

Software Development

Dr. Hamada I. AbdulWakel¹

¹Computer Science Department

2023 - 2022





Ch2: Process Life Cycle Models

Lec#3

Agile Development Model

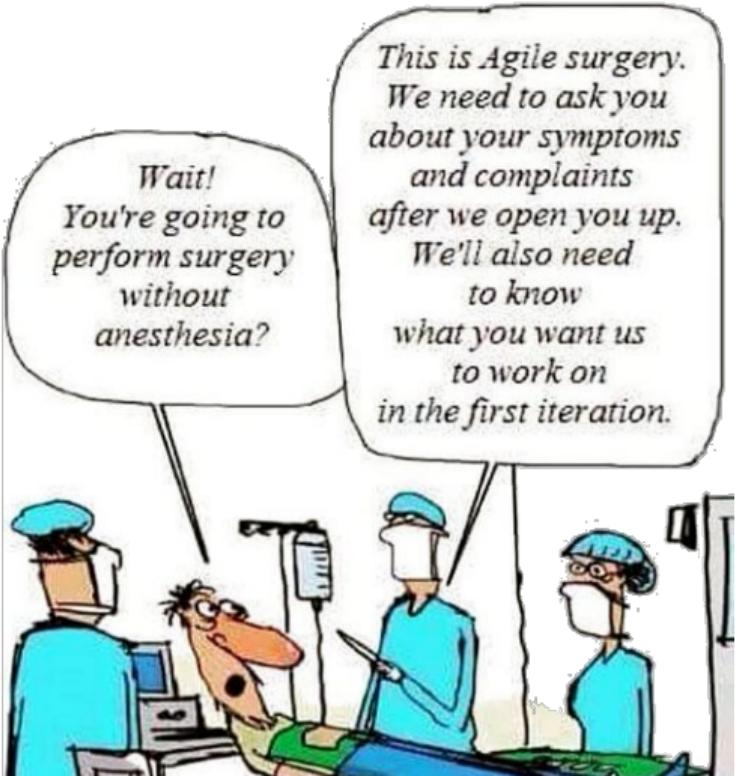
- Agile is a mindset (not street walking mindset) that helps us deliver valuable (time, cost and quality) software despite uncertainty and risk.



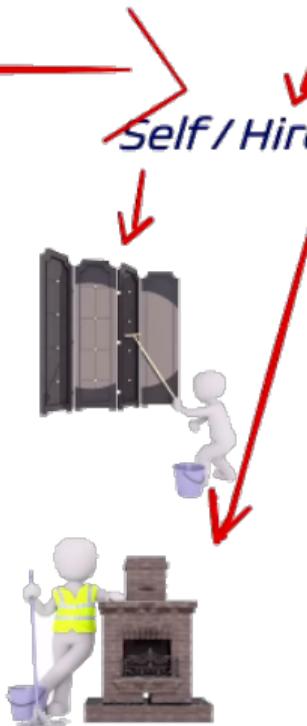
Agile Mindset

1. Focus on Value.
2. Iterative and incremental.
3. Modularity (needed for requirement validation).
4. Adaptive planning.
5. Flexible to change.
6. Fast delivery.
7. Fast learning & improvements.
8. People oriented (cross functional and self-organized team).

Agility



Agile Values



Agile Values

I Work with Customer to Respond

I = Individuals and interactions.

Work = Working software.

Customer = Customer collaboration.

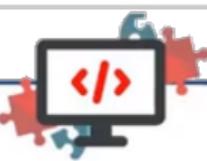
Respond = Responding to change



1

Individuals and interactions

over processes and tools



2

Working software

over comprehensive documentation



3

Customer collaboration

over contract negotiation



4

Responding to change

over following a plan

V1: Individuals and Interactions Over Processes and Tools

- Individuals may take care of processes instead of creating good product.
- A specific process does not fit all.
- Communication may be not clear and time-consuming.
- In Agile: communication easy and takes place when needed.



