



NAVAL
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The Agile Scheduling Process: *Kanban*

A Lean Approach to Workflow Optimization

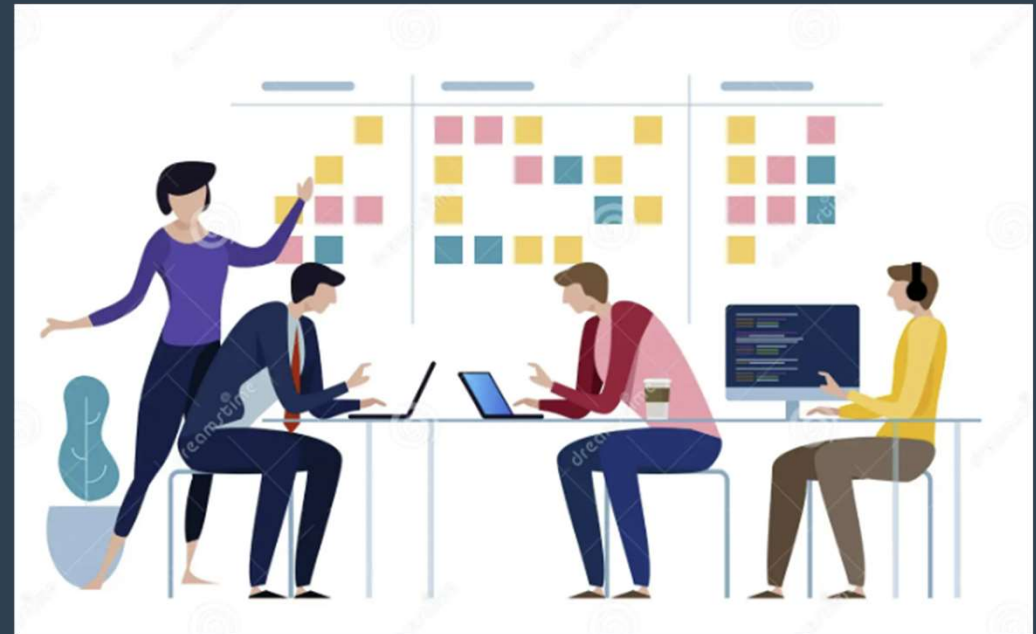
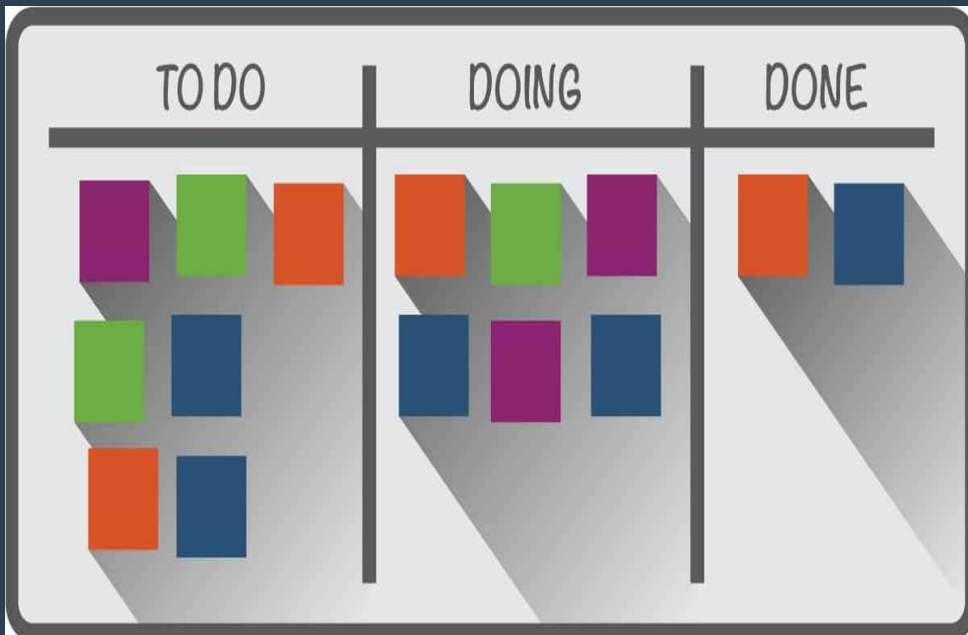
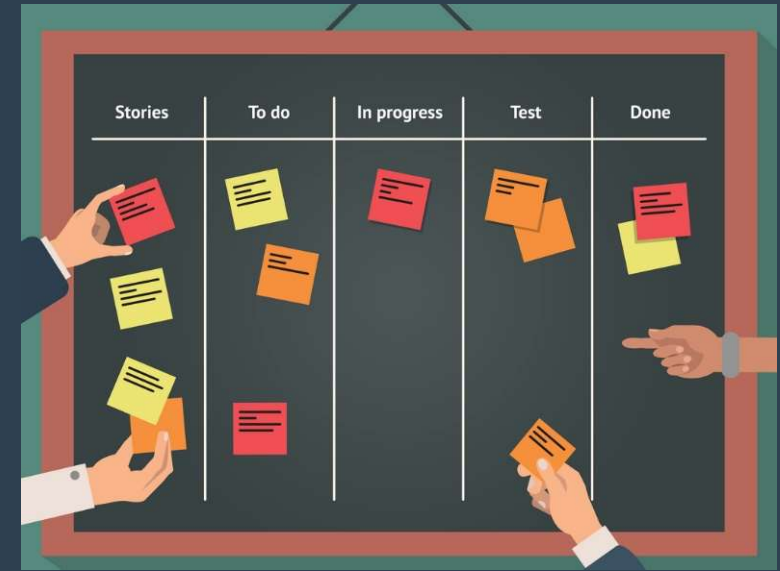
SE 4003

