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IN5140

Smart processes and agile methods in Software Engineering

Group session 3

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Agenda

First hour:

- Group project information
- Quick recap

Second hour:

- Quiz
- Previous Exam Questions

Last year's project (UiO GPT)

Feature Prioritization

Initial

We took several metrics into consideration when prioritizing the features. Initially, we asked all group members, as end-users, which feature they would like to see be developed the most.

The result of this prioritization was:

1. Integration with academic databases
2. Automated literature review and summarisation
3. Interactive visualisation of AI reasoning
4. Real-time language translation for international collaboration
5. Multi-modal input (text, voice, image)
6. Domain-specific knowledge graphs
7. Customisable AI model fine-tuning

Last year's project (UiO GPT)

Feature 2: Real-time language translation
(group 5)

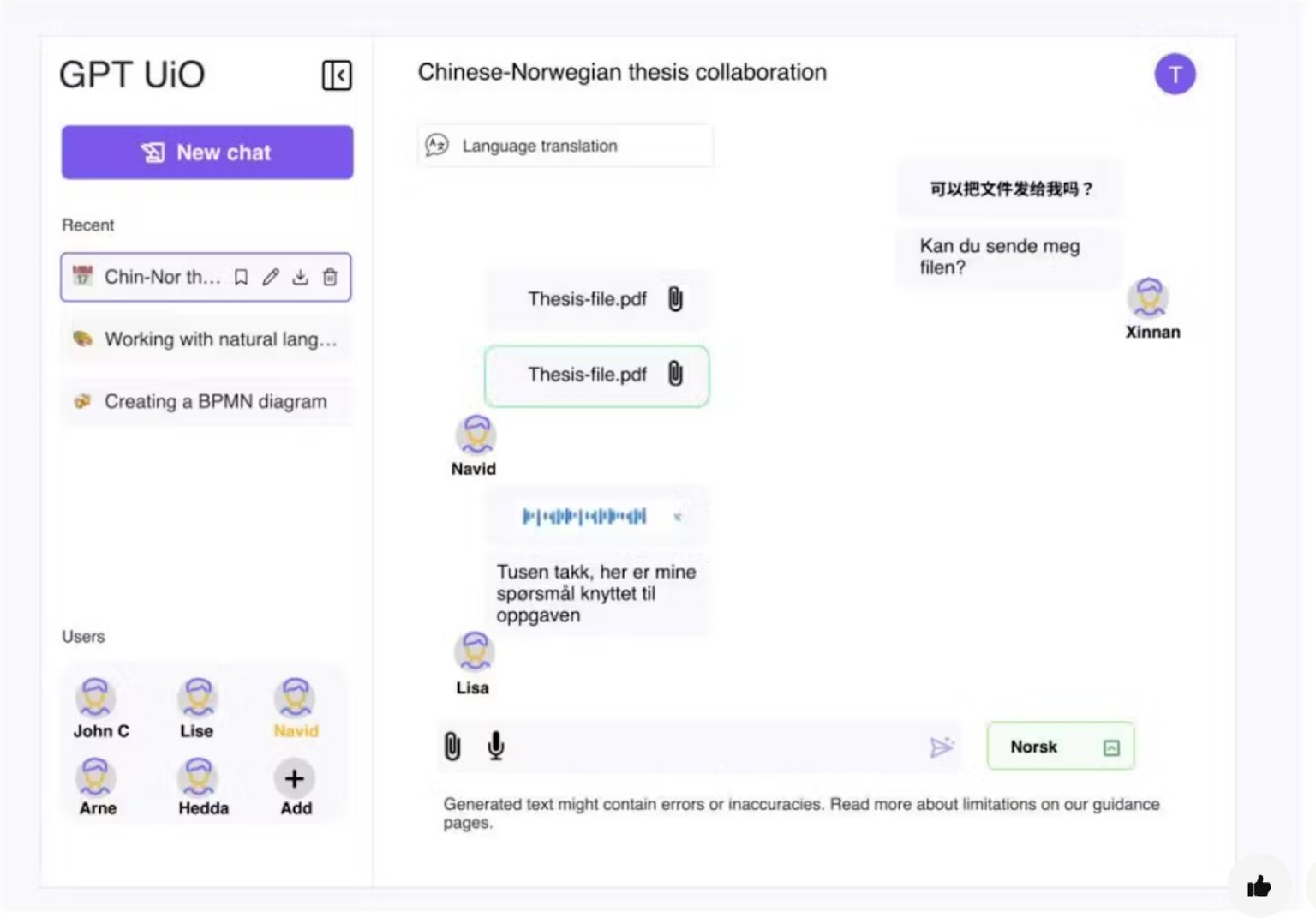
Scenario:

1. The International Researcher is working with another collaborator from different countries (e.g Germany) on a joint research paper using UiO GPT.
2. The researcher speaks and writes in Norwegian, while the collaborator uses German as input language
3. They use the UiO GPT model to communicate, edit their shared research documents, and ask the UiO GPT for assistance in translating the documents and, all in their respective languages to achieve a successful communication, free of misunderstandings and misinterpretations.

Main flow:

1. The International Researcher logs into UiO GPT and starts a session.
2. The researcher invites international collaborators, each selecting their preferred
3. language.
4. The collaborators communicate in their respective languages via chat or voice, with
5. real-time translation handled by UiO GPT Service.
6. They work on a shared document with the AI translating changes and providing
7. academic assistance in (generated in each user's language)
8. The user asks for a literature review, which the Collaborator provides in his/her
9. language, and the GPT translates it for the other users in their respective languages.
10. The session continues successfully, and all participants complete their tasks with
11. seamless communication and collaboration.
12. 7. User logs out, session ends, and chat/documents history are saved in UiO-GPT database.