V2: Working Software Over Comprehensive Documentation

- No SRS, Technical documents, Risk documents, or Bug sheet, etc.
- Working software is primary measure of progress.
- The backlog is ordered list of all the work, presented in story form, for a team.
- Demonstrations/Reviews.



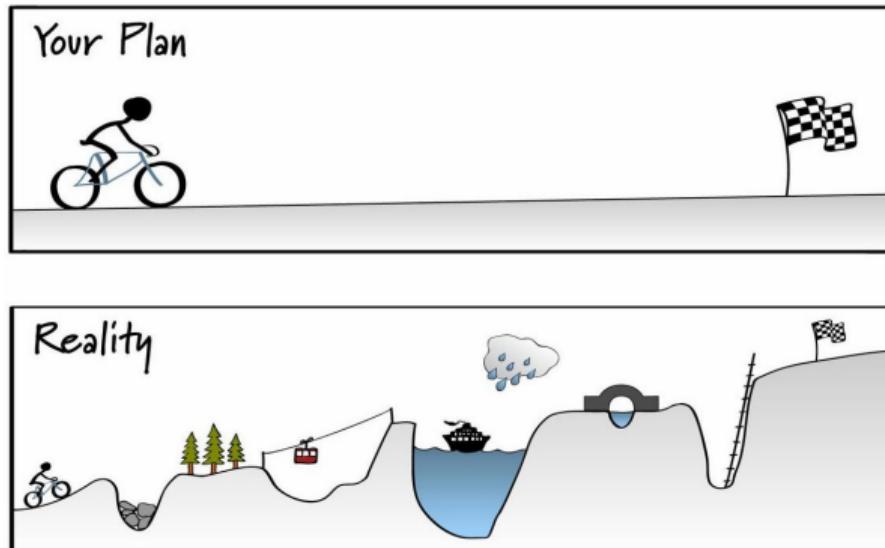
V3: Customer Collaboration Over Contract Negotiation

- Discover, ask, learn and modify during a project.
- Customer reviews and sees the product at the end of every sprint.
- Create an opportunity for increased customer satisfaction and return on investment by handling change effectively.



V4: Responding to Change Over Following a Plan

- Welcome changing requirements, even late in development.
- Backlog refinement based on demonstration/reviews.
- Retrospectives.



Read Then Answer?

Key stakeholders with product owner, team leader and his team in a meeting. As the product owner began to share the project's vision, a stakeholder asked when they would receive the full project management plan. How does agile master respond to that request?

1. Promise to submit as soon as possible.
2. Tell the stakeholder that it will be ready after collecting all requirements.
3. Talk with the stakeholder about agile mindset.
4. Tell stakeholders that no documentation is needed in agile projects.