December 2, 2024

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Agenda

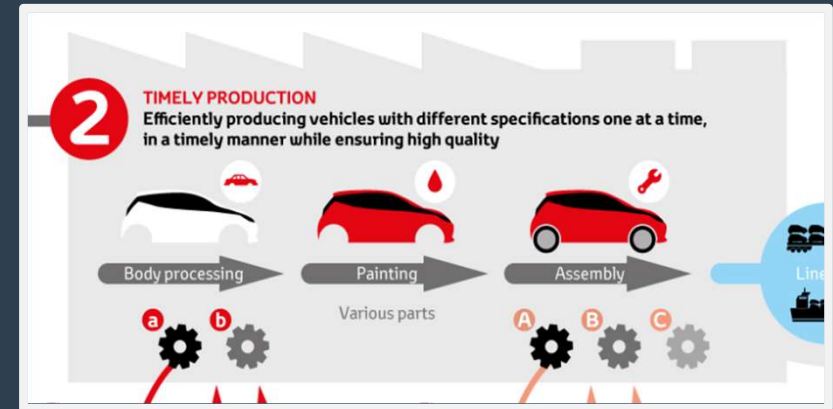
- Background and Motivation
- Overview
- Kanban in Defense Applications
- References



Background and Motivation

- **What is *Kanban*?**

- Kanban means “signal” in Japanese
- Originates from the Toyota Production System (TPS) (Sugimori et al., 1977)
- Kanban was designed as the scheduling system for Toyota’s lean manufacturing system
- Enables pull production through visual workflow management – facilitates transparency to achieve a quality deliverable through a continuous flow



The TPS: Principle and Lean Manufacturing (2022)



- **Motivation:**

- Addresses inefficiencies like overproduction and poor workflow transparency (Braglia et al., 2020)

