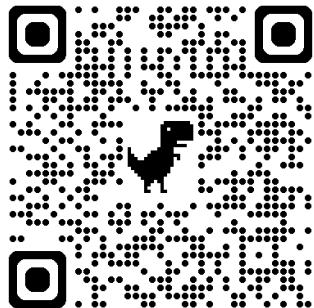


CS3213: Foundations of Software Engineering

In-class Lecture and Exercises

Bioblitz

- 147 observations
- 82 species
- 5 observers
- 53 identifiers



Mid-term Survey

Mid-term Feedback

Started: 8 Feb at 15:39

Quiz instructions

We have revised major parts of the course for this offering:

- We completely revised the project component and format
- We re-created the lab tutorial contents and slides to better align with the lab contents and the course project
- We made the lecture contents more visual and went more in-depth compared to previous years
- We restructured the course to a blended-learning format with more in-person interactive activities

Submit by the end of this week!

We would thus be grateful if you could spend some minutes to give us feedback on how these changes support your learning, hinder your learning, or any other feedback that you have that could help us to improve the class. We can try to address common feedback for the second part of the semester, or in next year's offering. Last year's feedback was already useful for us in identifying those components that required improvement, and we tried to address this feedback exhaustively.

The mid-term survey is anonymous.

(Planned) Project Assignments

Assignment 2: Requirements
Specification
Mon, 26 Jan to Mo, 10 Feb

Assignment 4: Intermediate
Artifact
Mon, 12 Feb to Fri, 20 Feb

Assignment 6: Final report
and presentation
Mon, 16 Mar to Fri, 27 Mar

By now, you (mostly) finished eliciting and documenting the key requirements, and should have already started with the architectural design (and implementation)

W1	W2	W3	W4	W5	W6														
					CNY														

Assignment 1: Requirements
Elicitation Preparation
Mon, 12 Jan to Fri, 23 Jan

Assignment 3: Design
Document
Mon, 2 Feb to Fri, 20 Feb

Assignment 5: Testing
Mon, 16 Mar to Fri, 27 Mar

(Planned) Project Assignments

Assignment 2: Requirements
Specification
Mon, 26 Jan to Mo, 10 Feb

Assignment 4: Intermediate
Artifact
Mon, 2 Mar to Fri, 13 Mar

Assignment 6: Final report
and presentation
Mon, 30 Mar to Fri, 17 Apr

W1	W2	W3	W4	W5	W6	R	D
					CNY		

Any questions regarding the lecture or project? Drop by my office (COM3-02-42) between 2pm and 4pm on February 16

Assignment 1: Requirements
Elicitation Preparation
Mon, 12 Jan to Fri, 23 Jan

Assignment 3: Design
Document
Mon, 2 Feb to Fri, 20 Feb

Assignment 5: Testing
Mon, 16 Mar to Fri, 27 Mar

(Planned) Project Assignments

Assignment 2: Requirements
Specification
Mon, 26 Jan to Mo, 10 Feb

Assignment 4: Intermediate
Artifact
Mon, 2 Mar to Fri, 13 Mar

Assignment 6: Final report
and presentation
Mon, 30 Mar to Fri, 17 Apr

Mid-term Exam!

W1	W2	W3	W4	W5	W6	Recess	W7	W8	W9	W10	W11	W12	W13
					CNY				HRP				

Assignment 1: Requirements
Elicitation Preparation
Mon, 12 Jan to Fri, 23 Jan

Assignment 3: Design
Document
Mon, 2 Feb to Fri, 20 Feb

Assignment 5: Testing
Mon, 16 Mar to Fri, 27 Mar



Mid-term Exam (Main Venue)

- Date: Monday, March 2, 2026
- **Location: MPSH 1A**
- Hall Entry Time: 14:00
- **Start Time: 14:30**
- **End Time: 15:30**
- Hall Exit Time: 16:00
- Pen-and-paper and a double-sided A4 help sheet

Last Year's Mid-term Exam

CS3213 Mid-term Exam

6. (1 points) Which of these characteristics are typical of agile methods? Select all that apply.

- ☐ Trust in individuals and empowering teams
- ☐ Optimizing the development process
- ☐ Following a pre-defined plan
- ☐ Elaborate documentation

Previous mid-term
exams are online

7. (1 points) Determine which of the following are true or false about *Extreme Programming (XP)*.

Specifies concrete development practices such as Pair Programming and Collective Code Ownership. ☐ True ☐ False

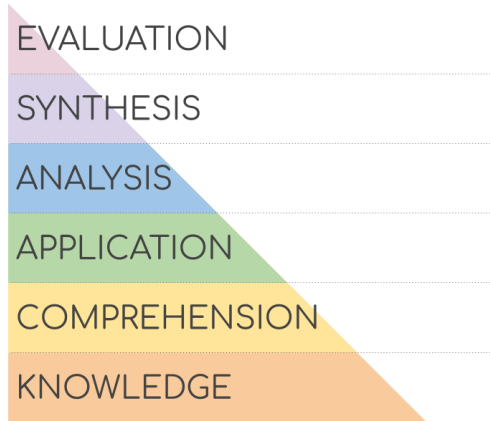
Various of its practices have become mainstream in both plan-driven as well as agile development. ☐ True ☐ False

Extreme Programming was pioneered by the team working on Windows XP, hence the name. ☐ True ☐ False

XP has parallels with DevOps, for example, the focus on Continuous Integration/Continuous Deployment (CI/CD). ☐ True ☐ False

This Year's Mid-term Exam

- More open-ended questions, few(er) multiple-choice questions
- Focus on the higher layers of Bloom's taxonomy
 - Fewer comprehension/knowledge questions





FAQ

- In-class contents? Yes
- Project-specific? No
- Diagraming? Yes
- Questionnaire design? No
- Optional videos? No

(Planned) Project Assignments

Assignment 2: Requirements
Specification
Mon, 26 Jan to Mo, 10 Feb

Assignment 4: Intermediate
Artifact
Mon, 2 Mar to Fri, 13 Mar

Assignment 6: Final report
and presentation
Mon, 30 Mar to Fri, 17 Apr

W1	W2	W3	W4	W5	W6	Recess	W7	W8	W9	W10	W11	W12	W13
					CNY				HRP				

Assignment 1:
Elicitation P
Mon, 12 Jan

We strongly encourage you to work on the implementation **already now** (finish Assignment 3 asap!), since the submission deadline will be preceded by CNY, recess week, and the mid-term exam

Assignment 5: Testing
to Fri, 27 Mar

(Planned) Project Assignments

Assignment 2: Requirements
Specification
Mon, 26 Jan to Mo, 10 Feb

Assignment 4: Intermediate
Artifact
Mon, 2 Mar to Fri, 13 Mar

Assignment 6: Final report
and presentation
Mon, 30 Mar to Fri, 17 Apr

W1	W2	W3	W4	W5	W6	Recess	W7	W8	W9	W10	W11	W12	W13
					CNY				HRP				

Assignment 1: Requirements
Elicitation Preparation
Mon, 12 Jan to Fri, 23 Jan

Assignment 3: Design
Document
Mon, 2 Feb to Fri, 20 Feb

Assignment 5: Testing
Mon, 16 Mar to Fri, 27 Mar

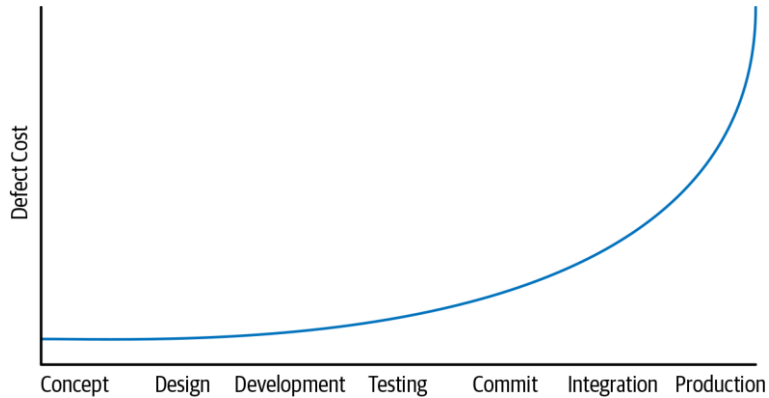
Week 1: Course Introduction

W1	W2	W3	W4	W5	W6	Recess	W7	W8	W9	W10	W11	W12	W13
L1	L2	L3	L4	L5				L6	L7	L8	L9	L10	

- Course overview
- What is software engineering?
 - Engineering discipline: messy real-world tradeoffs and decision making vs. elegant and clean principles
- *“No Silver Bullet”* essay

