Software and systems engineering

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To do before class

- Watch video
- Read related parts of chapters 7 and 10 in the textbook
- Send questions and opinions through slack

Project management

To deliver the required software and system, we have to specify, implement and test the needed features…

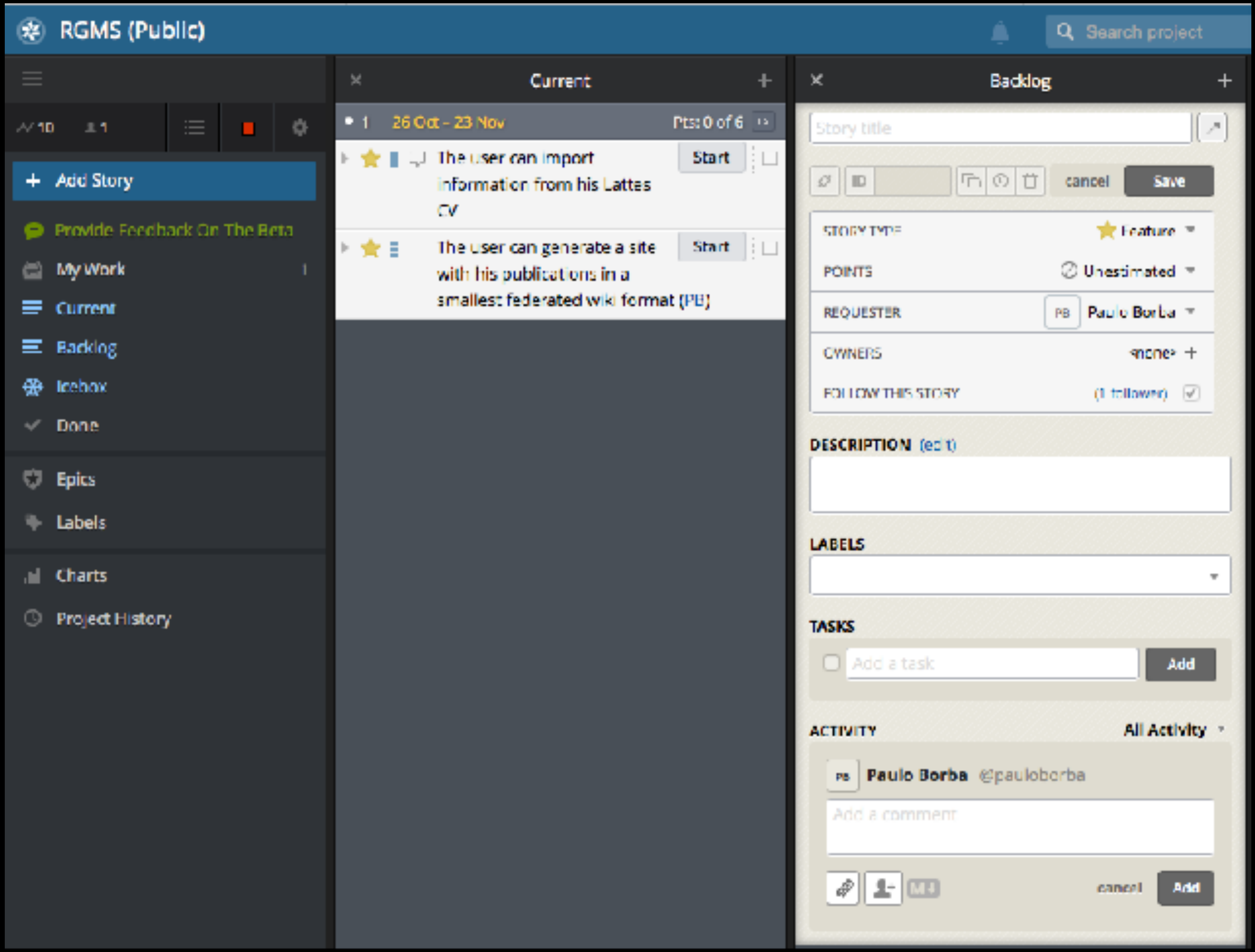
That often is a lot of work, carried on by a number of people, so we better get organized!

We need to control interdependent dimensions:

- scope (+)
- quality (+)
- time (-)
- costs (-)

Scope

To control scope, we need to manage a list of tasks



1 26 Oct - 23 Nov Pts: 0 of 6

The user can import information from his Lattes CV

The user can generate a site with his publications in a smallest federated wiki format (PB)

STORY TYPE: Feature

POINTS: Unestimated

REQUESTER: PB Paulo Borba

OWNERS: <none>

FOLLOW THIS STORY: (1 follower)

PB Paulo Borba @pauloborba

Tasks

- Fix a bug
- Implement a new scenario or feature
- Change the implementation of an existing feature
- Refactor
- Improve performance
- Study, investigate, prepare, organize, etc.