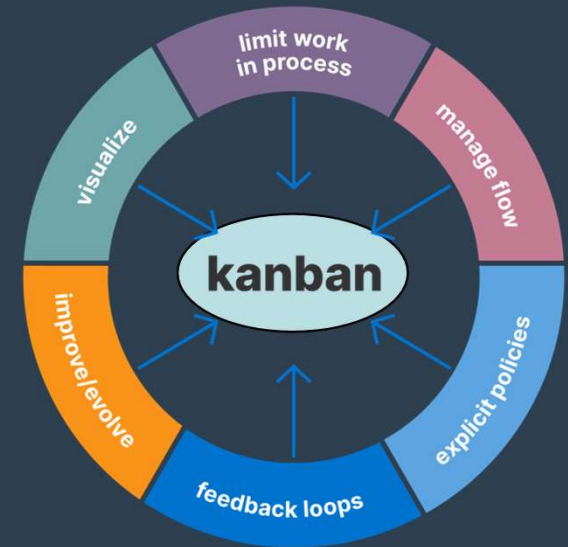
- **Key Question:**

- How is Kanban different from traditional Scrum?..

Overview

- **Six general practices of Kanban:**

- 1) Visualize the Workflow
- 2) Limit Work in Progress (WIP)
- 3) Manage the flow of work
- 4) Make the process/policies explicit
- 5) Implement feedback loops
- 6) Improve collaboratively and evolve experimentally



- **Core Principles**

- Visualize tasks, limit work-in-progress, reduce context switching, and optimize flow (Monden, 2011)

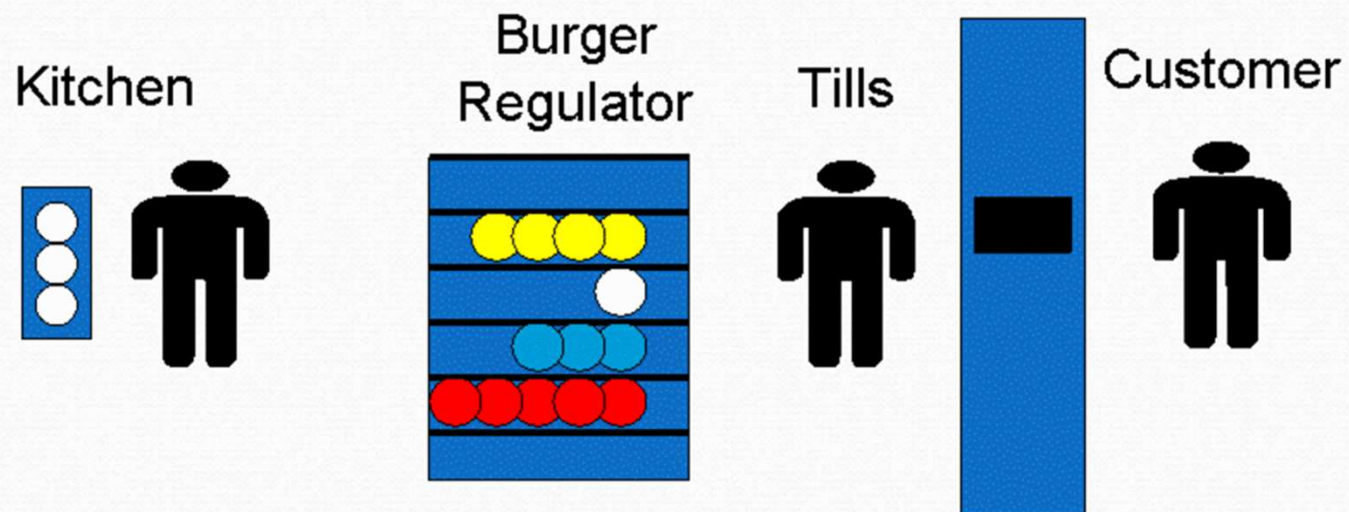
- **Continuous improvement through iterative processes (Reddy et al., 2023)**

- **Components:**

- Kanban boards (typically made of cards/sticky notes within columns) are utilized to manage workflows effectively
- Boards can be physical, digital, or both; boards must be located in a public venue

Overview (cont.)