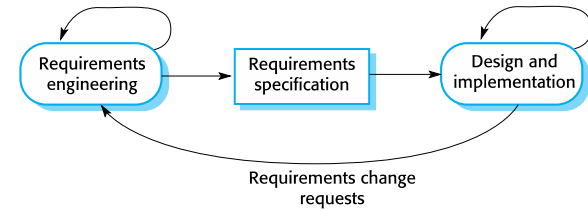
Week 1: Course Introduction

W1	W2	W3	W4	W5	W6	Recess	W7	W8	W9	W10	W11	W12	W13
L1	L2	L3	L4	L5				L6	L7	L8	L9	L10	

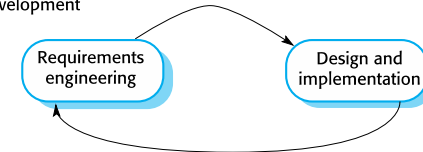


“Shifting Left”

Plan-based development



Agile development



“Plan-driven vs. agile development”

Week 2: Requirements Engineering (RE)

W1	W2	W3	W4	W5	W6	Recess	W7	W8	W9	W10	W11	W12	W13
L1	L2	L3	L4	L5				L6	L7	L8	L9	L10	

- Requirements elicitation and analysis
- Requirements specification
- Requirements validation
- Process models

Week 3: Project Overview and RE

W1	W2	W3	W4	W5	W6	Recess	W7	W8	W9	W10	W11	W12	W13
L1	L2	L3	L4	L5				L6	L7	L8	L9	L10	



Towards a Decade of Community Science Programme for Critically Endangered Primate

Citizen Science Program for Critically Endangered Primates: A Case Study from Singapore

Andie Ang^{1,2}, Sabrina Jabbar³, Vilma D'Rozario³ and Jayanti Lakshminarayanan¹

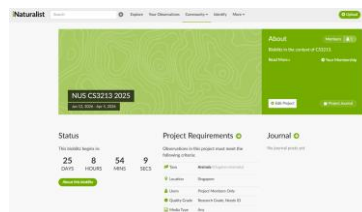
¹Raffles Banded Langur Working Group, Wildlife Reserves Singapore Conservation Fund, Singapore
²Jeppia Gandhi Institute, Singapore
³National Parks Board, Singapore

Abstract: Raffles' banded langur (*Presbytis femoralis*) is one of three species of non-human primates in Singapore. With only 67 individuals left, it is listed as locally Critically Endangered. Due to its elusive nature, alterability, and small population

Survey Purpose / Tracking Information		Observer 1	Observer 2	Observer 3	Observer 4	Observer 5	Observer 6	Observer 7	Observer 8	Observer 9	Observer 10	Observer 11	Observer 12	Observer 13	Observer 14	Observer 15	Observer 16	Observer 17	Observer 18	Observer 19	Observer 20	Observer 21	Observer 22	Observer 23	Observer 24	Observer 25	Observer 26	Observer 27	Observer 28	Observer 29	Observer 30	Observer 31	Observer 32	Observer 33	Observer 34	Observer 35	Observer 36	Observer 37	Observer 38	Observer 39	Observer 40	Observer 41	Observer 42	Observer 43	Observer 44	Observer 45	Observer 46	Observer 47	Observer 48	Observer 49	Observer 50	Observer 51	Observer 52	Observer 53	Observer 54	Observer 55	Observer 56	Observer 57	Observer 58	Observer 59	Observer 60	Observer 61	Observer 62	Observer 63	Observer 64	Observer 65	Observer 66	Observer 67	Observer 68	Observer 69	Observer 70	Observer 71	Observer 72	Observer 73	Observer 74	Observer 75	Observer 76	Observer 77	Observer 78	Observer 79	Observer 80	Observer 81	Observer 82	Observer 83	Observer 84	Observer 85	Observer 86	Observer 87	Observer 88	Observer 89	Observer 90	Observer 91	Observer 92	Observer 93	Observer 94	Observer 95	Observer 96	Observer 97	Observer 98	Observer 99	Observer 100
Date	Time	Observer 1	Observer 2	Observer 3	Observer 4	Observer 5	Observer 6	Observer 7	Observer 8	Observer 9	Observer 10	Observer 11	Observer 12	Observer 13	Observer 14	Observer 15	Observer 16	Observer 17	Observer 18	Observer 19	Observer 20	Observer 21	Observer 22	Observer 23	Observer 24	Observer 25	Observer 26	Observer 27	Observer 28	Observer 29	Observer 30	Observer 31	Observer 32	Observer 33	Observer 34	Observer 35	Observer 36	Observer 37	Observer 38	Observer 39	Observer 40	Observer 41	Observer 42	Observer 43	Observer 44	Observer 45	Observer 46	Observer 47	Observer 48	Observer 49	Observer 50	Observer 51	Observer 52	Observer 53	Observer 54	Observer 55	Observer 56	Observer 57	Observer 58	Observer 59	Observer 60	Observer 61	Observer 62	Observer 63	Observer 64	Observer 65	Observer 66	Observer 67	Observer 68	Observer 69	Observer 70	Observer 71	Observer 72	Observer 73	Observer 74	Observer 75	Observer 76	Observer 77	Observer 78	Observer 79	Observer 80	Observer 81	Observer 82	Observer 83	Observer 84	Observer 85	Observer 86	Observer 87	Observer 88	Observer 89	Observer 90	Observer 91	Observer 92	Observer 93	Observer 94	Observer 95	Observer 96	Observer 97	Observer 98	Observer 99	Observer 100

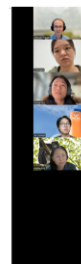
Date	Observer	Location GPS	Observer 1	Observer 2	Observer 3	Observer 4	Observer 5	Observer 6	Observer 7	Observer 8	Observer 9	Observer 10	Observer 11	Observer 12	Observer 13	Observer 14	Observer 15	Observer 16	Observer 17	Observer 18	Observer 19	Observer 20	Observer 21	Observer 22	Observer 23	Observer 24	Observer 25	Observer 26	Observer 27	Observer 28	Observer 29	Observer 30	Observer 31	Observer 32	Observer 33	Observer 34	Observer 35	Observer 36	Observer 37	Observer 38	Observer 39	Observer 40	Observer 41	Observer 42	Observer 43	Observer 44	Observer 45	Observer 46	Observer 47	Observer 48	Observer 49	Observer 50	Observer 51	Observer 52	Observer 53	Observer 54	Observer 55	Observer 56	Observer 57	Observer 58	Observer 59	Observer 60	Observer 61	Observer 62	Observer 63	Observer 64	Observer 65	Observer 66	Observer 67	Observer 68	Observer 69	Observer 70	Observer 71	Observer 72	Observer 73	Observer 74	Observer 75	Observer 76	Observer 77	Observer 78	Observer 79	Observer 80	Observer 81	Observer 82	Observer 83	Observer 84	Observer 85	Observer 86	Observer 87	Observer 88	Observer 89	Observer 90	Observer 91	Observer 92	Observer 93	Observer 94	Observer 95	Observer 96	Observer 97	Observer 98	Observer 99	Observer 100
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No questions about the project for the mid-term and final exam



Design

- Split offline and online.
- Offline:
 - Allow "Get-GPS"
 - Allow "Save-Draft" / "Load-Draft"
- Online:
 - Allow "Save-Draft" / "Load-Draft"
 - Submit



