Value-driven(Agile) Models

Software Development Life Cycle

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Also based on slides from

1

"Being Agile is to take that first of many steps and the best way to be Agile is; go Agile, step-by-step."

- CA Vikram Verma

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Project 1: Campus Event Discovery and Management Platform

- **Concept:** A centralized platform where students can discover, browse, and RSVP to campus events while event organizers can create and manage their events efficiently.

- Core Features:
  - Event browsing and discovery (talks, sports, clubs, performances)
  - RSVP and attendance tracking
  - Calendar integration for personal scheduling
  - Event creation and management dashboard for organizers
  - Ticket management or capacity tracking
  - Real-time event updates and notifications
  - Event categorization and search filters

- **Primary Users:** Students, event organizers, student club leaders, administrators
- **Key Challenges:** Calendar API integration, real-time notifications, capacity management, event discovery algorithms

Other Projects

- Project 2: Campus Peer Tutoring Marketplace
- Project 3: Campus Sustainability Tracker
- Project 4: Campus Gate Access System
- Project 5: Campus Counseling Appointment System

Poll Ev

Agenda

- Value-driven process models
  - Characteristics
  - Work flow

Agile Software Process Models

- Mix of incremental as well as iterative approach
- Small increments, i.e, working product (WP)
- Minimized documentation

Agile Process Models

- SCRUM
- Extreme Programming (XP)
- KANBAN
- … more

Scrum has been used by

- Microsoft
- Yahoo
- Google
- Electronic Arts
- High Moon Studios
- Lockheed Martin
- Philips
- Siemens
- Nokia
- Capital One
- BBC
- Intuit
- Intuit
- Nielsen Media
- First American Real Estate
- BMC Software
- Ipswitch
- John Deere
- Lexis Nexis
- Sabre
- Salesforce.com
- Time Warner
- Turner Broadcasting
- ….. Many more

Google

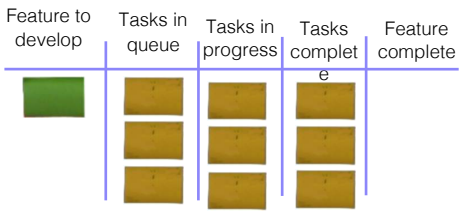
SCRUM

- Agile
- Iterative and incremental
- Time-boxed iterations
- Improved communication and maximized co-operation
- Scalable

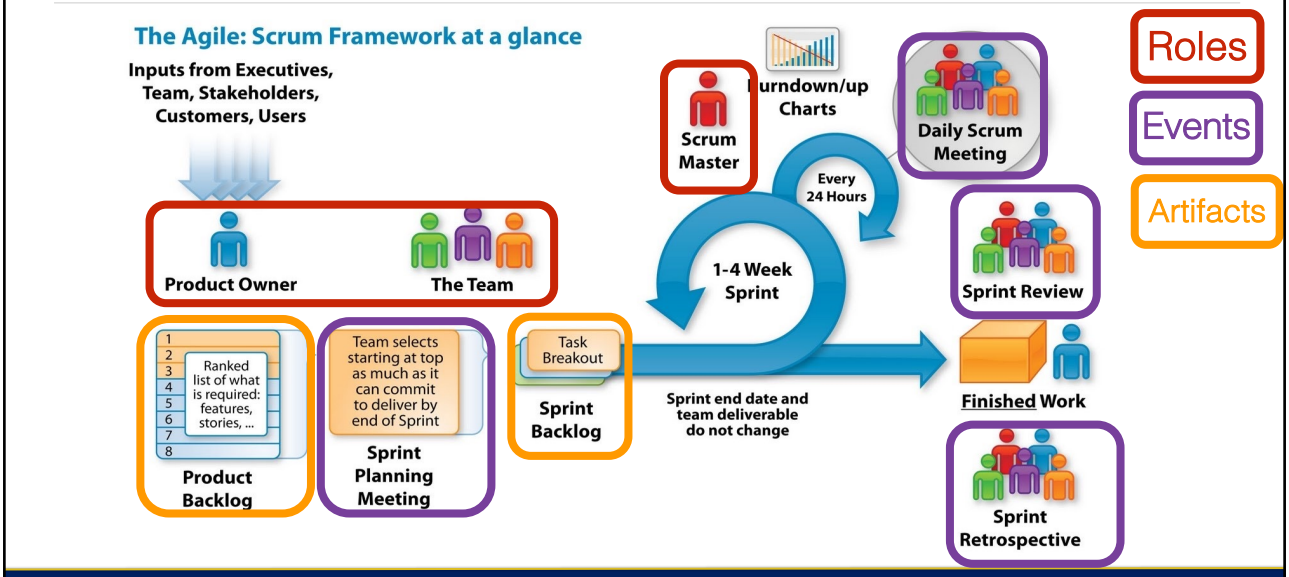
Key Terms

- Requirement – statement that outlines need
- Project – end user requirements
- Sprint – timeboxed event ~ 1-4 weeks
- Project backlog – current list of requirements
- Sprint backlog – subset of project backlog
- User story – business requirement
- Tasks – activities

