Defining Agile SE

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

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The World Through the Lens of an SE

- **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

Topics

- **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

    } Balancing Prescriptive and Emergent
  - "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

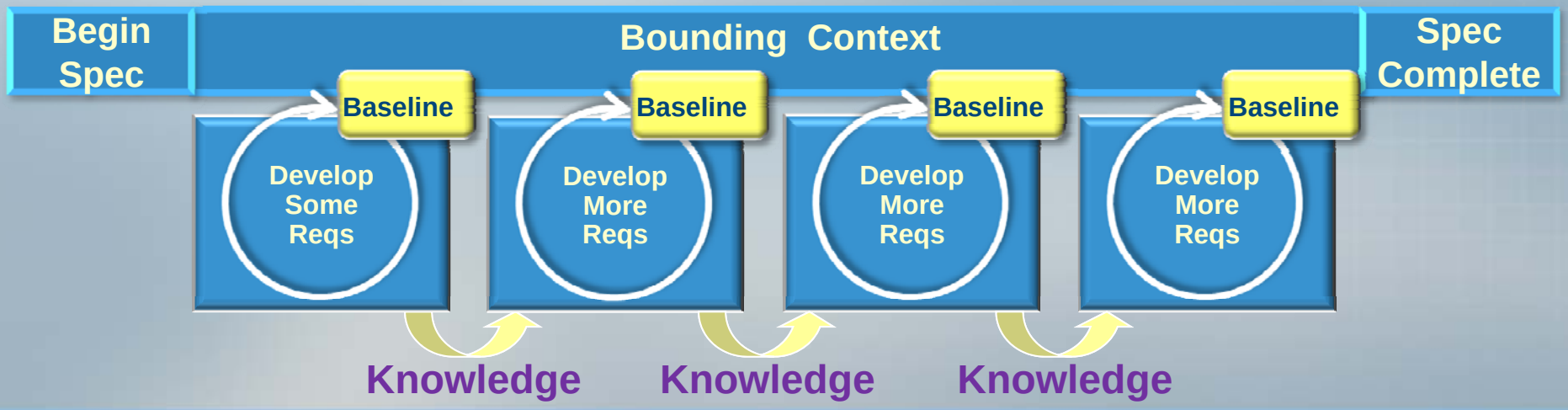
Traditional SE on a Traditional Program

- **We have been doing this one for decades…**

Traditional SE Managed as Agile

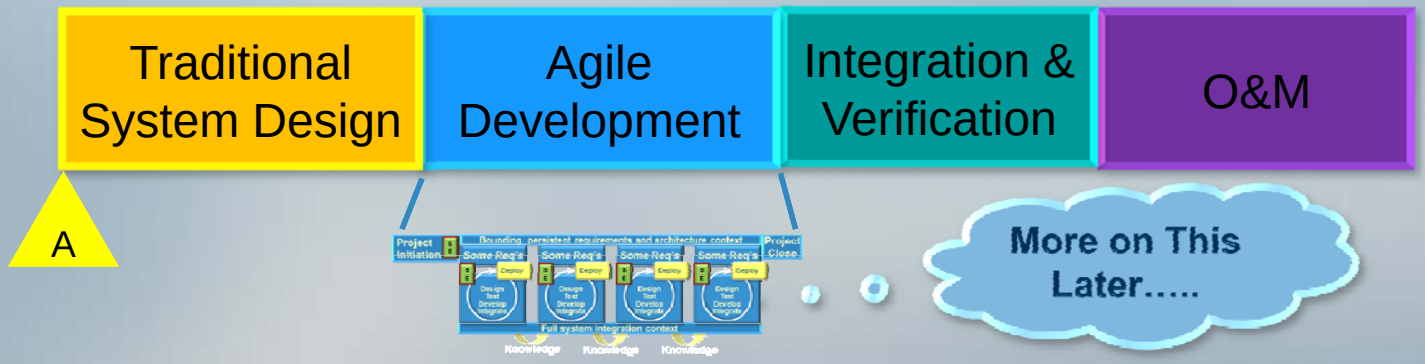
- **Management Approach**
  - Program Management Approach
    - Heterogeneous or Homogeneous
  - Project Management Approach
    - Value driven
- **Technical Practices Employed**
  - SE approach
    - Prescriptive design
    - Traditional technical practices
  - Development approach
    - Traditional or Agile Development practices

What might the agile management of Requirements Development look like?



