An
Introduction to

Agile Methodologies: SCRUM and XP

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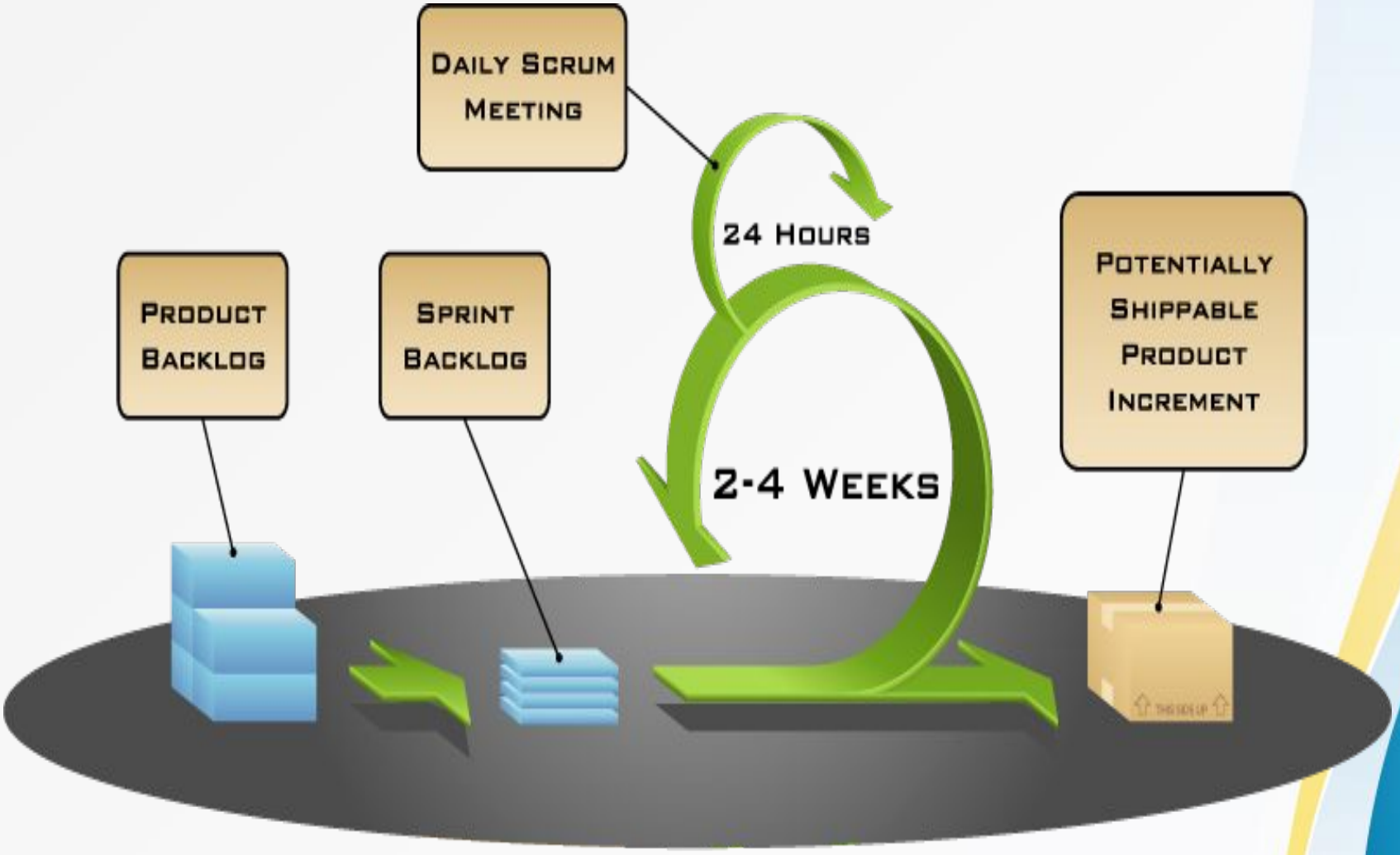
Agenda

