26TH ANNUAL

26TH LCI CONGRESS
OCTOBER 22-25, 2024

AI-Powered Scrum: Streamlined Success in Design & Construction

Felipe Engineer-Manriquez, The Boldt Company

Tom Martin, Sutter Health

Cristobal Gonzalez, Cristobal.Creates

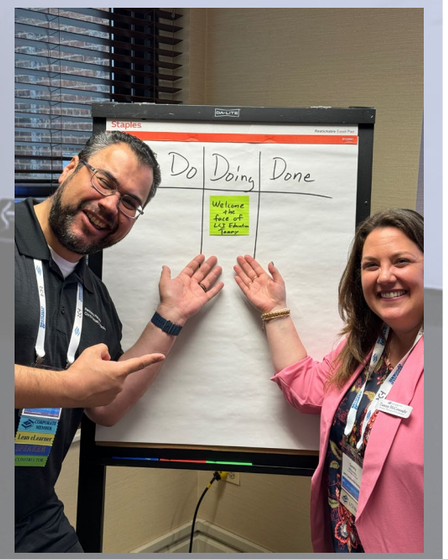


SURFING THE WAVE OF LEAN DESIGN AND CONSTRUCTION

Tuesday October 22, 2024

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Felipe Engineer-Manriquez



Co-Developed Registered Scrum Master™ (RSM) for Construction Professionals



https://thefelipe.bio.link/

REGISTERED SCRUM TRAINER by scruminc.

REGISTERED PRODUCT OWNER by scruminc.

REGISTERED SCRUM MASTER by scruminc.

REGISTERED SCRUM@SCALE PRACTITIONER by scruminc.



LCI Chairman's Award Recipient

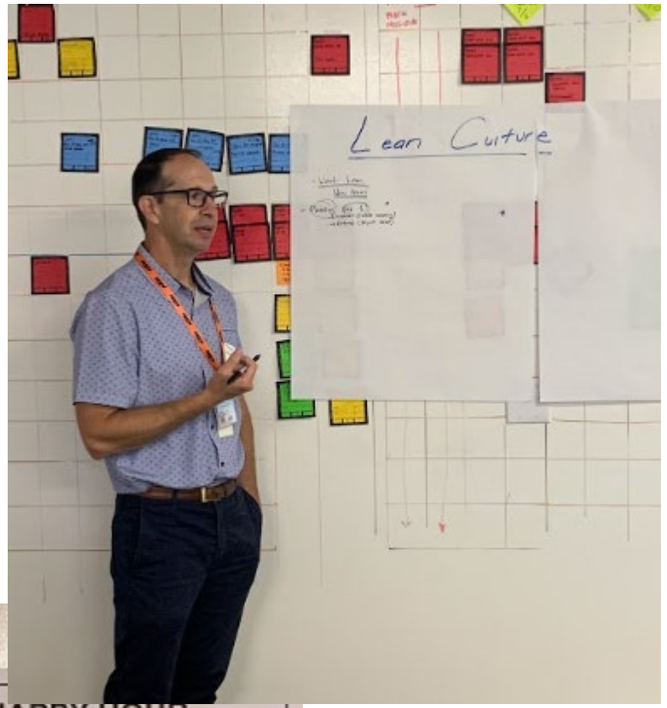
International Scrum Training
Virtual or In-Person



Tom Martin

Area Director, Sutter Health Project Delivery

LCI Northern California CoP





thomas.martin@sutterhealth.com

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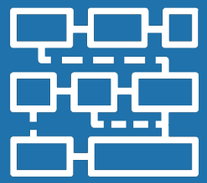
“LCI would like to acknowledge and thank Felipe Engineer-Manriquez of the Boldt Company and Stephanie Roldan of Rosendin Electric for their leadership, work, and collaboration to create this workshop. Learning opportunities like this exist because people like Felipe and Stephanie engage to create them.”

-Kristin Hill,
LCI, Director Education Programs

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Workshop Learning Objectives



01.

Master Scrum Fundamentals with an AI Twist: Grasp the essentials of the Scrum framework, enriched with AI integration, to enhance your project MGMT skills in design and construction.

02.

Understand the powerful combination of Scrum methodology and AI tools like Chat GPT and Claude, discovering how they revolutionize construction project management.

03.

Experience hands-on application of Scrum and popular AI platforms

04.

See the path to use the Scrum framework individually and/or with your teammates supplemented with Generative AI

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LCI Course:
AI-Powered Scrum: Streamlined Success in Design & Construction
4 CEU

Email Felipe for Certificate to be used with self-reporting hours

AIA Approved Continuing Education

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Introductions via Post-it notes

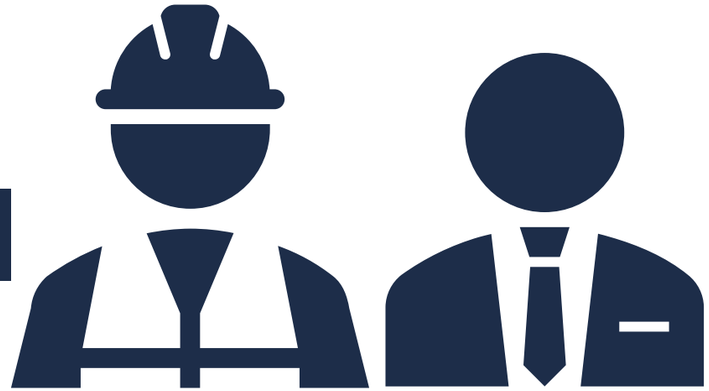
Tom
Project Delivery Area Manager
25+

Felipe
Project Delivery Support
25+

_____ is the one thing I must learn in this session.



My name / role is…



years Lean experience



years in industry

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Rules of Engagement

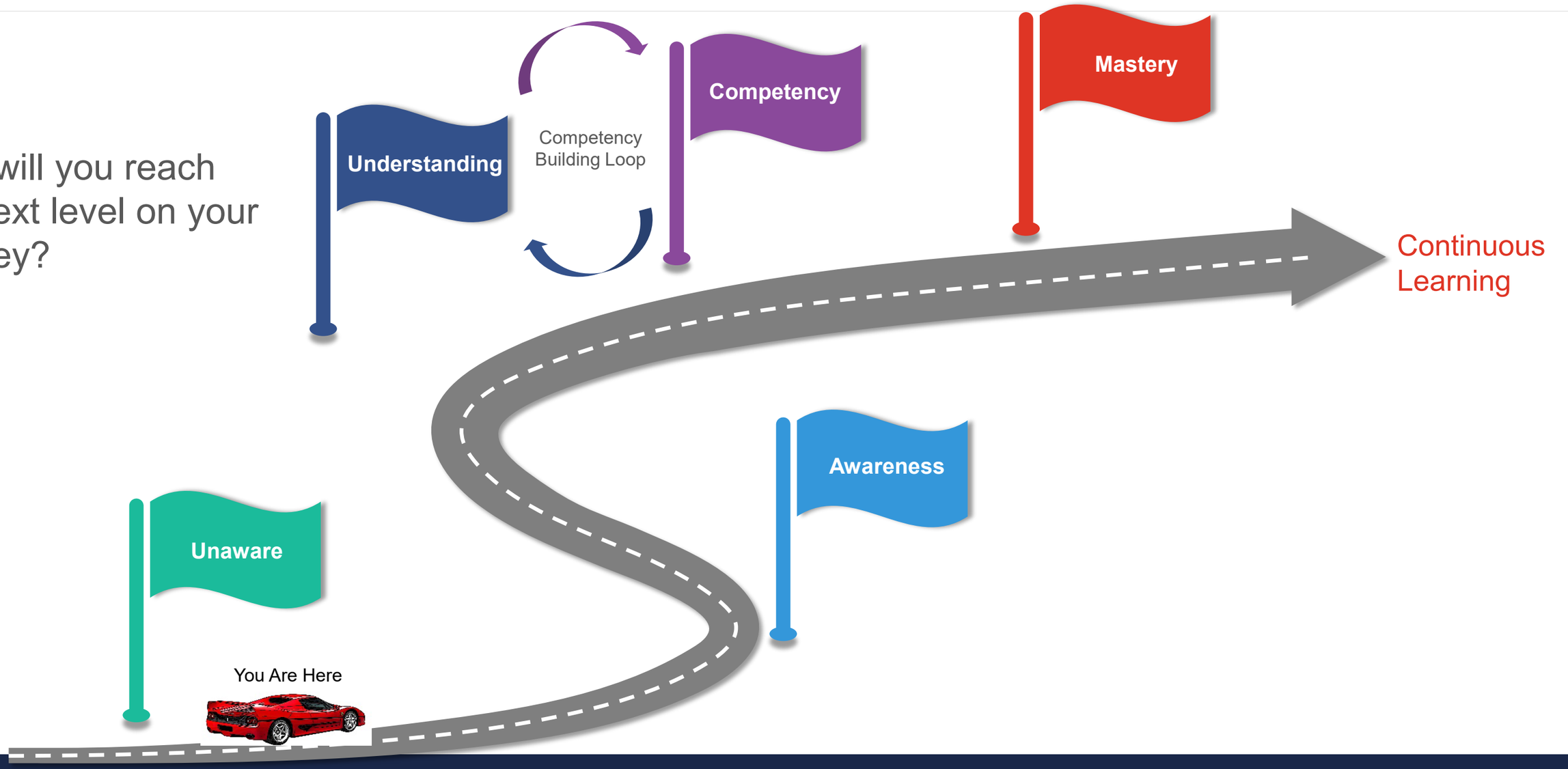
- This is a safe zone
- Everyone has equal status
- Speak up and share your ideas
- Actively listen to others
- One conversation at a time
- Use E.L.M.O.
- Silence phones
- Be focused and engaged
- Stay on time
- Have fun!

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Lean Journey to Mastery

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How will you reach the next level on your journey?



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WARNING

Using Lean principles and Agile methods result in increased capacity.

More time to improve, optimize, and coach others will be YOUR problem.

The Scrum Framework

As a Scrum practitioner, I need to know the Scrum framework so that I can adapt it to my work.



Construction Scrum - [Audio Ch9] The Scrum Guide for Designers and Builders

constructionscrum.com/downloads

GOAL

DEVELOPMENT TEAM

DAILY SCRUM

SCRUM MASTER

SPRINT PLANNING

TO DO

PRODUCT OWNER

BACKLOG

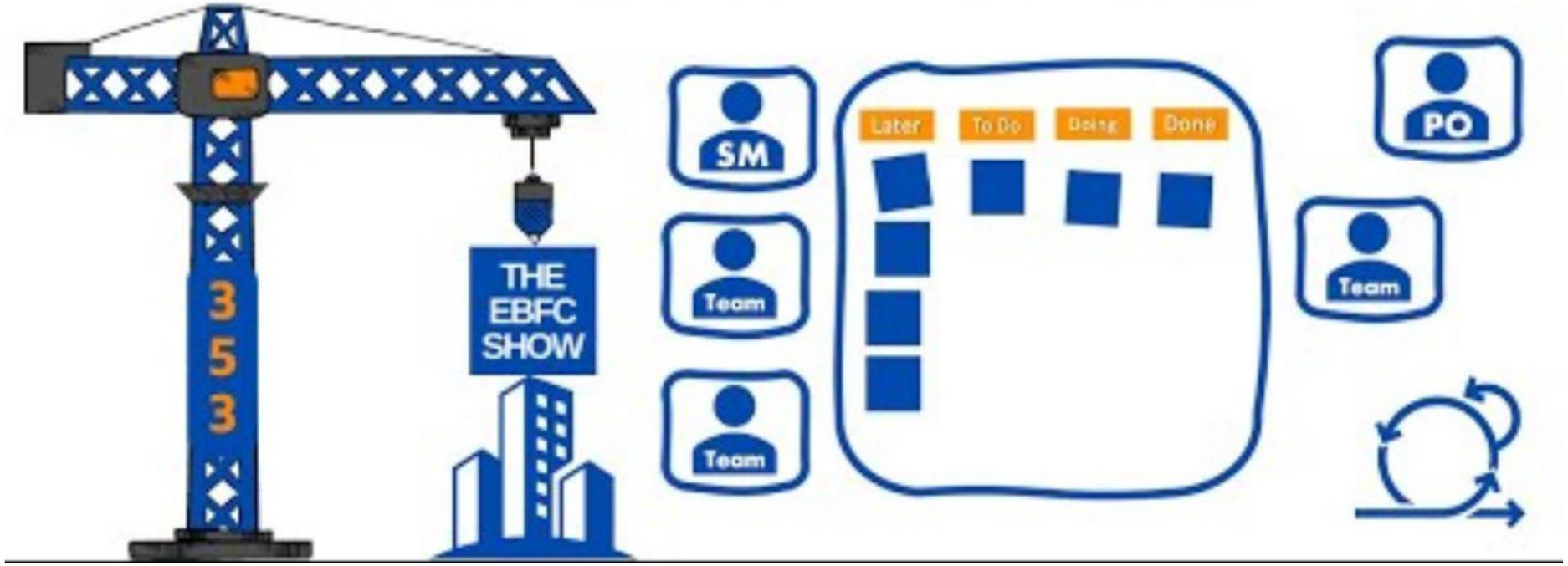
SPRINT TIME BOX

SPRINT REVIEW

Done

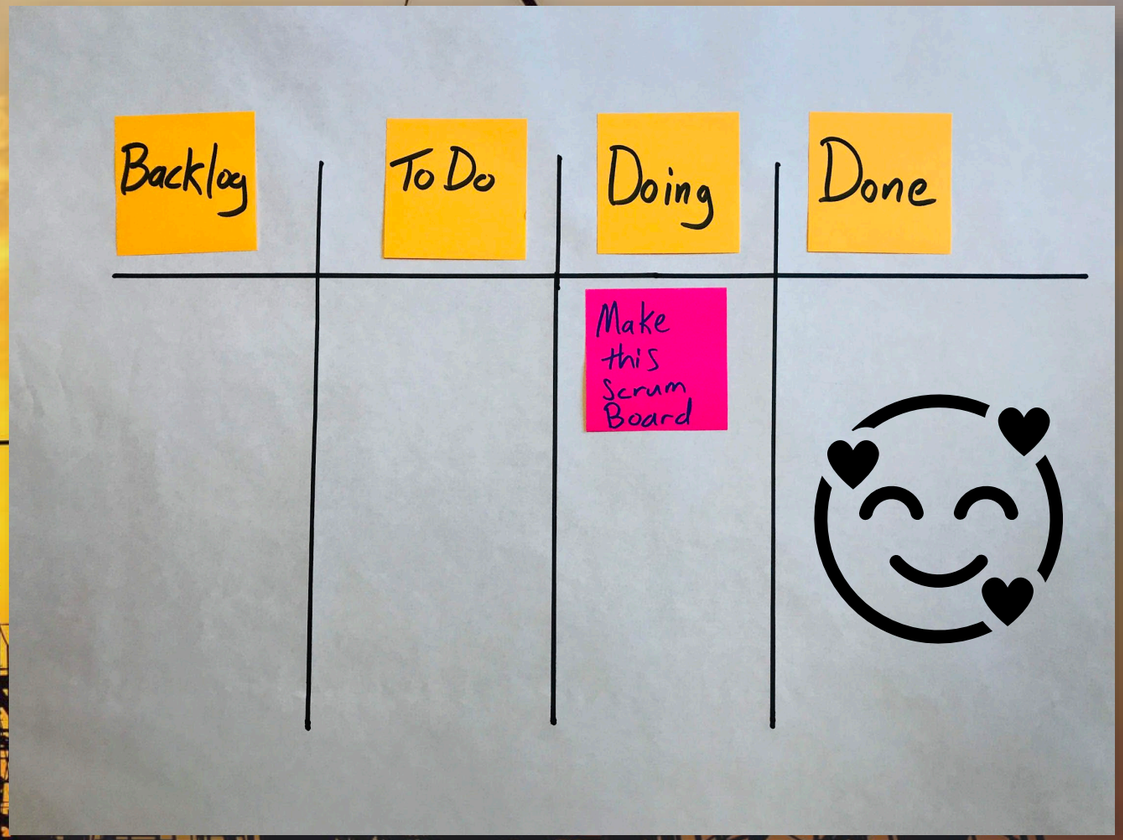
SPRINT RETROSPECTIVE

How does Scrum work in Construction?



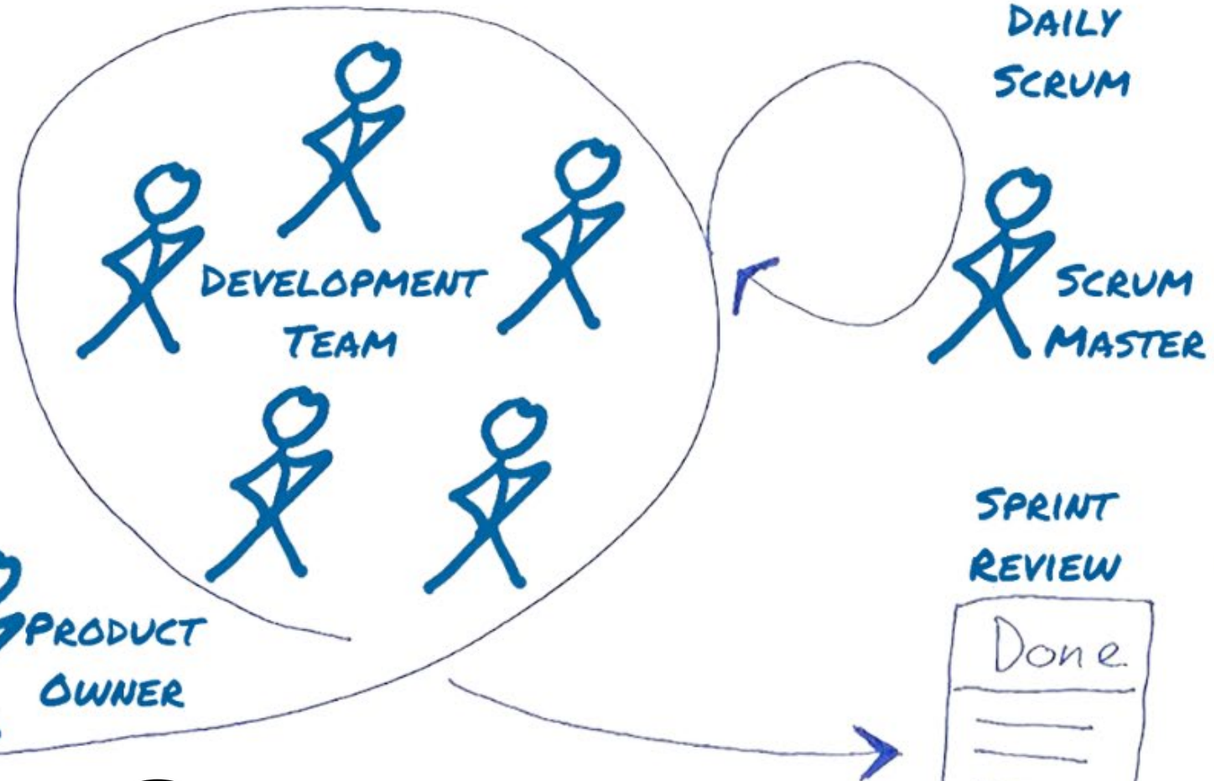
https://youtu.be/OmFJ_RwoUN4

Make a Scrum Board

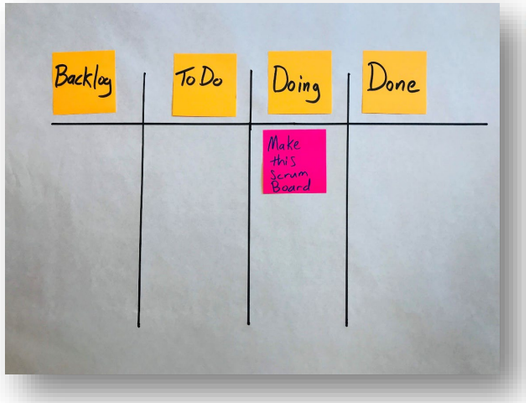


1 **What goal do you want to achieve in this workshop?**





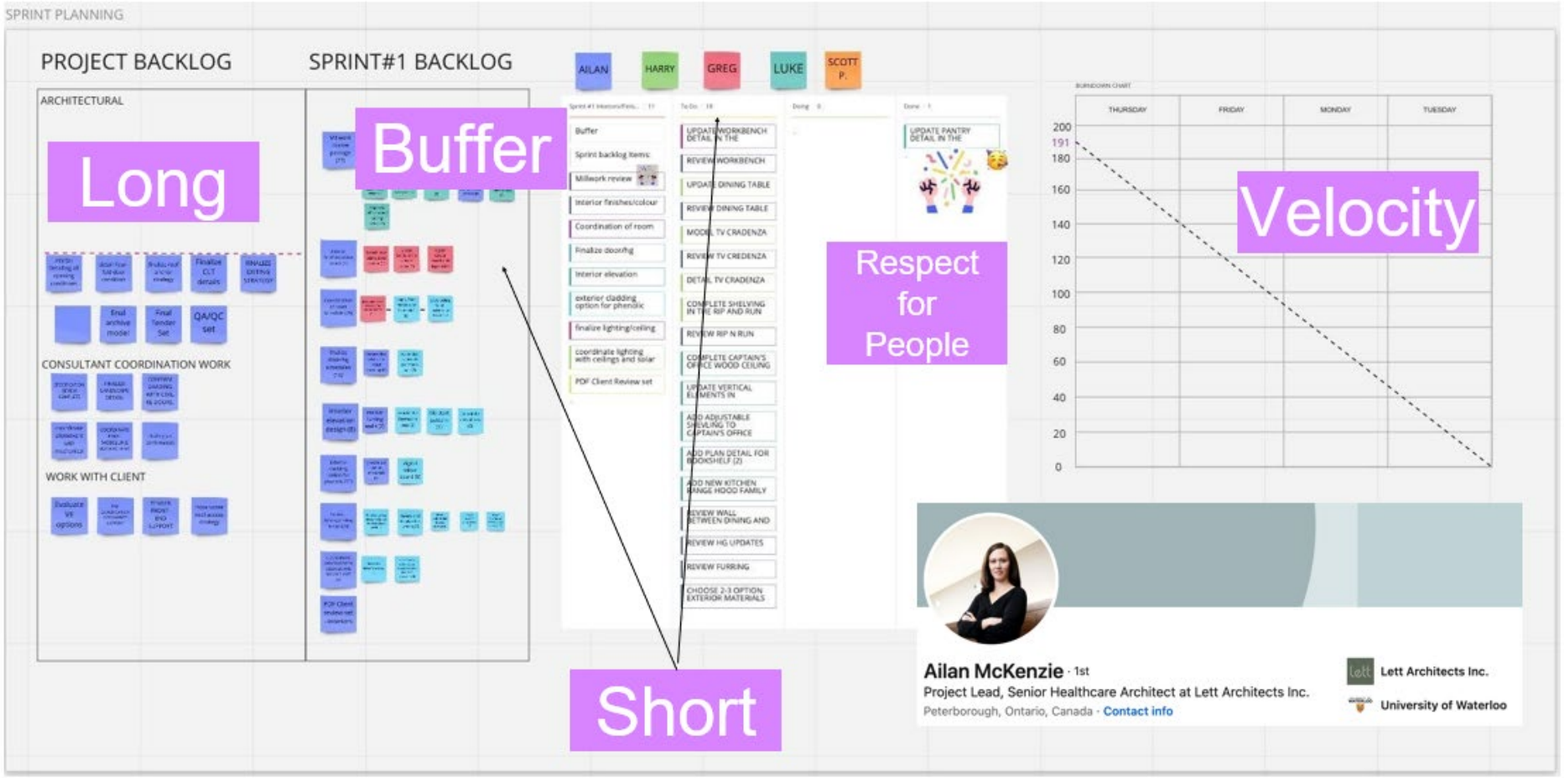
2 **Make work visible.**

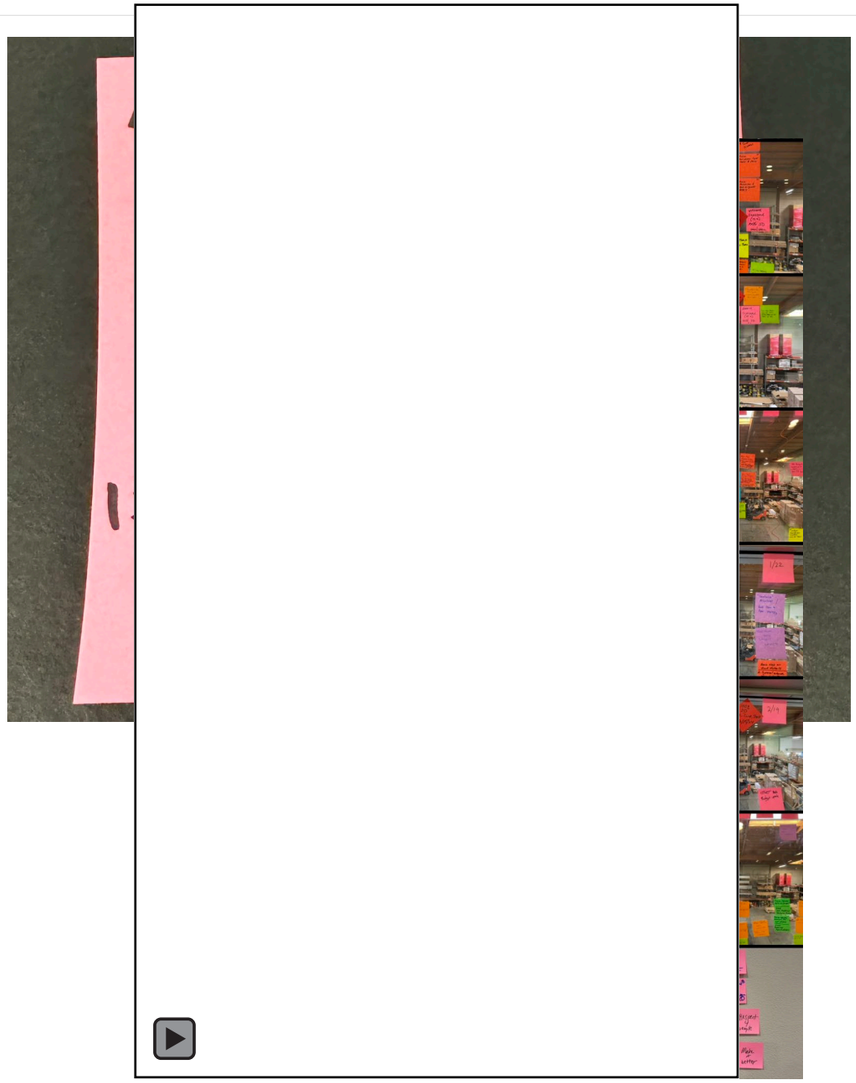


3 **Make a Post-It for each learning objective.**

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Why are we talking about Scrum in D+C?

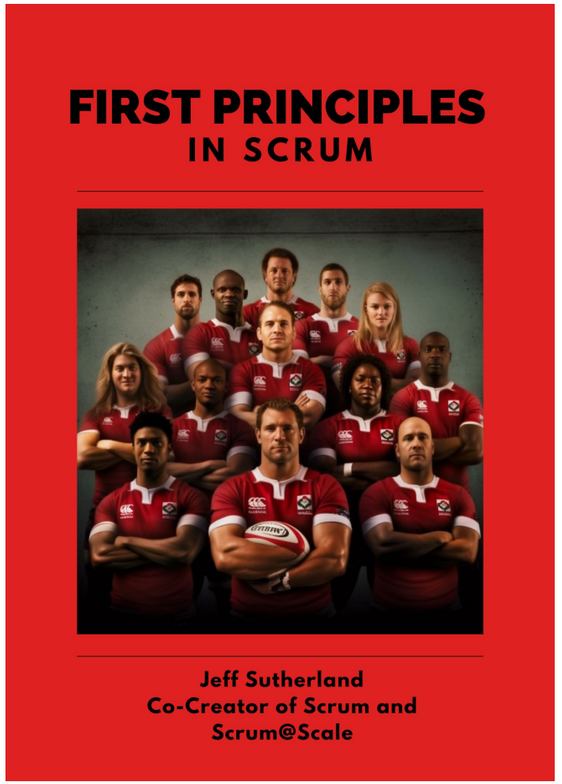




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We Are Going to Have a Different Conversation About Scrum

- Scrum is a framework that emerged from physics, evolution of the brain, complex adaptive systems, AI and robotics.
- We are going to look at Scrum from First Principles
- AI is changing the world. AGI is projected by 2025. AI must be both a collaborator with every team member and a member of the team.
- Twice the work in half the time is not enough when AI does 80% of the work. We need five times the work in 1/5 the time to compete.
- Current Scrum research is focused on whether the synergy of a team of individuals who do five times the work in 1/5 the time can go 25 times faster (analysts are predicting this will happen before 2030).



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“Human in the Loop”



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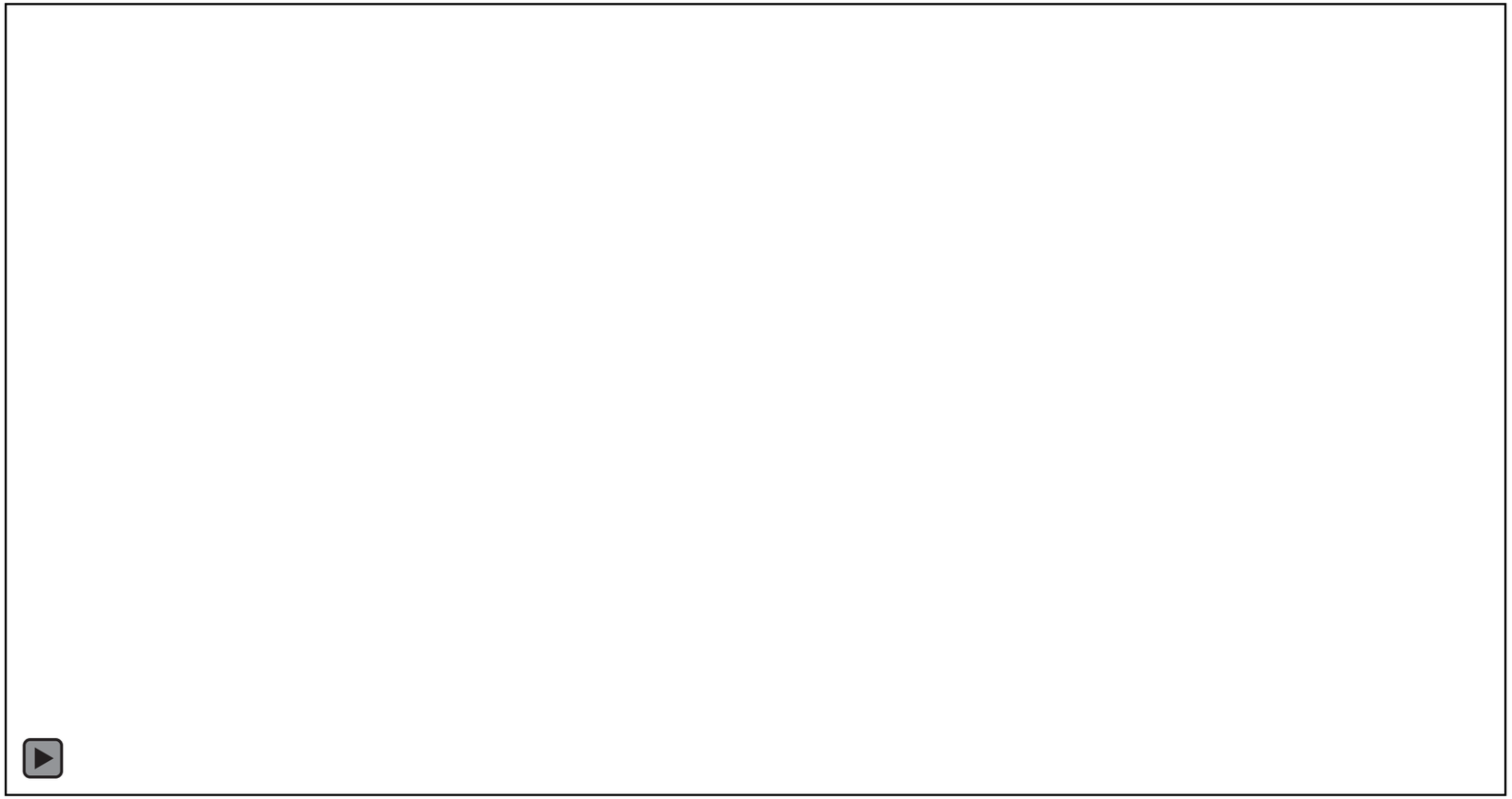
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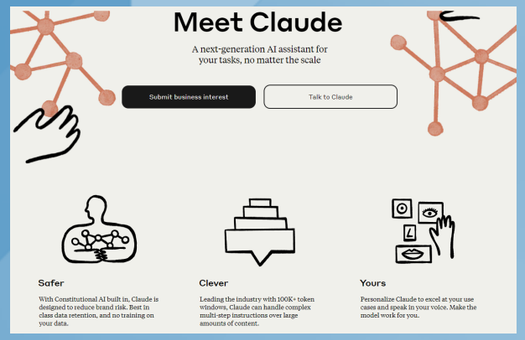
AI Activity https://claude.ai/

_____ is the one thing I must learn in this session.

As a design and construction professional, I want to learn how to effectively use AI and Scrum to better align my team's conditions of satisfaction using Scrum.



