Defining Agile SE

They say that ‘to dissect is to kill’ but let’s risk some collateral damage

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To properly and effectively create a solution we must:
- Understand the problem
- Effectively describe it
- Methodically create and communicate it

This is true of all efforts regardless of their size or life cycle model

These SE activities must be performed whether or not they carry the SE label

These activities can be time-boxed as appropriate
Leveraging Agile to cope with complexity ...

Presentations Perspective
They say “Agile Program” – What do they really mean?

- Traditional SE Managed as Agile
- Traditional SE with Agile Development
- Traditionally managed Evolutionary Agile SE technical approaches (Plan driven)
  - Scaled SE with Traditional Development
  - Scaled SE as precursor (leading) to Agile Development
- “Agilely” Managed Evolutionary Agile technical approaches
  - Ad-hoc SE driven by Agile Development (essentially no prescriptive design)
  - Scaled SE as precursor (leading) to Agile Development (the whole enchilada)
- Expedited SE – Traditional or Agile Management
- Combinations of approaches on complex programs

Examples of Scaled SE Technical Practices
Agile Management Practices

- Short, Time-Boxed Iterations with Frequent Deliveries
- Continuous Planning
- Small, Self-Directed Teams
- Early and Frequent Stakeholder Involvement
- Daily Standup Meetings
- Frequent Feedback/Early Learning (e.g. retrospectives)
- Backlog Driven Management

- Examples of Popular Approaches
  - Scrum
  - Scaled Agile Framework (SAFe) (Leffingwell)
  - Agile Project Management (APM) Framework (Highsmith)
  - Disciplined Agile Delivery (DAD) (Ambler)
Agile Technical Practices

- Test-driven Development (TDD)
- Automated Testing
- Continuous Integration (CI)
- Paired Programming
- Scaled Architecture
We have been doing this one for decades...
Traditional SE Managed as Agile

### Management Approach
- Program Management Approach
  - Heterogeneous or Homogeneous
- Project Management Approach
  - Value driven

### Technical Practices Employed
- SE approach
  - Prescriptive design
  - Traditional technical practices
- Development approach
  - Traditional or Agile Development practices

**What might the agile management of Requirements Development look like?**

<table>
<thead>
<tr>
<th>Begin Spec</th>
<th>Bounding Context</th>
<th>Spec Complete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>Baseline</td>
<td>Baseline</td>
</tr>
<tr>
<td>Develop Some Reqs</td>
<td>Develop More Reqs</td>
<td>Develop More Reqs</td>
</tr>
<tr>
<td>Knowledge</td>
<td>Knowledge</td>
<td>Knowledge</td>
</tr>
</tbody>
</table>

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Traditional SE with Agile Development

- **Management Approach**
  - Program Management Approach → Homogeneous or Heterogeneous
  - Project Management Approach → Plan or Value Driven

- **Technical Practices Employed**
  - SE approach
    - Will prescribe system architecture
      - But will allow for emergence at lower levels handled by change management from an SE Perspective (Retrospectives)
    - Traditional
  - Development approach → Agile SW/HW practices
Traditionally Managed, Evolutionary Agile SE Technical Approaches

- **2 Flavors**
  - With Traditional Development
  - As a Precursor to Agile Development

Traditionally Managed, Scaled SE with Traditional Development

**Management Approach**
- Program Management Approach → Homogeneous or Heterogeneous
- Project Management Approach → Plan Driven

**Technical Practices Employed**
- SE approach
  - Emergent design on SE Products
  - Evolution
  - Minimal Documentation post development (essential only)
- Development approach
  - Traditional Development practices
Traditionally Managed, Scaled SE as Precursor to (enabling) Agile Development

- **Management Approach**
  - Program Management Approach → Homogeneous or Heterogeneous
  - Project Management Approach → Plan Driven

- **Technical Practices Employed**
  - SE approach
    - Emergent
    - Evolution
    - Minimal Documentation post development (essential only)
  - Development approach: Agile
“Agilely” Managed Evolutionary Agile Technical Approaches
"Agilely" Managed, AD-hoc SE Driven by Agile Development

- **Management Approach**
  - Program Management Approach → Homogeneous or Heterogeneous
  - Project Management Approach → Value Driven

- **Technical Practices Employed**
  - SE approach
    - Non prescriptive, all emergent design
    - Evolutionary
  - Development approach → Agile HW/SW practices

![Diagram of Agile Systems Development](image)
“Agilely” Managed, Scaled SE as Precursor to Agile Development – The Whole Enchilada!

**Defining Agile SE**

- **Management Approach**
  - Program Management Approach → Heterogeneous
  - Project Management Approach → Value Driven

- **Technical Practices Employed**
  - SE approach
    - Emergent Design
    - Evolutionary
  - Development approach → Agile Development Practices

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Expedited SE – Traditional or Agile Management

- **Management Approach**
  - Program Management Approach → Homogeneous or Heterogeneous
  - Project Management Approach → Plan or Value Driven

- **Technical Practices Employed**
  - SE approach
    - Prescriptive Design
    - Lean
  - Development approach
    - Traditional or Agile HW/SW practices

Expedited SE is Performing “Just Enough” Systems Engineering to Develop the Solution
Depending on the complexity, one can use a number of different approaches effectively

- The approach may be driven by “Wicked Problems” [1]
  - You don't understand the problem until you have developed a solution
  - Wicked problems have no stopping rule
  - Solutions to wicked problems are not right or wrong, simply "better," "worse," "good enough," or "not good enough"
  - Every wicked problem is essentially unique and novel
  - Every solution to a wicked problem is a "one-shot operation"
  - Wicked problems have no given alternative solutions

This mix of possible agile approaches results in a number of variants of “agile” programs


There is much to learn in regard to which variants work best for a given effort
Example of Scaled SE Technical Practices