SYSTEMS ENGINEERING RESEARCH CENTER

Exploring Program Archetypes to Simplify Digital Transformation

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SERC COLLABORATION NETWORK

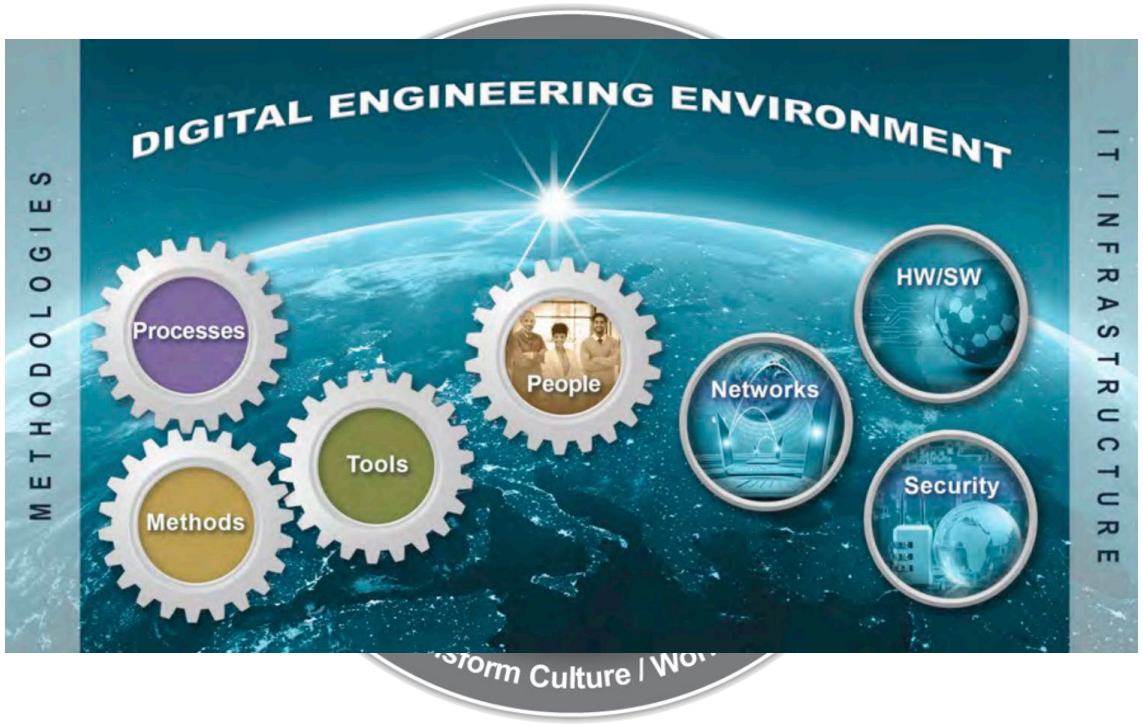
A collaboration platform for engaging stakeholders within the extended DoD Acquisition and Engineering Enterprise, thought leaders from across the nation, and researchers across academia.

OUTLINE

- Context and Background
- Research Issue Statement
- Methodology
- Data – and a Request
- Expected Results
- Conclusions

Context and Background

- In the U.S. Department of Defense (DoD), digital transformation is critical for successful acquisition
- DoD must continue to practice systems engineering efficiently and effectively to provide the best advantage for successful acquisitions and sustainment.
- DoD Digital Engineering Strategy (2018)



- Digital transformation requires the update of both acquisition and systems engineering practices to take full advantage of the digital power of computation, visualization, and communication throughout the lifecycle.

RESEARCH INTEREST STATEMENT

WHAT NEEDS TO BE DONE

- Program offices across the Department are faced with the challenge of digital transformation. For some, this is the challenge of **starting a program in a digital way**. For many others, it is a challenge of taking the **approaches and processes currently being used and updating them and their staff** to take advantage of digital approaches. Though each of the Services is working to create reference models and best practices, this **digital transformation process is often hindered by the workforce's understanding of how to tailor** approaches to fit the program's needs.