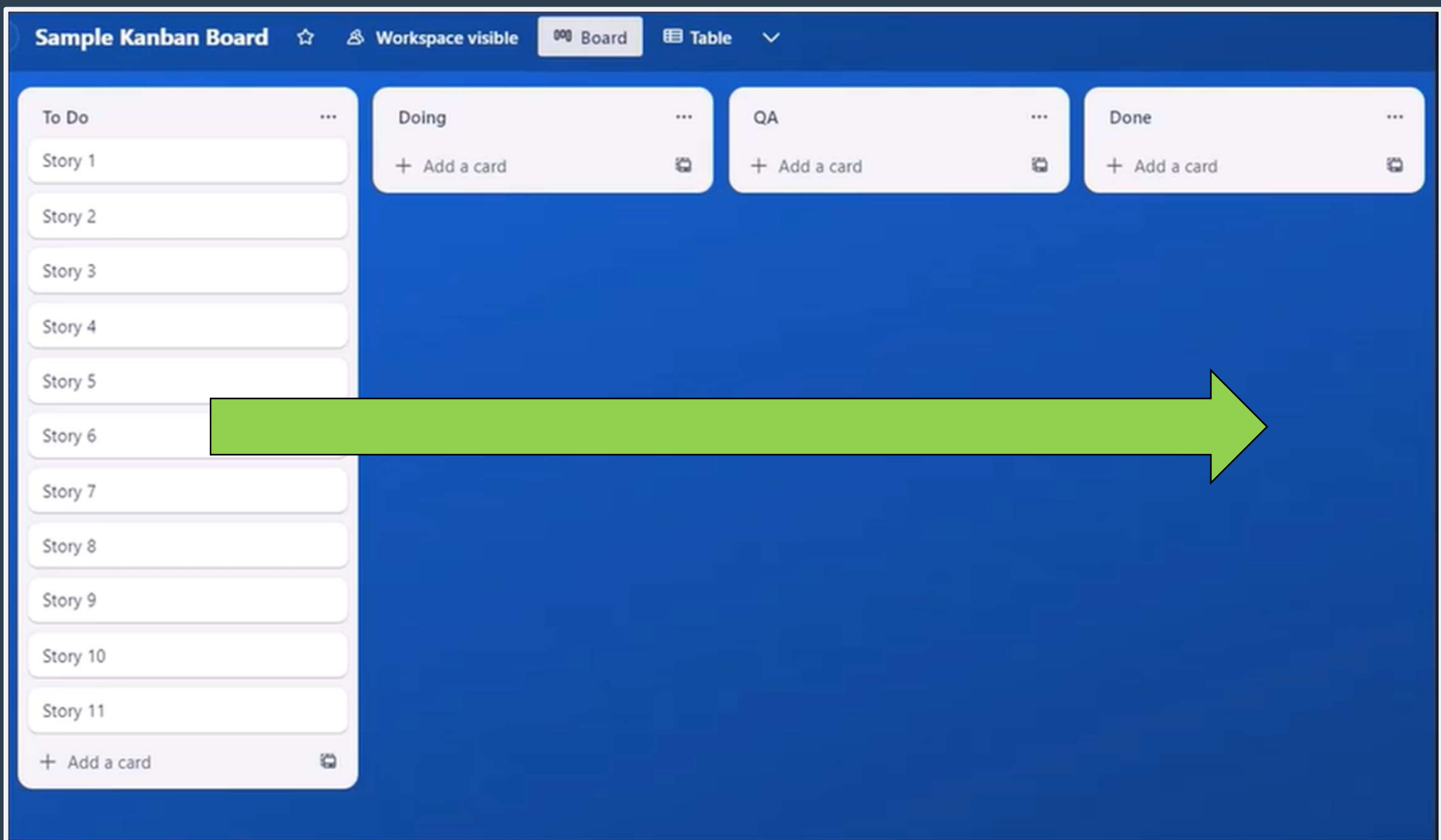
Kanban: A Simple Real Example



As each burger is consumed . . .
They are removed from the regulator . . .
And then replenished by the kitchen . . .
Not made to a forecast and pushed at the customer

