School of Computer Science and Engineering (CSE)

COMP9900 Information Technology Project COMP3900 Computer Science Project

2023 Term 2

Week 2

Dr Rachid Hamadi (r.hamadi@unsw.edu.au)



Outline

- Scrum Agile Methodology
- Scrum in Jira
- Interface and Flow Diagrams (Storyboards)
- System Architecture
- Week 2 Lab Tasks
- Q & A



Scrum Agile Methodology



Introduction

- Classical methods of software development have many disadvantages
 - huge effort during the planning phase
 - poor requirements conversion in a rapid changing environment
 - treatment of staff as a 'factor of production'
- New methods
 - Agile Software Development Methodology



Agile advocates believe

- Current software development processes are too heavyweight or cumbersome
 - Too many things are done that are not directly related to the software product being produced
- Current software development is too rigid
 - Difficulty with incomplete or changing requirements
 - Short development cycles (Internet applications)
- More active customer involvement needed



- Agile methods are considered
 - Lightweight
 - People-based rather than Plan-based
- Several agile methods
 - No single agile method
 - Scrum, Extreme Programming (XP), Rational Unified Process (RUP), ...
- No single definition
- Agile Manifesto closest to a definition
 - Set of principles
 - Developed by Agile Alliance



Agile Manifesto

- A Statement of Values
 - Individuals and interactions over processes and tools
 - Working software over comprehensive documentation
 - Customer collaboration over contract negotiation
 - Responding to change over following a plan
- See http://agilemanifesto.org for more details



Agile Methods

- Agile methods:
 - Scrum
 - Extreme Programming (XP)
 - Rational Unified Process (RUP)
 - Adaptive Software Development (ASD)
 - Dynamic System Development Method (DSDM)
 - ...
- Agile Alliance (<u>www.agilealliance.org</u>)
 - A non-profit organization that promotes agile development



Why is it called a **Scrum**?

- The term "Scrum" has its origins in rugby, a sport which revolves around cooperation, adaptability, speed and self-direction of the rugby team
- In a scrum, the team jointly tries to reach a goal and win the match
- In addition to cooperation, the team must rapidly respond to changes





Scrum in 100 words

- Scrum is an agile process that allows us to focus on delivering the highest business value in the shortest time
- It allows us to rapidly and repeatedly inspect actual working software (every two weeks to one month)
- The business sets the priorities. Our teams self-manage to determine the best way to deliver the highest priority features
- Every two weeks to a month anyone can see real working software and decide to release it as is or continue to enhance for another iteration



History of Scrum

- 1995
 - Analysis of common software development processes → not suitable for empirical, unpredictable and non-repeatable processes
 - Design of a **new** method: **Scrum** by Jeff Sutherland and Ken Schwaber
 - Enhancement of Scrum by Mike Beedle
 - Combination of Scrum with Extreme Programming
- 1996
 - Introduction of Scrum at OOPSLA conference
- 2001
 - Publication "Agile Software Development with Scrum" by Ken Schwaber and Mike Beedle
- Successful application of Scrum in over 50 companies
- Founders are members of the Agile Alliance



How Scrum Works?

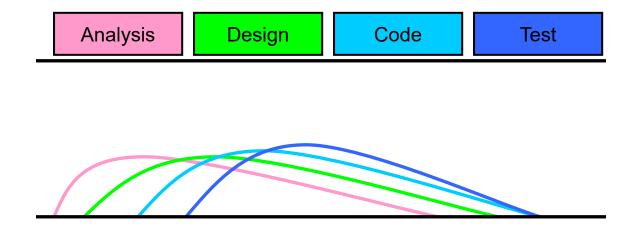


Sprints

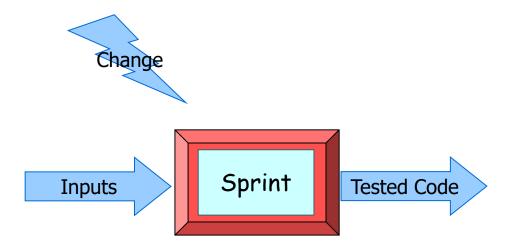
- Scrum projects make progress in a series of "sprints"
- Target duration is two weeks
 - +/- a week or two
 - A constant duration leads to a better rhythm
- Product is designed, coded, and tested during the sprint



Sequential vs. Overlapping Development



No changes during the sprint



Plan sprint durations around how long you can commit to **keeping change out of the sprint**



Roles

- Product Owner
- Scrum Master
- Scrum Team

Ceremonies

- Sprint Planning
- Sprint Review
- Sprint Retrospective
- Daily Scrum Meeting

Artifacts

- Product Backlog
- Sprint Backlog
- Burndown Chart



Product Owner

- Define the features of the product
- Decide on release date and content
- Be responsible for the profitability of the product, that is, Return On Investment (ROI)
- Prioritize features according to market value
- Adjust features and priority every iteration, as needed
- Accept or reject work results



Scrum Master

- Represents management to the project
- Responsible for enacting Scrum values and practices
- Removes impediments
- Ensure that the team is fully functional and productive
- Enable close cooperation across all roles and functions
- Shield the team from external interferences



Scrum Team

- Typically, 5-10 people
- Cross-functional
 - Programmers, UI Designers, QA (Testers), ...
- Members should be full-time
 - May be exceptions (e.g., System Admin, ...)
- Teams are self-organizing
 - Ideally, no titles but rarely a possibility
- Membership can change only between sprints

