Software Testing Methodologies

Agile Methodology

Agenda…

- Introduction
- What is Agile Methodology?
- What is Scrum?
- Characteristics of Scrum
- Functionality of Scrum
- Components of Scrum
  - Scrum Roles
  - The Process
  - Scrum Artifacts
- Scaling Scrum

What is Agile Methodology?

- It is a Disciplined project management with frequent inspection and adaptation. That encourages teamwork, self-organization and accountability.
- Testers will need to have an understanding of agile as a whole, but will also need to learn how to adapt their current approach to work within agile efforts.

Principles of Agile….

- Highest priority is to satisfy the customer through early and continuous delivery of valuable software.
- Welcome changing requirements, even late in development.
- Deliver working Software Frequently
- Business people and developers must work together daily through out the project.
- The most efficient and effective method of conveying information to and within the development team is face to face conversation.
- Working Progress is primary measure of progress
- Collaborative team work.
- Simplicity– the art of maximizing the amount of work not done –is essential.
- The reflection of team should become more effective, to tune and adjust their behavior accordingly

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.*

What is Scrum?

- 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.

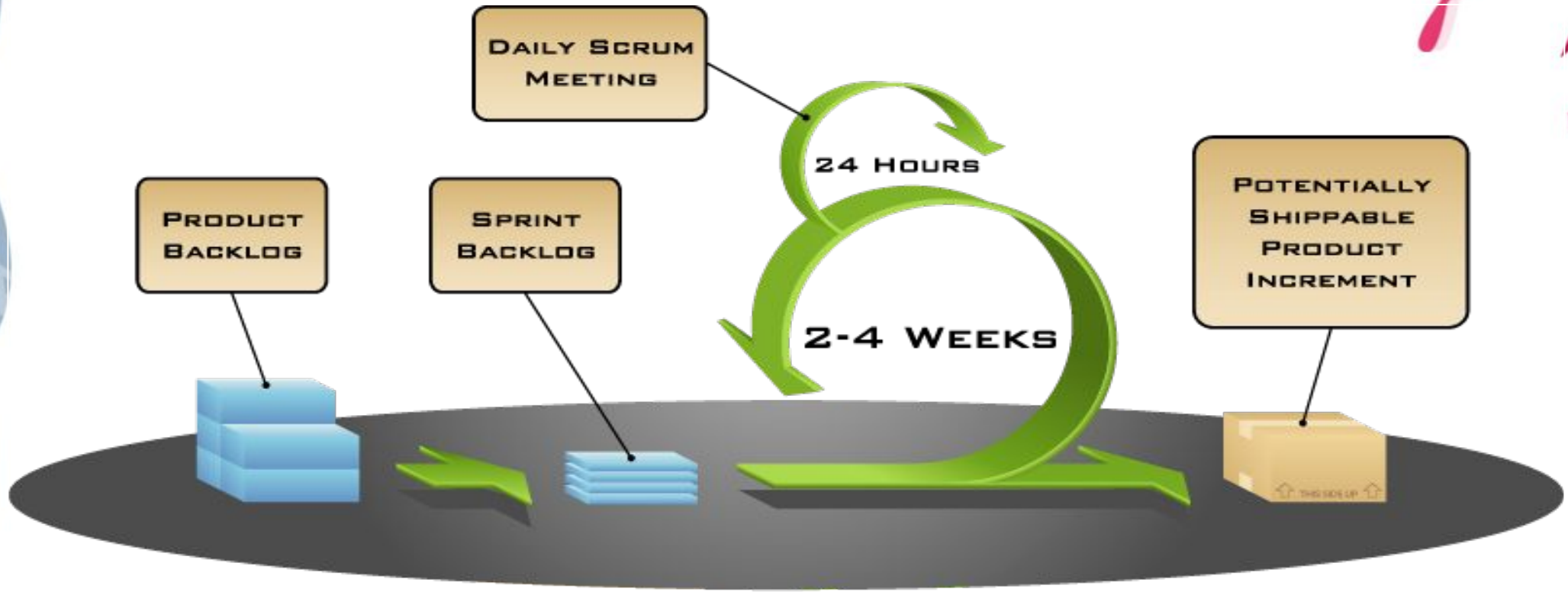
Characteristics of Scrum…

- Self-organizing teams
- Product progresses in a series of month-long “sprints”
- Requirements are captured as items in a list of “product backlog”
- No specific engineering practices prescribed
- Uses generative rules to create an agile environment for delivering projects
- One of the “agile processes”

Why Scrum is Powerful..?