Last year's project (UiO GPT)

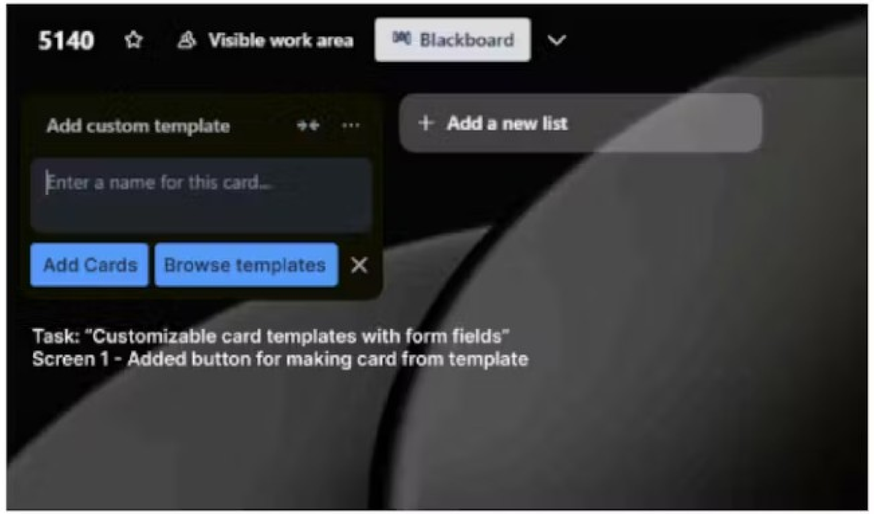


Last year's project (Trello)

Customizable card templates with form fields

Add Custom Template

This screen showcases the initial stage of creating a custom template in Trello. Users can easily start by entering a name for their new card. The interface includes an intuitive button layout with "Add Cards" for quick entry and "Browse templates" to explore existing templates. This design simplifies the user experience by providing a clear, straightforward pathway to either start from scratch or modify existing templates, making it easy to customize the workflow according to specific project needs.



Template Editor

The Template Editor screen is where users can dive deeper into customizing their card templates. It offers an array of elements such as labels, text fields, date fields, checkboxes, and more that can be added to the template. Users can browse existing templates or create new ones, adjusting the layout to include essential information fields that are relevant to their tasks. This screen is capable of supporting complex forms with multiple rows and columns, allowing for detailed data organization and efficient task management.

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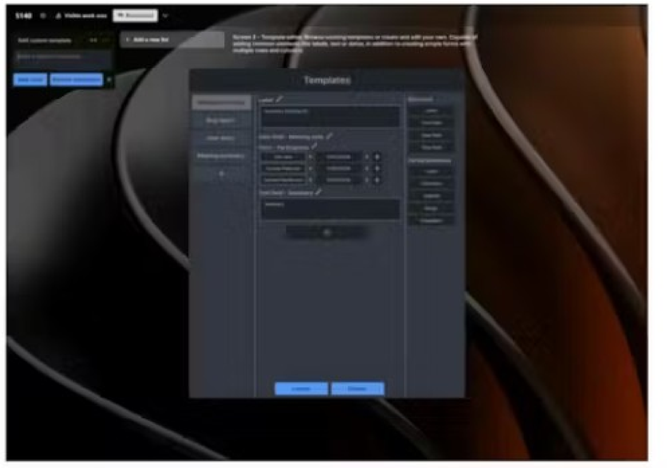
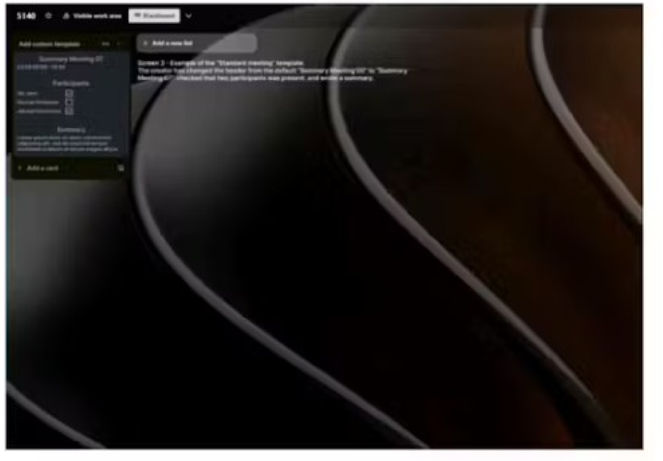
Last year’s project (Trello)



Standard Meeting Template Example

This screen displays an example of a "Standard Meeting" template that has been customized for specific needs. It includes sections for participants, with checkboxes to mark attendance, and a text field for meeting summaries. The template shows how users can adapt a standard format to include specific details such as meeting date, participants involved, and a summary of the discussions. This customization ensures that all relevant information is captured systematically, enhancing the efficiency of meeting documentation and follow-up actions.



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Questions?

Speak out loud, or type in chat

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Repetition from lecture

Quick Recap

Agile Basics

- What is agile software development?
- What are the key ideas of the Agile Manifesto?
- Can you name some of the 12 Agile principles?