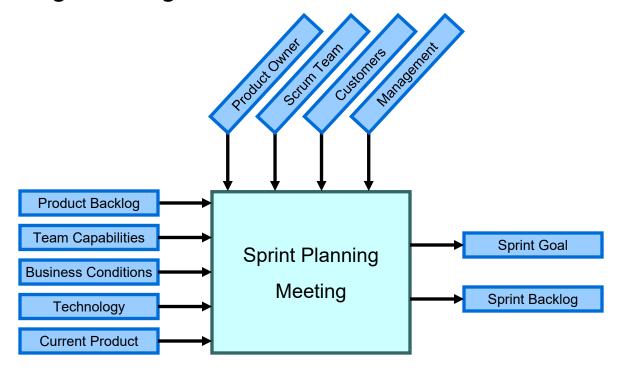


Ceremonies

- Sprint Planning Meeting
- Sprint
- Daily Scrum
- Sprint Review Meeting



Sprint Planning Meeting



Parts of Sprint Planning Meeting

- 1st Part:
 - Creating Product Backlog
 - Determining the Sprint Goal
 - Participants: Product Owner, Scrum Master, Scrum Team
- 2nd Part:
 - Creating Sprint Backlog
 - Participants: Scrum Master, Scrum Team



Pre-Project/Kickoff Meeting

- A special form of Sprint Planning Meeting
- Meeting before the beginning of the Project



Sprint

- A fortnight to a month-long iteration, during which a product functionality is incremented
- NO outside influence can interfere with the Scrum team during the Sprint
- Each Sprint begins with the Daily Scrum Meeting



Daily Scrum

- Parameters
 - Daily
 - 15-minutes
 - Stand-up
 - Not for problem solving
- Three questions:
 - What did you do yesterday
 - What will you do today?
 - What obstacles are in your way?



Daily Scrum

- Is NOT a problem solving session
- Is NOT a way to collect information about WHO is behind the schedule
- Is a meeting in which team members make commitments to each other and to the Scrum Master
- Is a good way for a Scrum Master to track the progress of the Scrum Team



Scrum FAQs

- Why daily?
 - "How does a project get to be a year late?"
 - "One day at a time"
 Fred Brooks, The Mythical Man-Month
- Can Scrum meetings be replaced by emailed status reports?
 - No
 - Entire team sees the whole picture every day
 - Create peer pressure to do what you say you will do



Sprint Review Meeting

- Team presents what it accomplished during the sprint
- Typically takes the form of a demo of new features or underlying architecture
- Informal
 - 2-hour prep time rule
- Participants
 - Customers
 - Management
 - Product Owner
 - Other engineers



Sprint Retrospective Meeting

- Scrum Team only
- Feedback meeting
- Three questions
 - Start (ideas for next sprint)
 - Stop (what didn't go well)
 - Continue (what went well)
- Do not skip!



Sprint Retrospective - Example for Sprint 1

Last			
retrospective's			
To Try			

First sprint so N/A

What went well

Met sprint goal

What didn't go so well

Duplicated work (2 team-members accidentally working on same task without knowing)

To Try



Sprint Retrospective - Example for Sprint 1

Last retrospective's To Try

First sprint so N/A

What went well

Met sprint goal

What didn't go so well

Duplicated work (2 team-members accidentally working on same task without knowing)

To Try

Ensure everyone sends daily scrum updates if absent from the daily scrum meeting (Jake checks that everyone's present, and reminds any absentees to email status update to team)



Sprint Retrospective - Example for Sprint 2

Last retrospective's To Try

Ensure everyone sends daily scrum updates if absent from the daily scrum meeting.
(Jake checks that everyone's present, and reminds any absentees to email status update to team)

This worked well. Everyone knows what everyone else is doing - no more duplicate work What went well

Met sprint goal

No more duplicated work

What didn't go so well

Software unit demonstrated was buggy

To Try

Write unit tests for each unit developed (all members to follow up on that)



Product Backlog

- A list of all desired work on the project
 - Usually, a combination of
 - story-based work ("let user search and replace")
 - task-based work ("improve exception handling")
- List is **prioritized** by the Product Owner (sometimes together with the Scrum Master)
 - Typically, Product Manager, Marketing, Internal Customer, ...



Product Backlog

- Requirements for a system, expressed as a prioritized list of Backlog Items
- Is managed and owned by a Product Owner
- Spreadsheet / Jira (typically)
- Is usually created during the Sprint Planning Meeting
- Can be changed and re-prioritized before each sprint planning meeting



Sample Product Backlog

	ltem #	Description	Est	Ву	
Very High					
	1	Finish database versioning	16	KH	
	2	Get rid of unneeded shared Java in database	8	KH	
	-	Add licensing	-	-	
	3		16	TG	
	4	Demo / Eval licensing	16	TG	
		Analysis Manager			
	5	File formats we support are out of date	160	TG	
	6		250	MC	
High					
	-	Enforce unique names	-	-	
	7	In main application	24	KH	
	8	In import	24	AM	
	-	Admin Program	-	-	
	9	Delete users	4	JM	
	-	Analysis Manager	-	-	
		When items are removed from an analysis, they should show			
	10		8	TG	
	-	Query	-	-	
	11	Support for wildcards when searching	16	T&A	
	12		16	T&A	
	13		12	T&A	
		Population Genetics	-	-	
	14	Frequency Manager	400	T&M	
	15	Query Tool	400	T&M	
	16	Additional Editors (which ones)	240	T&M	
	17	Study Variable Manager	240	T&M	
	18		320	T&M	
	19	Add icons for v1.1 or 2.0	-	-	
	- 20	Pedigree Manager Validate Derived kindred	-	- 1/1	
	20	Aalinate Delived Kludled	4	KH	
Medium					
	-	Explorer	-	-	
	24	Launch tab synchronization (only show queries/analyses for			
	21 22	logged in users)	8 4	T&A	
	22	Delete settings (?)	4	T&A	



From Sprint Goal to Sprint Backlog

- Scrum team takes the Sprint Goal and decides what tasks are necessary
- Team self-organizes around how they will meet the Sprint Goal
 - Manager does not assign tasks to individuals
- Managers do not make decisions for the team (but they can decide priority)
- Sprint Backlog is created