- Introduction
- Scrum in 100 words
- Functionality of Scrum
- Components of Scrum
  - Scrum Roles
  - The Process
  - Scrum Artifacts
- Scaling Scrum
- Extreme Programming

Scrum in 100 words

- Scrum is an agile process that allows us to deliver the highest business value in the shortest time.
- It allows us to rapidly and repeatedly inspect actual working software (**every two to four weeks**).
- The business sets the priorities. Scrum teams **self-manage** to determine the best way to deliver the highest priority features.
- Scrum supports **self-organizing teams**.
- Here, the product progresses in a series of month-long **"Sprints"**
- Requirements are captured as items in a list of **"Product Backlog"**
- Every two weeks to four weeks anyone can see real working software and decide to release it as it is or continue to enhance for another iteration.

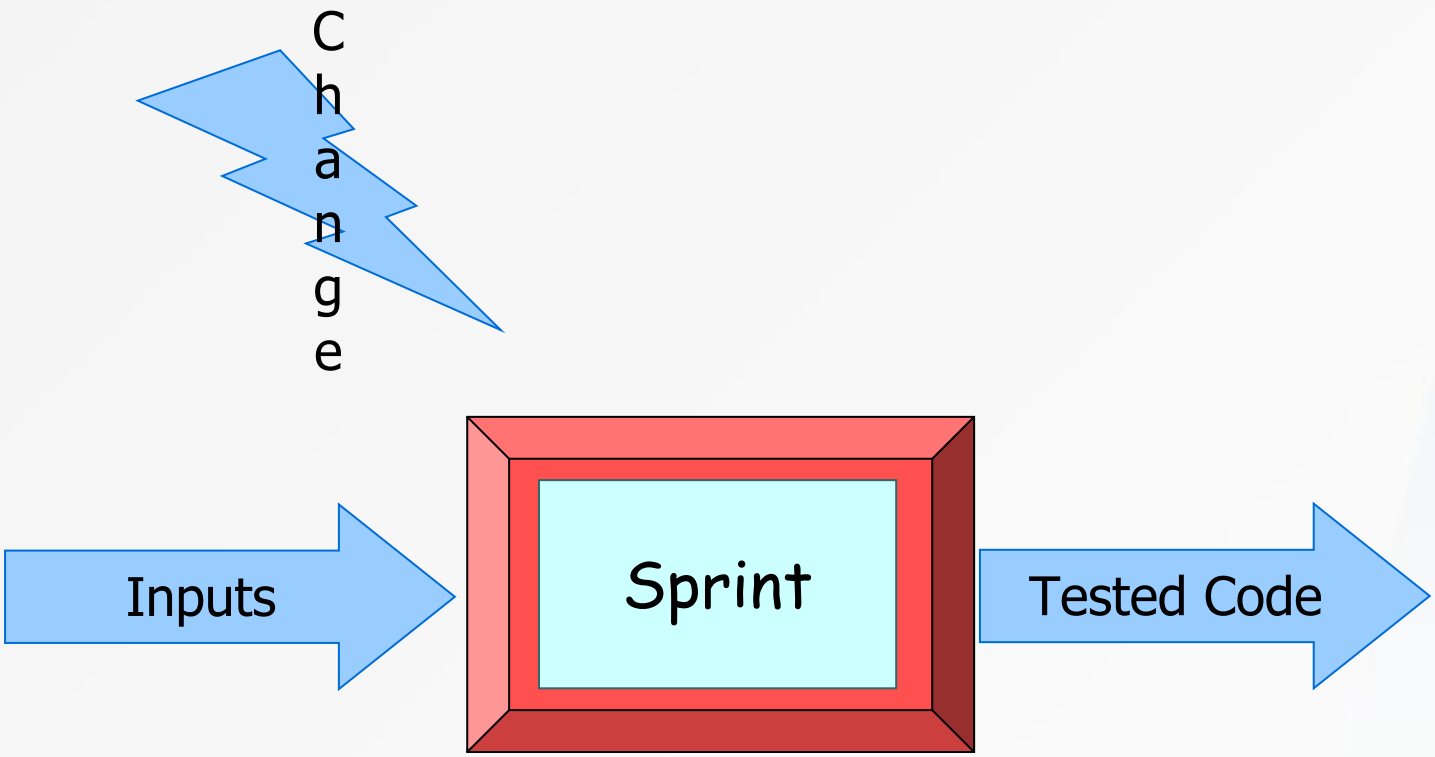
How Scrum Works?