Week 4: Modeling and Software Architecture

W1	W2	W3	W4	W5	W6	Recess	W7	W8	W9	W10	W11	W12	W13
L1	L2	L3	L4	L5				L6	L7	L8	L9	L10	

- UML and C4
- Attribute-driven Design (ADD)
- Architectural tactics and strategies

Week 5: (Agile) Software Frameworks

W1	W2	W3	W4	W5	W6	Recess	W7	W8	W9	W10	W11	W12	W13
L1	L2	L3	L4	L5				L6	L7	L8	L9	L10	

- Scrum
- Kanban
- Extreme Programming
- DevOps

Week 8: Software Testing

W1	W2	W3	W4	W5	W6	Recess	W7	W8	W9	W10	W11	W12	W13
L1	L2	L3	L4	L5				L6	L7	L8	L9	L10	

- Unit tests, integration tests, system tests
- Test-driven development
- Specification-based testing
- Structural testing

Week 9: Q/A with CHANG Sau Sheong

W:

L1

Shaping a digital nation: GovTech's Chang Sau Sheong on leading Singapore's tech evolution

Written by [KrASIA Writers](#)
Published on 5 Sep 2024 6 mins read

Share [f](#) [t](#) [in](#) [v](#)




Photo of Chang Sau Sheong, CTO and deputy chief executive (products) of GovTech.

GovTech's CTO discusses Singapore's digital trajectory, highlighting innovation, resilience, and the importance of events like the STACK Developer Conference.

V7	W8	W9	W10	W11	W12	W13
	L6	L7	L8	L9	L10	

Week 10: Debugging

W1	W2	W3	W4	W5	W6	Recess	W7	W8	W9	W10	W11	W12	W13
L1	L2	L3	L4	L5				L6	L7	L8	L9	L10	

- “The Scientific Method” to Debugging
- Program slicing
- Statistical fault localization
- Test-case reduction
- Isolating failure-inducing changes

Week 11: Advanced Testing

W1	W2	W3	W4	W5	W6	Recess	W7	W8	W9	W10	W11	W12	W13
L1	L2	L3	L4	L5				L6	L7	L8	L9	L10	

- Property-based testing
- Differential testing
- Metamorphic testing
- Fuzzing

Week 12: Software Evolution and Course Summary

W1	W2	W3	W4	W5	W6	Recess	W7	W8	W9	W10	W11	W12	W13
L1	L2	L3	L4	L5				L6	L7	L8	L9	L10	

- Software versioning
- Hyrum's Law
- Dependency management
- Deprecation

Week 13: Project Presentations

W1	W2	W3	W4	W5	W6	Recess	W7	W8	W9	W10	W11	W12	W13
L1	L2	L3	L4	L5				L6	L7	L8	L9	L10	

- Dr. Andie will join!

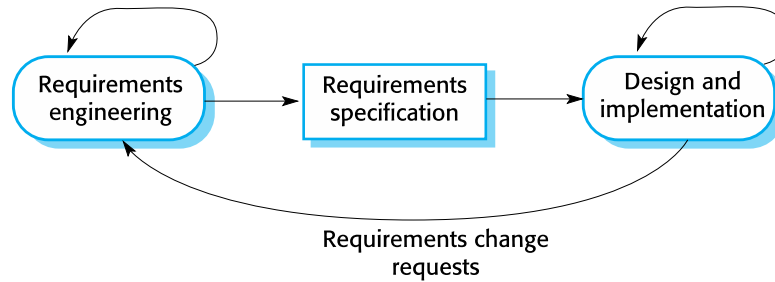




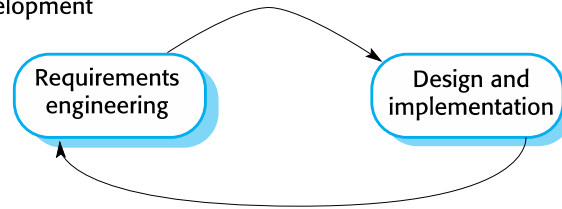
Recap

Plan-driven vs. Agile

Plan-based development



Agile development



Two general approaches to develop software: plan-driven and agile

Agile Manifesto (2001)

Manifesto for Agile Software Development

We are uncovering better ways of developing software by doing it and helping others do it.
Through this work we have come to value:

Through this work we have come to 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

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

The New New Product Development Game (1986)

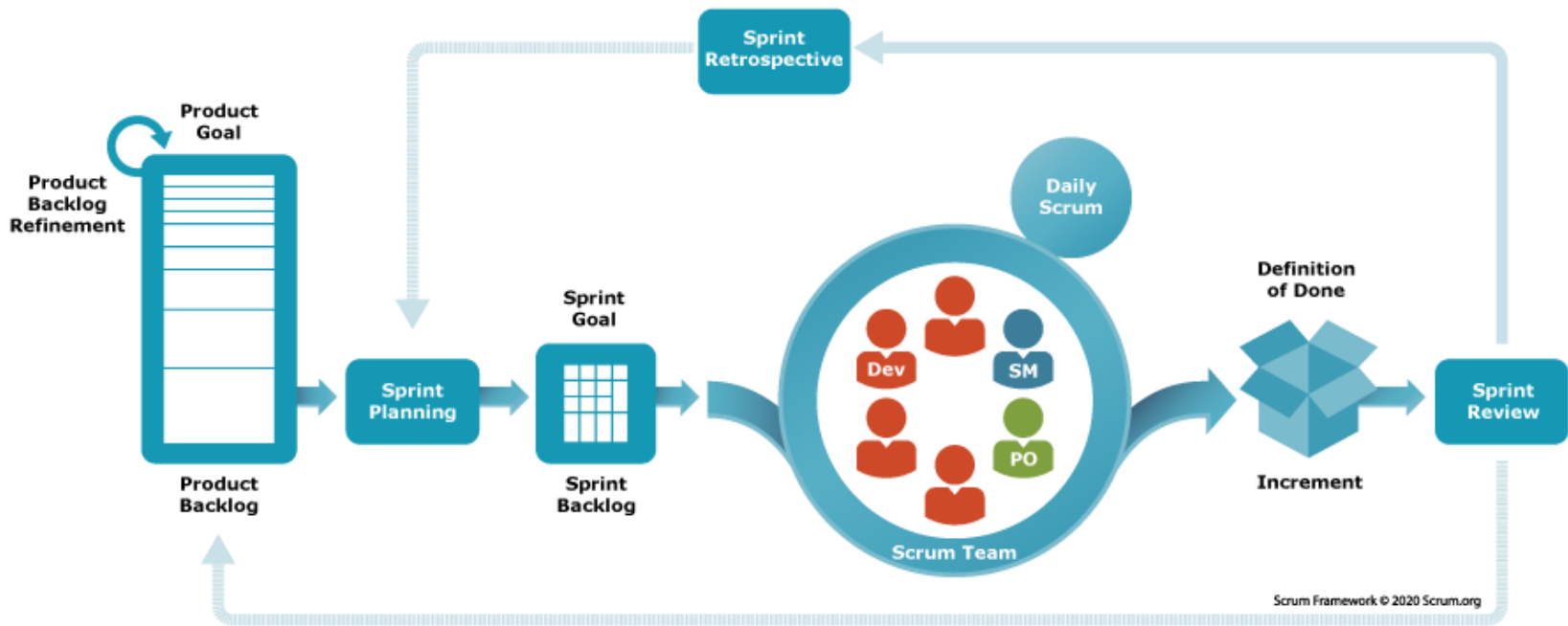
- New approach: fast and flexible, an “integrated” approach

“Scrum”



By PierreSelim - Own work, CC BY-SA 3.0, <https://commons.wikimedia.org/w/index.php?curid=17336884>