SCRUM Workflow



Scrum Framework



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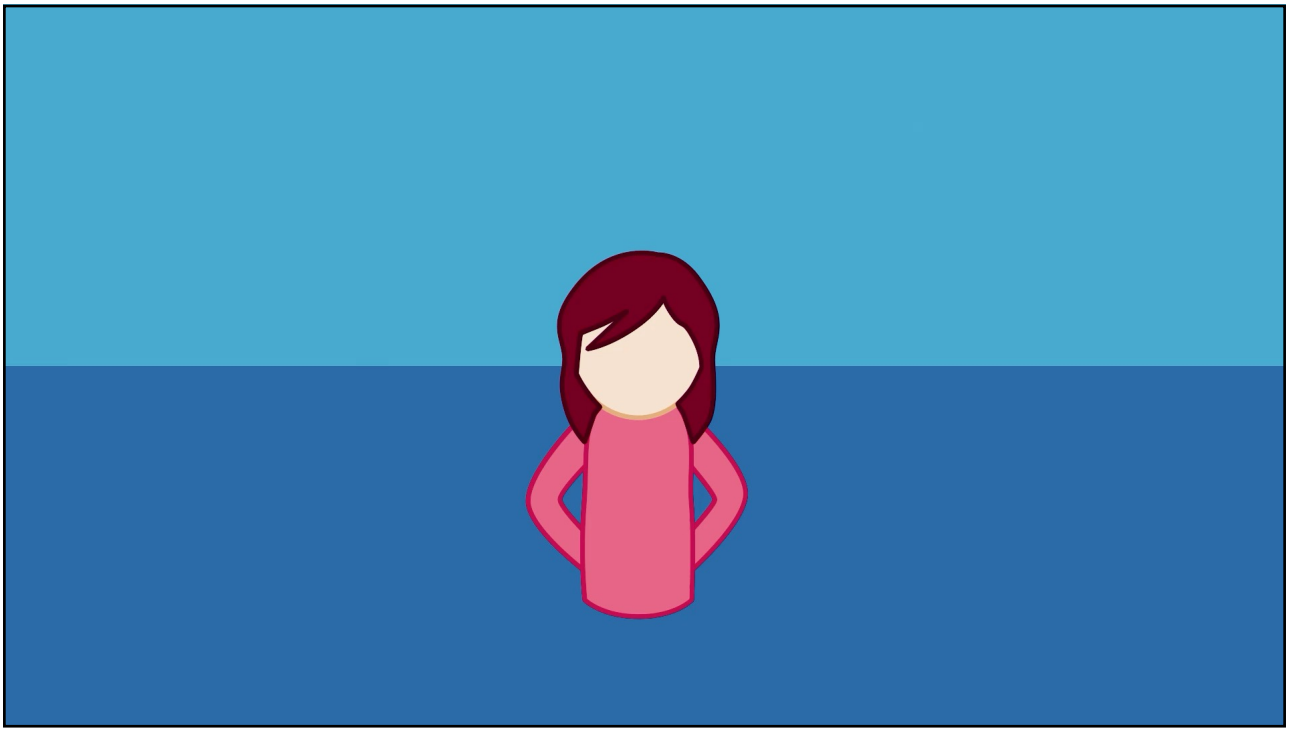

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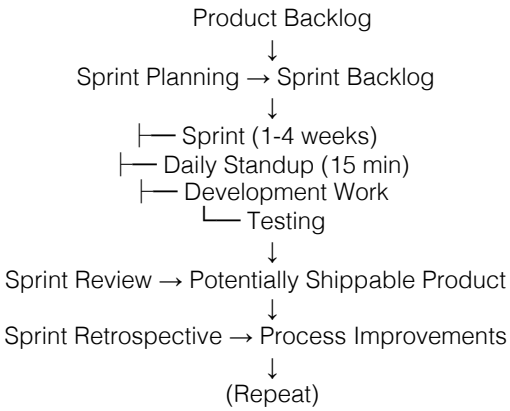
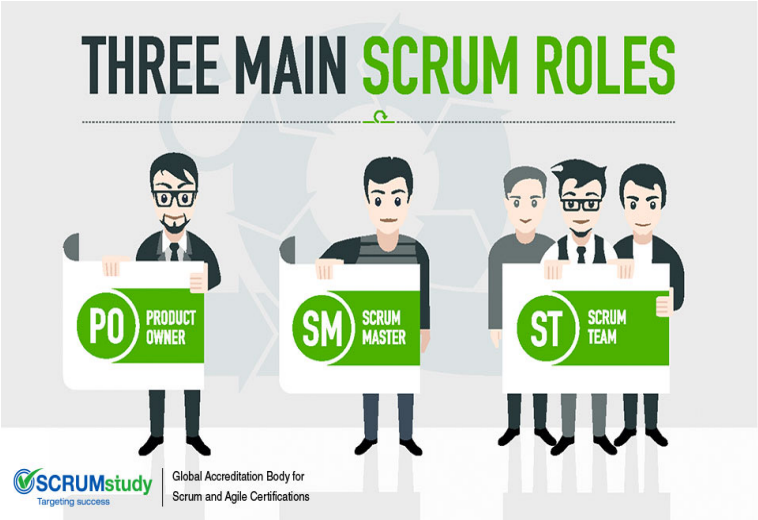
Scrum Framework



