School of Computer Science and Engineering (CSE)

COMP9900 Information Technology Project
COMP3900 Computer Science Project

2023 Term 3

Week 2

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UNSW
SYDNEY

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 (such as Waterfall) 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

What is Agile?

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

What is Agile?

- 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

What is Agile?

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

What is Agile?

Agile Methods

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

Scrum

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

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

Scrum

History of Scrum

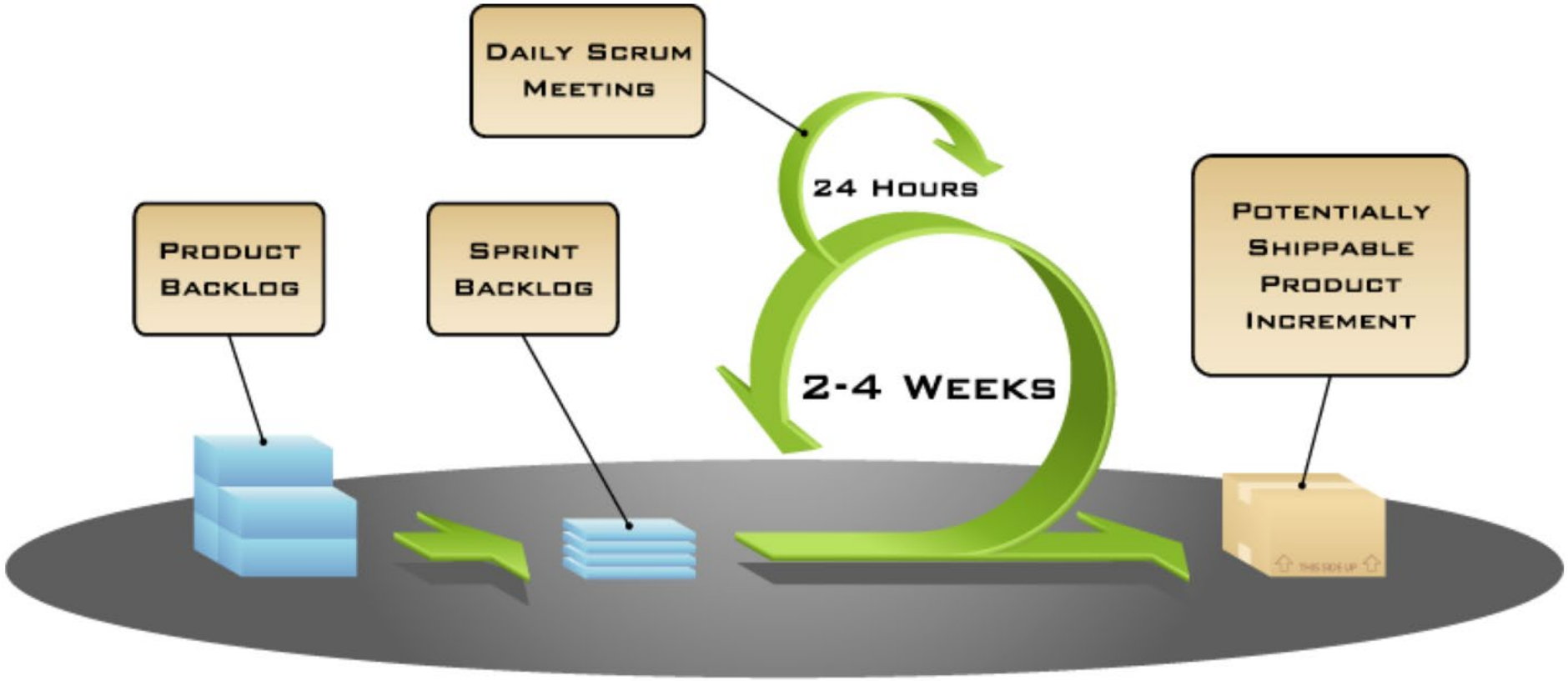
- 1995
  - Analysis of common software development processes → **not suitable** for **empirical**, **unpredictable** and **non-repeatable** processes
  - Design of a **new** method: **Scrum** by Jeff Sutherland and Ken Schwaber
  - **Enhancement** of Scrum by Mike Beedle
  - **Combination** of Scrum 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

Scrum

How Scrum Works?



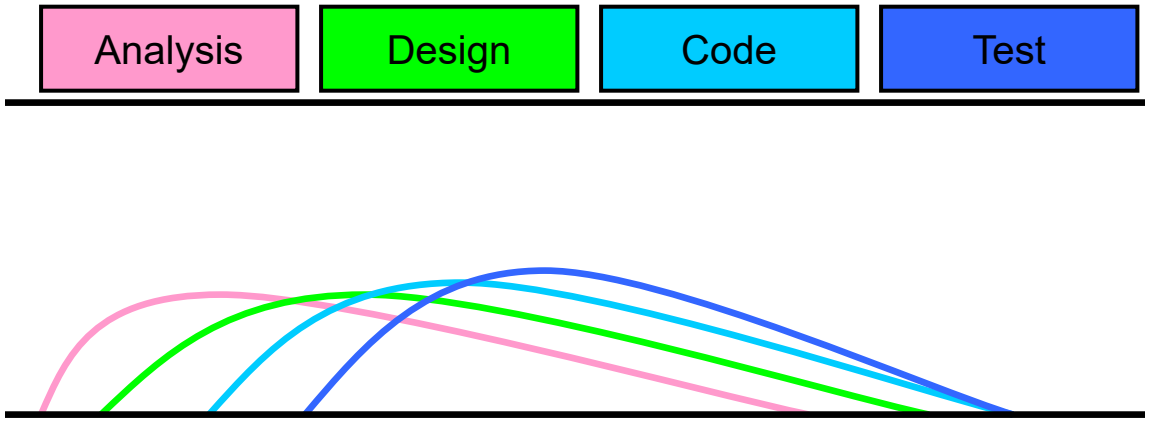
Scrum

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

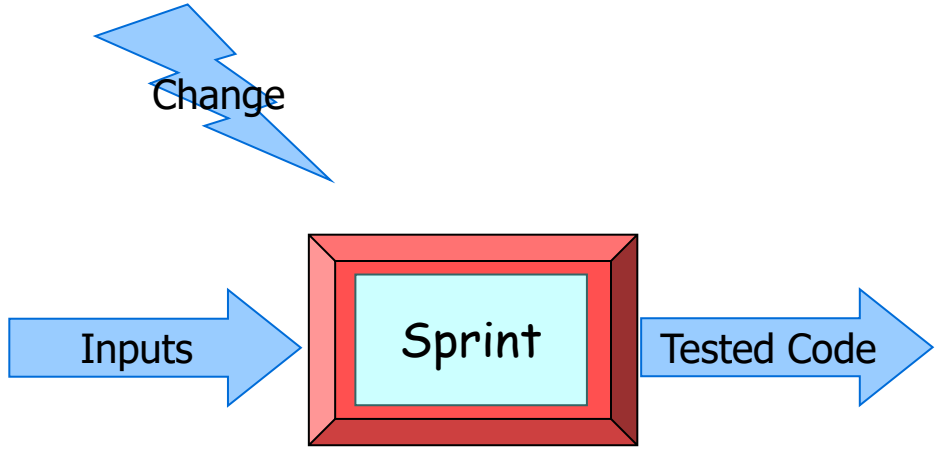
Scrum

Sequential vs. **Overlapping** Development



Scrum

No changes during the sprint



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

Scrum Framework

- **Roles**
  - Product Owner
  - Scrum Master
  - Scrum Team
- **Ceremonies**
  - Sprint Planning
  - Sprint Review
  - Sprint Retrospective
  - Daily Scrum Meeting
- **Artifacts**
  - Product Backlog
  - Sprint Backlog
  - Burndown Chart

Scrum Framework

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 of every iteration, as needed
- Accept or reject work results

Scrum Framework

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 Framework

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

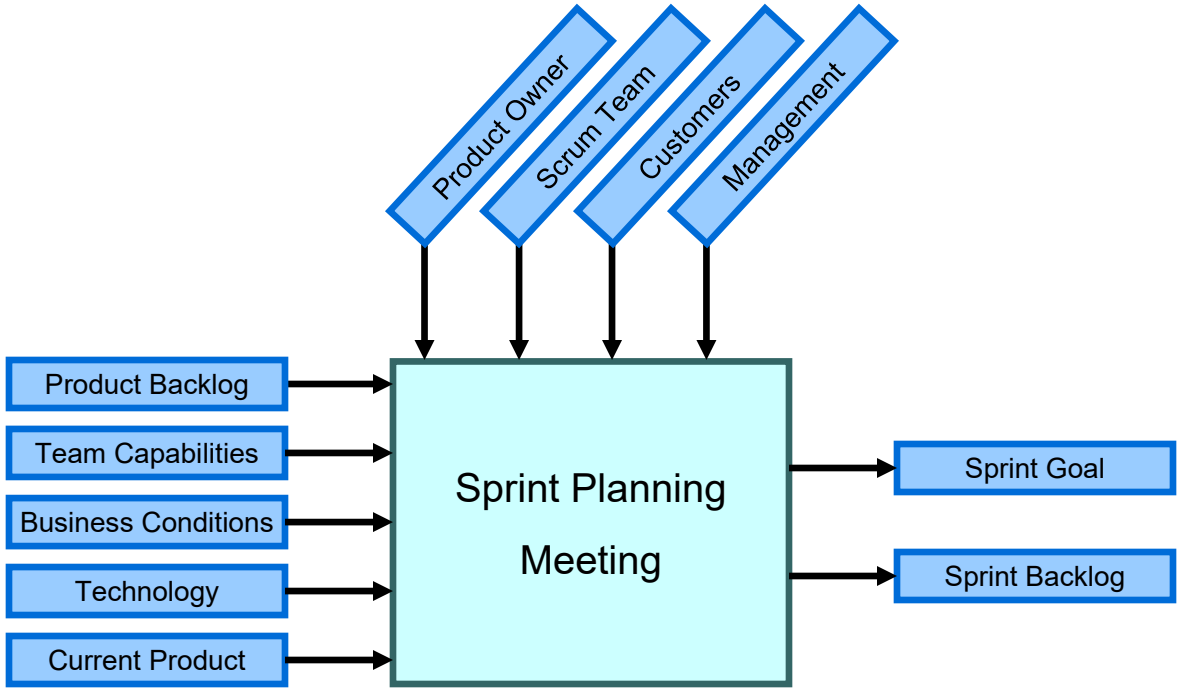
Scrum Framework

Ceremonies

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

Scrum Framework

Sprint Planning Meeting



Scrum Framework

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

Scrum Framework

Pre-Project/Kickoff Meeting

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

Scrum Framework

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

Scrum Framework

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?

