SOFTWARE TESTING

TEST-DRIVEN DEVELOPMENT

Mahdi Roozbahani

Slides are based on Alex Orso.

FROM WATERFALL ...

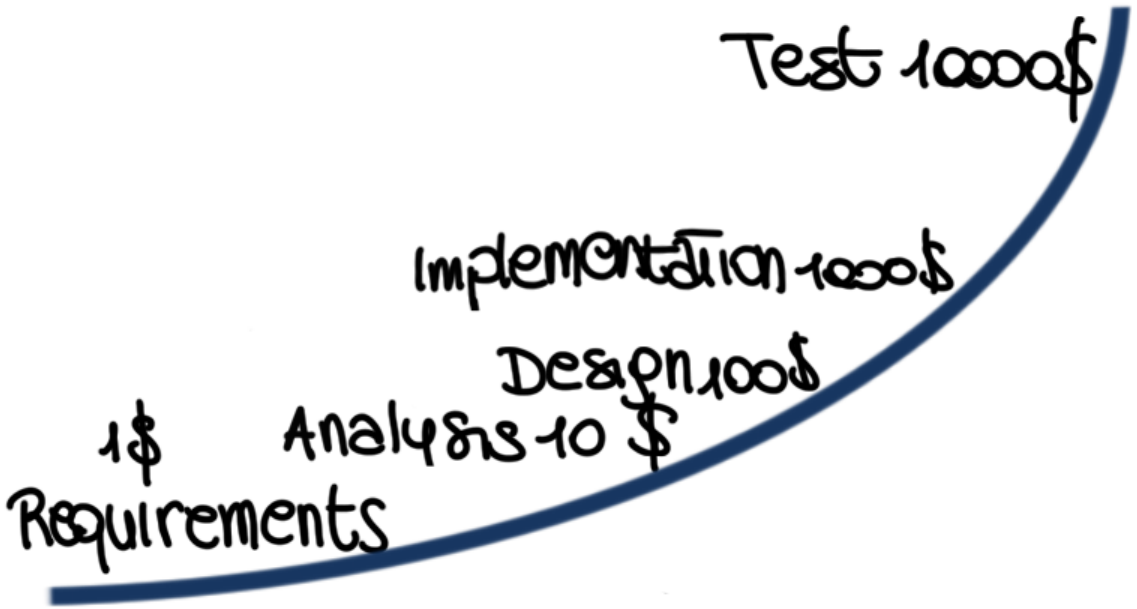
FROM WATERFALL ...

... TO AGILE

AS BOEHM SAID...

Cost of change grows exponentially with time

AS BOEHM SAID...



Cost of change grows exponentially with time

WHAT TO DO, THEN ?

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Discover errors early ⇒ upfront planning

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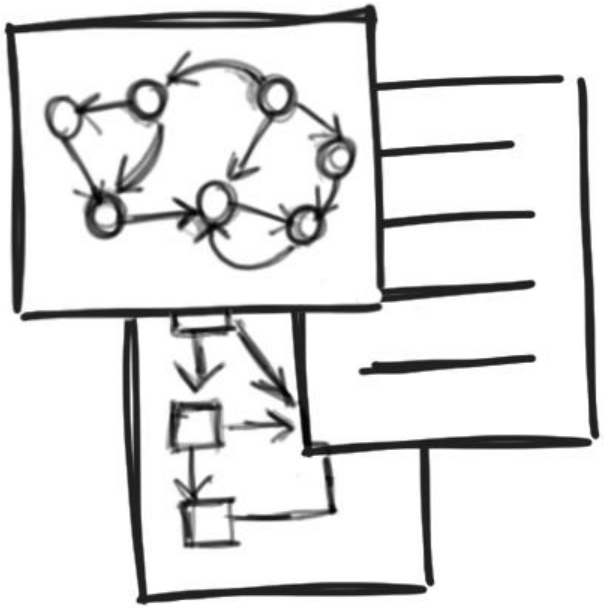
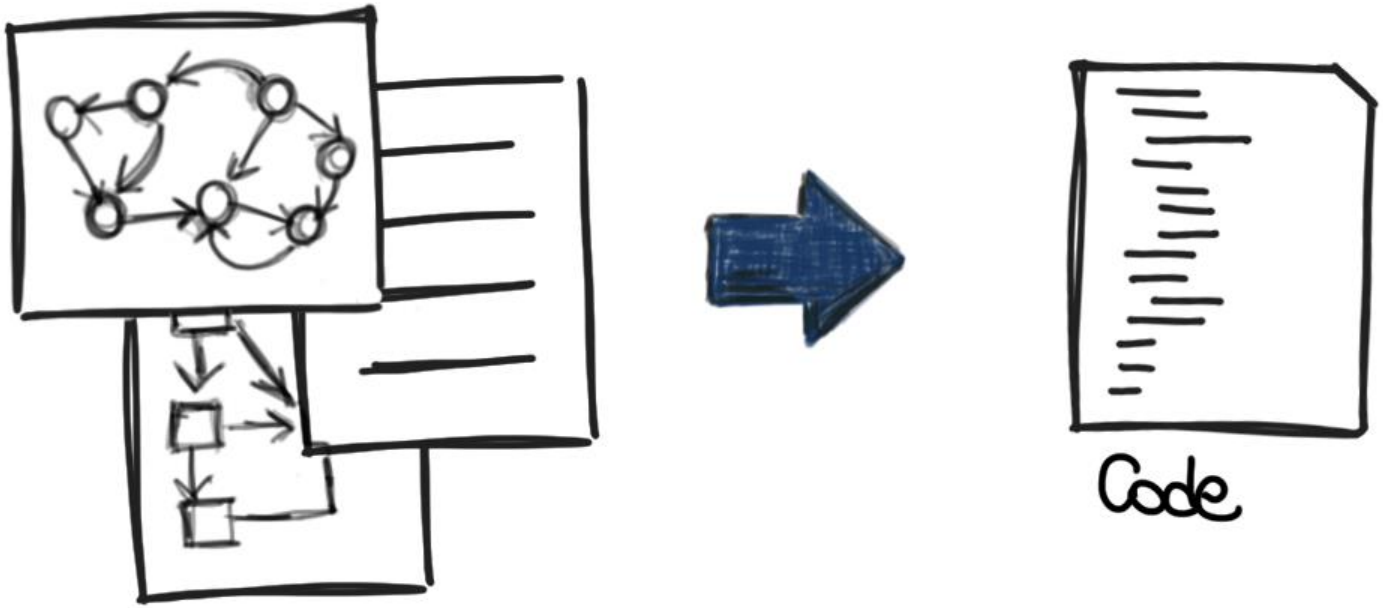


Model documents

WHAT TO DO, THEN ?

Discover errors early ⇒ upfront planning



SOMETHING CHANGED IN THE LAST 30 YEARS

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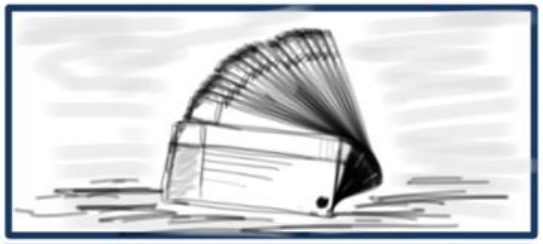

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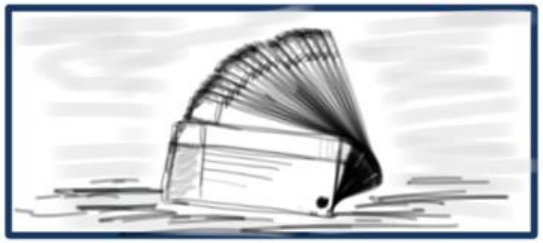

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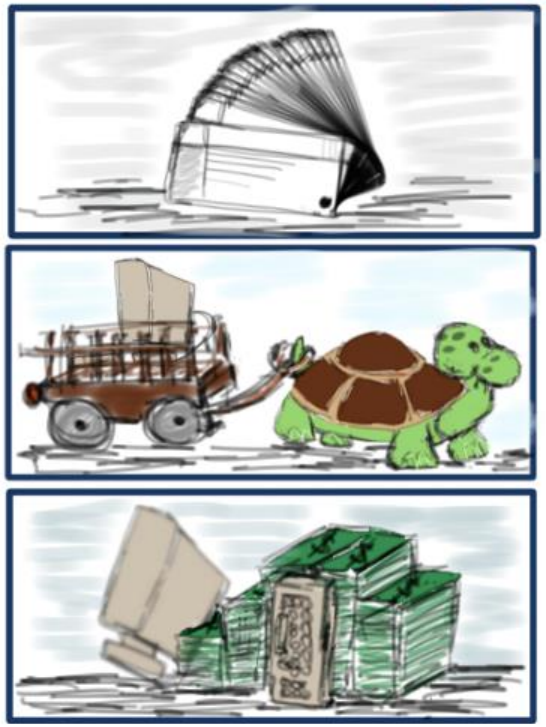

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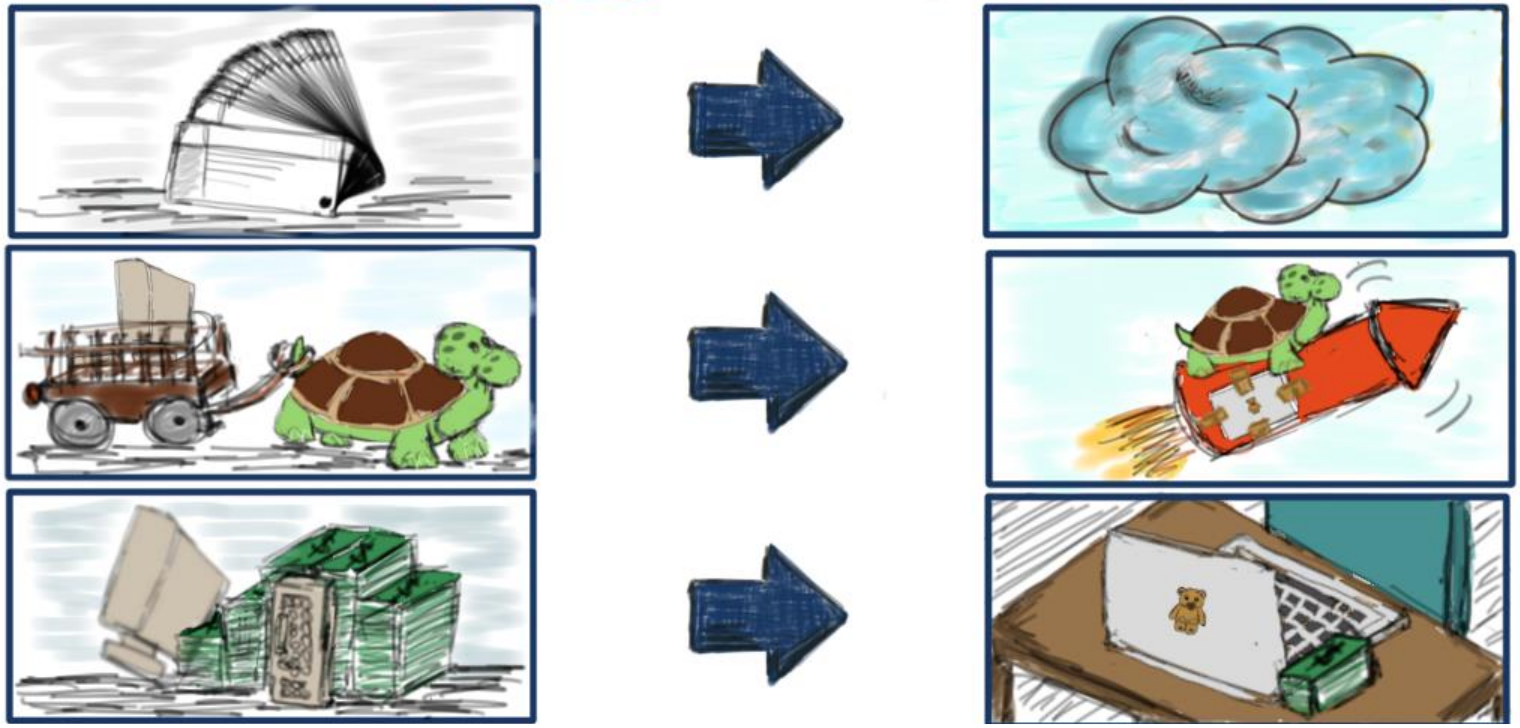