- Focus is on team's work and team's work only
- Daily communication of status occurs
- Enables low-overhead empirical management
- Makes impediments visible
- Someone is willing to make decisions and
- remove impediments real-time

How does it works?



Components of Scrum…

- A process for incrementally building software in complex environments.
- Backlog – all outstanding work for a product area
- Sprints – 30-day increments of work that produce a deliverable
- Scrums – daily status check meetings
- K. Schwaber, Agile Project Management with Scrum, 2004. http://www.controlchaos.com

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 Team

Three Scrum Roles…

- Scrum Master
  - project master?
  - coach, facilitator, expediter
- Product Owner
  - customer point of contact
  - “whole team”
- Development Team
  - small, co-located?
  - generalists?

Project Owner…

- Define the features of the product
- Decide on release date and content
- Be responsible for the profitability of the product (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 Ceremonies…

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

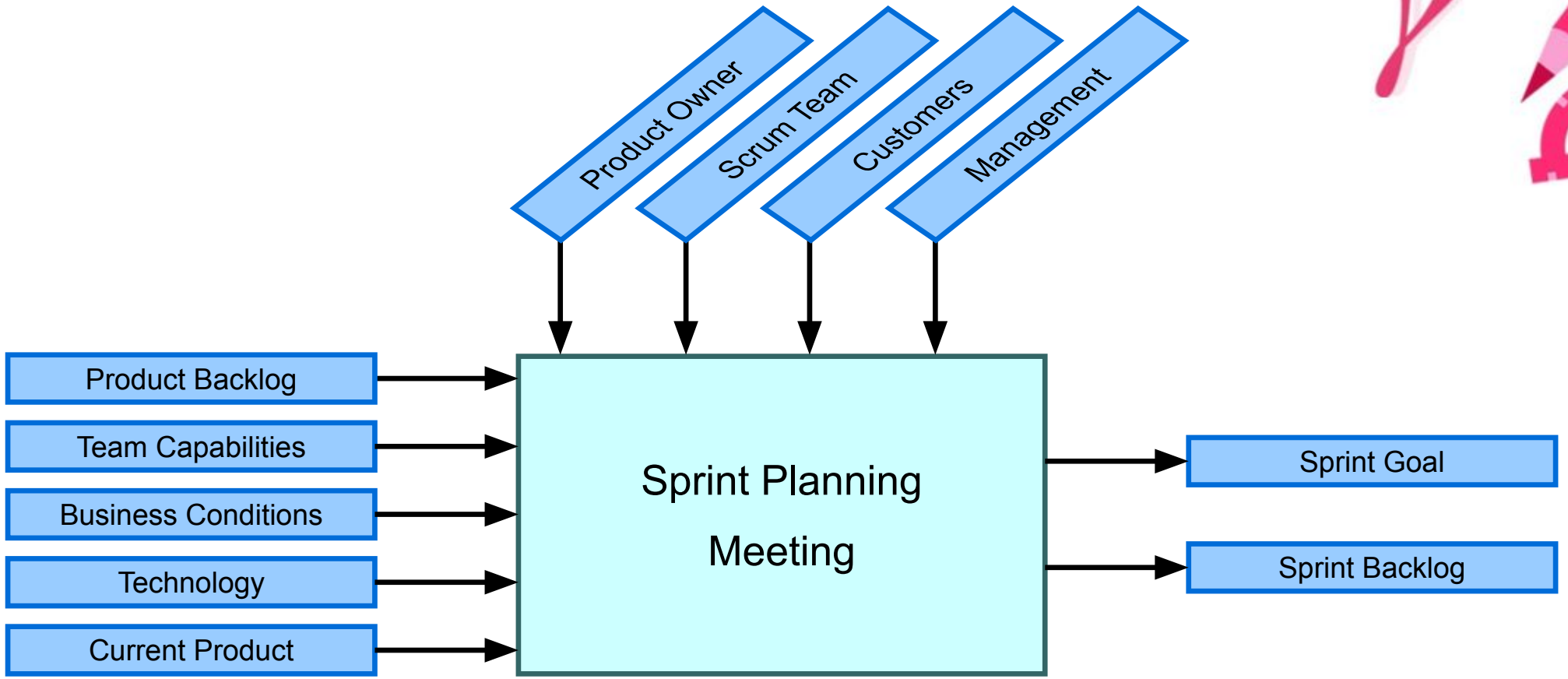
Scrum Members…

- Typically 5-10 people
- Cross-functional
  - QA, Programmers, UI Designers, etc.
- Members should be full-time
  - May be exceptions (e.g., System Admin, etc.)
- Teams are self-organizing
  - What to do if a team self-organizes someone off the team??
  - Ideally, no titles but rarely a possibility
- Membership can change only between sprints

Scrum Sprint Rules…

- Use small interdisciplinary teams
- Build clean interface software
- Intelligent management required
- Solid systems architecture and framework upfront
- Prototype all new tools and technology
- Develop infrastructure first
- Each Sprint results in an executable
- Develop, document, and test in parallel

Spring Planning Meeting....



Products Sprint Planning Meeting…

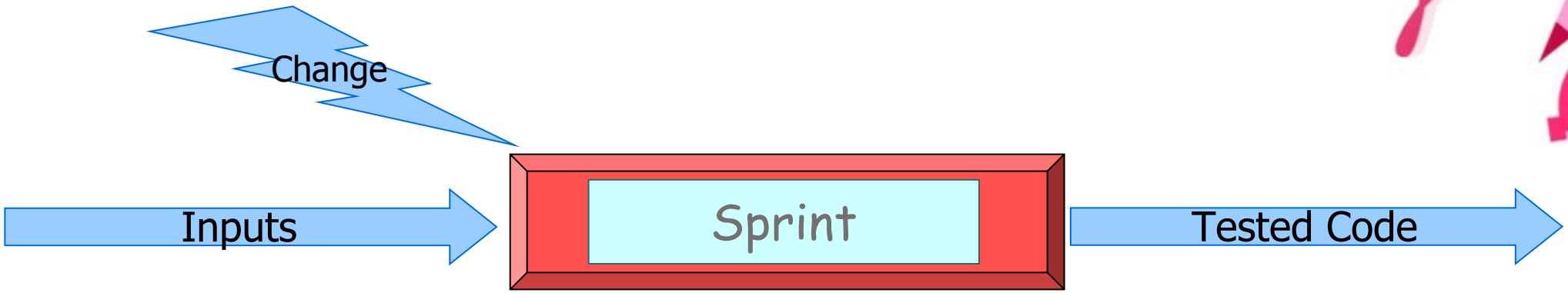
1st Part:

- Creating Product Backlog
- Determining the Sprint Goal.
- Participants: Product Owner, Scrum Master, Scrum Team

2nd Part:

- Participants: Scrum Master, Scrum Team
- Creating Sprint Backlog