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"Human in the Loop"



Based on the objective of learning how to effectively use AI and Scrum to better align the team's conditions of satisfaction, the most relevant Scrum roles would be the Product Owner and the Scrum Master.

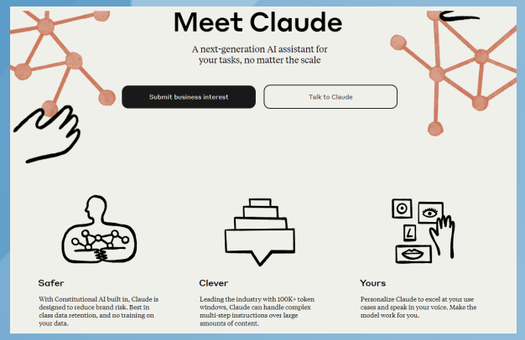
Product Owner:
The Product Owner is responsible for maximizing the value of the product resulting from the work of the Scrum Team. In this context, the Product Owner's responsibilities would be crucial in achieving the desired learning outcome:

1. Understanding the team's conditions of satisfaction: The Product Owner is responsible for clearly defining and communicating the requirements, goals, and conditions of satisfaction for the product or project. This aligns with the objective of better aligning the team's conditions of satisfaction using Scrum.

2. Prioritizing the Product Backlog: The Product Owner would need to prioritize the tasks and requirements related to understanding and implementing AI and Scrum practices effectively. This would include tasks such as researching AI tools, defining how AI can enhance the team's processes, and identifying areas where Scrum practices can be optimized.

3. Collaborating with the team: The Product Owner works closely with the development team, including designers and construction professionals, to ensure a shared understanding of the project's goals and conditions of satisfaction. This collaboration would be crucial in effectively integrating AI and Scrum practices into the team's workflow.

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"Human in the Loop"



Based on the objective of learning how to effectively use AI and Scrum to better align the team's conditions of satisfaction, the most relevant Scrum roles would be the Product Owner and the Scrum Master.

Scrum Master:
The Scrum Master is responsible for ensuring that the Scrum framework is followed and that the team is working effectively. The Scrum Master's responsibilities would also be relevant in achieving the desired learning outcome:

1. Facilitating Scrum events: The Scrum Master facilitates Scrum events such as Sprint Planning, Daily Scrums, Sprint Reviews, and Retrospectives. These events provide opportunities for the team to discuss and align on the conditions of satisfaction, as well as identify areas for improvement in their processes, including the integration of AI and Scrum practices.

2. Coaching the team: The Scrum Master coaches the team on effective Scrum practices and helps remove impediments. In this case, the Scrum Master could guide the team on how to effectively utilize AI tools and optimize Scrum practices to better align with the conditions of satisfaction.

3. Promoting continuous improvement: The Scrum Master encourages the team to continuously inspect and adapt their processes. This aligns with the objective of learning how to effectively use AI and Scrum, as the Scrum Master can facilitate discussions and retrospectives to identify areas for improvement and promote the adoption of new practices and tools.

By leveraging the responsibilities of the Product Owner and the Scrum Master, the design and construction professional can effectively learn how to use AI and Scrum to better align the team's conditions of satisfaction. The Product Owner ensures that the team understands and works towards the desired conditions of satisfaction, while the Scrum Master guides the team in adopting and optimizing Scrum practices, including the integration of AI tools and techniques.

“Human in the Loop”



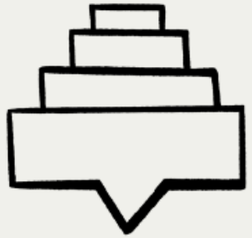
Meet Claude

A next-generation AI assistant for
your tasks, no matter the scale

Submit business interest | Talk to Claude

Based on the objective below, which Scrum role(s) would be most relevant, and why? Please provide specific details on how the responsibilities of the role(s) align with the student's desired learning outcome.







Safer

With Constitutional AI built in, Claude is designed to reduce brand risk. Best in class data retention, and no training on your data.

Clever

Leading the industry with 100K+ token windows, Claude can handle complex multi-step instructions over large amounts of content.

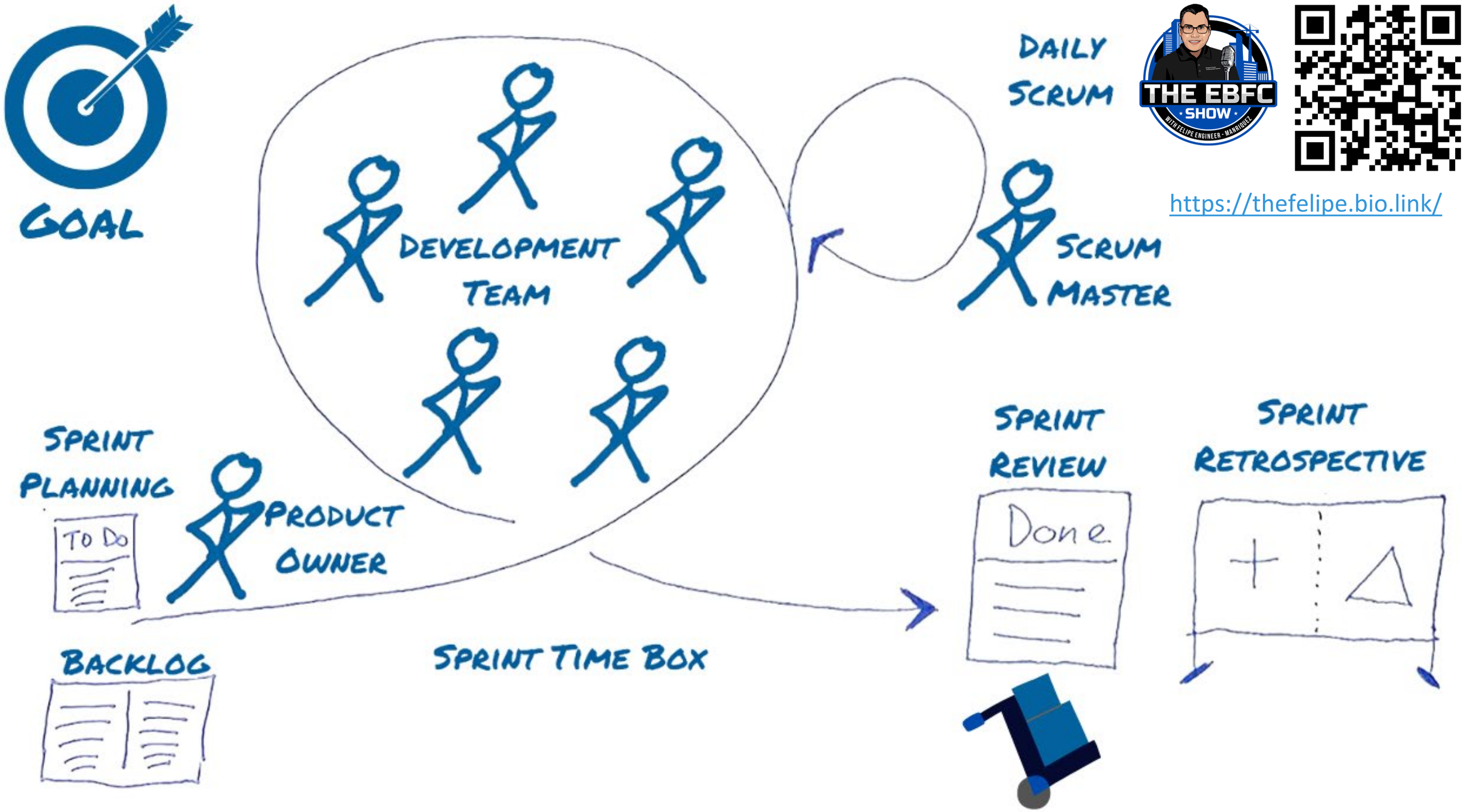
Yours

Personalize Claude to excel at your use cases and speak in your voice. Make the model work for you.

Continued Prompt:
As a [my role], I want to learn [my personal learning objective] using Scrum.

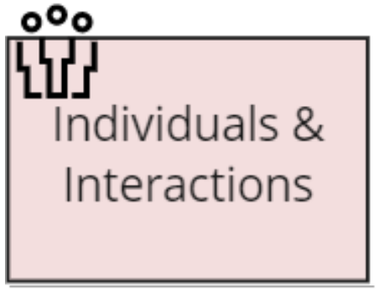
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https://thefelipe.bio.link/

Agile Movement: Agile Manifesto (2001) - Values



Individuals & Interactions

over Process & Tools



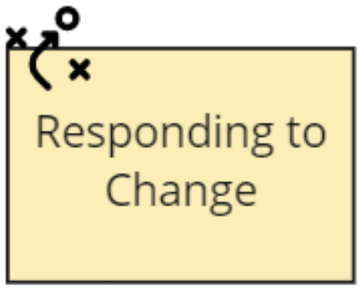
Working Product

over Comprehensive Documentation*



Customer Collaboration

over Contract Negotiation



Responding to Change

over Following a Plan

Kent Beck, Mike Beedle, Arie vanBennekum, Alistair Cockburn, Ward Cunningham, Martin Fowler, James Grenning, Jim Highsmith, Andrew Hunt, Ron Jefferies, Jon Kern, Brian Marrick, Robert C. Martin, Steve Mellor, Ken Schwaber, Jeff Sutherland, Dave Thomas

That is, while there is value in the items on the right, we value the items on the left more.

©199

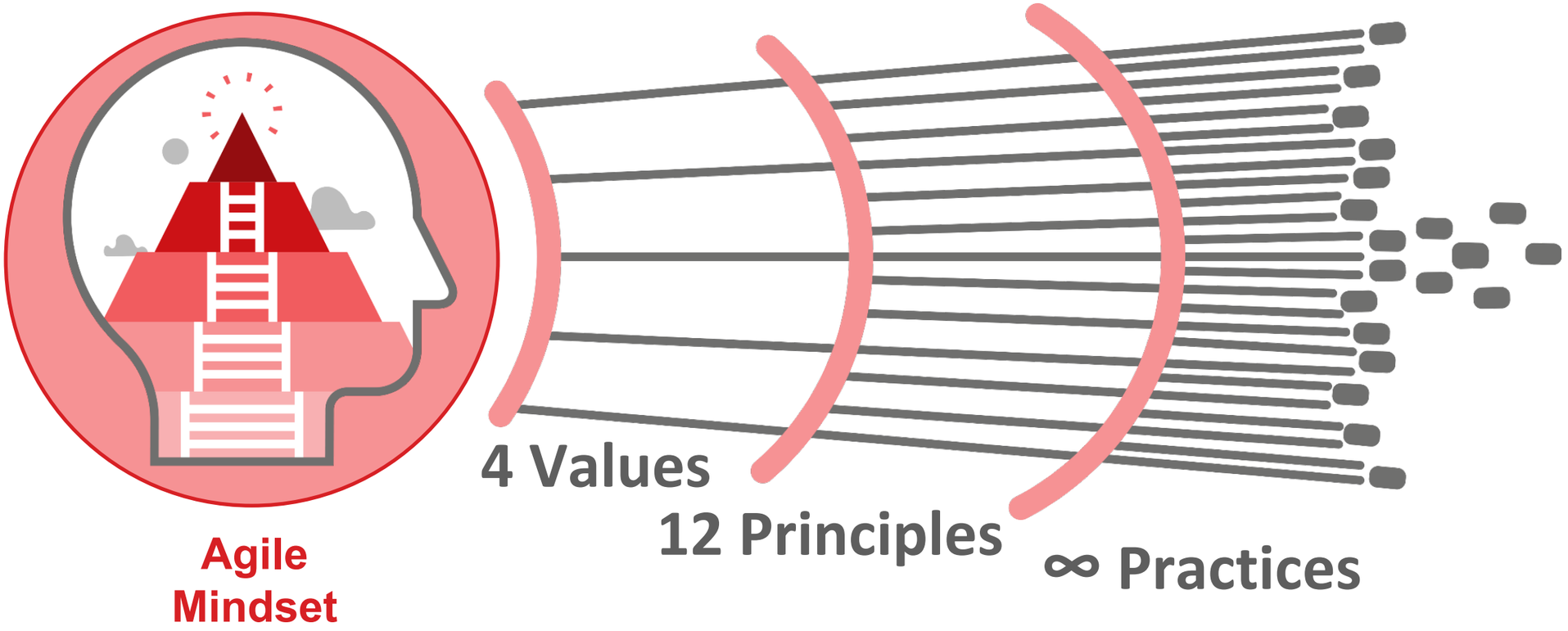
12 Principles of Agile Development*

1. Our highest priority is to satisfy the customer through early and continuous delivery of valuable product*.
2. Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.
3. Deliver working product* frequently, from a couple of weeks to a couple of months, with a preference to the shorter time scale.
4. Business people and developers must work together daily throughout the project.
5. Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done.
6. The most efficient and effective method of conveying information to and within a development team is face-to-face conversation.
7. Working product* is the primary measure of progress.
8. Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely.
9. Continuous attention to technical excellence and good design enhances agility.
10. Simplicity – the art of maximizing the amount of work not done – is essential.
11. The best architectures, requirements, and designs emerge from self-organizing teams.
12. At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly.

*The original Manifesto only referred to "Agile Software". As Scrum and implementing Agile development has been done countless times outside of the software domain, many in the industry have chosen to update these principles from "software" to "product".

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What is Agile?



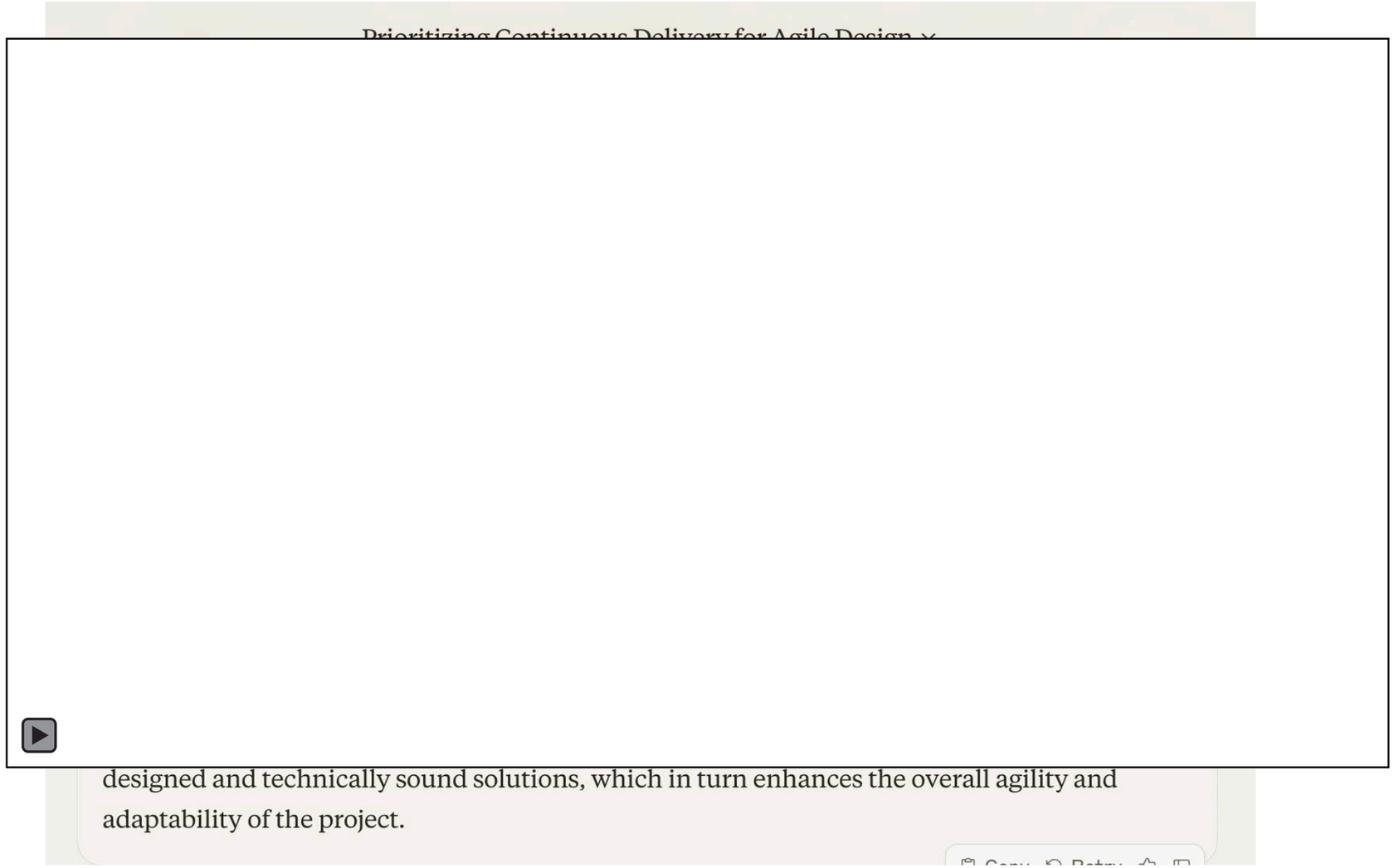
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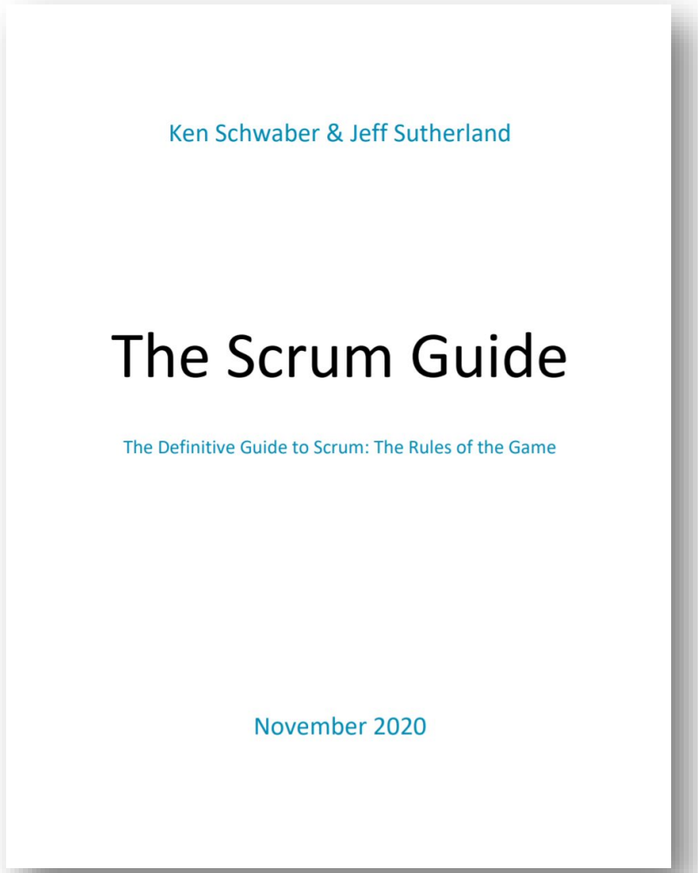
AI Activity https://claude.ai/

_____ is the one thing I must learn in this session.

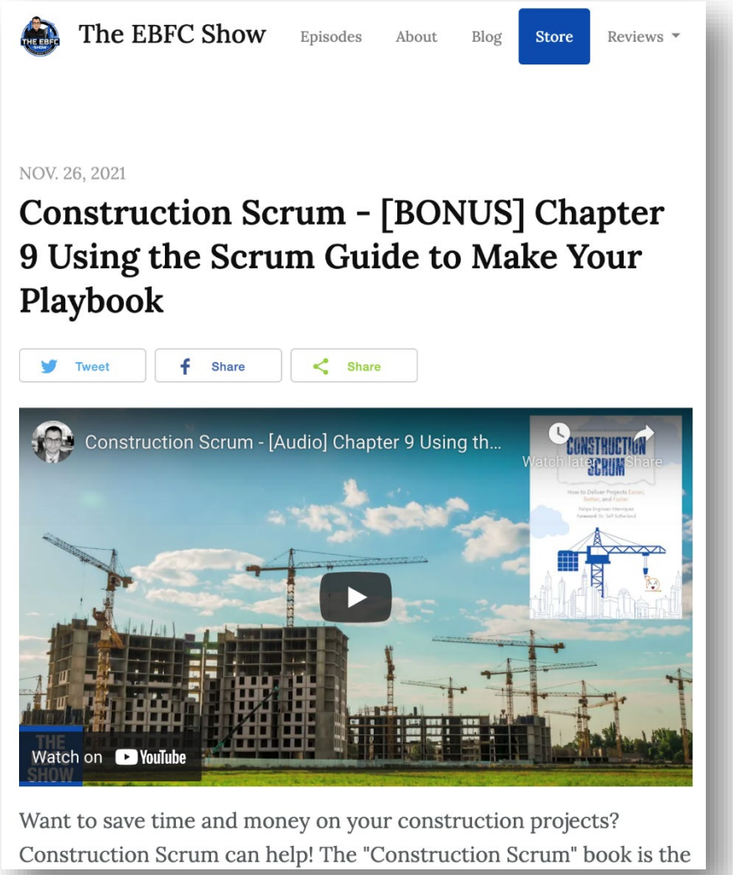
Do you know the **12 Principles of Agile?** Based on my [current role], which Agile principle should be my top priority and why?



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https://www.theebfcshow.com/construction-scrum-bonus-chapter-9-using-the-scrum-guide-to-make-your-playbook/

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Basics for getting started include:

- Understanding the essential Scrum Framework
- Courage

- Scrum Board
  - Makers
  - Post-Its
  - Scrum Board

Claude 3

ChatGPT

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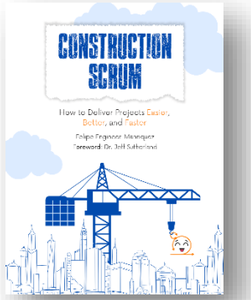
Questions?

Scrum In Construction for Pursuits & More





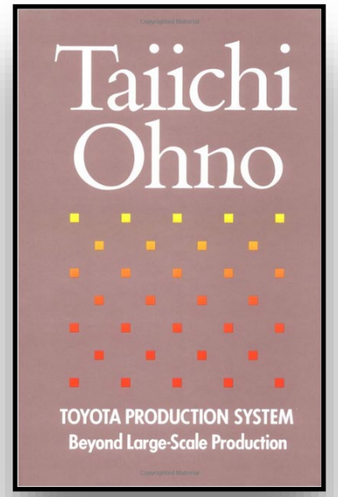
THE EBFC SHOW
WITH FELIPE ENGINEER - MANRIQUEZ



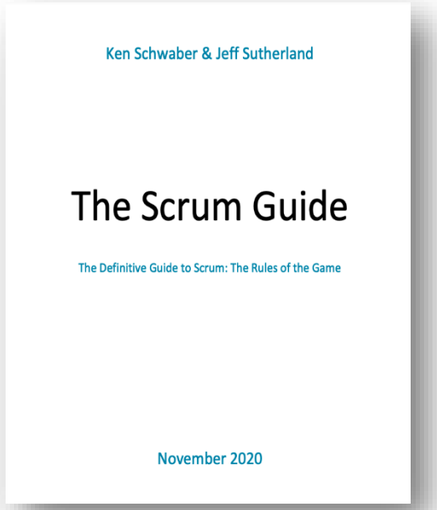
https://thefelipe.bio.link/

Scrum and Lean Connection

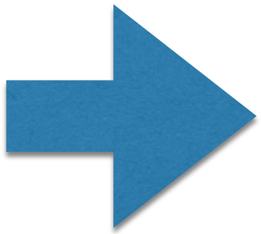
TPS
1950s



Scrum Guide
1990s - Today



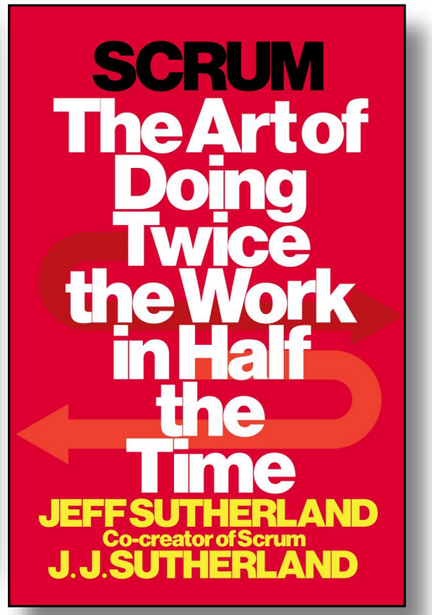
One Parent



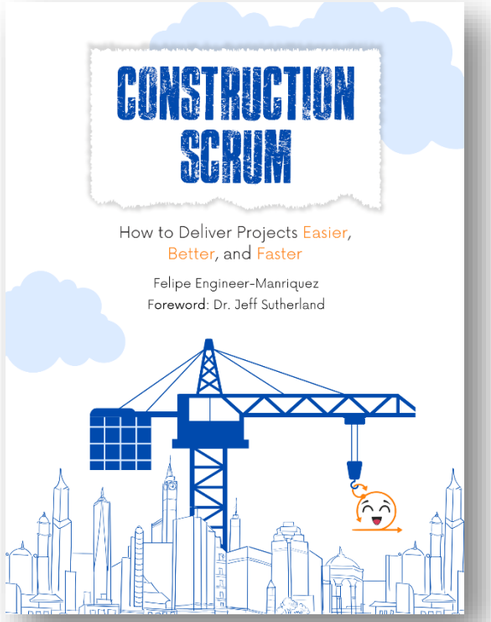
Agile
2001



Scrum
Red Book
2014



Construction
Scrum
2021



Six Tenets of Lean

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1. Respect for people
2. Generate Value
3. Focus on Flow
4. Eliminate Waste
5. Continuous Improvement
6. Optimize the Whole



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Value-Added Work 2 Generate Value



***20% - 40%**

of design and construction work is value-added from the perspective of the customer



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Does waste impact my work? 4 Eliminate Waste

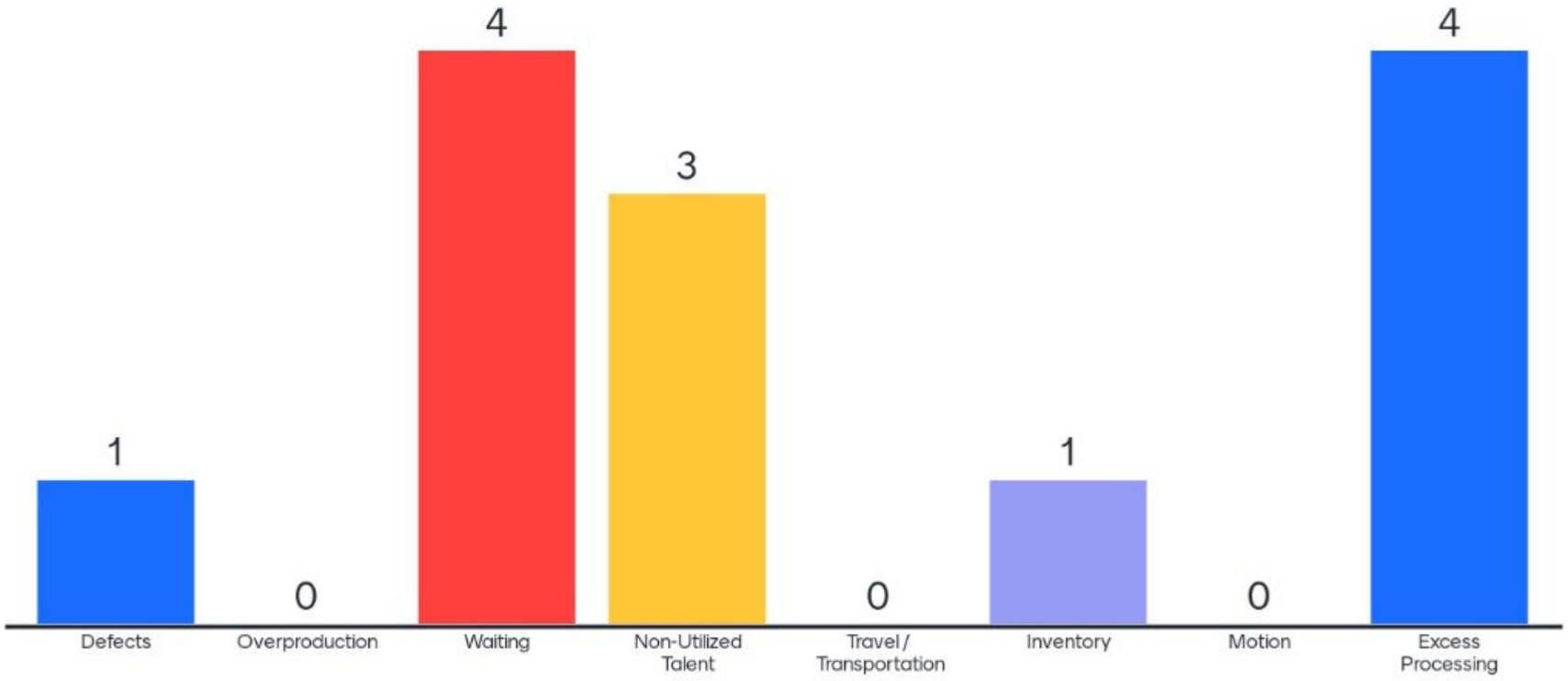


What are the different types of waste in LEAN?
https://youtu.be/NJN-lsk_DLU

Non-Value Adding Activities

Past
LCI Design
Forum Results

Which impacted you most this week?
DOWNTIME



Defect

Effort involved in inspecting for and fixing defects such as data entry errors

Overproduction

Unnecessary efforts producing work in excess or ahead of customer requirements like processing items before they're required for the next process

Waiting

Waste through delays or stoppages such as waiting for instructions, waiting for the next production step, or simply running slow computers

Non Utilized Talent

Aspects such as ignoring improvement ideas from people on the floor or restricting employees' responsibilities to make routine decisions

Travel / Transportation

Unnecessary movement of work, for example sequential process steps are not co-located or files are being transported from one location to the other

Inventory

Holding information and material longer than required such as piles of unprocessed work, unread emails or overstocked marketing materials

Motion

Non-value-added movements of people such as unnecessary meetings or walking to the copier and printer

Excess Processing

Unnecessary activity due to complex processes and systems such as too many approvals or an application form where the same data is needed in different places

Individually: _____ is one type of waste that impacted me last week.