Sprint Backlog during the Sprint

- Changes
 - Team adds new tasks whenever they need to in order to meet the Sprint Goal
 - Team can remove unnecessary tasks
 - Sprint Backlog can only be updated by the team
- Estimates are updated whenever there is new information



Sprint Backlog

- A **subset** of Product Backlog Items
- Define the work for a Sprint
- Is **ONLY** created by team members
- Each item has its own status
- Should be updated every day



Sprint Backlog

- No more than 300 tasks in the list
- If a task requires say more than 21 **story points** (to be precise, a small number of story points, to be discussed), it should be broken down
- Team can add or subtract items from the list
 - Product Owner is not allowed to do it



Sample Sprint Backlog

Days Left in Sprint		15	13	10	8	
						ī
Who	Description	100	2002/2/2/2/2/2/2/2/2/2/2/2/2/2/2/2/2/2/	2002 / S. / S	2005/2/2/2/2/2/2/2/2/2/2/2/2/2/2/2/2/2/2	2005/
	Total Estimated Hours:	554	458	362	270	0
-	User's Guide	-	-	-	-	-
SM	Start on Study Variable chapter first draft	16	16	16	16	
SM	Import chapter first draft	40	24	6	6	
SM	Export chapter first draft	24	24	24	6	
	Misc. Small Bugs					
JM	Fix connection leak	40				
JM	Delete queries	8	8			
JM	Delete analysis	8	8			
TG	Fix tear-off messaging bug	8	8			
JM AM	View pedigree for kindred column in a result set	2	2	2	2	
Alvi	Environment	-				
TG	Install CVS	16	16			
TBD	Move code into CVS	40	40	40	40	
TBD	Move to JDK 1.4	8	8	8	8	
100	Database		-		-	
KH	Killing Oracle sessions	8	8	8	8	
KH	Finish 2.206 database patch	8	2	Ŭ		
KH	Make a 2.207 database patch	8	8	8	8	
KH	Figure out why 461 indexes are created	4	<u> </u>	Ŭ		
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Sprint Burndown Chart

- Depicts the total Sprint Backlog hours (i.e., sprint points) remaining per day
- Shows the estimated amount of time to release
- Ideally should burn down to zero to the end of the Sprint
- It is not a straight line
- Can bump up



Sprint Burndown Chart



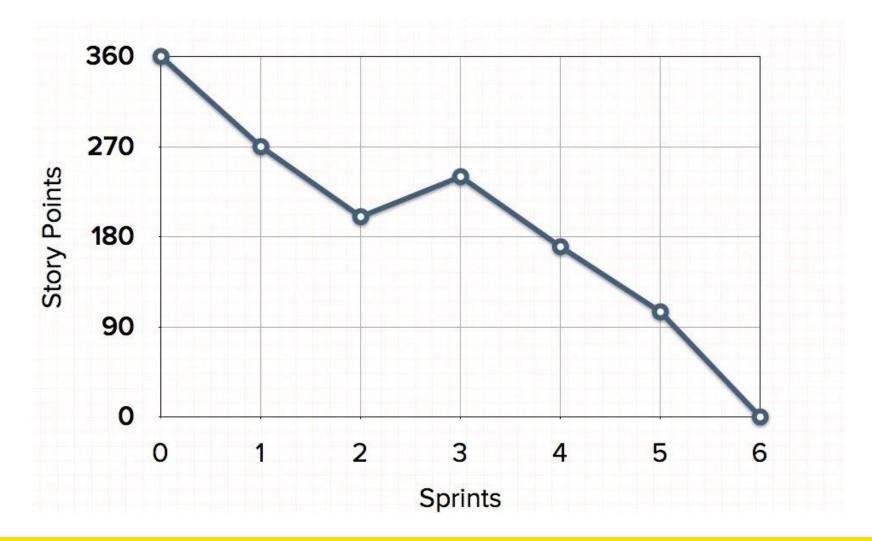
Release/Product Burndown Chart

- Will the release be done right time?
- X-axis: sprints
- Y-axis: number of hours (or sprint points) remaining
- The estimated work remaining can also burn up



Release/Product Burndown Chart

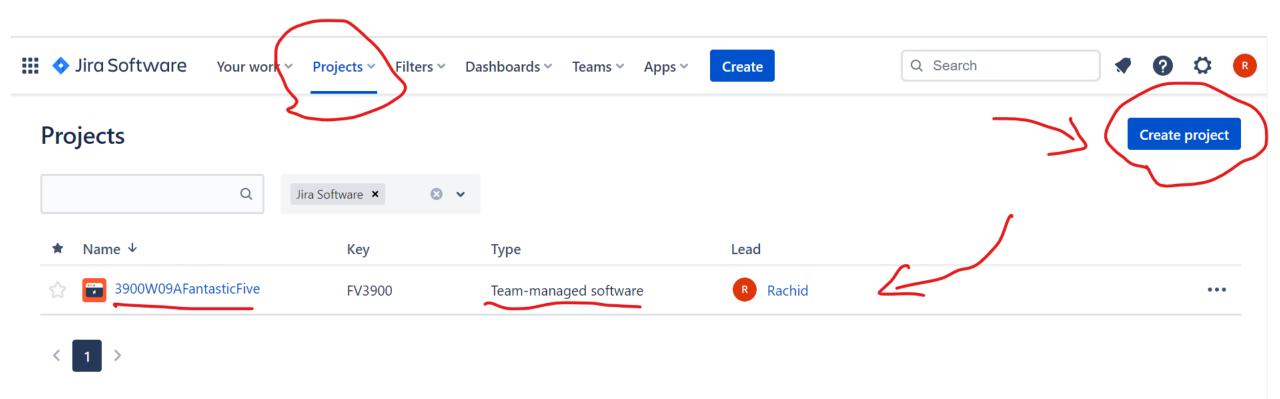
 Is a "big picture" view of project's progress (all the releases)