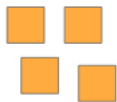



Scrum



Flow

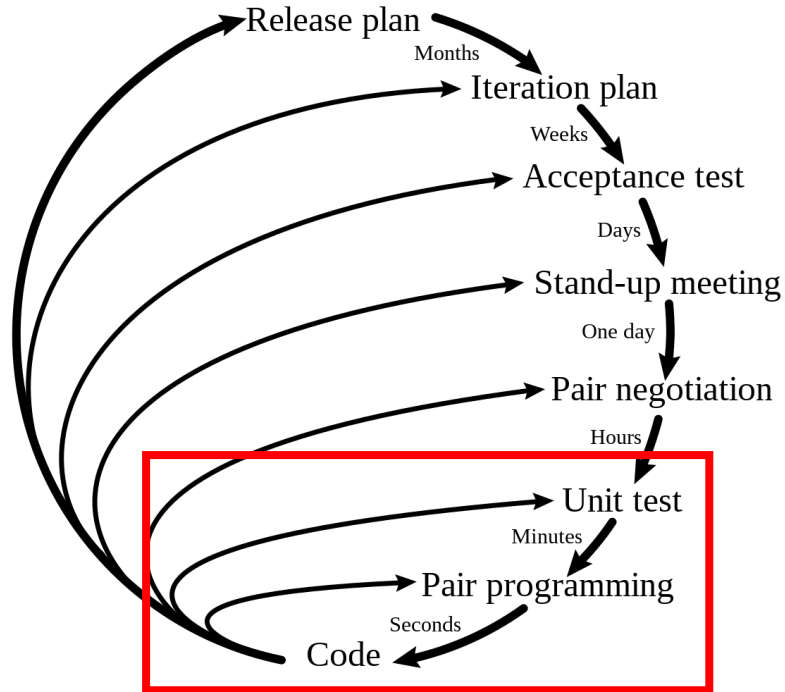
- **Flow**: movement of potential value through a system
- Kanban optimizes *flow*
- Enforces a *work in progress (WIP) limit*



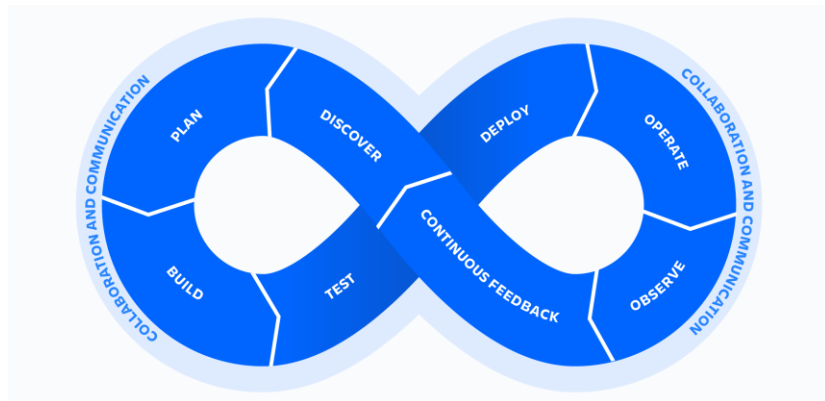
Backlog	Creating (WIP: 3)	Review (WIP: 2)	Publishing (WIP: 1)	Done
				

Extreme Programming

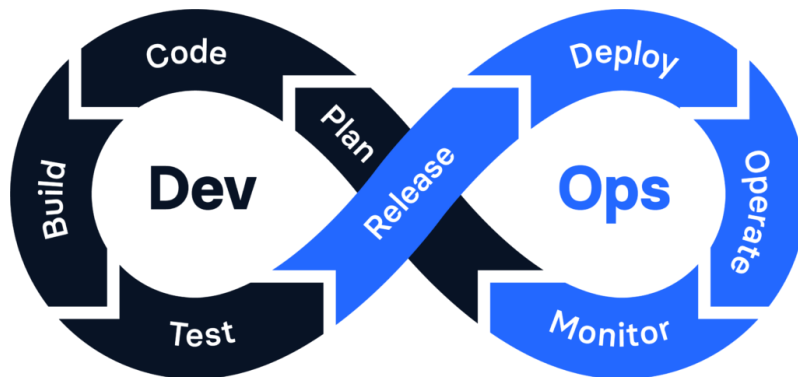
Planning/feedback loops



DevOps



<https://www.atlassian.com/devops>

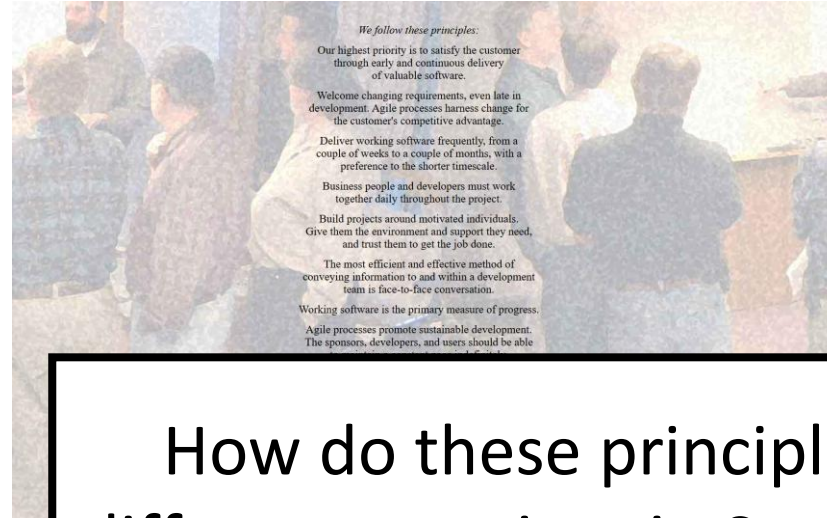
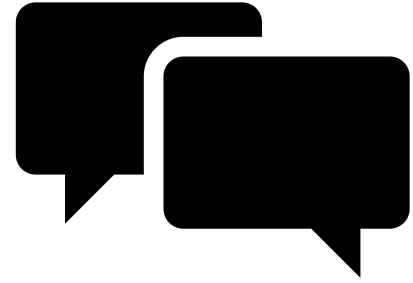


<https://ubiqware.net/en/our-approach-to-devops/>

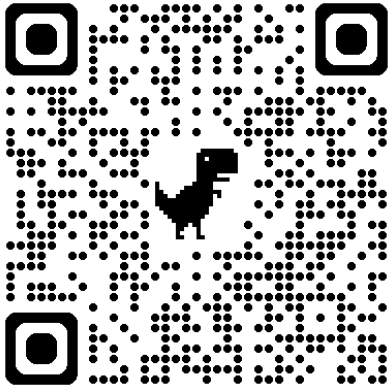



Agile Exercises

Course Exercise



How do these principles map to the different practices in Scrum, Kanban, and DevOps?






Business people and developers must work together daily throughout the project.


Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely.

At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly.




Business people and developers must work together daily throughout the project.

- Scrum: Product Owner role
- Extreme Programming: on-site customer
- DevOps: shared responsibility and breaking down silos



Agile processes promote sustainable development.
The sponsors, developers, and users should be able
to maintain a constant pace indefinitely.

