogy based sizing

Program Backlog

- Stories based on EPICS
- Size by means of Story Points
- Determine velocity of teams
- Assign EPICS to teams

Program stories are assigned to teams

Team Backlog

- Estimation based on stories
- Estimation of tasks (optional)
Size Based Estimation for scaled Agile deliveries

Functional size (estimate) → Functional size (metrics, report, benchmarking)

Portfolio Backlog
- EPICS with business needs
- Sizing based on EPICS
- Detailed sizing / Analogy sizing
- Sizing in FPA (market conform)

Program Backlog
- Stories based on EPICS
- Sizing based on stories
- Prioritize Backlogs
- Sizing in FPA (market conform)

Team Backlog
- Estimation based on stories
- Estimation of tasks (optional)

Scrum
XP
Delivery approach supported by SAFe®

### Portfolio Backlog
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- Prioritize Backlogs
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### Team Backlog
- Estimation based on stories
- Estimation of tasks (optional)

Functional size (estimate) ➔ Functional size (metrics, report, benchmarking)

www.scaledagileframework.com
Sizing on portfolio level

- Analogy based sizing of Epics (e.g. Planning Poker)
- Estimation by comparison of Epics with statistical support (Historical data)
- T-Shirt sizing – Relative sizing of EPICs

- The size estimate will result in a functional sizing (Function Points)
- Determine the uncertainty when using a relative sizing method

- Validate the sizing with the actual size (manual, automated)
Sizing on program level

- Analogy based sizing of Features (e.g. Planning Poker)
- Estimation by comparison of Features with statistical support (Historical data)
- T-Shirt sizing – Relative sizing of Features
- Manual sizing of FPs if enough details are available (FPA, QFP)
  - FPA = Function Point Analysis
  - QFP = Quick Function Points
- Validate the sizing with the actual size (manual, automated)
Estimation on team level

- Planning Poker (Story Points) will be mainly on team level
- Functional sizing (FPA) can mostly not be applied on team level (size is to small)

- Team level characteristics
  - User stories are defined
  - Teams size is defined
  - Duration of the sprint is fixed
  - Budget is fixed based on the team effort
  - Functionality is flexible

- Can we use a ratio between FPA and Story Points?
Solution elements are mapped on sprints

On sprint level it’s difficult to compare sizing with the initial sizing on Portfolio or program level. The size of a release can be compared with the initial sizing.
Summary

- Scaled Agile delivery requires a scaled management approach
- Scaled Agile delivery requires a solution based estimation approach
- Scaled Agile delivery can be supported by functional sizing

SAFe, SBE and FPA are a strong combination (if applied correctly)!
Questions?

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