Sprints

- Scrum projects make progress in a series of "**Sprints**".
- Sprint is usually a **month-long iteration**, during which the product functionality is enhanced.
- Target duration is **one month** (+/- a week or two)
- Product is **designed, coded, and tested** during the sprint
- **NO outside influence** can interfere with the Scrum team during the Sprint.
- Each Sprint begins with the **Sprint Planning.**

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
  - Daily Scrum Meeting
  - Sprint Review
- **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 (ROI)
- Prioritize features according to market value
- Adjust features and prioritize every iteration, as needed
- Accept or reject work results.

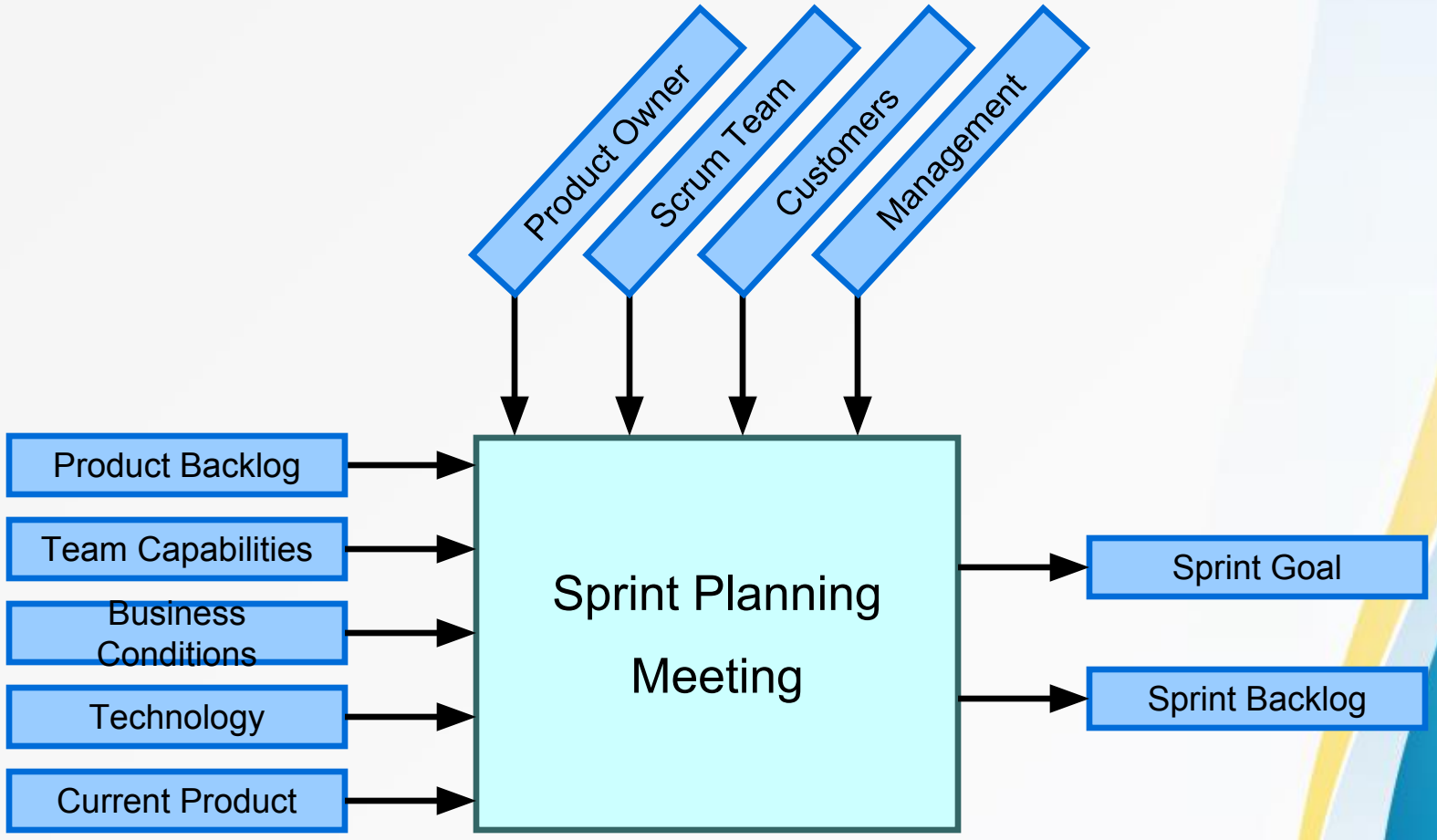
The Scrum Master

- Represents management to the project
- Responsible for enacting Scrum values and practices
- 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, a team of 5-10 people
- Cross-functional
  - Analysts, Designsers, Programmers, Testers, UI Designers, QA etc.
- Members should be full-time
  - May be exceptions (e.g., System Admin, etc.)
- Teams are self-organizing
- Membership can change only between sprints

