How Rough is Your Project?

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Project Governance & Control Symposium 2016

KEYHOLDER

How Rough is Your Project?

Source: Comma Express

How Rough is Your Project?

KEYHOLDER

Agenda

- A little on Complex Projects
- Coastline Paradox
- The Coastline Paradox in Projects
- Potential Solutions

Complex Projects

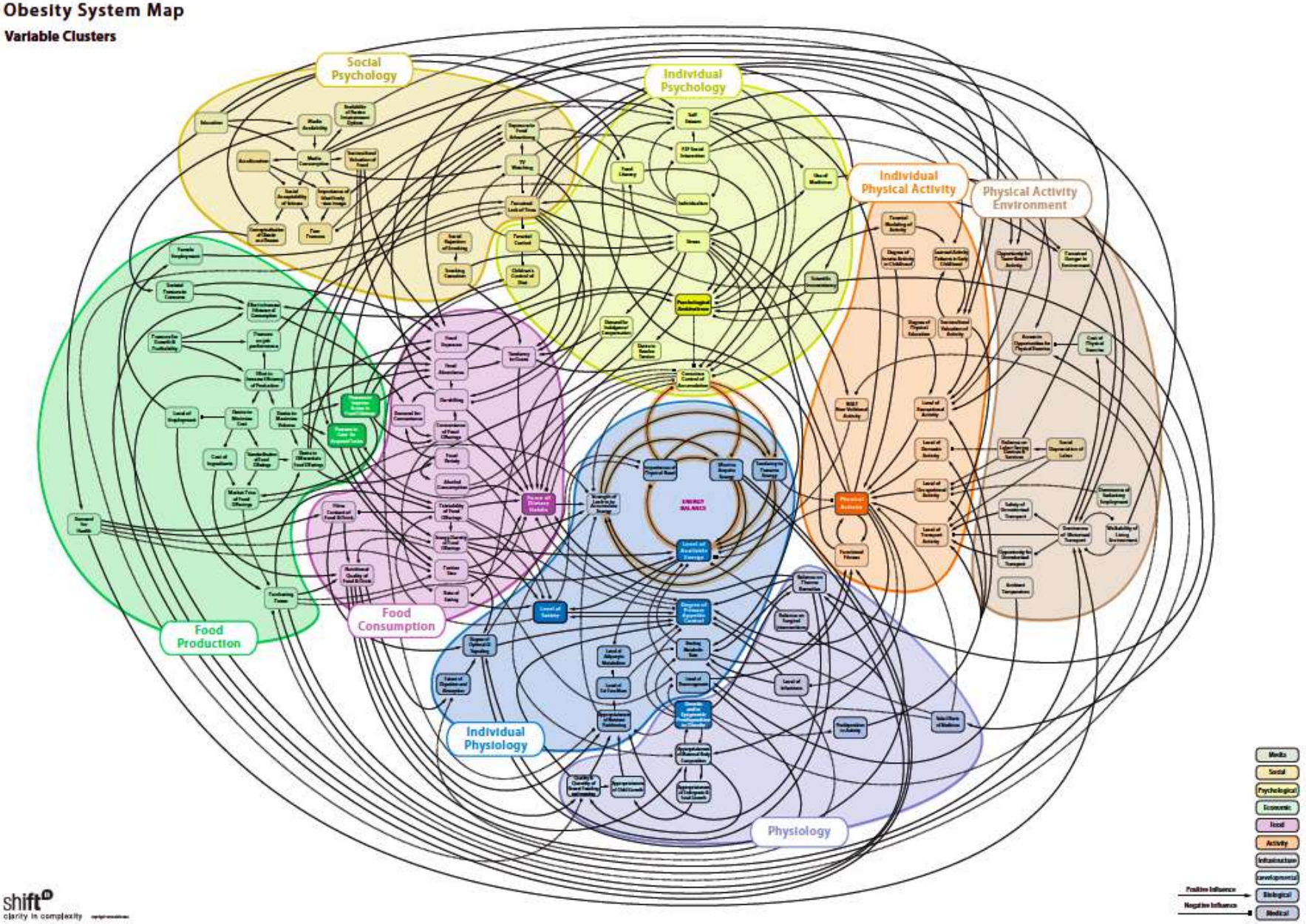
- Remington & Pollock
  - Types
    - Structural
    - Technical
    - Directional
    - Temporal
  - Edge of Chaos
  - Fitness Landscapes
- Jackson
  - Complex Adaptive Systems
  - Relationship between participants, as much as between things
- Other (Anon)
  - Its not just the system you build
  - It's the system that builds the system

Complex Projects

- Adaptive System-of-Systems
- Uncertainty in scope definition
- Distributed (organisationally, geographically, jurisdictionally)
- Environmental & internal turbulence
- Wave planned
- Unable to be decomposed to elements with clearly defined boundaries

The Project as a System

- Systems
  - Interconnection
  - Hierachy
  - Communication
  - Control
  - Emergence
- Adaptive Systems
  - Phase transitions
  - Adaptiveness
  - Sensitivity to initial conditions
  - Non-linearity