METHODOLOGY

Develop

DRAFT Program Characteristic Framework

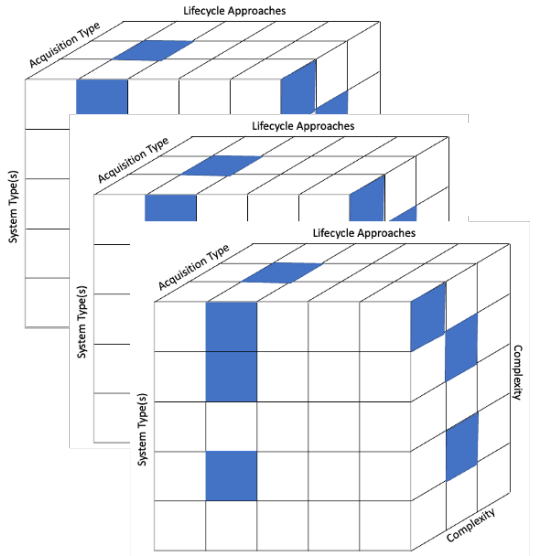
Collect

Program Data

Analyze

Develop

Develop Draft Archetypes

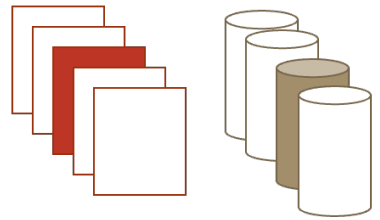


Collect

DE Implementation Data

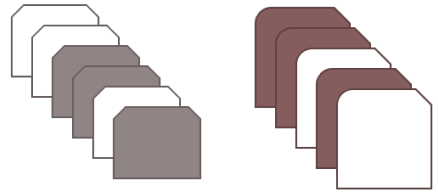
Develop

Recommended DE Approaches



DE Environment Architectures

Data Structures



Toolsets

Templates

We expect to collect data on

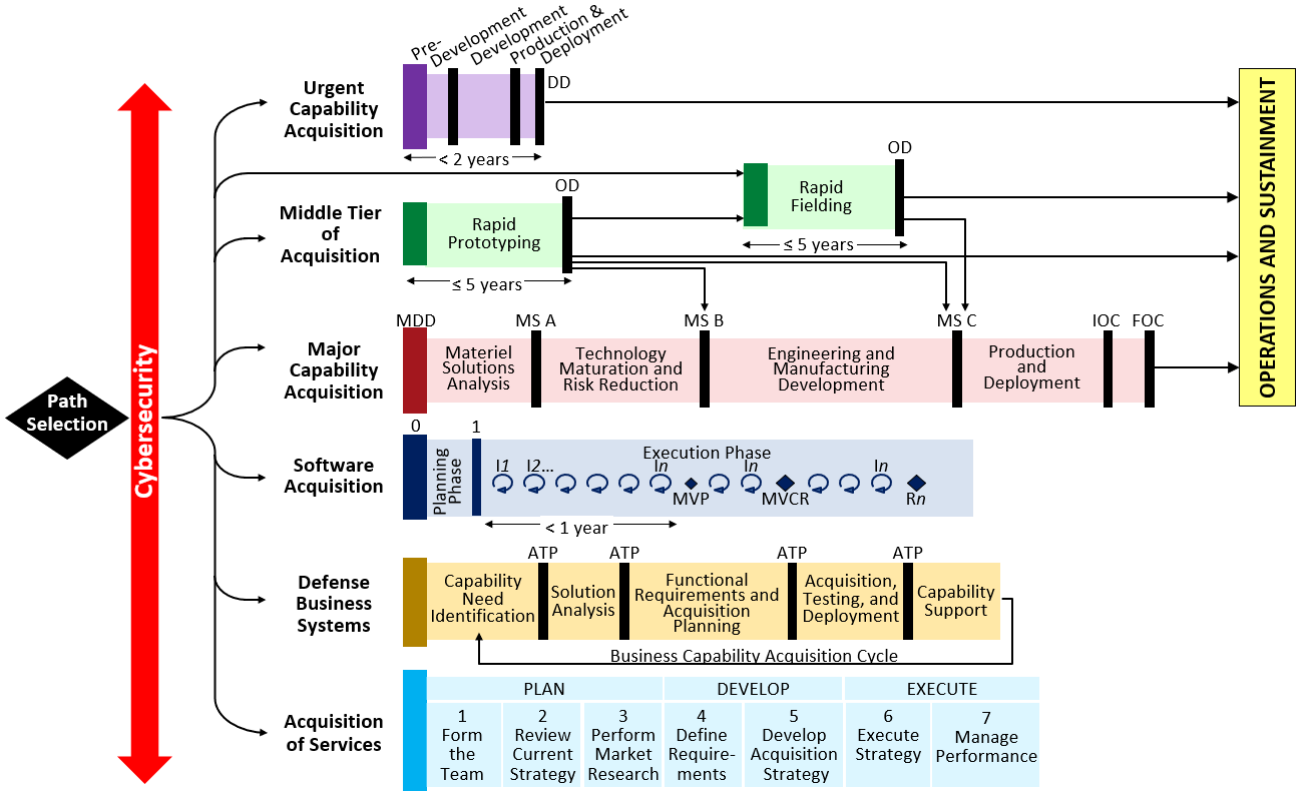
- Type of acquisition
- Complexity
- Novelty
- Technology
- Pace
- Scope
- Greenfield vs brownfield
- Lifecycle approach