Agile Principles

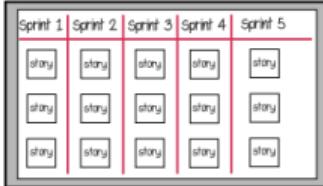
1 Satisfy the **customer**



2 Welcome **change**



3 Deliver **frequently**



4 Work **together**



5 Trust and **support**



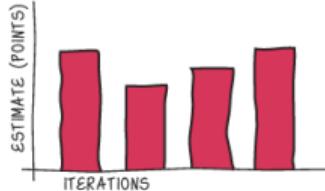
6 Face-to-face **conversation**



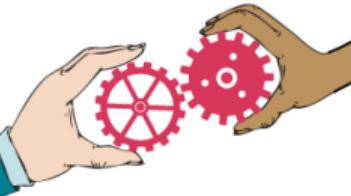
7 Working **software**



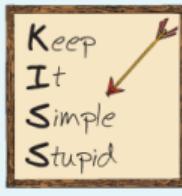
8 Sustainable **development**



9 Continuous **attention**



10 Maintain **simplicity**



11 Self-organizing **teams**



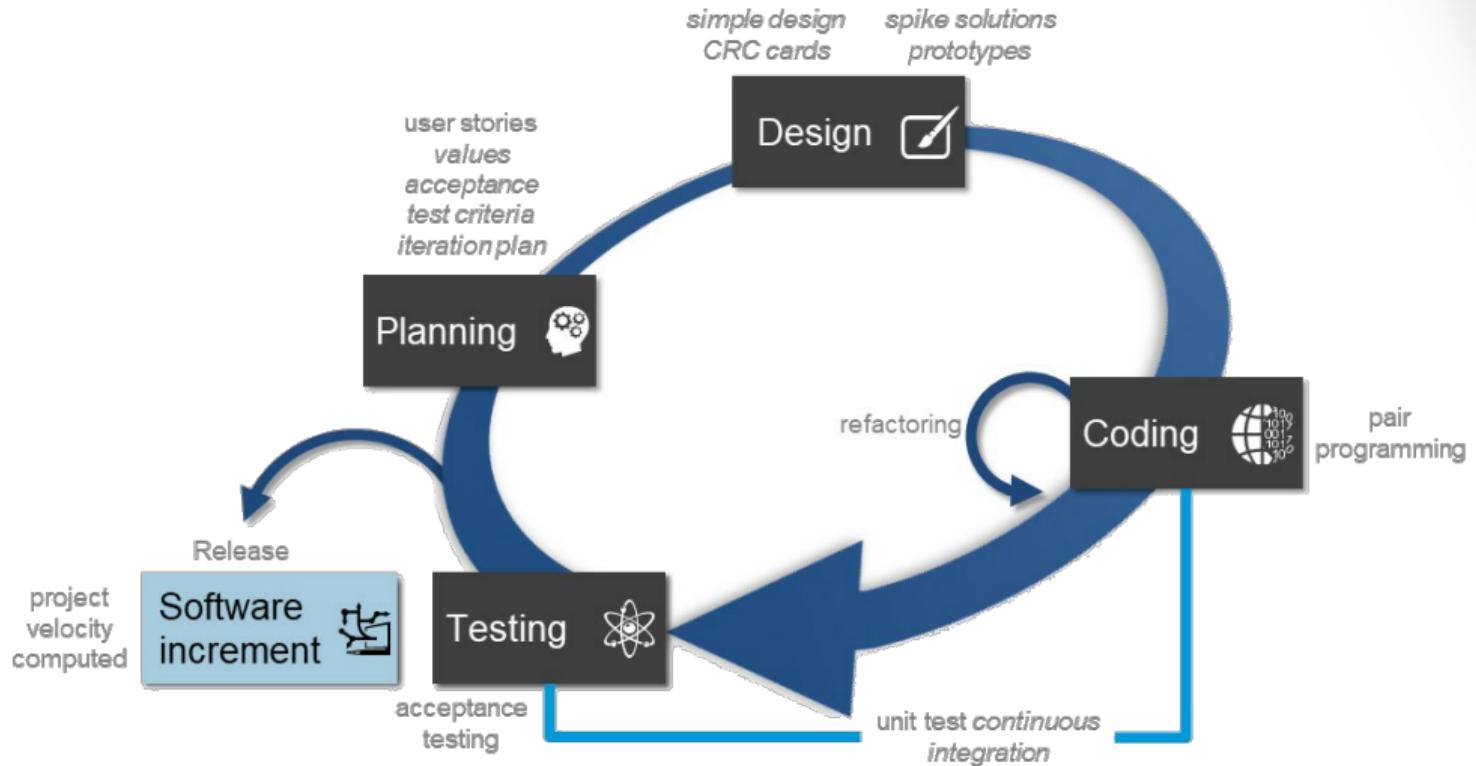
12 Reflect and **adjust**



eXtreme Programming Practices

- XP is a style of software development focusing on excellent application of programming techniques, clear communication, and teamwork which allows us to accomplish things we previously could not even imagine.
- "Extreme" means the practices get "turned up" to much higher "volume" than on traditional projects.
- XP is a lightweight, humanistic (i.e., People-oriented), efficient low risk, flexible, and predictable methodology to develop software.