Table: Pick largest example from individuals. Listen for instructions

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AI Activity https://claude.ai/

Enter the prompt below with details from your table's largest example.

Do you know the 8 wastes in Lean Construction?

If my crew is worth $100/hour for each person, 5 people total and I face a 2 week design delay, how much is that worth and what DOWNTIME wastes are in play?

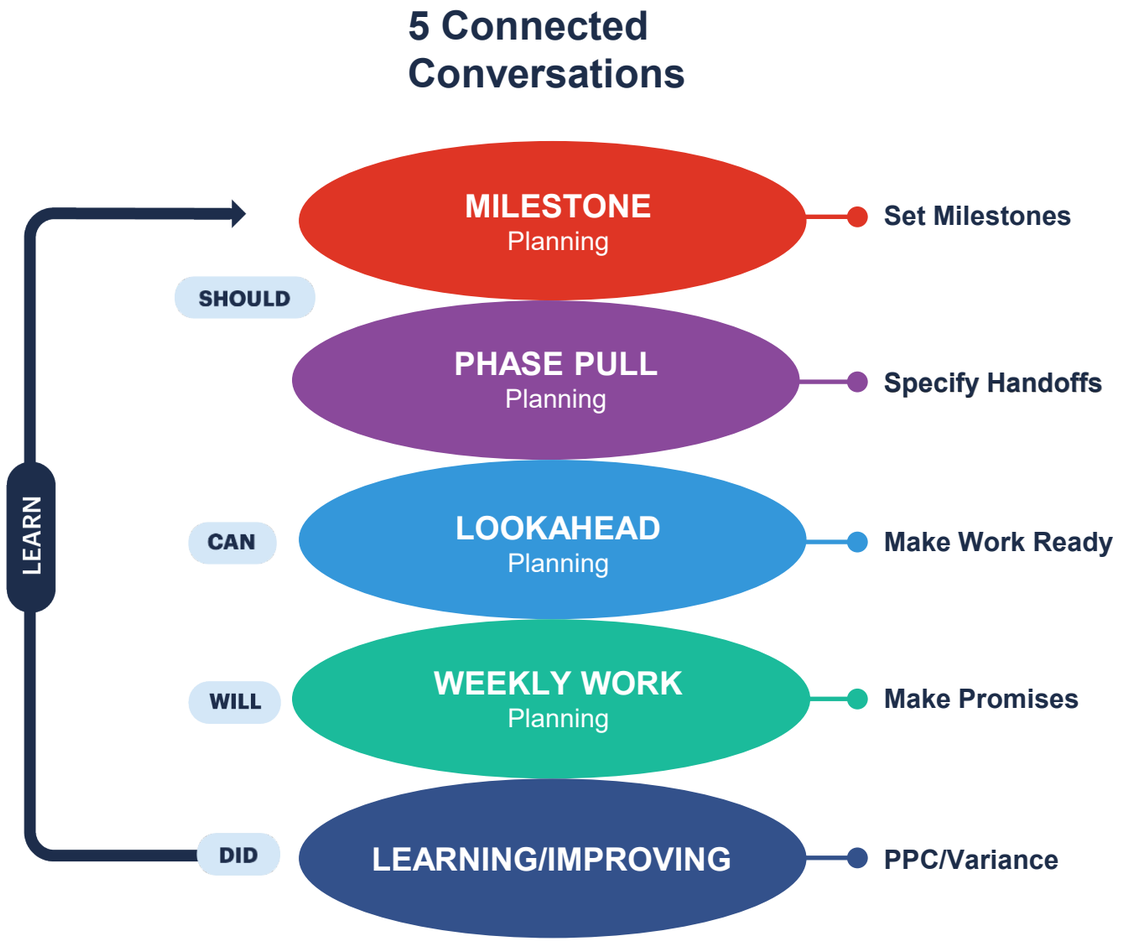


5 Connected Conversations Of LPS®

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The LPS is a commitment-based system integrating 5 connected planning conversations at 5 levels:

1. Milestone Planning (Should)
2. Phase Pull Planning (Should)
3. Lookahead Planning (Can)
4. Weekly Work Planning (Will)
5. Learning & Improving (Did/Learn)

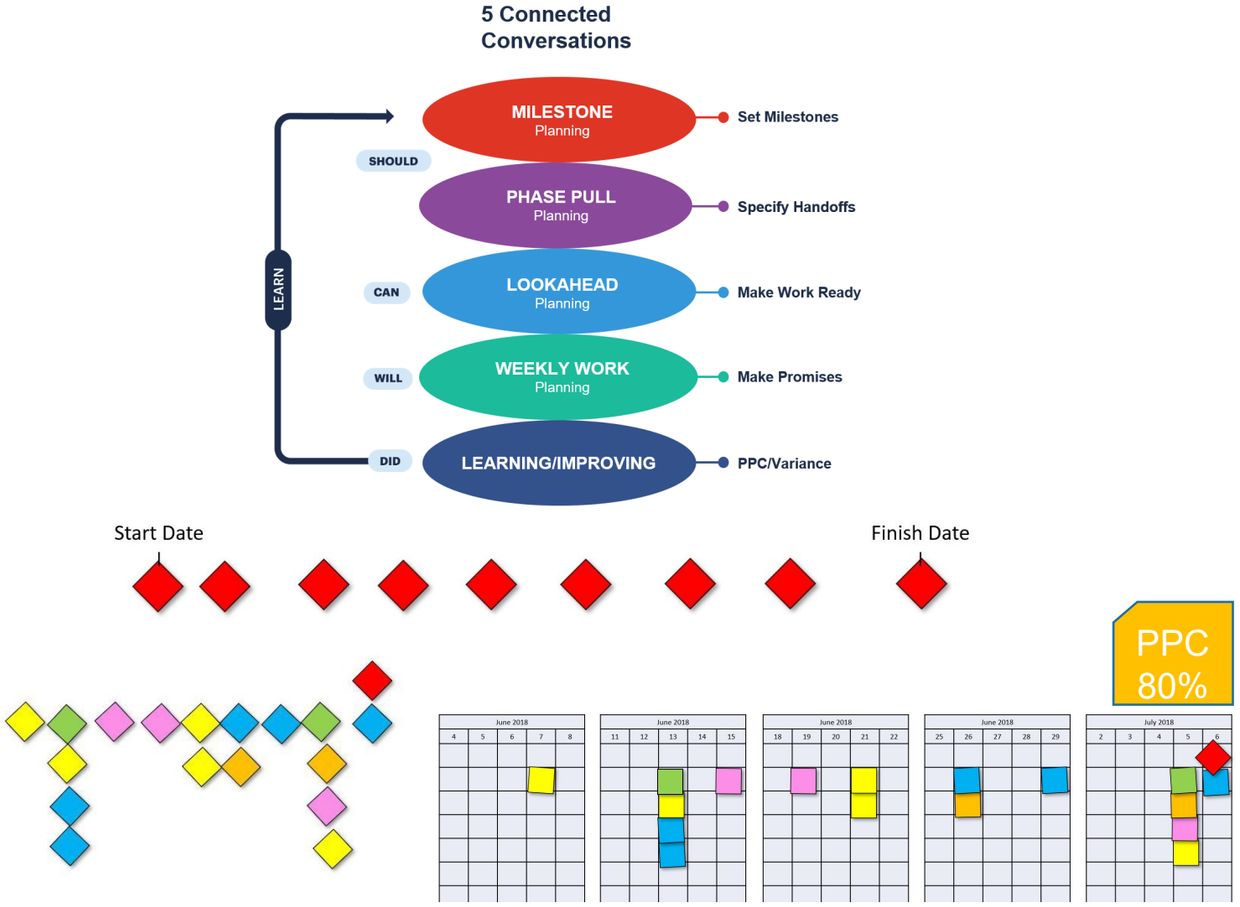


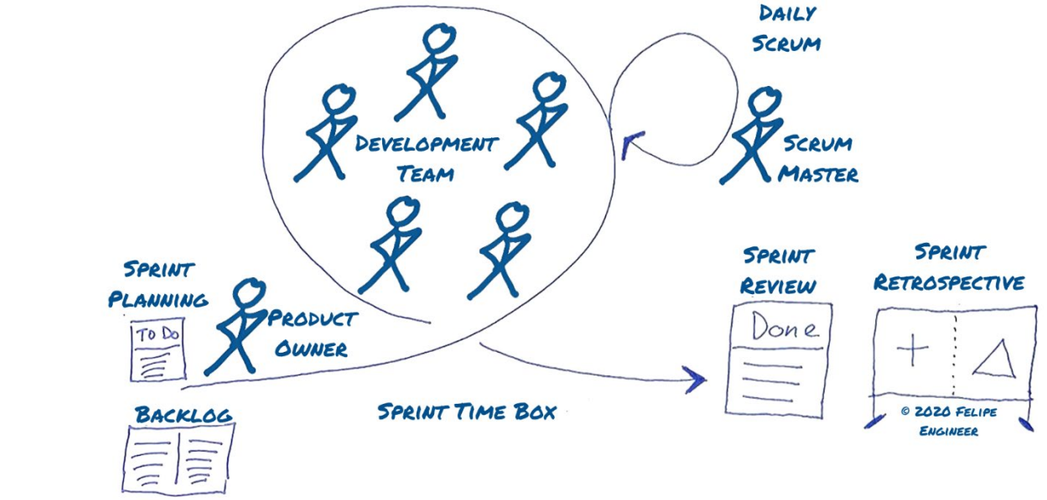
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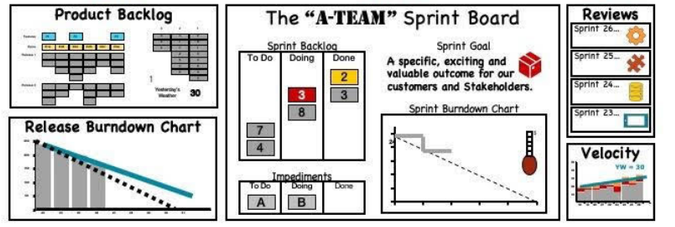
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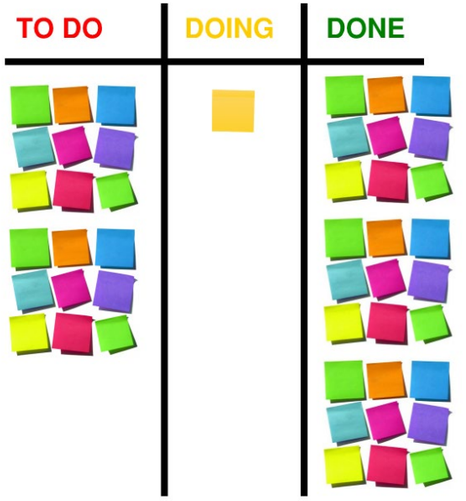
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LPS® and Scrum



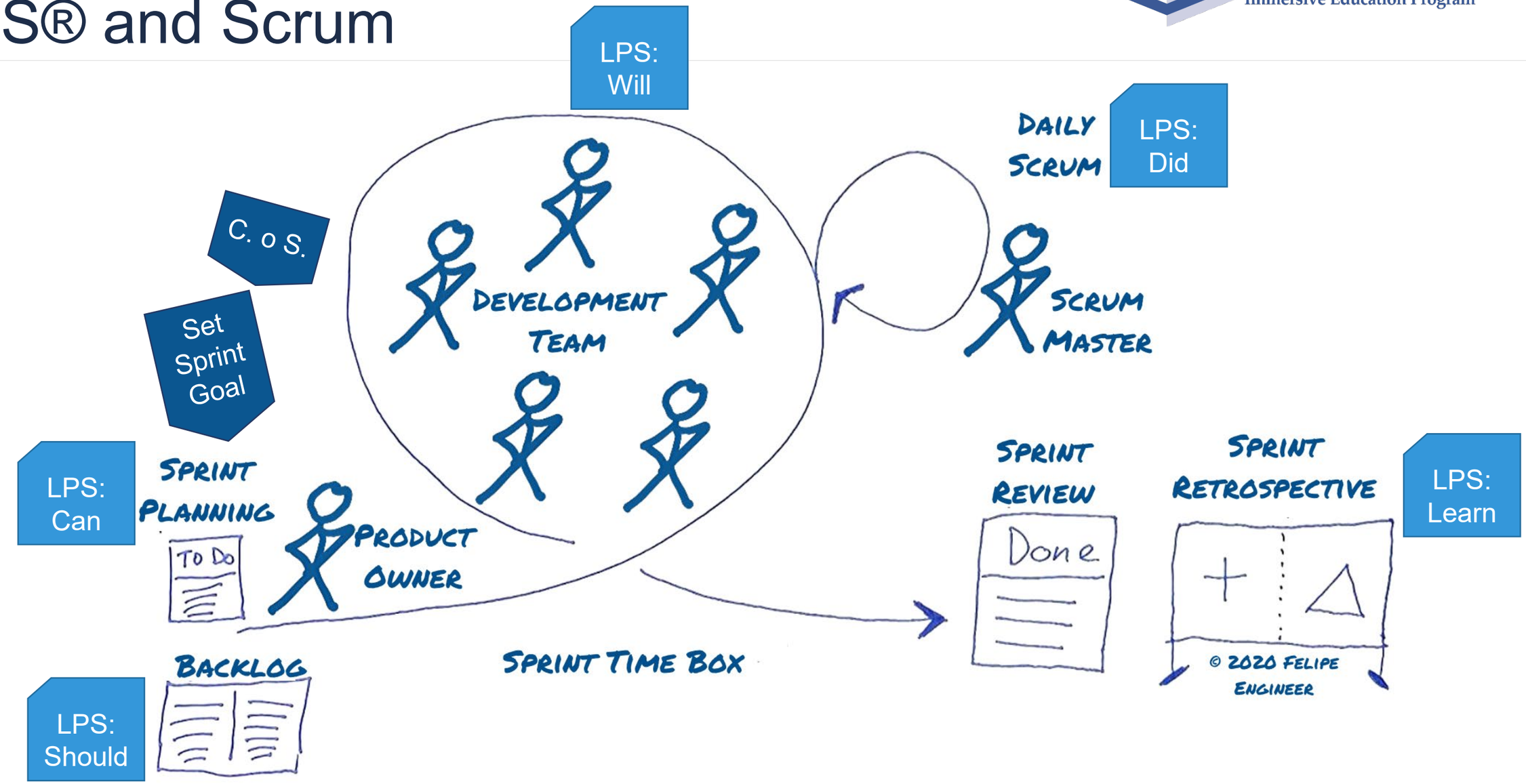






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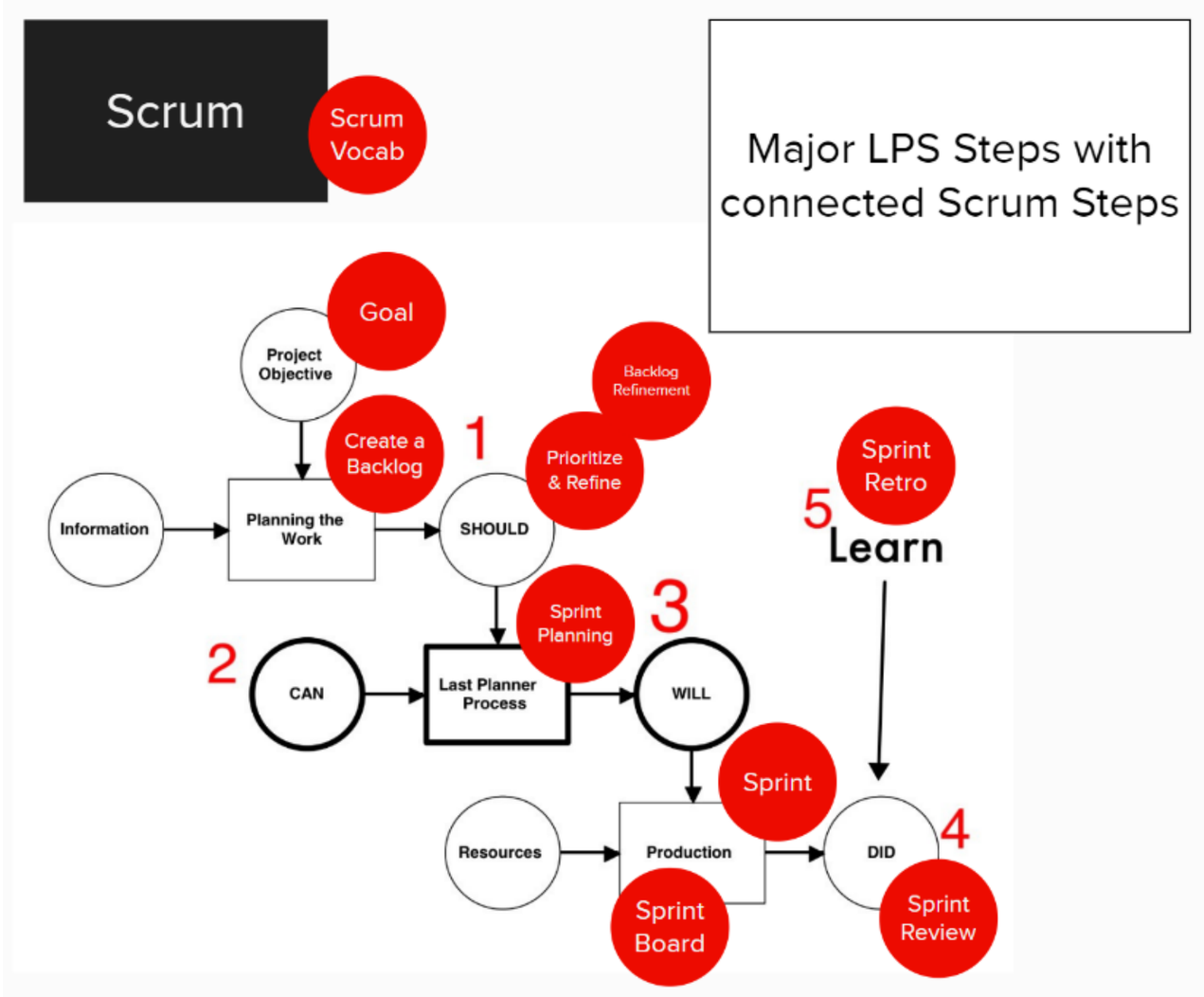
LPS® and Scrum



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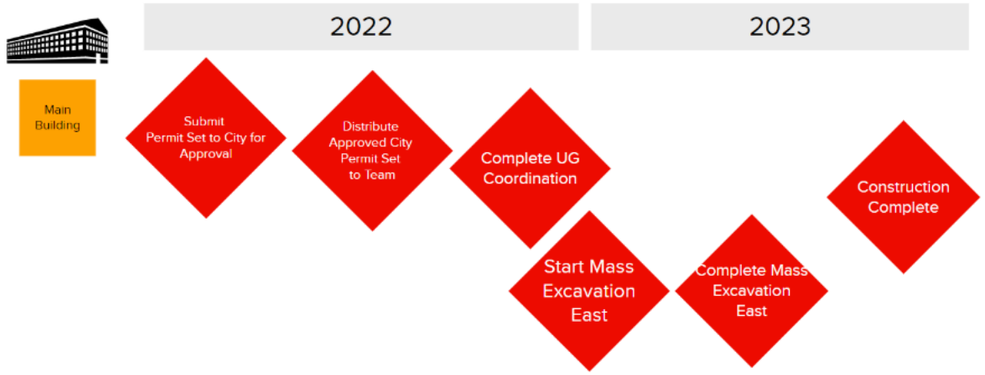
LPS® and Scrum

Milestones



Production Strategy
Why? To collaboratively develop an execution plan to meet or beat the milestones in the Master Schedule with the project managers and superintendents who are responsible for overseeing performance of the work ("Last Planners") resulting in stable & predictable workflow.

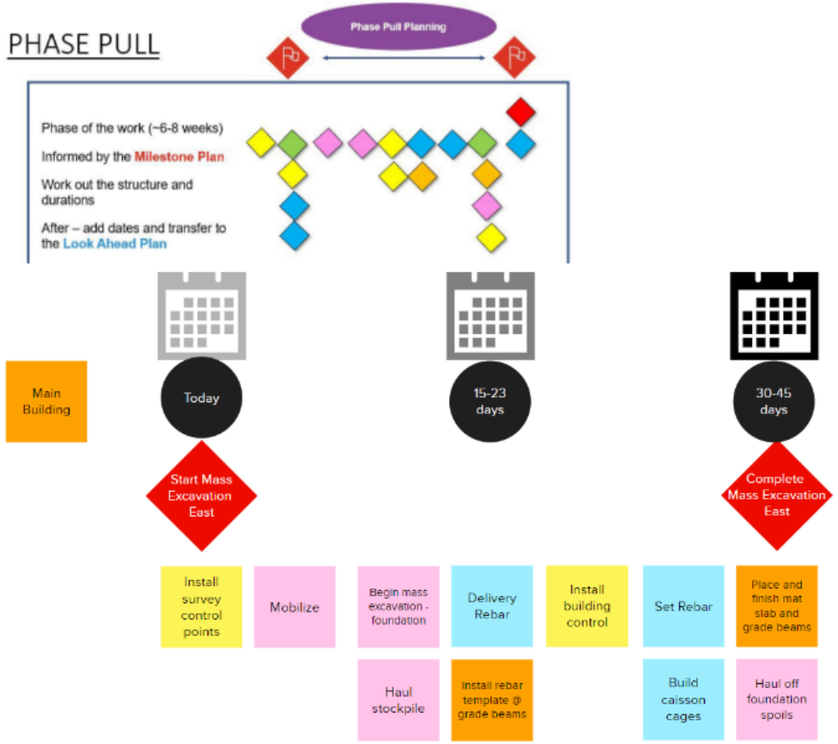
Schedule Milestone
A significant event in the project schedule, such as an event restraining future work or marking the completion of a phase/deliverable.



Phase

Schedule Phase
A collection of logically related project activities that culminates in the completion of one or more deliverables.

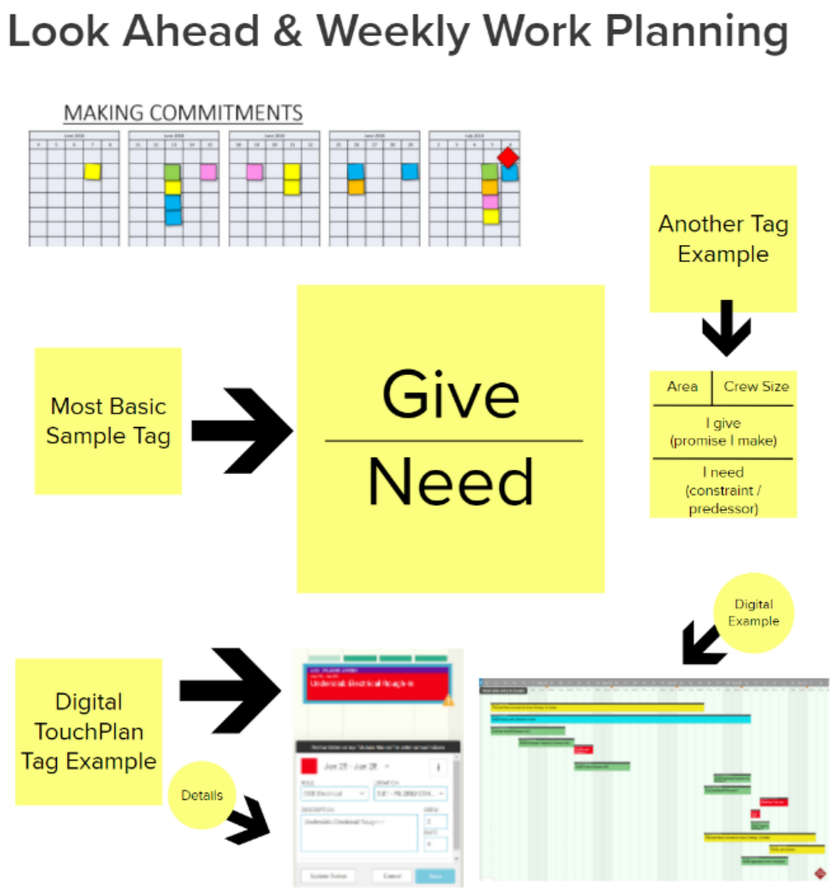
Production Strategies
-Establish major phases of work between milestones with project team's input
-Establish Flow (Takt) planning for repeatable areas identified
-Develop pull plans
-Align resources (supply chain, material handling) to plan and production rules
-Identify crew/team sizes and develop labor plans

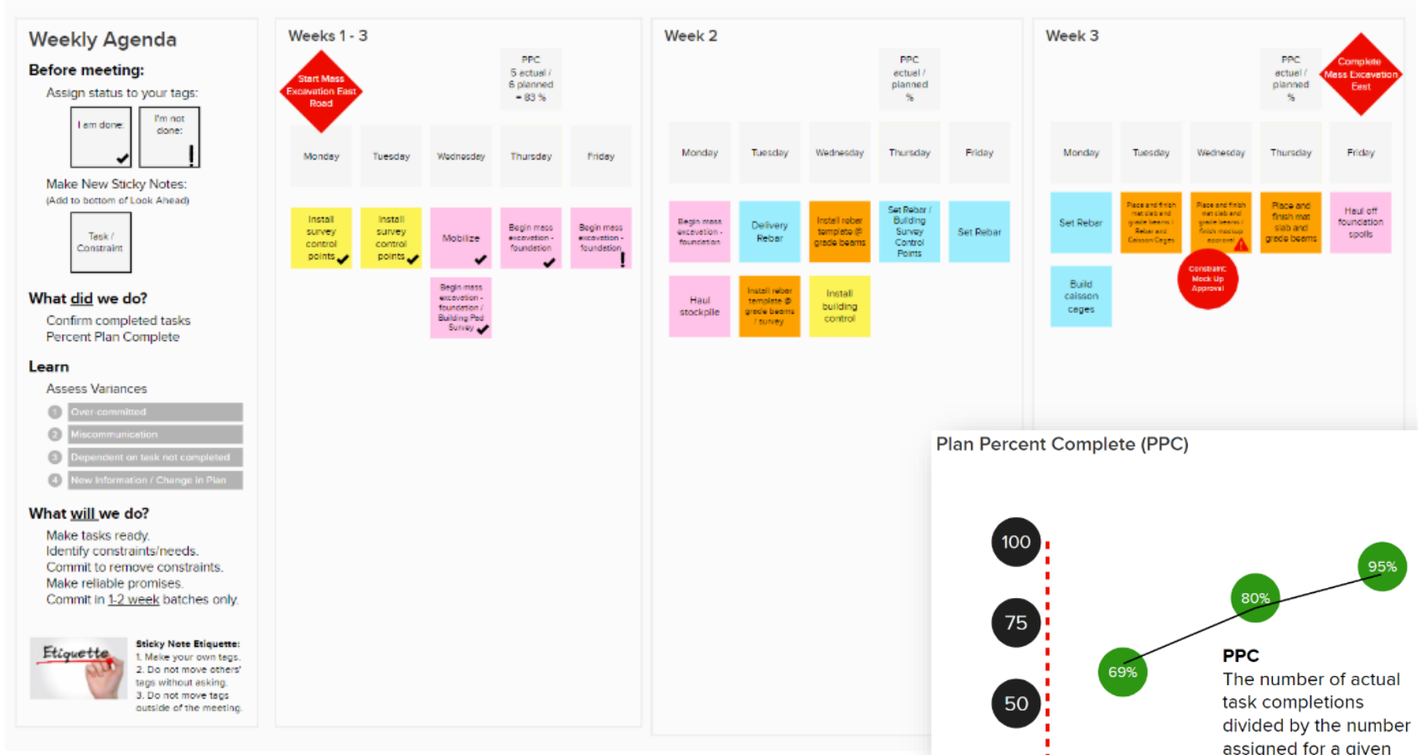


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LPS® and Scrum



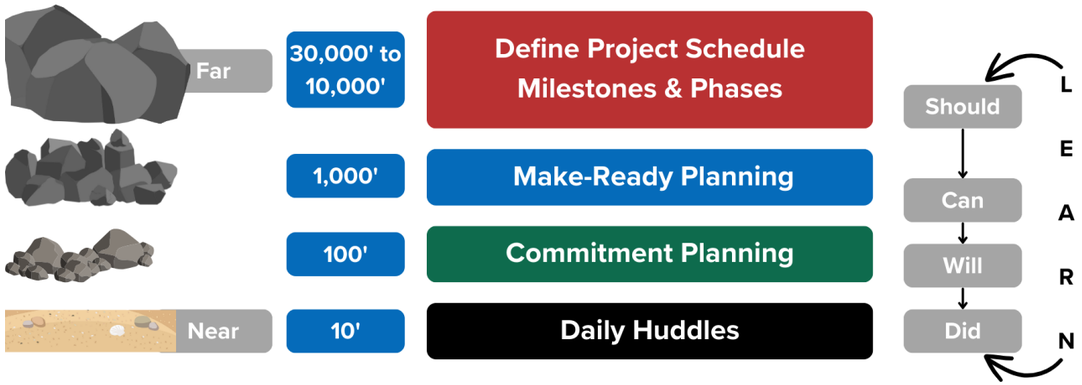


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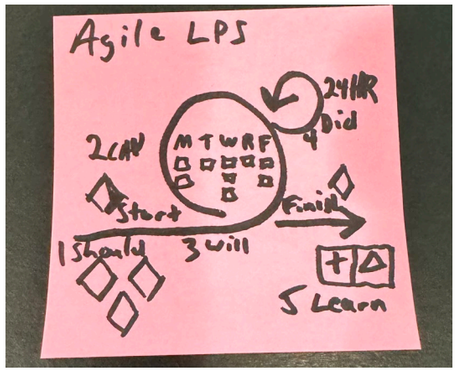
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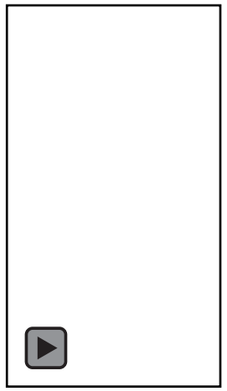
LPS® and Scrum

The Last Planner System® of Production Controls



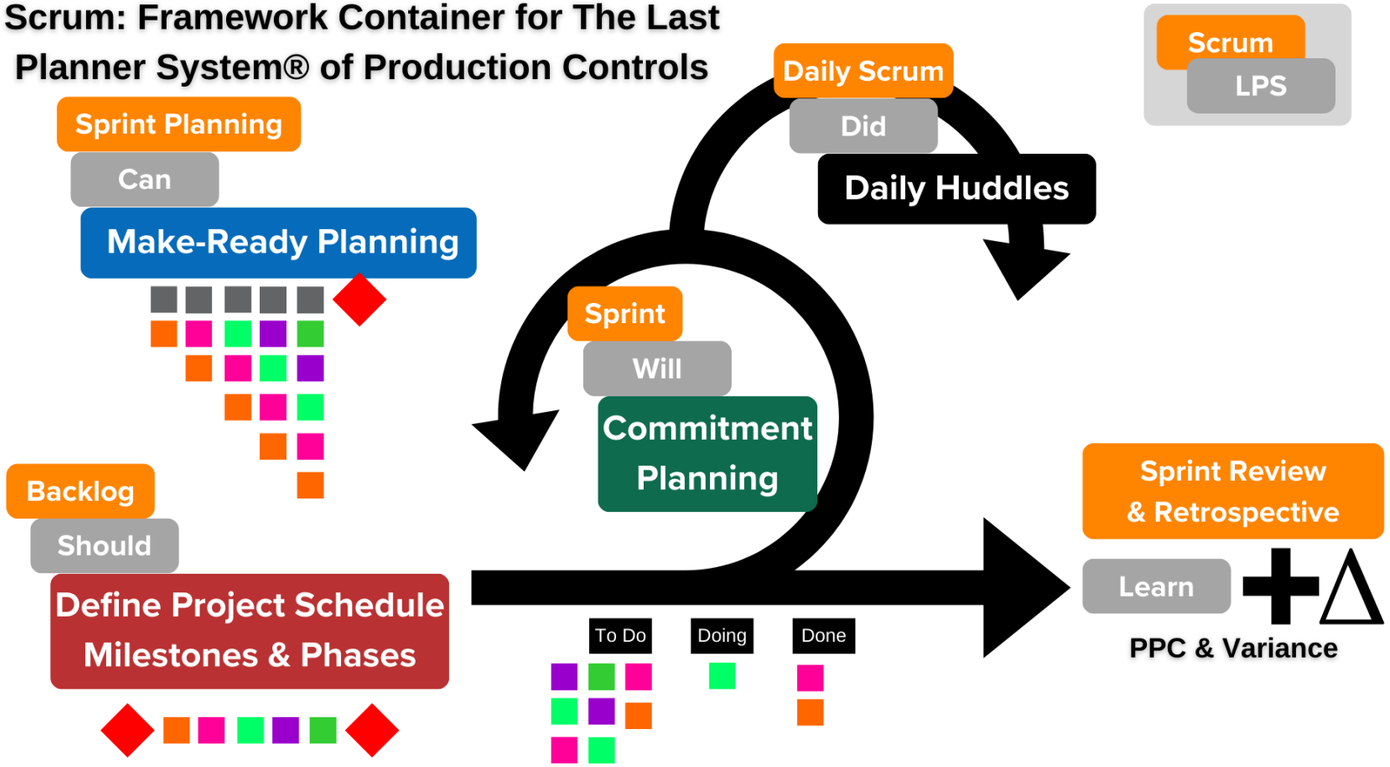
The Last Planner System (LPS) is a project production framework that promotes predictable workflow among various parties for reliable project delivery. LPS is a collaborative, commitment-based planning system that integrates should-can-will-did-learn conversations to define **WHAT** is to be done and **HOW** with teamwide controls making it happen in a continuous learning approach.