Quick Recap

Agile Practices

- What are some popular agile practices?
- What roles exist in an agile team?
- What is the difference between feature teams and component teams?
- What are the four types of teams in “Team Topologies”? (stream-aligned, platform, complicated subsystem, enabling)

Quick Recap

Agile Practices (Org & Tech)

- What are examples of agile organizational practices?
- What are examples of agile technical practices?

Quick Recap

Agile Challenges

- Why is coordination between teams often difficult in agile projects?
- How can large-scale agile frameworks support coordination?
- What challenges evolve?

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Quiz Time

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Question 1

What is a key defining feature of agile methods? (1p)

A) To create as much software as possible, as fast as possible

B) To build the software product iteratively and incrementally

C) To have a lot of defined roles and procedures

D) To plan first, then write and test the software, and in the end release it

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Question 1

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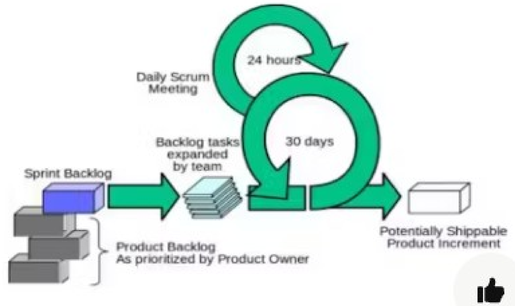
D) To plan first, then write and test the software, and in the end release it

What is agile software development?

«Agile» refers to a set of *iterative* approaches to software delivery that builds software *incrementally* from the start of the project, instead of trying to deliver it all at once near the end.

- An iteration is a cycle in the development (sprint)
- An increment is a subset of requirements (e.g., backlog items, user stories) for the system
- Agile software development : creating small pieces of software at the time(incremental), repeating the process many times (iterative) in development sprints.



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Question 2

According to the agile principles, what is the most efficient way to share information in a development team? (1p)

A) Documentation

B) Task boards like Scrumboards or Kanbanboards

C) Face-to-face communication

D) Slack

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Question 2

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B) Task boards like Scrumboards or Kanbanboards

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The 12 agile principles

1. Our highest priority is to satisfy the customer through early and continuous delivery of valuable software.
2. Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.
3. Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale.
4. Business people and developers must work together daily throughout the project.
5. Build projects around motivated individuals. Give them the environment and support their needs, 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 software 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.

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Question 3

On a typical agile team, who are likely to have the best insight into task execution? (1p)

A) Project Manager
B) Team members
C) Scrum Master
D) Agile Coach

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Question 4

What is a cross-functional development team? (1p)

A) A team with specialists only
B) A team that builds one specific component
C) A team that builds a feature of the final product
D) A team with 7 ± 2 people

Question 4

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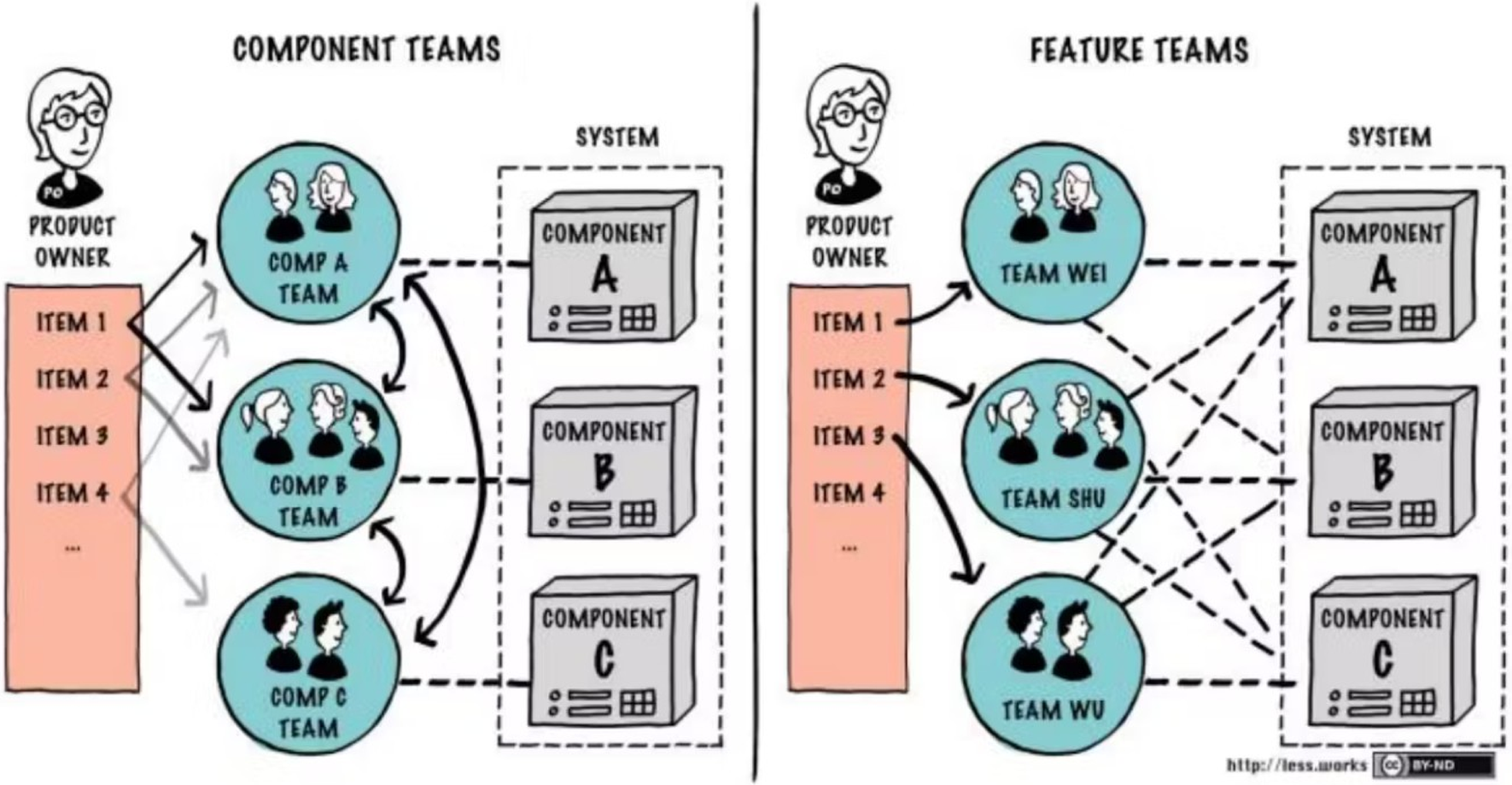
Two types of software development teams