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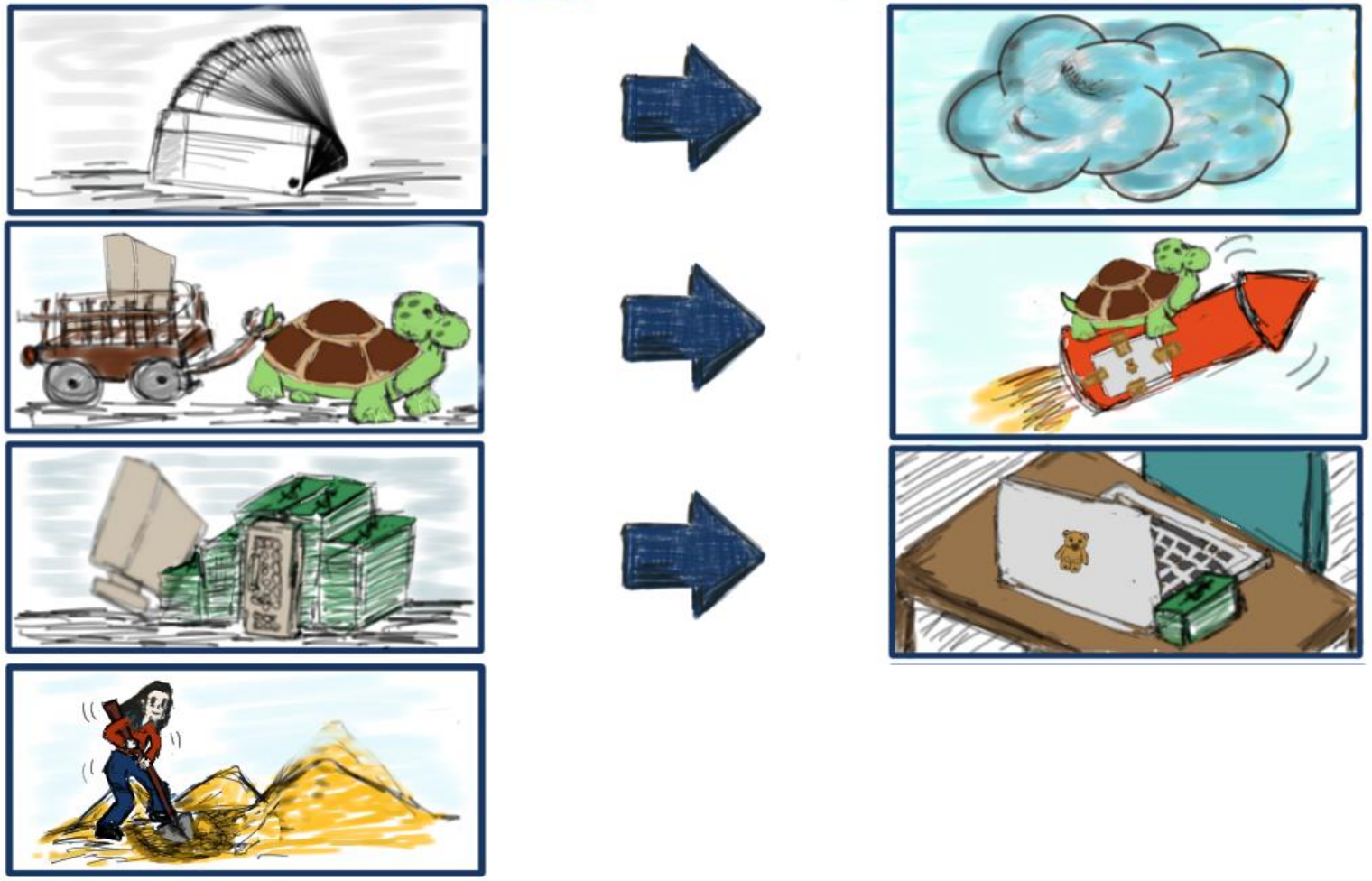

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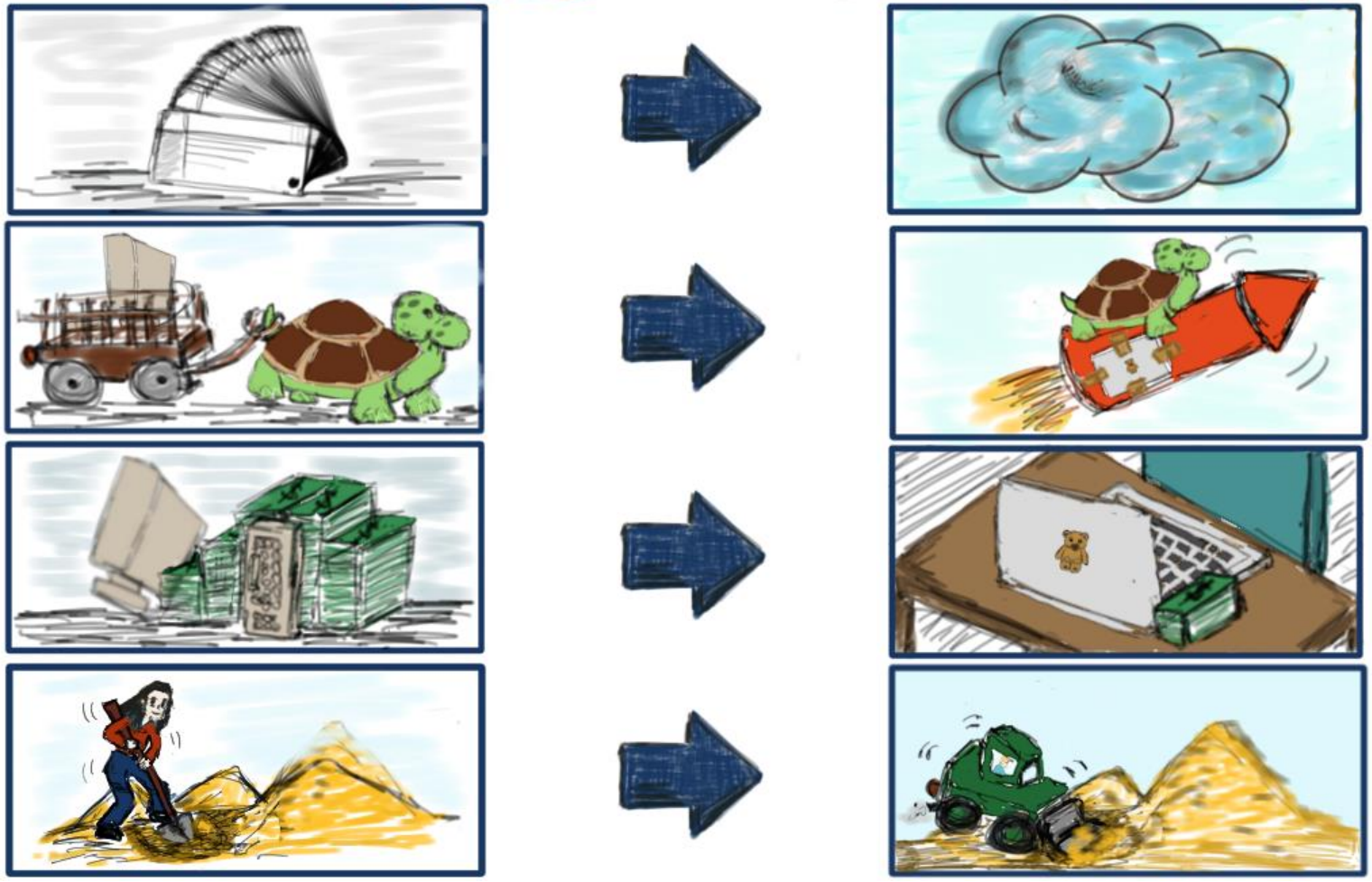

SOMETHING CHANGED IN THE LAST 30 YEARS

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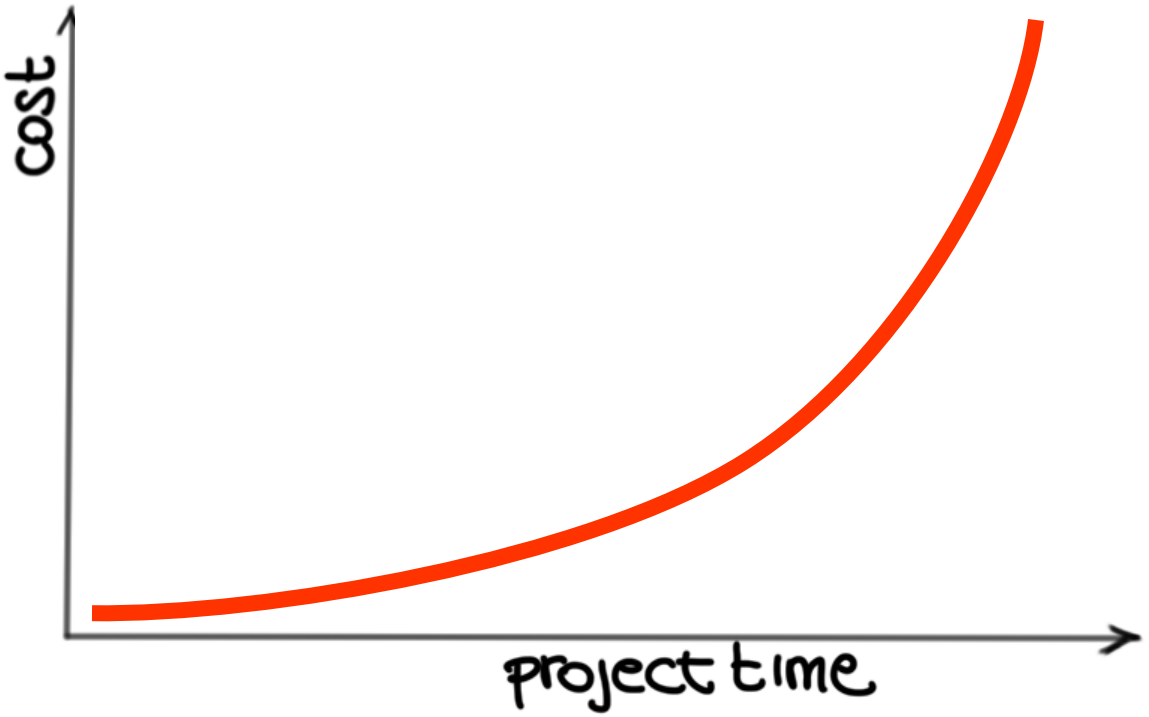