Source: Complex system map of obesity in the UK. (shiftn, 2006)

Structural Complexity

- Huge number of interconnected activities
- Perhaps “complicated” rather than “complex”
- Can manage the sub-projects, but not the dependencies
- Can’t see forest for trees
- Impossible to schedule
- Coordination nightmare
- Too many risks to manage
- Too much going on at once

Technical Complexity

- Nothing like this out there
- Not done before
- High levels of development
- Have to plan an unknown process
- Eg R&D Projects

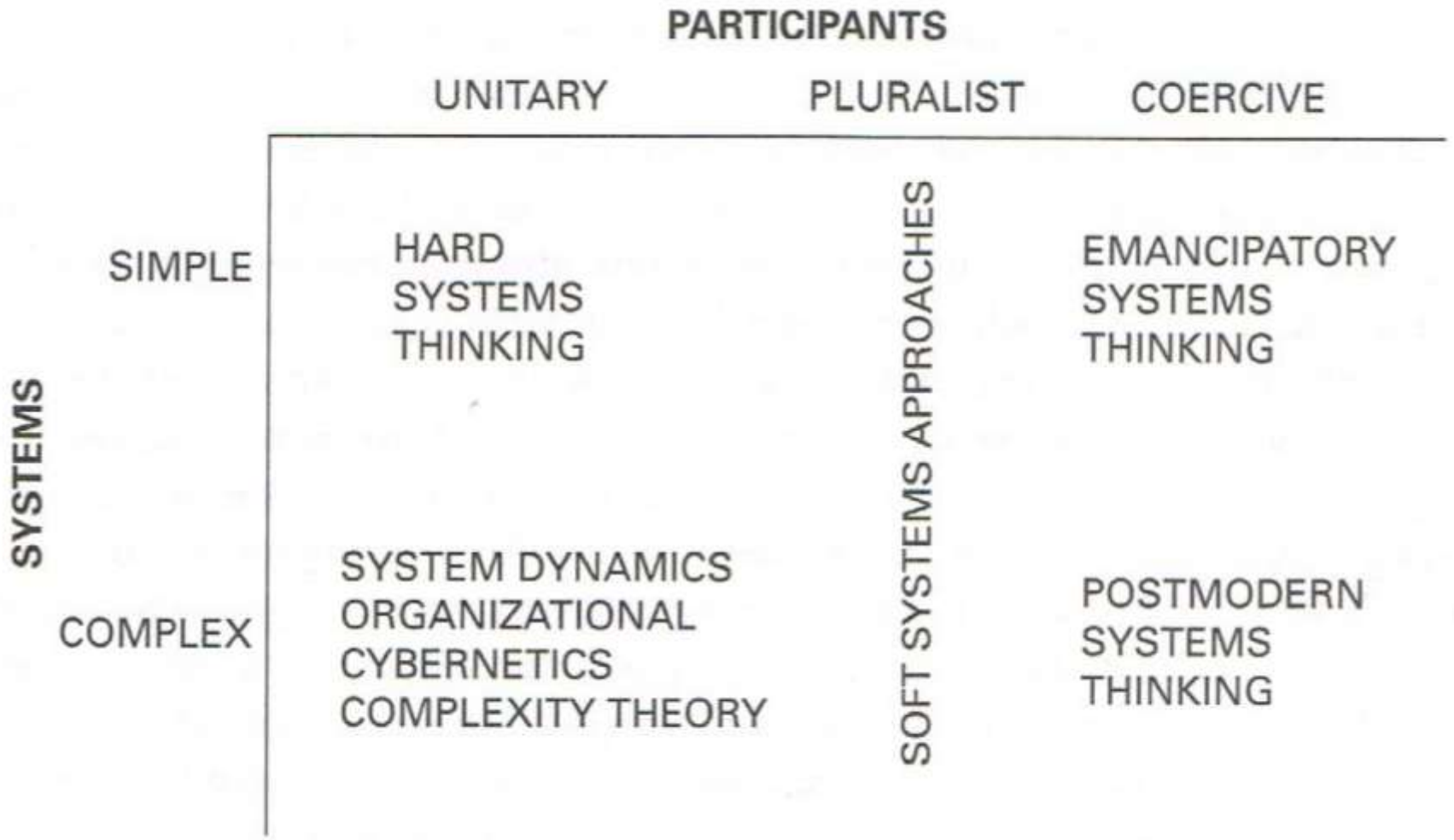
Directional Complexity

- No-one seems to be on the same page
- No-one is listening to anyone else
- Not sure why
- Hidden agendas drive the project
- Political motivations
- More arguing than doing