Scrum Ceremonies

Ceremony	When	Duration	Purpose
Sprint Planning	Start of sprint	2-4 hours	Decide what to build this sprint
Daily Standup	Every day	15 minutes	Sync up, identify blockers
Sprint Review	End of sprint	1-2 hours	Demo completed work
Sprint Retrospective	After review	1 hour	Improve process

Scrum Roles



Scrum Roles

Product Owner

- Define and prioritize features
- Decide on release dates
- Accept or reject results

Scrum Master

- Managing project
- Responsible for enforcing scrum values and principles
- Enable close coordination

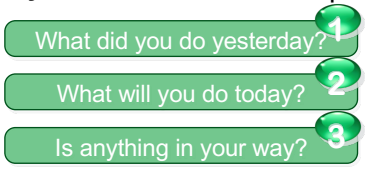
Scrum Roles

Scrum Team

- 5 – 9 members
- Cross functional team
- Full-time workers
- Self organizing
- Membership should change only between sprints

Scrum Meetings

- **Daily scrum**
  - Daily, 15-min, stand-up meeting



- **Sprint review**
  - informal meeting, 2-3 hrs long
  - Status meeting with all stakeholder
  - Increments are delivered
  - New estimates and team assignments

Scrum Meetings(1)

- Sprint retrospective
  - After every sprint
  - Typically 15 -30 Minutes
  - Whole team participates
  - What is and what is not working ?

What worked well

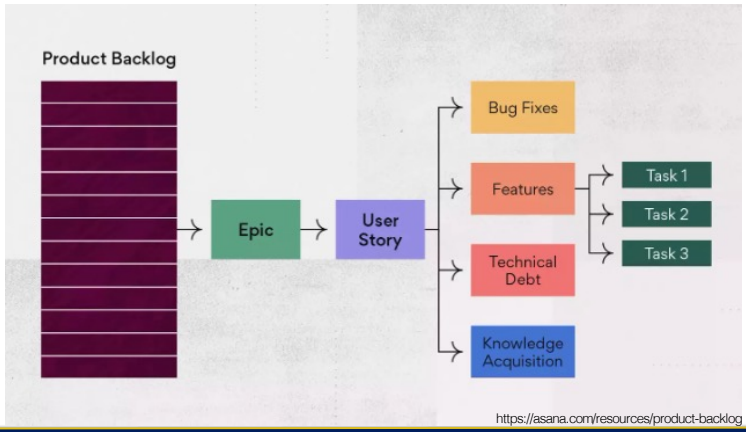
What could be improved

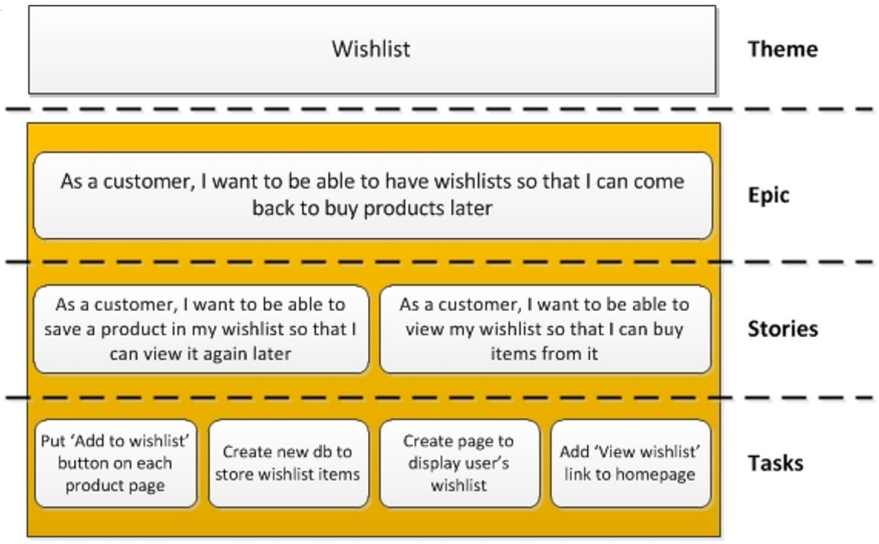
What will we commit to do in next sprint

Scrum Team members make actionable commitments

Product backlog

- A product backlog is an ordered list of tasks, features, or items to be completed as part of a larger roadmap.