No Changes In Scrum…



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

Daily Scrum Questions…

- What did you do since the last Scrum?
- What got in your way?
- What are you going to do before the next Scrum?

Daily Scrum Protocol…

- Daily, same place and time, 15 minutes
- Only three questions
- All pigs (committed) must respond
- Chickens (involved) can attend, but must be silent
- No new backlog can be introduced externally
- Backlog can be added internally

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

Other Scrum Practices…

- Product Backlog, Release Plan
- Sprint Planning Meeting (4+4 hr), Sprint Backlog
- Backlog/Release Burn down Charts
- Sprint Review Meeting (4 hr)
- Sprint Retrospective Meeting (3 hr)

From Sprint goal to Sprint Backlog……

- Scrum team takes the Sprint Goal and decides what tasks are necessary
- Team self-organizes around how they'll meet the Sprint Goal
- Manager doesn't assign tasks to individuals
- Managers don't make decisions for the team
- 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
  - But: Sprint Backlog can only be updated by the team
- Estimates are updated whenever there's new information

Sprint Backlog…

- A subset of Product Backlog Items, which define the work for a Sprint
- Is created ONLY by Team members
- Each Item has it’s own status
- Should be updated every day
- No more than 300 tasks in the list
- If a task requires more than 16 hours, it should be broken down
- Team can add or subtract items from the list. Product Owner is not allowed to do it

Sprint Backlog…

	Days Left in Sprint	15	13	10	8	
						F
Who	Description	7/22/2002	7/24/2002	7/26/2002	7/31/2002	
	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	View pedigree for kindred column in a result set	2	2	2	2	
AM	Derived kindred validation	8				
	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	
	Database					
KH	Killing Oracle sessions	8	8	8	8	
KH	Finish 2.206 database patch	8	2			
KH	Make a 2.207 database patch	8	8	8	8	
KH	Figure out why 461 indexes are created	4				

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
  - Typically a Product Manager, Marketing, Internal Customer, etc.