Temporal Complexity

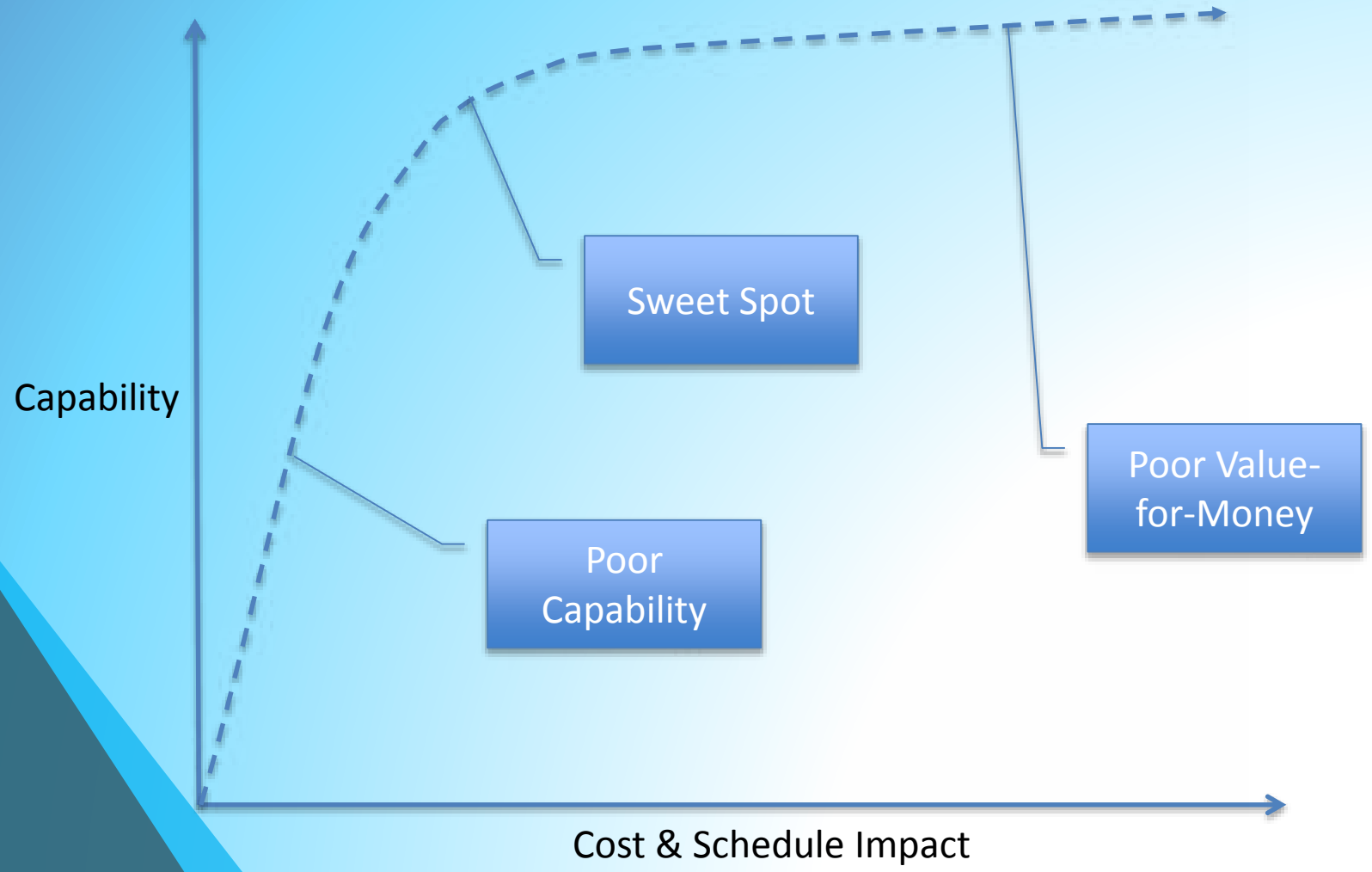
- Change beyond the control of the project
- Standing on quicksand
- Everything keeps moving
- We don’t know what will change next
- Work is made redundant by developments
- Better to wait