Product Backlog – Example

ToDo List		
Story	**Estimation**	**Priority**
As a user I want to be able to reset my password	1	1
As a user I want to edit items	3	2
As a user I want to export data	2	3
As an administrator I want to define KPI's for my sales team	4	4
As a user I want to view my data on mobile	5	5
As an administrator I want to send alerts when new leads come in	2	6
As a user I want to create a report of my data	5	7
As a user I want to update my reminder settings when a date is added	3	8
As a user I want filtering enhancements	4	9
As an administrator I want to configure views of data	5	10
Total	**34**	

Sprint Backlog

User Story	Sub-user Stories	Tasks	Estimate	Priority
As a user, I want to edit my information	As a user, I want to reset my password	Front-end support • Add button view settings • Add button reset	1hr	Medium

Tasks	Mon	Tues	Wed	Thur	Fri
Code the user interface	8	4	8		
Code the middle tier	16	12	10	4	
Test the middle tier	8	16	16	11	8
Write online help	12				
Write the foo class	8	8	8	8	8
Add error logging			8	4	

Key Scrum Concepts

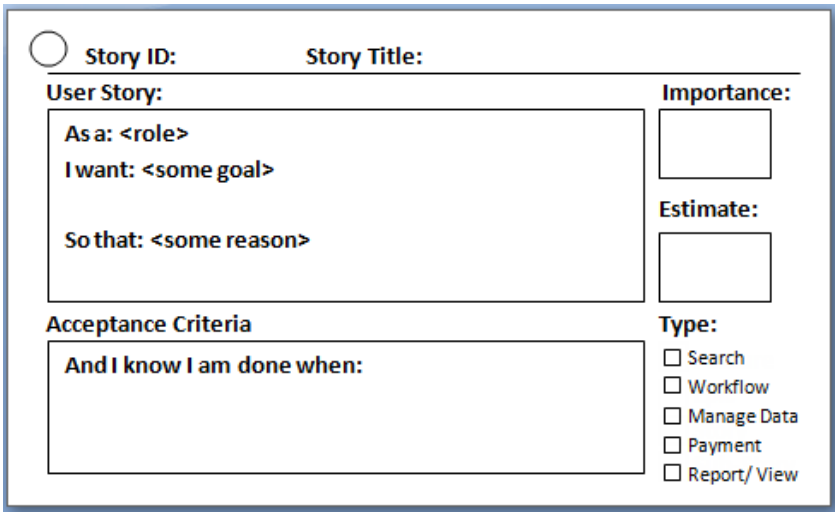
- **Sprint:** Fixed timeframe (e.g., 2 weeks) where team commits to completing specific work
- **Velocity:** How many story points a team completes per sprint (used for planning)
- **Burndown Chart:** Visual showing work remaining vs. time in sprint
- **Definition of Done:** Shared understanding of what "complete" means
  - Code written and reviewed
  - Tests passed
  - Documentation updated
  - Deployed to staging
  - Product Owner accepted

User stories

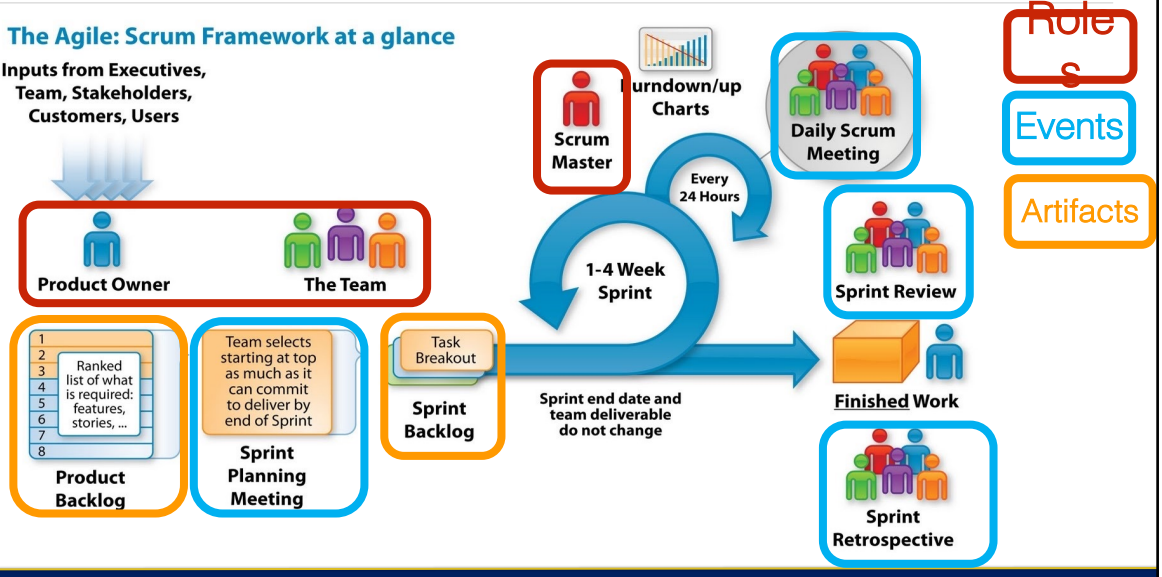
Ex1: As a power user, I can specify files or folders to backup based on file size, date created and date modified.

