Good software practices

Fethi Rabhi

What is a successful software project ?

- Successful project can be measured by
    - Happy customers
    - Happy teams
    - Software that is being used
- Success does not come from a prescriptive process but experienced people who possess
    - Rules of thumb
    - Practices, *not processes*
- Learning from failures is encouraged

Processes vs practices

- Processes prevent the mediocre from making mistakes.
- Practices make the professional exceptional.

Good practice requires

- Project planning
- Agile principles
- User requirements management
- Agile roles
- Agile tools

Project Planning

Planning is hard

It helps to know where you are going...

How do I plan and estimate?

- Understand the goals
- Plan work to make the goals happen
- Think about risk and how to minimise it
- Write it down and share it
- Estimation...a problem

Is it just an exercise in futility?

- Start with a broad brush and paint in detail as you go
- Invest the right amount in planning

Typical Methodologies

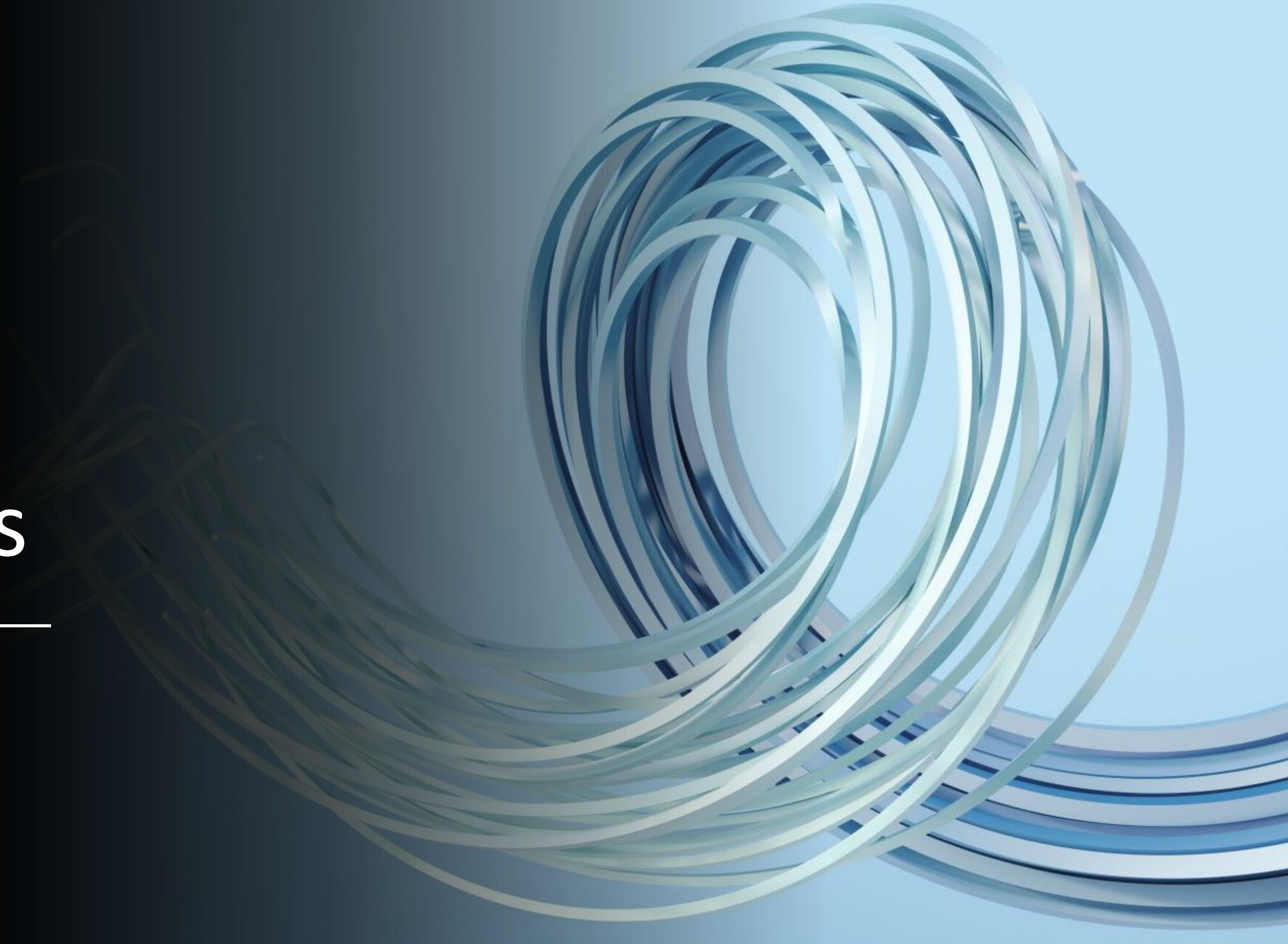
Fancy names for methodologies

- Waterfall, Iterative, Spiral, RAD

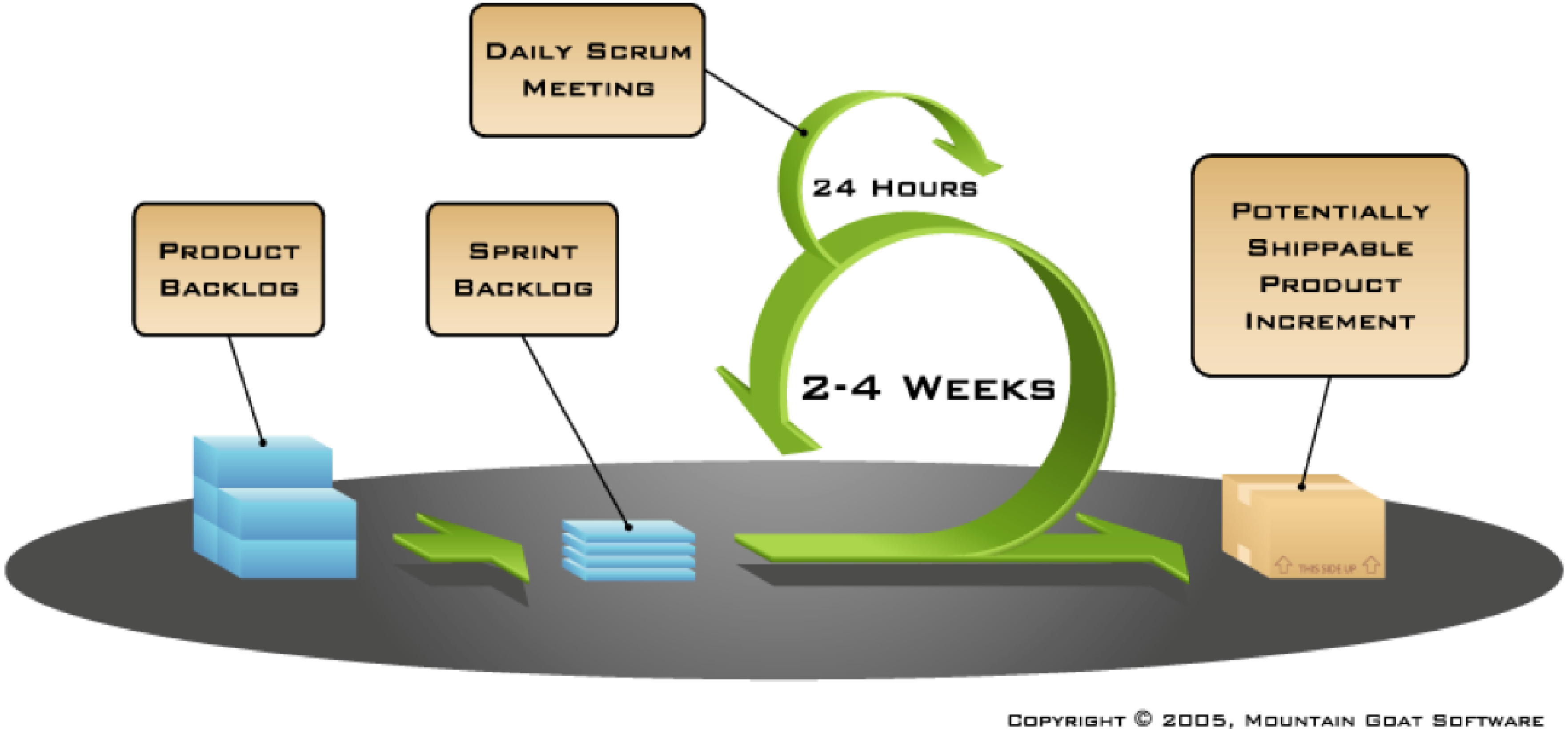
Use Agile principles and here's why...

- It's a natural process
- It brings risk forward, rather than pushing it to the end
- It puts quality, value and end-user priority first