Relationships



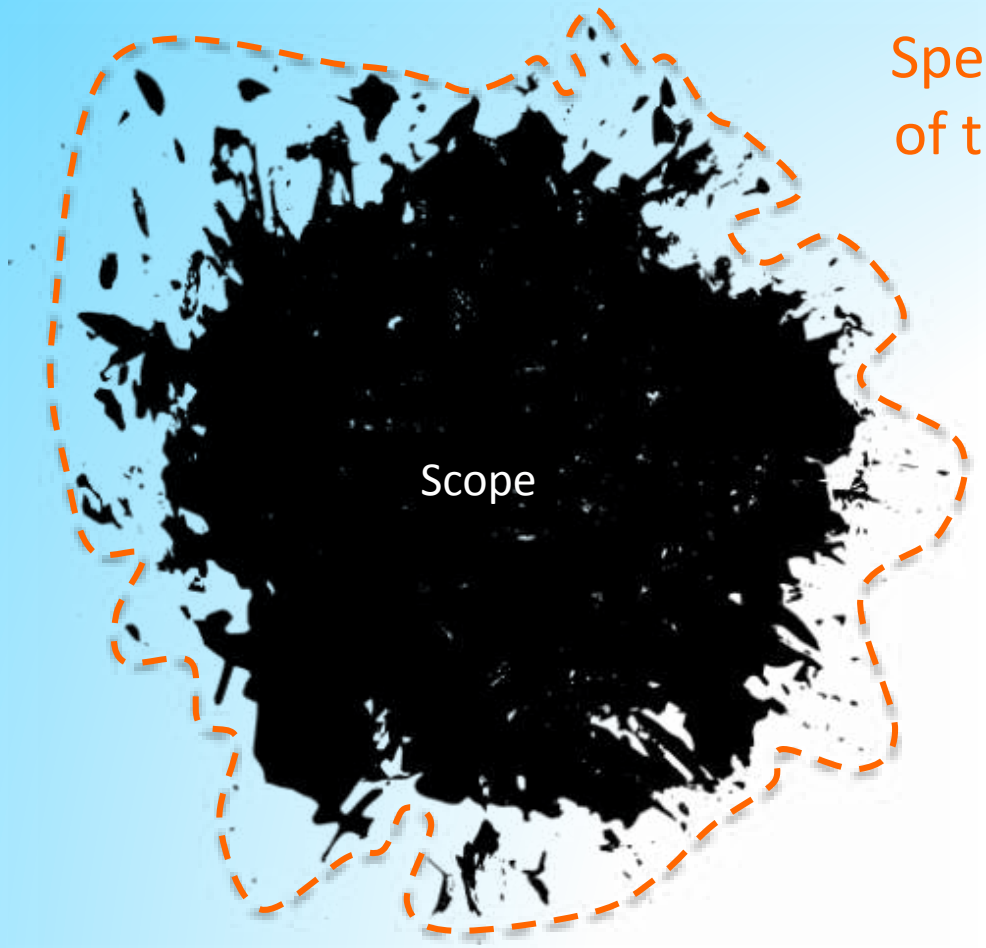
Source: Jackson

Non-Linearity



Source: CASG

The focus of this presentation….



Specification of the Scope

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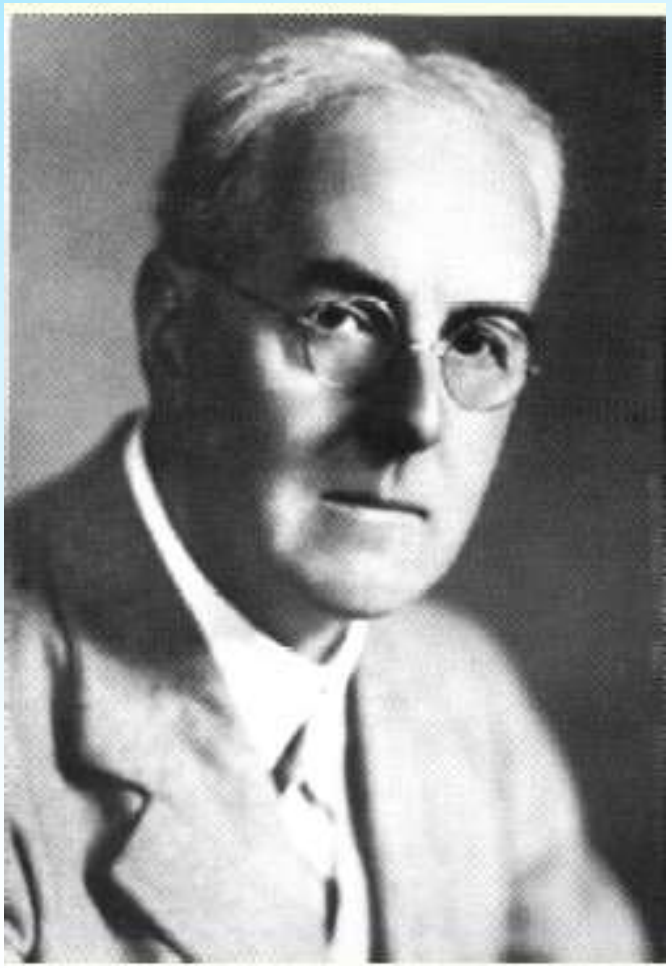
The Coastline Paradox