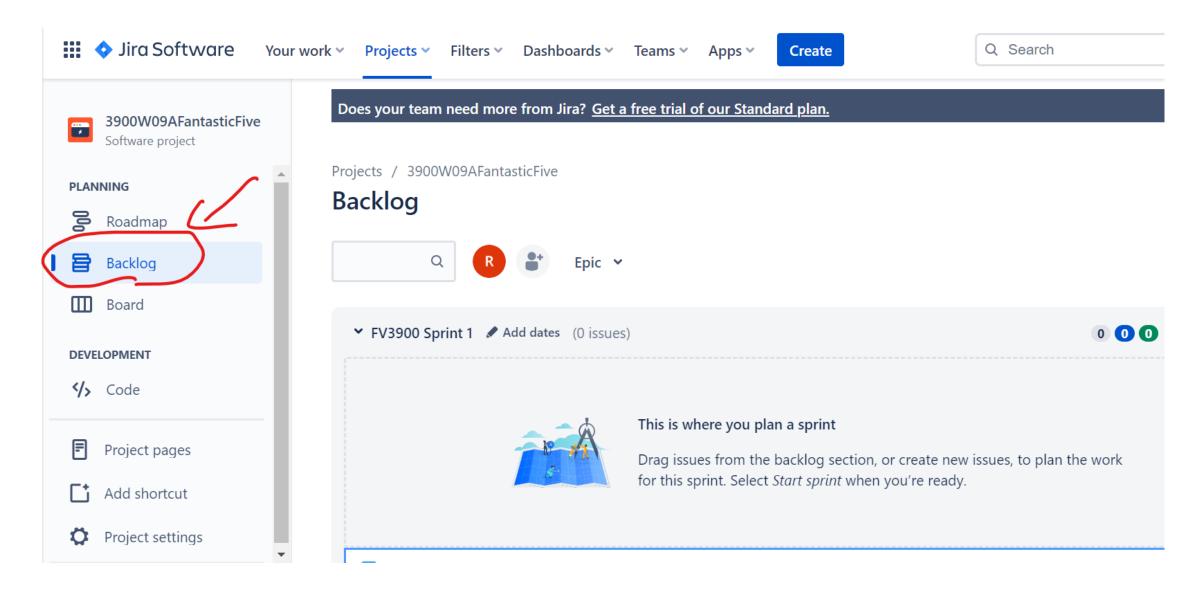




Scrum with Jira

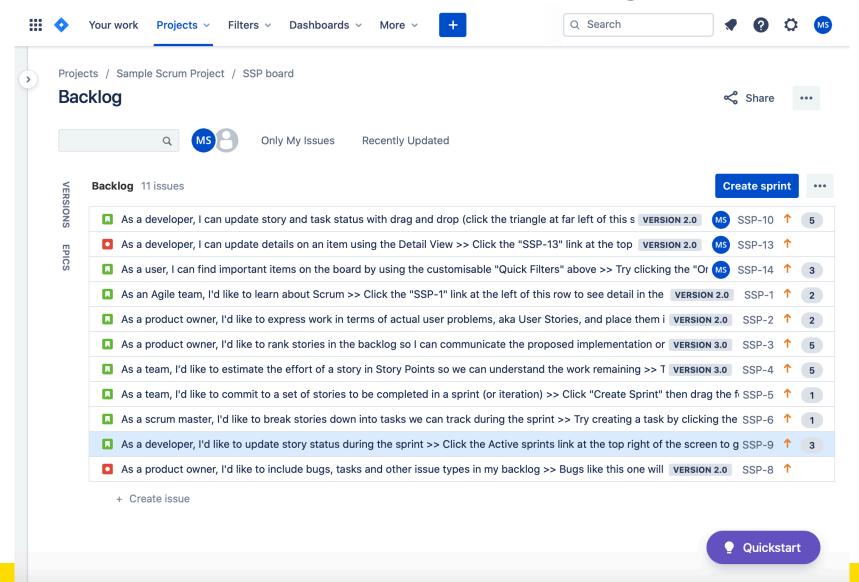




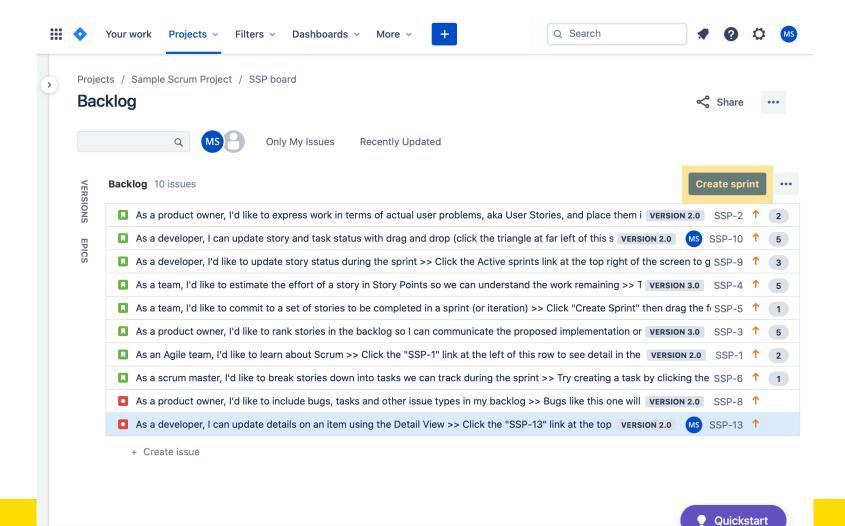




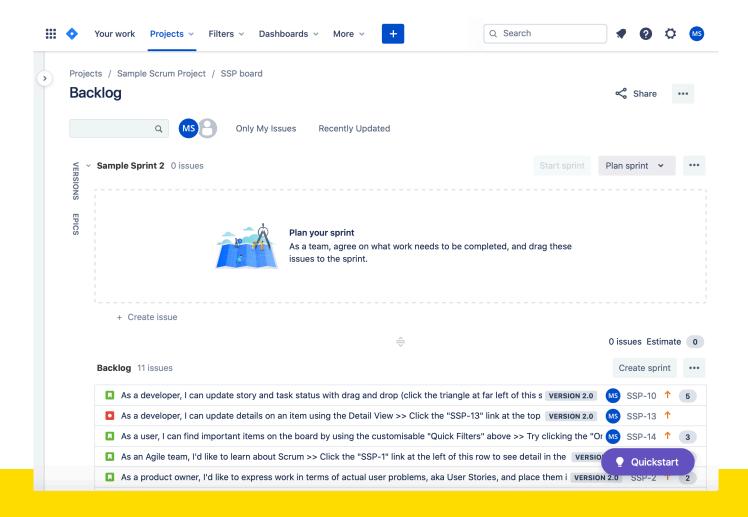
Jira Product Backlog