Scrum Framework

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 Framework

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

Scrum Framework

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

Scrum Framework

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	*What went well*	*What didn't go so well*	*To Try*
First sprint so N/A	Met sprint goal	Duplicated work (2 team-members accidentally working on same task without knowing)	

Sprint Retrospective - Example for Sprint 1

Last retrospective's To Try	*What went well*	*What didn't go so well*	*To Try*
First sprint so N/A	Met sprint goal	Duplicated work (2 team-members accidentally working on same task without knowing)	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	*What went well*	*What didn't go so well*	*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)	Met sprint goal No more duplicated work	Software unit demonstrated was buggy	Write unit tests for each unit developed (all members to follow up on that)

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

Scrum Framework

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, …

Scrum Framework

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

Scrum Framework

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

Scrum Framework

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

Scrum Framework

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

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Scrum Framework

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

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Scrum Framework

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

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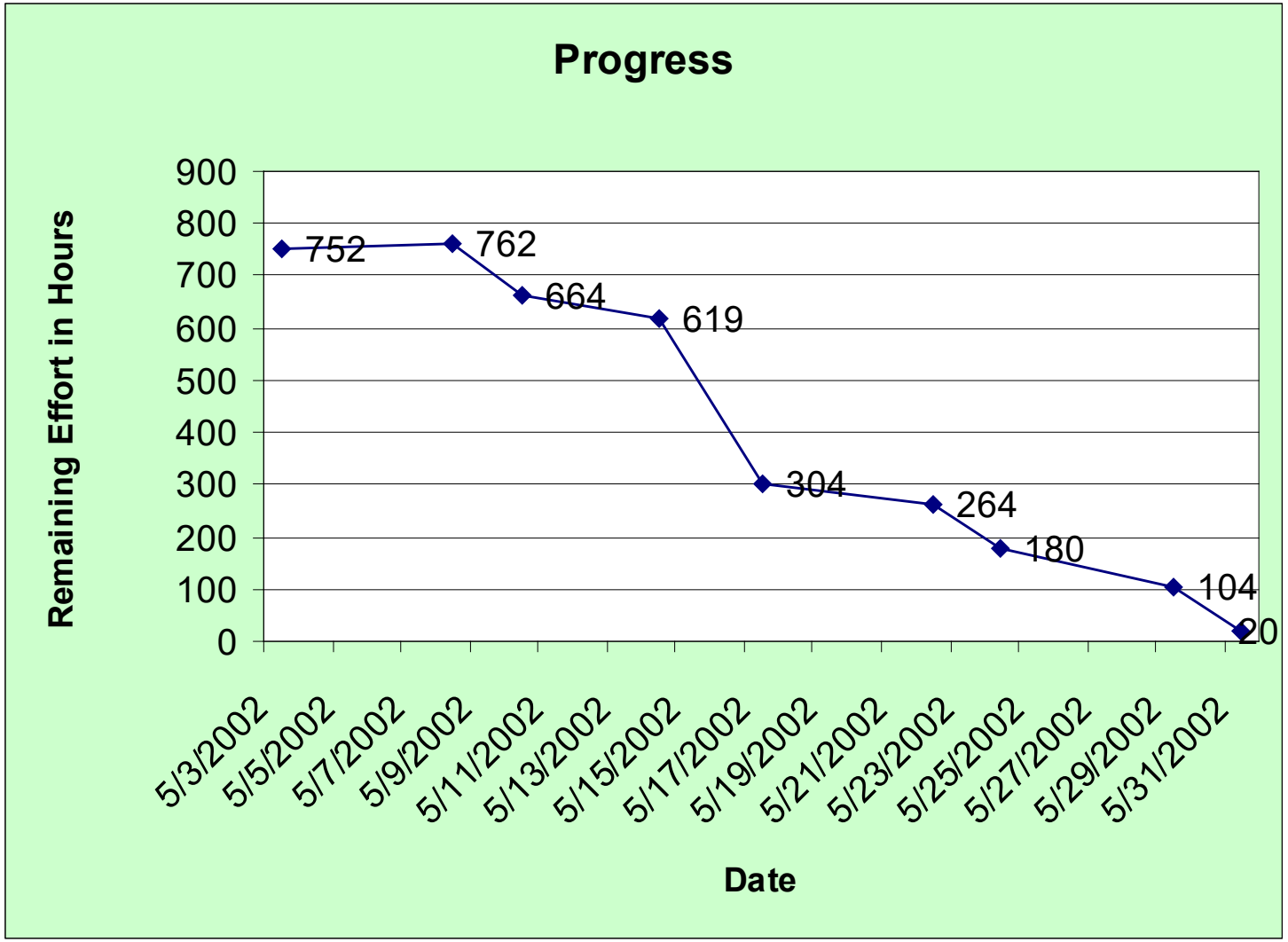
Scrum Framework

Sprint Burndown Chart



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Scrum Framework

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

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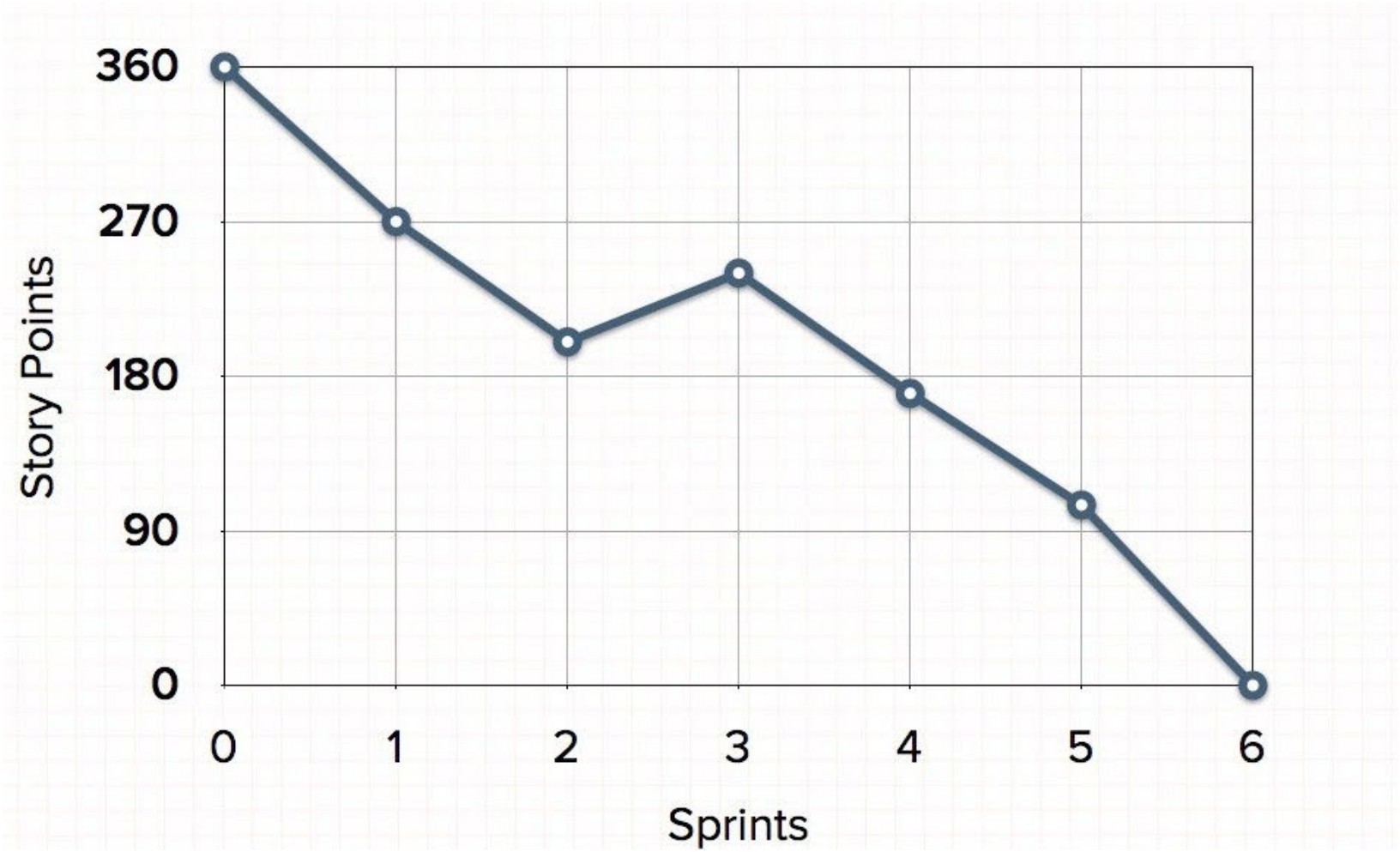
Release/Product Burndown Chart

- Is a “big picture” view of project’s progress (all the releases)



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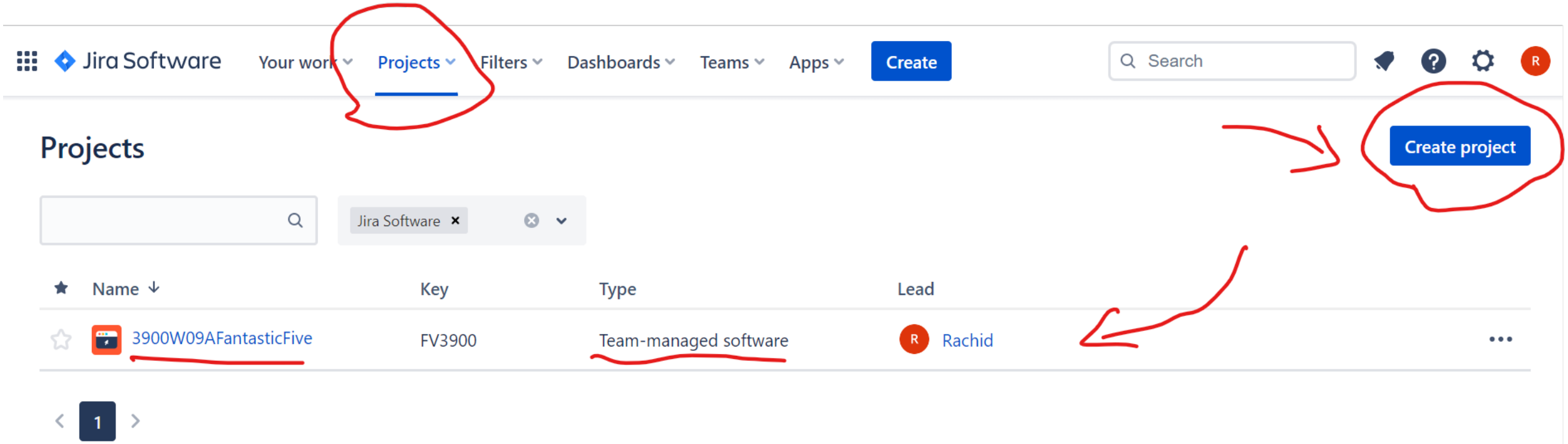
Scrum with Jira