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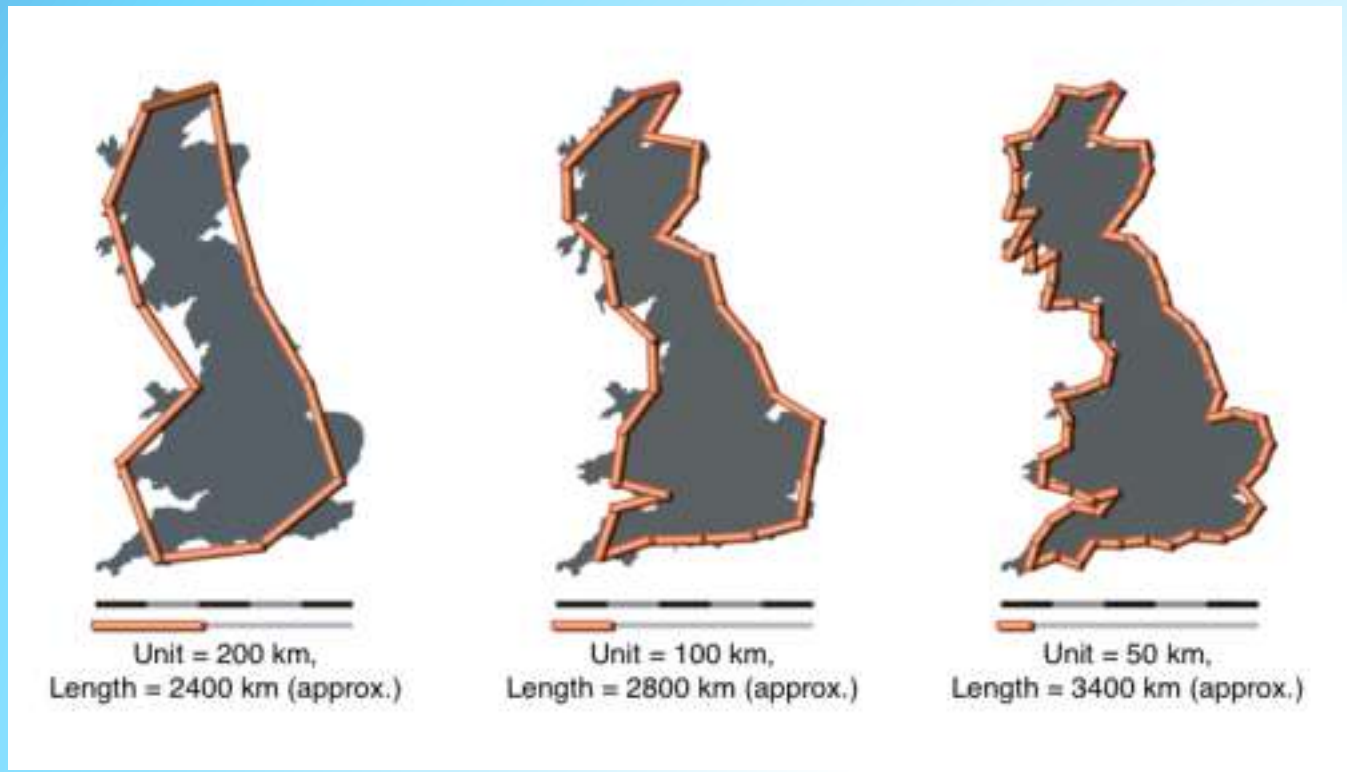

Source: https://41.media.tumblr.com/cdb7b518ed96f5d1ba3abace99077638/tumblr_n5s9fhsUsw1sutkk1o1_500.png