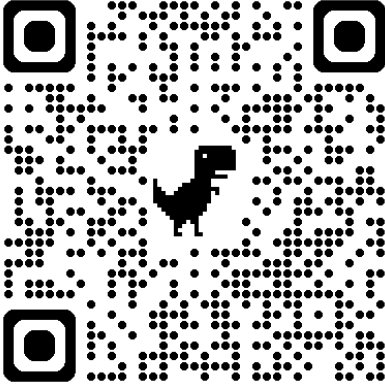
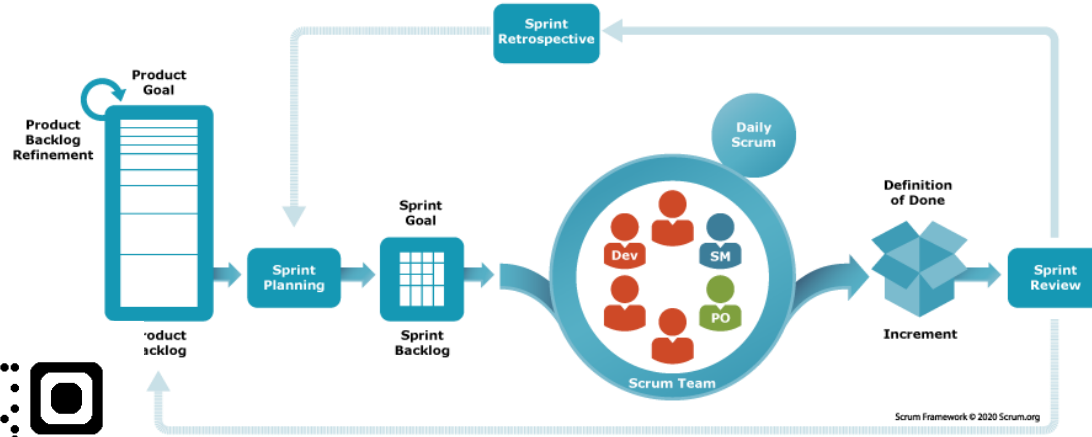
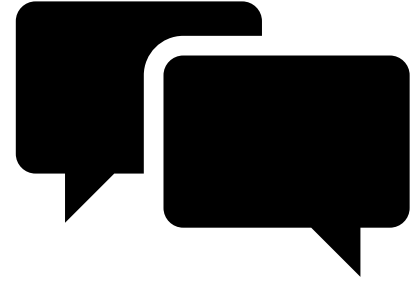
- Scrum: Sprints
- Kanban: Flow
- DevOps: continuous deployment, Value Stream Mapping



At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly.

- Scrum: Sprint Retrospective
- Kanban: continuous improvement (Kaizen)
- DevOps: blameless postmortems, monitoring and continuous improvement

Course Exercise



Do you think that agile approaches are a silver bullet? Why/why not?

Agile: Challenges with Adoption and Drawbacks



Have Agile Techniques been the Silver Bullet for Software Development at Microsoft?

Brendan Murphy
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bmurphy@microsoft.com

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Thomas Zimmermann
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Redmond, USA
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Laurie Williams
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Nachiappan Nagappan
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nachin@microsoft.com

Andrew Begel
Microsoft Research
Redmond, USA
andrew.begel@microsoft.com

Abstract—Background. The pressure to release high-quality, valuable software products at an increasingly faster rate is forcing software development organizations to adapt their development practices. Agile techniques began emerging in the mid-1990s in response to this pressure and to increased volatility of customer requirements and technical change. Theoretically, agile techniques seem to be the silver bullet for responding to these pressures on the software industry.

Aims. This paper tracks the changing attitudes to agile adoption and techniques, within Microsoft, in one of the largest longitudinal surveys of its kind (2006-2012).

dology was used to develop these large software products. In reality, many large software companies did not religiously follow any specific development methodology and adapted methods and tools to suit the products they were producing.

Over time, consumers of software and software-intensive products increasingly welcomed more frequent software releases. Simultaneously, software began to be distributed electronically, and software-as-a-service (SaaS) increased in popularity. Traditional methodologies were viewed as too slow, not customer focused, not adaptable and too bureaucratic to handle the new software reality. In response, agile methods emerged in

Agile: a Silver Bullet?

*“[...] some proponents of agile (both at Microsoft and elsewhere) appear to become **almost religious** about its use. These proponents **emphasize the potential benefits of using agile** while often **downplaying the cost or the learning curve**. We observed in some the attitude of “if agile doesn’t work for you, then you’re doing it wrong.” Whether this is true or not (we do not claim either) is immaterial. In either case, **teams have attempted to adopt an agile practice and have run into problems**. Portraying agile as a nearly universal solution, downplaying its difficulties, or blaming the team when they do not reap the expected benefits, all serve to drive potential adopters away from agile practices.”*

Agile: Problems with Adoption

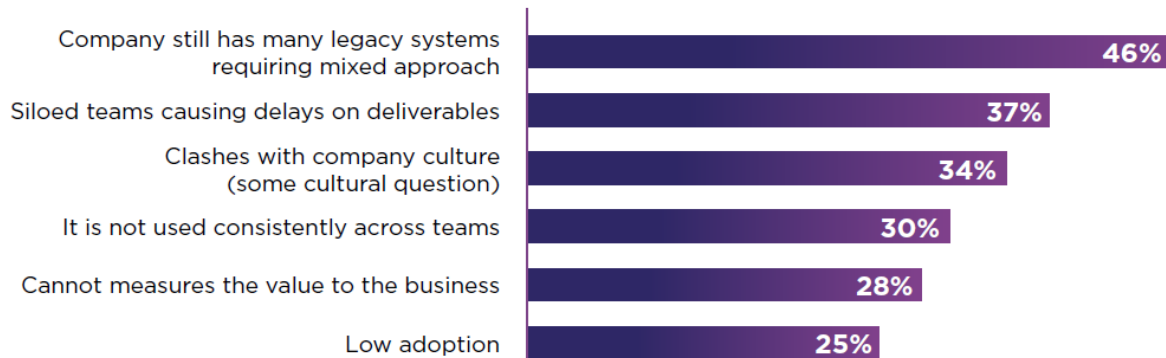
The 17th
State of Agile
Report



- Almost half of the survey takers perceive a general resistance to adopting agile practices
- Business teams do not understand what agile is and what it can do for them
- Only 6% of survey takers said they have no barriers to Agile adoption

Agile: Problem After Adoption

The 17th
State of Agile
Report



- “Too many mixed systems”, forcing practitioners to adopt hybrid approaches
- Siloed teams causing delays

A horizontal stacked bar chart with 12 rows, each representing a different agile practice. The x-axis shows percentages from 0% to 100% in 20% increments. Each bar is divided into three segments: light gray (left), medium gray (middle), and black (right). The practices and their approximate percentages are as follows:

Practice	Light Gray (%)	Medium Gray (%)	Black (%)
Incorrect practice of agile	10	25	65
Distributed development...	18	25	57
Scalability	18	30	52
Lack of documentation	22	25	53
Managing dependencies	25	25	50
Lack of upfront planning	30	25	45
Too many meetings	32	28	40
Process overhead	32	30	38
Sprints are too short	35	28	37
Management buy-in	32	35	33
Team buy-in	32	38	30

The entire chart is crossed out with a large, thick black 'X'.

A horizontal stacked bar chart showing the percentage of responses for various agile practices. The x-axis represents the percentage from 0% to 100%. The y-axis lists the practices. The legend indicates three response categories: No (light gray), Neutral (medium gray), and Yes (black).

Practice	No (%)	Neutral (%)	Yes (%)
Incorrect practice of agile	5	15	80
Scalability	15	25	60
Management buy-in	10	30	60
Distributed development...	15	30	55
Managing dependencies	15	30	55
Lack of upfront planning	25	25	50
Lack of documentation	20	30	50
Team buy-in	10	40	50
Too many meetings	20	35	45
Sprints are too short	30	35	35
Process overhead	40	30	30

Agile Devs: Perceived Problems



Agile: a Silver Bullet?

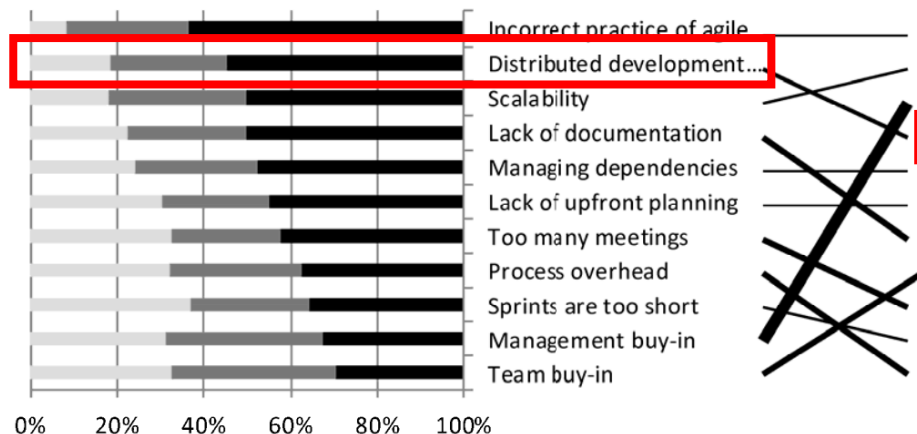


Abstract. Background. The pressure to release high-quality, reliable software products at an increasingly faster rate is forcing software development organizations to adopt new development practices. Agile techniques have emerged as the most popular response to this pressure and are becoming widely adopted. However, agile techniques were not the silver bullet for improving software development processes as the software industry has discovered. This paper tracks the changing attitudes in agile software development practices at Microsoft, in one of the largest technology companies in the world (2006-2015).