Ex2: As a user, I can indicate folders no to backup so that my backup drive isn't filled up with things I don't need saved.

User Story Template



Scrum Framework



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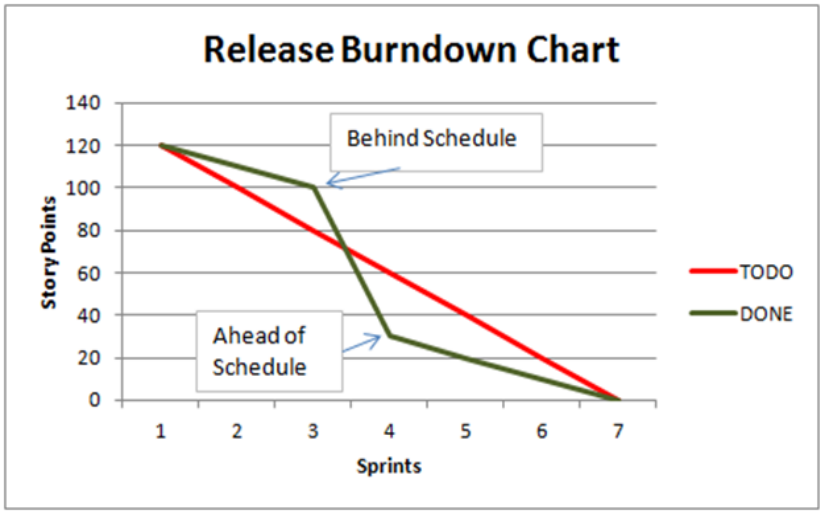
Progress Monitoring



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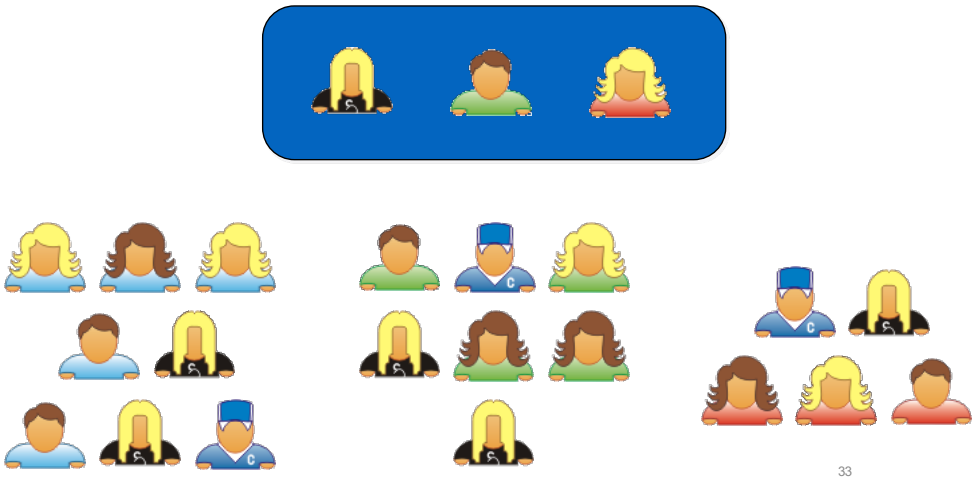
Scalable Scrum



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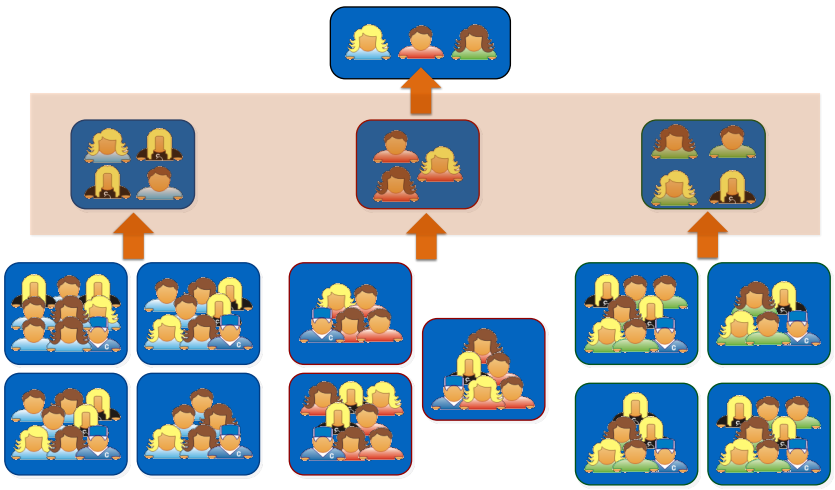
Scrum of Scrums