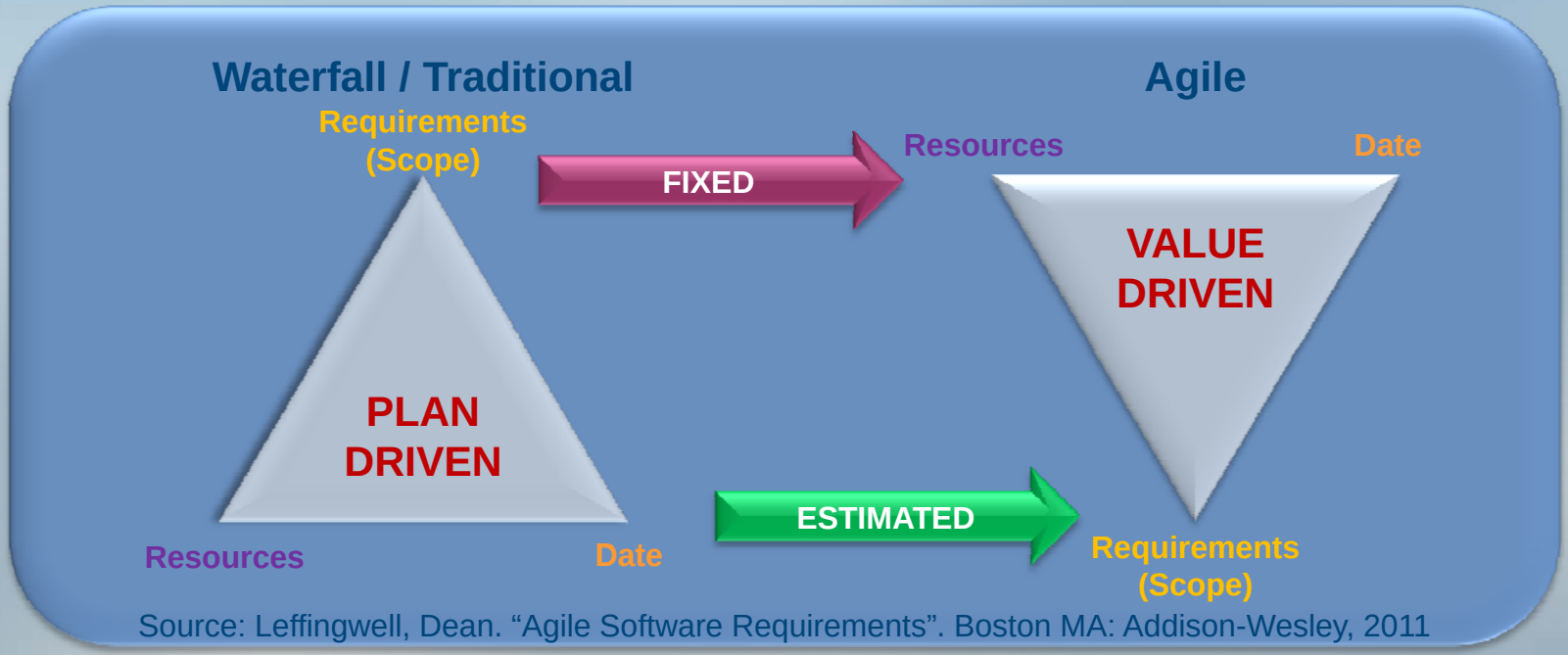
Traditional SE with Agile Development

- **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

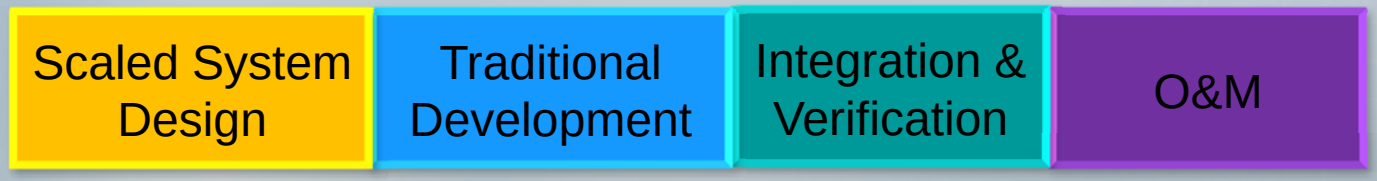
- **2 Flavors**
  - With Traditional Development
  - As a Precursor to Agile Development