Creating a Sprint

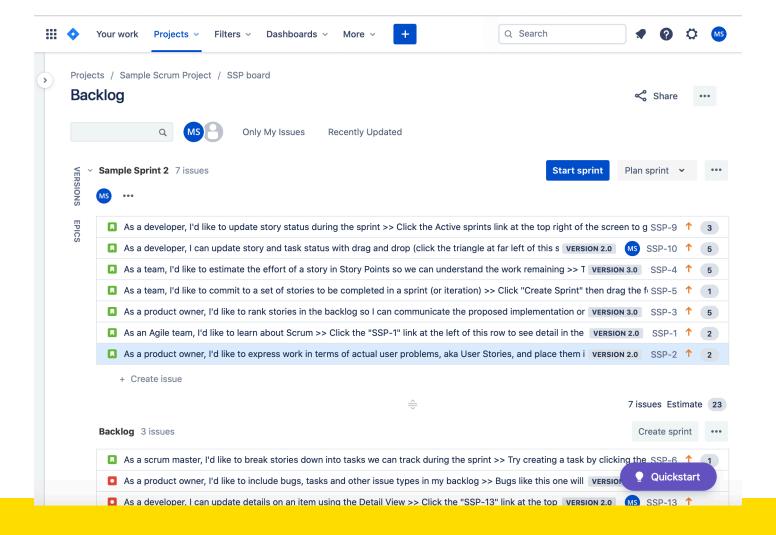


Creating a Sprint



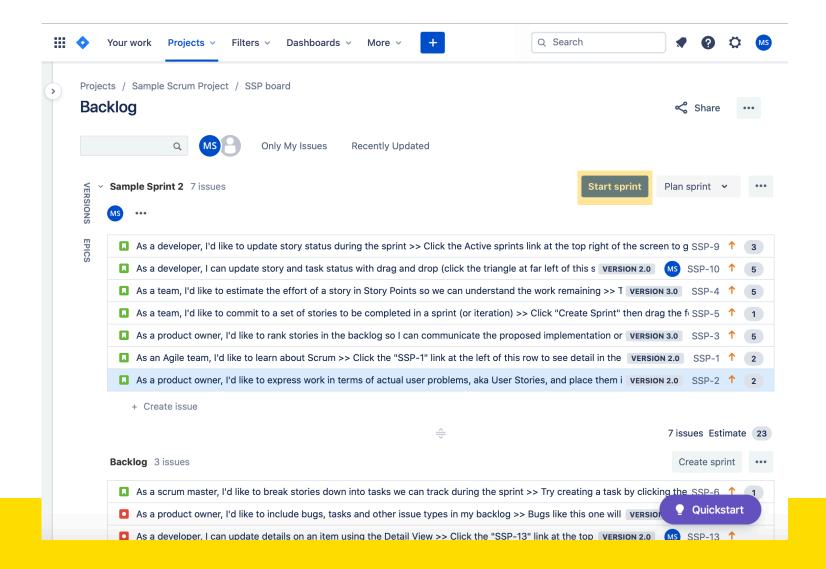


Creating a Sprint



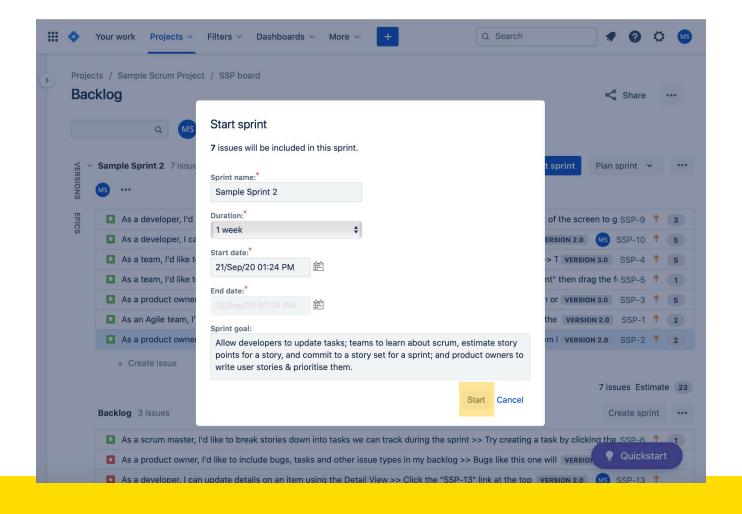


Creating a Sprint (cont'd)