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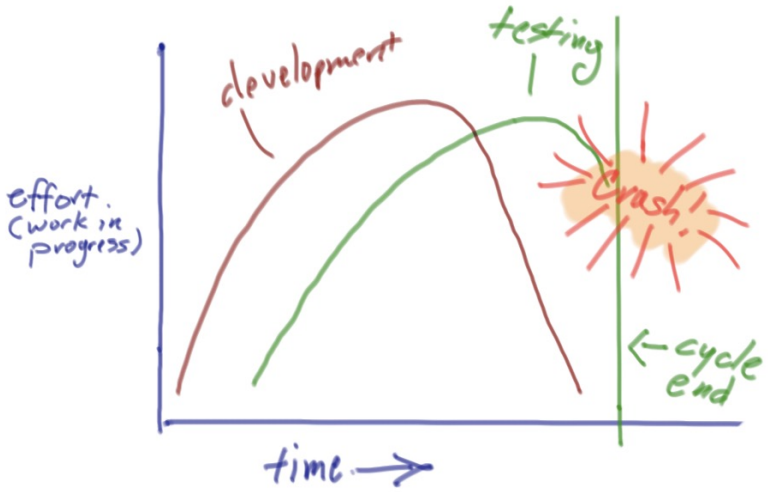
Issues with Scrum



KANBAN

Kan-Ban

- Kanban means “signboard”
- Lean agile model
- No more time-boxed iterations
- Visual boards
- Represents teams current work and workflow
- Can be used anywhere, any domain

Toyota Pioneers

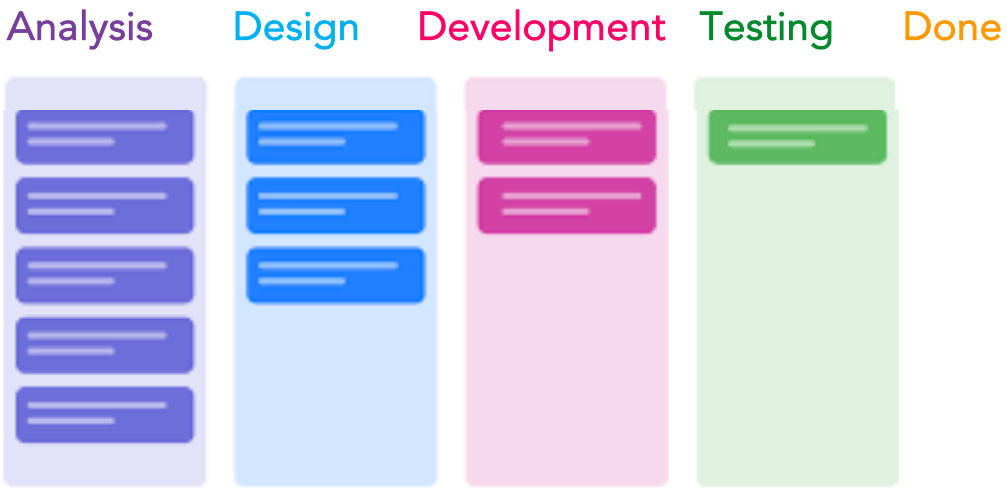
Kanban

- Visualize you work
  - Work and work flow is visible
  - Monitor, adapt and improve
- Limit Work In Progress (WIP)
- Push versus pull work allocations
- Continuous and incremental changes
- Lean Methodology

Work Flows

- Analysis
  - Create specification and acceptance criteria
- Development
  - Code features
- Validation
  - Testing and bug fixing
- Merge and deploy
  - Release features

Work Flow – Example



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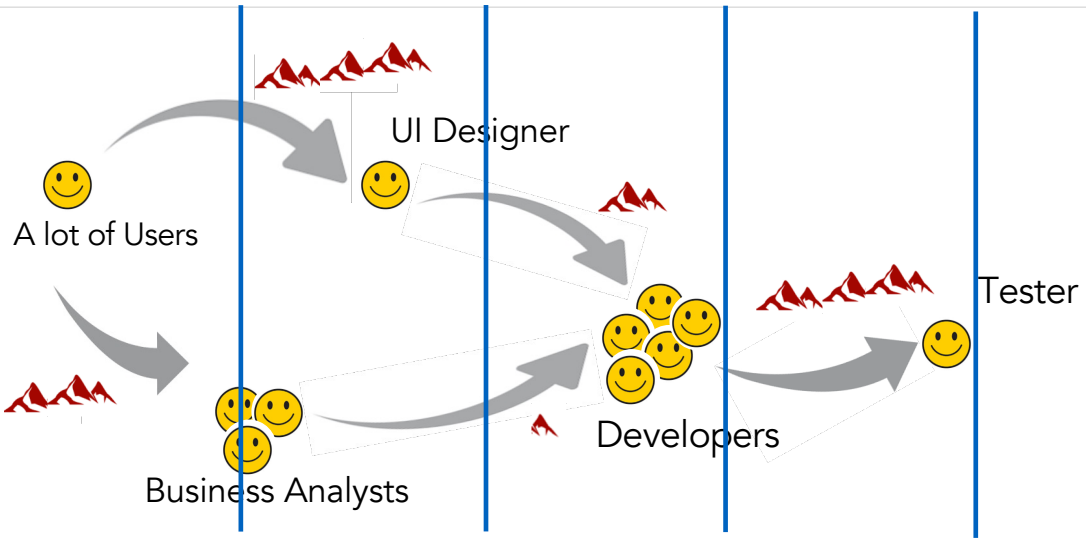
Work in Progress (WIP)