Product Backlog…

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

Sample Product Backlog…

	Item #	Description	Est	By
Very High				
	1	**Finish database versioning**	16	KH
	2	**Get rid of unneeded shared Java in database**	8	KH
	-	**Add licensing**	-	-
	3	Concurrent user licensing	16	TG
	4	Demo / Eval licensing	16	TG
		Analysis Manager		
	5	File formats we support are out of date	160	TG
	6	Round-trip Analyses	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**	-	-
	10	When items are removed from an analysis, they should show up again in the pick list in lower 1/2 of the analysis tab	8	TG
	-	**Query**	-	-
	11	Support for wildcards when searching	16	T&A
	12	Sorting of number attributes to handle negative numbers	16	T&A
	13	Horizontal scrolling	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	Haplotypes	320	T&M
	19	**Add icons for v1.1 or 2.0**	-	-
	-	**Pedigree Manager**	-	-
	20	Validate Derived kindred	4	KH
Medium				
	-	**Explorer**	-	-
	21	Launch tab synchronization (only show queries/analyses for logged in users)	8	T&A
	22	Delete settings (?)	4	T&A

Pros/Cons…

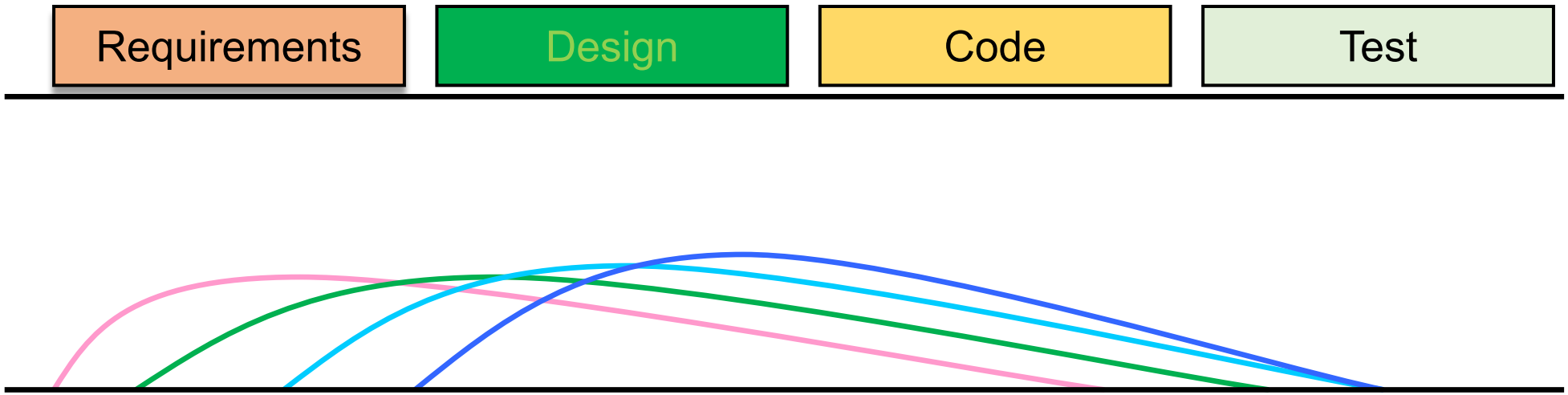
Advantages-

- Completely developed and tested features in short iterations
- Simplicity of the process
- Clearly defined rules
- Increasing productivity
- Self-organizing
- each team member carries a lot of responsibility
- Improved communication
- Combination with Extreme Programming

Drawbacks-

- “Undisciplined hacking” (no written documentation)
- Violation of responsibility
- Current mainly carried by the inventors

Sequential vs. Overlapping Dev.



Thankyou!