Source: Leffingwell, Dean. “Agile Software Requirements”. Boston MA: Addison-Wesley, 2011

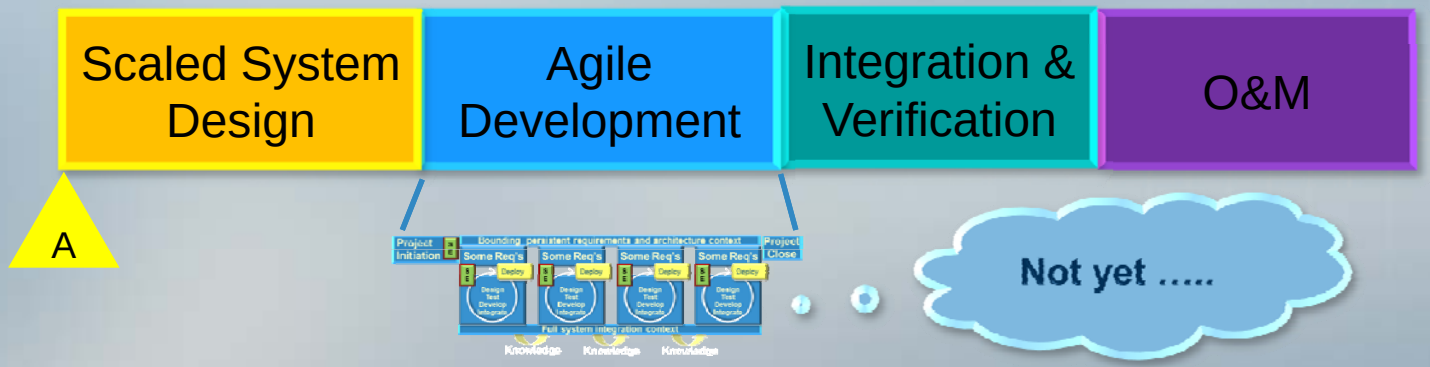
Traditionally Managed, Scaled SE with Traditional Development

- **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

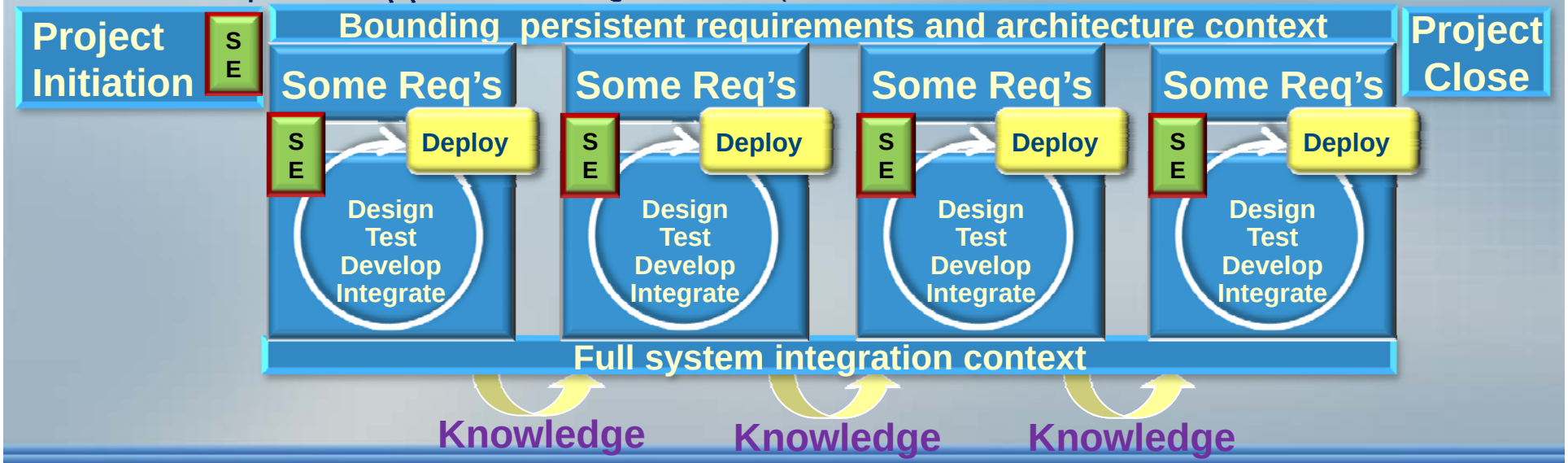
- **Management Approach**
  - Program Management Approach → Homogeneous or Heterogeneous
  - Project Management Approach → Plan Driven
- **Technical Practices Employed**
  - SE approach
    - Emergent
    - Evolution
    - Minimal Documentation post development (essential only)
  - Development approach: Agile