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

Note: A special form of Sprint Planning Meeting that happens before the beginning of the Project.

Daily Scrum Meeting

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

Few 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'll 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
- Formal
  - 2-hour prep time rule
- Participants
  - Customers/Users
  - Management
  - Product Owner
  - Other engineers

Artifacts: Product Backlog

- A list of all desired work on the project
- List is prioritized by the Product Owner
- 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

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
- 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 is new information

Sprint Backlog

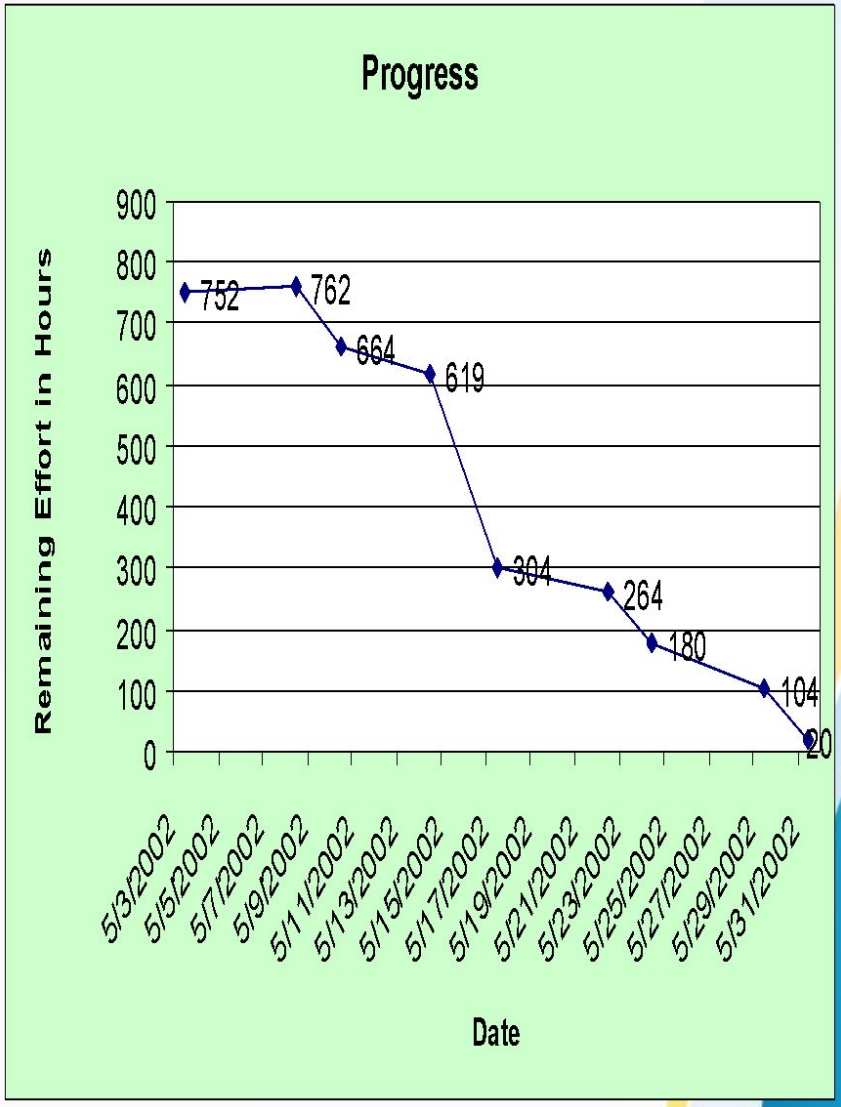
- A subset of Product Backlog Items, which define the work for a Sprint
- Is created ONLY by Team members
- Each Item has its own status
- Should be updated every day
- No more than 300 tasks in the list
- If a task requires more than 16 hours, it should be broken down
- Team can add or subtract items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