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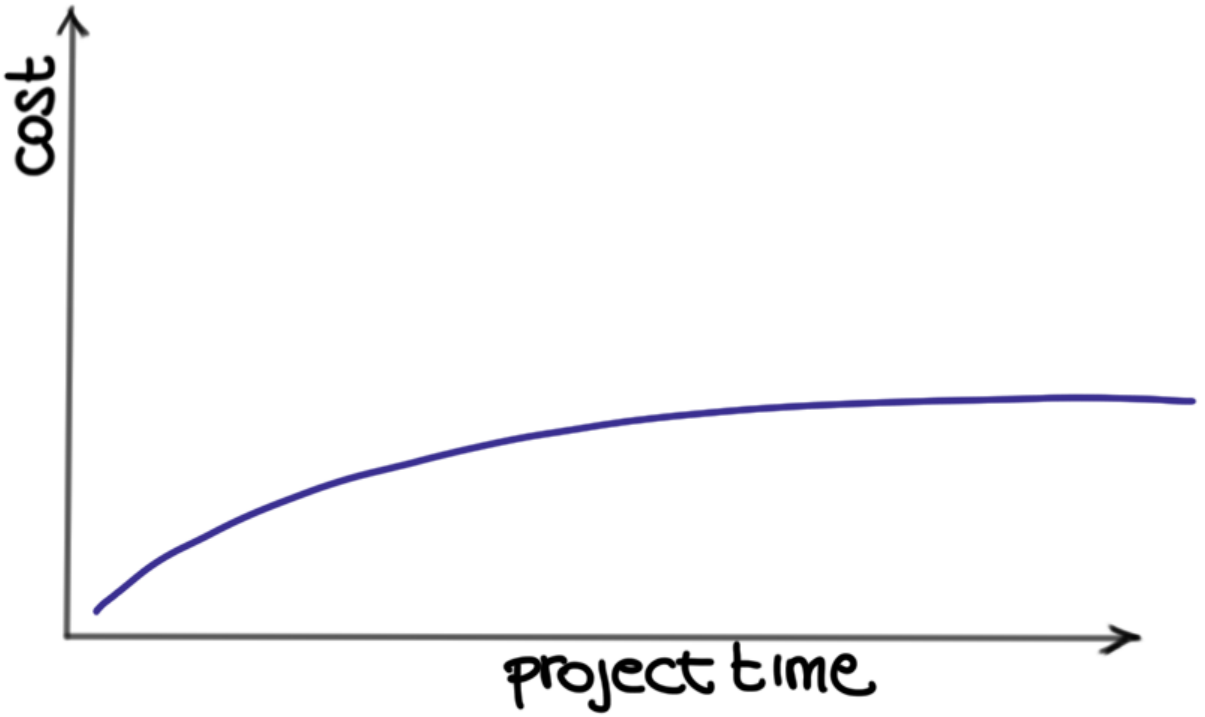

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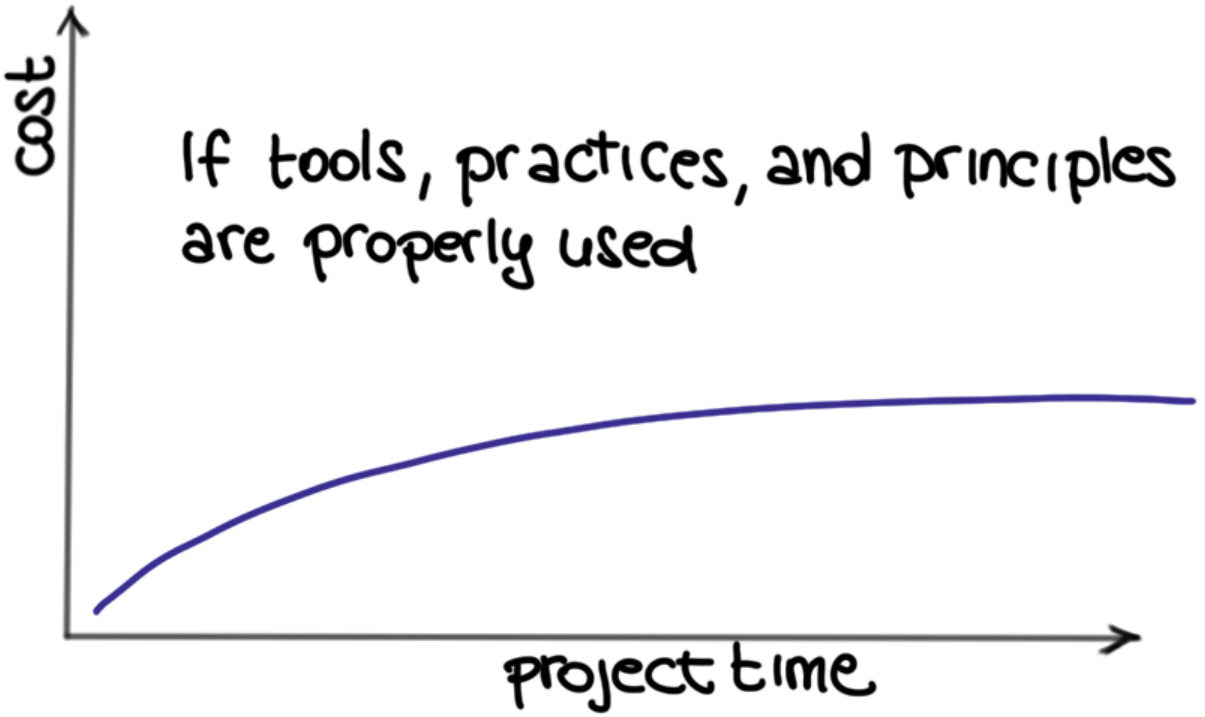

IF COST IS FLAT...

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Upfront work == liability

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Ambiguity, volability ⇒ good to delay

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Upfront work == liability

Ambiguity, volability ⇒ good to delay

There is value in waiting!

AGILE METHODS AIM AT FLAT COST

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Manifesto for agile software development

Manifesto for Agile Software Development

We are uncovering better ways of developing
software by doing it and helping others do it.
Through this work we have come to value:

Individuals and interactions over processes and tools
Working software over comprehensive documentation
Customer collaboration over contract negotiation
Responding to change over following a plan

That is, while there is value in the items on
the right, we value the items on the left more.

Kent Beck
Mike Beedle
Arie van Bennekum
Alistair Cockburn
Ward Cunningham
Martin Fowler
James Grenning
Jim Highsmith
Andrew Hunt
Ron Jeffries
Jon Kern
Brian Marick
Robert C. Martin
Steve Mellor
Ken Schwaber
Jeff Sutherland
Dave Thomas

AGILE METHODS AIM AT FLAT COST

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Focus on the code

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People over process

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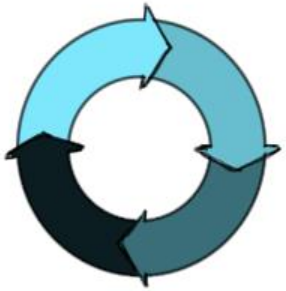
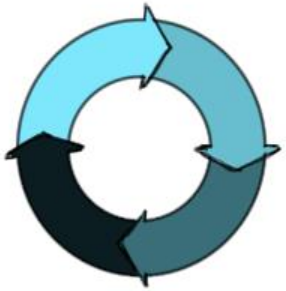


Iterative approach

AGILE METHODS AIM AT FLAT COST

Focus on the code

People over process



Iterative approach

Customer involvement

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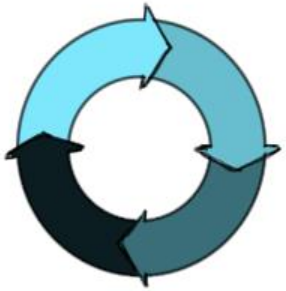
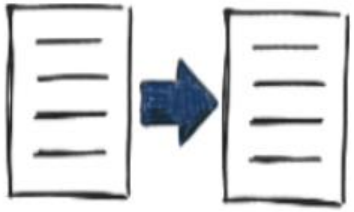
People over process



Iterative approach

Customer involvement



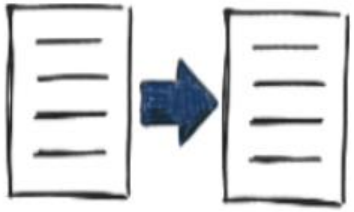
Expectation that requirements will change

AGILE METHODS AIM AT FLAT COST

Focus on the code

Customer involvement

People over process



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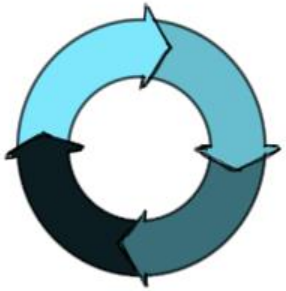

Iterative approach

Simplicity

XP

"XP is a lightweight methodology for small to medium sized teams developing software in the face of vague or rapidly changing requirements "

Kent Beck

WHAT IS XP?

WHAT IS XP?

Lightweight

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Lightweight

Humanistic

WHAT IS XP?

Lightweight

Discipline

Humanistic

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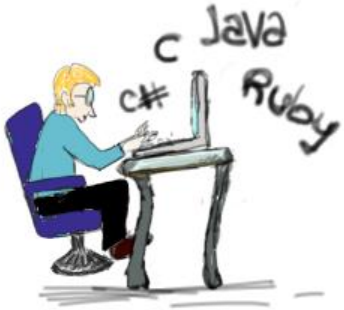
Lightweight