Agile Principles



Project Shape – Small sprints


Daily Scrum Meeting
24 Hours
Product Backlog
Sprint Backlog
2-4 Weeks
Potentially Shippable Product Increment
This side up
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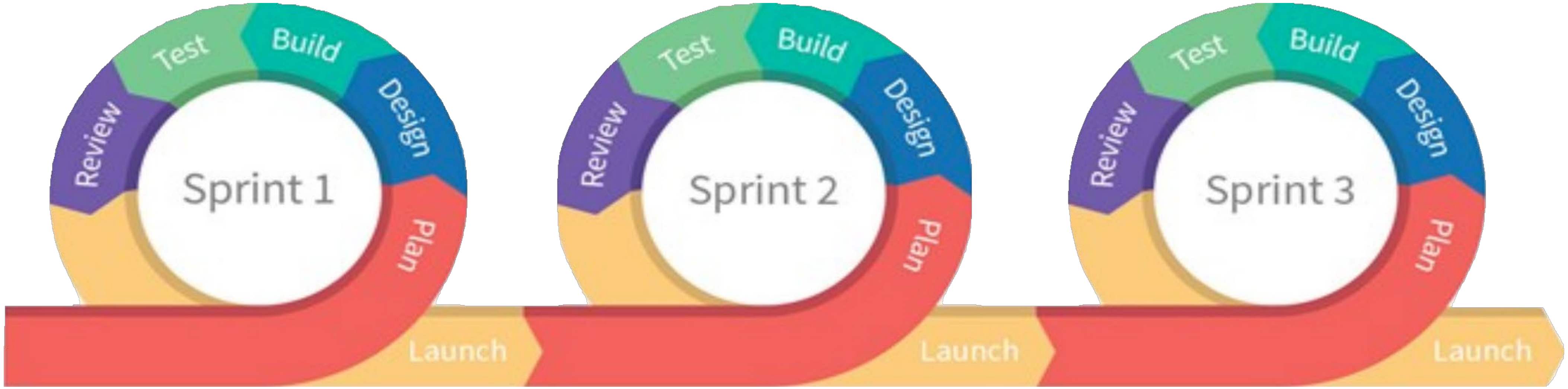
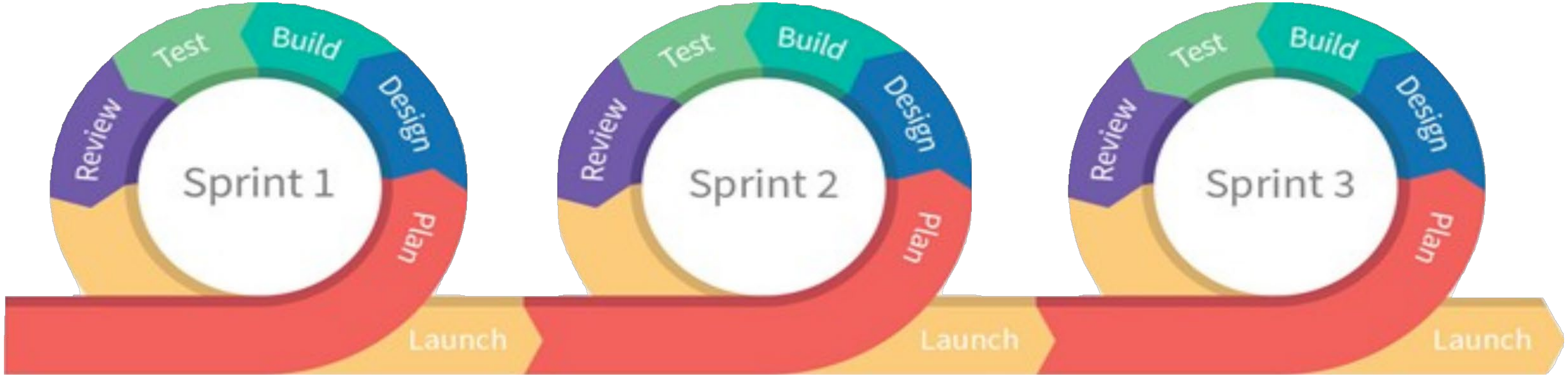
Waterfall - Agile

PLAN DESIGN BUILD TEST REVIEW MAINTAIN



Waterfall - Agile

1. Add posting
2. View postings
3. Search for posting
4. User login



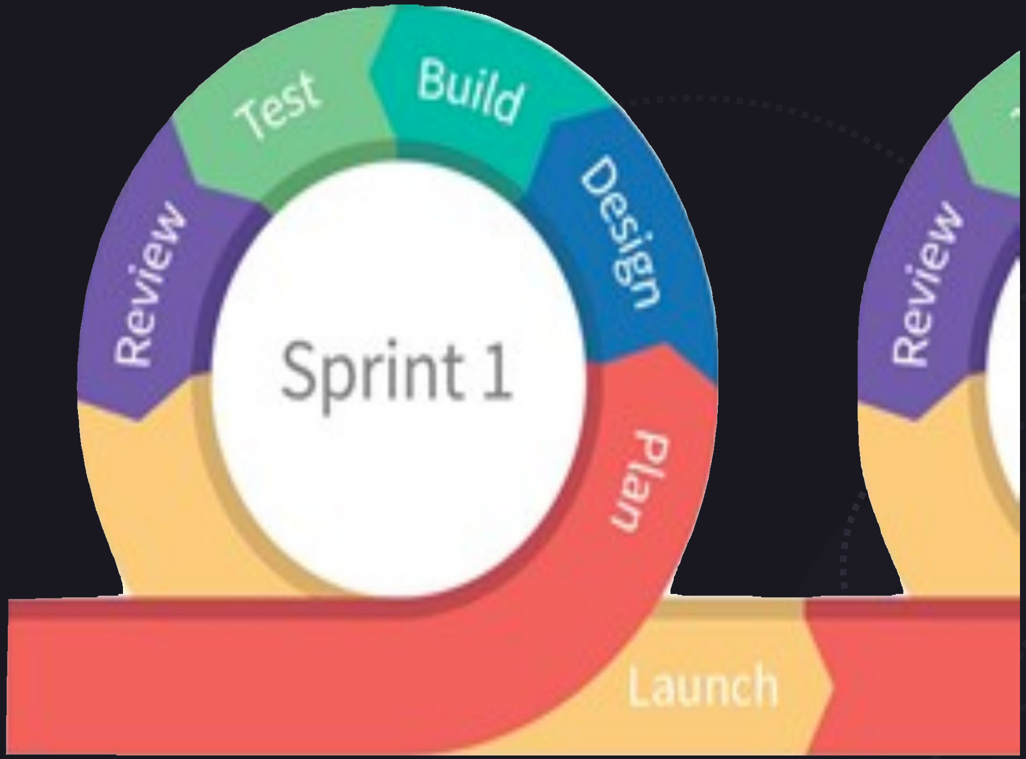
View postings

Add posting

Homepage

How do you get started?