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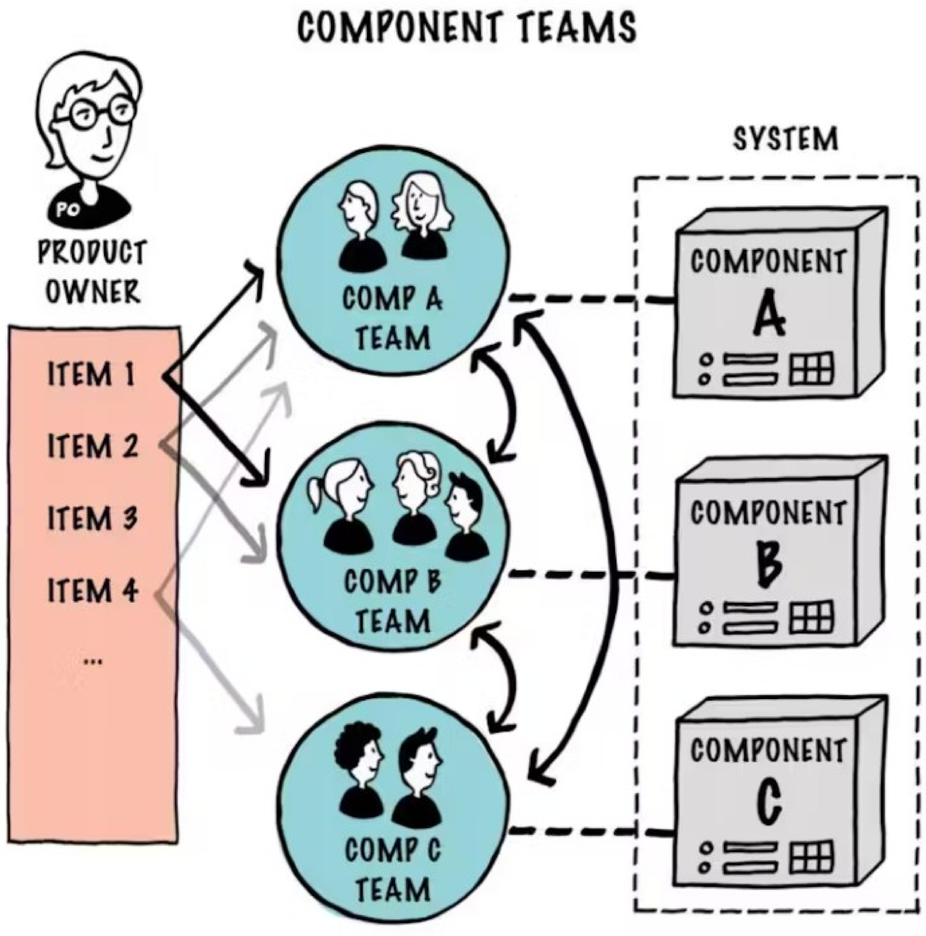
Component (specialized) teams

- More **traditional** approach
- Focus one component of the overall product or development process
- **Clearly defined roles**
  - e.g., Backend team, Front-end team, test team
- Understand their own component well, but may lack overall system understanding