Scrum: Framework Container for The Last Planner System® of Production Controls



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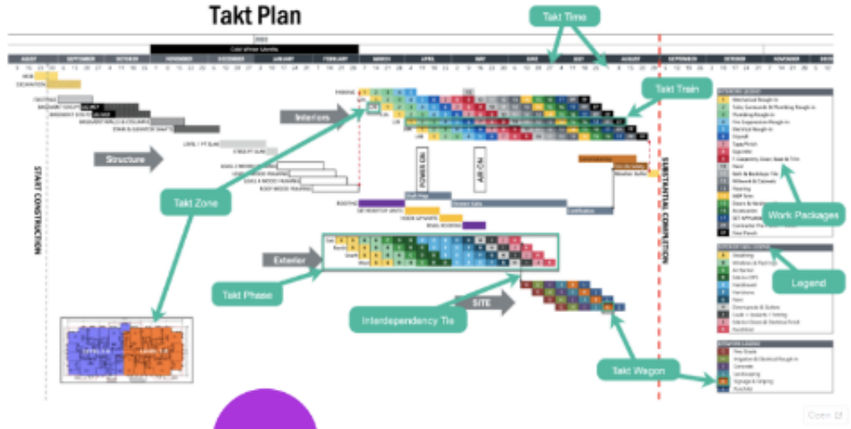
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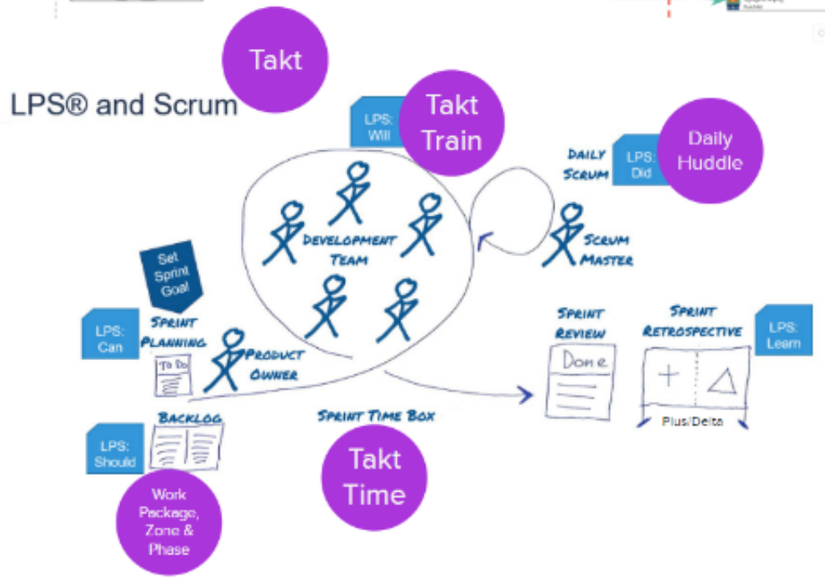
LPS® and Scrum *(and Takt)*

"Takt is Scrum." Jason Schroeder, President of Elevate Construction & leanTakt

Takt planning makes work happen on a beat frequency or cycle. In Scrum we call this the Sprint.







These frameworks enable Critical Flow schedules that focuses on information and work throughput and bottlenecks (constraints), to enable flow (work, trades, logistics).

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Questions?

Even More Scrum In Construction

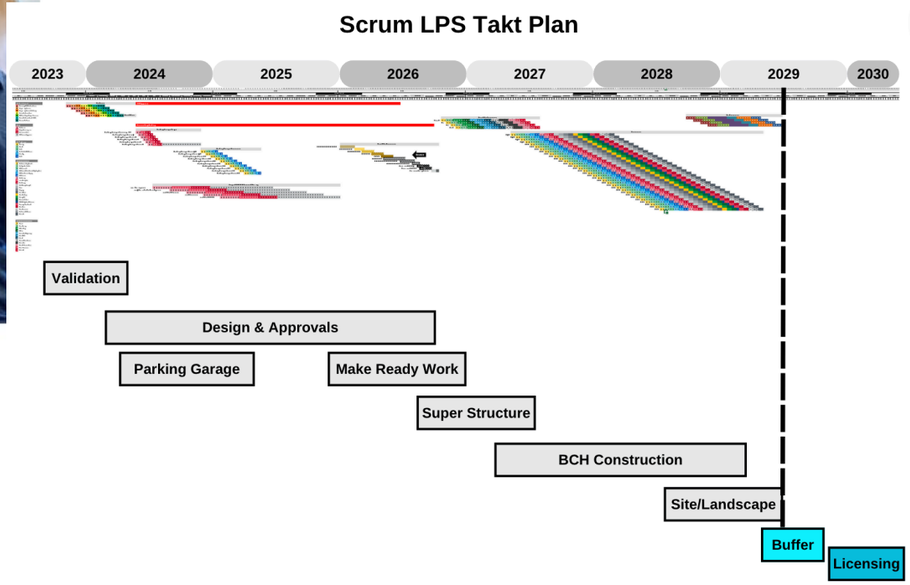






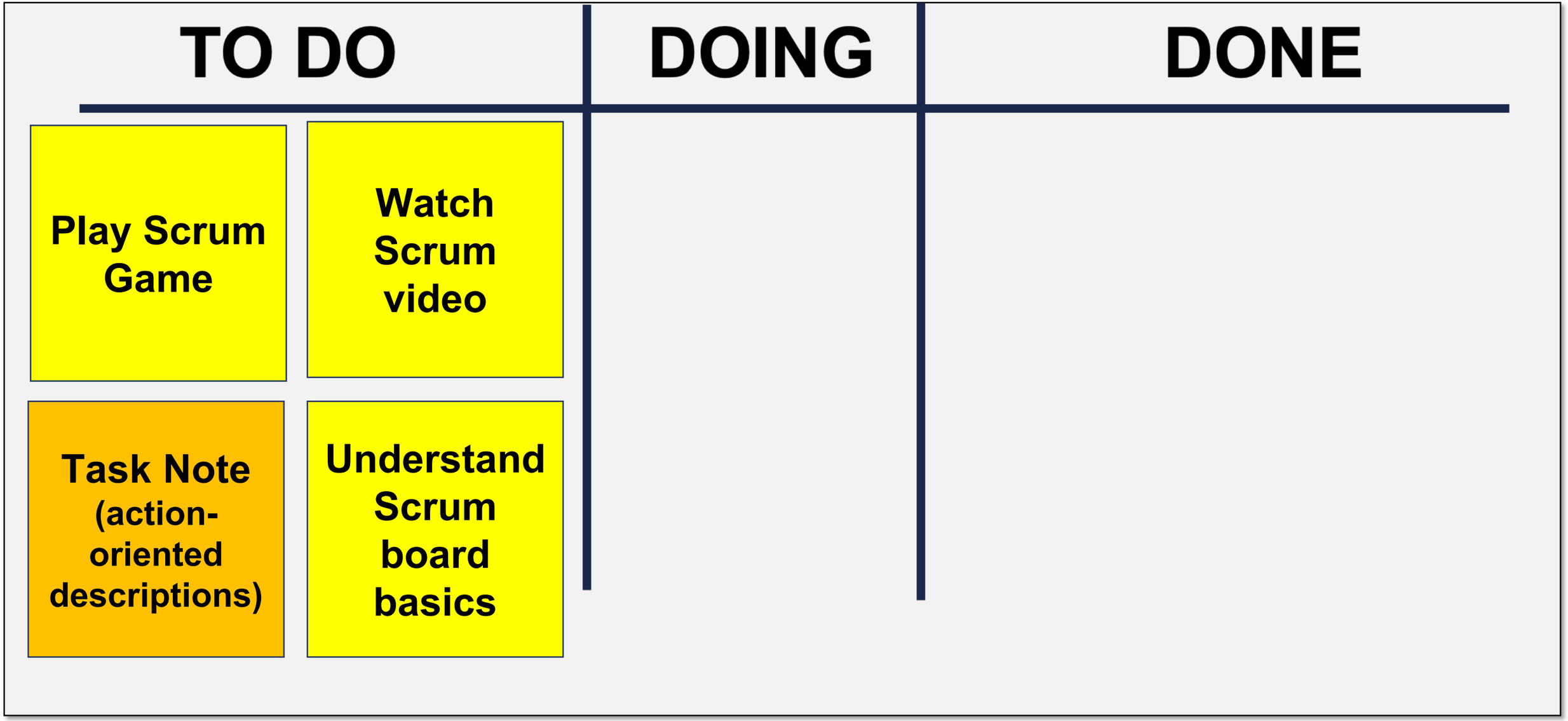


https://thefelipe.bio.link/

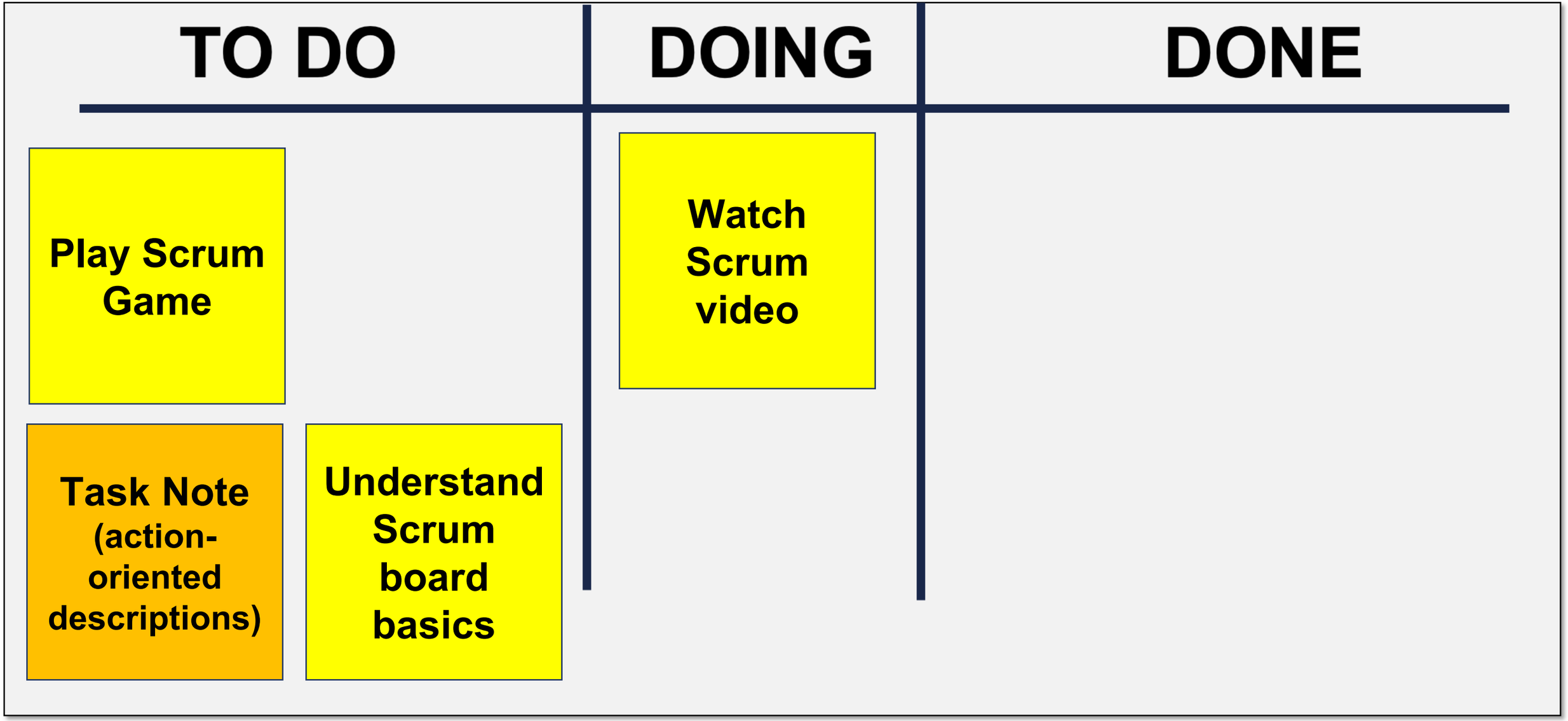


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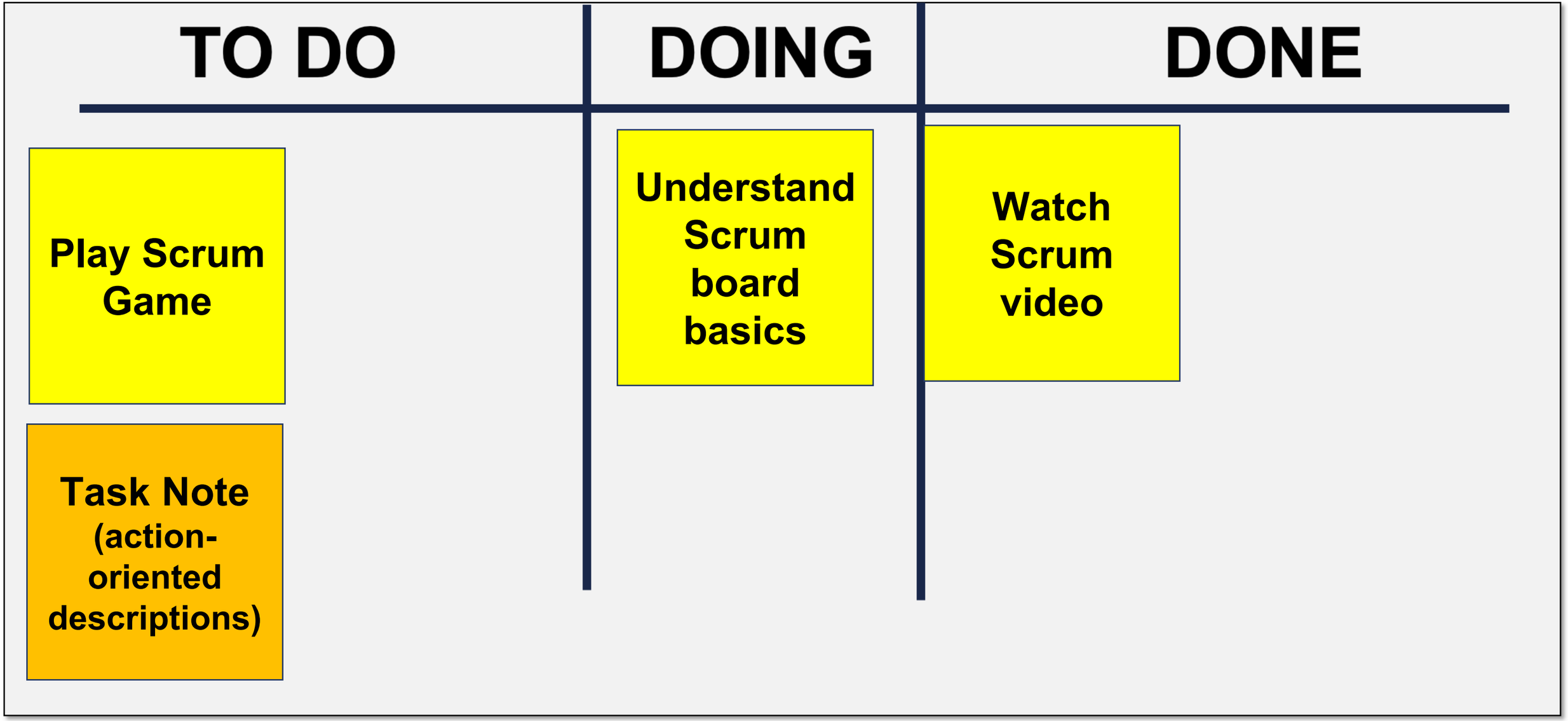
Fundamental Scrum Board



Fundamental Scrum Board



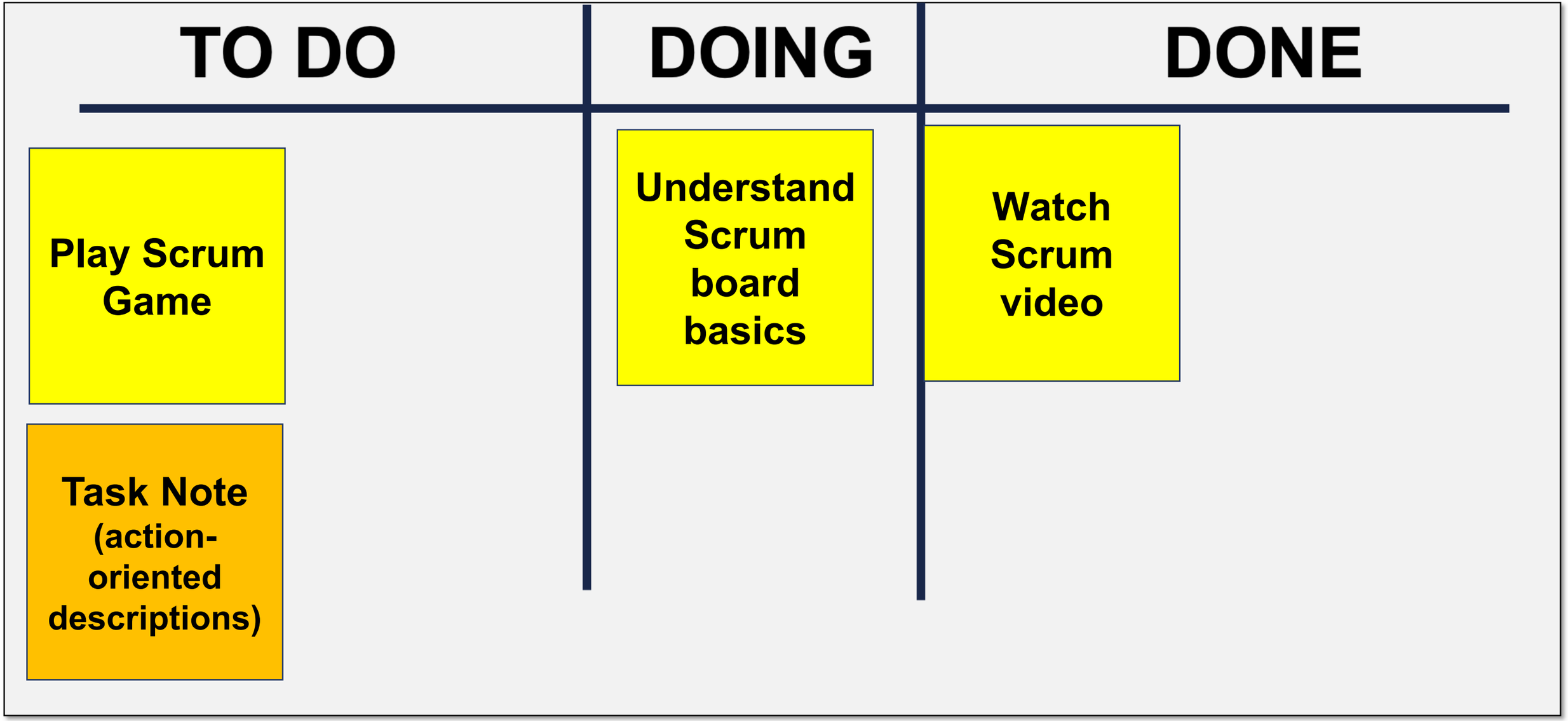
Fundamental Scrum Board



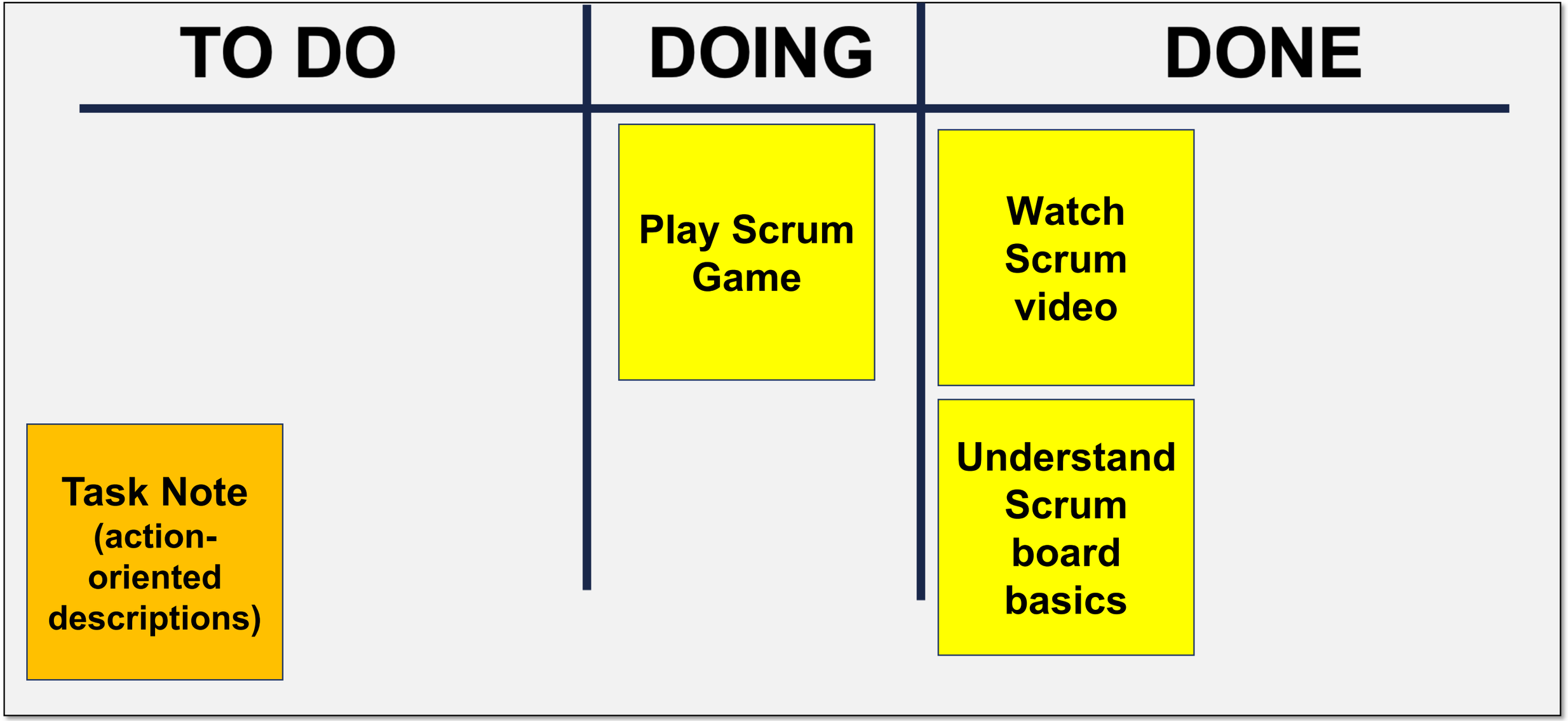
Another Fundamental Scrum Board Example



Fundamental Scrum Board



Fundamental Scrum Board



Sprint Goal
“Learning Done Right”

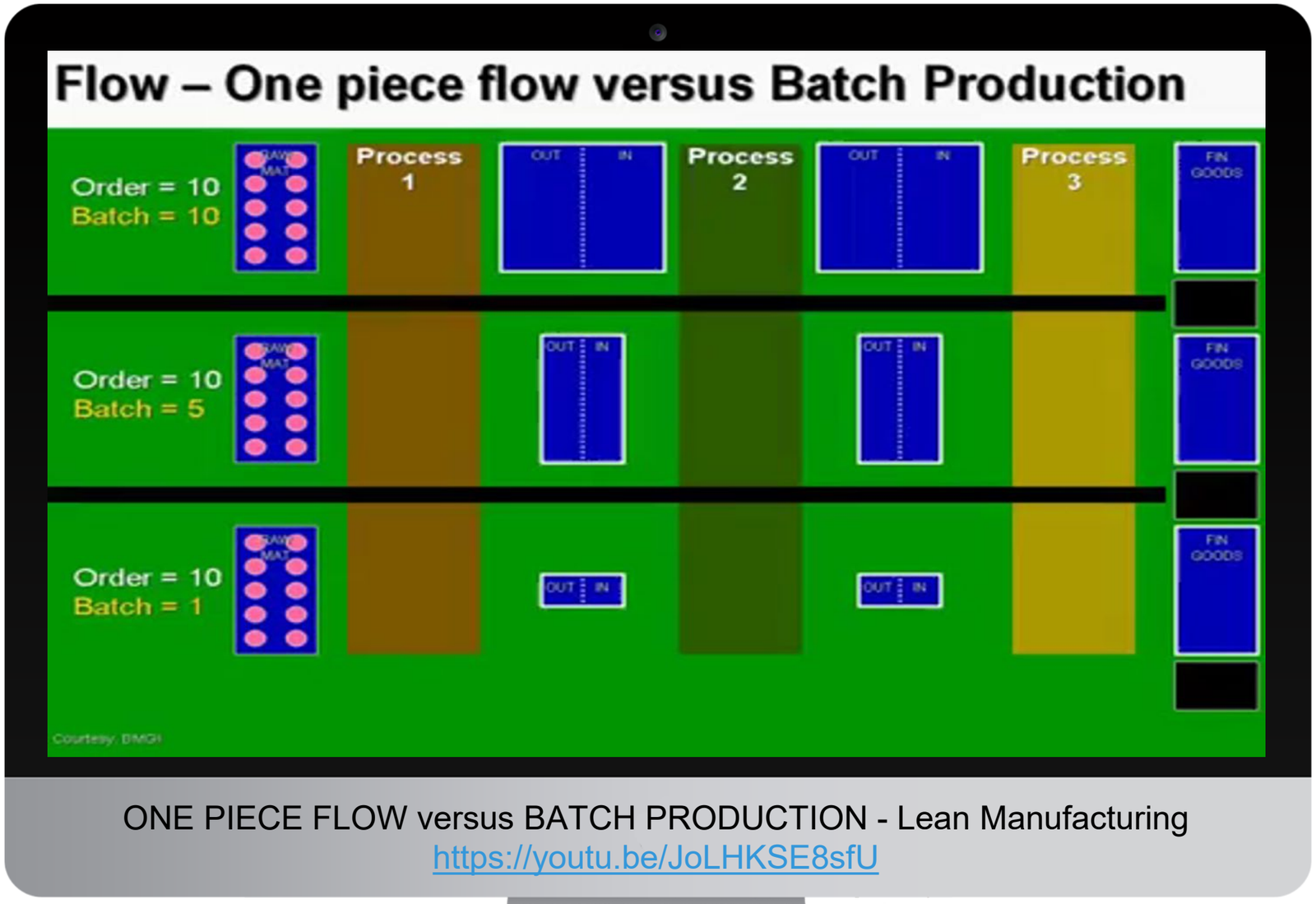


Let’s move as ONE

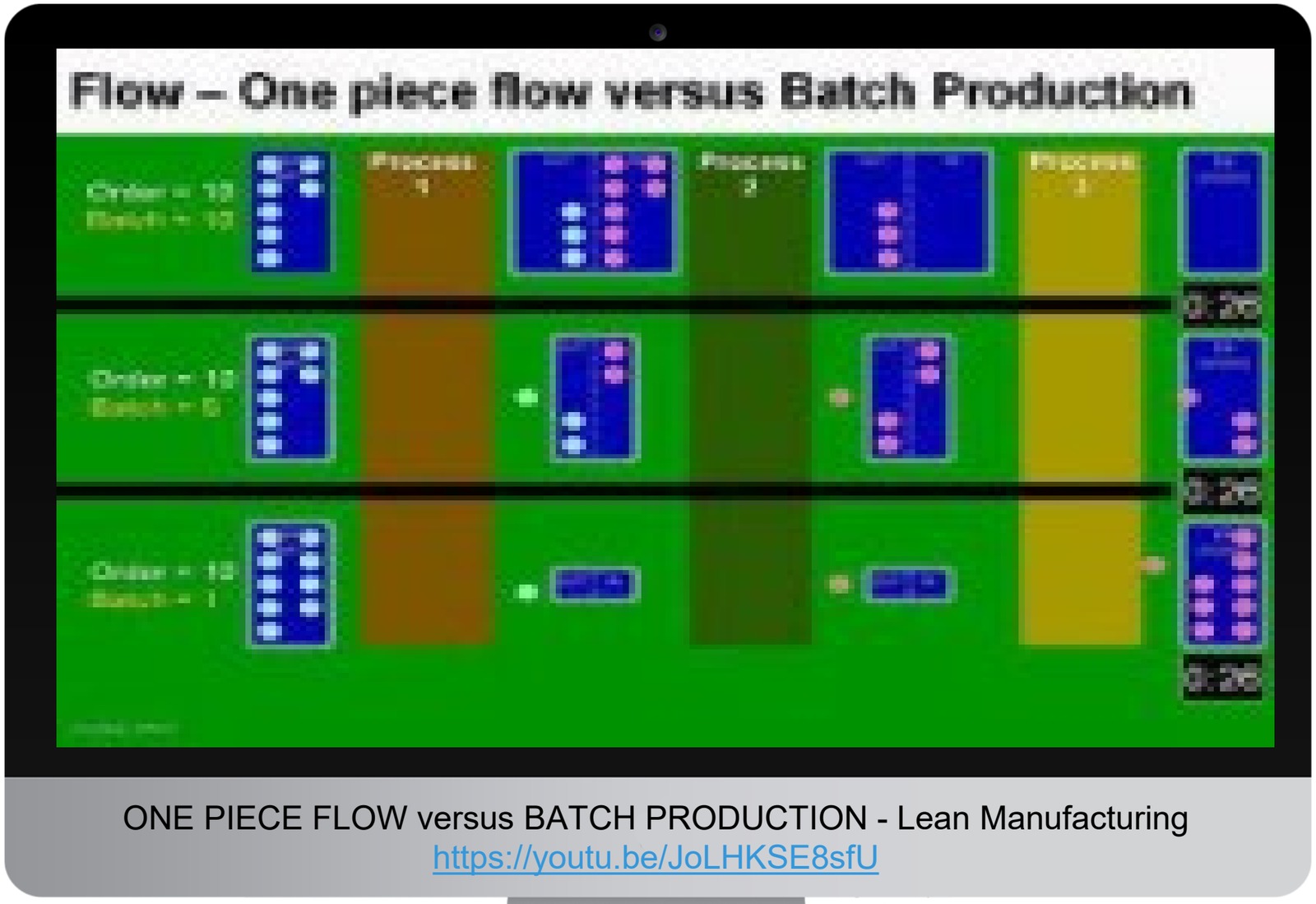


fast and furious 8 Dwayne Johnson entry| Haka dance by the rock|
https://youtu.be/2BPvFnyWAG0