1. Define Problem
2. Document Stories
3. Sprint Planning
4. Track sprint as it goes
5. Retrospective



User Requirements Management

Epics, Stories, Backlogs …

Your product is currently set up as *Epics*

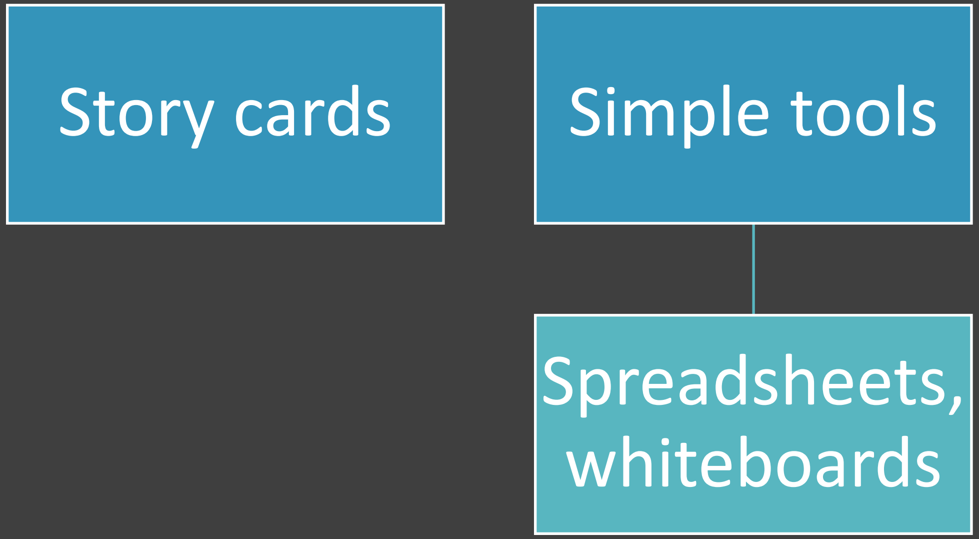
You need to break them into stories, prioritise them and elaborate them

Start by elaborating just the story titles

Estimate them...

Before your first sprint, fully elaborate the stories for that sprint (at least)

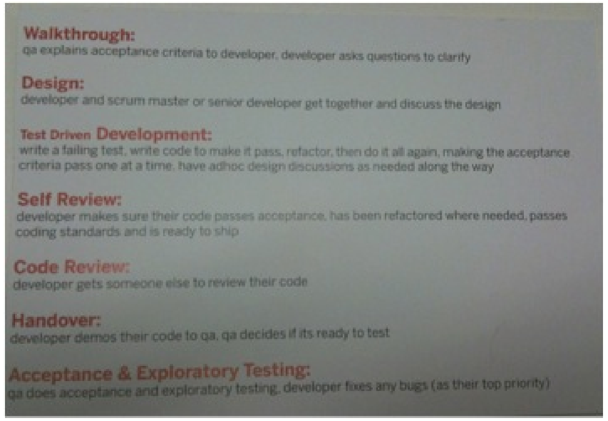
Story telling tools



Story cards

Simple tools

Spreadsheets, whiteboards



Walkthrough:
qa explains acceptance criteria to developer, developer asks questions to clarify

Design:
developer and scrum master or senior developer get together and discuss the design

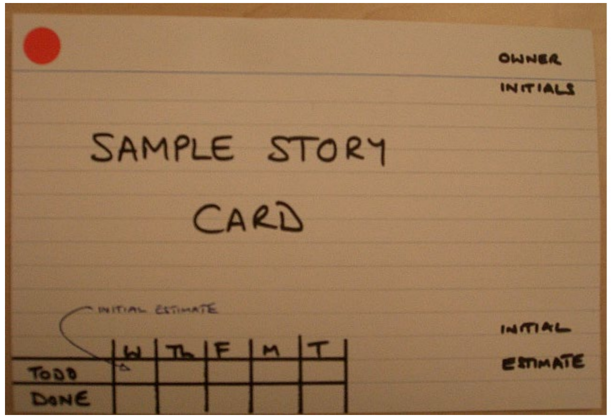
Test Driven Development:
write a failing test, write code to make it pass, refactor, then do it all again, making the acceptance criteria pass one at a time. have adhoc design discussions as needed along the way

Self Review:
developer makes sure their code passes acceptance, has been refactored where needed, passes coding standards and is ready to ship