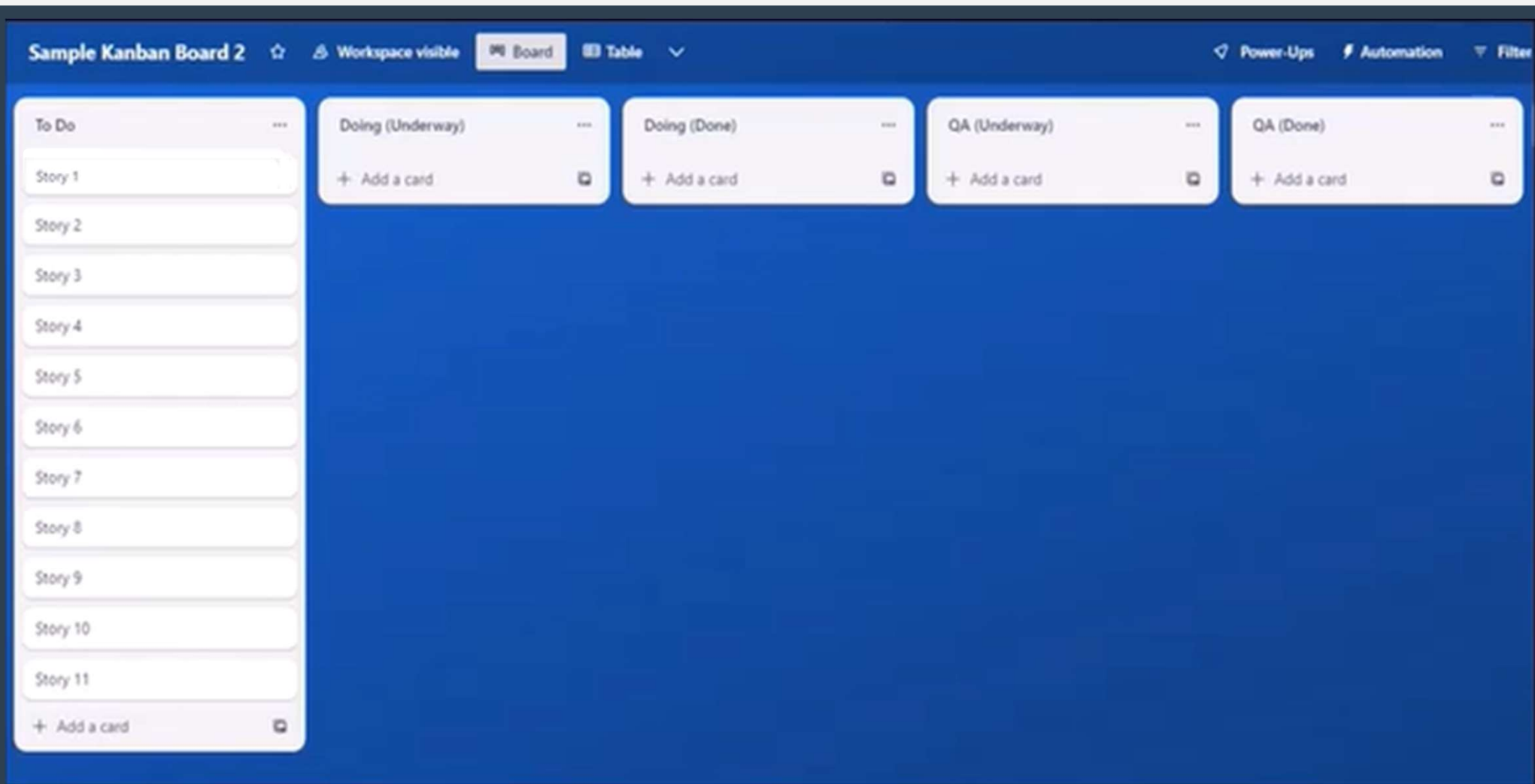
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Overview (Kanban Board)



Sample Kanban Board (Payne, 2023)

Overview (Kanban Board, cont.)