Play Scrum Game
Warm-Up Question

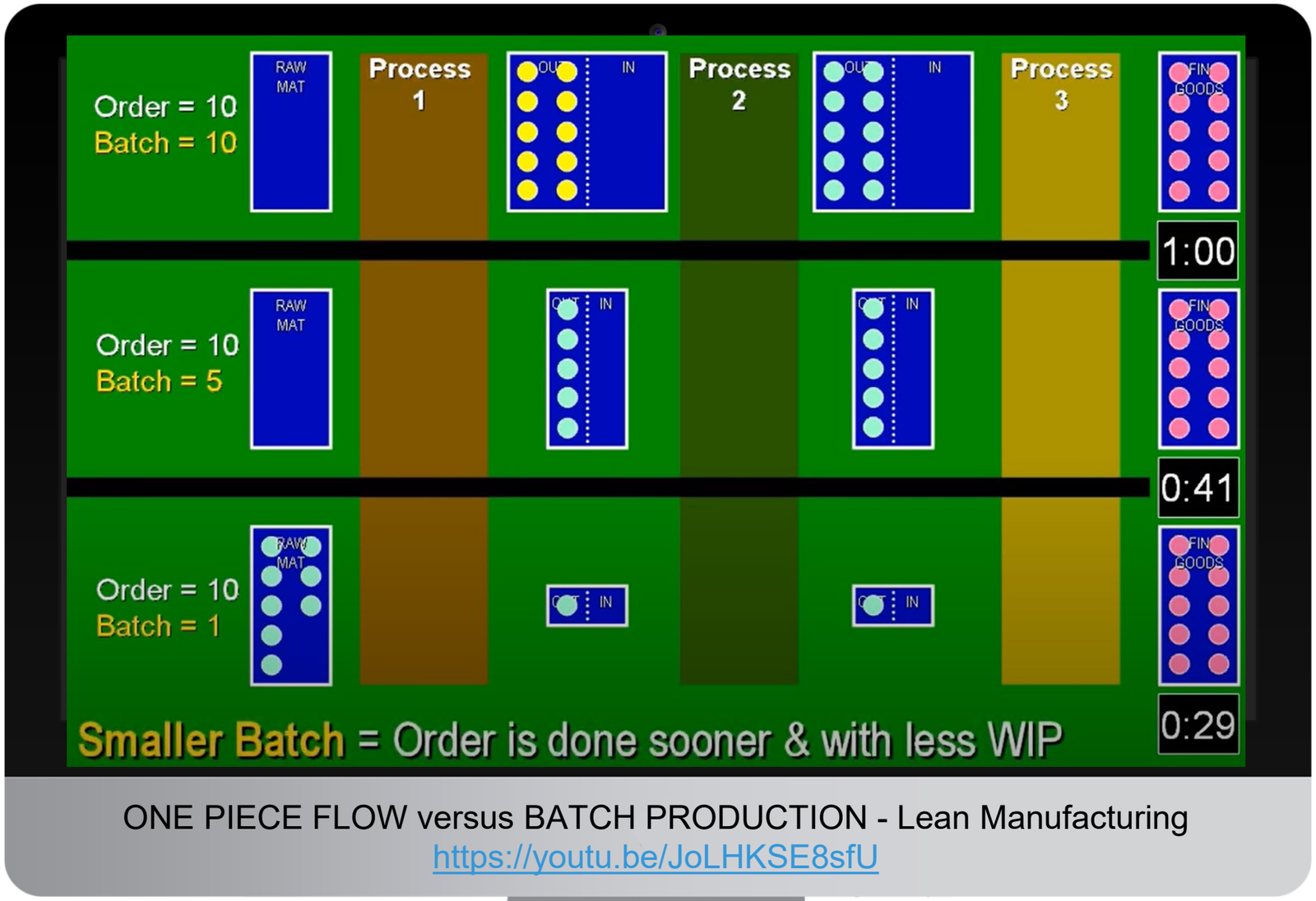


ONE PIECE FLOW versus BATCH PRODUCTION - Lean Manufacturing
https://youtu.be/JoLHKSE8sfU



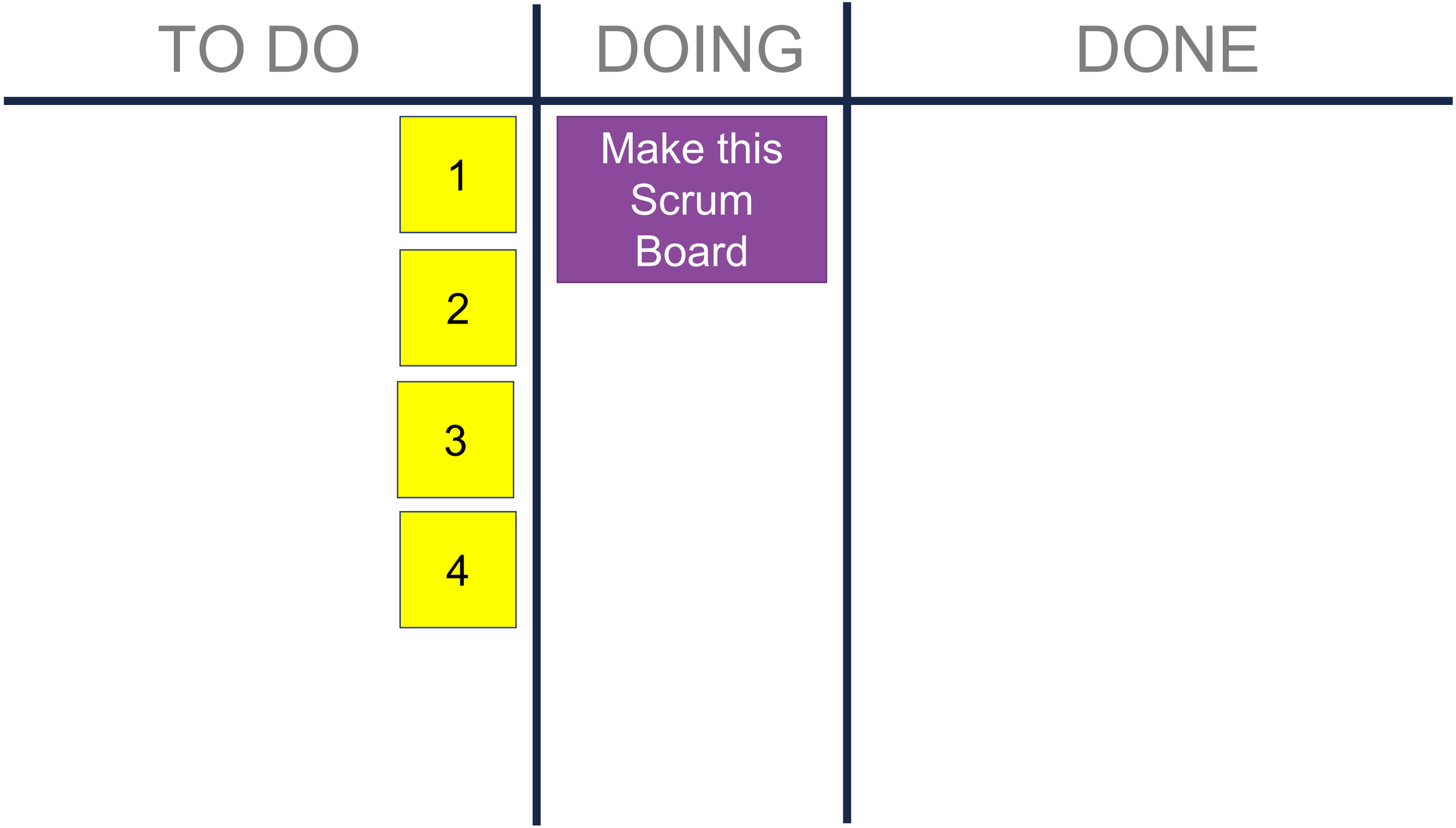
ONE PIECE FLOW versus BATCH PRODUCTION - Lean Manufacturing
https://youtu.be/JoLHKSE8sfU

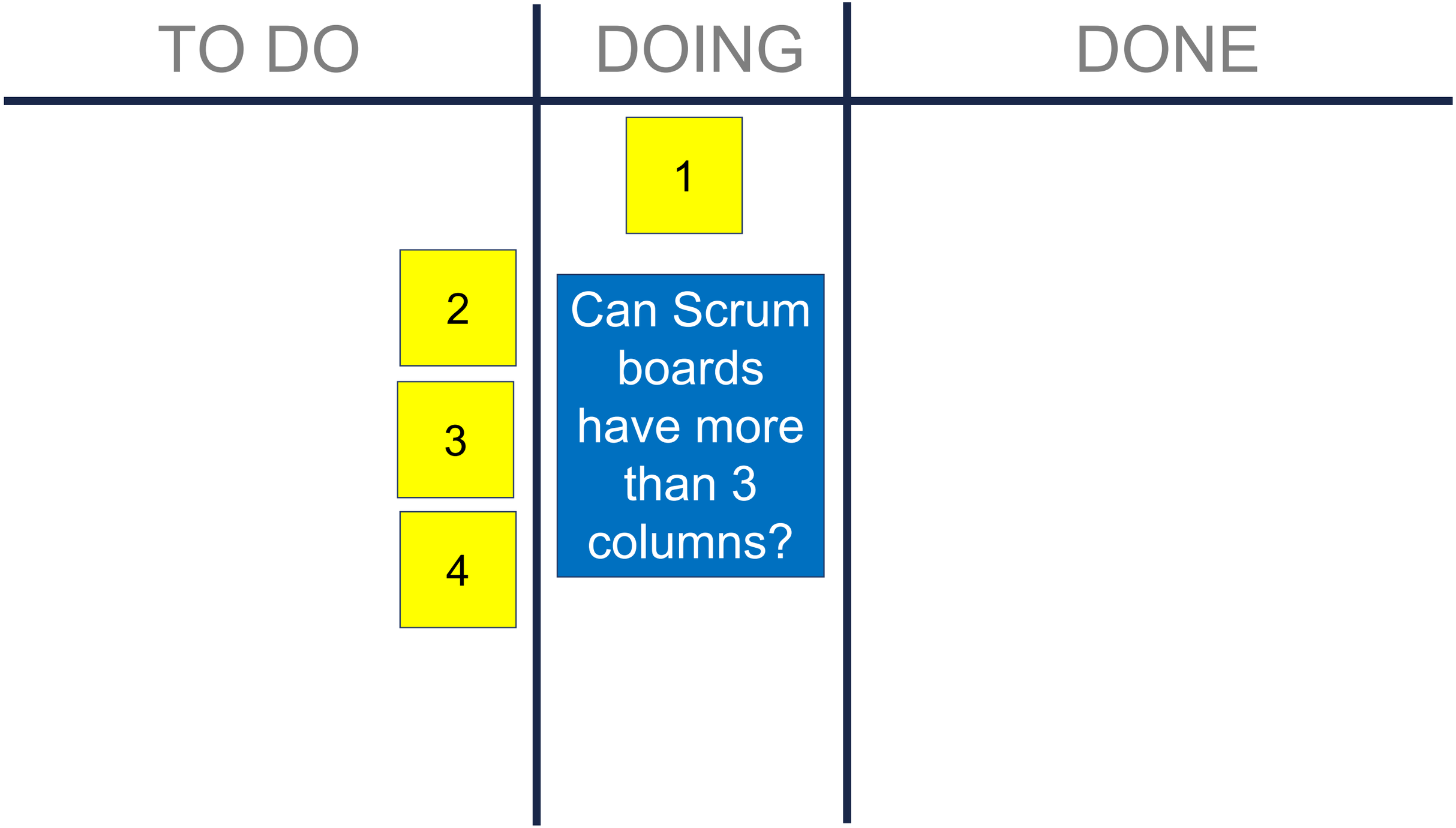
Batch size matters…, What about Multi-tasking?

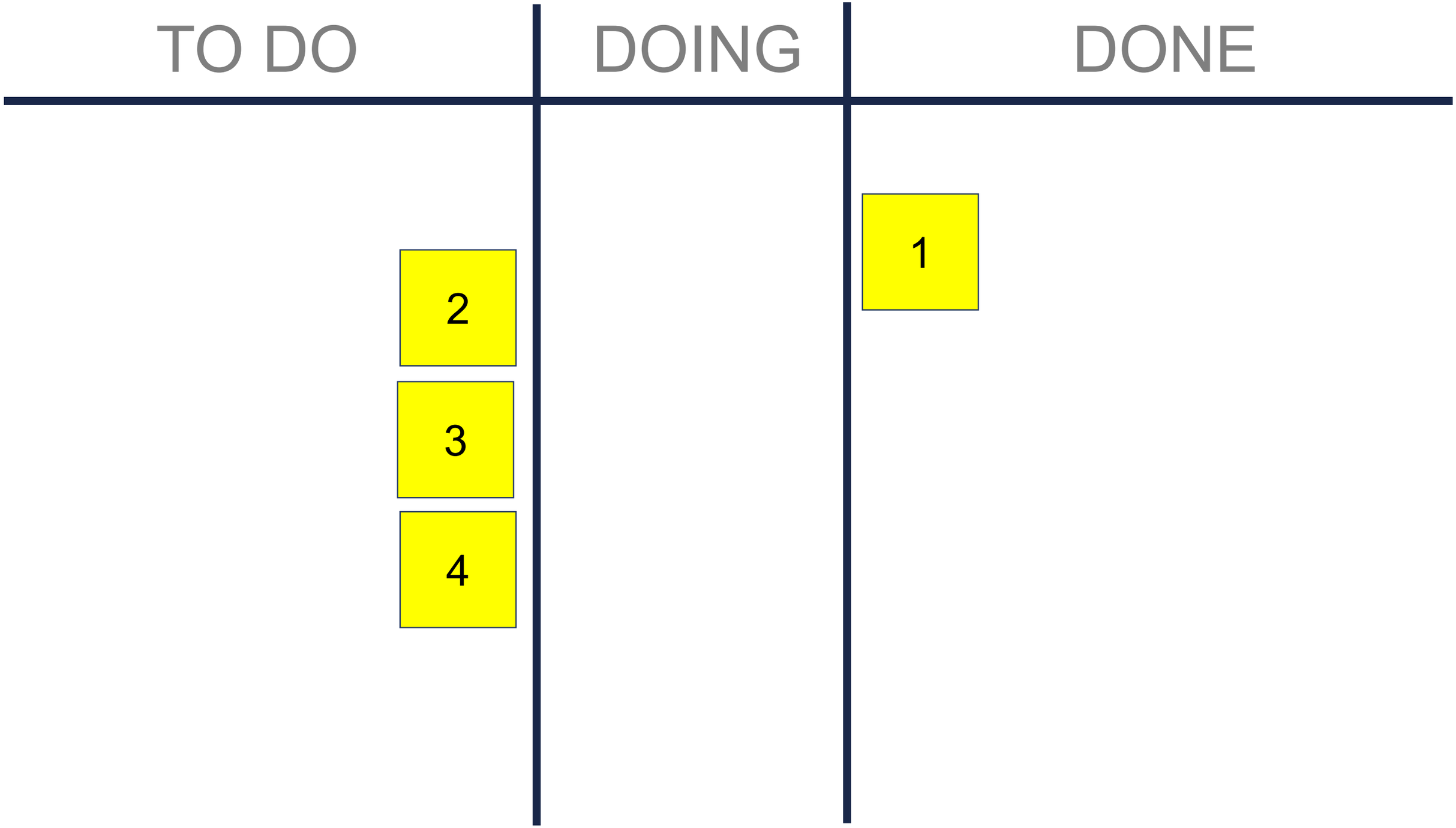


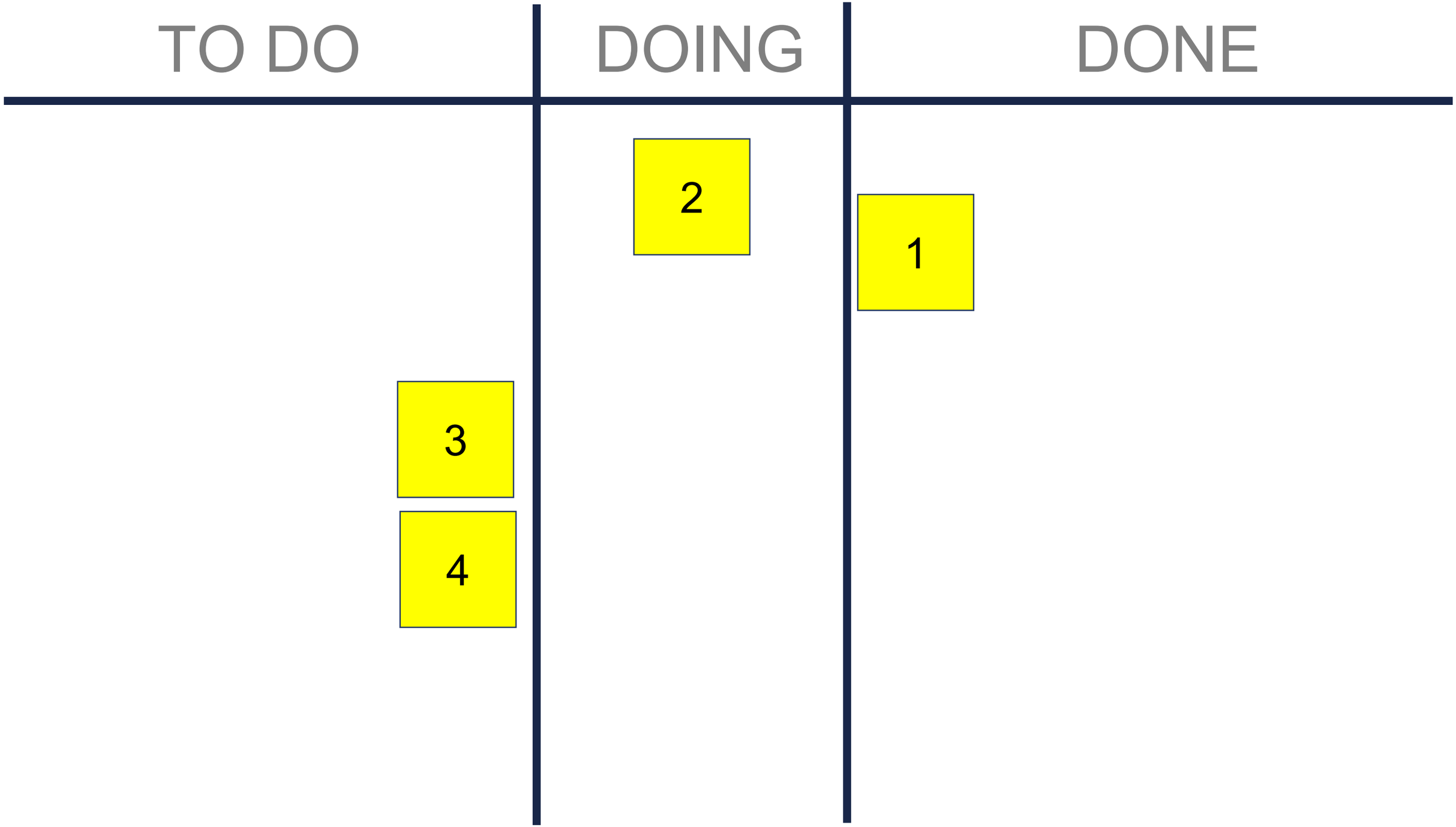
ONE PIECE FLOW versus BATCH PRODUCTION - Lean Manufacturing
https://youtu.be/JoLHKSE8sfU

TO DO	DOING	DONE
1	Read the Scrum Guide	
2	https://scrumguides.org/	
3		
4		


TO DO
DOING
DONE
1
2
3
4
Make this Scrum Board


TO DO
DOING
DONE
1
2
3
4
Can Scrum boards have more than 3 columns?


TO DO
DOING
DONE
1
2
3
4


TO DO
DOING
DONE
2
1
3
4

2

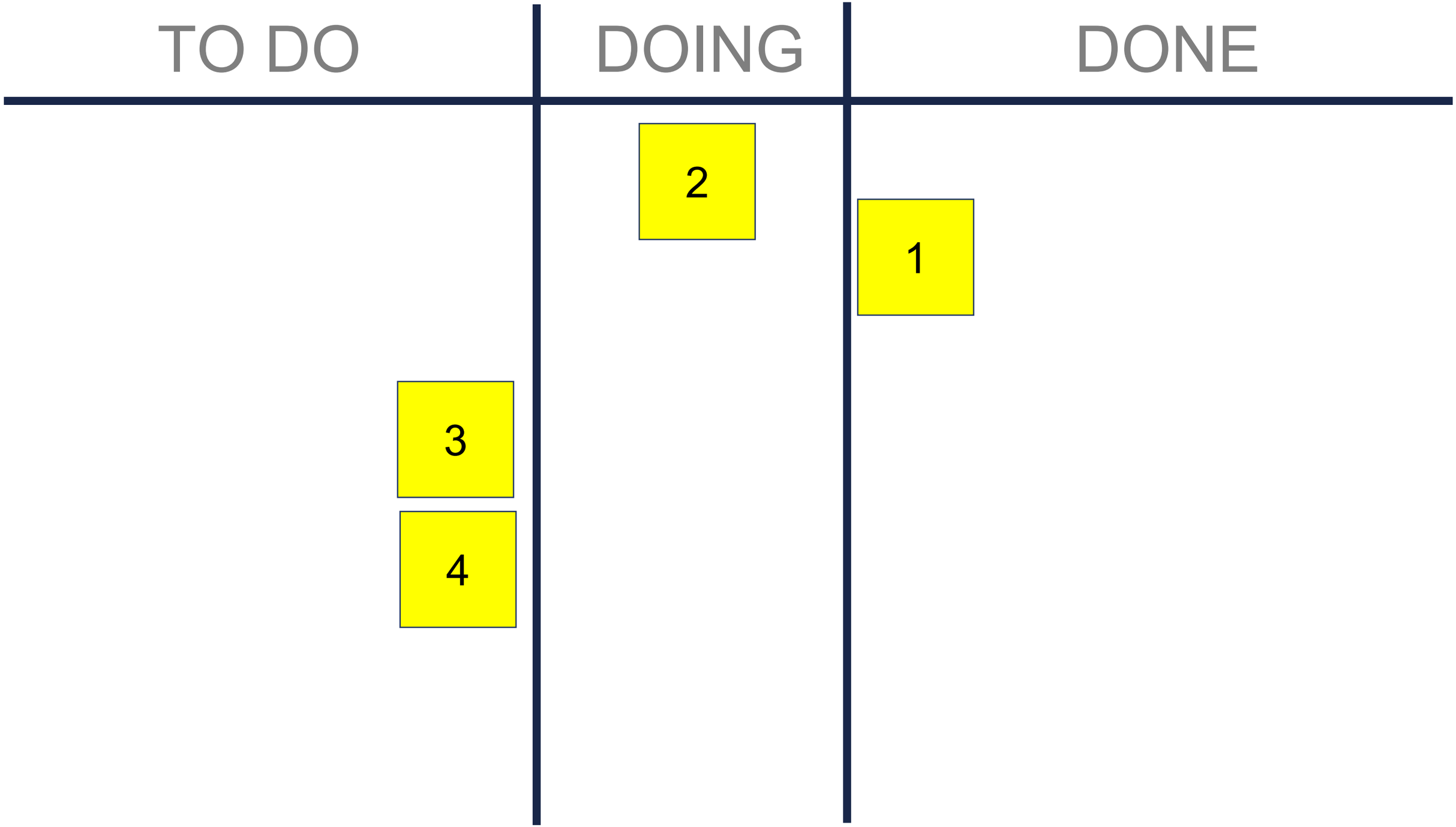
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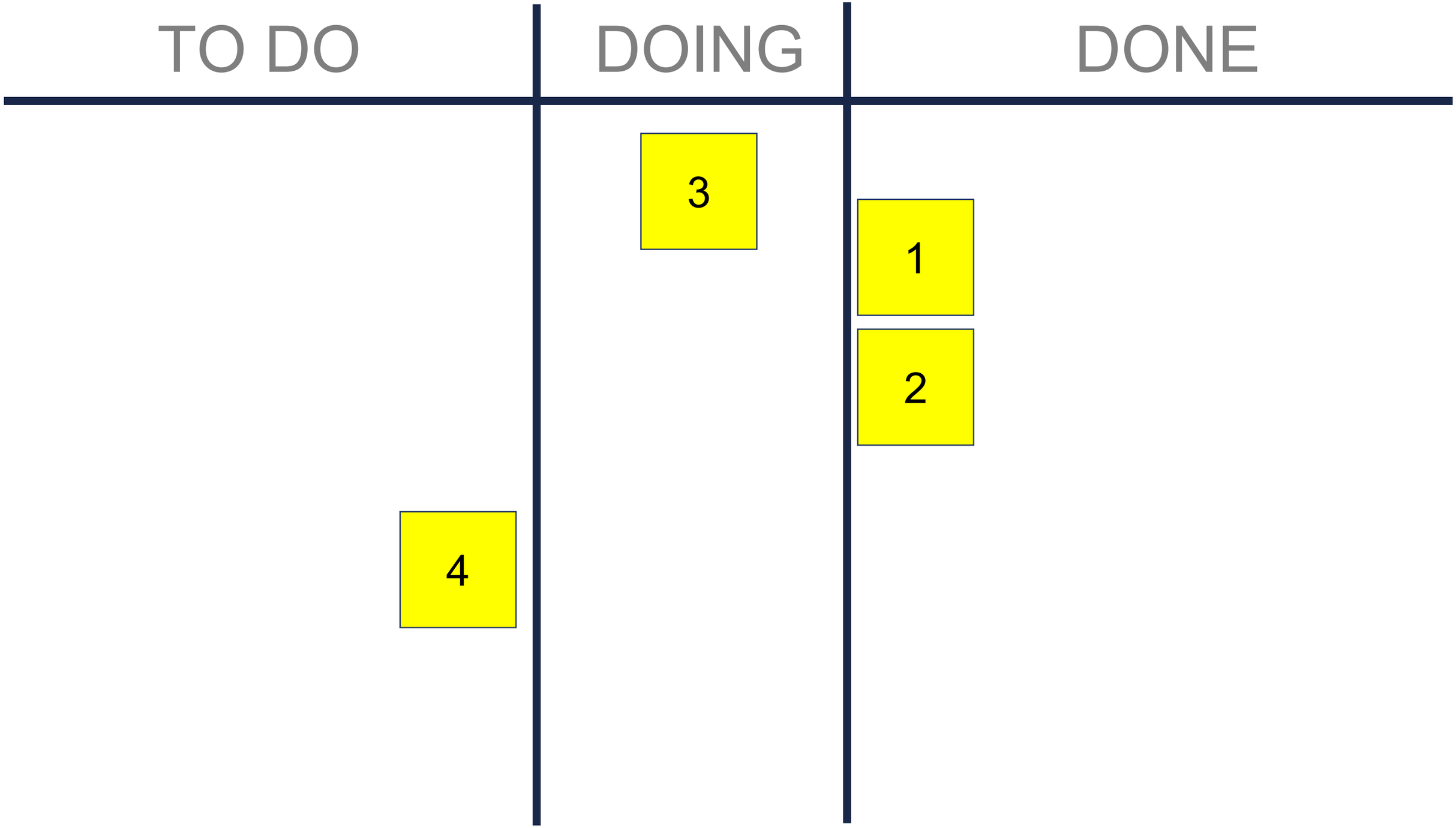
2+

In Scrum, how many tasks can be in the “Doing” Column?