- What else? Grounded theory approach - we will capture anything else that seems useful and determine if there are any patterns

We hope to collect data on

- Common DE policies, processes, and methods
- DE implementation
  - Tools
  - Templates
  - Common data sources

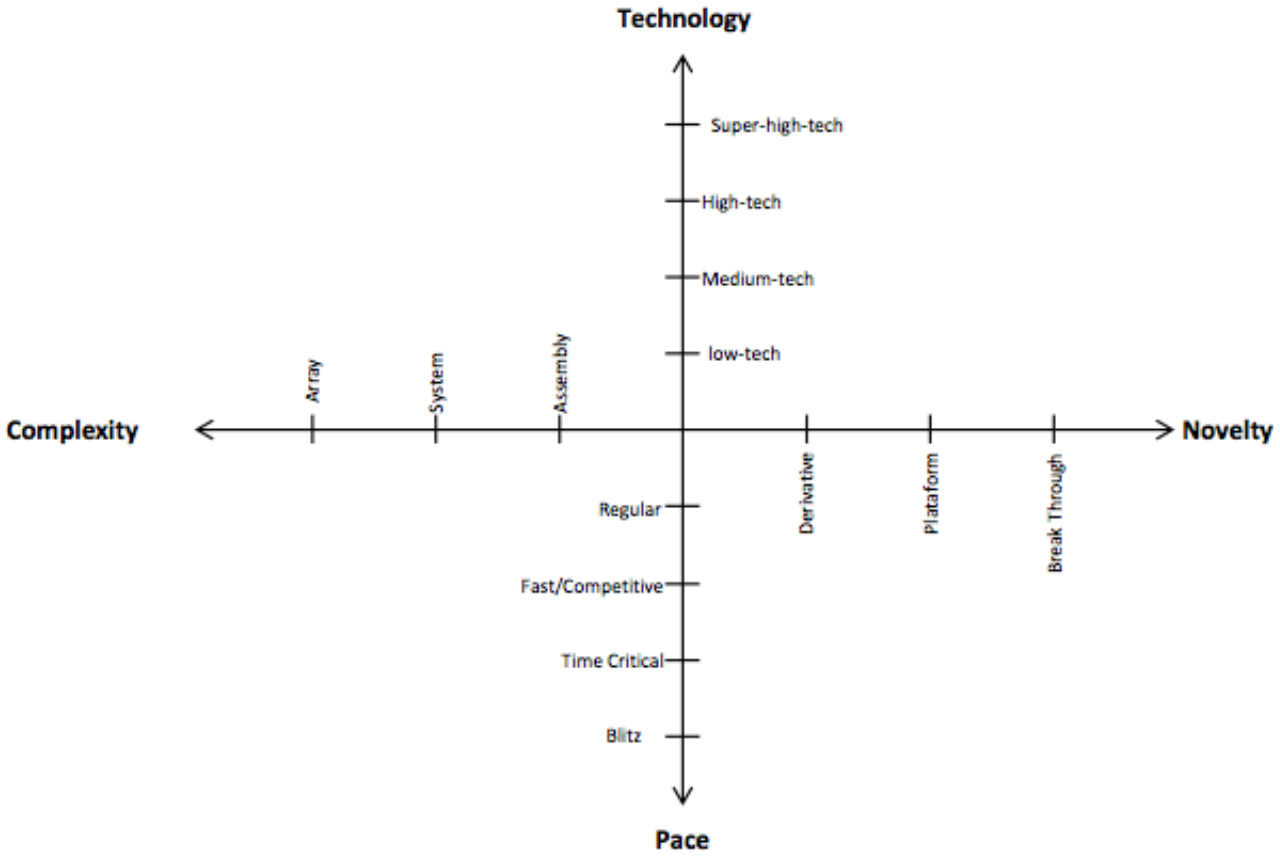
ACQUISITION TYPE



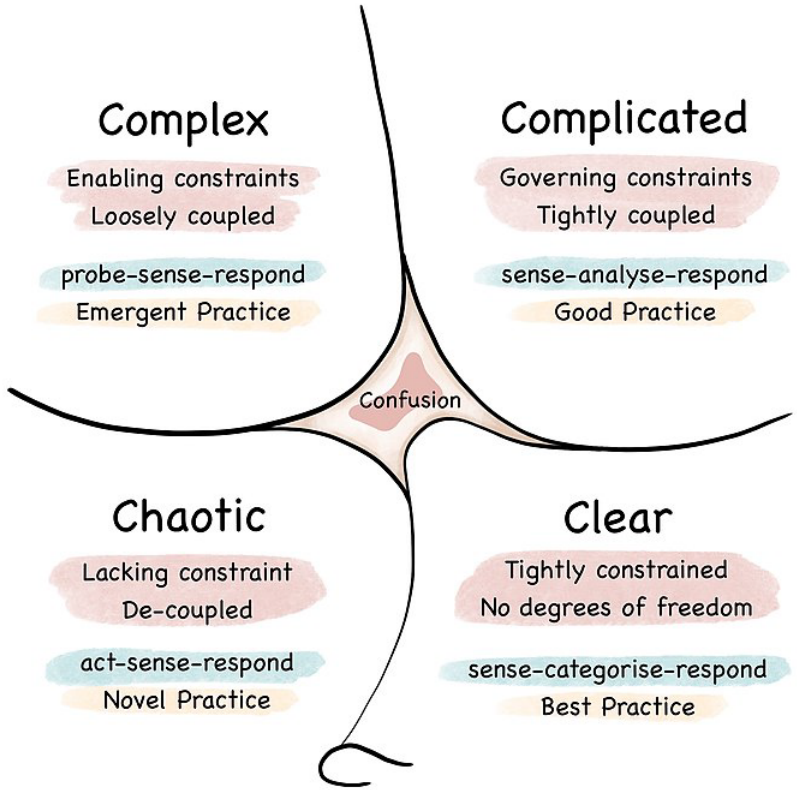
Adaptive Acquisition Framework (DAU 2023)

- Within MCA programs, ACAT classification will also be captured.