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Roughness

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The Scope

Source: Satellite Magazine

Specifying the scope

Source: World Atlas

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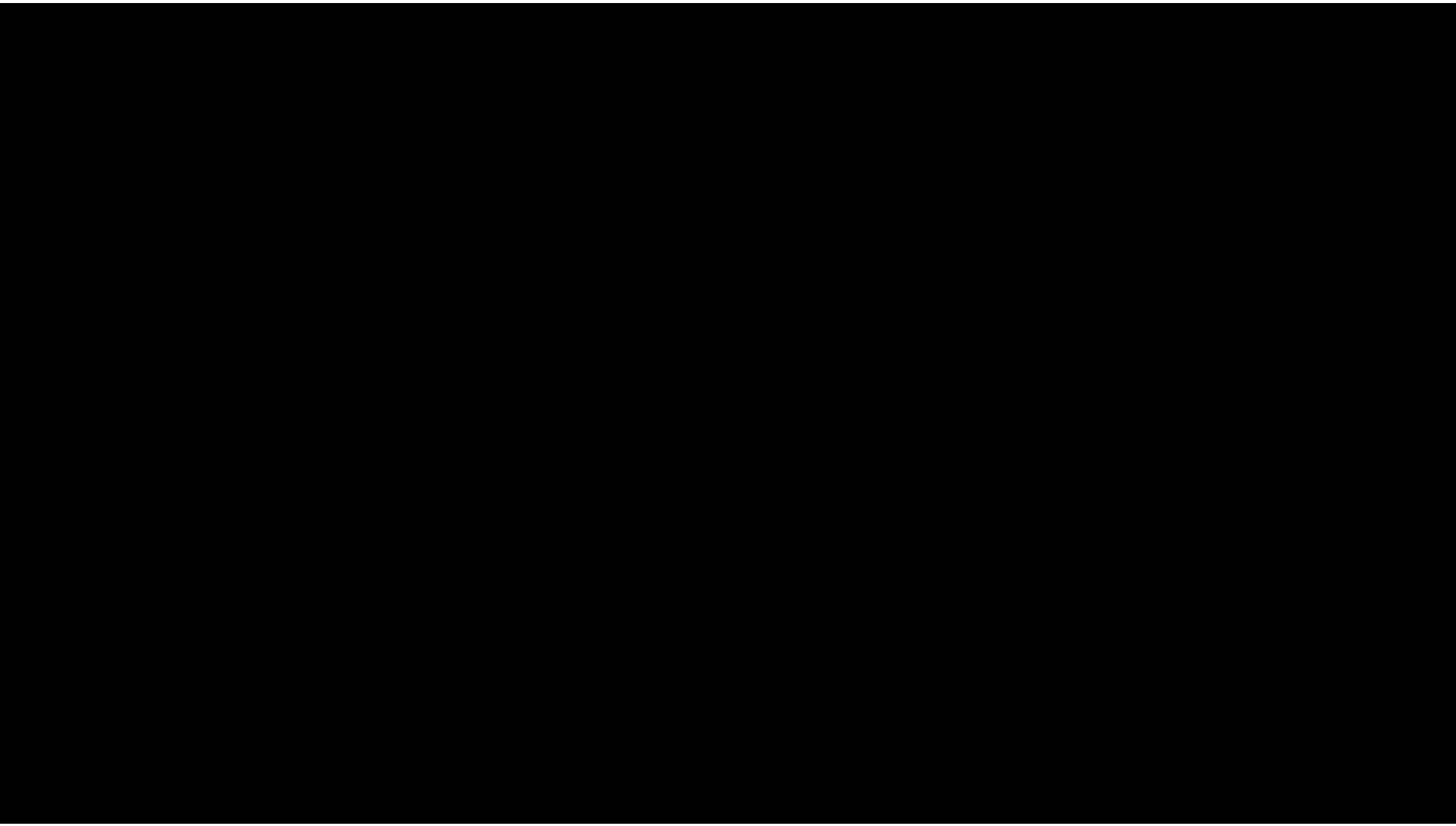
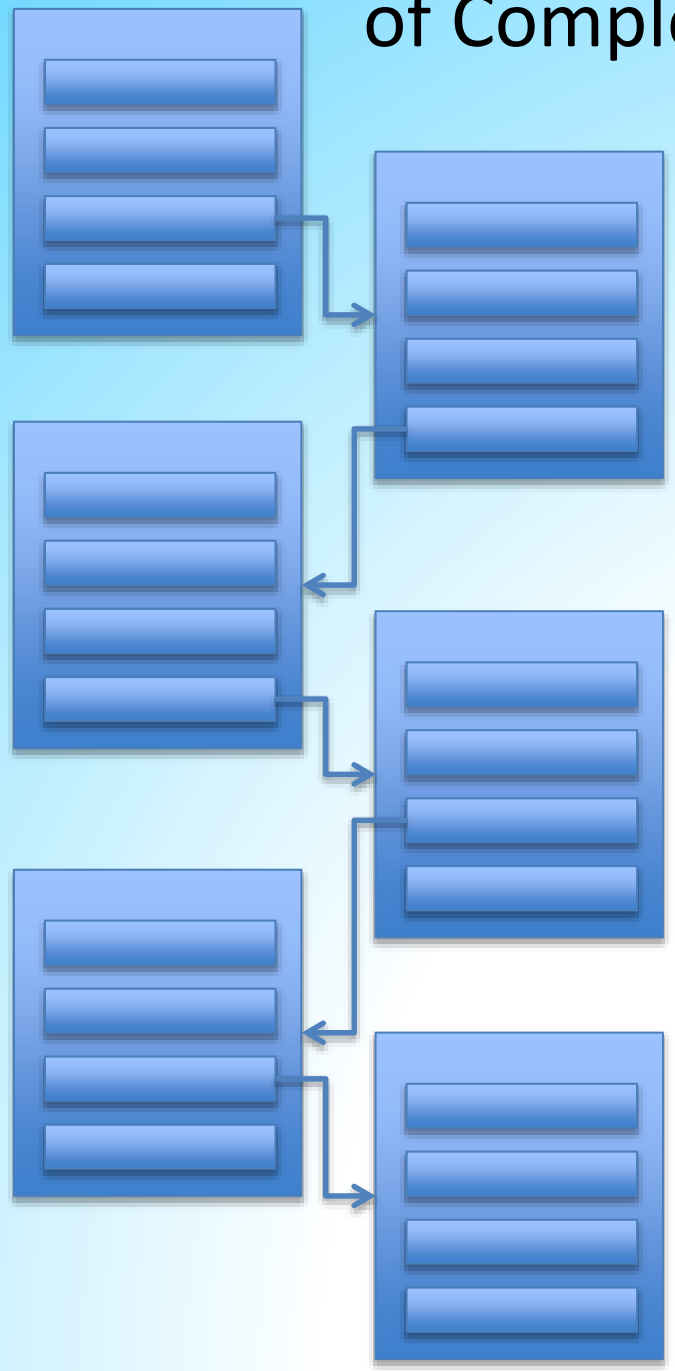