Jira Software
Your work
Projects
Filters
Dashboards
Teams
Apps
Create
Search
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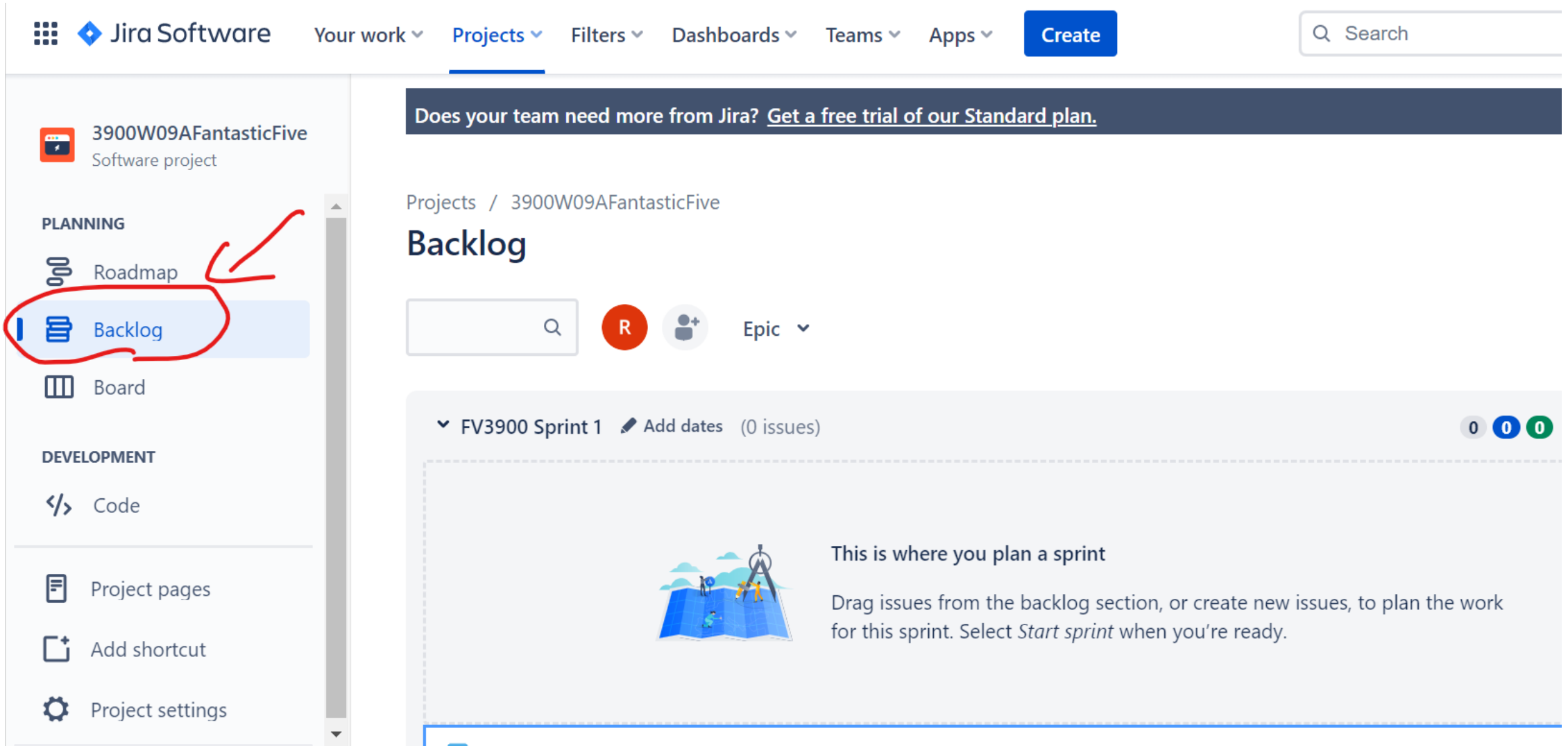
Jira Software
Your work
Projects
Filters
Dashboards
Teams
Apps
Create
Search
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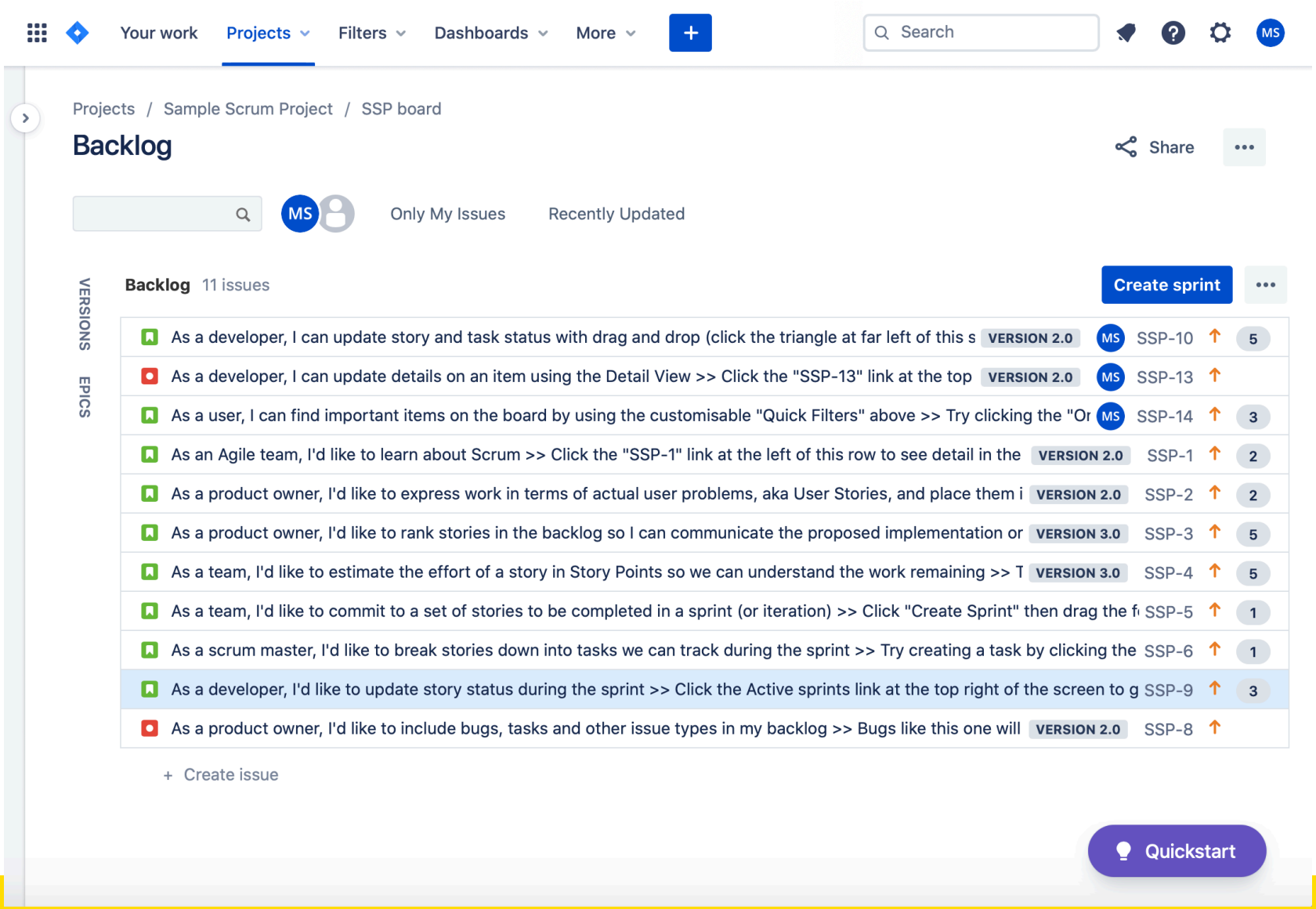
Software project
PLANNING
Roadmap
Backlog
Board
DEVELOPMENT
Code
Project pages
Add shortcut
Project settings
Does your team need more from Jira? Get a free trial of our Standard plan.
Projects / 3900W09AFantasticFive
Backlog
R
Epic
FV3900 Sprint 1
Add dates
(0 issues)
0 0 0
This is where you plan a sprint
Drag issues from the backlog section, or create new issues, to plan the work for this sprint. Select Start sprint when you're ready.

Jira Product Backlog



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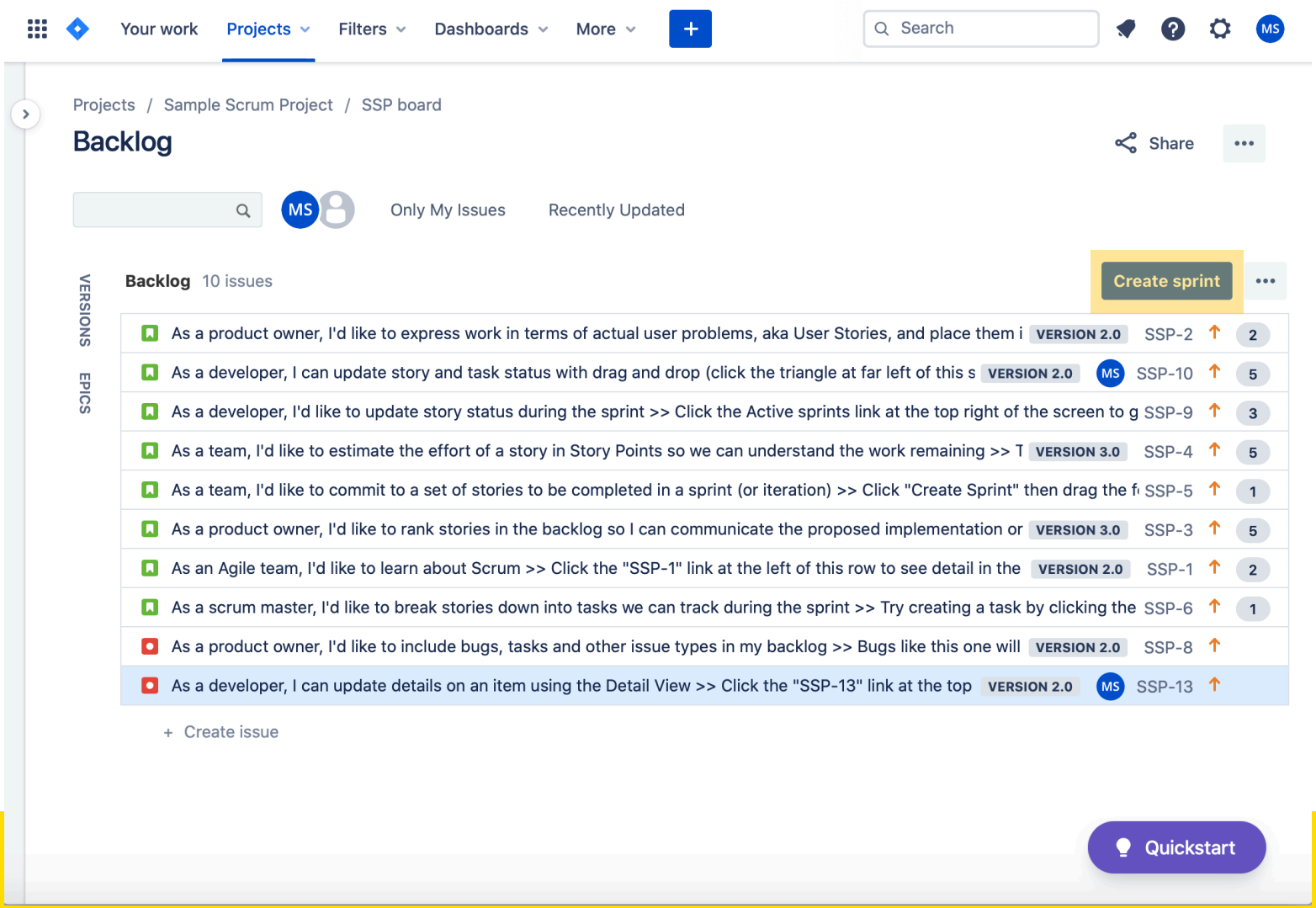
Creating a Sprint