COMPLEXITY

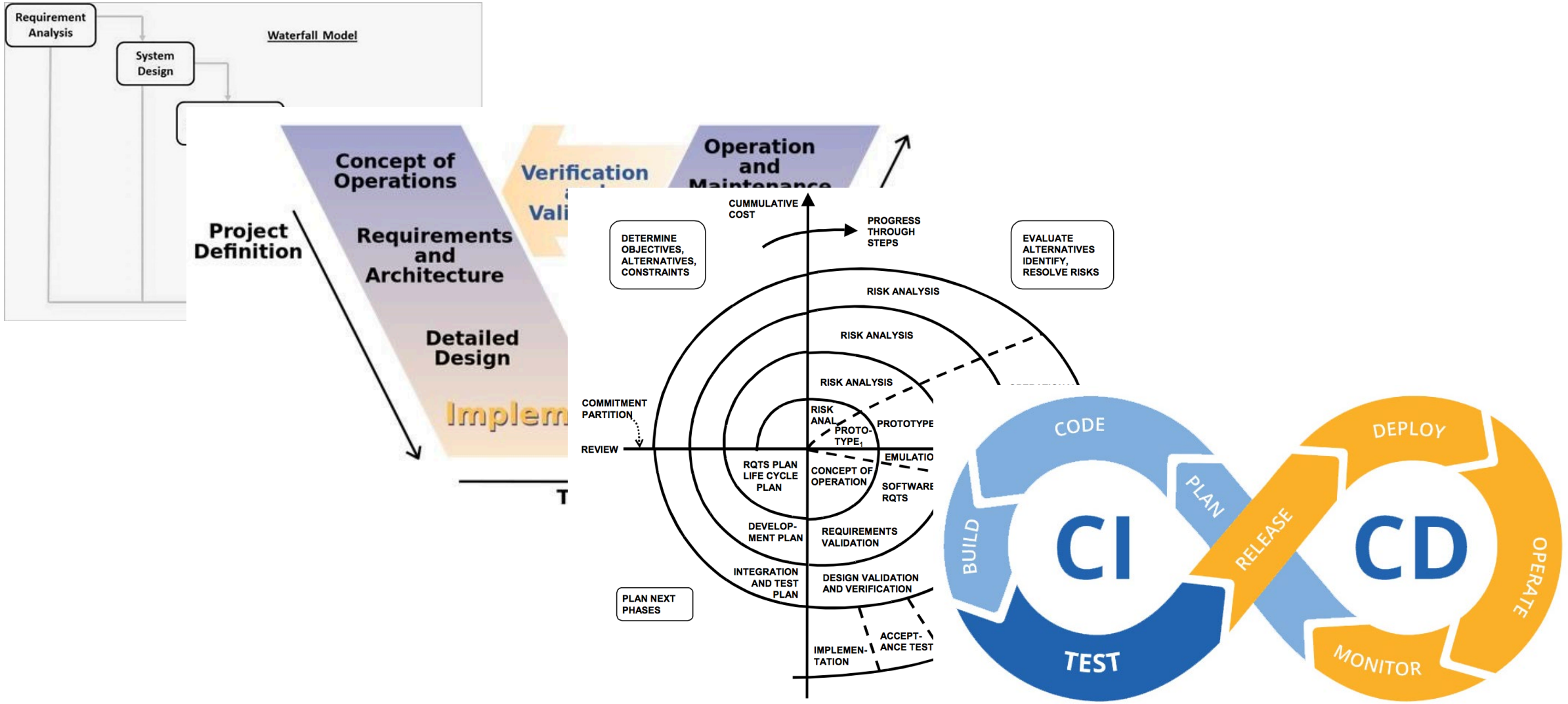


(Shenhar and Dvir 2007)