Fractal-Like Features of Complex Projects

- Recursive subcontracting
- Recursive systems integration
- Systems Requirements Analysis
- Verification & Validation
- In documents:
  - Specifications
  - Plans
  - Checklists
  - Implied requirements

Fractal-Like Features of Complex Projects

- Subcontracting
- Systems Integration
- Requirements Analysis
- Verification & Validation



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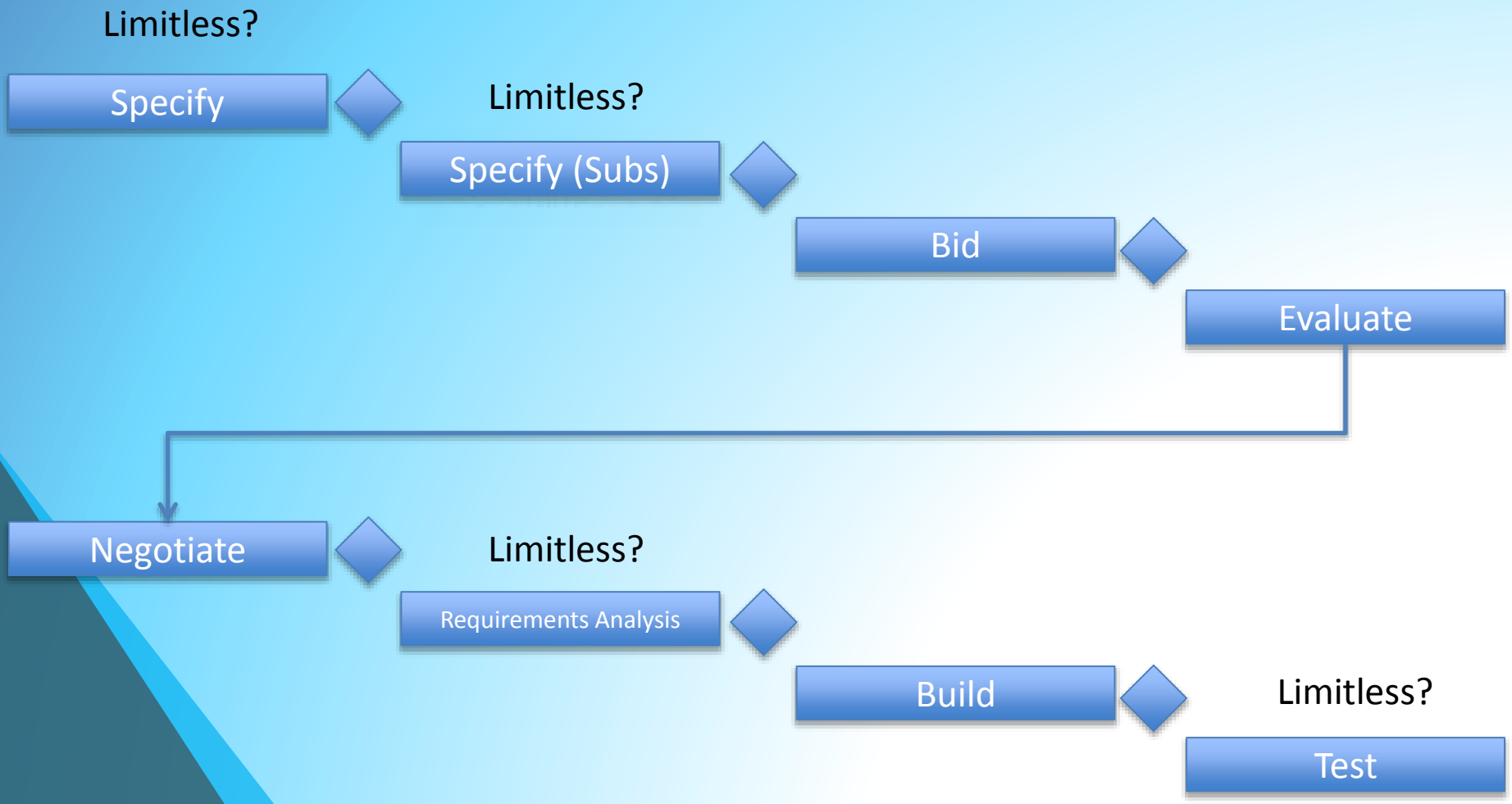
Limitless?
Specify
Limitless?
Specify (Subs)
Bid
Evaluate
Negotiate
Limitless?
Requirements Analysis
Build
Limitless?
Test

- Contract
  - Conditions of Contract
  - Statement of Work
    - General
      - Specification
        - Mission System
          - Design
          - Produce and Deliver
          - Verify & Validate
          - Subsystem
            - Design
            - Produce and Deliver
            - Verify & Validate
            - Sub-Sub-System
              - Design
              - Produce and Deliver
              - Verify & Validate
        - Support System
    - Project Management
      - Plans
        - Checklists
          - Work Instructions
    - Systems Engineering
    - Integrated Logistics Support
    - Configuration Management
    - Verification & Validation
    - Quality Management
    - Health, Safety & Environment