XP Processes



XP Values

- **Communication:** enhance the communication of team members with customers.
- **Simplicity:** build something simple that will work today rather than something that takes time. Never think tomorrow.
 1. Follow **YAGNI** "You Ain't Gonna Need It".
 2. Follow **DRY** "Don't Repeat Yourself".
- **Feedback:** continuous feedback must be taken from customer.
- **Courage:** put your work out there for others to review, inspect, and edit.
- **Respect:** must maintain among the team members and stakeholders. Quality and the success or failure of the project is everyone's responsibility.

Pair Programming in XP

- Two programmers are sitting together at the same workstation for developing.
- Knowledge sharing is important as it reduce overall risk to the project.
- Advantages:
 1. Individual not responsible, team is responsible.
 2. It act as informal review process.

User Stories Representations

- A user story is a tool used in Agile SWD to capture a description of a SW feature from an end-user perspective.
- A user story describes the type of **user, what they want and why**. It helps to create a simplified description of a requirement.

User Stories Representations ...

Story Title

User Story 1

As a(stakeholder)
I want to (task),
So That (desired result)

Acceptance Criteria

Measurable results, what defines "done"?
And I know I am done when

User Stories Representations Example



As an Account Manager
I want a sales report of my account
to be sent to my inbox daily
So that I can monitor the sales
progress of my customer portfolio

Acceptance criteria:

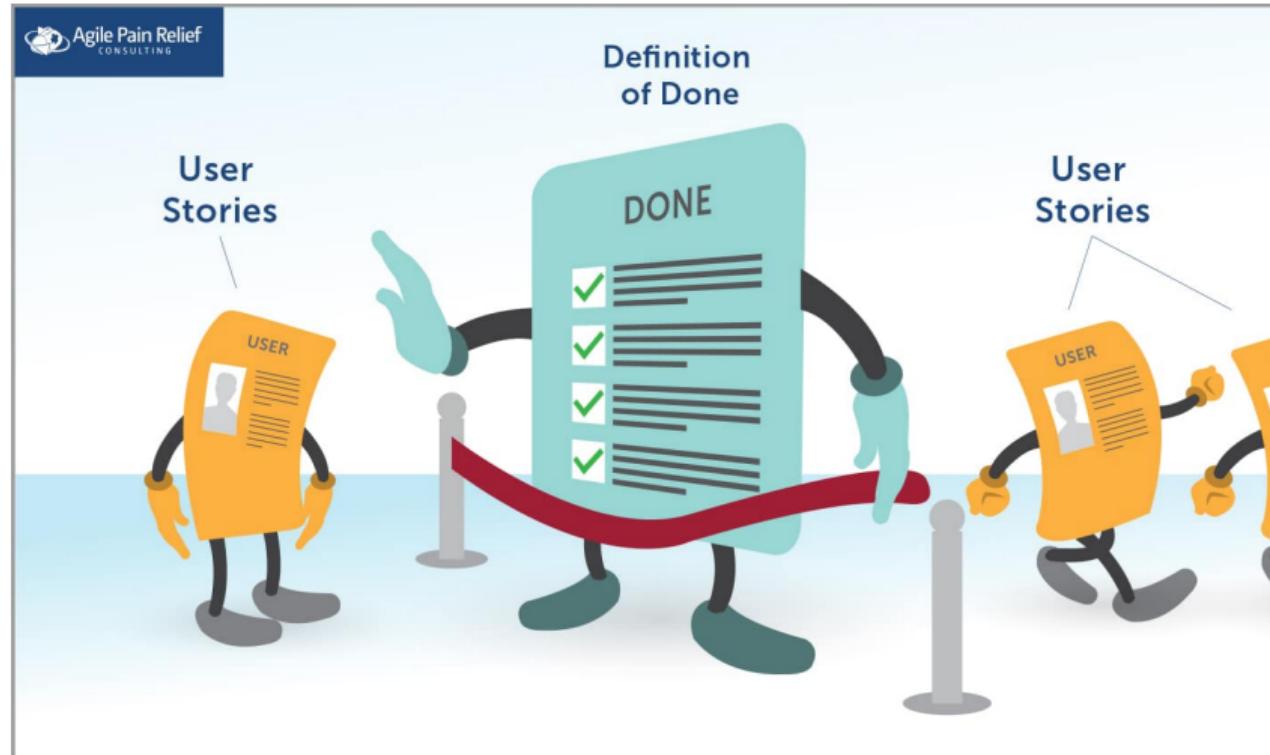
1. The report is sent daily to my inbox
2. The report contains the following sales details: ...
3. The report is in csv format.