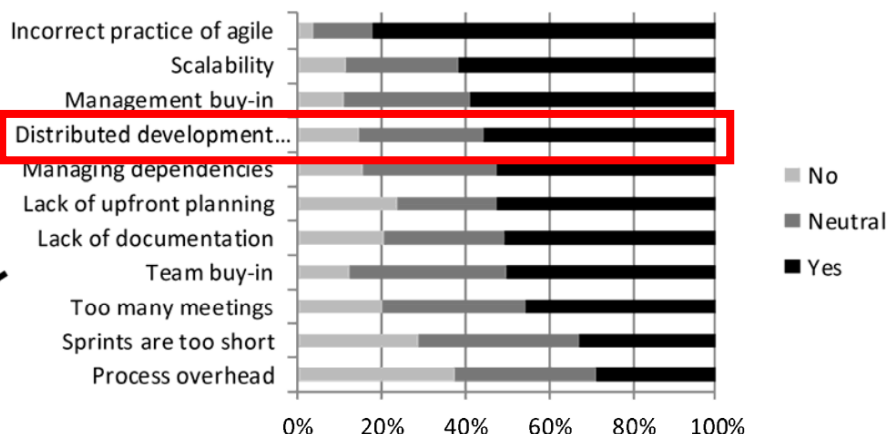
Today, many large software companies do not exclusively follow any specific development methodology and adopted multiple practices to suit the project, team, and organization. This trend, especially in software development, has led to the emergence of hybrid agile development practices. Increasingly, software teams are adopting agile techniques to improve their development processes. However, agile techniques were not the silver bullet for improving software development processes as the software industry has discovered. This paper tracks the changing attitudes in agile software development practices at Microsoft, in one of the largest technology companies in the world (2006-2015).

Agile: a Silver Bullet?

Agile Devs: Perceived Problems



Non Agile Devs: Perceived Problems

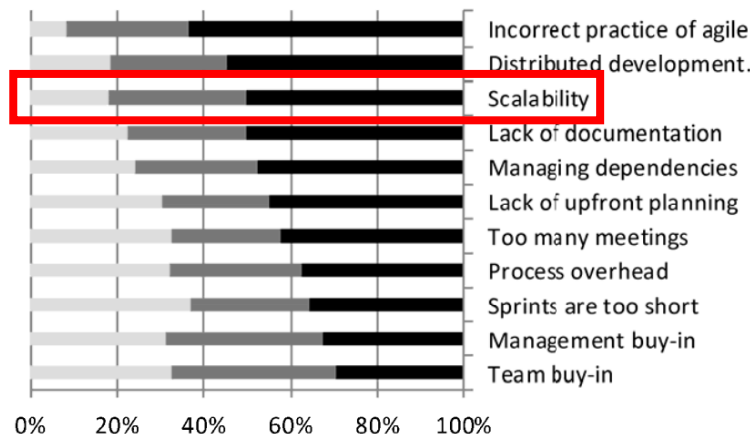


- Microsoft has many geographically distributed teams

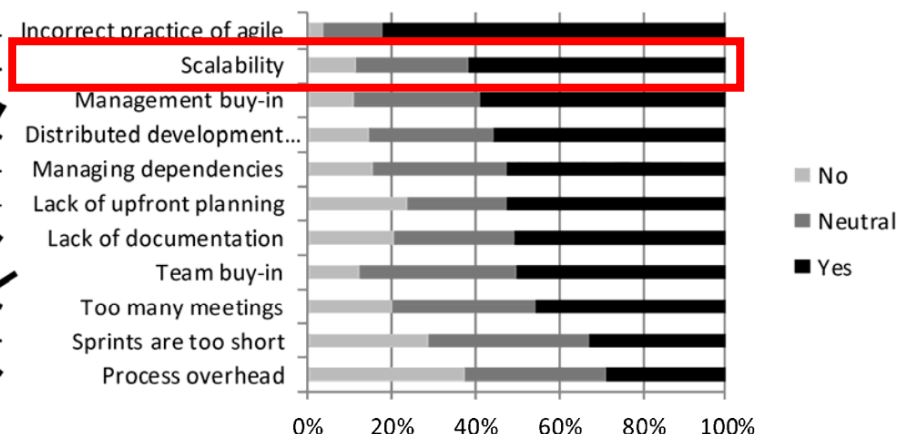
Abstract: Developed the process to release high-quality software products at an increasingly faster pace, agile development practices have become a dominant paradigm in software development. Agile techniques have changed the way software is developed, but have they also changed the way software is managed? This paper tracks the changing attitudes in agile development and explores the challenges in agile development. The paper tracks the changing attitudes in agile development and explores the challenges in agile development. The paper tracks the changing attitudes in agile development and explores the challenges in agile development.

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Non Agile Devs: Perceived Problems



- Products like Microsoft Windows or Office have thousands of developers
- Multiple Product Owners, but causes some problems

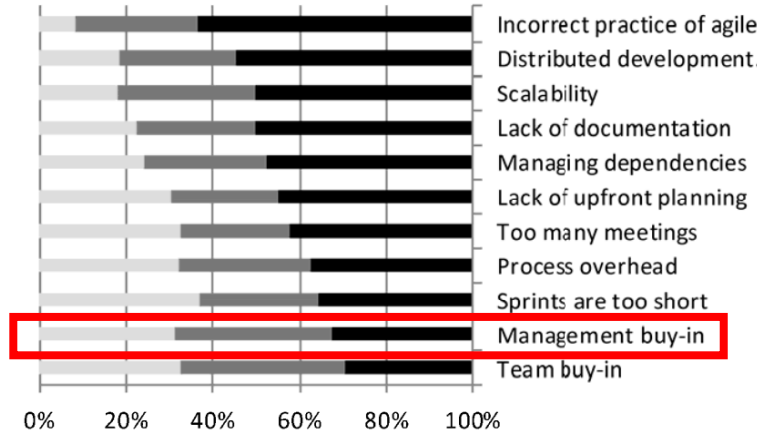


Scaling Scrum

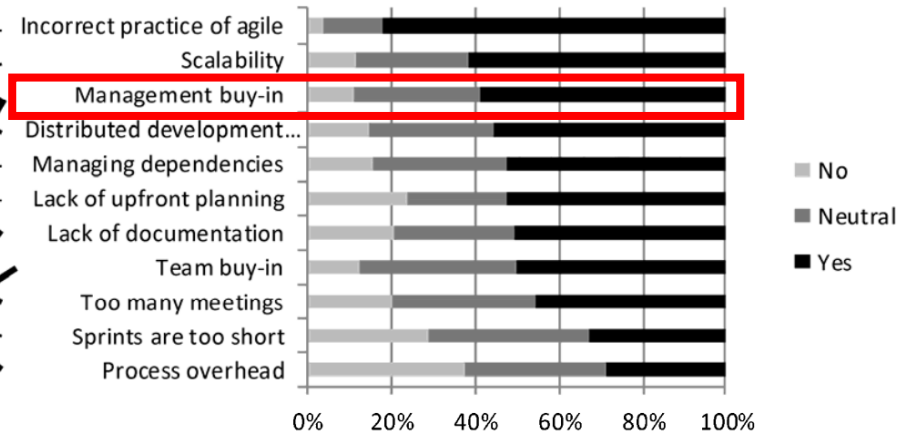
- Various approaches have been proposed to scale Scrum
- Scaled Agile Framework (SAFe)
- Scrum@Scale (S@S)
- Nexus
- Large Scale Scrum (LeSS)
- Disciplined agile delivery (DAD)
- The “Spotify model”
- ...