"Agilely" Managed Evolutionary Agile Technical Approaches

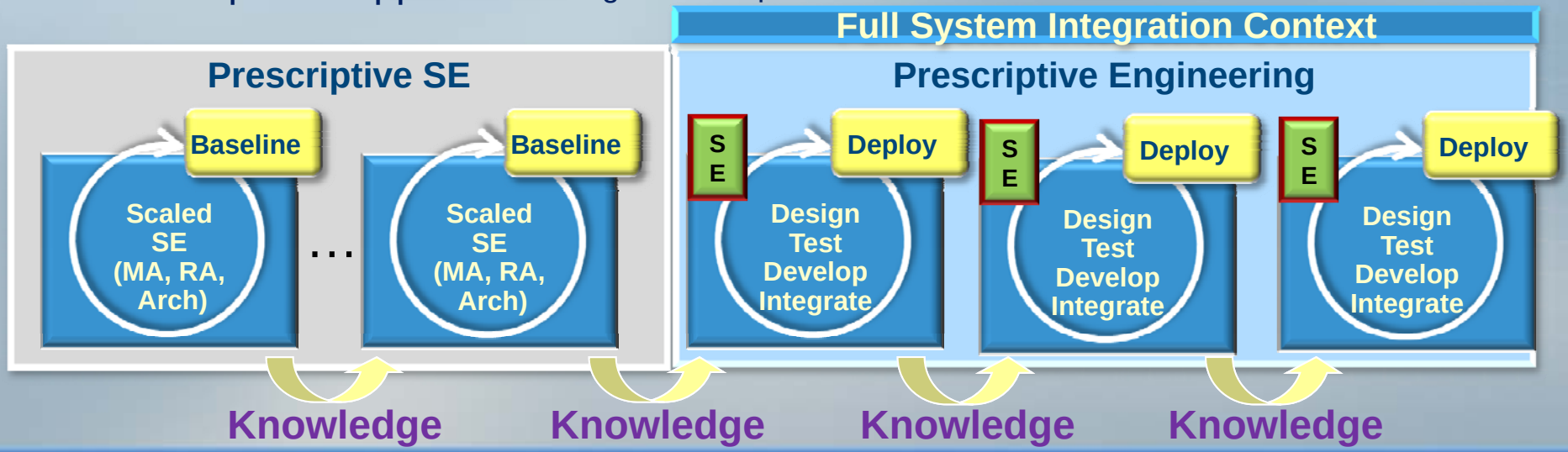
"Agilely" Managed ,
AD-hoc SE Driven by Agile Development

- **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



"Agilely" Managed , Scaled SE as Precursor to Agile Development – The Whole Enchilada!