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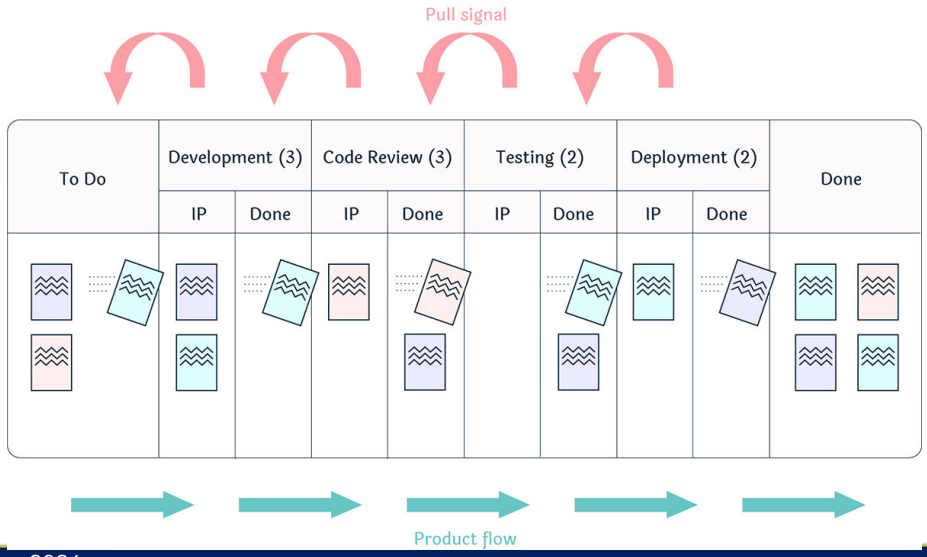
Limiting Work In Progress (WIP)

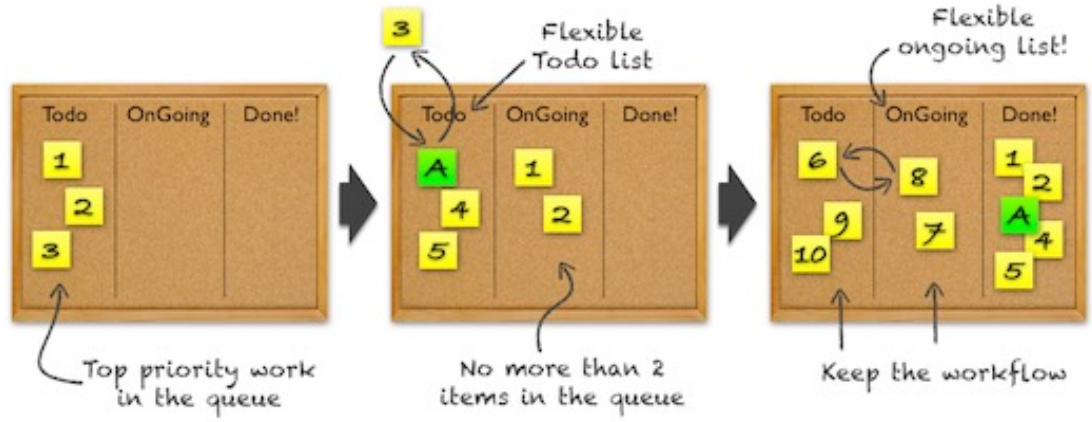
Backlog 8	Analysis 3	Design 2	Development 2	Testing 1
				

- Reduce cycle time per task
- Ensure WIP is high priority task
- Reduces or eliminates queues between groups
- Reduce multi tasking by team members