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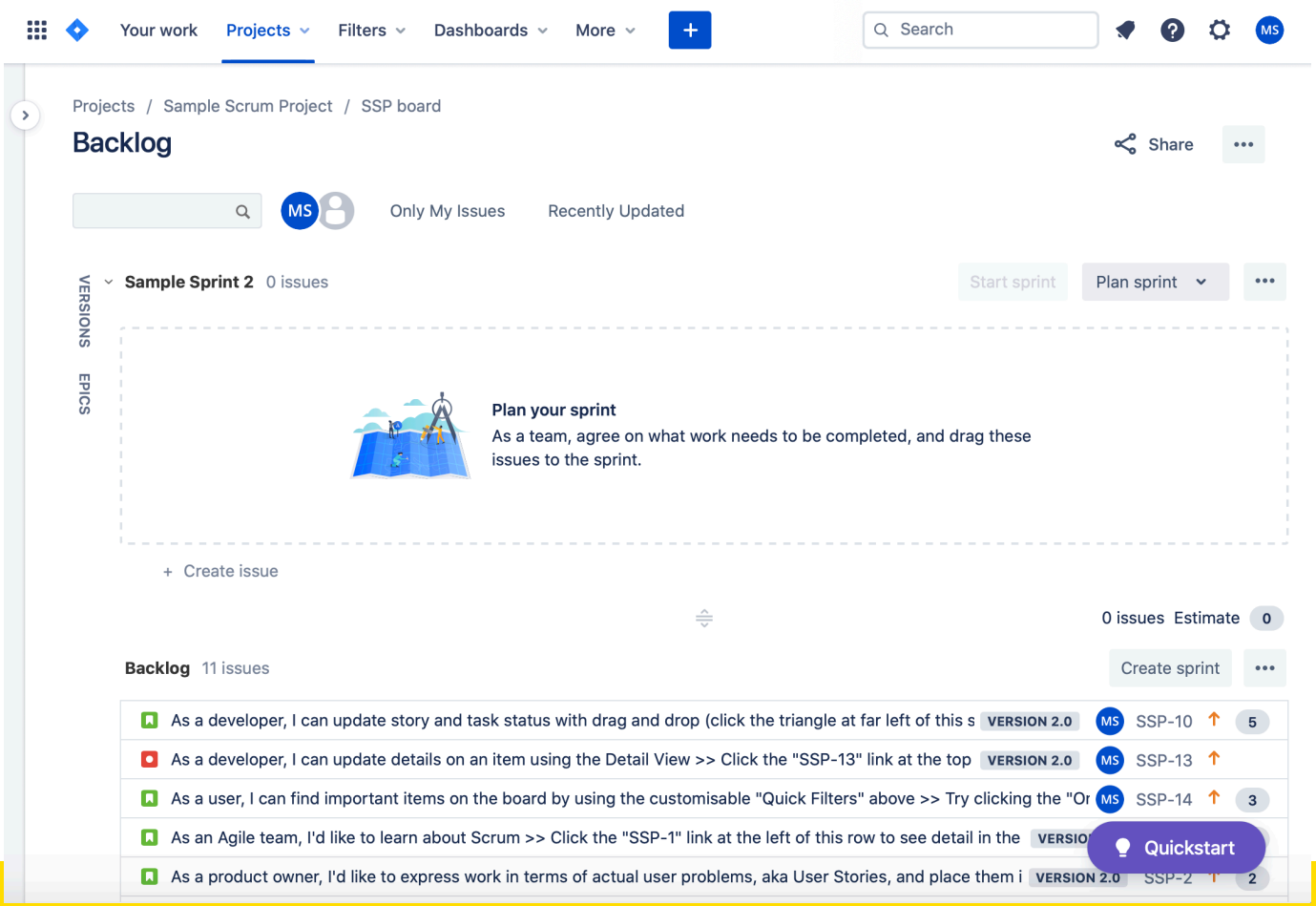
Creating a Sprint



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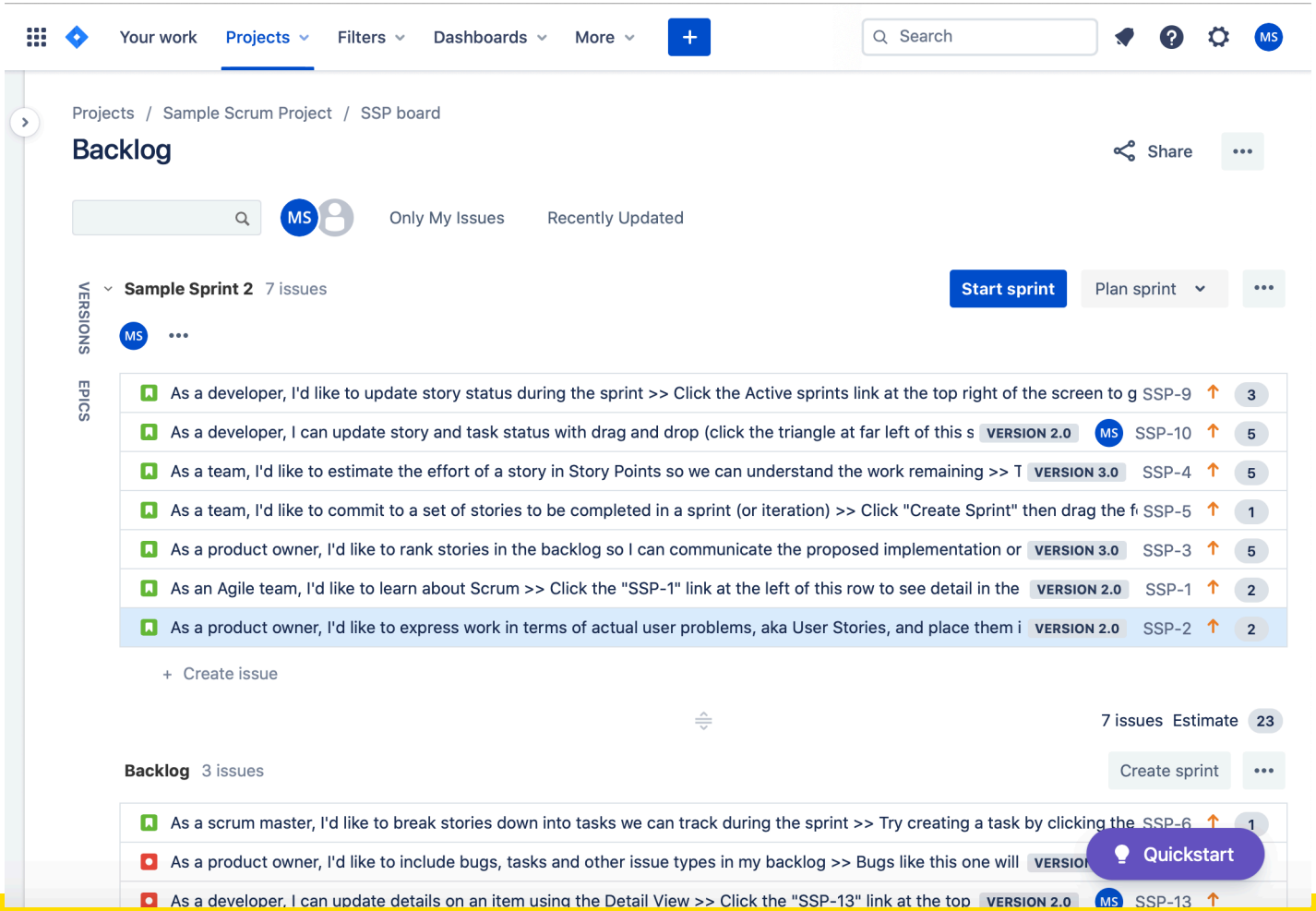
Creating a Sprint



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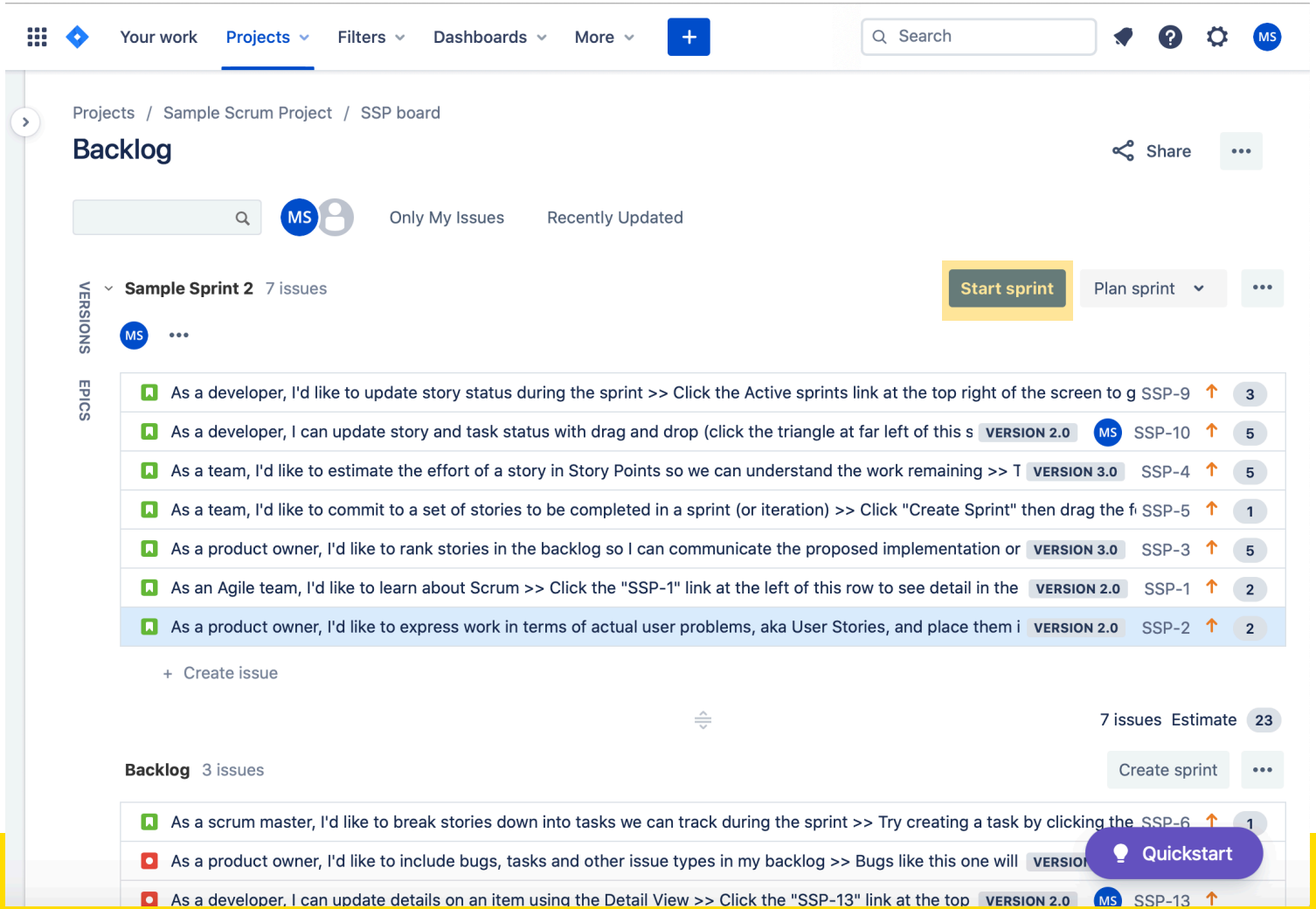
Creating a Sprint (cont'd)