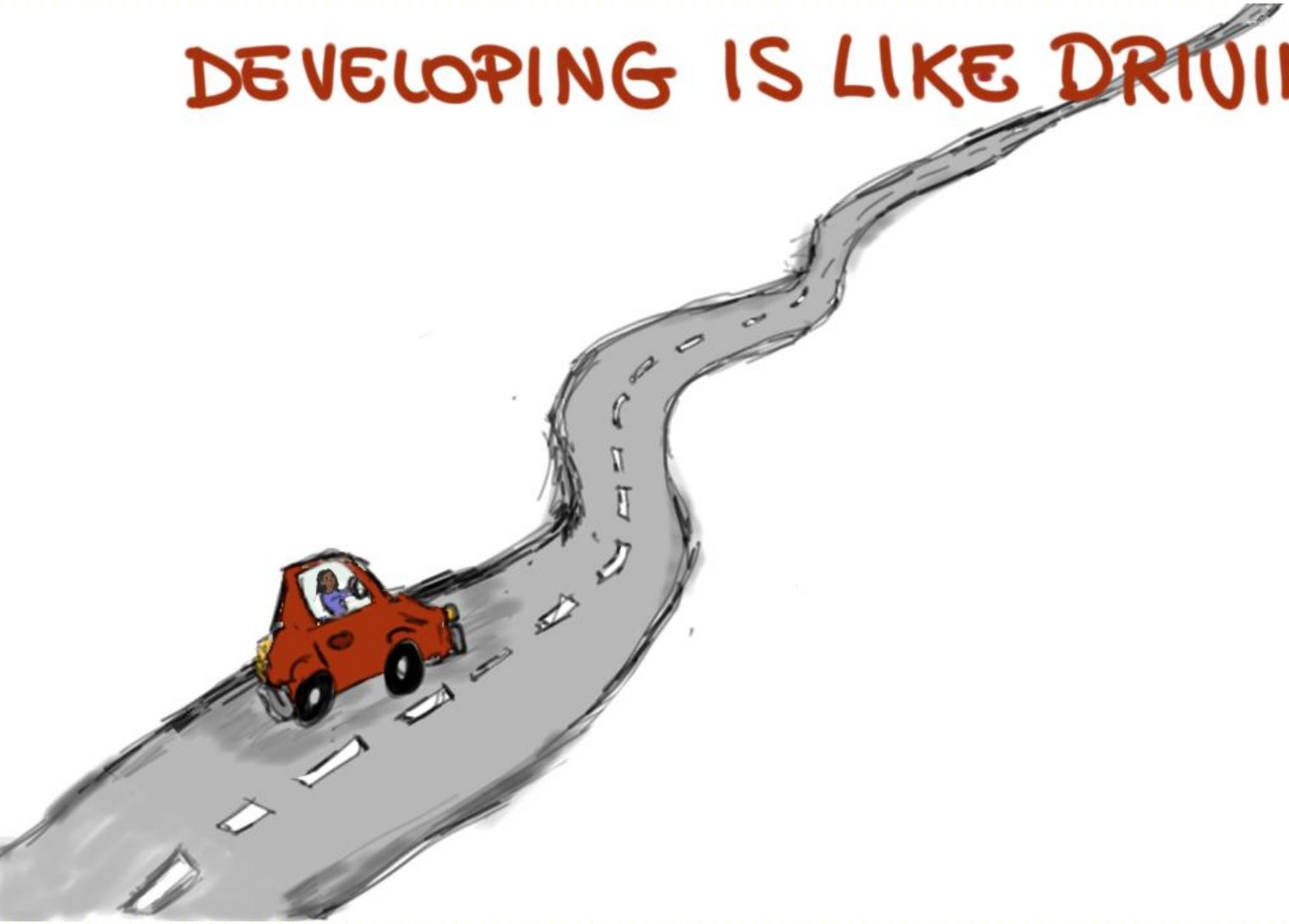
Discipline

Humanistic



Software development

DEVELOPING IS LIKE DRIVING



MENTALITY OF SUFFICIENCY

How would you program if you had all the time in the world?

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- Write tests

MENTALITY OF SUFFICIENCY

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- Write tests
- Restructure often

MENTALITY OF SUFFICIENCY

How would you program if you had all the time in the world?

- Write tests
- Restructure often
- Talk with fellow programmers and with the customer often

XP'S VALUES AND PRINCIPLES

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Communication

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Communication

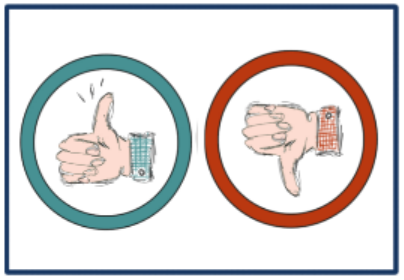
Simplicity

XP'S VALUES AND PRINCIPLES

Communication

Simplicity

Feedback



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Communication

Simplicity

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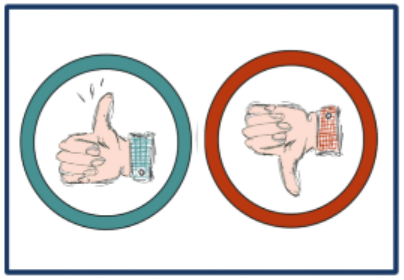


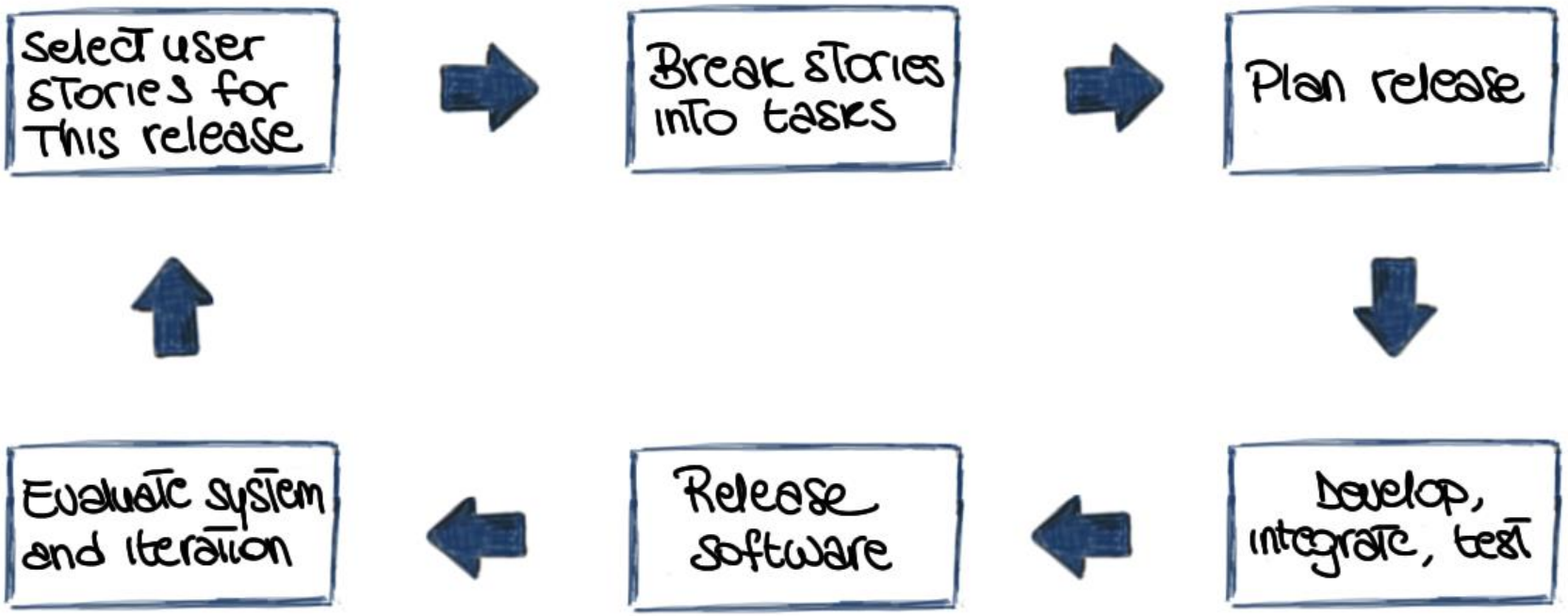
Courage

XP'S PRACTICES

1) Incremental planning
2) Small releases
3) Simple design
4) Test first
5) Refactoring
6) Pair programming
7) Continuous integration
8) On-site customer

...

INCREMENTAL PLANNING



SMALL RELEASES

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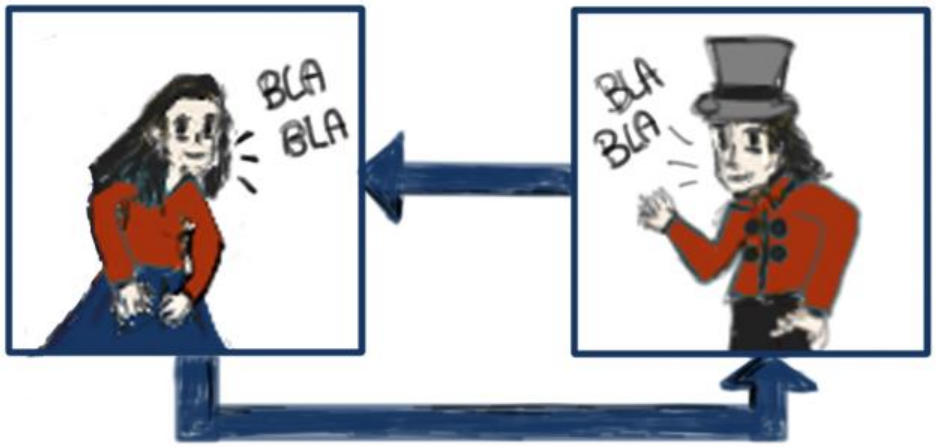

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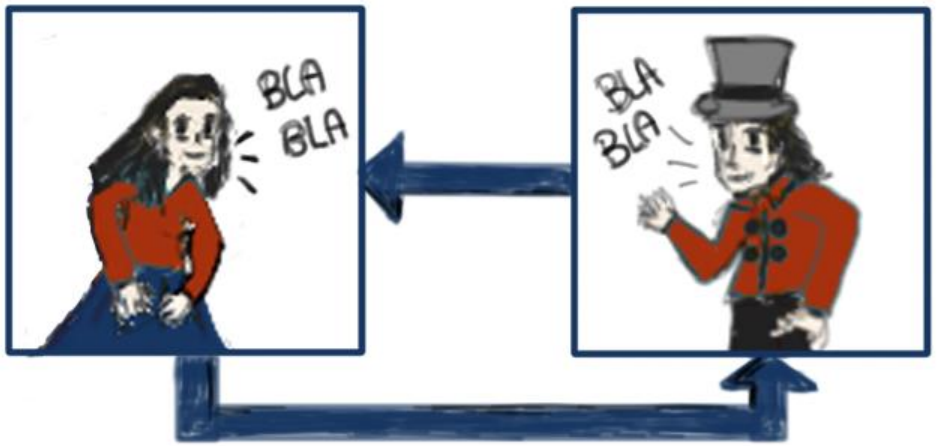

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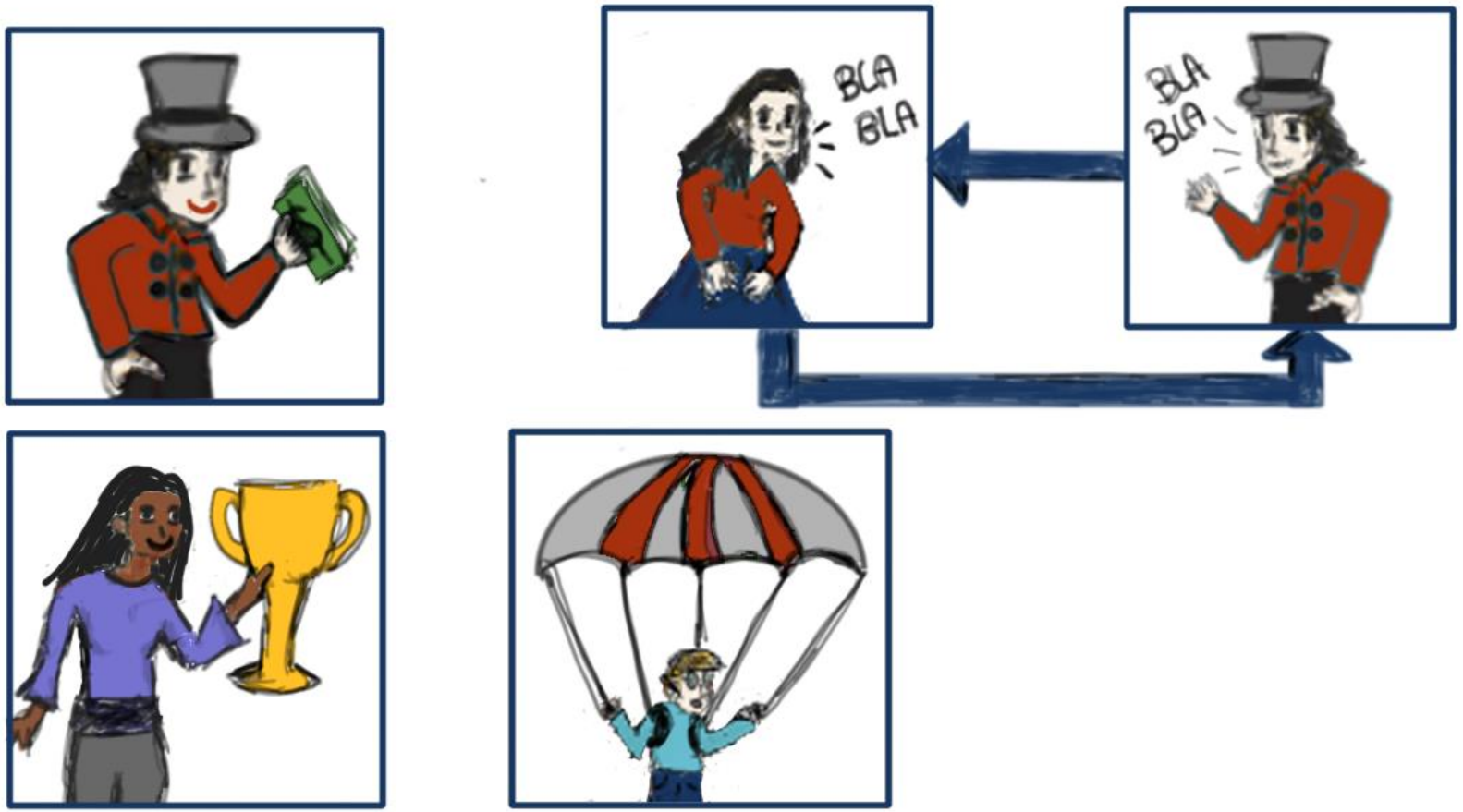