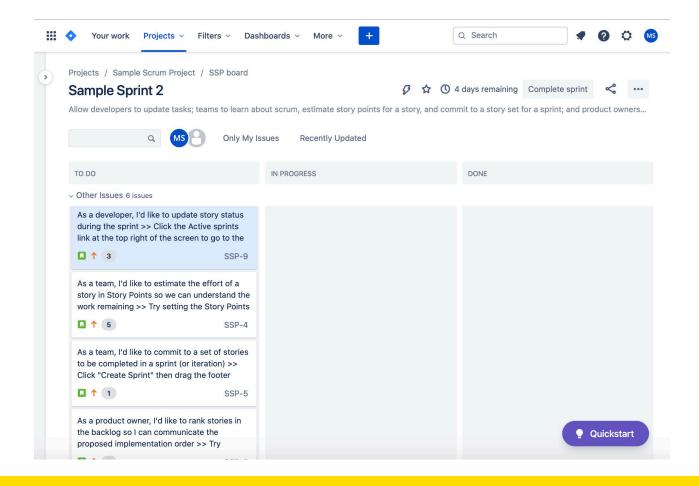




Creating a Sprint (cont'd)

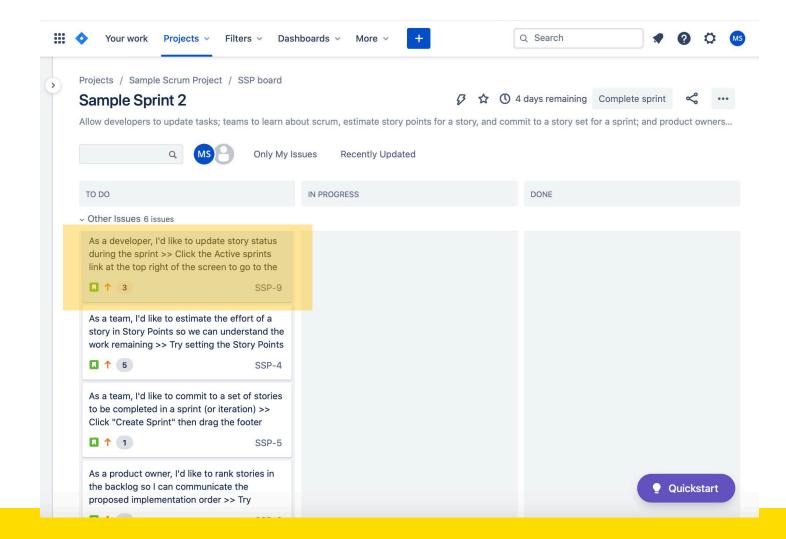


Sprint Board

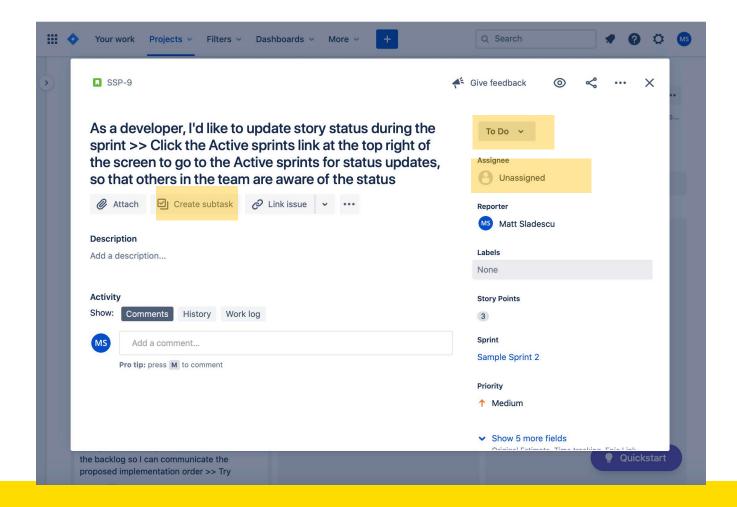




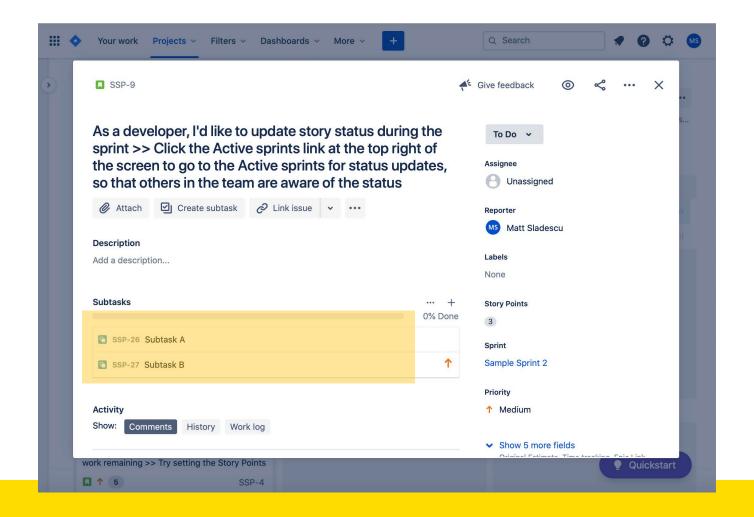
Story Details