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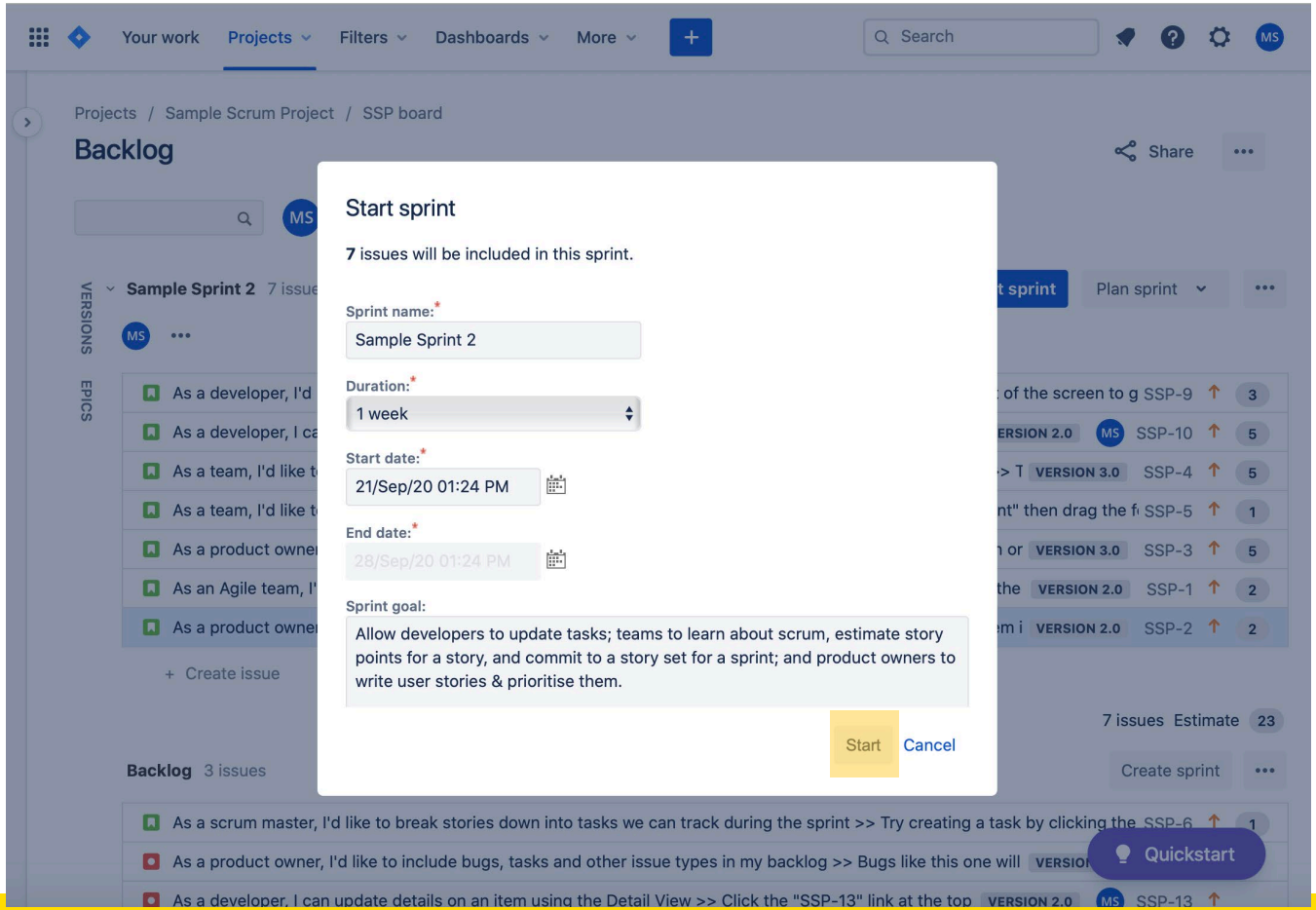
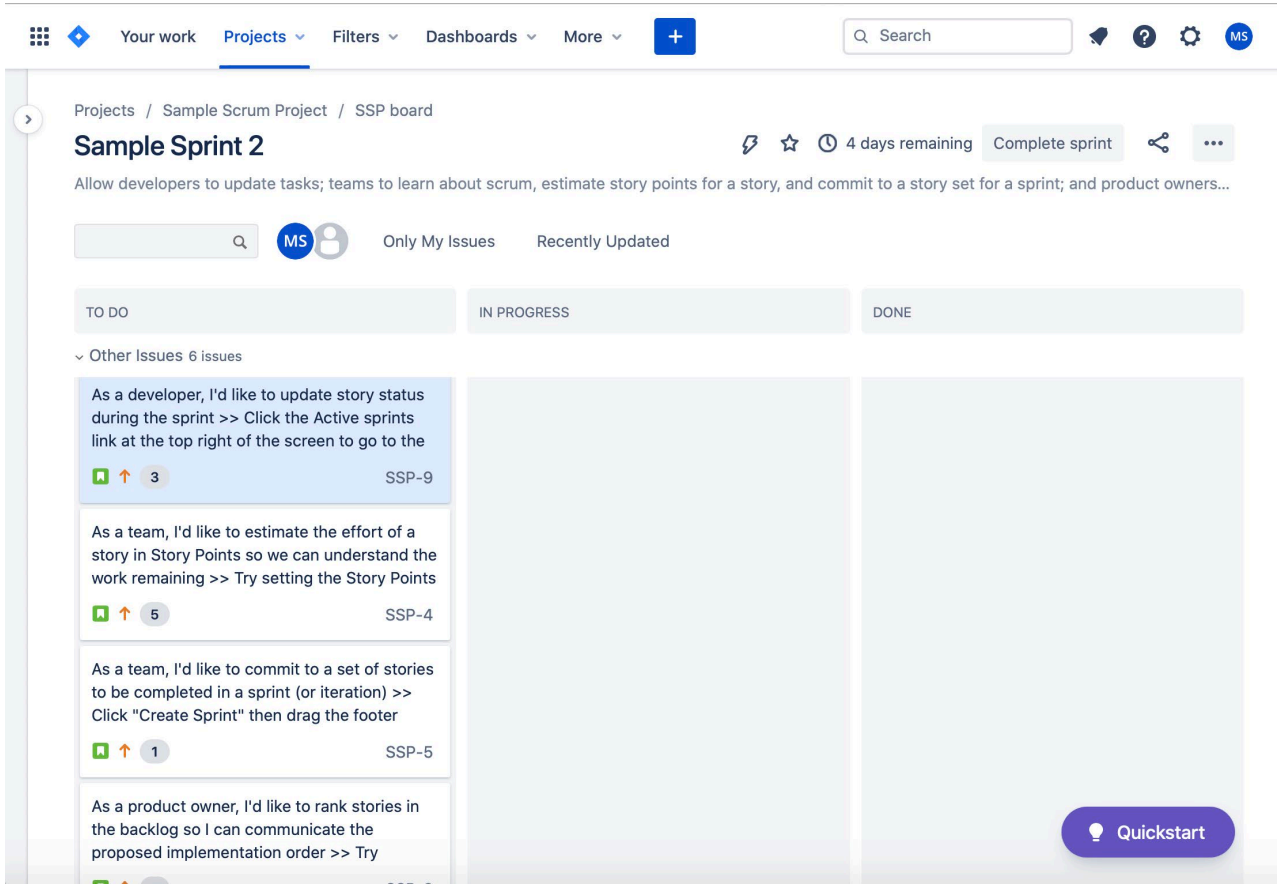
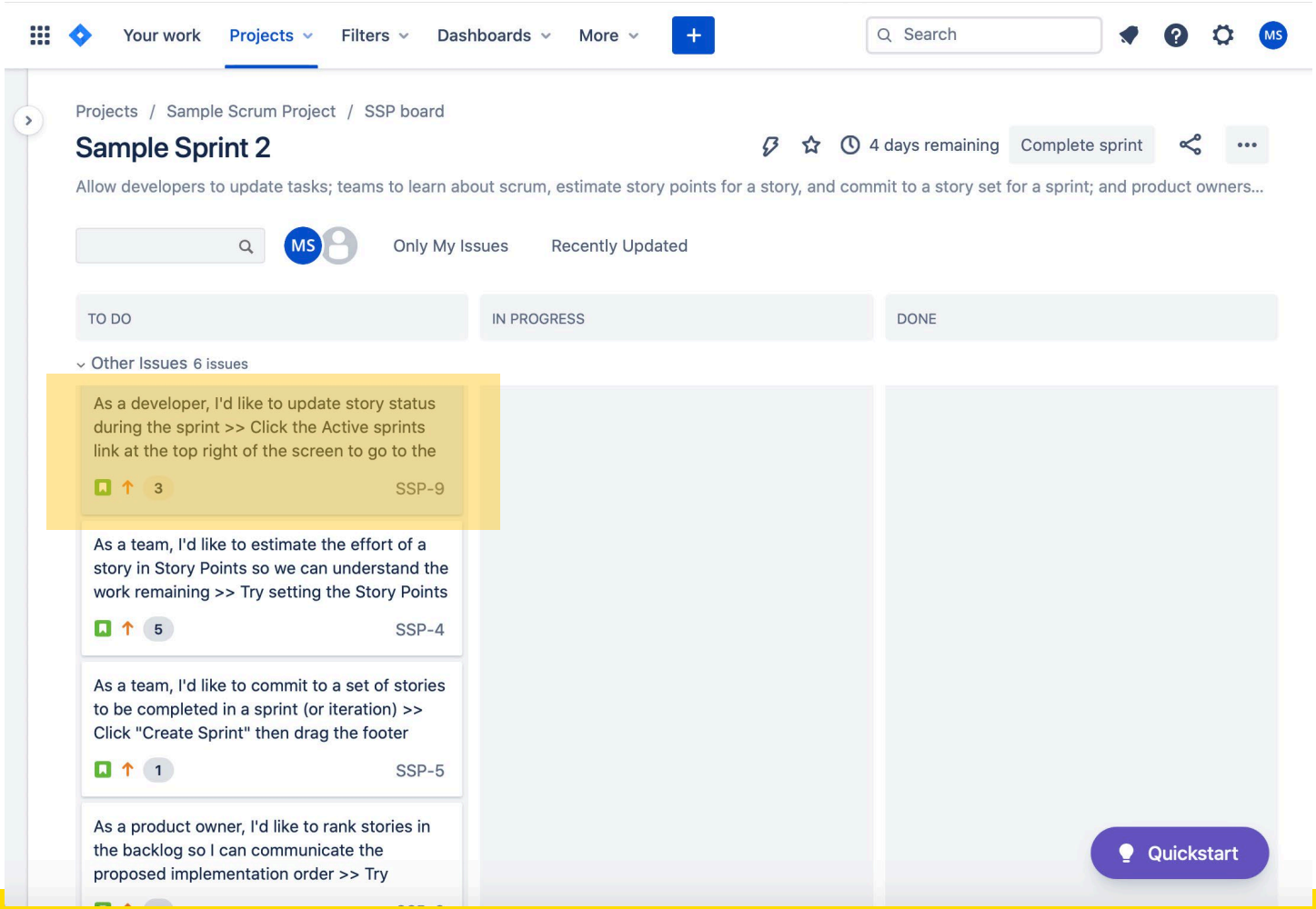
Creating a Sprint (cont'd)