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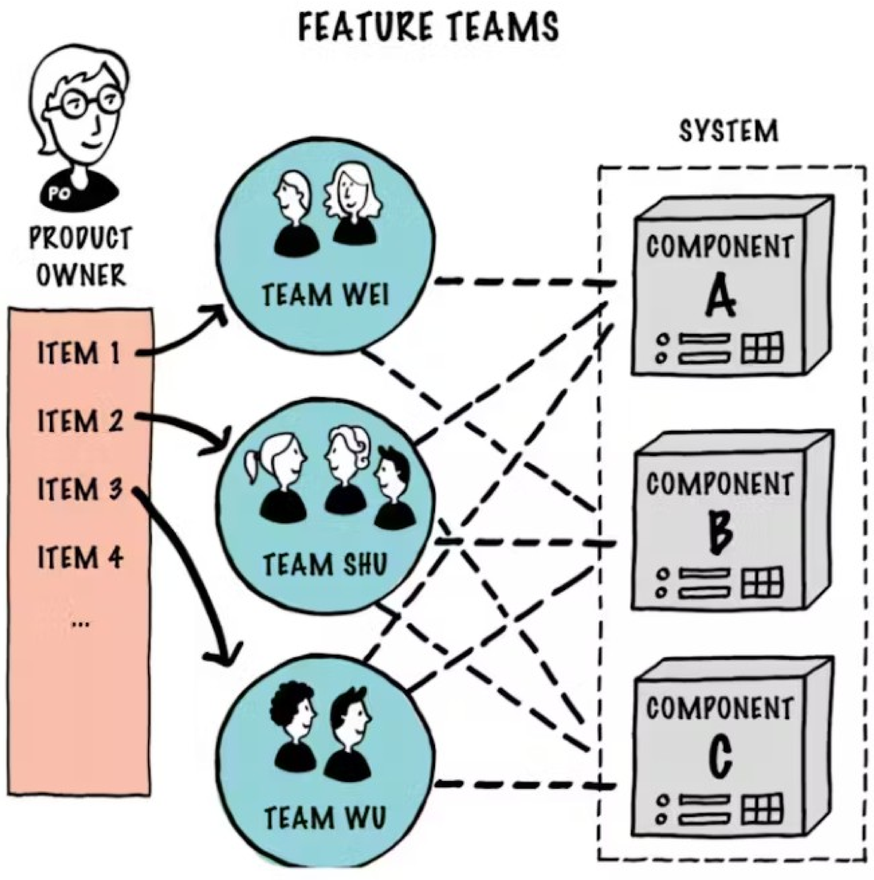
Feature (cross-functional) Teams

- **Modern** way of organizing teams
- Build features of the final product
- Team members **not committed to one specialists** (i.e., full-stack)
- preferably co-located
- Focus on value delivery
- Common in agile teams (e.g. Scrum teams)
- Typically, 7 ± 2 people



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Question 5

According to agile principle #11, *the best what or who* emerges from self-organizing teams? (1p)

A) Architectures, requirements and designs

B) Documentation and code reviews

C) Product Managers and Product Owners

D) Coordination problems and bottlenecks

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Question 5

According to agile principle #11, the best what or who emerges from self-organizing teams? (1p)

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Question 6

Pair the following sentences so they fit

(1 p per correct pair!)

Individuals and interactions over…	…comprehensive documentation
Responding to change over…	…contract negotiation
Customer collaboration over…	…processes and tools
Working software over…	…following a plan

Bonus question (1p): What did you just pair?

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Question 6

Pair the following sentences so they fit

(1 p per correct pair!)

Individuals and interactions over…	…processes and tools
Working software over…	…comprehensive documentation
Customer collaboration over…	…contract negotiation
Responding to change	…following a plan

Bonus question (1p): What did you just pair?

The agile manifesto 😊

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Question 7

Which statement about refactoring is true? (1p)

A) Refactoring is cheap

B) Refactoring is about making the design more attractive to investors

C) Refactoring is only about improving the architecture

D) Refactoring shoud be done in one big step

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Question 7

Which statement about refactoring is true? (1p)

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Technical practices: Refactoring

What it is: The process of restructuring code with the goal of improving the internal quality without changing the code's functionality.

How it should be done:

- Refactoring is only about improving the quality of the architecture
- Refactoring should "make the design simpler"
  - No duplication of code
  - As few classes and methods as possible
- Refactoring should be done in small, incremental steps

In practice:

- Over time, technical debt is likely accumulate, and a "Big refactoring" may be needed to fix it
- The cost of managing technical debt, including refactoring, in large software organizations is estimated to be, on average, 25% of the whole development time (Martini et al., 2018)
- Refactoring is increasingly being automated (Baquais & Alshayeb, 2020)

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Question 8

According to agile principle #12, at regular intervals, the team should do what? (1p)

A) Celebrate!

B) Work slower to send signals to management

C) Reflect on their own practices

D) Perform code refactoring

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Question 8

According to agile principle #12, at regular intervals, the team should do what? (1p)

A) Celebrate!

B) Work slower to send signals to management

C) Reflect on their own practices

D) Perform code refactoring

Question 9

When should the stand-up meeting ideally be held? (1p)

A) The meeting is not used in agile teams

B) First thing in the morning

C) When everyone has arrived

D) Just before lunch

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Question 9

When should the stand-up meeting ideally be held? (1p)

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Question 10

Which of these are typical challenges in large-scale agile? (1p per correct)

A) Dependencies between teams
B) Documentation and code reviews
C) Too many managers
D) Lack of overview

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Question 10

Which of these are typical challenges in large-scale agile? (1p per correct)

A) Dependencies between teams

B) Documentation and code reviews

C) Too many managers

D) Lack of overview

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Discussion

You can keep the quiz groups!

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Consider your teamwork in your group project in IN5140

Discuss the following questions:

1) What challenges might you face during the teamwork?
2) How will you meet these challenges?

Share some thoughts with the other groups.

You can keep the quiz groups!

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Consider your teamwork in your group project in IN5140

Discuss the following questions:

3) Have you considered to use any agile practices or techniques?

4) Which practices from this week's lecture and chapters 6 and 7 in Meyer could be relevant for your group?

Share some thoughts with the other groups.

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Previous Exam Questions

14

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(2024)

2.2 Finish the sentences

Finish the sentences below regarding agile, so that they are correct.
Each correct sentence gives 1 point. 1 bonus point if all are correct.

Sentence 1 - The agile manifesto

As software developers, we value individuals and interactions over _____ (contract negotiation, comprehensive documentation, following a plan, processes and tools).