Code Review:
developer gets someone else to review their code

Handover:
developer demos their code to qa, qa decides if its ready to test

Acceptance & Exploratory Testing:
qa does acceptance and exploratory testing, developer fixes any bugs (as their top priority)



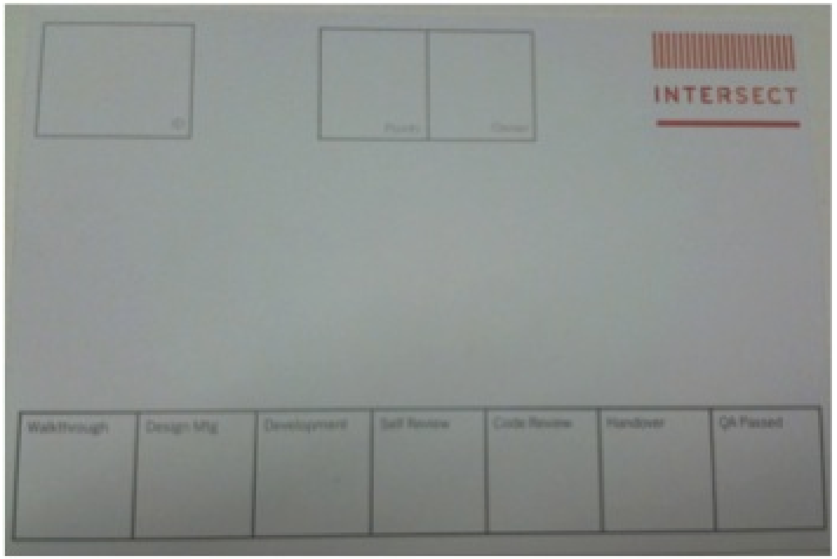
OWNER
INITIALS

SAMPLE STORY
CARD

INITIAL ESTIMATE

	W	Th	F	M	T
TODO					
DONE					

INITIAL
ESTIMATE



INTERSECT

Walkthrough	Design Mtg	Development	Self Review	Code Review	Handover	QA Passed

What is a user story?

FORM:

As <PERSONA> I want to be able to <ACTION> because <JUSTIFICATION>

EXAMPLE:

- As Kerry I want to be able to upload a photo to share with my friends and win prizes

Personas

DEFINITION:
A user of your application

- **EXAMPLE:**

Kerry is an 18 year old girl and loves using her iPhone. She is an avid Facebook user and regularly shares pictures with her friends.

- **WHAT TO PUT IN:**

Relevant facts to the project that app that you are developing

- **WHAT NOT TO PUT IN:**

Unrelated facts, e.g. hair colour, geographic location, things she likes, etc.

What goes in a story?

Title: User upload photo Epic: Sharing Photos

1. User Story:

- As Kerry I want to be able to upload a photo to share with my friends and win prizes.

2. Deliverables:

- Kerry can upload a photo once she is logged in.

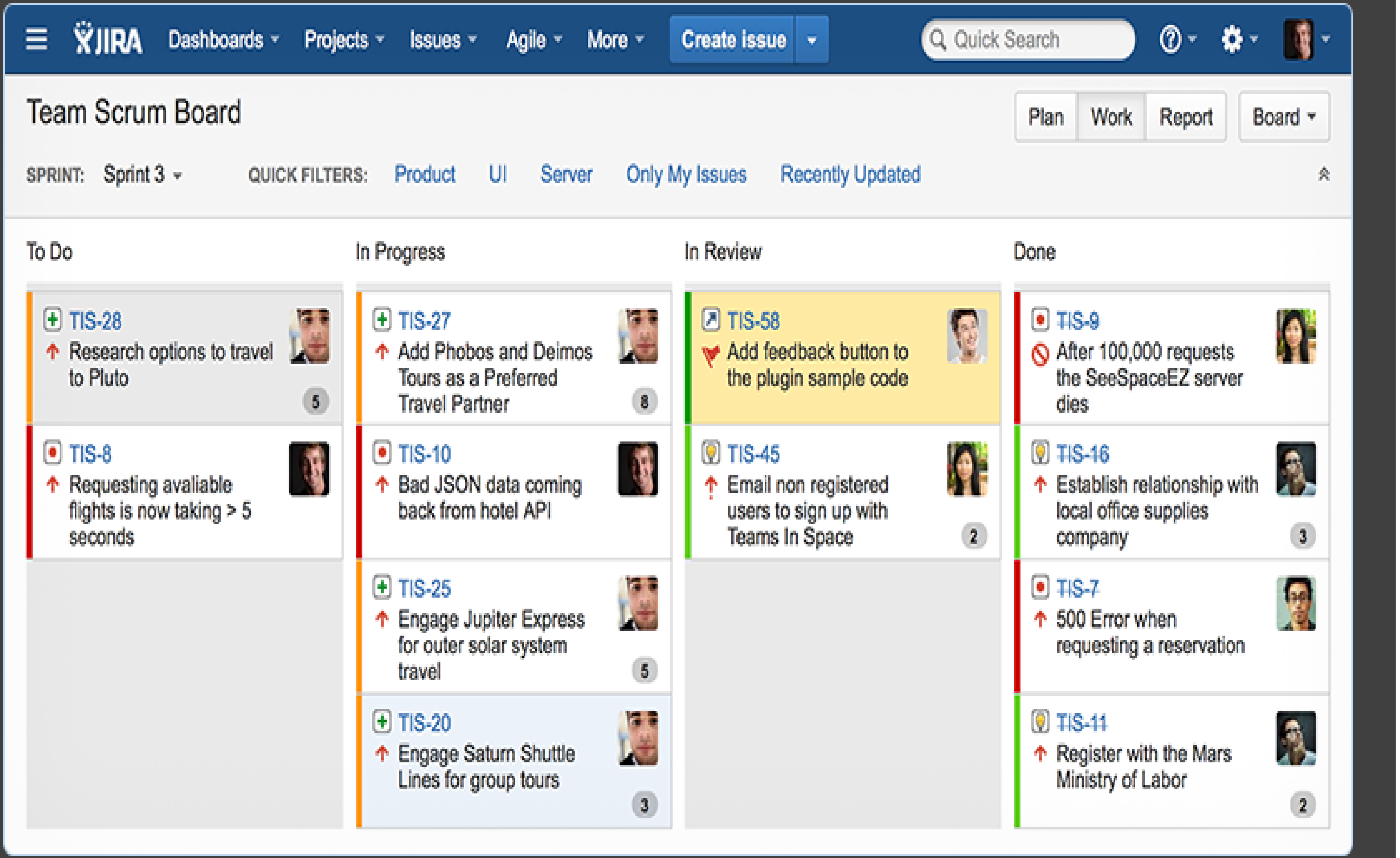
3. Exceptions and Notes:

- Kerry cannot upload a photo when she is not logged in Kerry can only upload JPEG, PNG or GIF
- Kerry should be given feedback during the upload process, e.g. upload bar
- Kerry should be able to upload a photo from her phone.

Sprint Planning

- Which stories go into the sprint?
- Do the stories make sense together?
- How hard is this going to be to complete?
- Who can work on what?

Tracking the Sprint



Team Scrum Board

SPRINT: Sprint 3

QUICK FILTERS: Product UI Server Only My Issues Recently Updated

To Do	In Progress	In Review	Done
TIS-28 Research options to travel to Pluto 5	TIS-27 Add Phobos and Deimos Tours as a Preferred Travel Partner 8	TIS-58 Add feedback button to the plugin sample code	~~TIS-9~~ After 100,000 requests the SeeSpaceEZ server dies
TIS-8 Requesting avaliable flights is now taking > 5 seconds	TIS-10 Bad JSON data coming back from hotel API	TIS-45 Email non registered users to sign up with Teams In Space 2	~~TIS-16~~ Establish relationship with local office supplies company 3
	TIS-25 Engage Jupiter Express for outer solar system travel 5		~~TIS-7~~ 500 Error when requesting a reservation
	TIS-20 Engage Saturn Shuttle Lines for group tours 3		~~TIS-11~~ Register with the Mars Ministry of Labor 2

Daily Standups (online ?)

WHAT DID YOU DO YESTERDAY?

WHAT ARE YOU GOING TO DO TODAY?

IS THERE ANYTHING IN MY WAY?

Sprint Review / Retrospective

Demo your work and get feedback from the team.