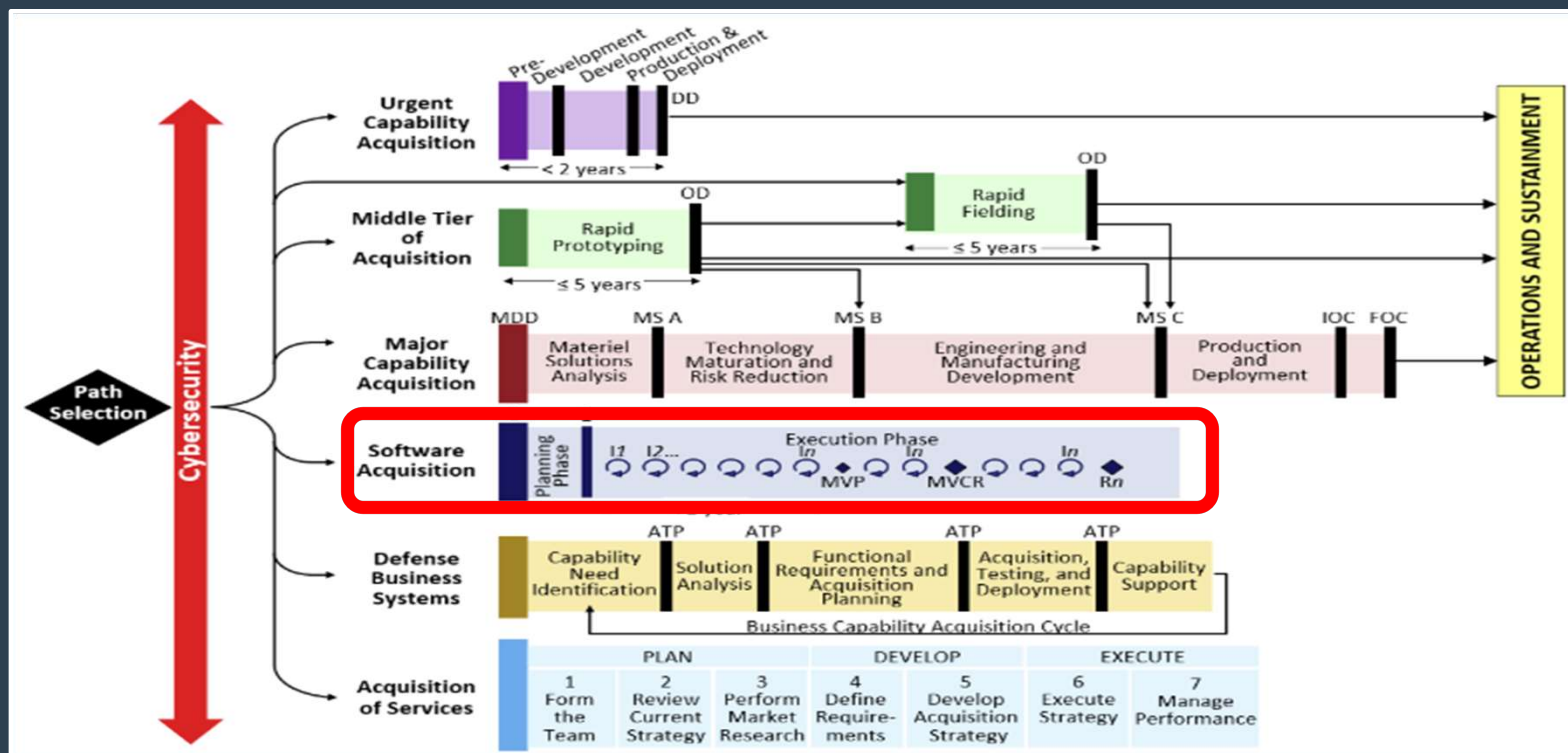


Sample Kanban Board (Payne, 2023)

- Both the *Doing* and the *Quality Assurance (QA)* columns are further subdivided into two columns each; an *Underway* and a *Done* column