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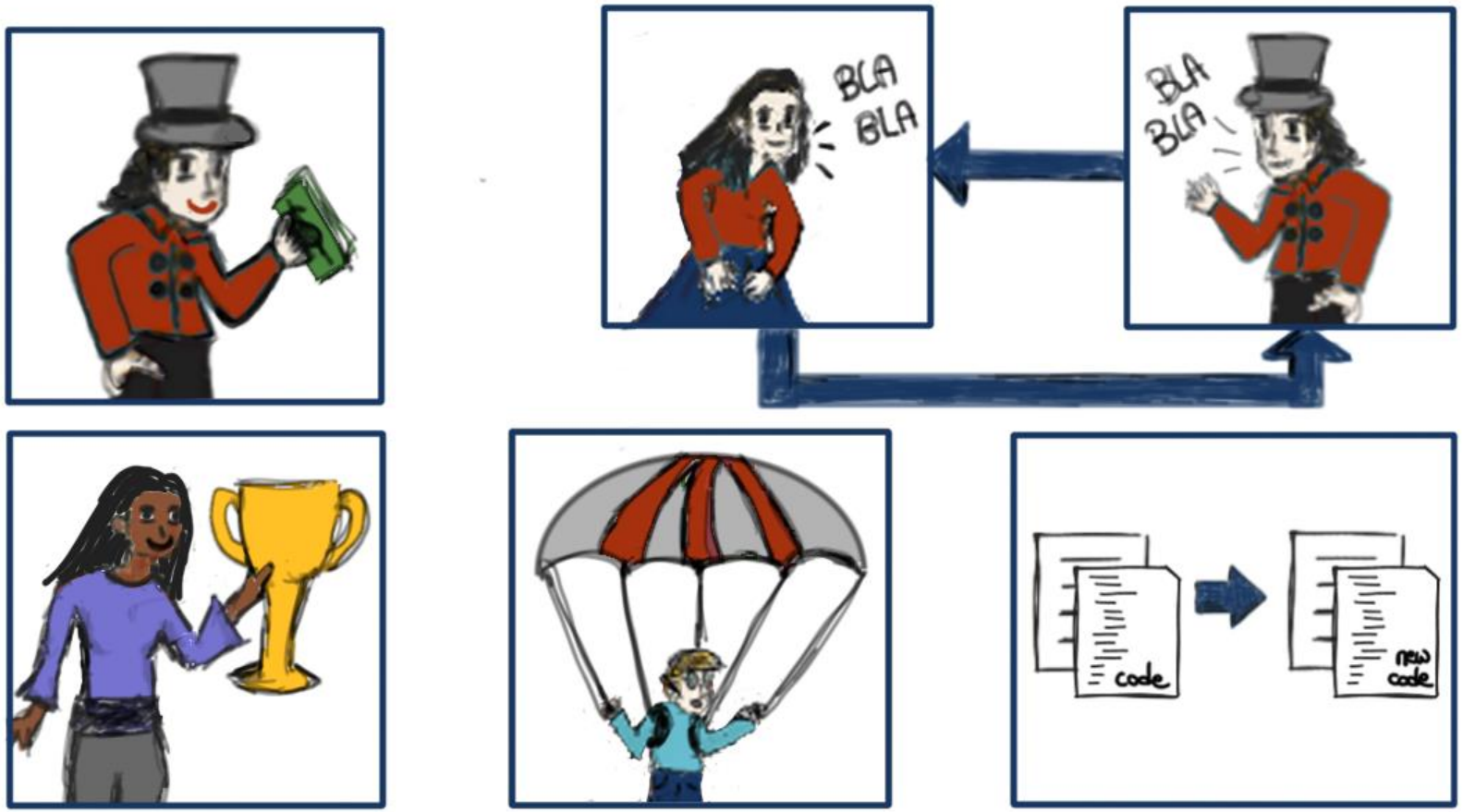

SIMPLE DESIGN

Enough to meet the requirements

No duplicated functionality

Fewest possible classes and methods

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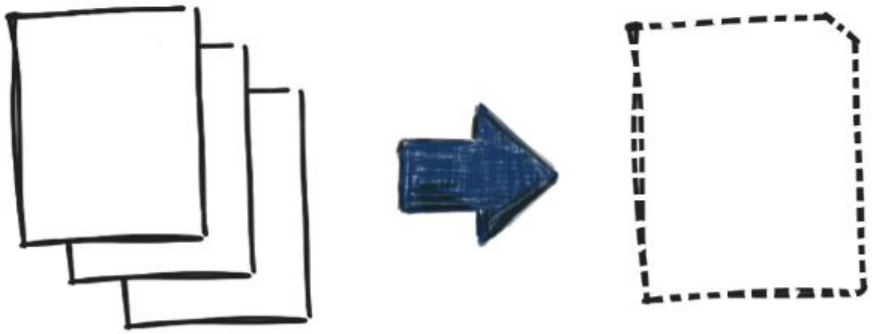

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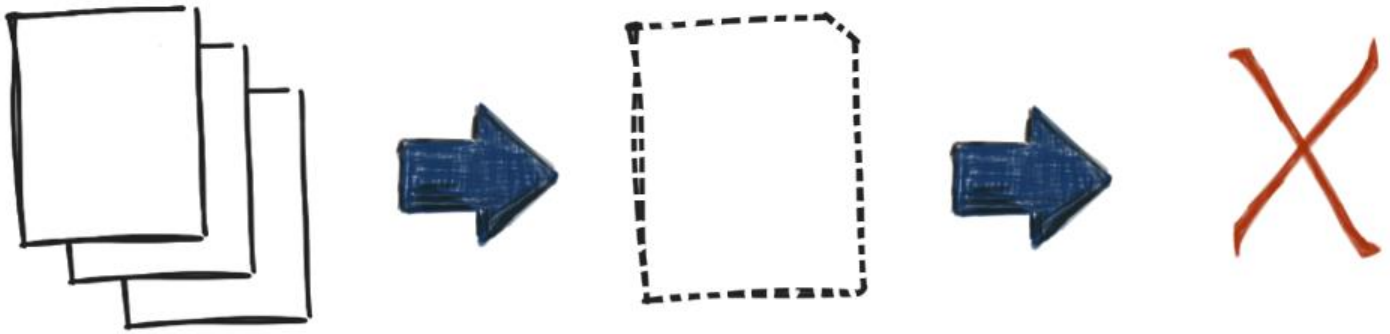

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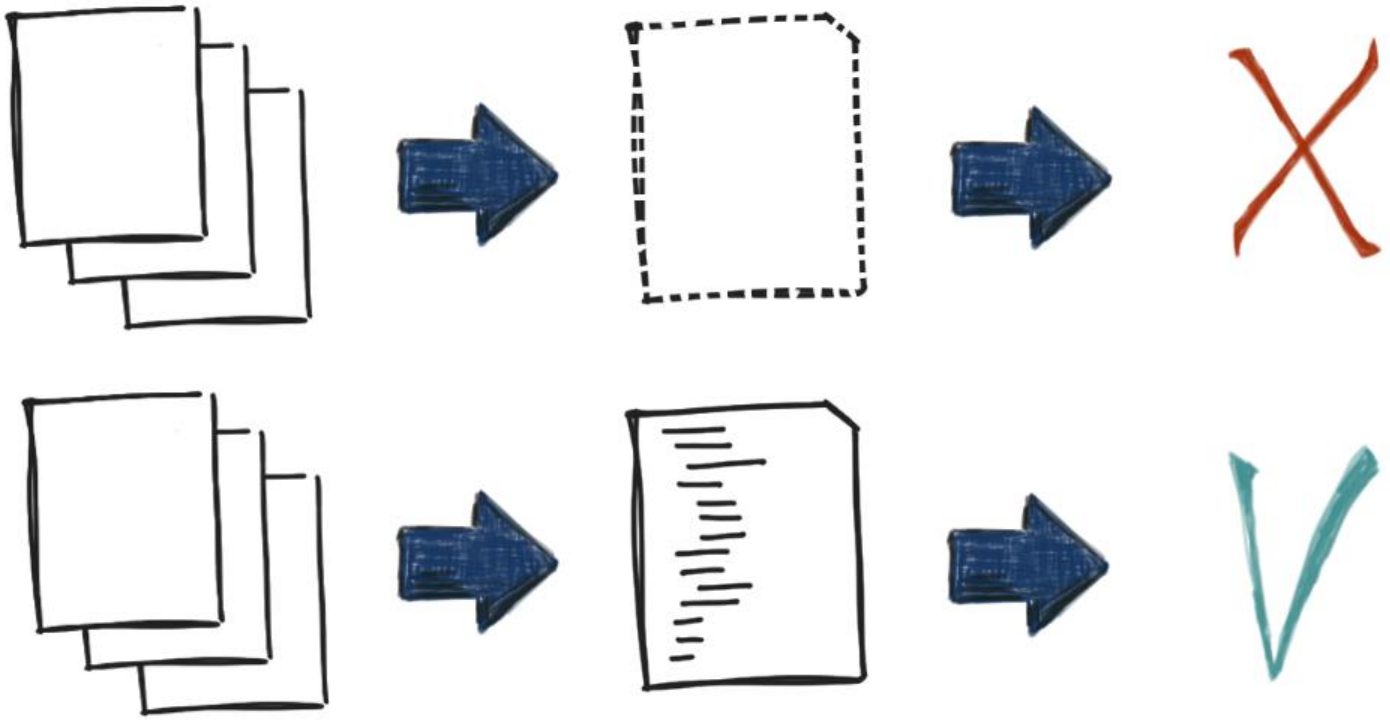