It Depends

0


TO DO
DOING
DONE
2
1
3
4


TO DO
DOING
DONE
3
1
2
4

3

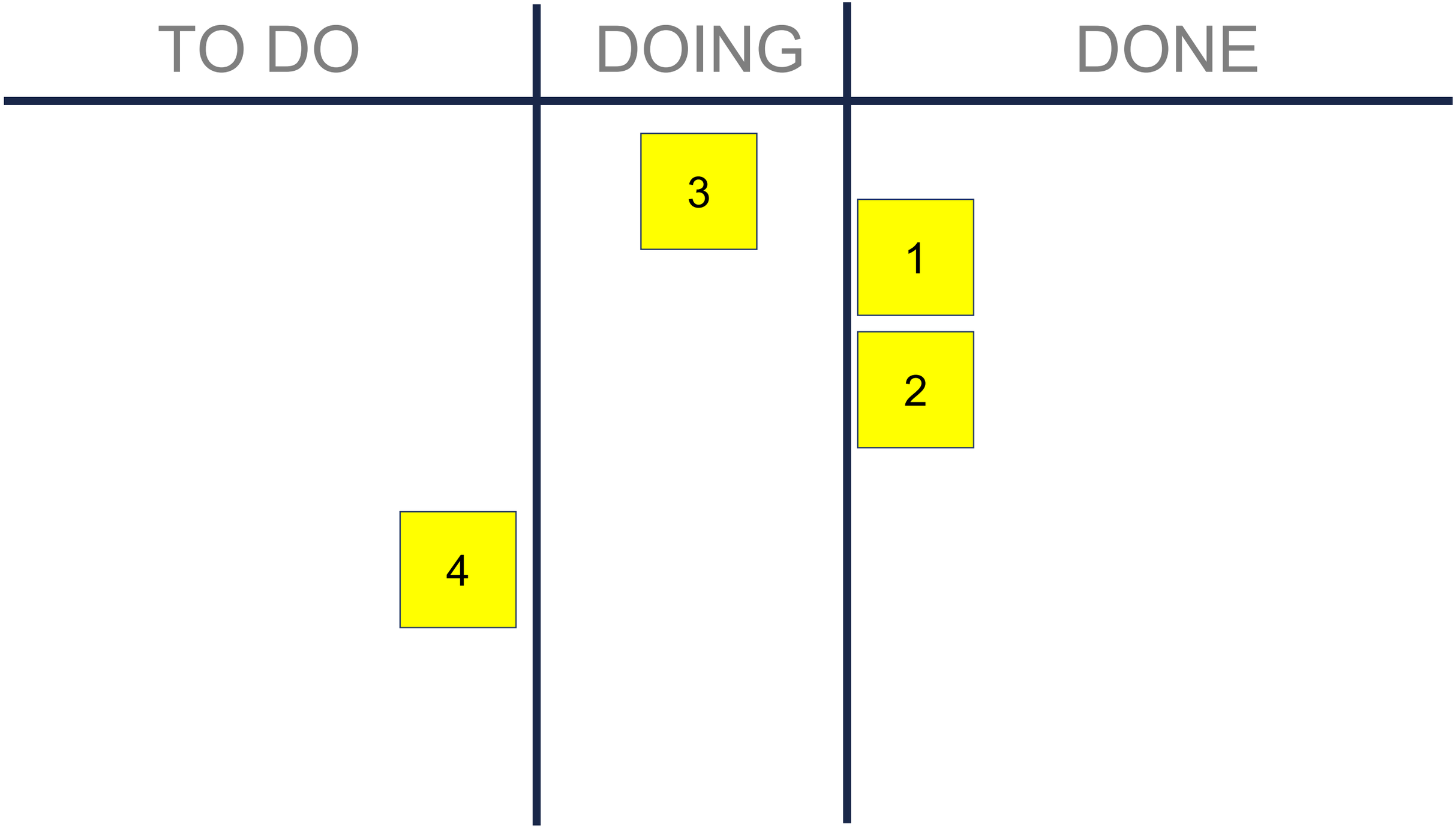
Tasks that take longer than a week to complete

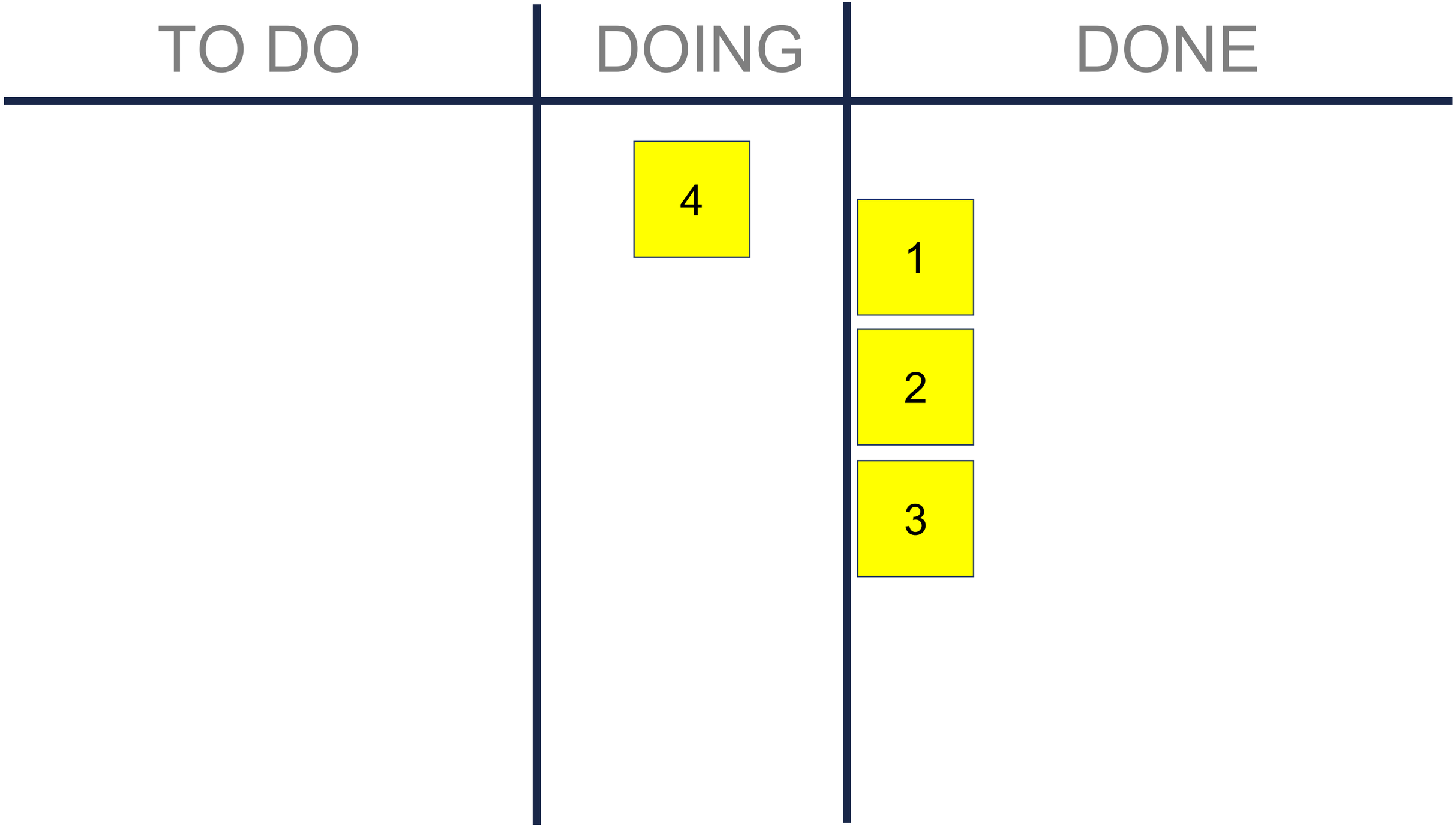
Tasks I can’t complete this Sprint

What tasks are on my Backlog?

Value-added tasks

What’s a Backlog?


TO DO
DOING
DONE
3
1
2
4


TO DO
DOING
DONE
4
1
2
3

4

Any Assigned Work by Your Boss

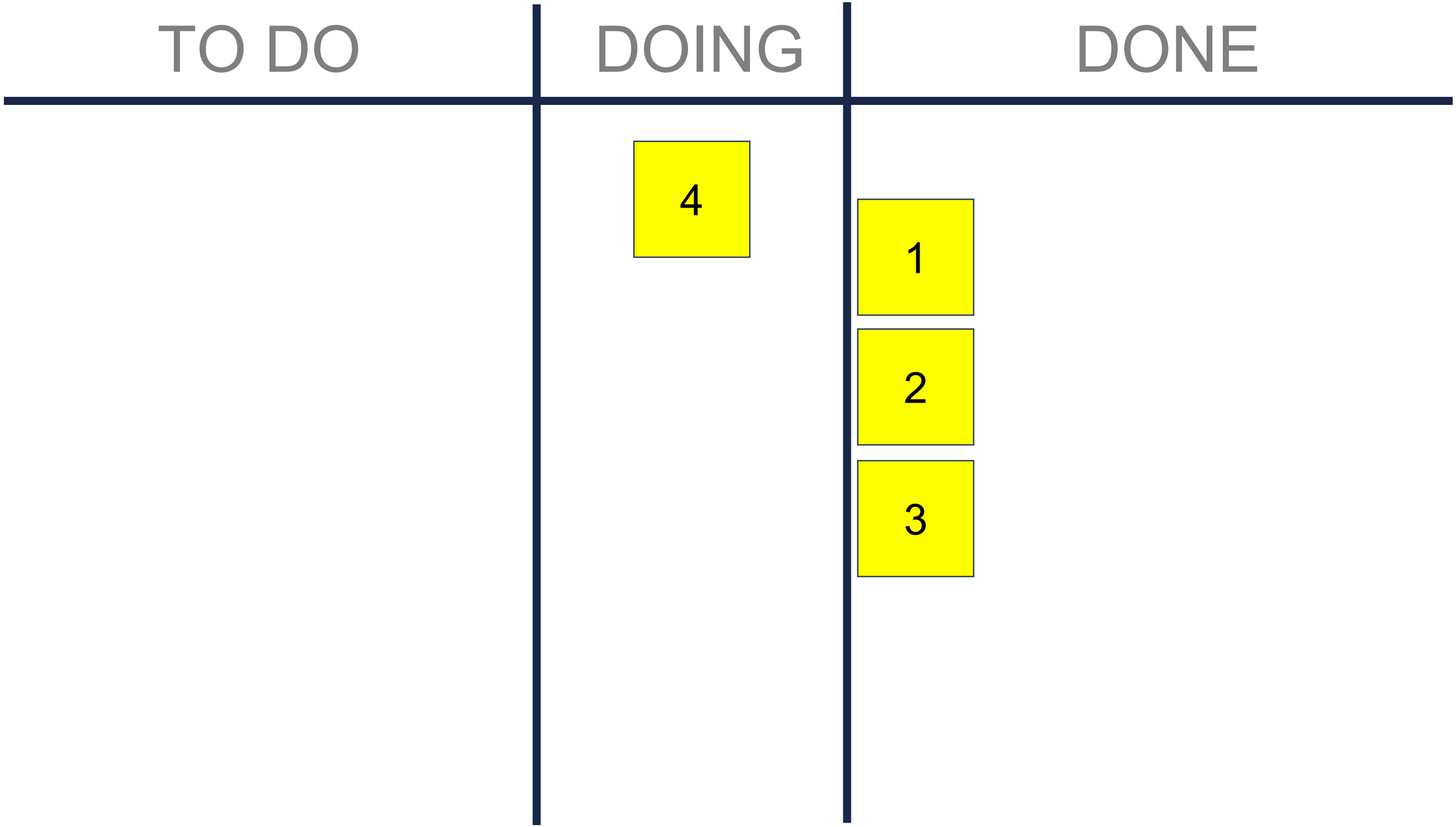
All Items From My Email

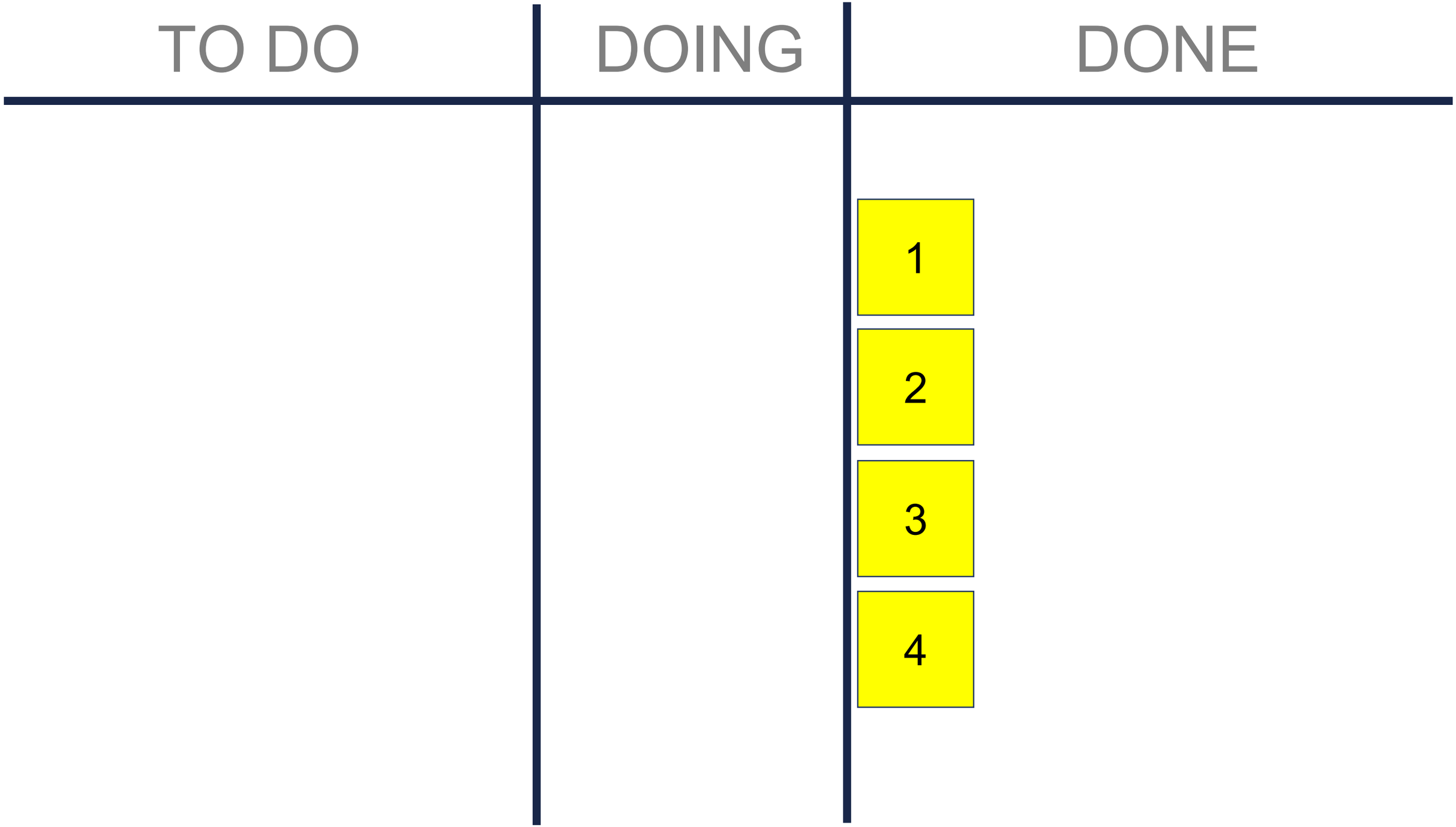
What kind of tasks belong on my board?

Any Work Task That Takes More Than 15 Minutes

Everything Known To Be Needed For This Work Increment

Share some examples


TO DO
DOING
DONE
4
1
2
3


TO DO
DOING
DONE
1
2
3
4

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Questions?



JJ Sutherland
CEO scruminc.

- Major categories include tools for product/sprint backlog management, sprint planning, daily standups, burndown charts, retrospectives, and overall project tracking.
- Some of the most popular and widely-used Scrum tools are Jira, Trello, VersionOne, Azure DevOps, Rally, Asana, Pivotal Tracker, Scrumwise, and ScrumDo.
- In addition to dedicated Scrum tools, many general project management software like Microsoft Project, Wrike, Basecamp etc. now offer Scrum-specific features and capabilities.
- There are also open-source and free Scrum tools like Taiga, ScrumNinja, ScrumDesk, Scrumbytes that teams can utilize.
- The tools landscape is constantly evolving with new players and options emerging frequently to cater to various needs, team sizes, budgets and integration requirements.

While an exact count is impractical, it's safe to say there are likely hundreds of digital tools and platforms that provide Scrum-specific functionality to development teams in some capacity in today's market. The choice depends on the specific needs, processes and preferences of each organization.

Copy Retry

Claude can make mistakes. Please double-check responses.

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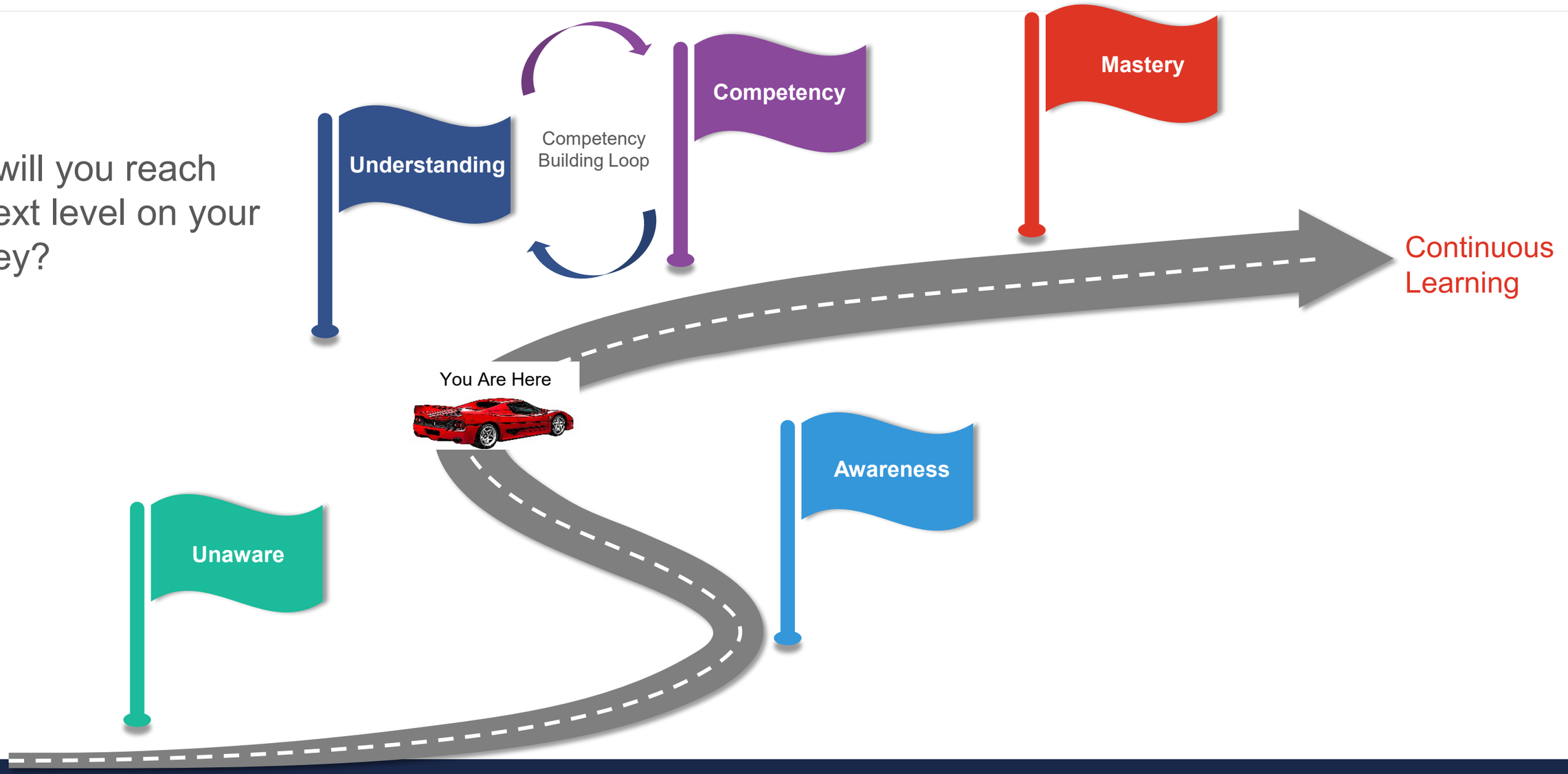
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Lean Journey to Mastery

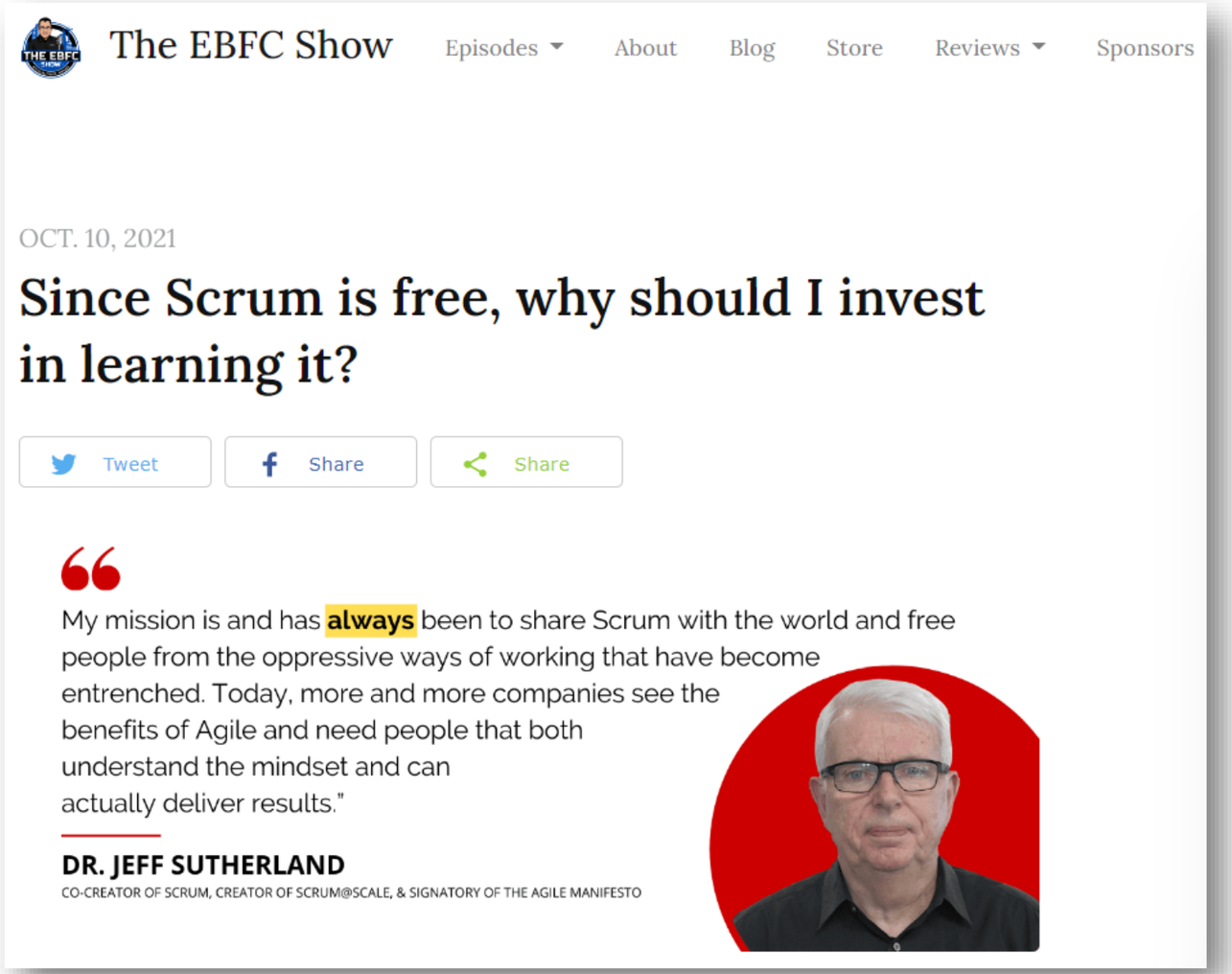
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How will you reach the next level on your journey?



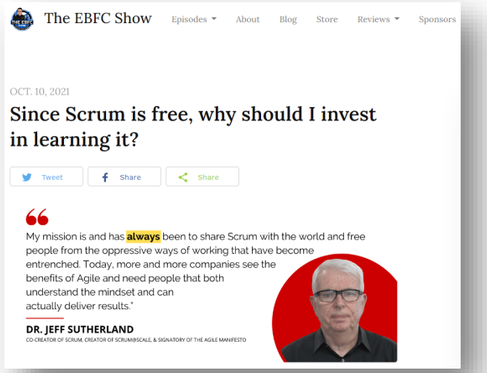
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The adventure begins with you!



https://www.theebfcshow.com/blog/since-scrum-is-free-why-should-i-invest-in-learning-it/

The adventure begins with you!

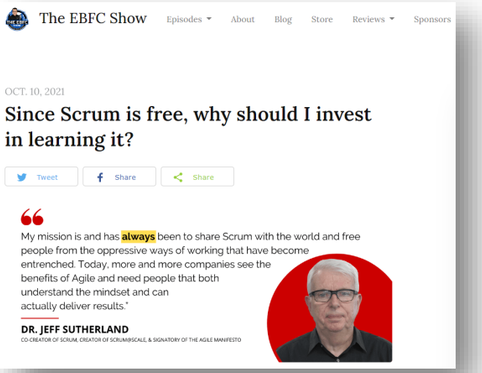


Work Categories	
Value-Added	🟢 Work that clients and supply chain partners want, appreciate, or pay for.
Non-Value-Added but Necessary	🟡 Work that does not add value to a product or service from the client's perspective, but occurs for a reason such as following a policy.
Non-Value-Added, Pure Waste	🔴 Work that consumes resources, but does not add value to the product or service.

1. categorize your work

https://www.theebfcshow.com/blog/since-scrum-is-free-why-should-i-invest-in-learning-it/

The adventure begins with you!



Sprint #1

To Do	Doing	Done
Team size, finding "just right"	Create a 1 Week Sprint Goal Example: This week I will practice Scrum daily using my Scrum Board and ask Felipe no less than 2 questions.	Read the Scrum Guide
Prioritizing our work		Make this Scrum Board
Work cycle size matters		
Why are we doing this work?		

Create a 1 Week Sprint Goal

Example: This week I will practice Scrum daily using my Scrum Board and ask Felipe no less than 2 questions.

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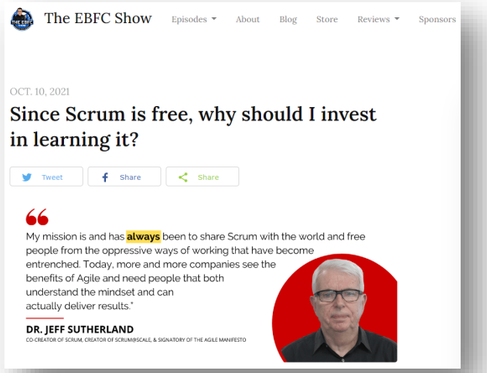
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Sprint #1

Create a 1 Week Sprint Goal

Example: This week I will practice Scrum daily using my Scrum Board and ask Felipe no less than 2 questions.

To Do	Doing	Done
Team size, finding "just right"	Prioritizing our work	Read the Scrum Guide
Work cycle size matters	***Give yourself grace during this experiment.***	Make this Scrum Board
Why are we doing this work?		



2. List 5 or less tasks that will help you achieve your goal.

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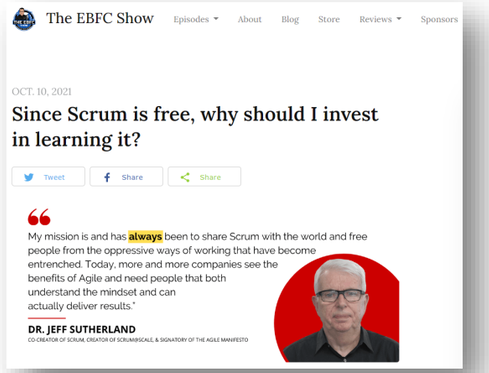
The adventure begins with you!

Sprint #1

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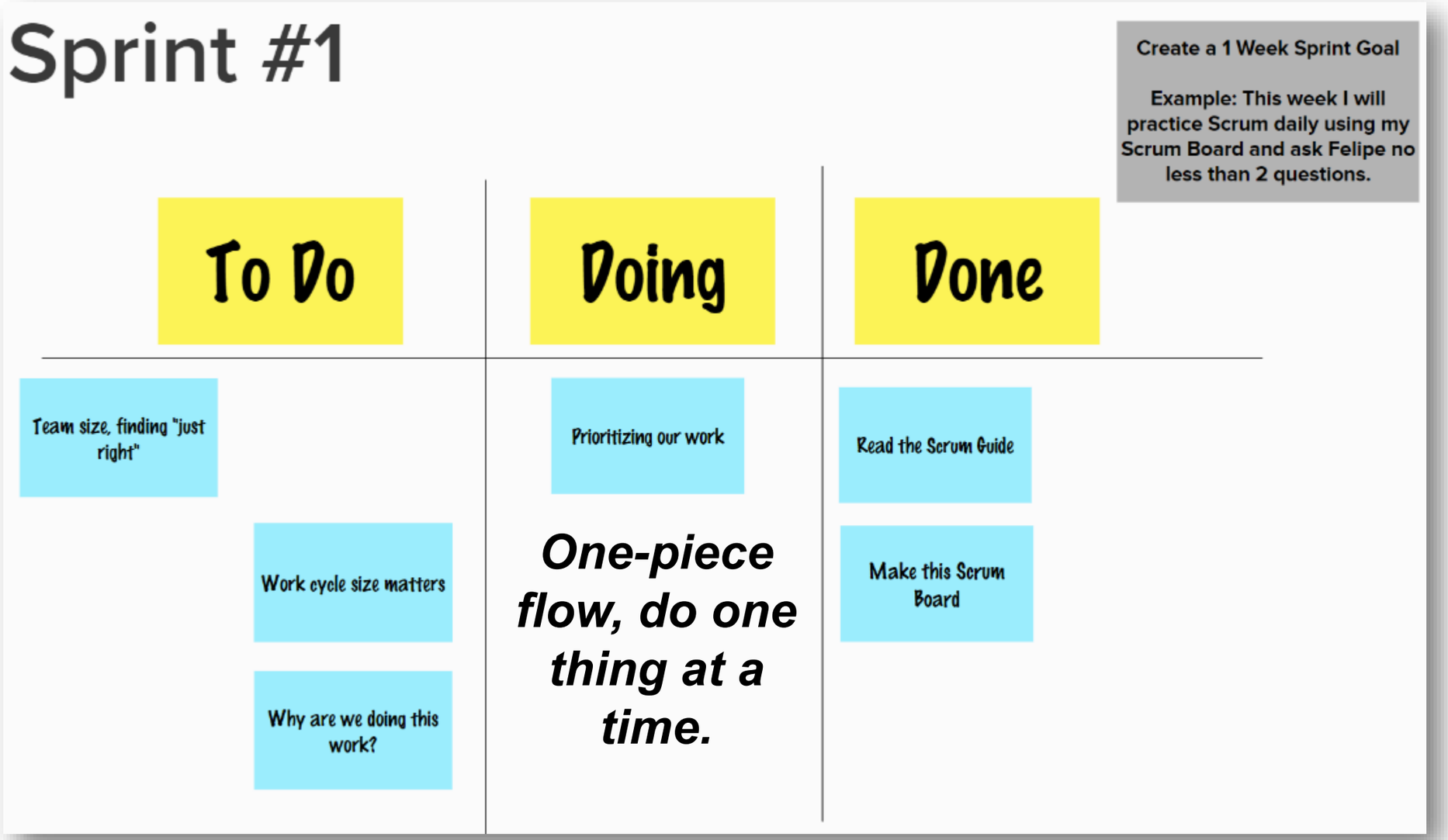
To Do	Doing	Done
Team size, finding "just right"	Prioritizing our work	Read the Scrum Guide
Work cycle size matters	***Put first things first, then OODA***	Make this Scrum Board
Why are we doing this work?		

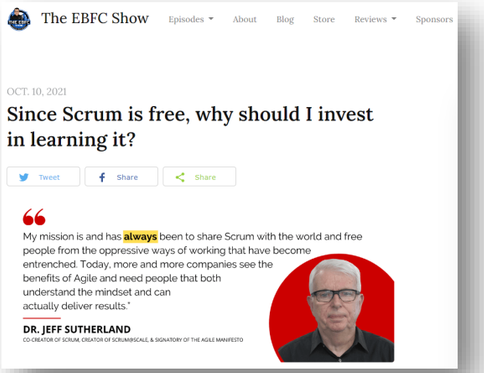


3. Prioritize & Check-In using your board daily

https://www.theebfcshow.com/blog/since-scrum-is-free-why-should-i-invest-in-learning-it/

The adventure begins with you!