- **Management Approach**
  - Program Management Approach → Heterogeneous
  - Project Management Approach → Value Driven
- **Technical Practices Employed**
  - SE approach
    - Emergent Design
    - Evolutionary
  - Development approach → Agile Development Practices



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

Combinations of Approaches on Complex Programs

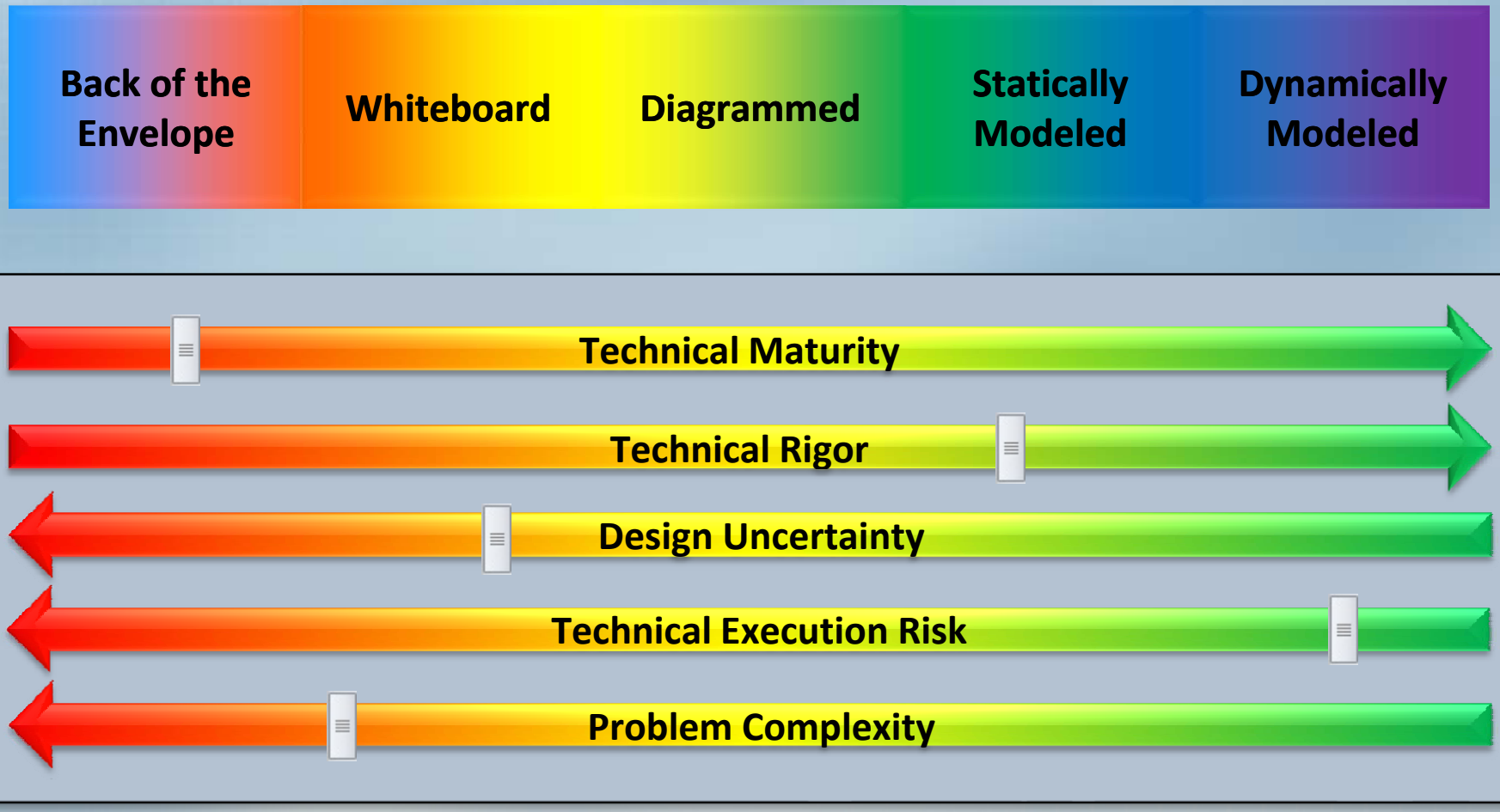
- **Depending on the complexity, one can use a number of different approaches effectively**
  - The approach may be driven by “Wicked Problems” [1]
    - You don't understand the problem until you have developed a solution
    - Wicked problems have no stopping rule
    - Solutions to wicked problems 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**

[1] Rittel, Horst W. J.; Melvin M. Webber (1973). "Dilemmas in a General Theory of Planning“

There is much to learn in regard to which variants work best for a given effort

- Example of Scaled SE Technical Practices

Scaled Solution Description (Architecture)



Questions and/or Comments?