REFACTORING

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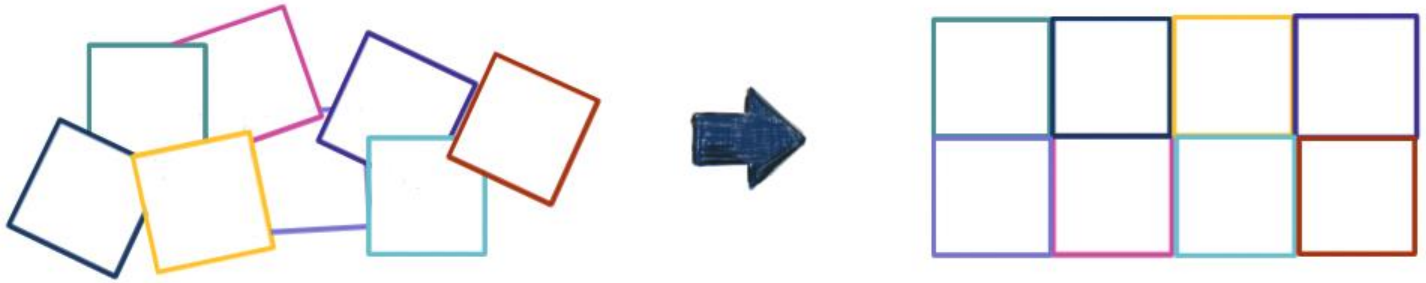

PAIR PROGRAMMING

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programming ⇔ strategizing

CONTINUOUS INTEGRATION

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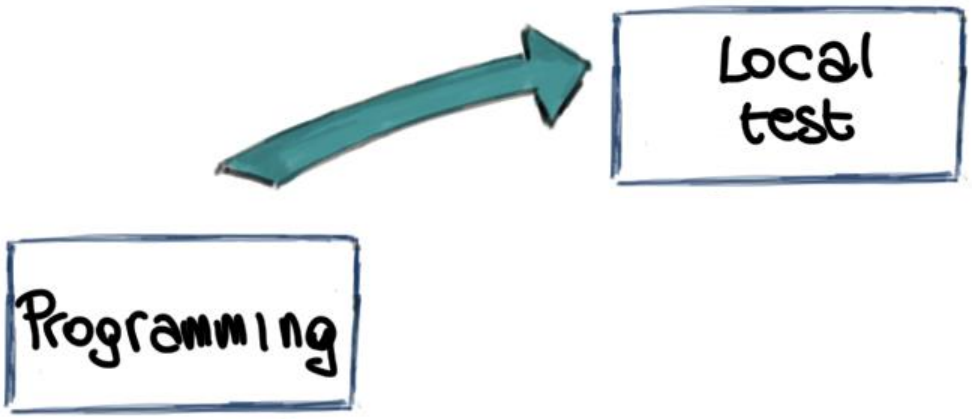

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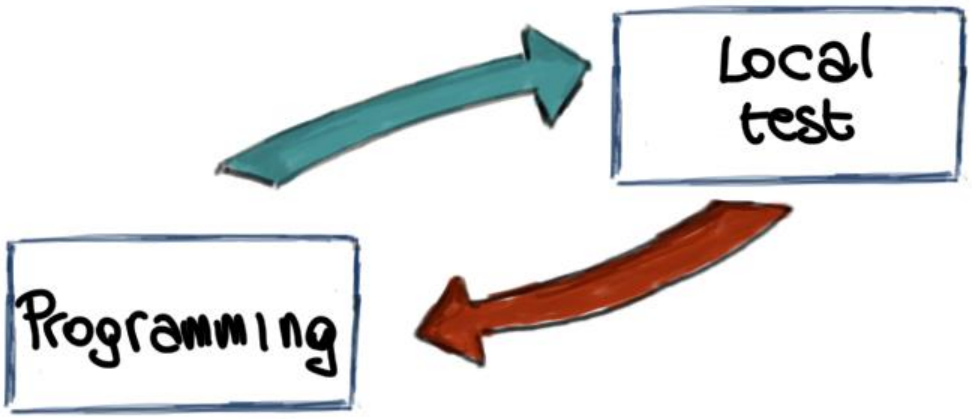

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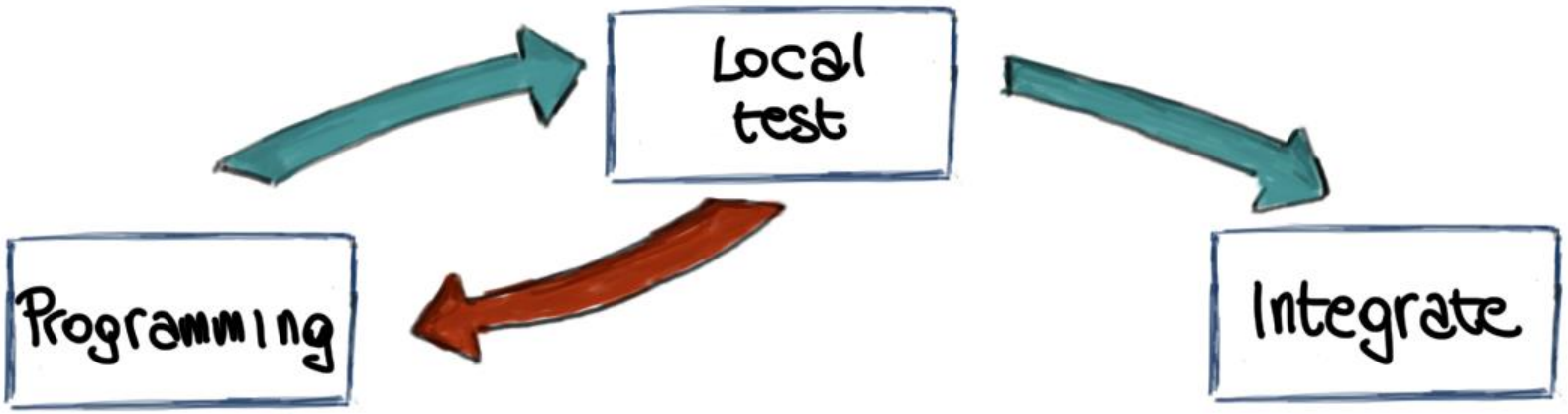

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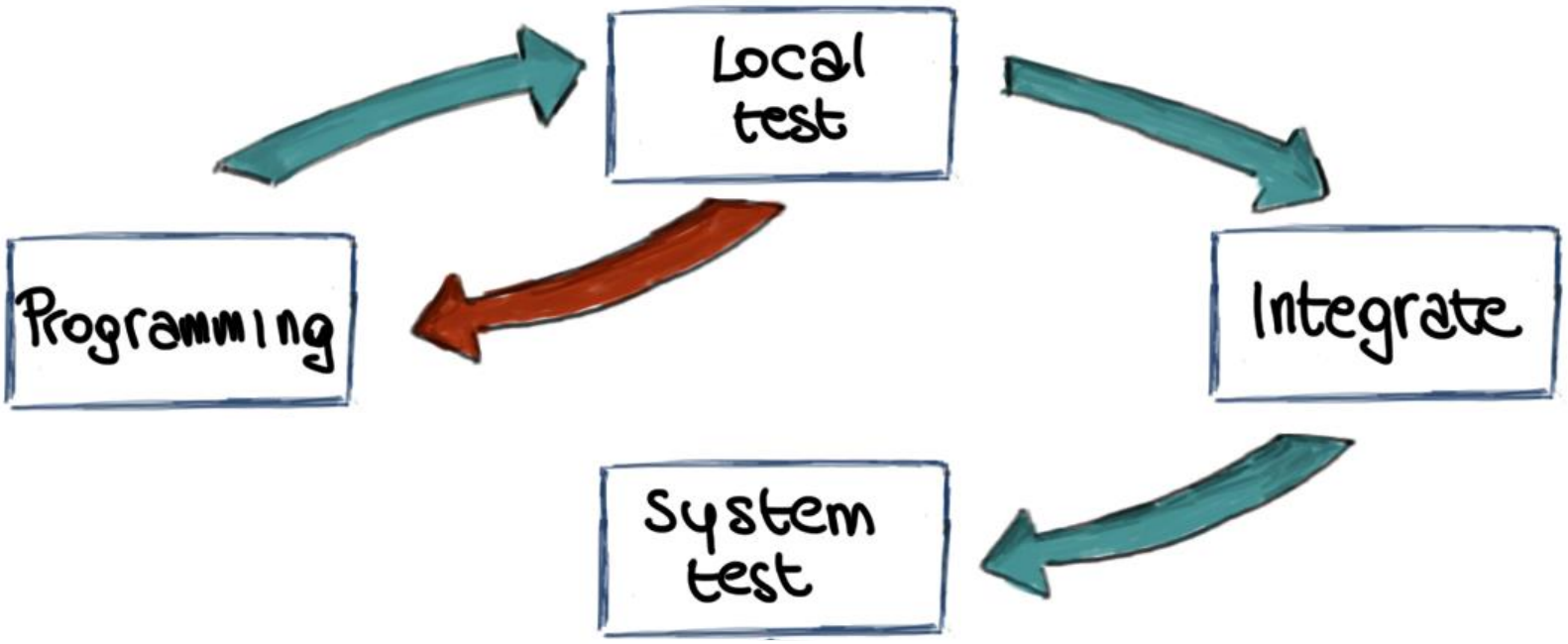

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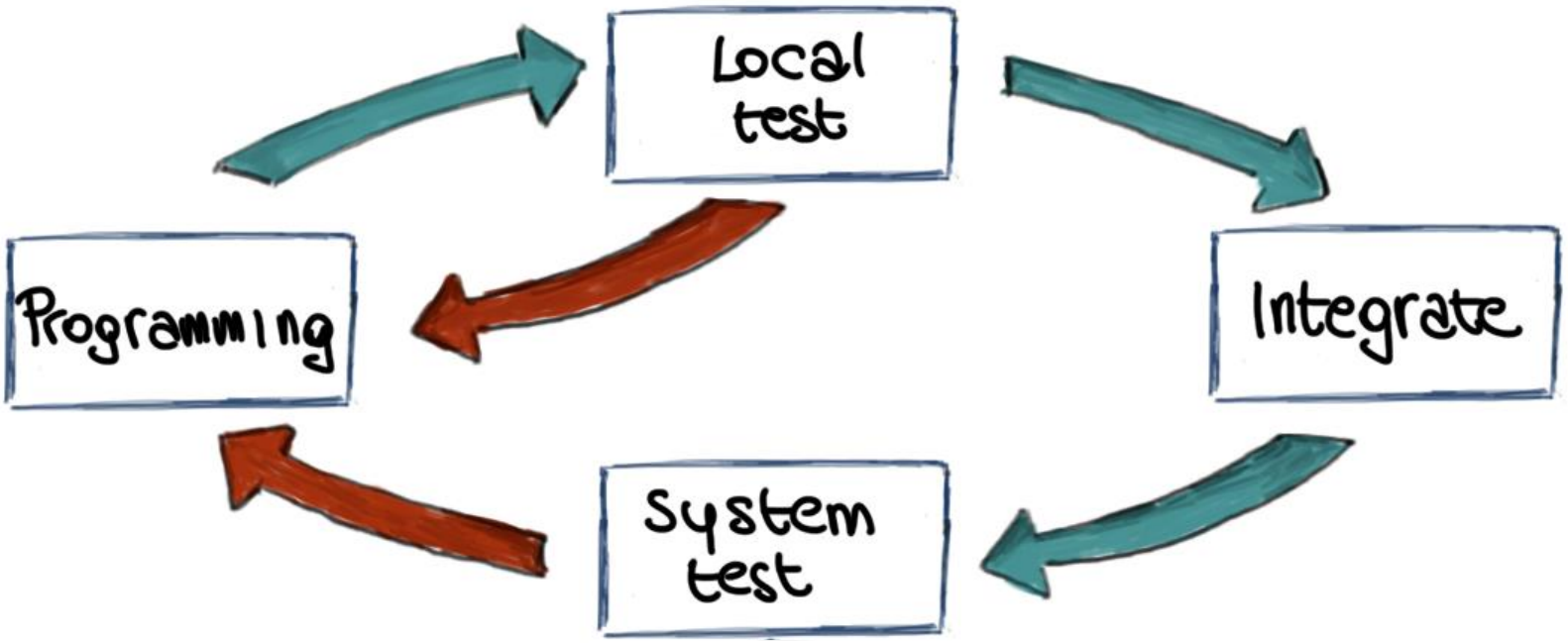