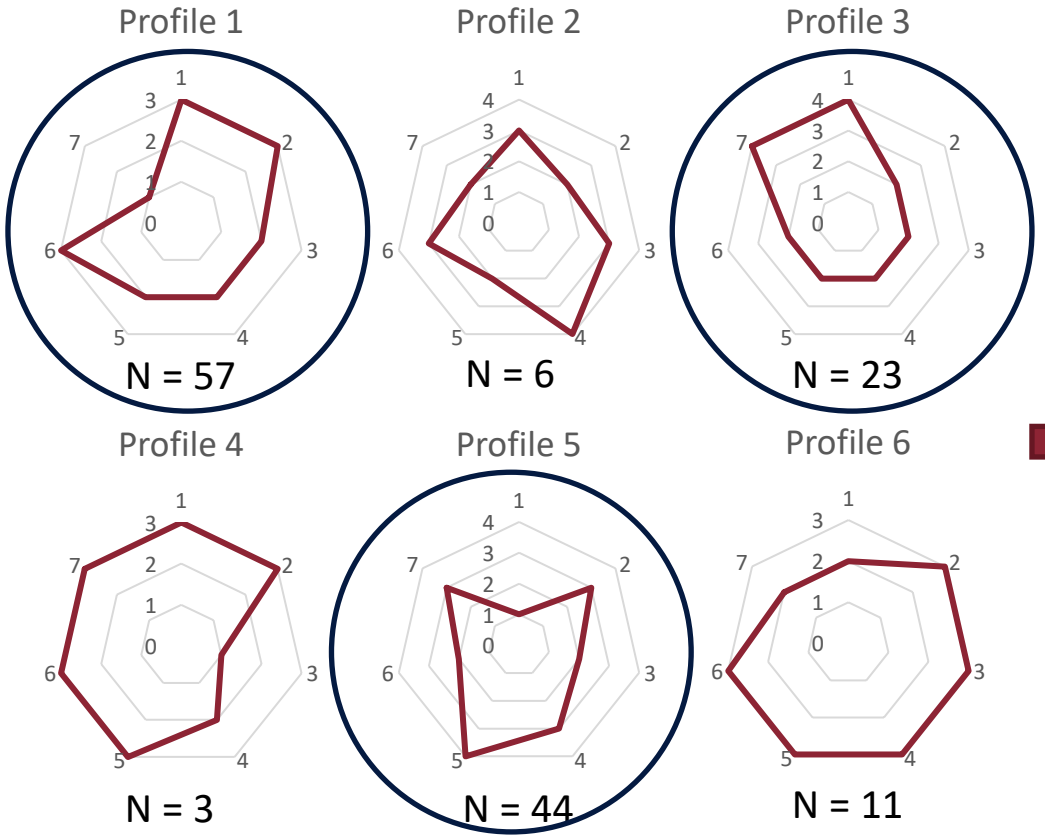
Cynefin Framework (Snowden and Boone 2007)