2

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processes and tools

processes and tools

Following a plan

Processes and tools

Process and tools

processes and tools

Processes and tools

processes and toola s

23

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contract negotiation

Interactions over tools

Process and tool

processes and tools

Processes and tools

Processes and tools

Processes and tools

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23

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process and tools!

processes and tools

Proscesses and tools

comprehensive documentation

Processes and tools

Processes and tools

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The agile manifesto reflects this mindset

As software developers, we value

Individuals and interactions over processes and tools

Working software over comprehensive documentation

Customer collaboration over contract negotiation

Responding to change over following a plan

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

2

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(2024)

Sentence 2 - Cross functional team size

A cross-functional team (feature team) typically consists of _____ (1, 2, 3, 4, 5, 6, 7, 8, 9)+/- 2 team members.

4

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7

7

7

7

5

7

7

7

24

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7

7

7

7+2

7

7

7

7

24

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5

7+-2

7+-2

7

7±2

7

7 pluss 2

2+-7

24

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Product owner

PO

24

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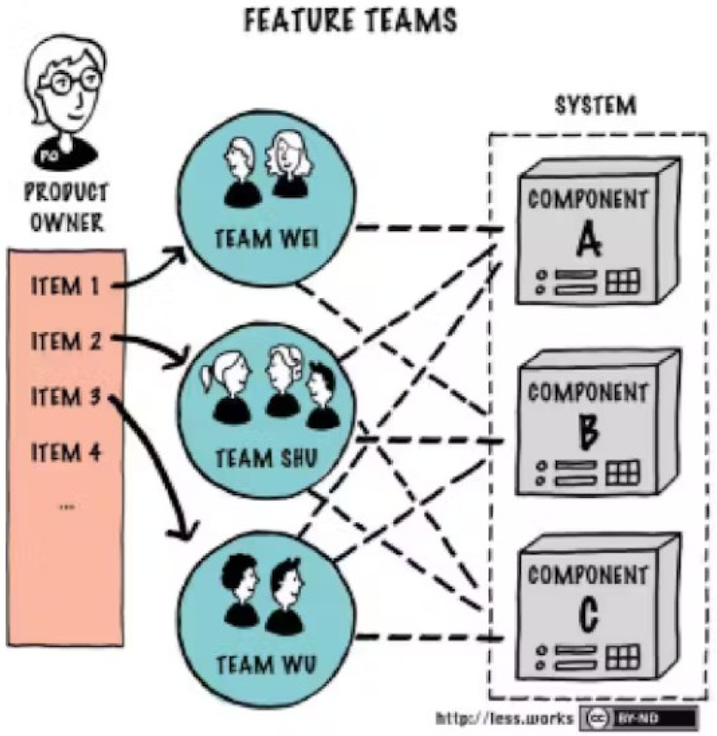
Cross-functional teams (feature teams)

The ideal of agile teams

- Build *features of the final product*
- Team members not committed to one specialist area (i.e., they are full-stack)
- Ideally, any developer can work on any task
- Should work together for a longer time period (preferably co-located)
- Typically, 7 ± 2 people



3

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(2024)

Sentence 3 - Roles

The _____ (development team, scrum master, manager, product owner) is often responsible for coordination and prioritization of features in the backlog.

4

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PO

PO

PO

Po

owner

Scrum master

Product manager

PO

1

25

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scrum master

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Product owner

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Product owner

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Product owner

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Product owner

product owner

Product owner

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product owner

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25

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Daily standup

1

25

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Agile roles: **The Product Owner**

The core tasks of the role:

- Define and maintain the product backlog (the list of features to be developed)
  - What to be made, not how to make it. The “how” is decided by the team.
- Involved at the start and end of the sprint
  - Select user stories from the backlog
  - Evaluate the results of the sprint

Product Owners do a lot more!

- In large-scale projects, they are often responsible for coordination and prioritization of features across teams (Berntzen, Moe & Stray, 2019)
- They must handle conflicting business needs, groom and prioritize requirements, act as release master, risk assessor, governor, technical architect… and more! (Bass & Haxby, 2019)

1

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(2024)

Sentence 4 - Agile practices

According to ***14th Annual State of Agile Report*** (2020), the most poular agile practice is _____ (daily standup, sprint planning, short iterations, sprint review, retrospectives).