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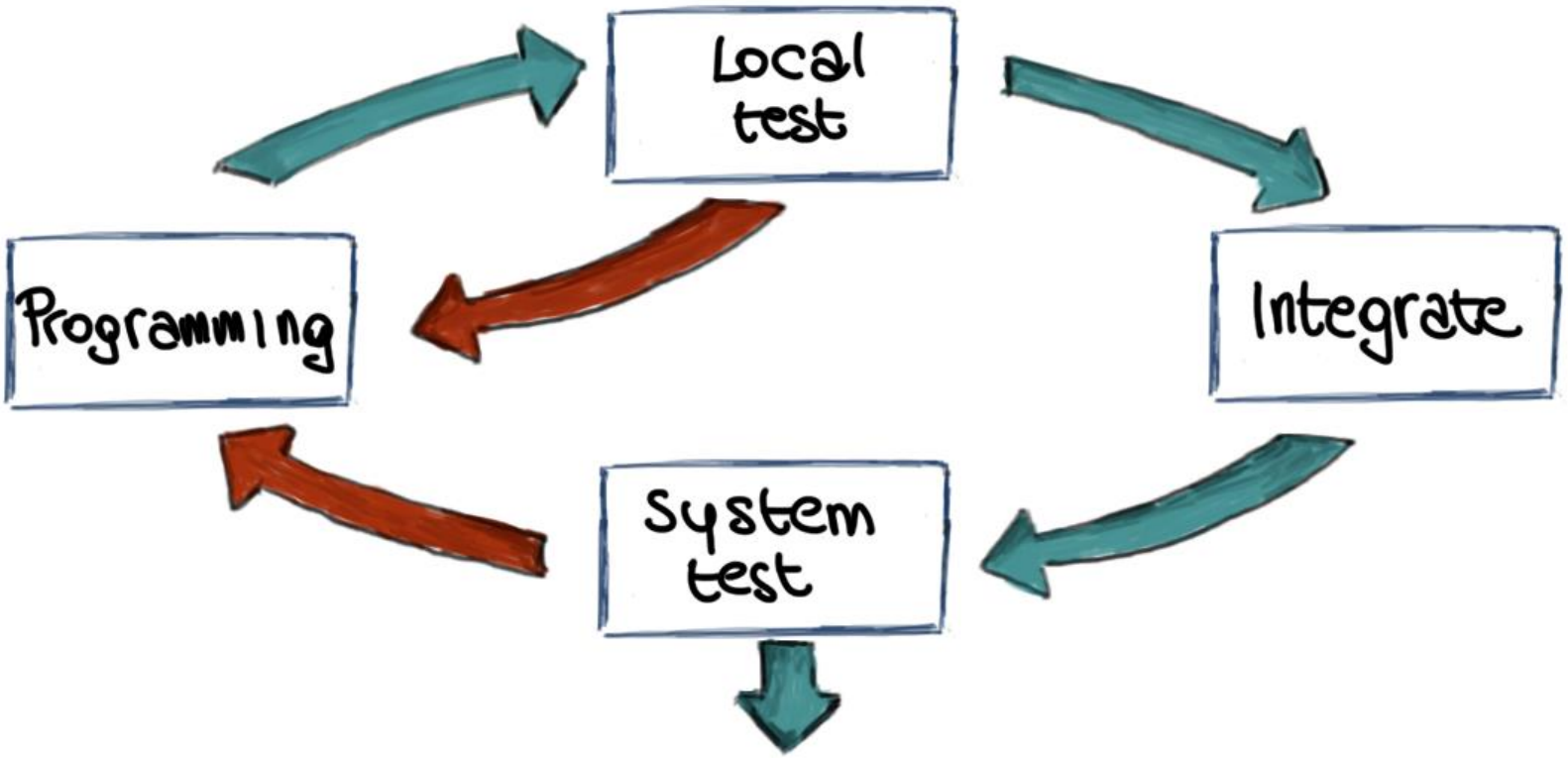

ON-SITE CUSTOMER

The customer is an actual member of the team

ON-SITE CUSTOMER

The customer is an actual member of the team

- sits with the team
- brings requirements

REQUIREMENTS ENGINEERING IN XP

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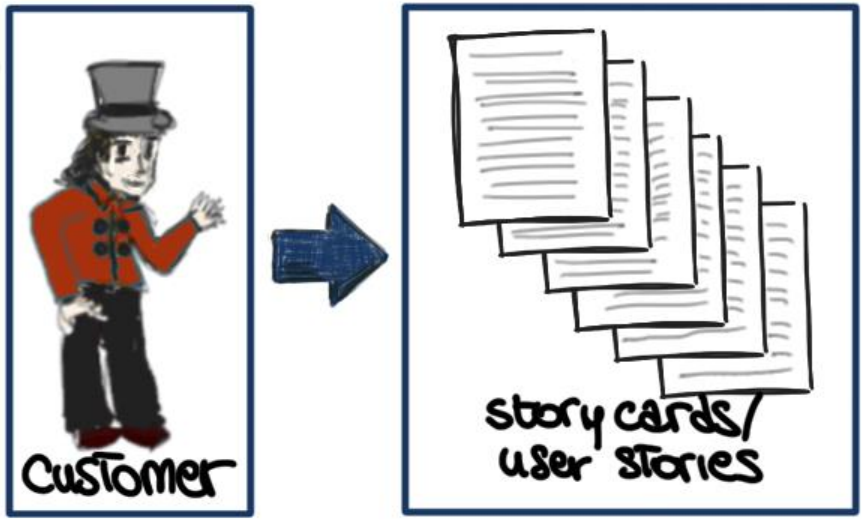

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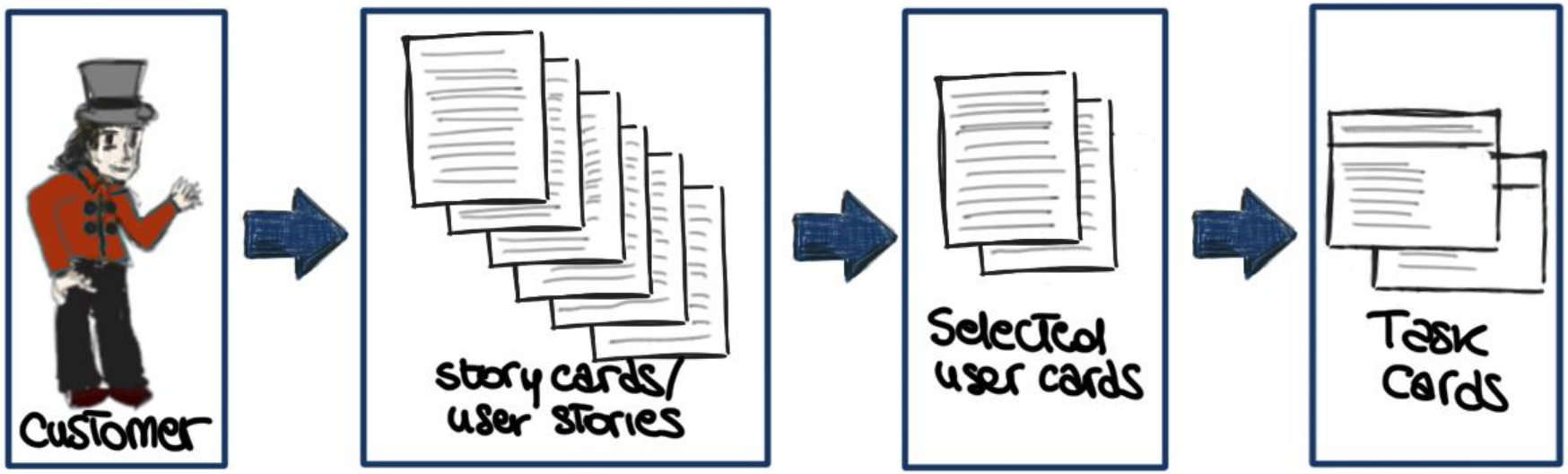
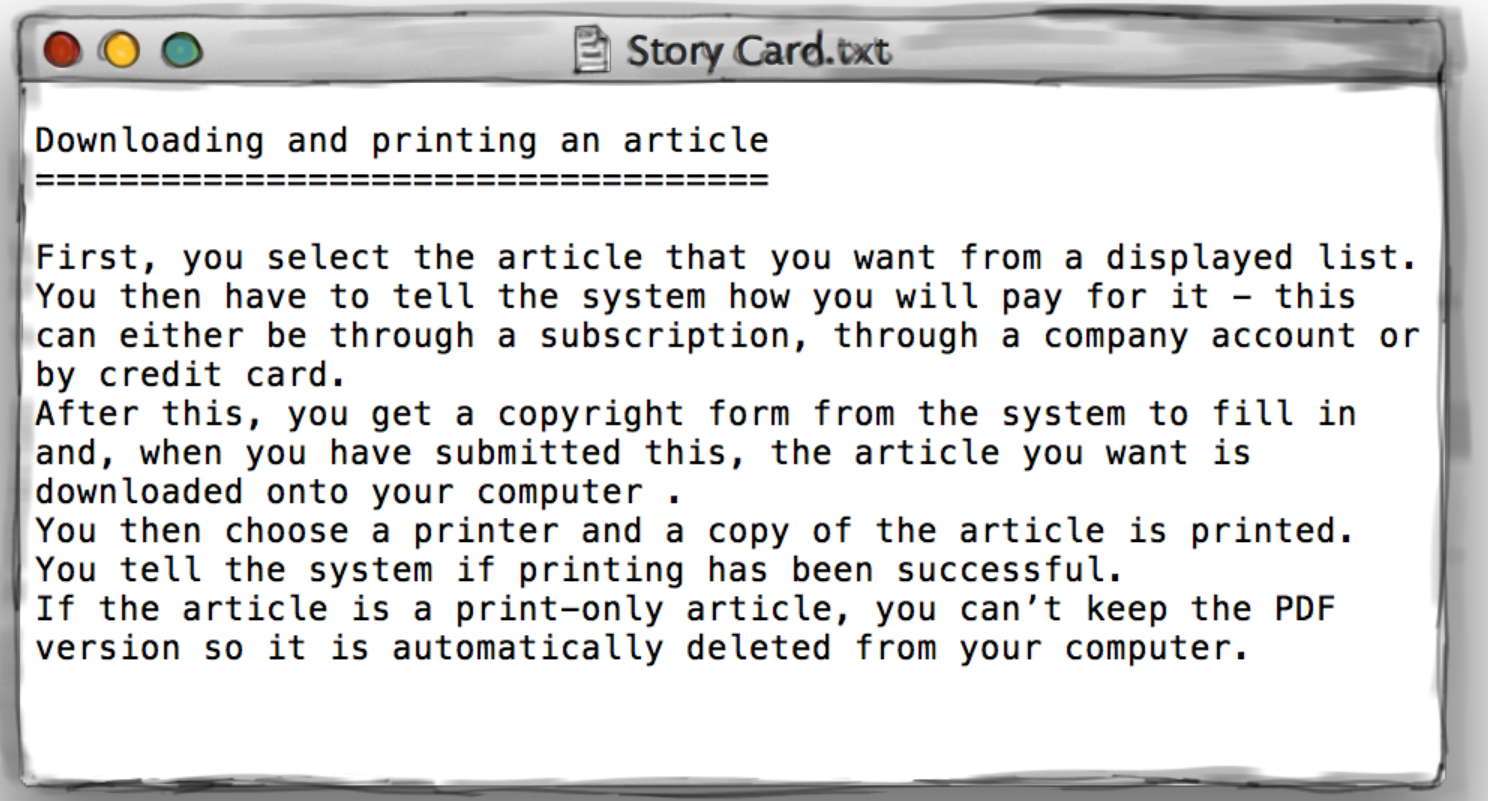
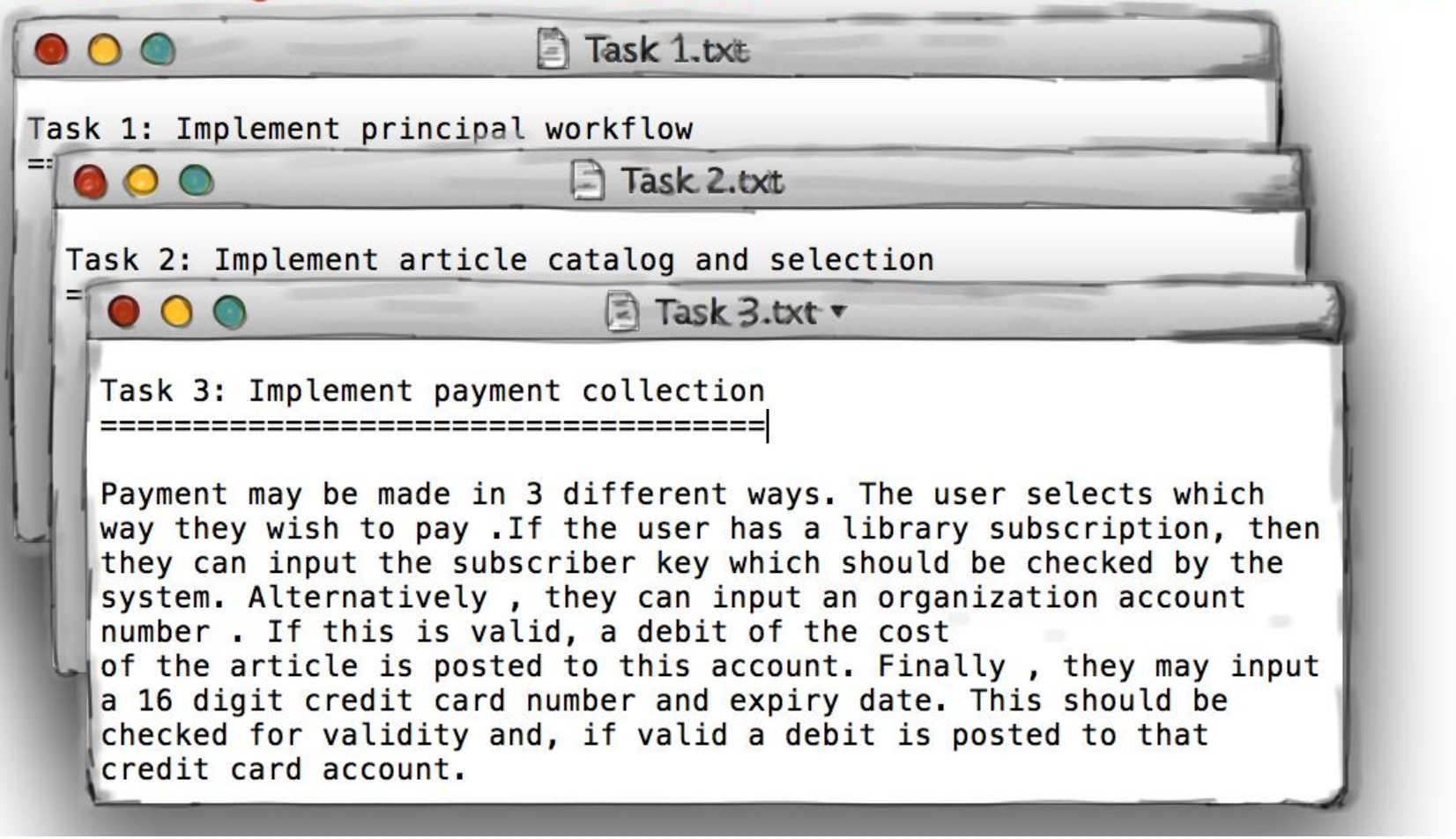