Agile: a Silver Bullet?

Agile Devs: Perceived Problems



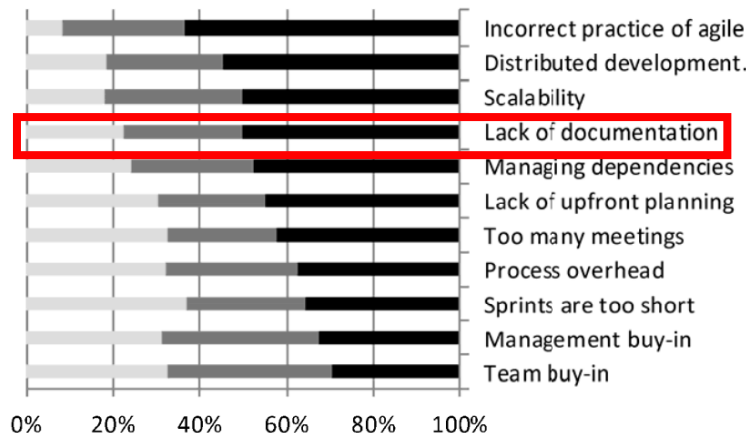
Non Agile Devs: Perceived Problems



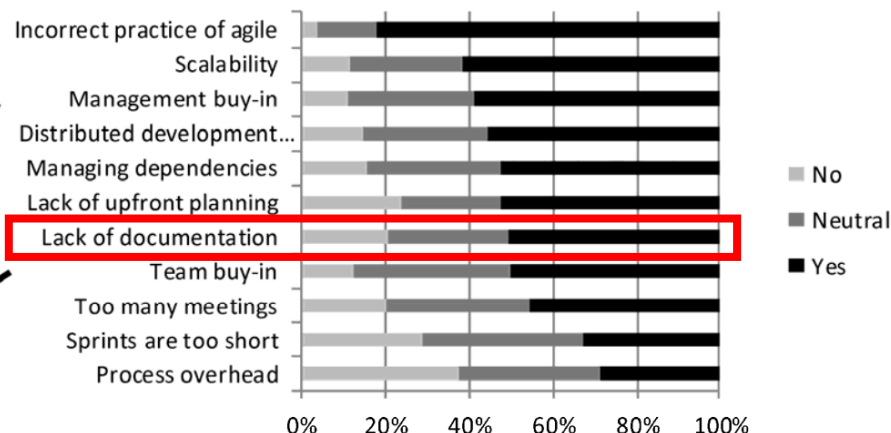
- For agile practitioners, buy-in already exists
- Non-agile developers might have seen resistant to agile techniques

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Agile Devs: Perceived Problems



Non Agile Devs: Perceived Problems



- Agile developers might have “felt the pain” of not having documentation when they would have required it

Planning in Agile

Numbers: 0, 1, 2, 3, 5, 8, 13

1

Changing the
background color
of the page to
blue

3

Add an export
button that
downloads the
data from
database

5

Adding an admin
dashboard

13

Train and
integrate a ML-
based classifier to
distinguish
different kinds of
animals

Planning in Agile

Numbers: 0, 1, 2, 3, 5, 8, 13

???

Automatically
resolve conflicts
when multiple
volunteers submit
a report

1

Changing the
background color
of the page to
blue

3

Add an export
button that
downloads the
data from
database

5

Adding an admin
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13

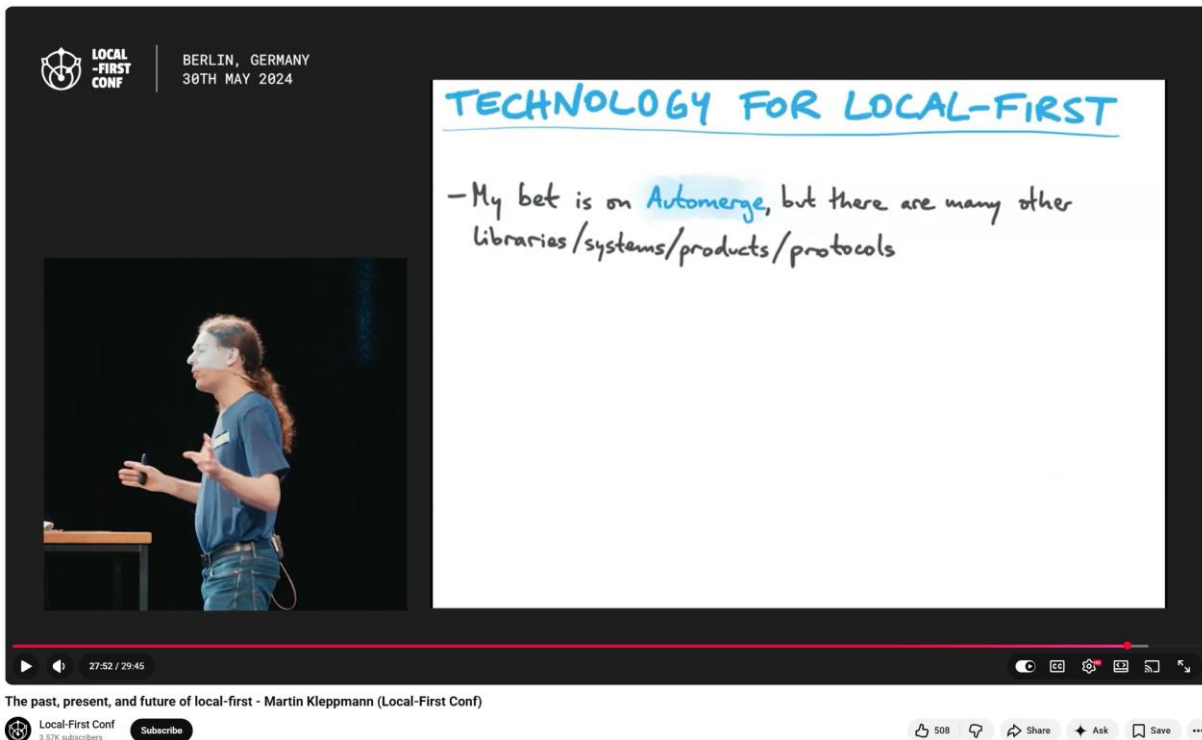
Train and
integrate a ML-
based classifier to
distinguish
different kinds of
animals



Planning Poker

- Improves planning accuracy
- Estimating tasks relative to completed ones, rather than in absolute time
- Avoid bias and give equal voice to everyone

Local-First Software



LOCAL-FIRST CONF | BERLIN, GERMANY
30TH MAY 2024

TECHNOLOGY FOR LOCAL-FIRST

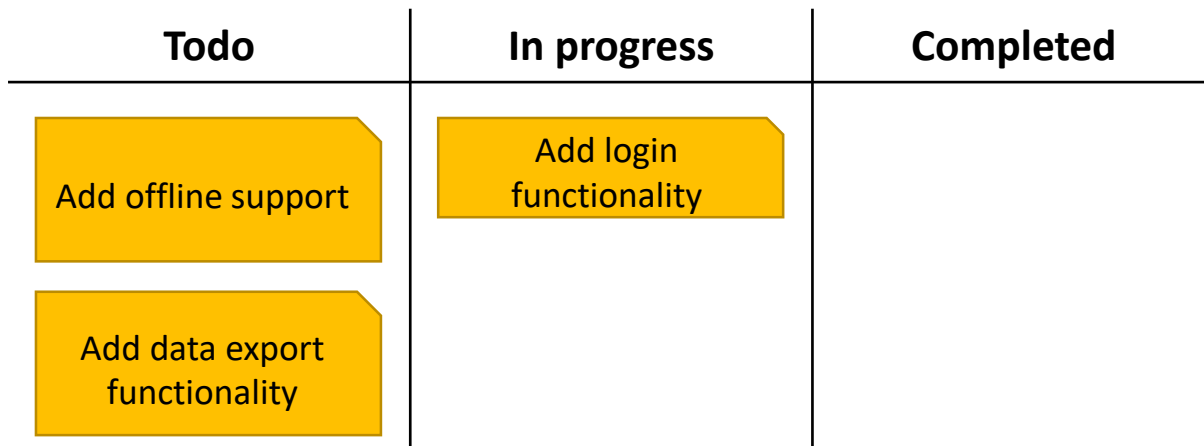
- My bet is on Automerge, but there are many other libraries/systems/products/protocols