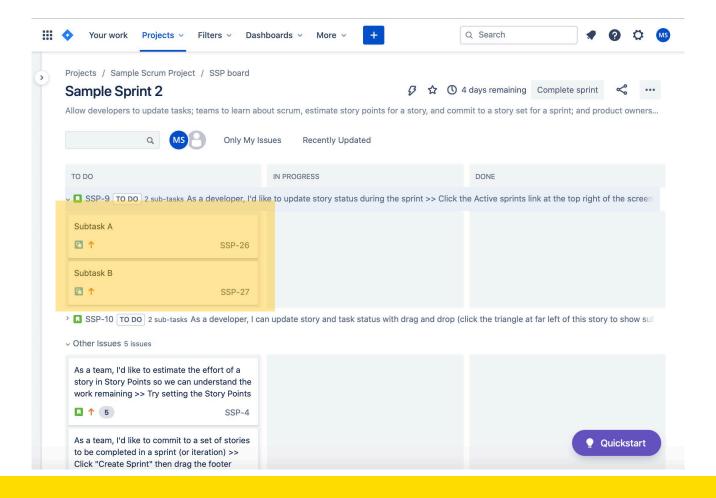
Story Details and Subtasks



Story Details and Subtasks



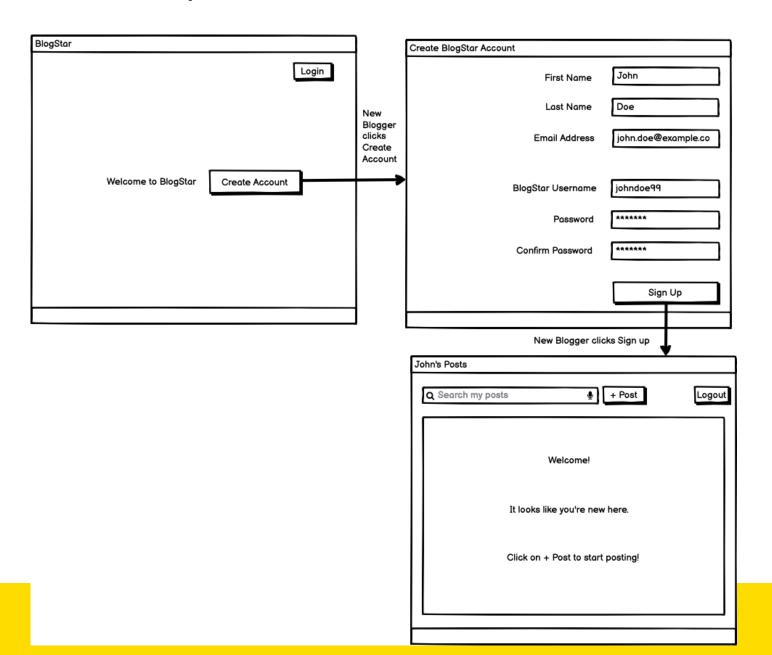
Story Details and Subtasks



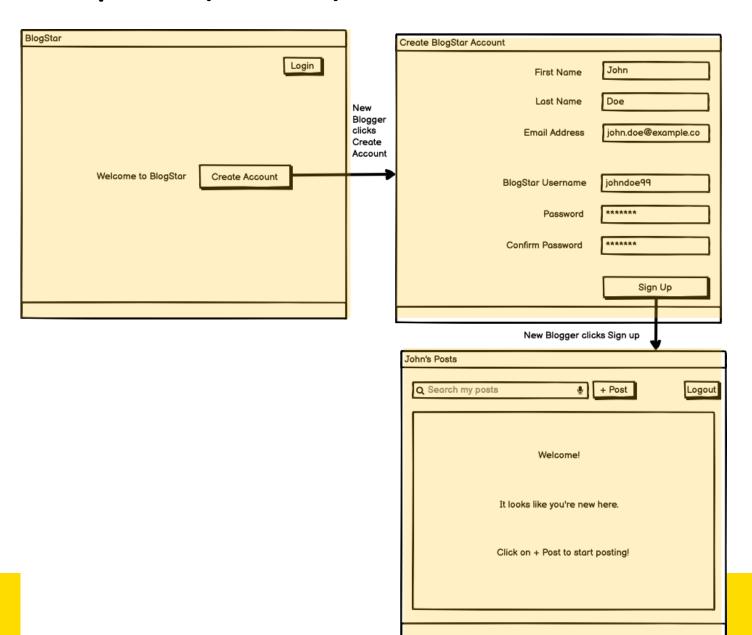
Interface and Flow Diagrams (Storyboards)