Defense Applications

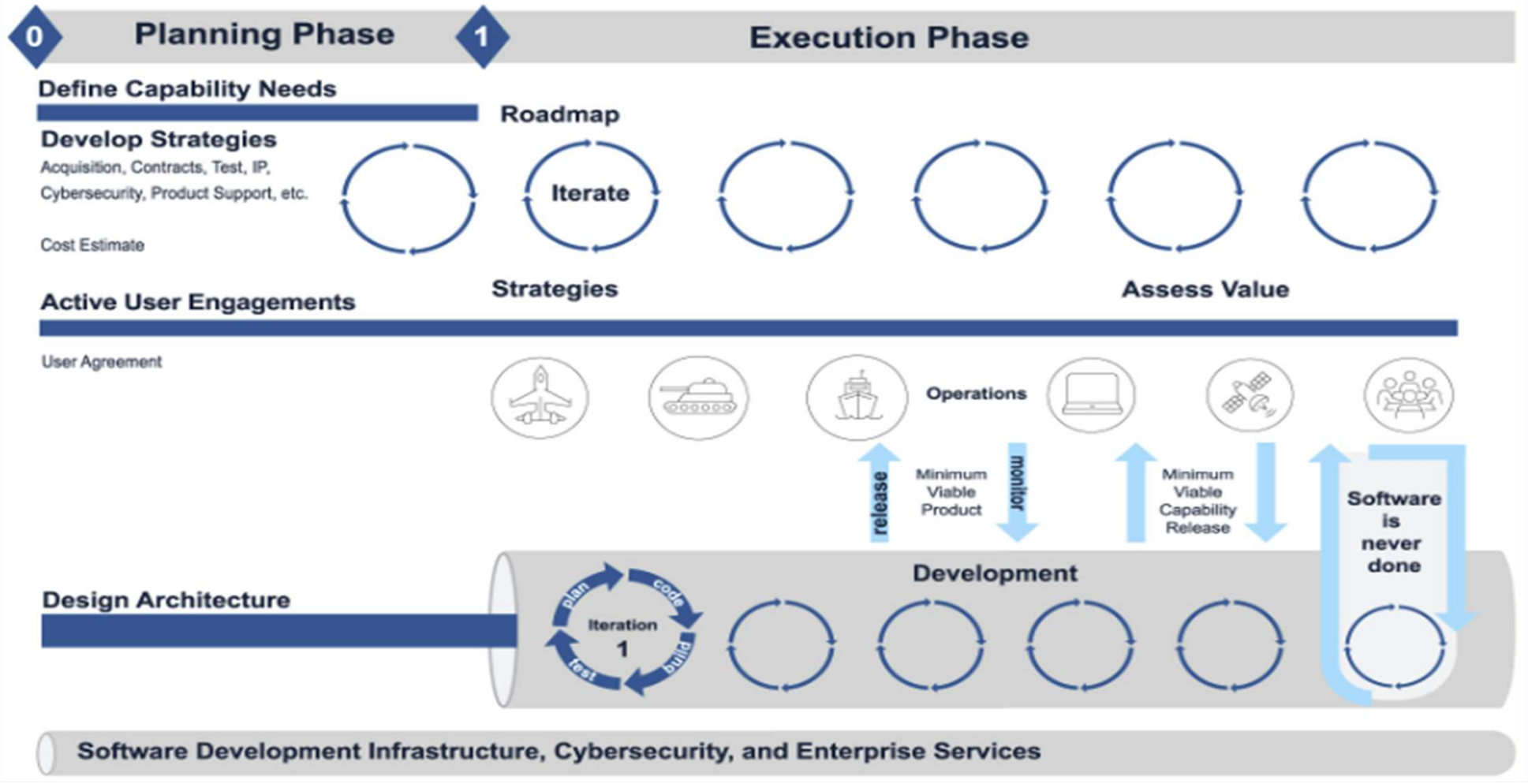
- **How is Kanban Relevant to Military/Defense Applications?**
 - The ability to visualize tasks, limit work-in-progress, and flow/process optimization can be applied to a myriad of military tasks: maintenance, training/readiness, etc.
 - However, Kanban is particularly useful in the management of DoD software programs or programs that rely heavily on integrated software to meet their given requirement.



Adaptive Acquisition Pathways (DAU, 2020)

Defense Applications (cont.)

Lifecycle View of Software Acquisition



Software Acquisition Lifecycle (DAU, 2020)

References

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