Sprint Board



Story Details



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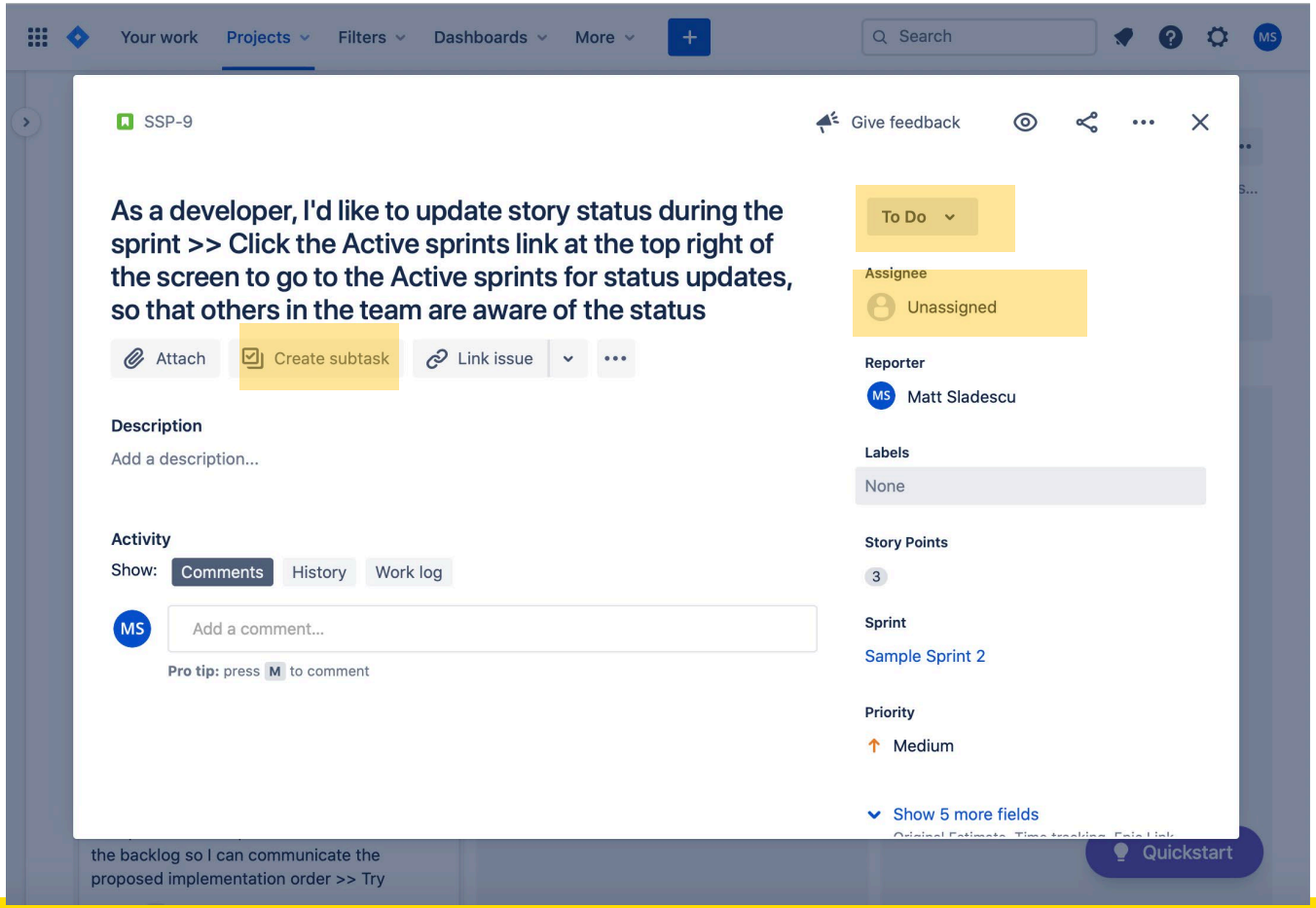
Story Details and Subtasks



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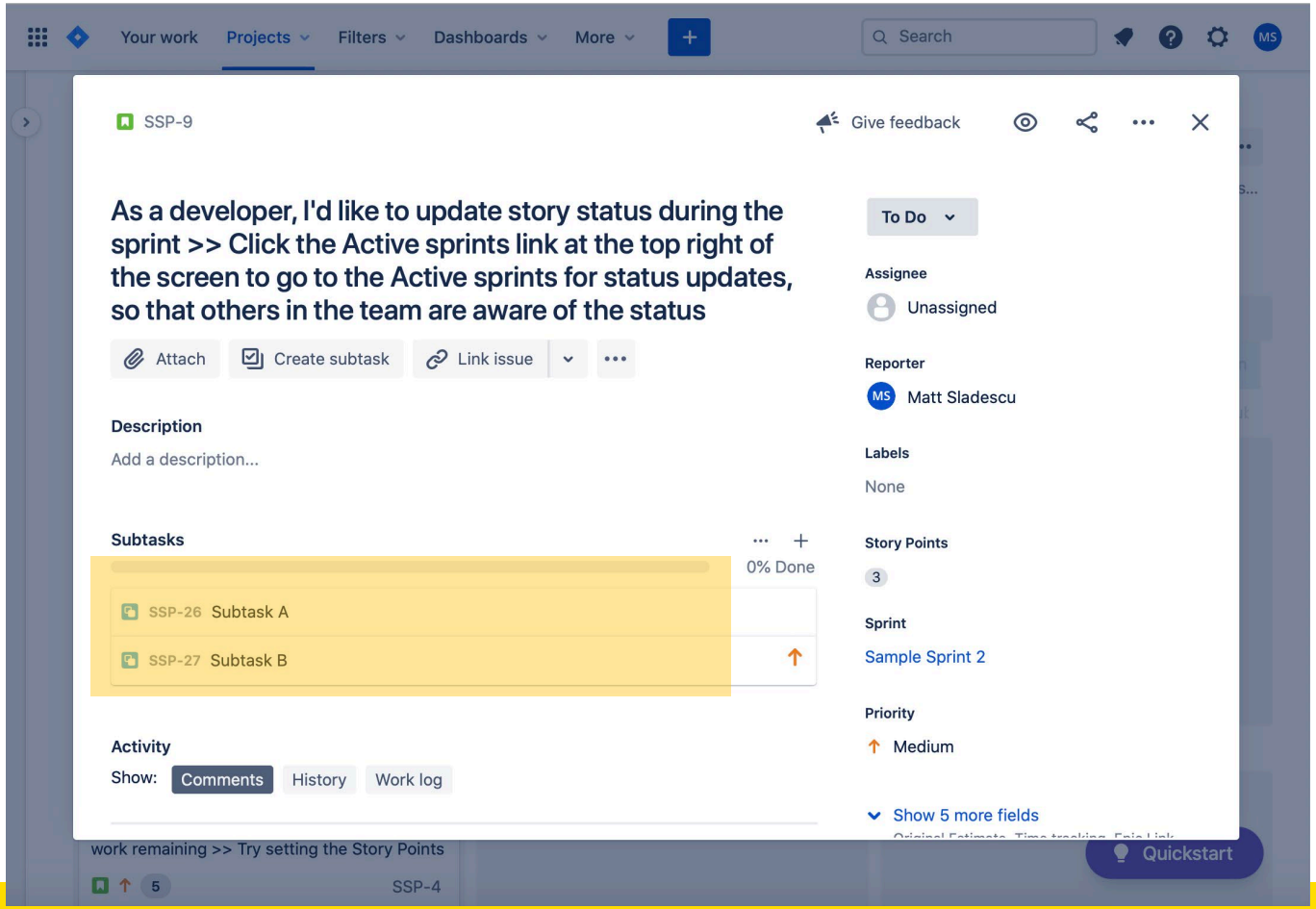
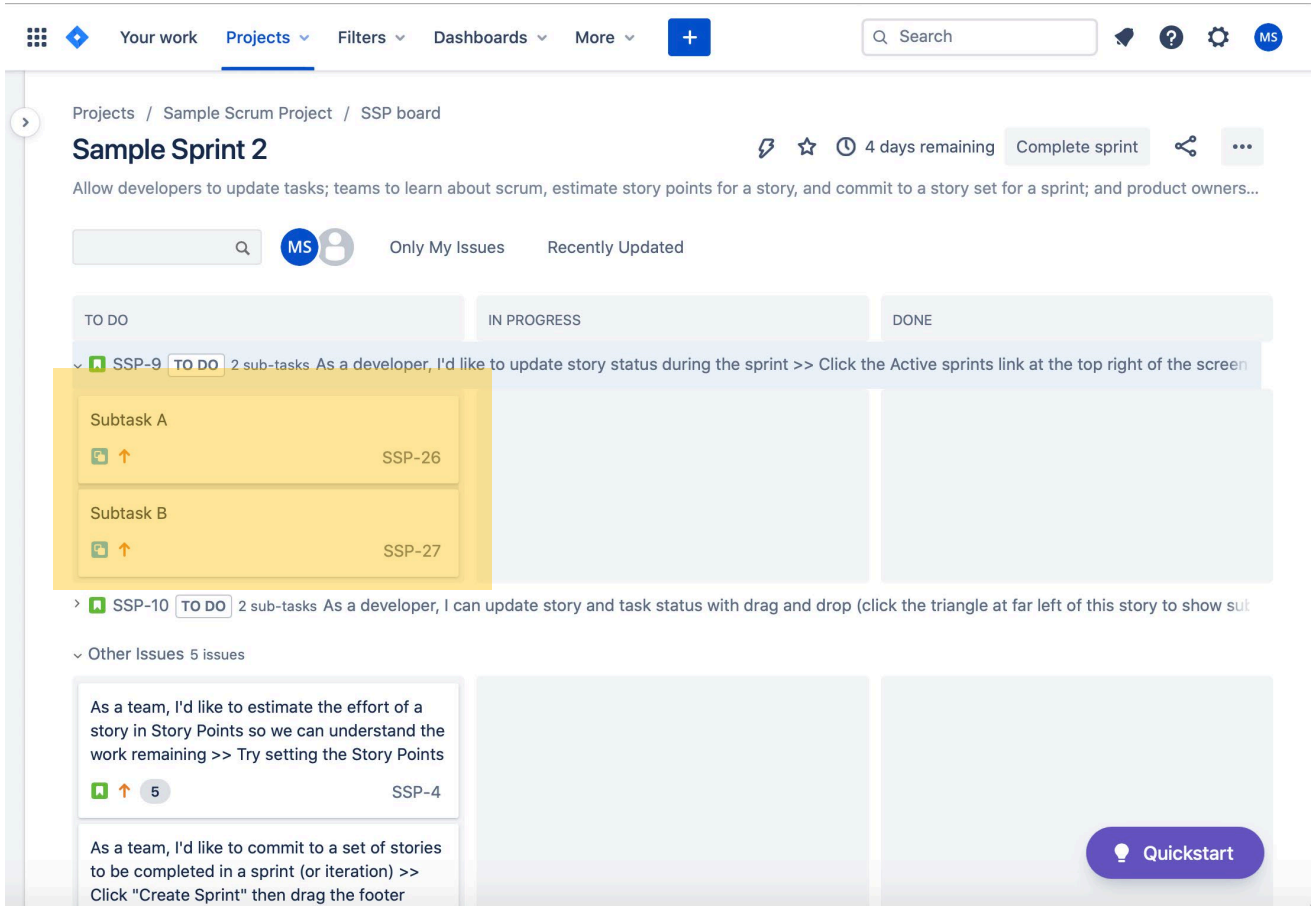
Story Details and Subtasks