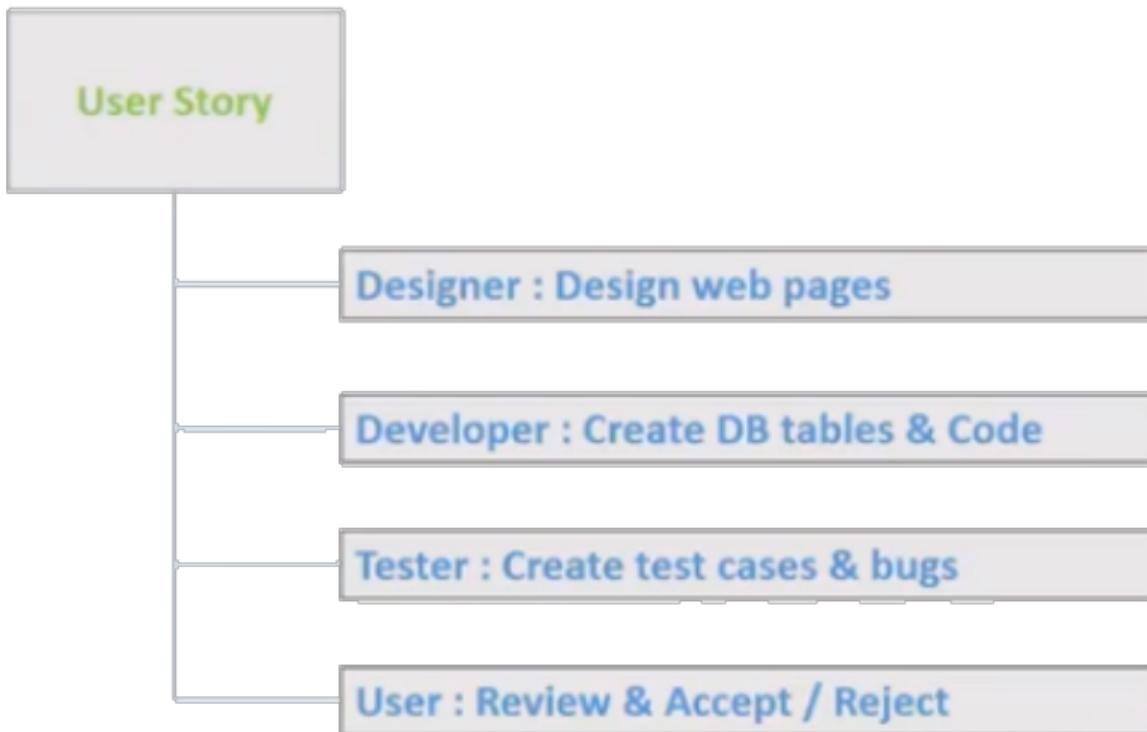
User Stories Representations Example ...

**As an
admin user
I want to
disable a user
So I can
prevent unauthorized logins by past
employees**

User Stories Sorting



User Story Implementation



Scrum Framework

Inputs from Executives,
Team, Stakeholders,
Customers, Users:



Product Owner



The Team



Product Backlog

Team selects starting at top as much as it can commit to deliver by end of Sprint

Sprint Planning Meeting



Sprint Backlog

Scrum Master

Every 24 Hours

1-4 Week Sprint

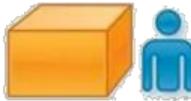
Sprint end date and team deliverable do not change



Daily Scrum Meeting



Sprint Review



Finished Work



Sprint Retrospective

Scrum Roles

- **Product Owner:** is responsible for defining and sequencing the work that is to be done.
- **Scrum Master:** keeps things organized and helps remove obstacles that could slow down the development team.
- **Development Team:** does the work.