4. Learn by doing and sharing with others.

https://www.theebfcshow.com/blog/since-scrum-is-free-why-should-i-invest-in-learning-it/

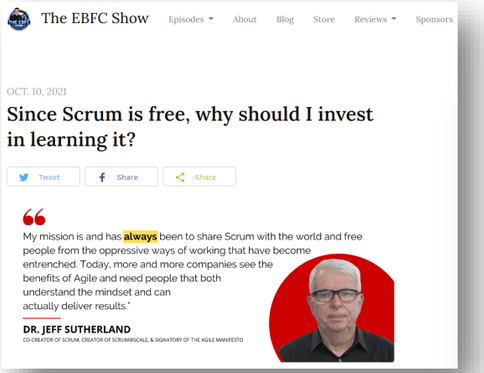
The adventure begins with you!

Sprint #1

Create a 1 Week Sprint Goal

Example: This week I will practice Scrum daily using my Scrum Board and ask Felipe no less than 2 questions.

To Do	Doing	Done
	Team size, finding "just right"	Read the Scrum Guide
		Work cycle size matters
	Who will you share Scrum with?	Make this Scrum Board
		Why are we doing this work?
		Prioritizing our work



5. Repeat and bring along others to join you.

https://www.theebfcshow.com/blog/since-scrum-is-free-why-should-i-invest-in-learning-it/

What could stop you from trying Scrum?



THE CHOICE (Short Animated Movie)
https://youtu.be/_HEnohs6yYw

What could stop you from trying Scrum?

Habits

***noun* | acquired modes of behavior that become nearly or completely involuntary**

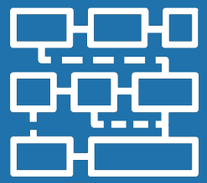


Just Start

THE CHOICE (Short Animated Movie)
https://youtu.be/_HEnohs6yYw

Workshop Learning Objectives Review



01.

Master Scrum Fundam entals with an AI Twist: Grasp the essentials of the Scrum framework, enriched with AI integration, to enhance your project management skills in design and construction.

02.

Understand the powerful combination of Scrum methodology and AI tools like Chat GPT and Claude, discovering how they revolutionize construction project management.

03.

Experience hands-on application of Scrum and popular AI platforms

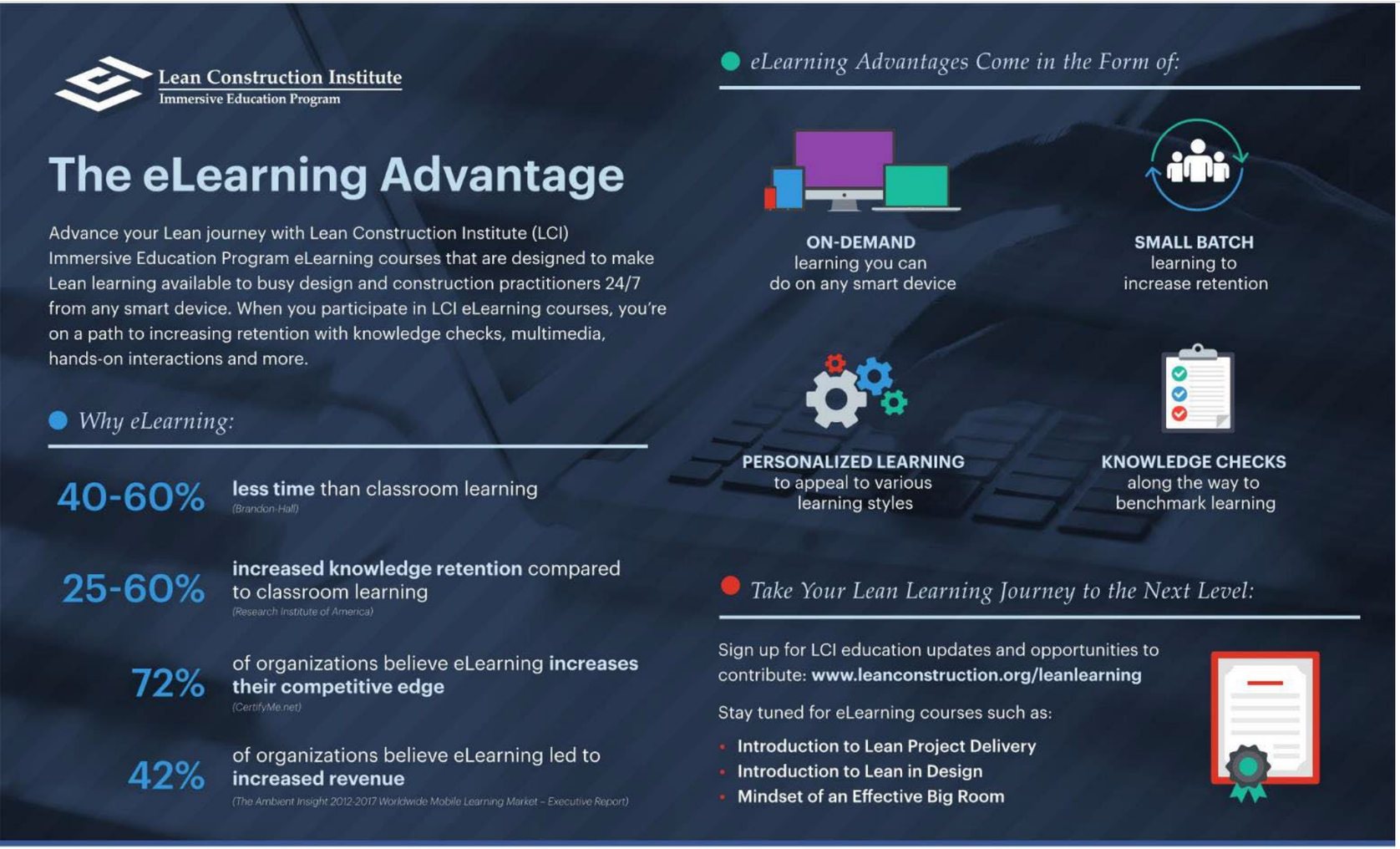
04.

See the path to use the Scrum framework individually and/or with your teammates supplemented with Generative AI

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Immersive Education Program



For eLearning volume discounts of up to 65% off, email: **elearningdiscounts@leanconstruction.org**.

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- Introduction to Lean Project Delivery
- Introduction to Last Planner System®
- Introduction to Last Planner System® in Design
- Mindset of an Effective Big Room
- Lean in the Design Phase
- Target Value Delivery
- Conducting Gemba Walks
- Business Case for Lean Project Delivery
- For more information please visit: WWW.LEANCONSTRUCTION.ORG

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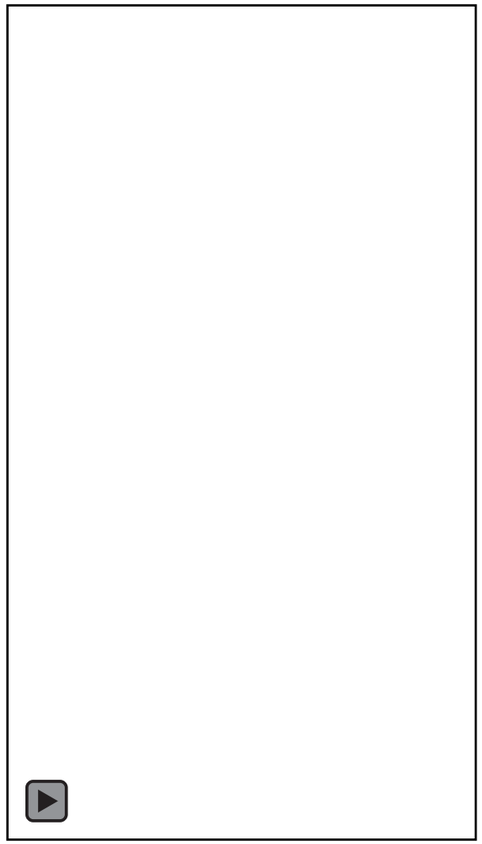
Plus/Delta

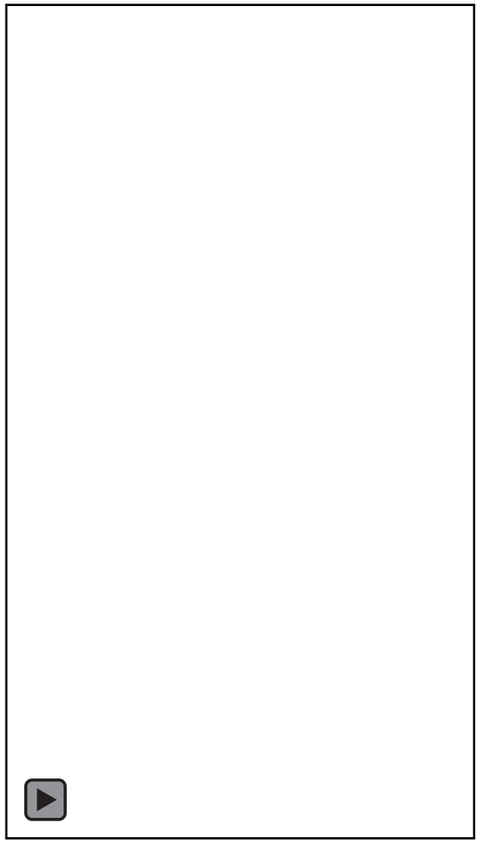




Thank You

👋 Stay Connected





REGISTERED SCRUM MASTER by scruminc.

REGISTERED PRODUCT OWNER by scruminc.

REGISTERED SCRUM@SCALE PRACTITIONER by scruminc.

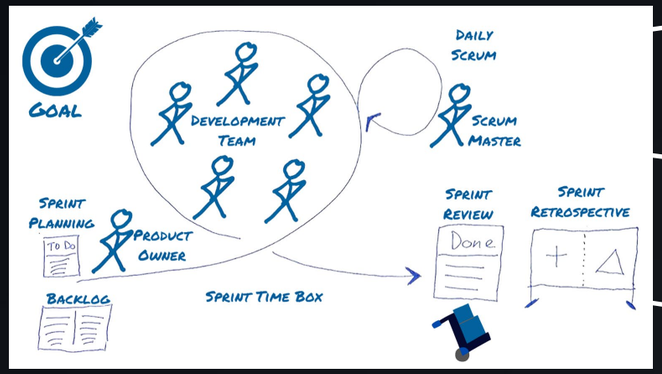
RST

REGISTERED SCRUM TRAINER by scruminc.

https://thefelipe.bio.link/

THE EBFC SHOW WITH FELIPE ENGINEER - MANRIQUEZ

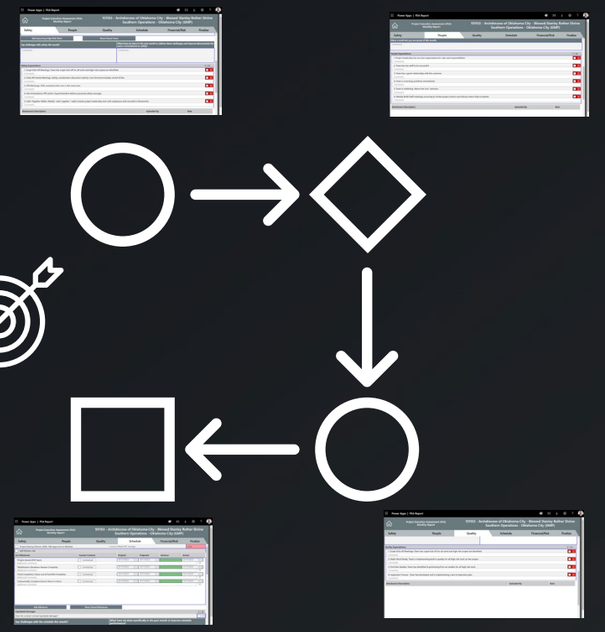
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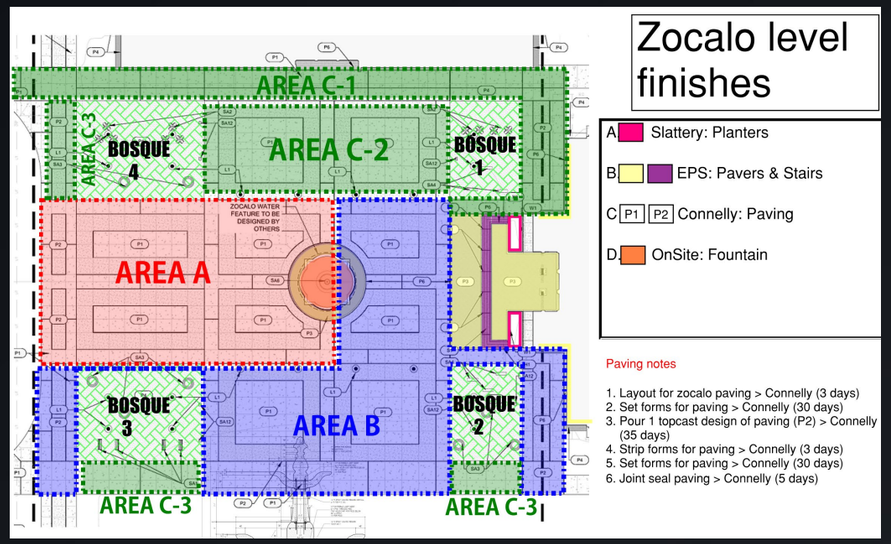


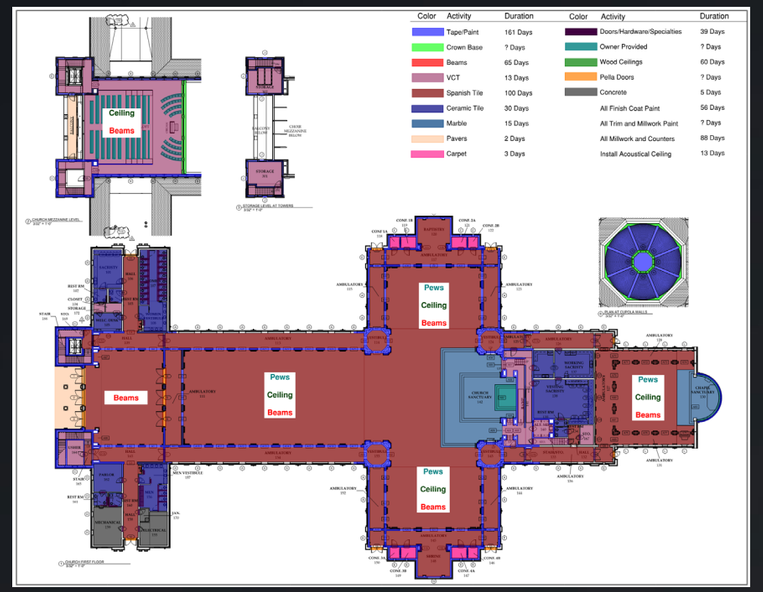
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2. Make Work Visible (BPS) — Color-Ups | MVP Data Updating

3. Teamwork on a Cycle (Takt Sprints) — 5 Days | 30 Days







- Cost
- Schedule
- Quality

Main Construction



Cost

$50 Million



Main Construction



Cost

$50 Million



Schedule

Fall 2019 – Winter 2022
< 4 Years



Main Construction



Cost

$50 Million



Schedule

Fall 2019 – Winter 2022

< 4 Years



Quality

2,000 seat church, chapel, visitor center, museum, and sacred mound



Main Construction



Cost

$50 Million



Schedule

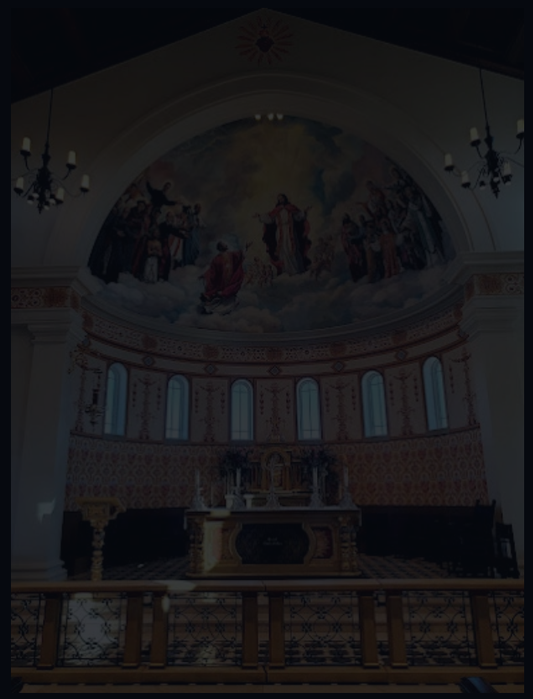
Fall 2019 – Winter 2022

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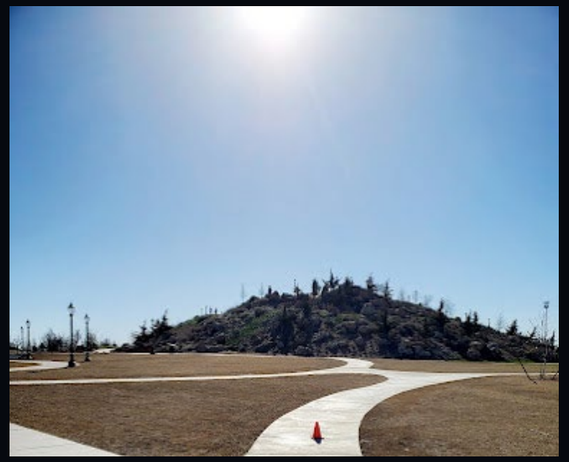
Quality

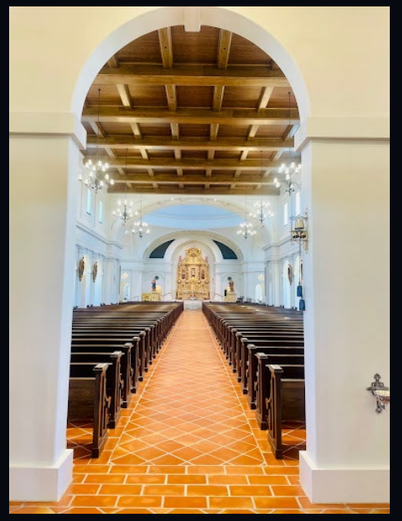
2,000 seat church, chapel, visitor center, museum, and sacred mound



4 Key Challenges









Main Construction



Cost

$50 Million

Schedule

Fall 2019 – Winter 2022

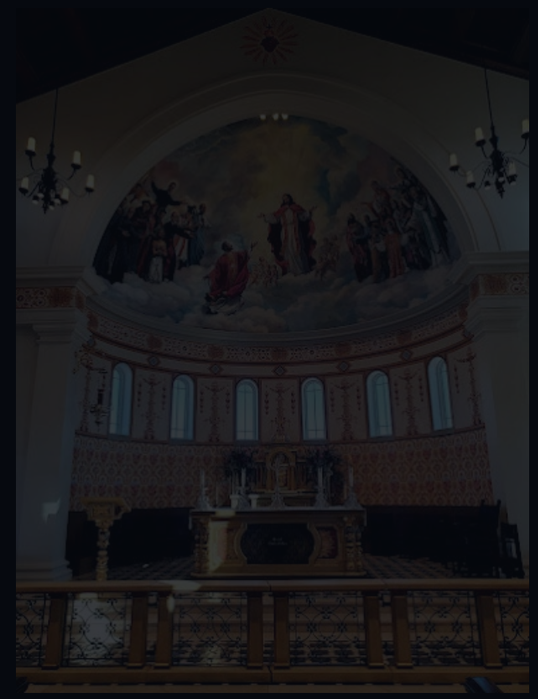
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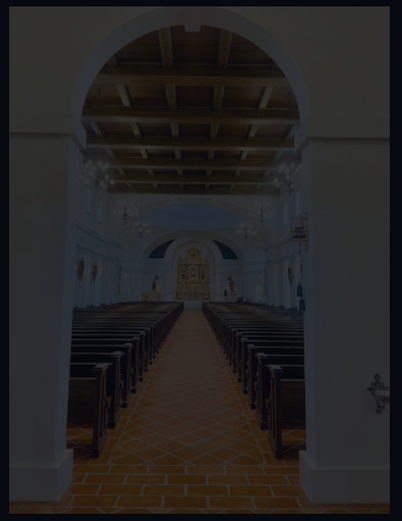




4 Key Challenges







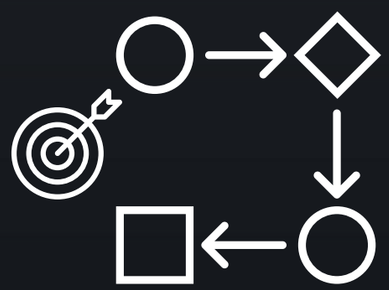


Main Construction

Philosophy > Process > People > Problem-Solving











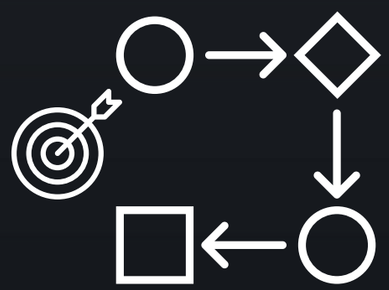


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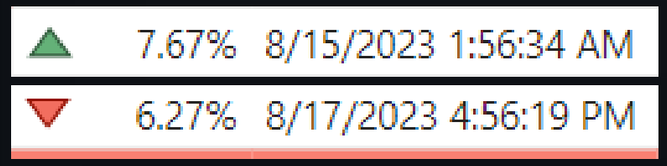


The Boldt Project Execution Assessment & Dashboard Reports provide

- Visibility
- Project health and performance
- Risk and mitigation practices sharing

Business analytics via Power BI enables:

- Data analysis
- Realtime dashboards
- Interactive reports
- Compelling visualizations



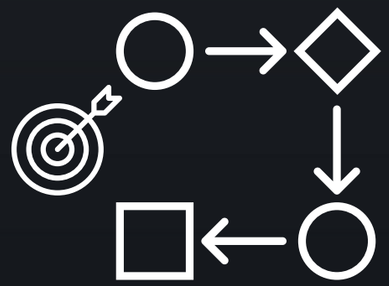


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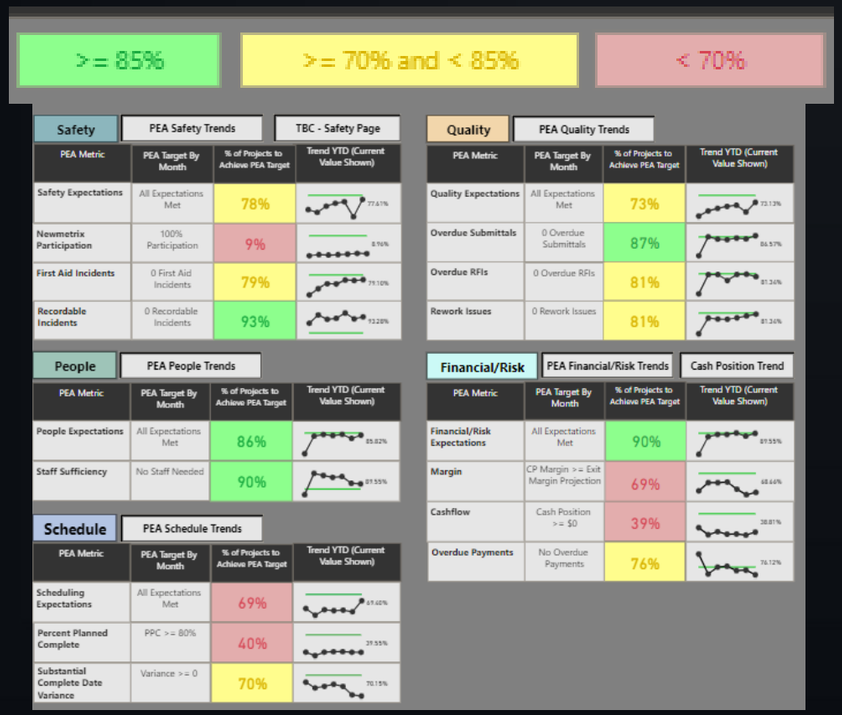


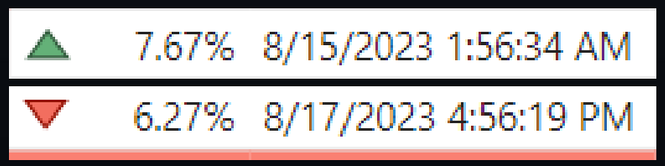










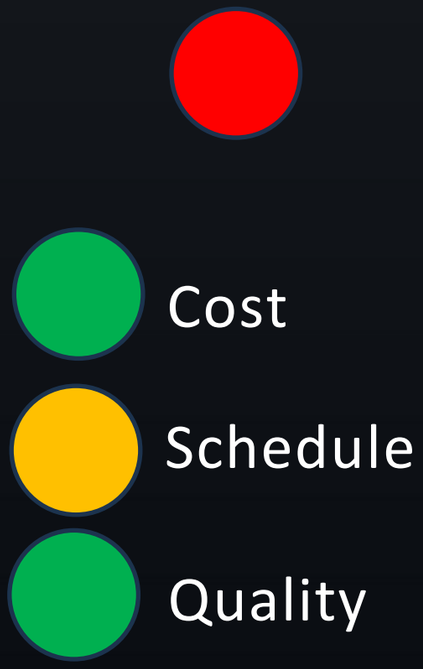


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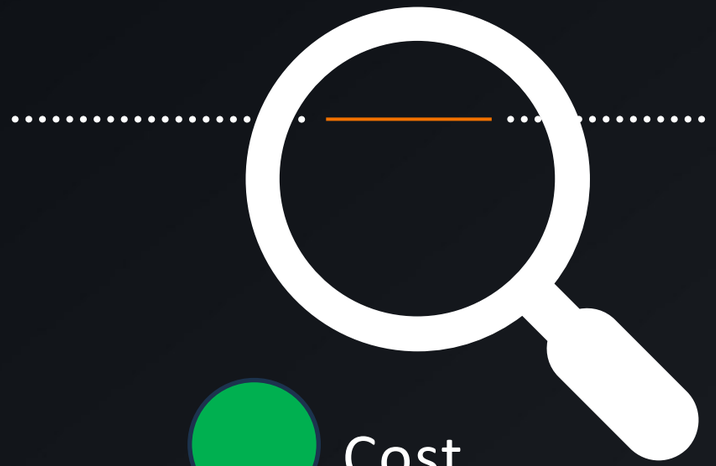
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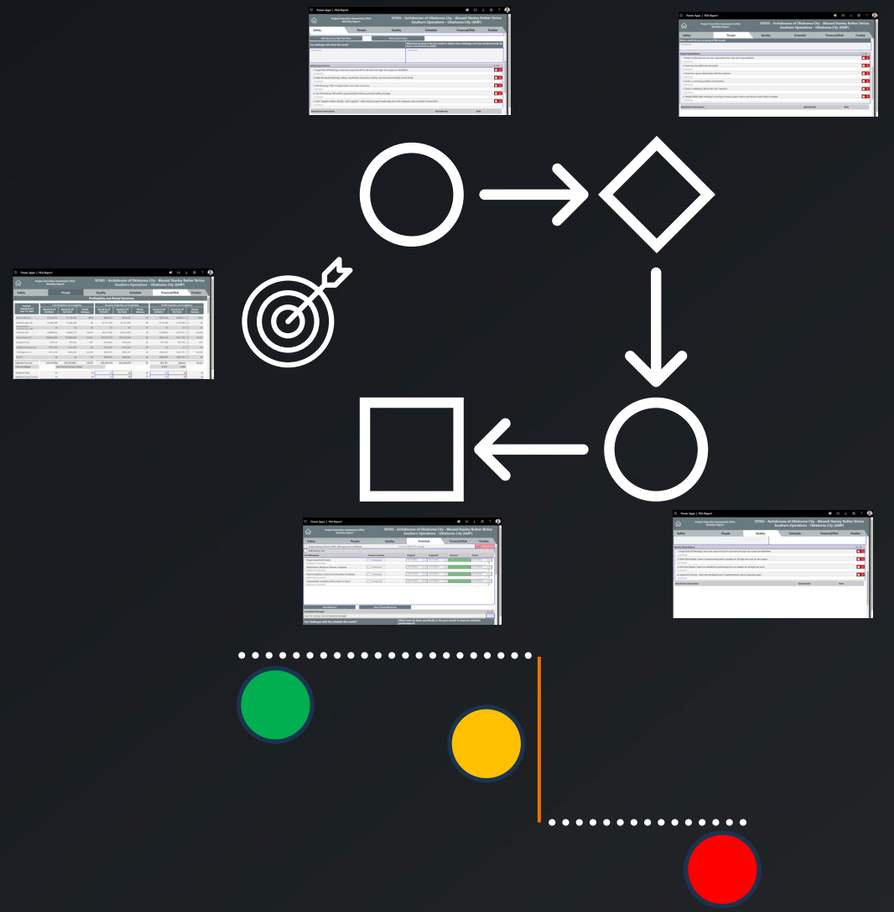
Using Scrum for Data Analytics