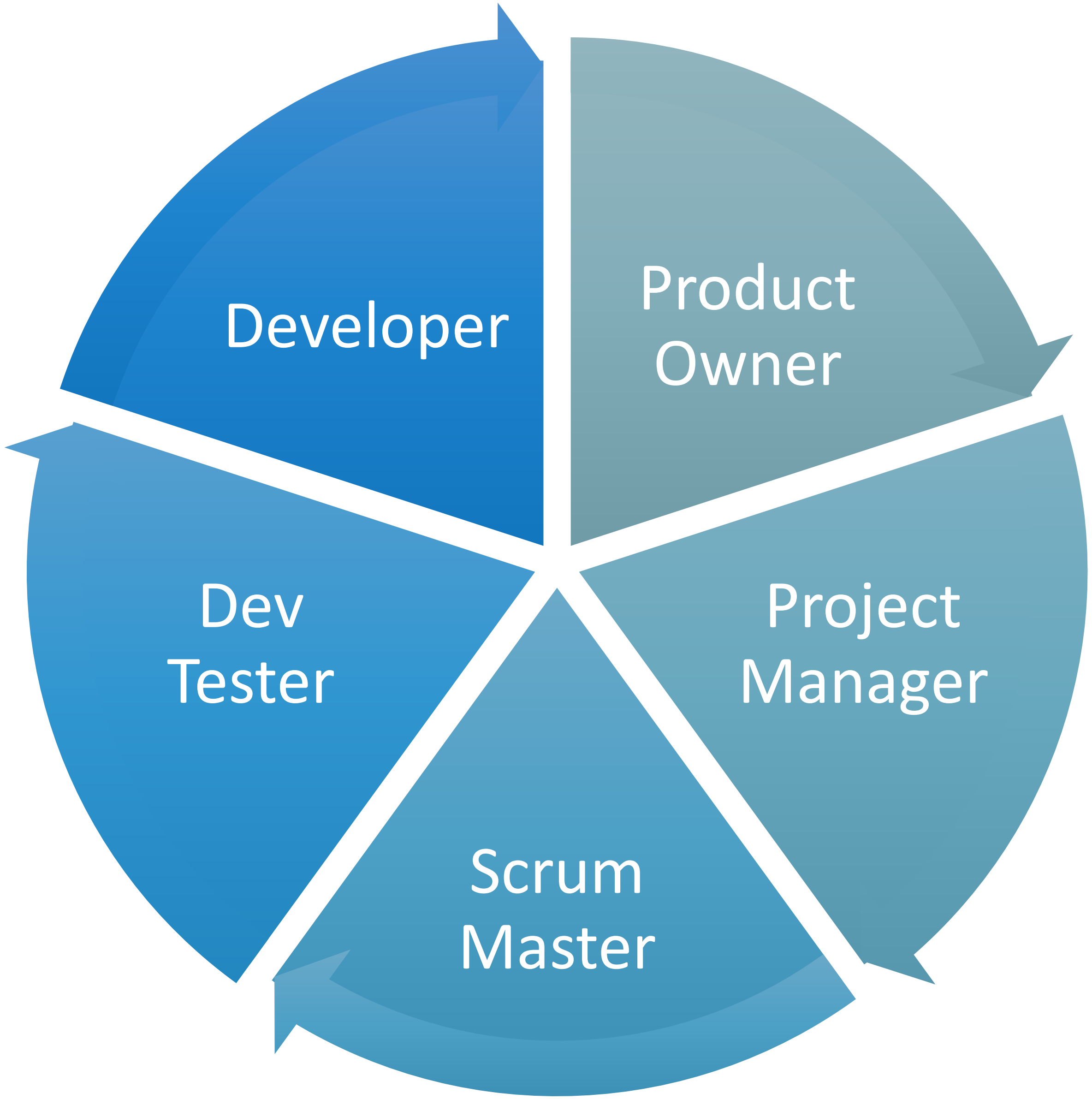
What worked well?

What didn’t work well? How can we improve things?

Do we have something that works?

Agile Roles

Roles


Developer
Product Owner
Project Manager
Scrum Master
Dev Tester

Roles

- Assign them, **assign them wisely**
- Of course, there are **many more roles** but you **don't need** them in this case.
- Roles: **People is not 1:1.** One person can have many roles, you can swap roles.
- You can **not** be the **Dev-Tester** for your **own code** - you can be a developer and a tester but only testing other people's code
- You **can't review** your **own work**

Product Owner

Is a business analyst

Consults with stakeholders and documents their input

Creates stories that can be implemented

- Does enough analysis up front
- Sufficiently described
- Are not designs

Works with QA and stakeholders to ensure acceptance criteria are right

Owns the product backlog

Prioritises all stories into backlog in consultation with the project sponsor

Scrum Master

- Ensures engineers have no roadblocks and are doing what they should be doing
- Keeps the PM updated re progress, risks, issues
- Has daily meetings with her team
- Provides technical leadership, design guidance, design review and code review
- Ensures quality is maintained at an appropriate level
- Helps his team to plan and estimate work
- Updates Sprint Board Daily
- Maintains backlog for the project, Updates backlog each Sprint
- Facilitates Showcase and Retrospectives each Sprint

Developer

Understands the story and acceptance criteria

Analyses problems

Designs solutions

- in collaboration with architect, infrastructure etc
- let's us know if major re-design is needed on existing systems