1

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Standup

Standup

daily standup

Daily standup

Daily standup

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Daily standup

STANDUP

20

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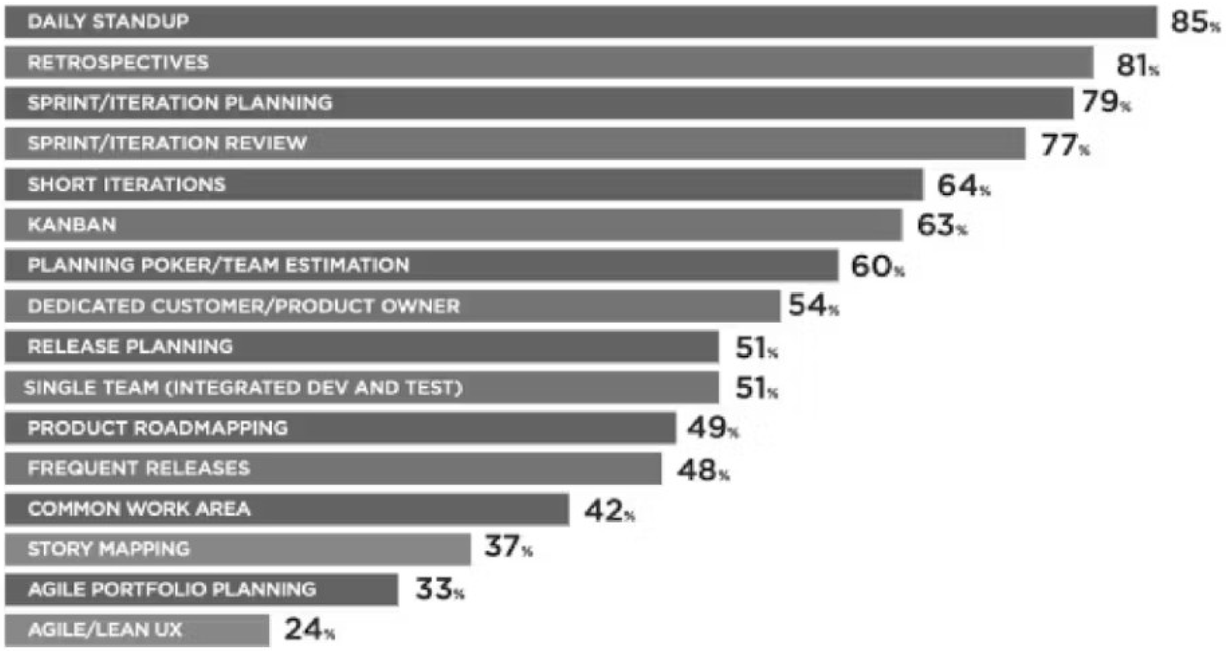
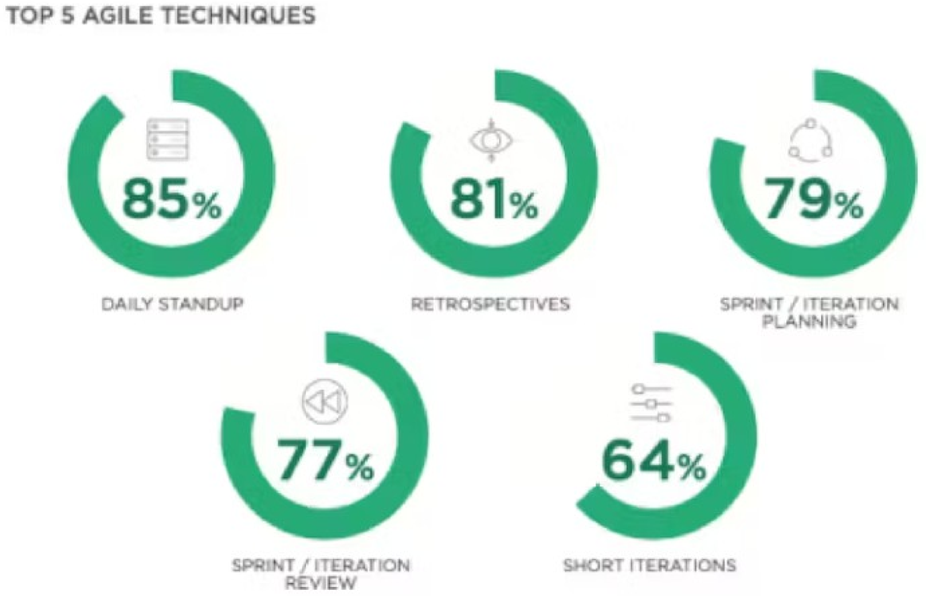
20

The most popular agile organizational practices





Digital.ai, (2020) "14th Annual State of Agile Report" https://digital.ai/catalyst-blog/the-14th-annual-state-of-agile-report/

2

(2024)

3.6 Agile roles

Briefly describe **five** Agile roles and what their responsibilities are:

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PO, PM, Scrum master, Customer, Member

Product Manager, developers, testers, customers, product owner

Scrum master, PO, manager, team members, some role

Members do the task Product owner set up backlog Manager coordination Customer communicate with product owner Scrum master group practices

po: backlog prio scrum master: agile practices in the team customr: has requirements discusses with po team member: works on the project

scrum master, po, customer, tester, group member

Product manager - Establish good working environment Product owner - Grooms and prioritize backlog Members - Team members executing tasks Scrum master - facilitate agile practices Customer.

scrum master, product owner, costumer, team member, product, tester

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Product owner: customer needs project manager: tasks prioritization scrum master: removing disturbances testers: testing products

Po Scrum master Members and observers Customer Tester

PO - manages backlog Product manager - is present at the beginning and end Members and observers - works on the project directly Customer

Team member - execution Scrum master - agile practices Product owner - prioritization of backlog Manager - coordination Customer - requirements

Agile coache

Manager - handle resources, outsourcing etc, PO - define and maintain product backlog, Members - committed to project, Observers - involved from sideline, customer- self explanatory, scrum master-

*PO - Organize product backlog, prioritize tasks etc. *Scrummaster - Facilitate agile principles *Member - Developer, tester etc. Responsible for creating the feature *Customer - Requesting software

PO (communication with business) Observers (observation) Customer(customer input) Developer (task execution) Manager (team lead)

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Project Manager: provides support for the team Po: middle man between customers and team? Memebers : team member Scrum master: coaching

Scrum master facilitates meetings Customers requests feature Po focuses on backlog and interprets customer Devs work on selected features

1. PO- grooming the backlog 2. Scrum master - facilitate the process 3. Tech lead - could be a part of the project - technical advisor 4. Team member - developers 5. Observer - observes the process