Scrum Events

- **Sprint:** is a time-boxed fixed length iteration. Typically 2 weeks in length, but no more than 4 weeks. The team sticks with it.
- **Sprint Planning:** is a collaborative effort and involves the whole team having discussions about what has a valuable return on investment and define the work and the goal they want to achieve in the upcoming sprint.
- **Daily Scrum (Standup):** is a daily 15 minute time-boxed meeting for the team to coordinate their work toward achieving the sprint goal.
- **Sprint Review:** a collaborative meeting to show what was accomplished during the sprint (i.e., Demo) and get feedback on the work shown to stakeholders.
- **Sprint Retrospective:** is a chance for the team to reflect on how things have gone and how they can improve.

Scrum Artifacts

- **Product Backlog:** is a list of things that the product owner wants.
- **Sprint Backlog:** a set of items selected from product backlog for the sprint.
- **Increment:** is the thing that is actually delivered (i.e., a new release).

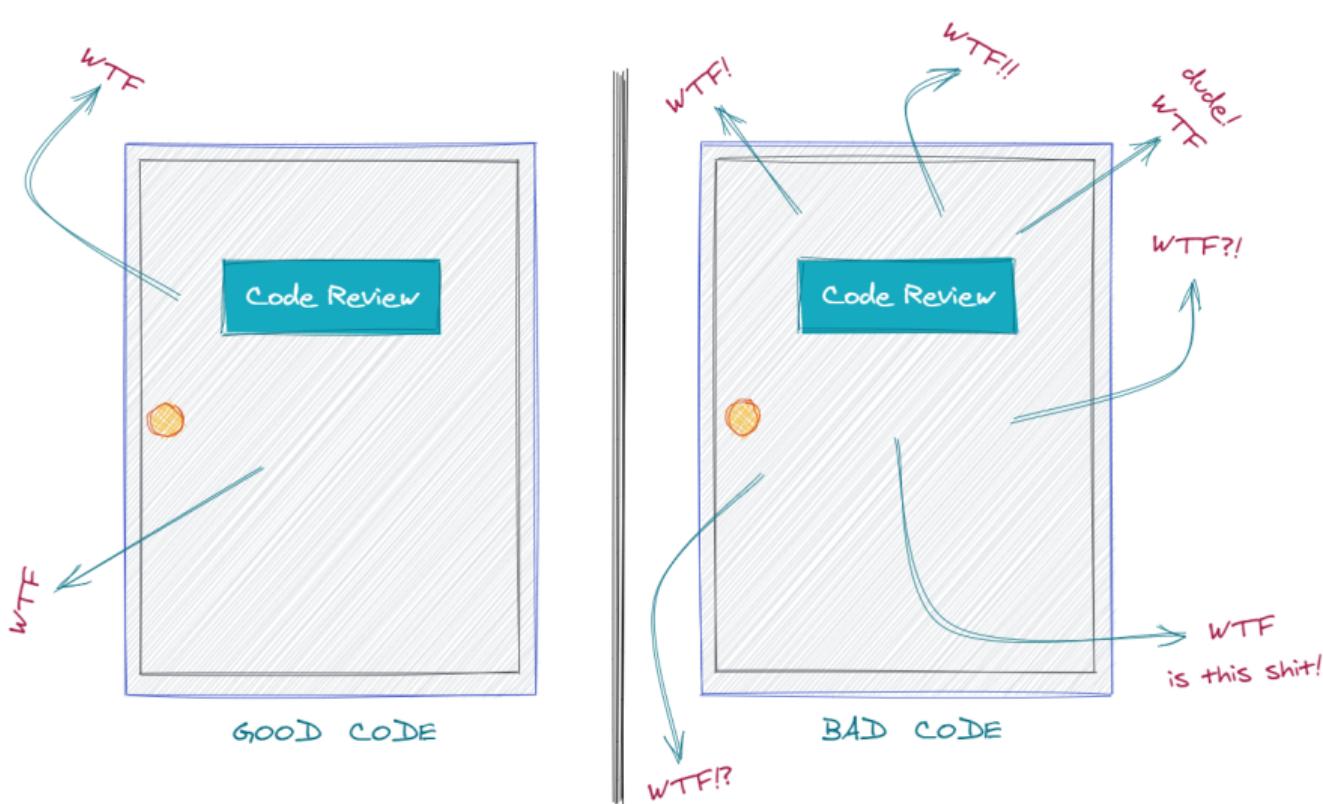


Ch3: Code Construction

Uncle Bob??!!



Code Quality Measure



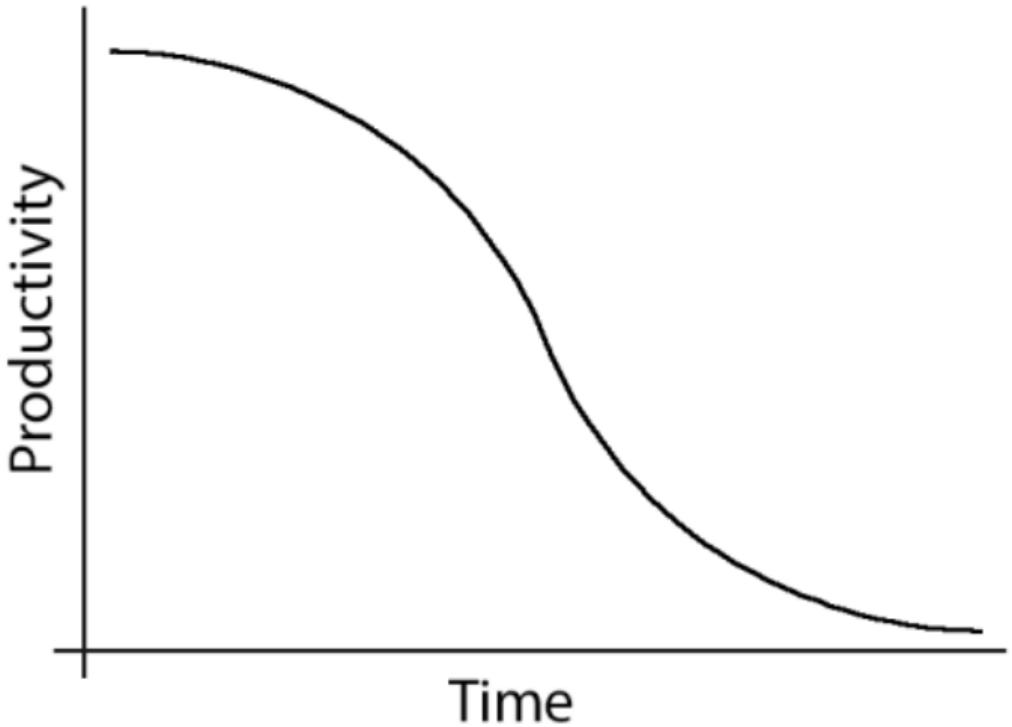
How Do You Write Clean Code?

ATTENTION

YOUR MOTHER DOESN'T
WORK HERE.

PLEASE CLEAN UP YOUR
OWN MESS!

Cost of Bad Code



What is Clean Code?

* One Question ...



...many answers!

Why Clean Code??

- Simplicity & Clearness.
- Ability to respond to change requests
- Easy to bring new resources into project.
- Logic behind the code.
- Time & Cost savings. **LeBlanc's law: Later equals never.**

خليها كدا دلوقت بس ونعملها ريفاكتورينج
علي نضيف بعدين..
- مسيلمة الكذاب

- Easy to unit test code.
- Issue detection and resolution is more efficient.
- Reduce repeated code.

What is Refactoring?



Code Refactoring

How to write great code that is easy to modify and understand. Making code better without changing the functionality.