Push versus Pull Work Allocations



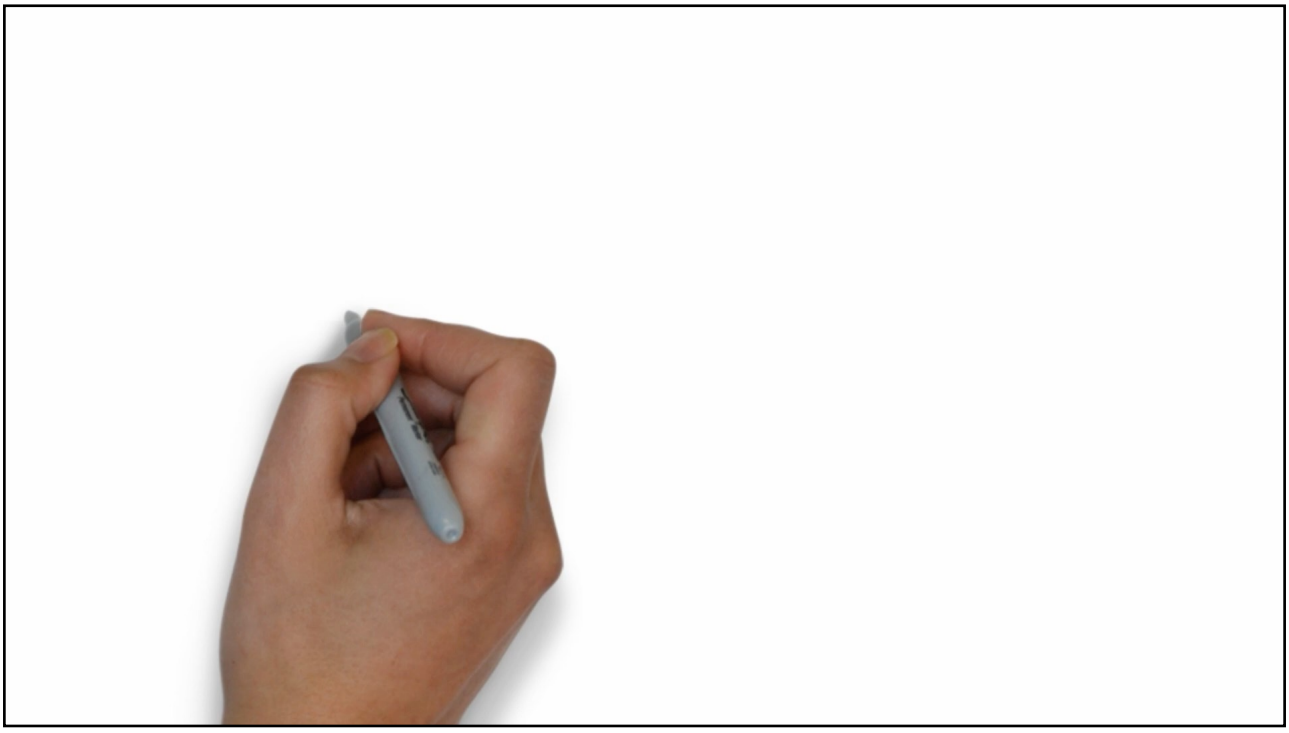
Scrum vs Kanban



- Small collocated teams vs Large distributed teams

The Big Picture

Aspect	Scrum	Kanban
Philosophy	Time-boxed iterations	Continuous flow
Change	No changes during sprint	Changes anytime
Roles	PO, SM, Dev Team	No prescribed roles
Cadence	Fixed sprints	Continuous
Commitment	Sprint commitment	Pull when ready
Metrics	Velocity, burndown	Cycle time, throughput
Board	Resets each sprint	Persistent
WIP Limits	Implicit (sprint backlog)	Explicit (per column)
Ceremonies	4 required events	None required
Best For	Feature development	Operations, support



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Real-World Examples

- Scrum Works Well For:
  - New product development (like your semester projects!)
  - Feature-rich applications with release cycles
  - Teams building long-term roadmaps
  - Example: Developing a mobile app with quarterly releases

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Real-World Examples

- **Kanban Works Well For:**
  - Customer support teams
  - DevOps/Infrastructure teams
  - Maintenance and bug fixes
  - Example: IT helpdesk handling incoming tickets

Scrumban (Hybrid)

- **Scrumban (Hybrid) Works Well For:**
  - Teams transitioning from Scrum to Kanban
  - Development teams with operational responsibilities
  - Example: Product team that also handles production incidents

eXtreme Programming (XP)

Agile Process Models

- SCRUM
- KANBAN
- Extreme Programming (XP)
- … more

Agile Process Models

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eXtreme Programming (XP)

- Based on four values
- Twelve practices **extended** in various ways
- Extreme approach to iterative development
  - New version many times a day
- Increments every two weeks
- Test driven development
  - All test must be run for each build
  - Accepted only if tested successfully

XP and Agile principles

- Full time customer engagement
- Pair programming – collective ownership
- Change supported through continuous releases
- Maintenance through constant refactoring

XP – Four Values

- Communication
  - Force communication in positive way
- Simplicity
  - Develop simplest product
- Feedback
  - Customer collaboration over contract negotiation
- Courage
  - Be prepared to make hard decisions

XP Release Cycle

XP Requirements

- Customer is a part of XP Teams
- Requirements as user stories or scenarios
- From story cards to implementation tasks
  - Schedule
  - Cost
- Story selection is done by customer

Thank you!