Self-Similarity

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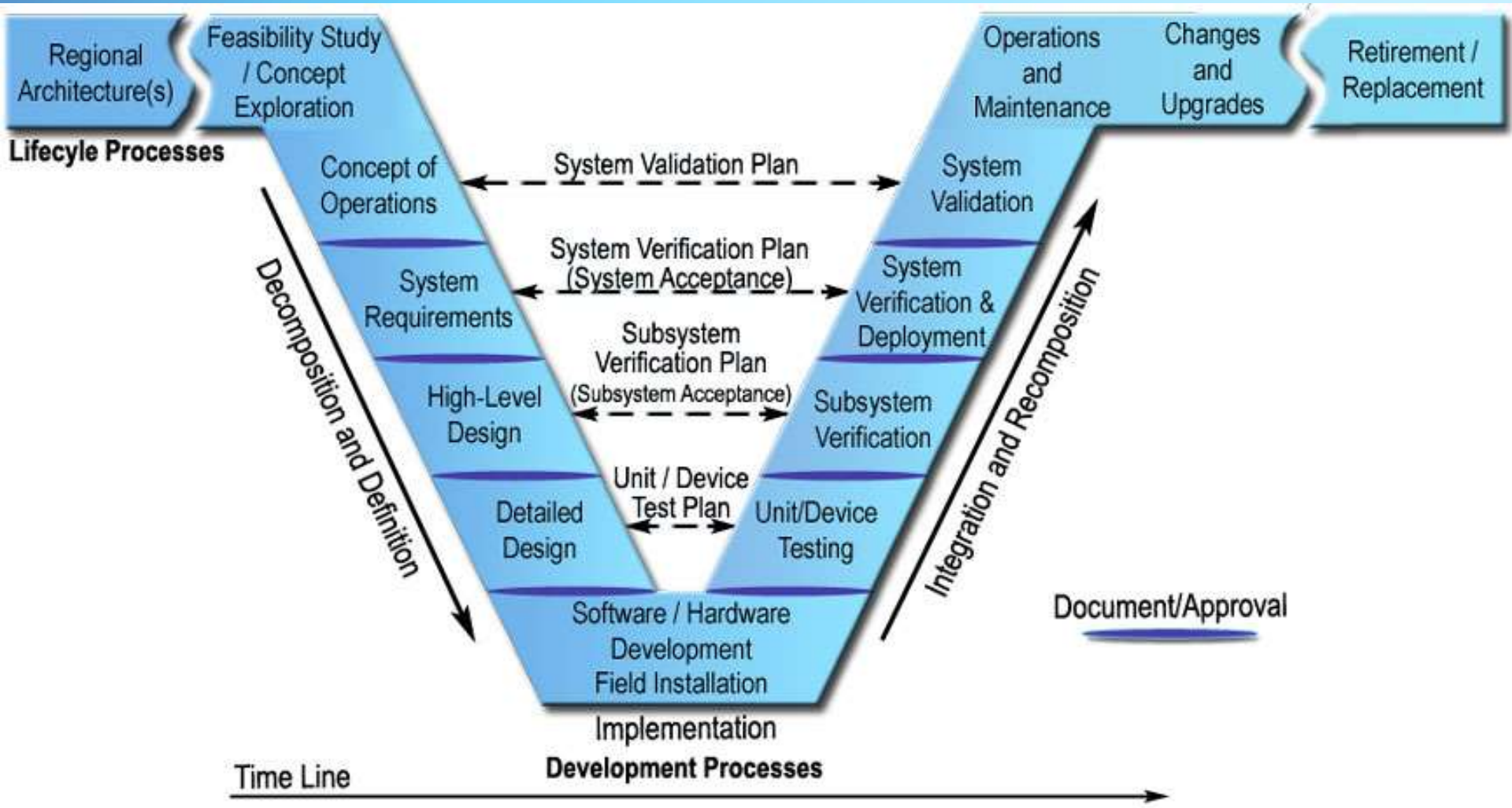

Source: US Dept Transportation

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Some Questions

- When is a system over/under-specified?
- When is “manage by plans” appropriate vs a fractal cost/schedule-driver?

Ironically….

- We a great at specifying coastline we know
- Not so great at specifying coastline we don’t know

Source: https://au.pinterest.com/pin/220535712979677679/

Some Solutions

- Watch out for fractal-like features:
  - Processes
  - Product specifications
  - Contracting
- Recognise project “roughness”
- Question the diminishing returns

Some Solutions

- Choose your measuring stick; eg:
  - Cost
  - Time
- Maybe accept a shared budget for requirements analysis and V&V

Some Solutions

- Negotiate the straight line approximations
  - Negotiate, negotiate, negotiate
- Don’t over-specify “known coastline”

How rough is your project?

- Finite Scope
- Finite Boundary

- Finite Scope
- “Limitless” Boundary

Bibliography

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