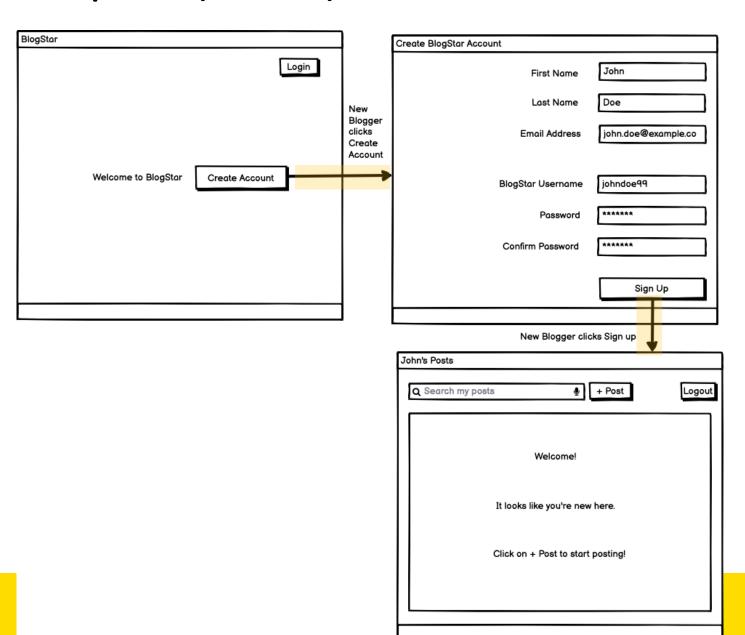
Example 1



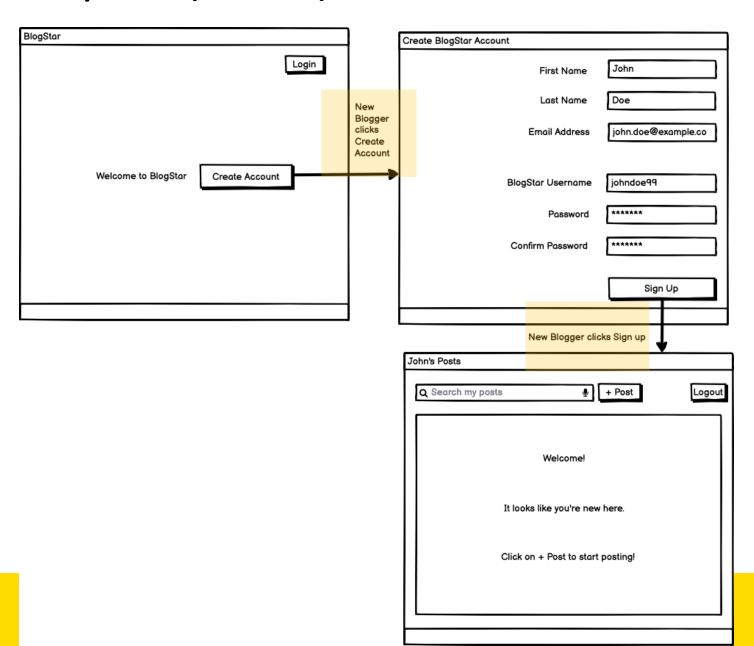
Example 1 (cont'd)



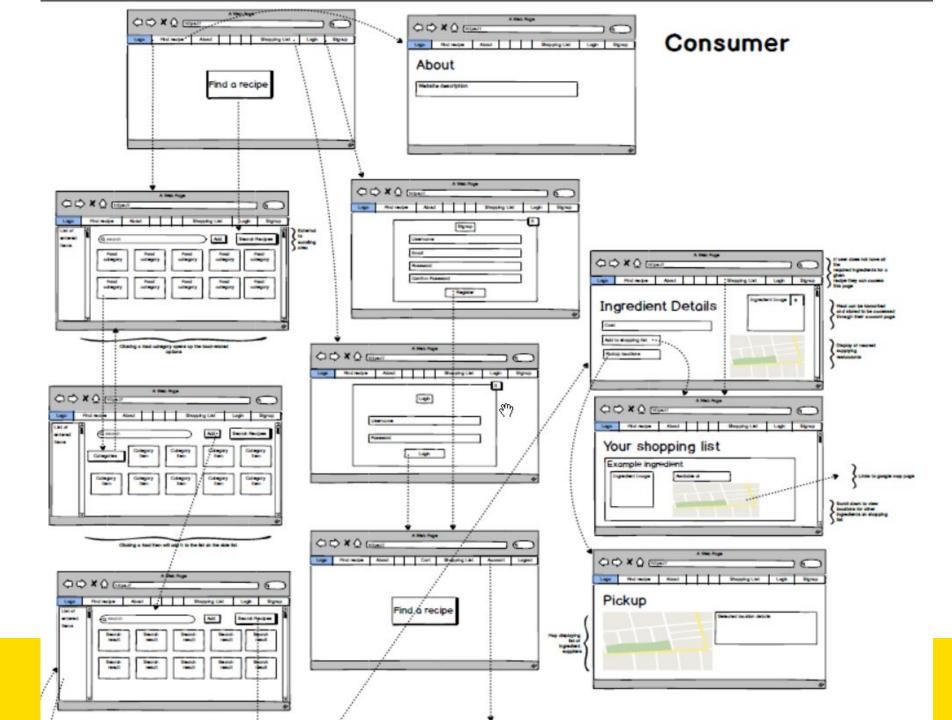
Example 1 (cont'd)



Example 1 (cont'd)



Example 2



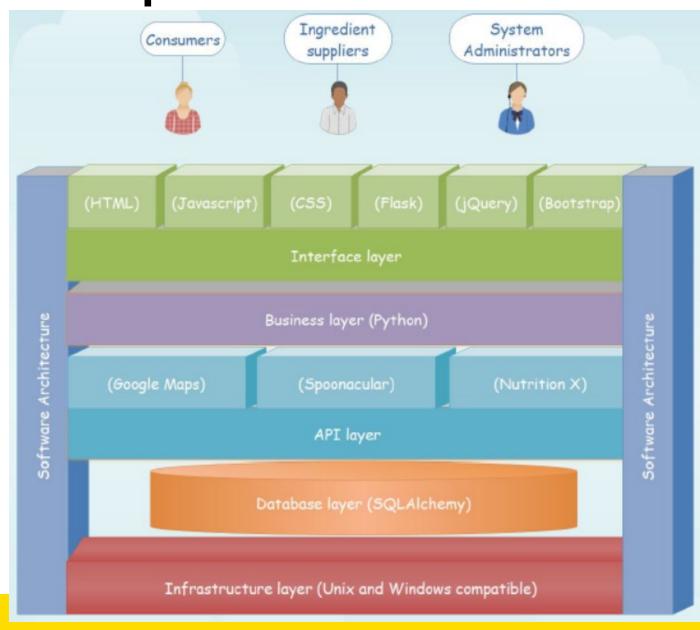


System Architecture



System Architecture Example

- Infrastructure and Framework
- Database layer
- API layer
- Business layer
- Interface layer



Useful Sources:

https://en.wikipedia.org/wiki/Software architecture

Week 2 Lab Tasks



Week 2 Lab Tasks

- Make sure you are in a team of 5 (ideally) or 4 (if not possible)
- Your team has decided on a name, scrum master, project, and created the team in Moodle
- Your team is signed up to Jira and has invited the mentor as site-admin
- You accepted your invite and linked properly your zID with your GitHub account in the GitHub Organisation
- In GitHub, you have a team, a repository, a maintainer, and a folder/branch where individual work diaries are stored and updated regularly (at least once a week)



Week 2 Lab Tasks (cont'd)

- You started working on the proposal and refining it to come up with at least eight objectives/functionalities/requirements including at least two novelties with respect to existing related systems (as per the assignment guidelines)
- This is the starting point of getting your proposal ready by Week 3 Friday 16/6/23 @ 9pm
- Your developed system should be deployed/run in one of the three (3) environment options available as per the Assessment Guidelines document



Q & A