Sample Sprint Backlog

		Days Left in Sprint	15	13	10	8	
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				

Sprint Burn down Chart

- Depicts the total Sprint Backlog hours remaining per day
- Shows the estimated amount of time to release
- Ideally should burn down to zero to the end of the Sprint
- Actually, it is not a straight line



Scalability of Scrum

- A typical Scrum team is 5-10 people
- Jeff Sutherland - up to over 800 people
- "Scrum of Scrums" or what called "Meta-Scrum“

Pros:

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

Cons

- “Undisciplined hacking” (no written documentation)
- Lack of authority may create an atmosphere of endless debate whic ultimately affects the sprint.
- Self organizing team means engaging experienced staff

Extreme Programming

- Widely referred to as “XP”
- Proposed by Kent Back in 1999
- It is based on the fact that “**Taking the best practices that have worked well in the past in development projects should be taken to the extreme levels**.”
- **Code Review:** Its a good way to detect and correct problems at the earliest. XP suggests “Pair Programming”.
- **Testing:** Testing helps to remove bugs and improves the reliability. XP suggests “Test Driven Development”.
- **Incremental Development:** XP suggests that team should come up with new increments every few days, rather than doing all the development in one go.
- Encourages **“Simplicity”** in development.

Basic idea of XP

- XP is based on frequent releases called **“iterations”** during which the developers implement **“user stories”**.

- A **user story** is a simplistic statement of a user about a functionality, they need. It carefully **avoids** finer details like different scenarios, the preconditions etc.

- Based on user stories, the team proposes **“Metaphors”**. It is a common vision of **“how the system would work”**.

- The team also constructs a **“Spike”** which is actually like a prototype. i.e. a proposed solution which may or may not be the best one.

Contd..

- Design, Coding, Testing
- Listening
- Feedback
- Keeping the solution to a problem as simple as possible.
- Applicability of XP
  - Innovative and research projects
  - Smaller projects.

Selecting an appropriate SDLC model

- **Characteristics of the software to be developed:**
  - For small projects, agile is favorable.
  - Products or embedded software, iterative model may be preferred.
  - Object oriented projects is good with incremental model.
- **Characteristics of the development team:**
  - for experienced team, embedded system can also be developed in iterative waterfall.
  - If the team is novice, then even a simple processing application software may also need prototype model.
- **Characteristics of the customer:**
  - If the customer is not quite familiar with computers, then prototype model is suitable.