Product owner: talks to customer, decides what, backlog Scrum master: know the practices of scrum, leads the team via scrum tester: tests the features product manager:

PO-define and maintain the product backlog. Scrum master: follow agile processes Team members: code parts of project Manager: Assign tasks. decide what to implement Testers: test code

PO - manage backlog Scum Master - make sure the group follows agile principles, helps overcome obstacles Members - the ones who work on the tasks in the backlog Manager - allegedymakes life easier

Po: manages backlog and prioritization scrum master: Leads scrum meetings team lead: Leads team and standup meeting team member: completes task and cooperates scrum coach: how to imprvoe scrum

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Agile roles (chapter 5)

- **The self-organizing team**
- Manager
- Product Owner
- Members and observers
- The customer
- Agile coach/ Scrum Master

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(2025) Describe similarities between Lean and Agile development

1

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I didnt attend the lecture about lean:(

Iterative work! :D

Continuous development, reduce managerial overhead

Both value customer's needs

Lean: focused on customers needs and wants Agile: deliver incremenatly over iterations.

Lean focuses on reducing waste and improving efficiency, while Agile development focuses on delivering value to the customer through incremental and iterative development.

Meetings, communication, set up backlog task

Make the project succeed

1

19

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costumer focus, and working incremental and iterative

Both support iterative, incremental deliveries rather than big planning. Focus on delivering value to customers, and collaboration in teams

Team-based, iterative, structured workflow

Similarities: remove waste/fluff, iterative, respond to changing needs

Similarities: - Close cooperation - Use task board - Fixing problems early/quicly

Both are focused on producing a working product fast?

teamwork, planning, interative

just lean 😓 ✋

1

19

Effectivty

Iterative development, continuous improvement

Organisational change - strict management to more autonomy less planning and different way of securing financing New way of working and planning/prioritizing tasks

1

19

(2025) Describe similarities between Lean and Agile development

Similarities:

- Customer Value
- Continuous Improvement
- Efficiency & Waste Reduction
- Teamwork & Collaboration
- Flexibility & Adaptability

Lean = optimize process (framework)

Agile = practices for iterative, incremental development

1

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(2025)

Global Finance is a large organization with deeply ingrained traditional practices.

Reflect on some of the challenges a large organization might face when transitioning from a waterfall to an agile approach

and describe an approach or framework to help the transition

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Mentimeter

How to prioritize

not flexible

Waterfall is linear and non flexible.

less autonomy, more time pressure, being more flexible, being able to prioritize

Time managment diffrence and how to prioritize right

Prioritising tasks, flexibility, time management

Waterfall is inflexible

Based on where in the waterfall method the company is at, develop a backlog and start working iteratively following agile practices.

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there might be too big of a workload transition from waterfall to agile as waterfall is more linear? i.e difficulties splitting tasks properly. maybe you can fix it by slowly incorporating agile?

Very long iteration cycles

waterfall is not flexible so they have to adjust their aproch and find a good way to prioritize

Slow delivery, not flexible Use kanban or scrum

Delivering on time Prioritize tasks Incremental delivery Being more flexible Communication between teams

Challanges: - Employees unfamiliar with agile - Might have projects allready in development Solution: Hire spesialist/training for employees

conservative employees adapting to ci/cd from more linear development hire a scrum coach

The challenges can be that it is different and more dynamic. You work close with costumer and it can be dynamic that you have to change things through the sprint. Soultion is to have good communicati

Waterfall follows a strucuture where the plan is already set and doesnt allow room for changes. Whereas agile is built for changes under development

Daily meetings. Can be solved by moving meeting time and changing meeting interval (3 times a week instead of 5 , etc)

Adapt a new way of thinking and working. Which feature to priotize will be a problem. But they can focus on making a MVP as the first sprint and then extend to more feature later

Challange to switch to shorter intervals of work Value customer feedback and adapt to continious feedback Suggest starting with kanban and focus on limiting WIP

Solution: hire agile specialist

Since waterfall is step-by-step procedure and Agile is iterative with continuous changes. It can be difficult to prioritize when transisting

(2025)

4.3 Global Finance is a large organization with deeply ingrained traditional pr
some of the challenges a large organization might face when transitioning fro
agile approach and describe an approach or framework to help the transition

Lack of Agile skills - little experience

Management Mindset shift - from control -> servant leadership

scaling agile - coordination, alignment, multiple teams

Feedback

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Mentimeter

Menti 👍

Very nice 💪

Good to go through questions and discuss

I prefer the use of menti to answer exam questions - it makes it easier to answer

i prefer menti

Liked the interactive lesson

menti works well, maybe transfer the quiz over to menti?

Group discussions 👍

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Mentimeter

Good and interactive. Menti👍

Answering previous exam questions and going over the answers is a good practice.

Nice with exam questions

😁👍

Good with repetition (especially menti), but not too fun with singling out people to answer questions

Good recap of previous lecture/s. Enjoyed testing myself

Very good

Very informative sesssion

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Mentimeter

More fun with menti, though direct questions were not bad

Group discussion and menti works well

I like the discussion and answering question, because it forces you to think

It's good. Very nice to reflect on the lecture. I liked the summarisation as well but 5 minutes was a little short, and i would like it to be easier to know what question i was supposed to answer.

More exam question Menti is better so that everyone can answer a question in text, not orally 5 min summary in the beginning could be nice

Share more detailed thoughts / correct answer after group presentation

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Next Week (Lean and Agile Software Engineering)