SYSTEMS LIFECYCLE APPROACH

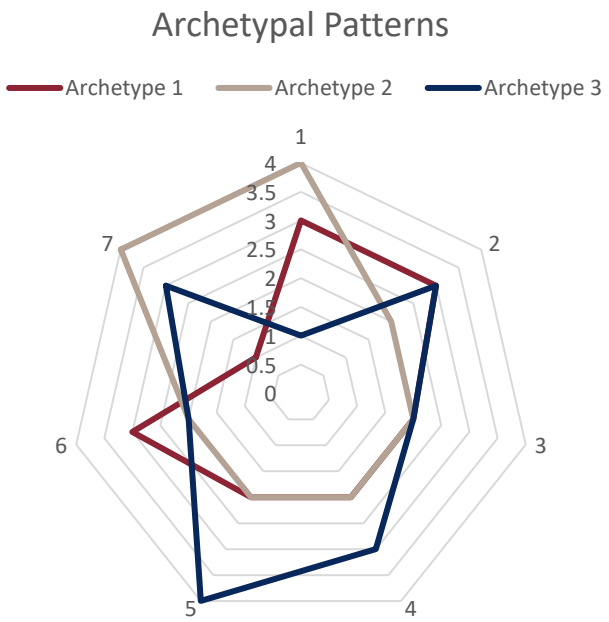


ANALYSIS TO DRAFT PROGRAM ARCHETYPES (**NOTIONAL**)

- Analysis of data to identify common profiles/patterns > archetypes



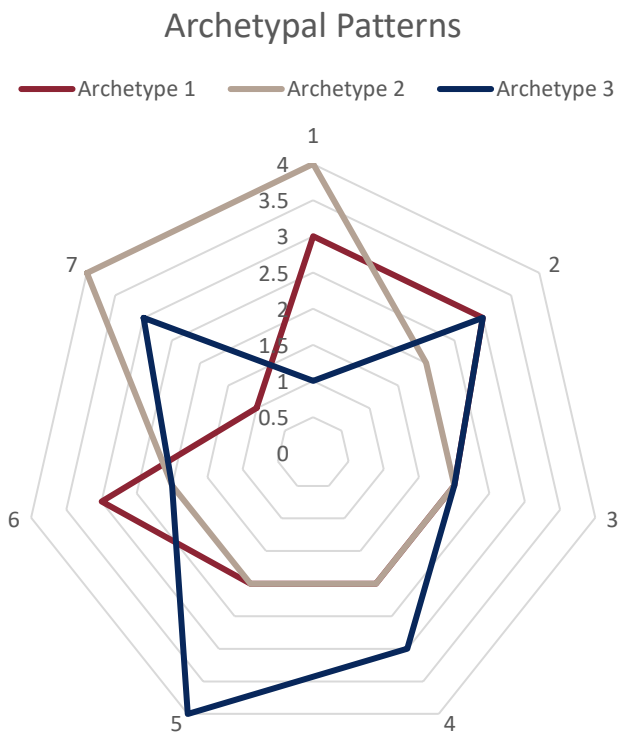
- More programs with the same pattern → Archetypes
- Threshold for selecting archetypes will not be understood until the data is collected

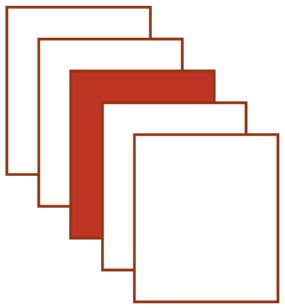


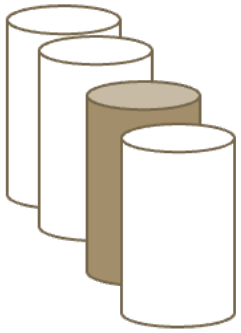
To this point, some of the data is relatively available through sources like DAVE. To make the connection between program archetypes and DE implementation, we need more detailed data.

- DE Environment/Ecosystem/Architecture
- Data structures
- Data sources
- Toolsets
- Templates
- Policies/Procedures

END GOAL

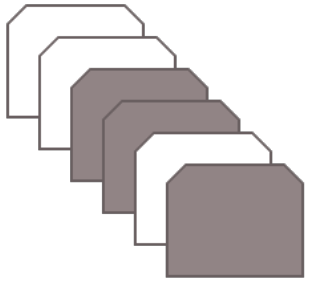






DE Environment Architectures

Data Structures



Toolsets

Templates

- Common patterns for digital engineering environments by archetype
- Starting place for new programs
- Insight for existing programs

QUESTIONS AND DISCUSSION

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