The past, present, and future of local-first - Martin Kleppmann (Local-First Conf)

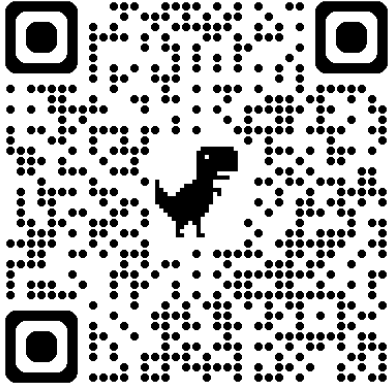
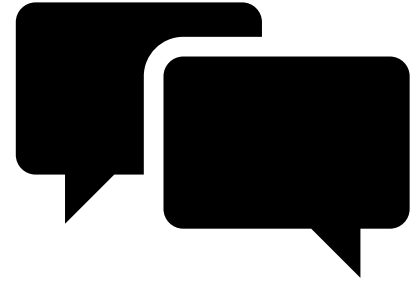
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Kanban: Definition of Workflow

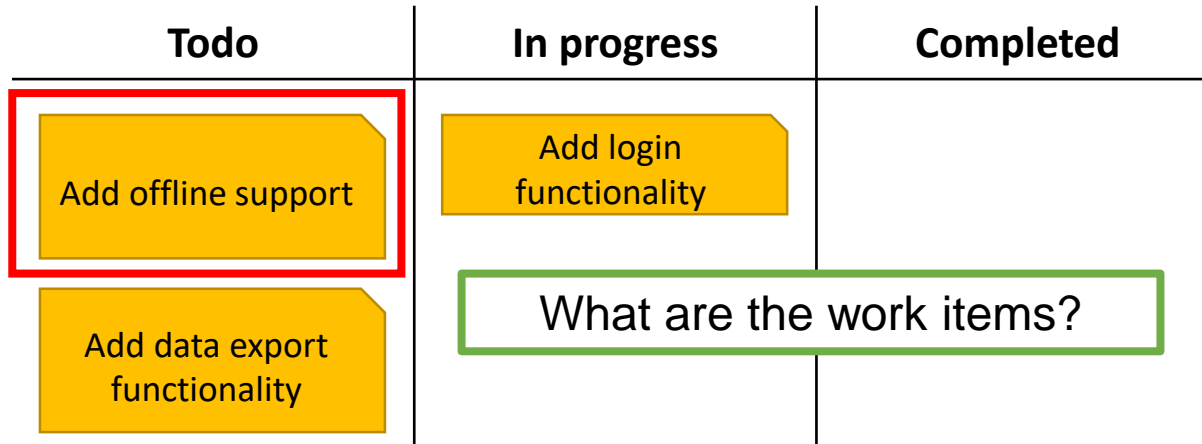


Definition of Workflow

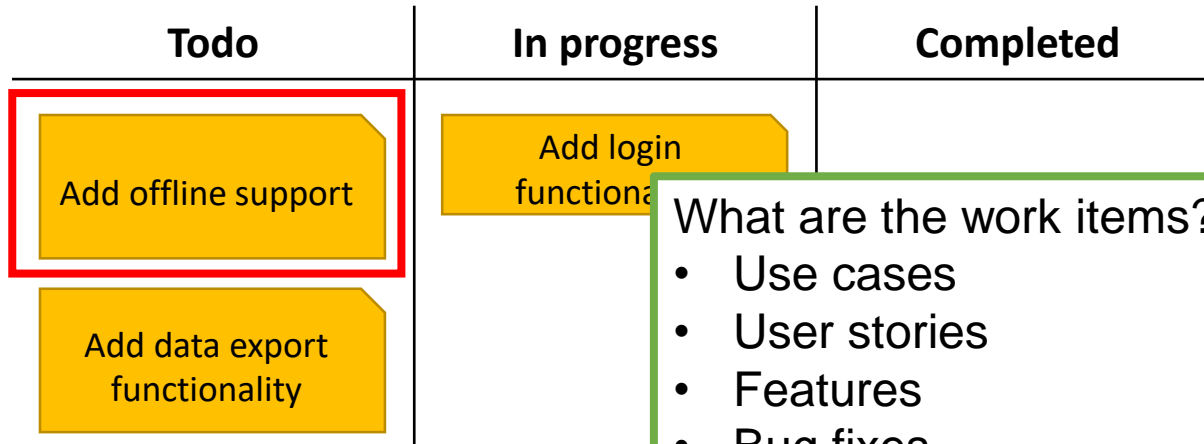


What concepts do we need to
define for the Kanban
Definition of Workflow?

Definition of Workflow



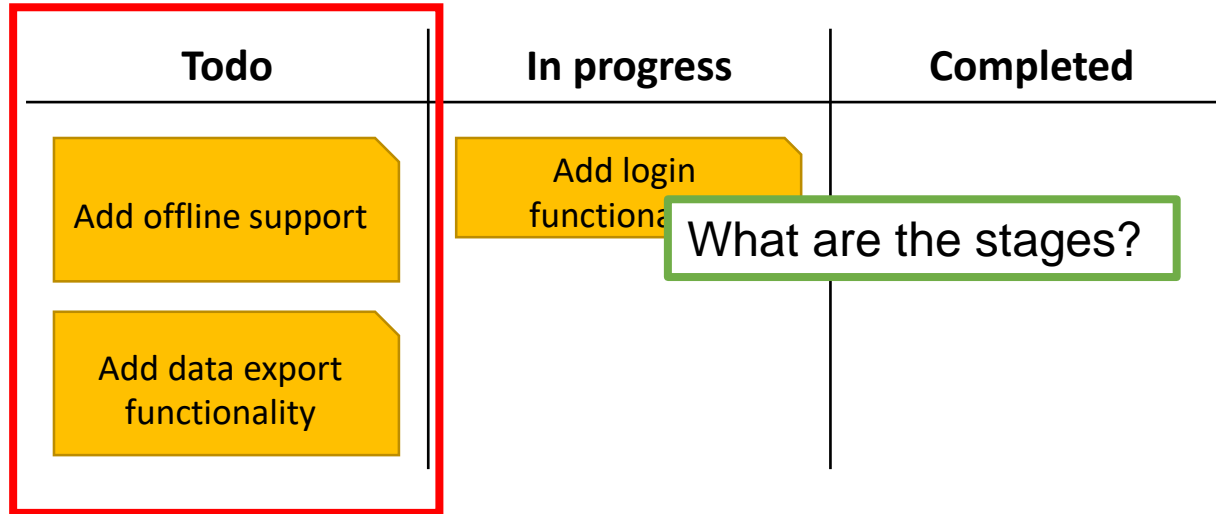
Definition of Workflow



What are the work items?

- Use cases
- User stories
- Features
- Bug fixes
- Experiments
- ...

Definition of Workflow



Definition of Workflow

Use Case	Before Next TA Meeting	In progress	Completed
Add offline support		Add login functionality	
Add data export functionality			

Definition of Workflow

Use Case	Before Next TA Meeting	In progress	Completed
<div>Add offline support</div> <div>Add data export functionality</div>	<div>What are the policies that you apply to items and stages?</div>	<div>Add login functionality</div>	

Definition of Workflow

Use Case	Before Next TA Meeting	In progress	Completed
<div>Add offline support</div> <div>Add data export functionality</div>	<div>Add login</div> <ul style="list-style-type: none">• Start and end points• When an item can move from one to another stage or entry/exit criteria• WIP limit. How enforced?• Sorting/prioritization		