Plans and Estimates their own work

Codes and Unit Tests

Participates in design and code reviews

Asks for review and assistance

Tests their own work against acceptance criteria

Developmental Tester

Understands requirements provided by PO and writes acceptance criteria

Develops & maintains test scripts

Updates API test harnesses

Ensures unit testing happens

Ensures Dev Testing happens

Reports on progress, raises bugs, retests

Regression tests

Breaks stuff

Monitors automated build and test

Monitors code coverage

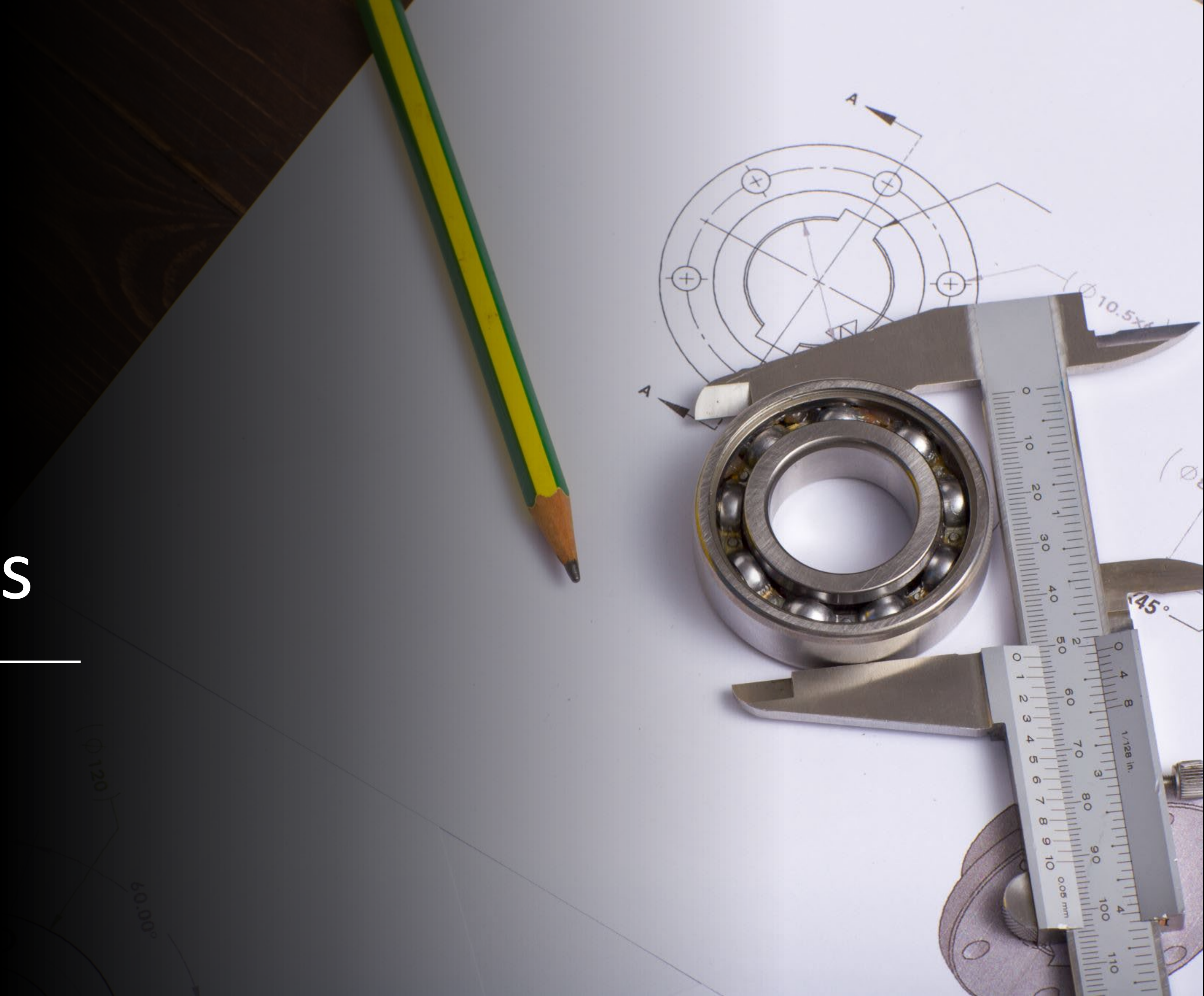
Project Manager

- Is a Communicator, Facilitator and Trouble Shooter
- Understands project goals and benefits and shares vision with the team
- Ensures work is prioritised and scheduled
- Ensures work is planned by the engineers and is carried out as scheduled
- Manages project risks and ensures mitigation is executed
- Helps make sure project stakeholders are communicated with and that goals are met
- Maintains schedules and other project documentation

Team Activity 1: Each team completes the first 3 columns

Team Member Name	GitHub email	Experience	Possible Roles (leave blank)
John Snow	j.snow@xyz.edu	Programming in C++, Work experience in Banking	
Patricia Pineo	ppineo@Netscape.com	HTML/CSS, Graphic Design	
Mark Hassan	mmh@gmail.com	Hardware circuit design, Assembler coding	
Alicia Key	alkey@unsw.edu	Python programming, Sales job experience	
Alva Hyunh	alva@toto.com	Double major in business, sports coaching	

Agile Practices



Practices

- **Review** (documents, code, design, architecture, test scripts, everything)
- **Architecture** - have one
- **Design** - everything
- **Unit Testing** - no excuses
- **Regression Testing** - automated
- **Configuration Management** (software & environments)
- **Daily Check-in**

Practices

- **Automated Testing**
- **Automated Build**
- **Continuous Integration** - at least daily
- **Daily meetings**...?
- **Sprints** (Momentum, Planning, Showcases, Retrospectives)
- **Co-locate during development**

Choosing collaboration tools

Source control

Meetings and discussions

Project Management

Document sharing

Activity 2: Each team must choose collaboration tools

- Populate remaining rows in table
    - Meetings and discussions e.g. WeChat, Facebook Messenger, MSTeams, Zoom, Discord
    - Project Management e.g. Trello, Asana
    - Document sharing e.g. Google Drive
- Same tools can be used in multiple rows
- Create more rows if necessary

Collaboration Tool Type	Collaboration Tool Name	Account Manager	Remarks
Source control	GitHub	Alva Hyunh	Repo address is…
Meetings and discussions			
Project Management			
Document sharing			

Agile Methodologies vs Agile Principles

THEY FOCUS ON:
- THINK
- INTERACT
TO ACHIEVE AGILITY