Story Details and Subtasks



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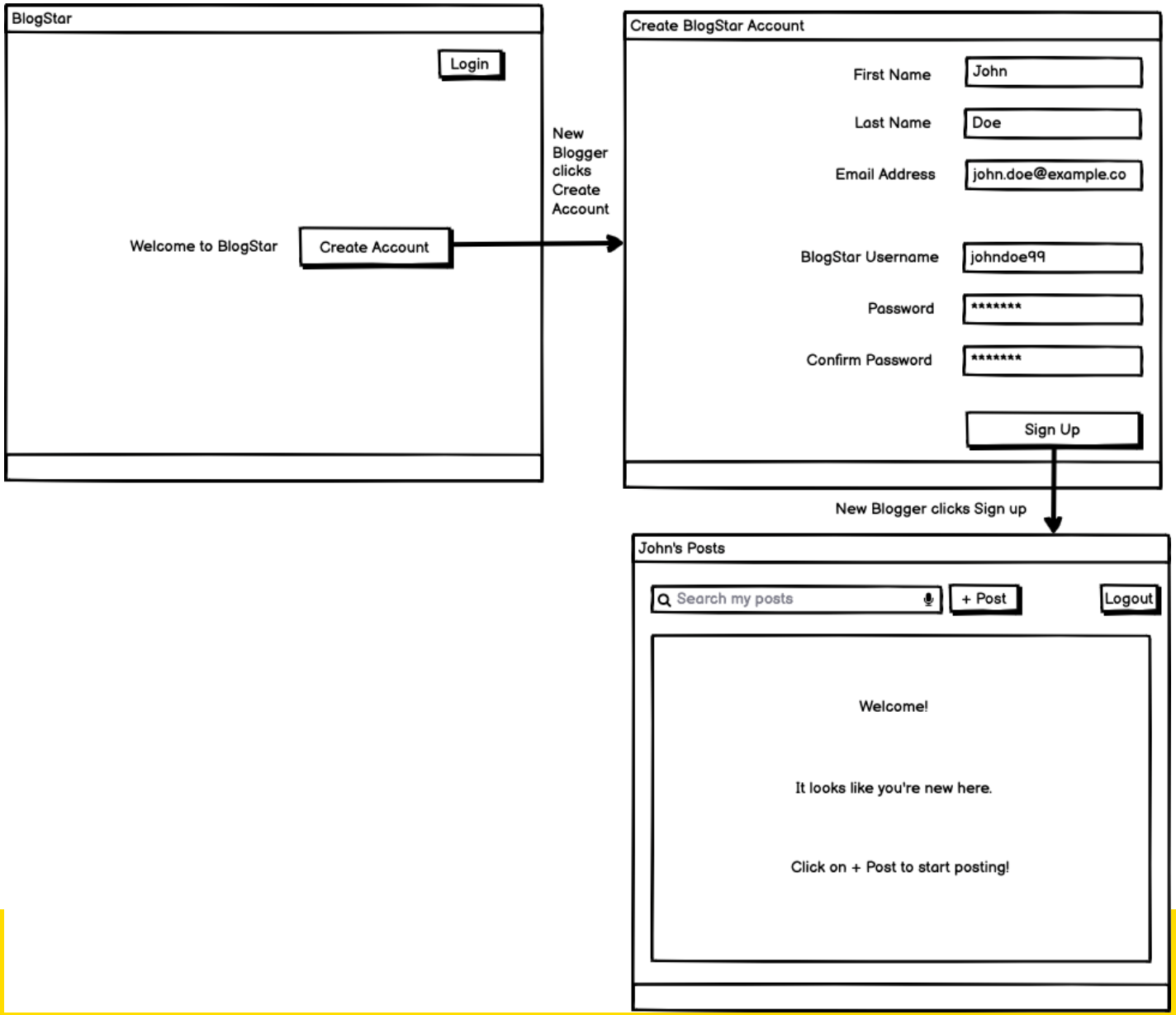
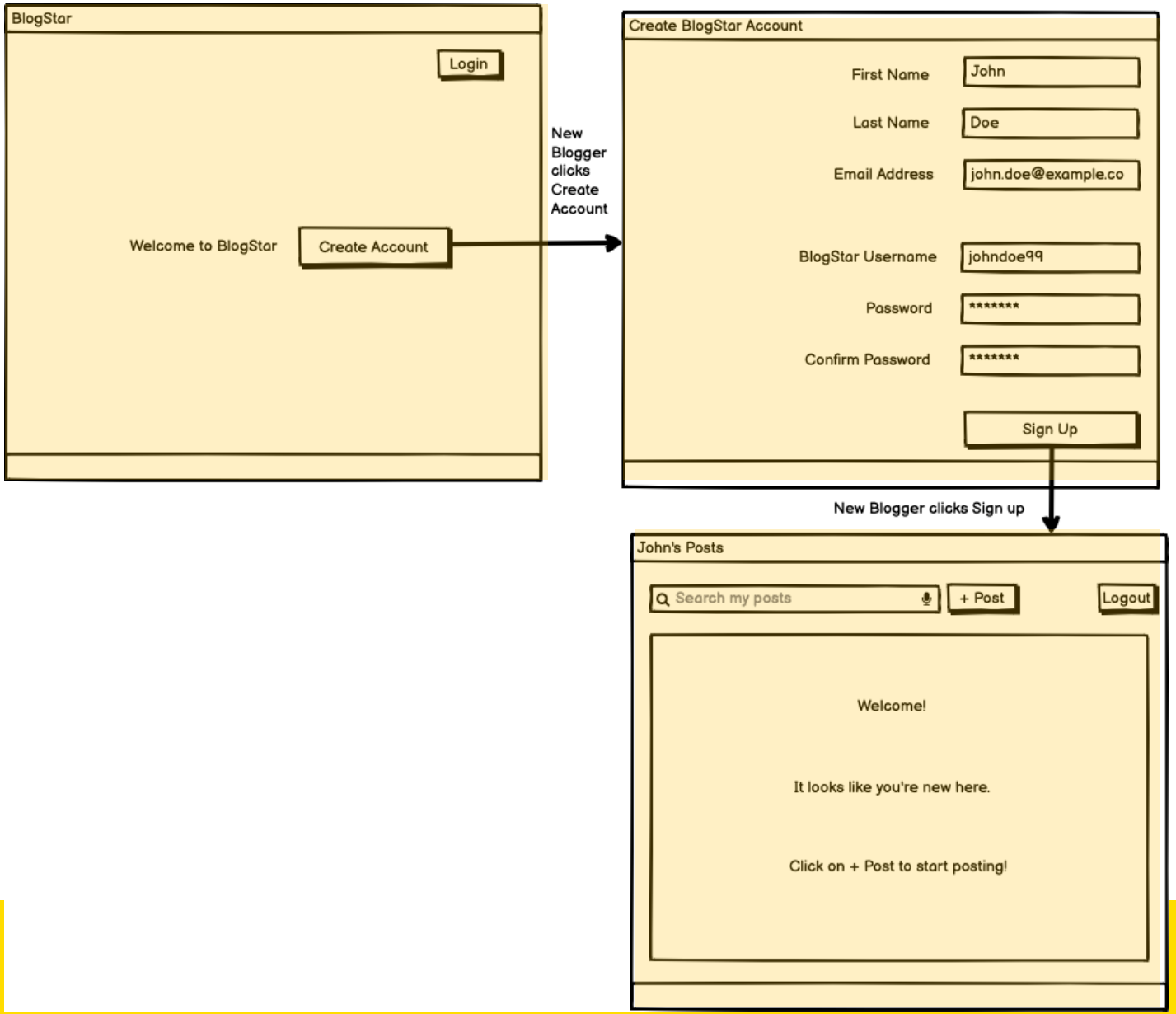
Interface and Flow Diagrams (Storyboards)

Example 1


BlogStar
Login
Welcome to BlogStar
Create Account
New Blogger clicks Create Account
Create BlogStar Account
First Name
John
Last Name
Doe
Email Address
john.doe@example.co
BlogStar Username
johndoe99
Password
****
Confirm Password
****
Sign Up
New Blogger clicks Sign up
John's Posts
Search my posts
+ Post
Logout
Welcome!
It looks like you're new here.
Click on + Post to start posting!

Example 1 (cont'd)



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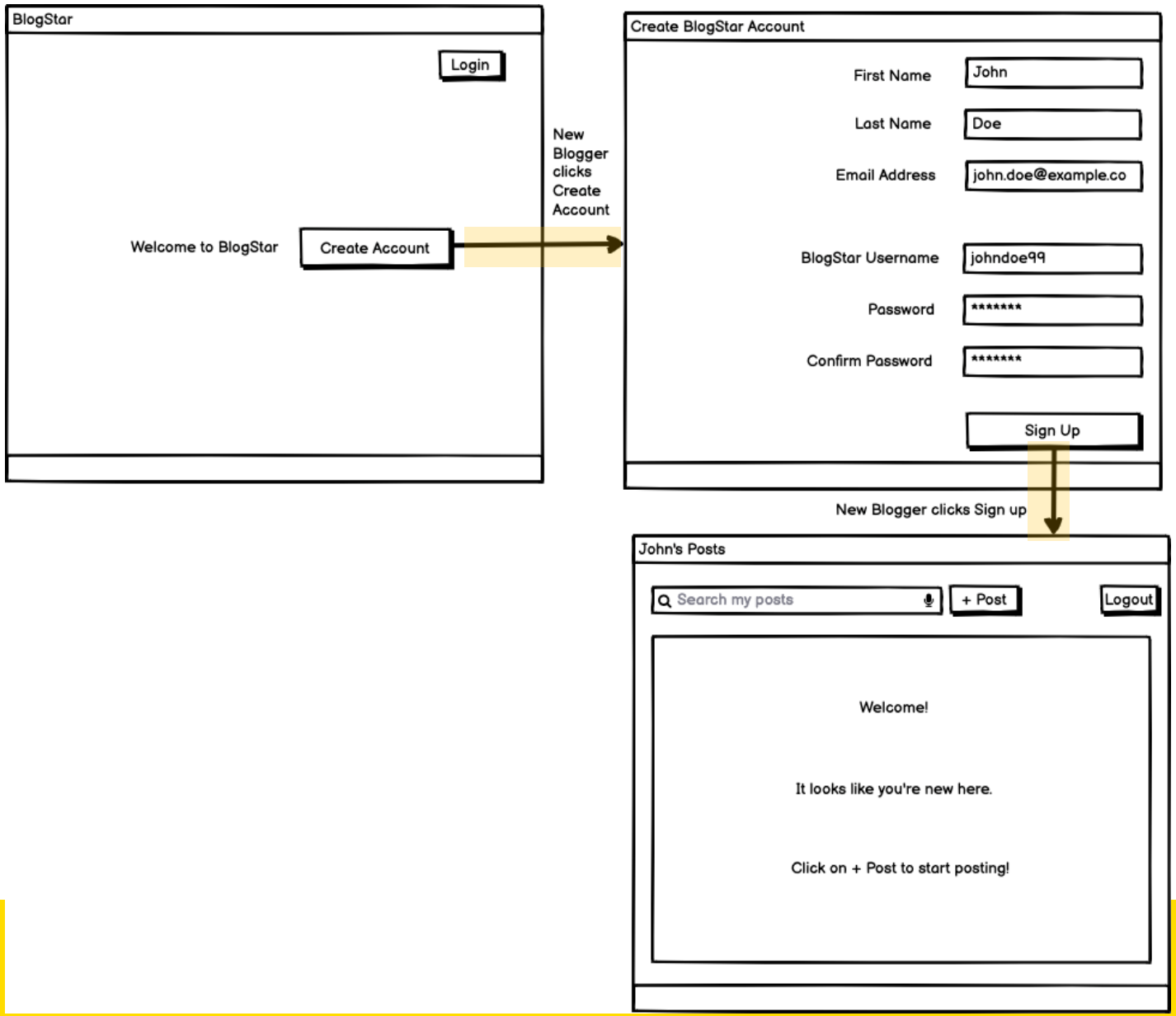