STORY CARD FOR DOCUMENT DOWNLOADING



TASK CARDS FOR DOCUMENT DOWNLOADING



TESTING STRATEGY

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Testing is
coded confidence

TESTING STRATEGY

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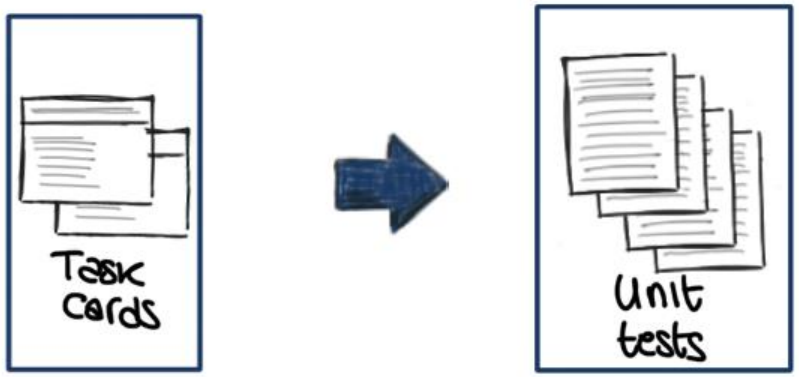

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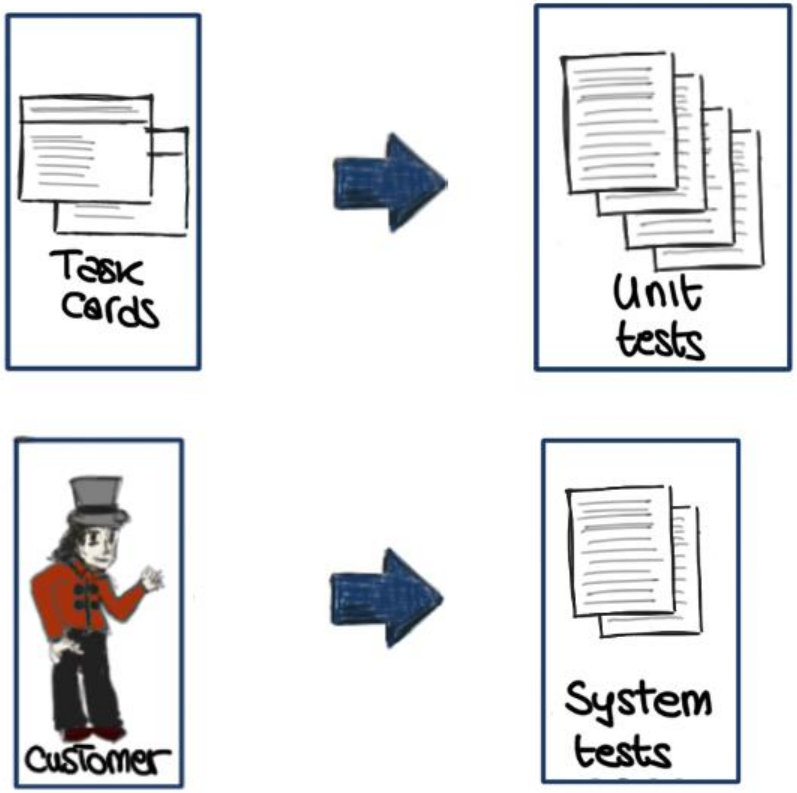


Which of the following statements about XP are true?

[ ] Because of pair programming, XP requires twice the number of developers

[ ] In XP, code is rarely changed after being written

[ ] XP follows the test driven development (TDD) paradigm

[ ] The customer does not need to provide any requirements in XP

[ ] XP is an iterative software development process


SCRUM

SCRUM ACTORS

SCRUM ACTORS

Product owner (customer)

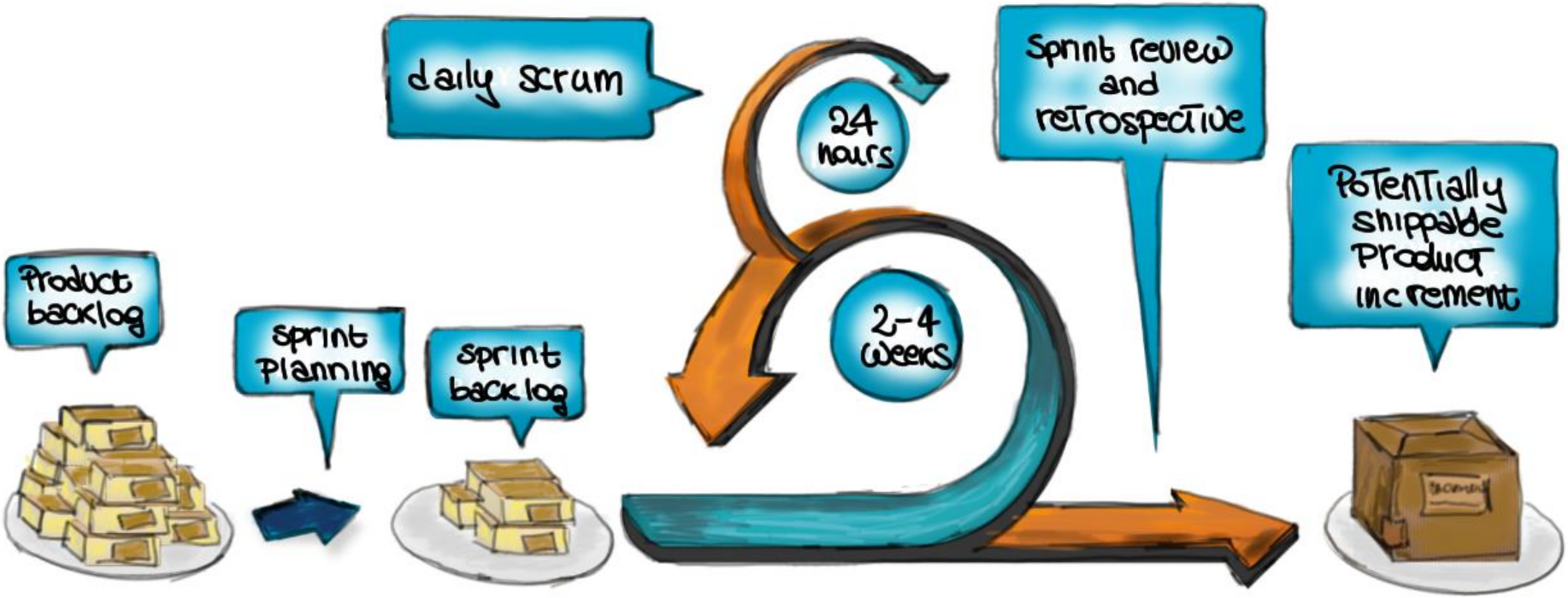
SCRUM ACTORS

Team

Product owner (customer)

Scrum master

HIGH-LEVEL PROCESS



Agile Development Resources

- WWW
  - www.extremeprogramming.org
  - www.refactoring.com
  - www.XProgramming.com
  - www.scrum.org
- Books
  - *Many* on agile software development
  - Refactoring: Improving the Design of Existing Code (Addison-Wesley)