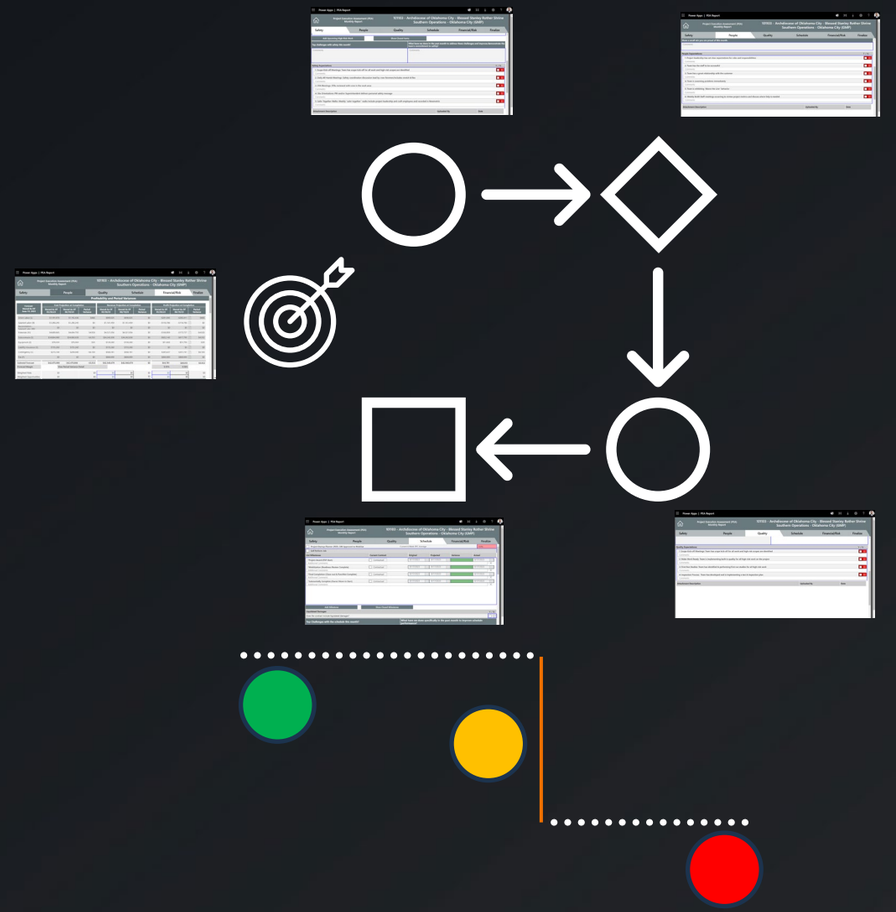
Cost

Schedule

Quality



Using Scrum for Data Analytics

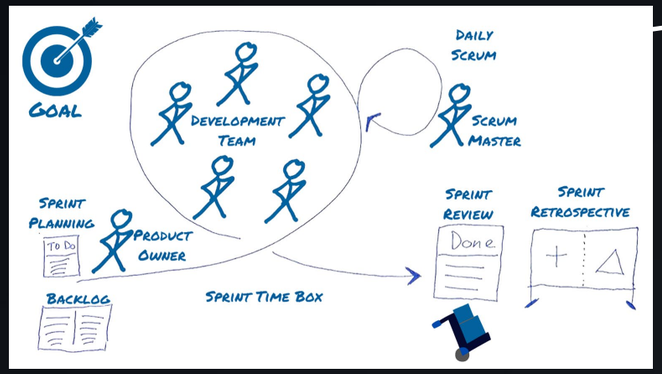


Cost

Schedule

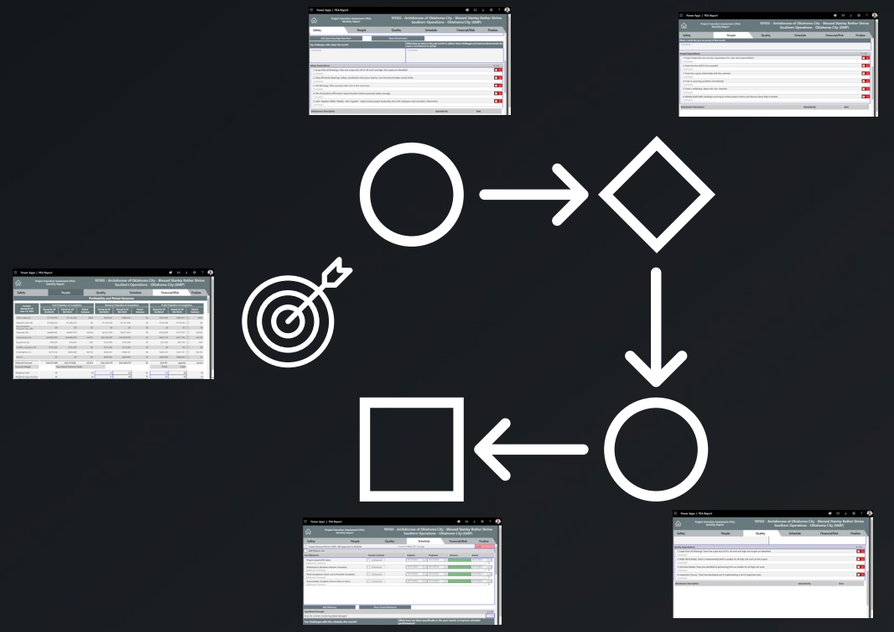
Quality

Using Scrum for Data Analytics



1. Define the Goal

October 31st

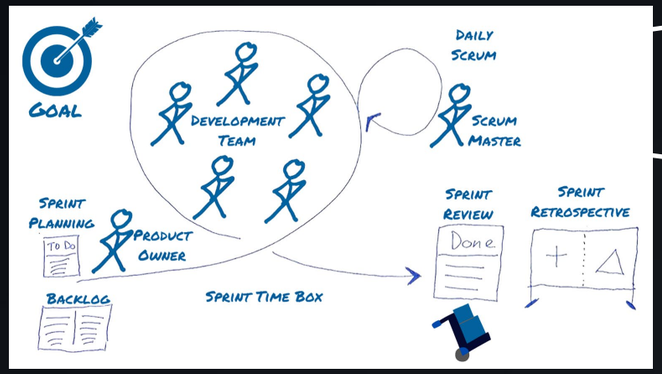


Cost

Schedule

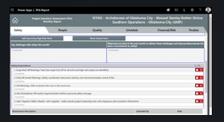
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Using Scrum for Data Analytics



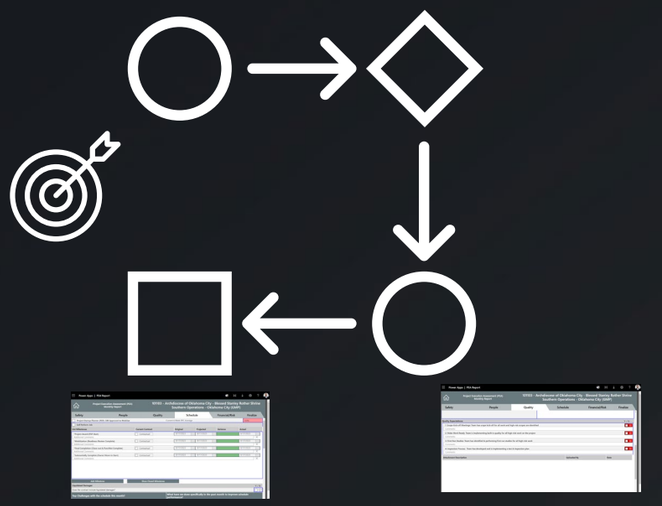
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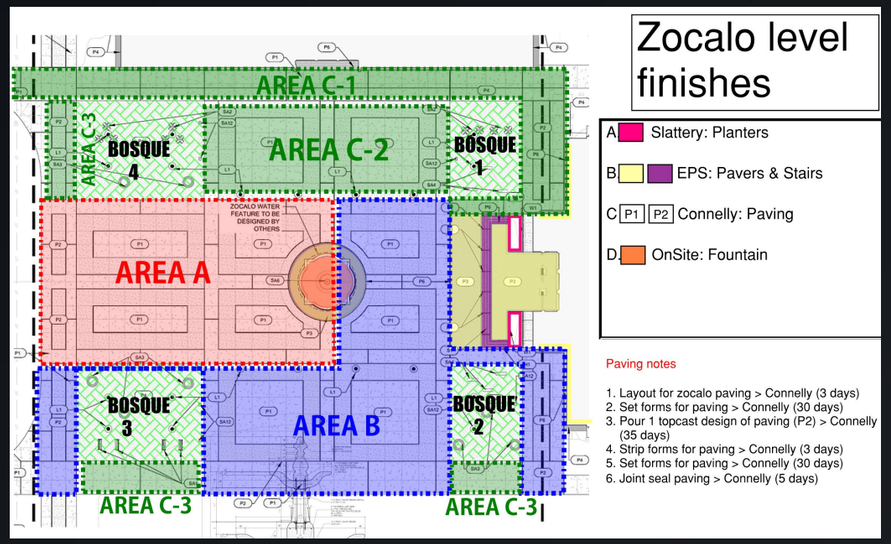
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Zocalo level finishes

A Slattery: Planters

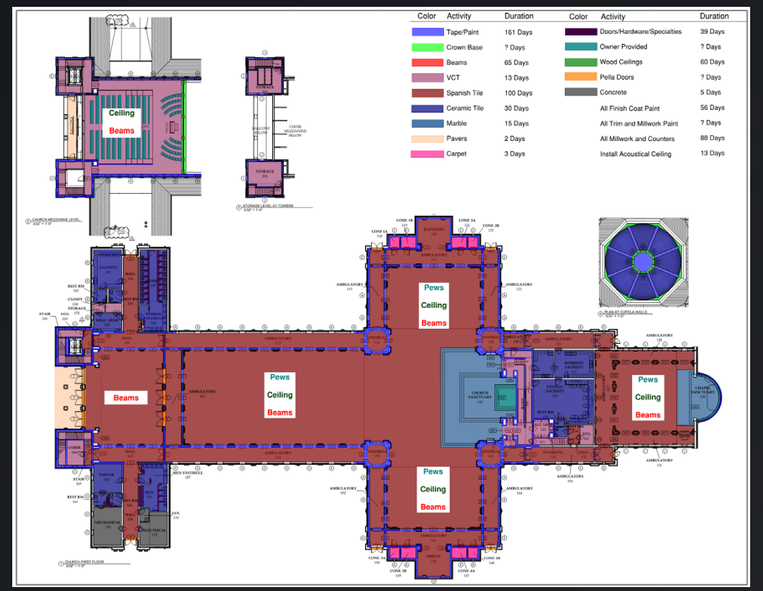
B EPS: Pavers & Stairs

C P1 P2 Connelly: Paving

D. OnSite: Fountain

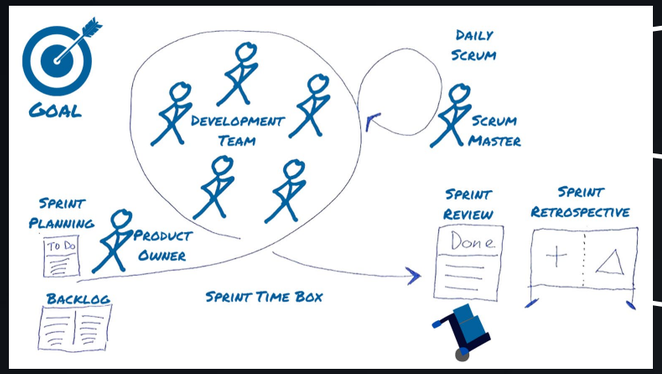
Paving notes

1. Layout for zocalo paving > Connelly (3 days)
2. Set forms for paving > Connelly (30 days)
3. Pour 1 topcast design of paving (P2) > Connelly (35 days)
4. Strip forms for paving > Connelly (3 days)
5. Set forms for paving > Connelly (30 days)
6. Joint seal paving > Connelly (5 days)



- Cost
- Schedule
- Quality

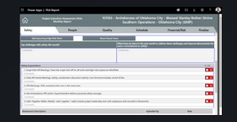
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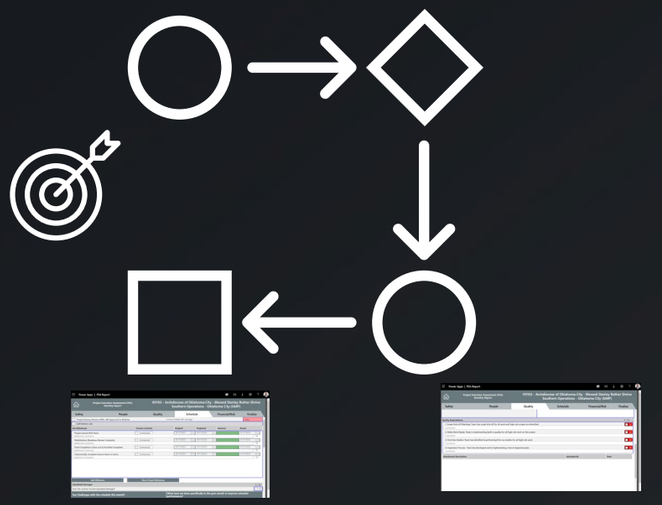
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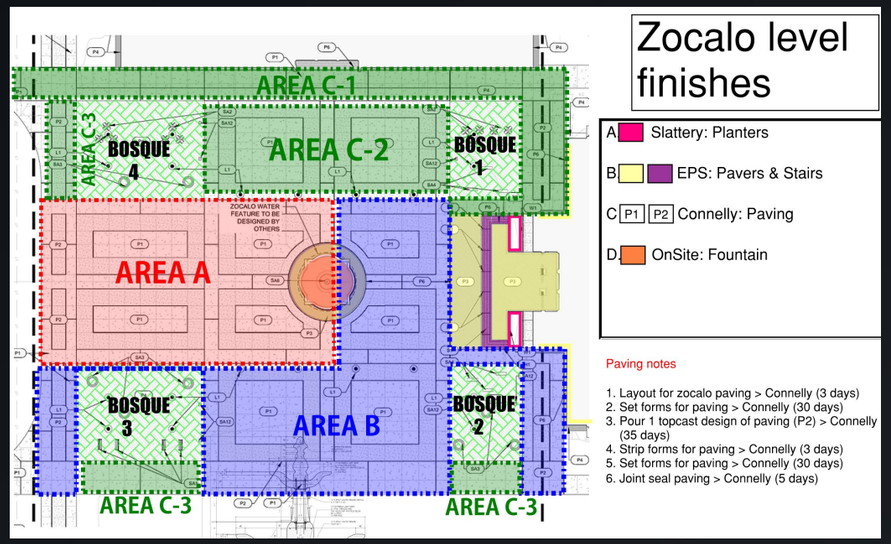
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Zocalo level finishes

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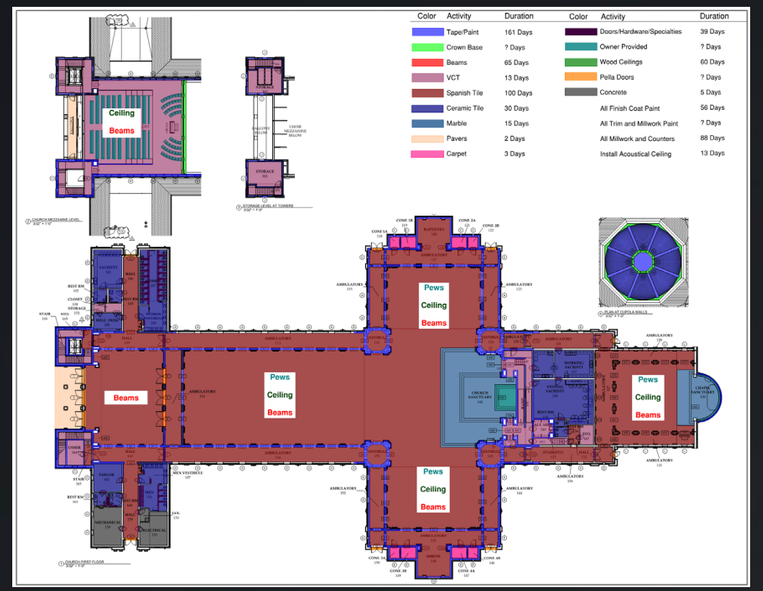
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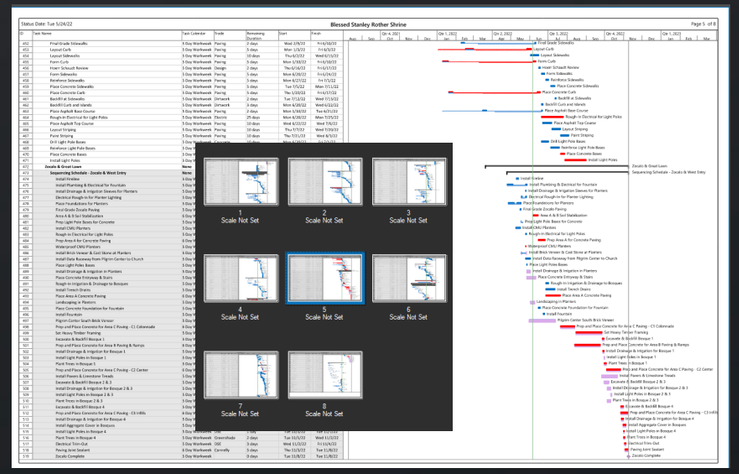
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- Cost
- Schedule
- Quality

DATA ANALYSIS

Brooks' Law
Adding manpower to a late project makes it later.

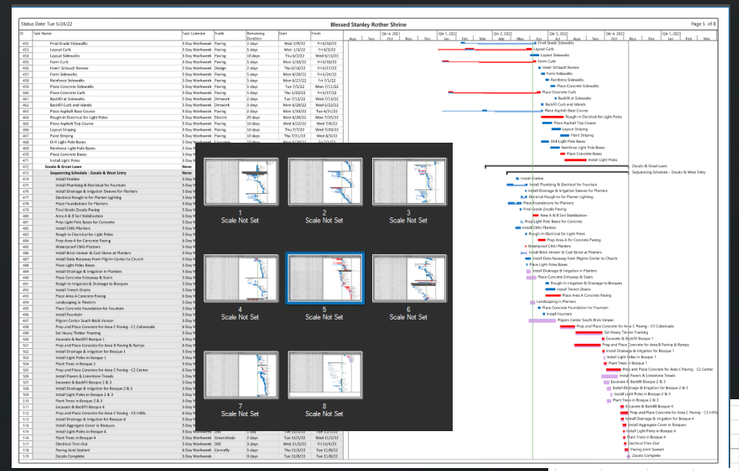




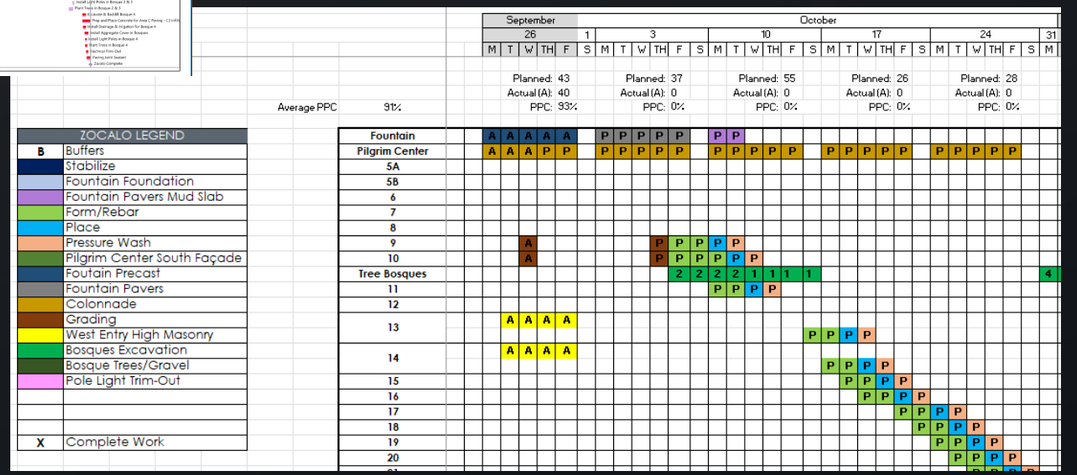
DATA ANALYSIS

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Free 2 Month Schedule Improvement





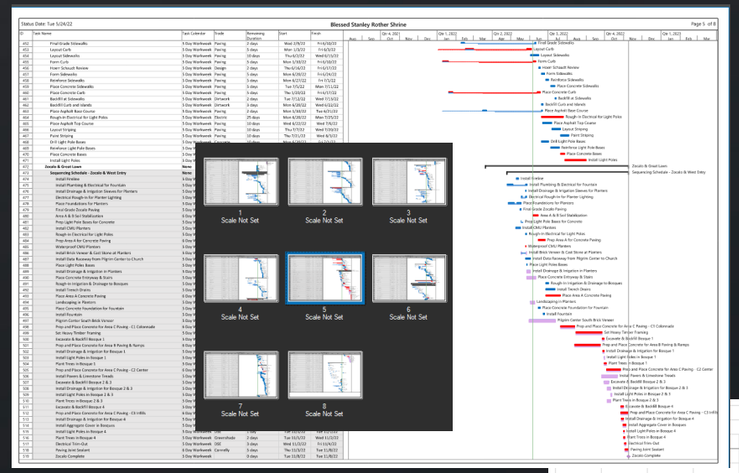


Flow

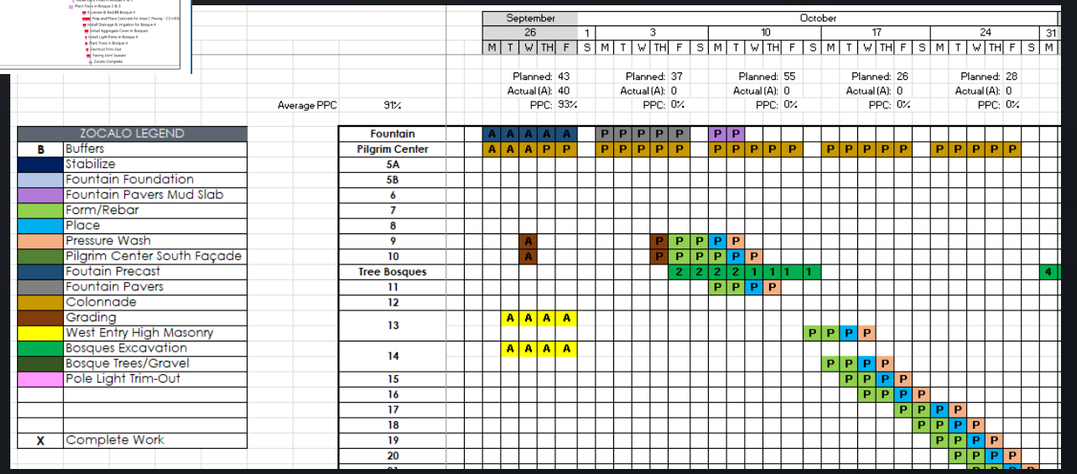
Schedule

DATA ANALYSIS

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Free 2 Month Schedule Improvement

Owner Granted 4 Month Schedule Extension

Flow



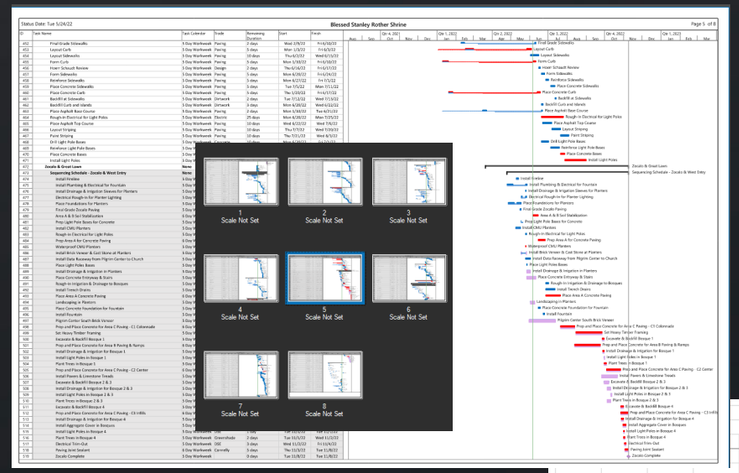
Cost

Schedule

DATA ANALYSIS

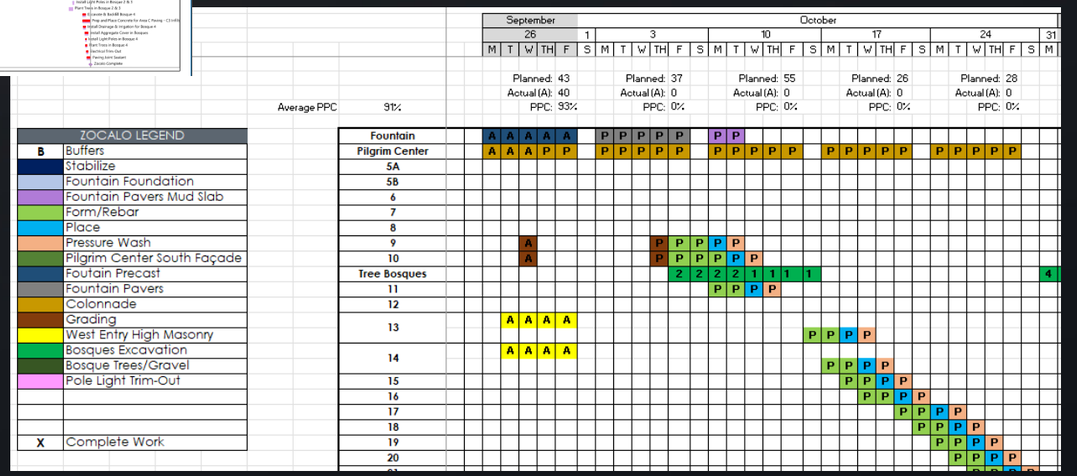
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Free 2 Month Schedule Improvement



Owner Granted 4 Month Schedule Extension





Flow



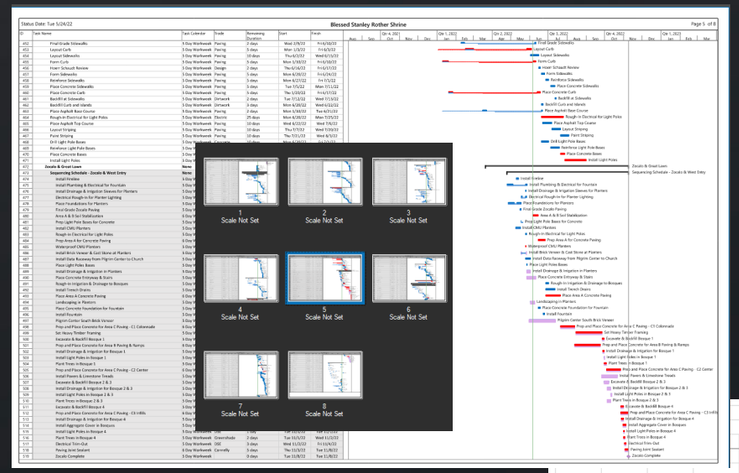
Cost

Schedule

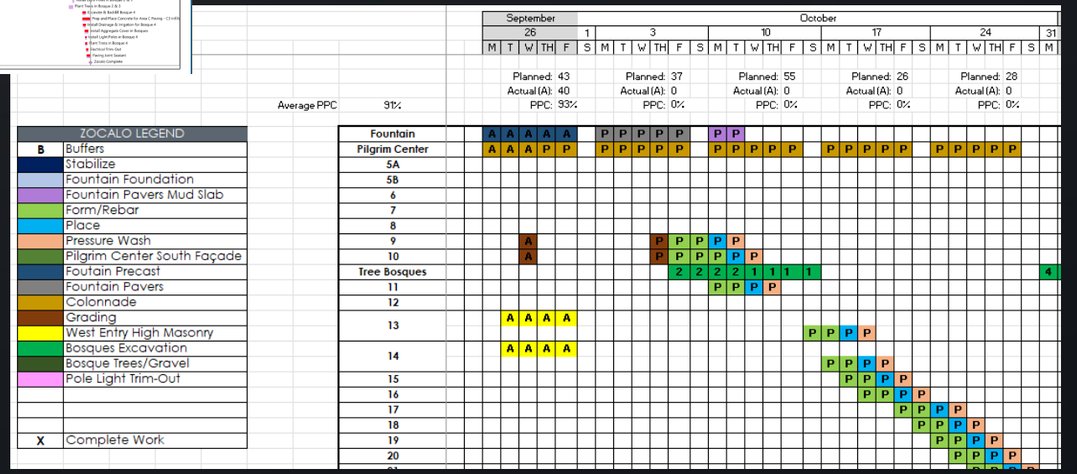
Quality

DATA ANALYSIS

Brooks' Law
Adding manpower to a late project makes it later.







Free 2 Month Schedule Improvement

Less Stress. Easier MGMT More Fun.

Owner Granted 4 Month Schedule Extension



Flow



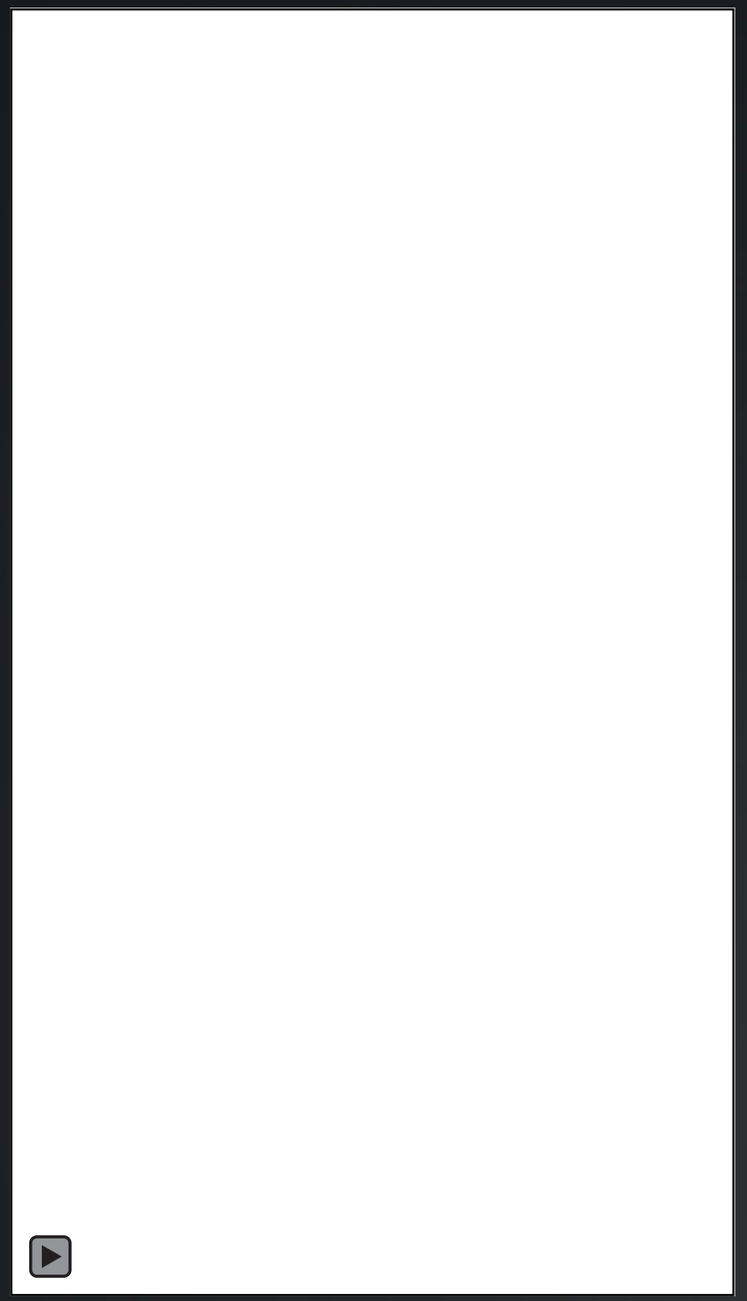
Cost

Schedule

Quality

Scrum | Takt

After 4 onsite meetings lasting 2 hours or less, executives to interns, everyone knows and follows the plan.

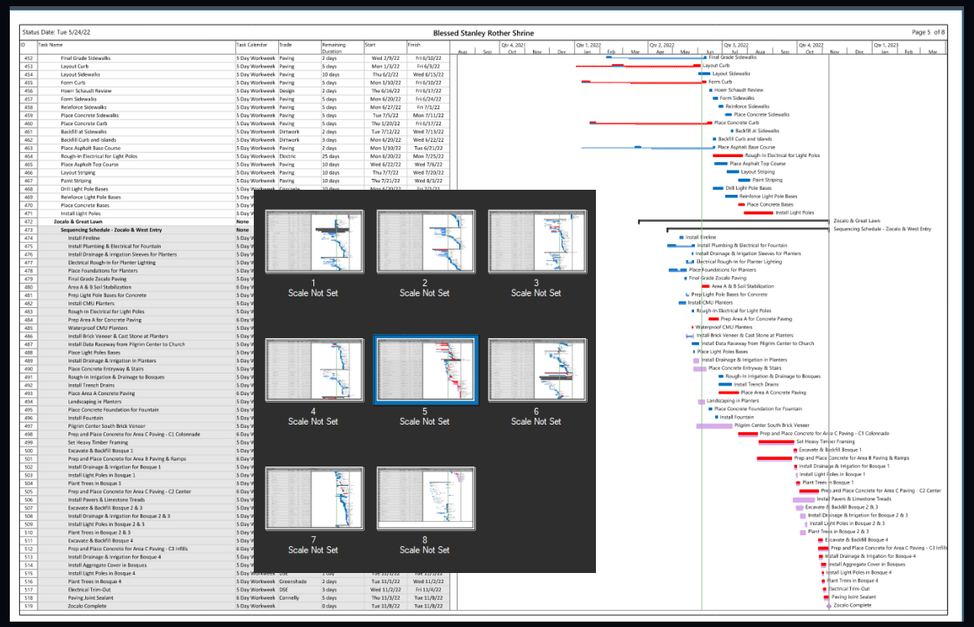


Make work visible so no problems are hidden.











Limits

What could go wrong?