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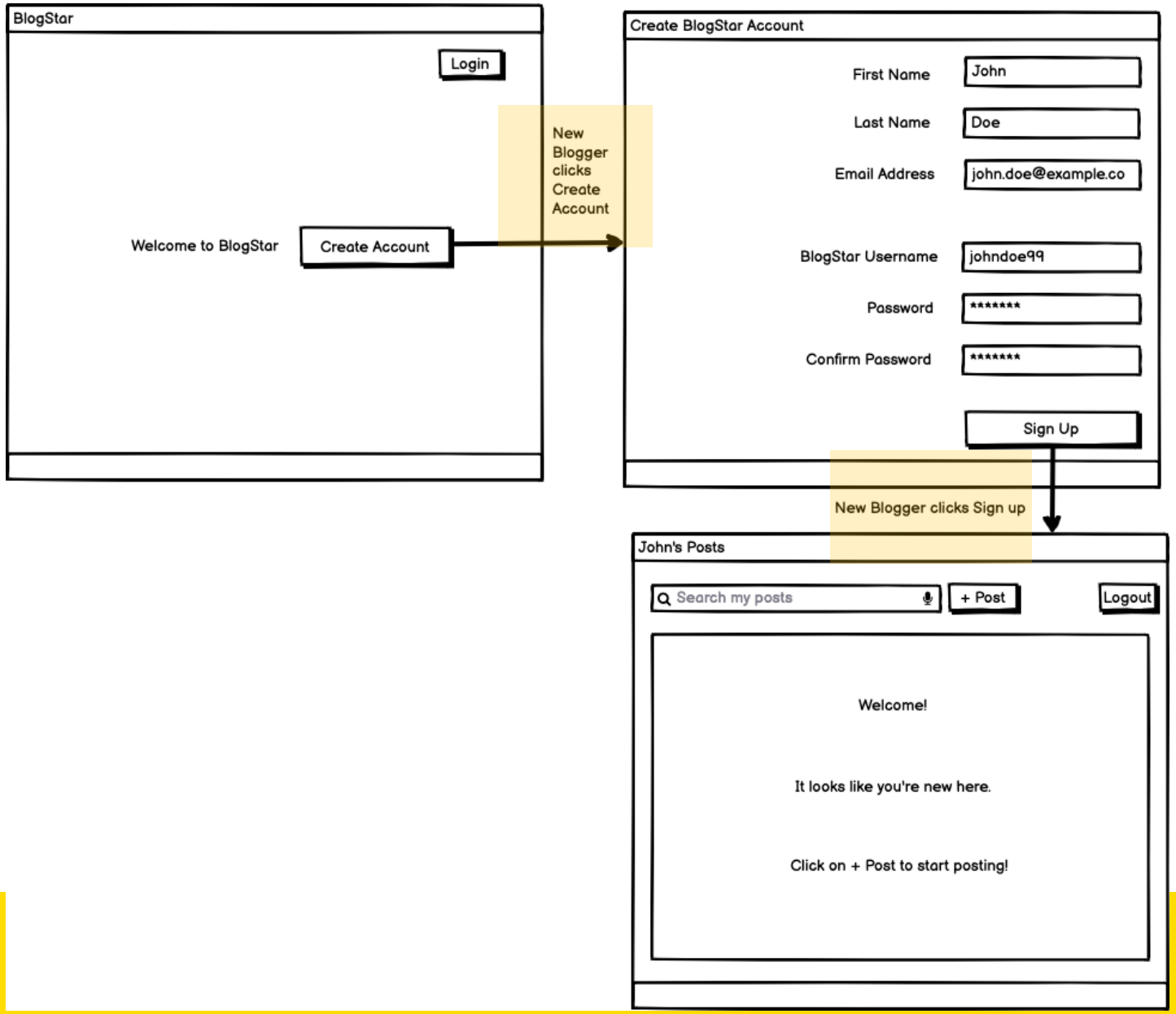
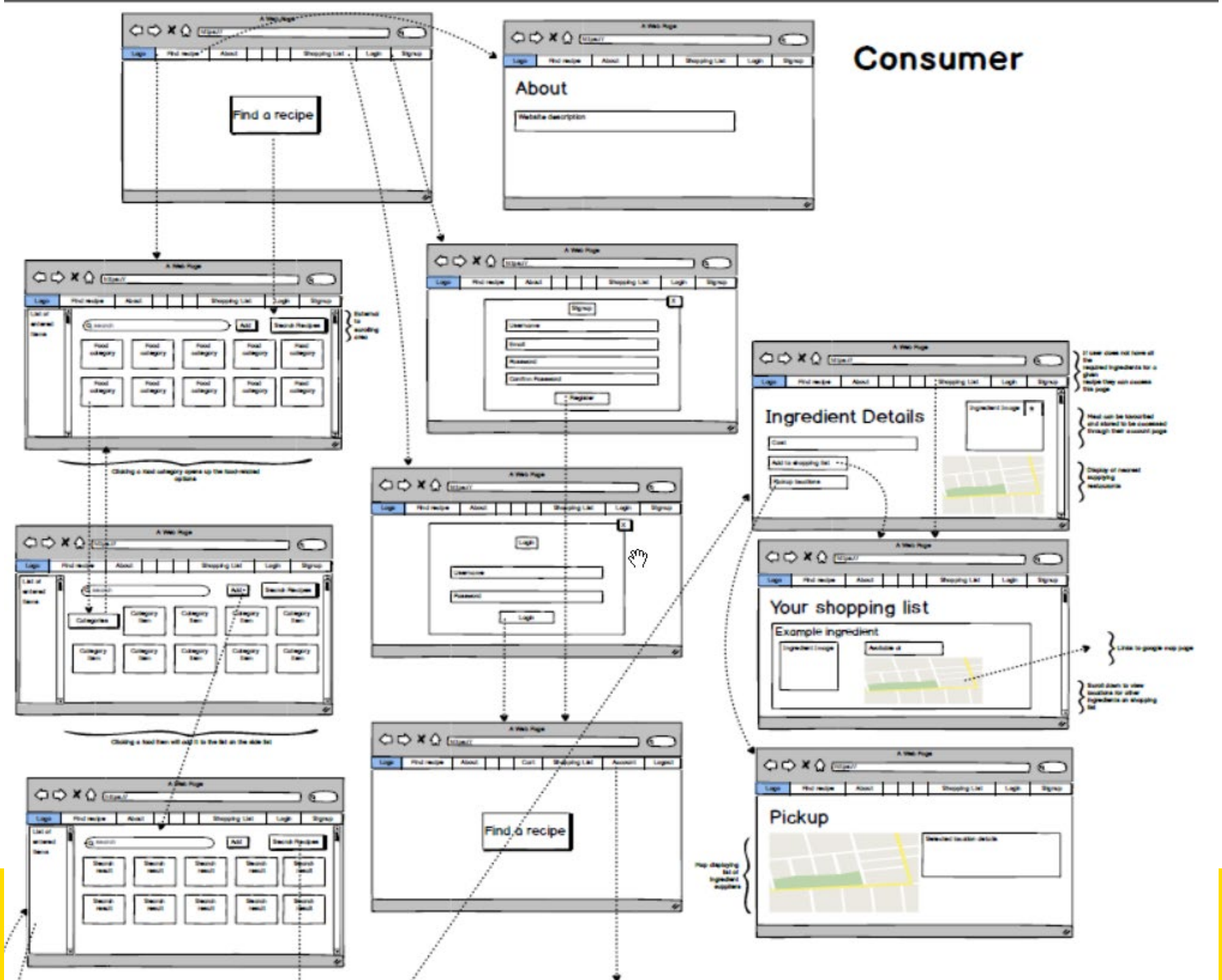


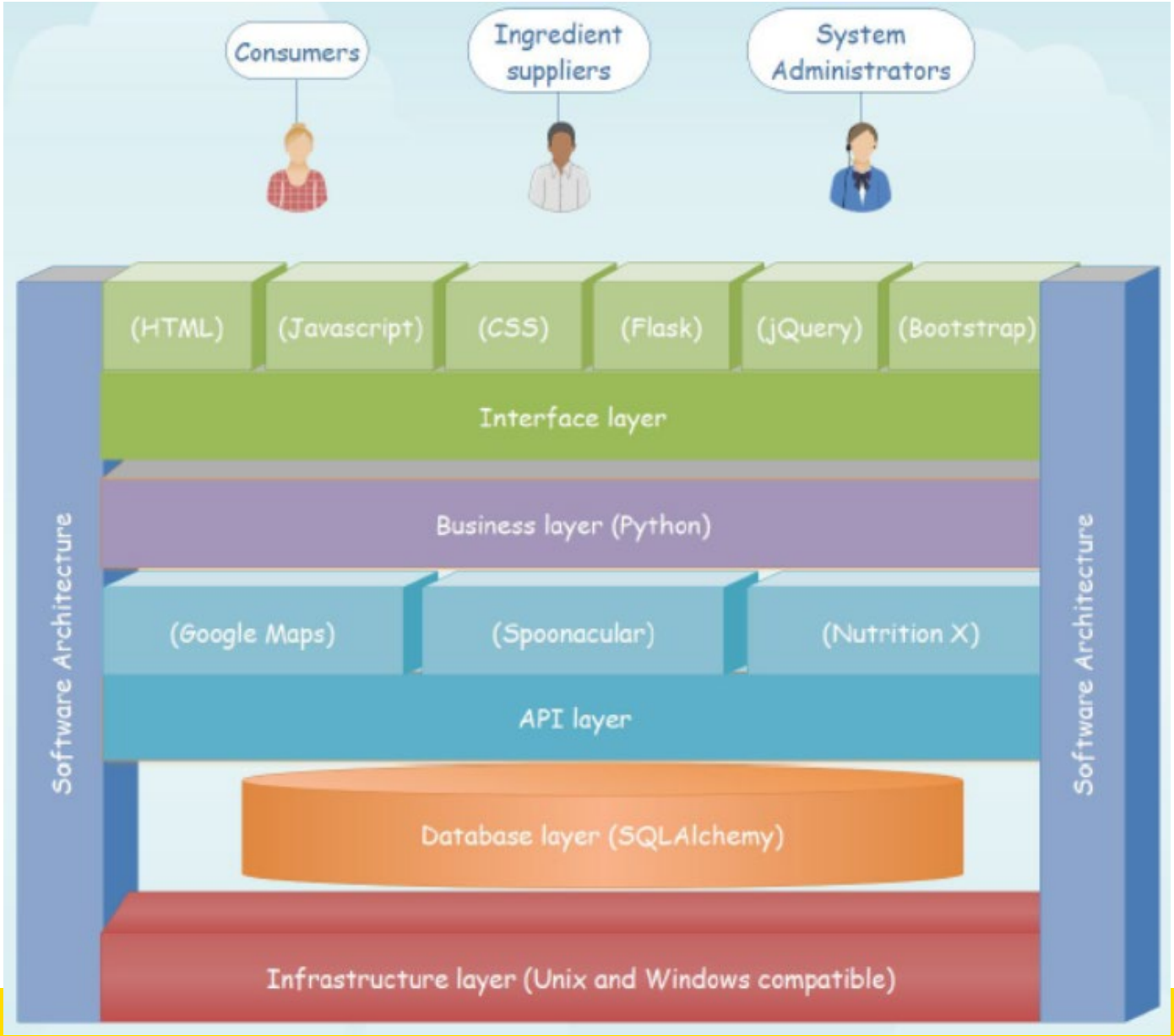
Example 2


Consumer
Find a recipe
About
Website description
Ingredient Details
Your shopping list
Example ingredient
Pickup
Find a recipe

System Architecture

System Architecture Example

- Infrastructure layer
- Database layer
- API layer
- Business layer
- Interface layer



Useful Sources:
https://en.wikipedia.org/wiki/Software_architecture
https://codeburst.io/software-architecture-the-difference-between-architecture-and-design-7936abdd5830
https://www.synopsys.com/software-integrity/resources/knowledge-database/software-architecture.html

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, team lead (could be same as scrum master), project, and created the team in Moodle
- Your team is signed up to Jira site 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

Week 2 Lab Tasks (cont'd)

- 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)
- You started working on the proposal and clarifying requirements with clients
- This is the starting point of getting your proposal ready by Week 3 Friday 29/09/23 @ 9pm

Useful Links

- Figma

  http://www.figma.com

- Balsamiq

  https://balsamiq.com

- Release Burndown Chart

  https://www.mountaingoatsoftware.com/agile/scrum/scrum-tools/release-burndown

- Alternative Release Burndown Chart

  https://www.mountaingoatsoftware.com/agile/scrum/scrum-tools/release-burndown/alternative

Q & A