Quality

scope and time

For early and continuous delivery and feedback, tasks are grouped in iterations (sprints)

Iterations

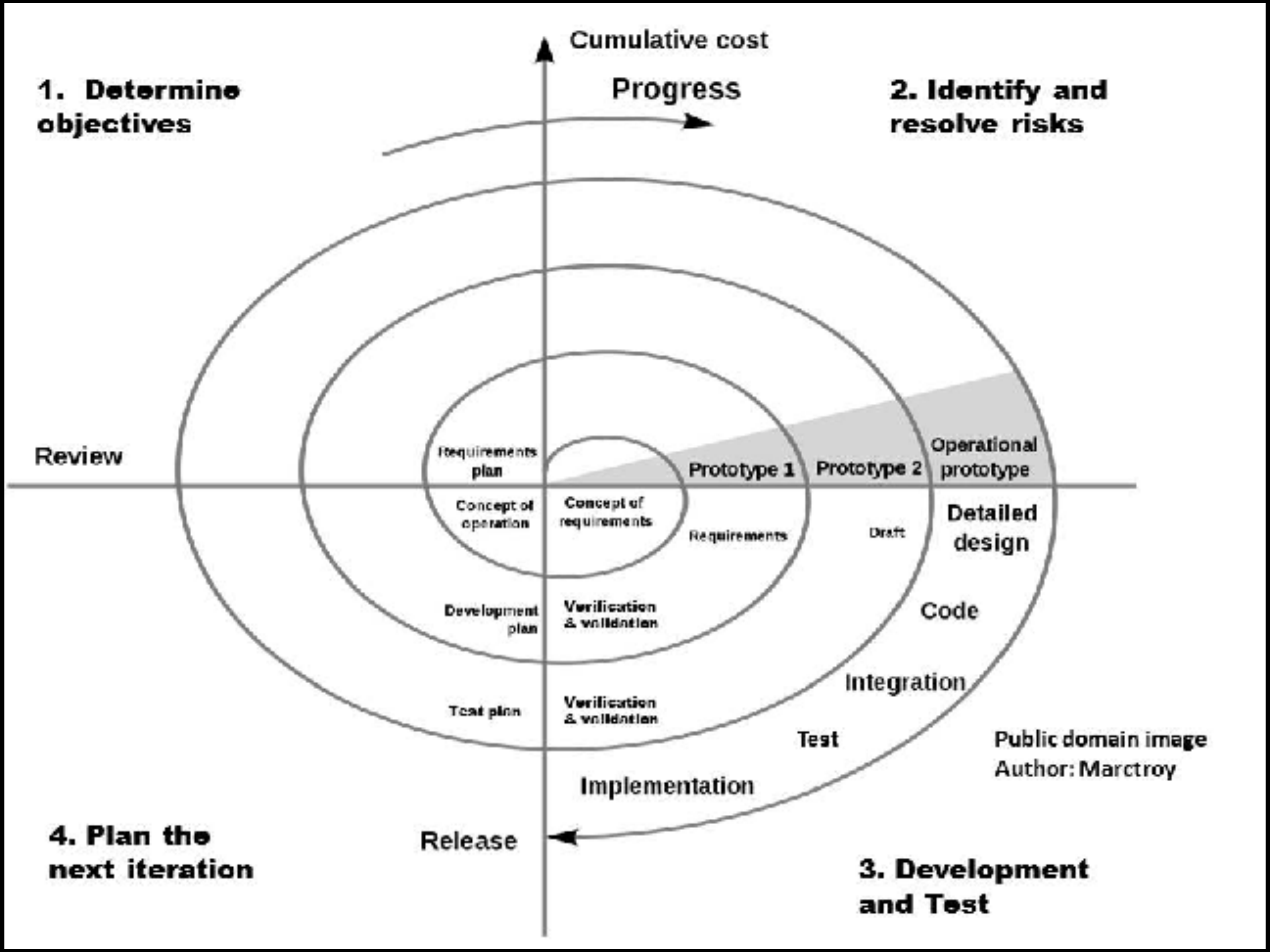
- are defined by a (sprint) backlog
- last from one to four weeks
- incrementally develop the system
- assign each task to a team member (owner)
- perform tasks in 4 to 16 hours
- run daily (scrum) meetings (15 min)
  - done? to do? obstacles?

System is developed by a sequence of iterations

- planning meetings: defines priorities and sprint contents and deadlines, triage
- review meetings: discuss implemented features in a sprint, and changes to the product backlog
- retrospective meetings: discuss good and bad aspects of a sprint

facilitated by the Scrum master

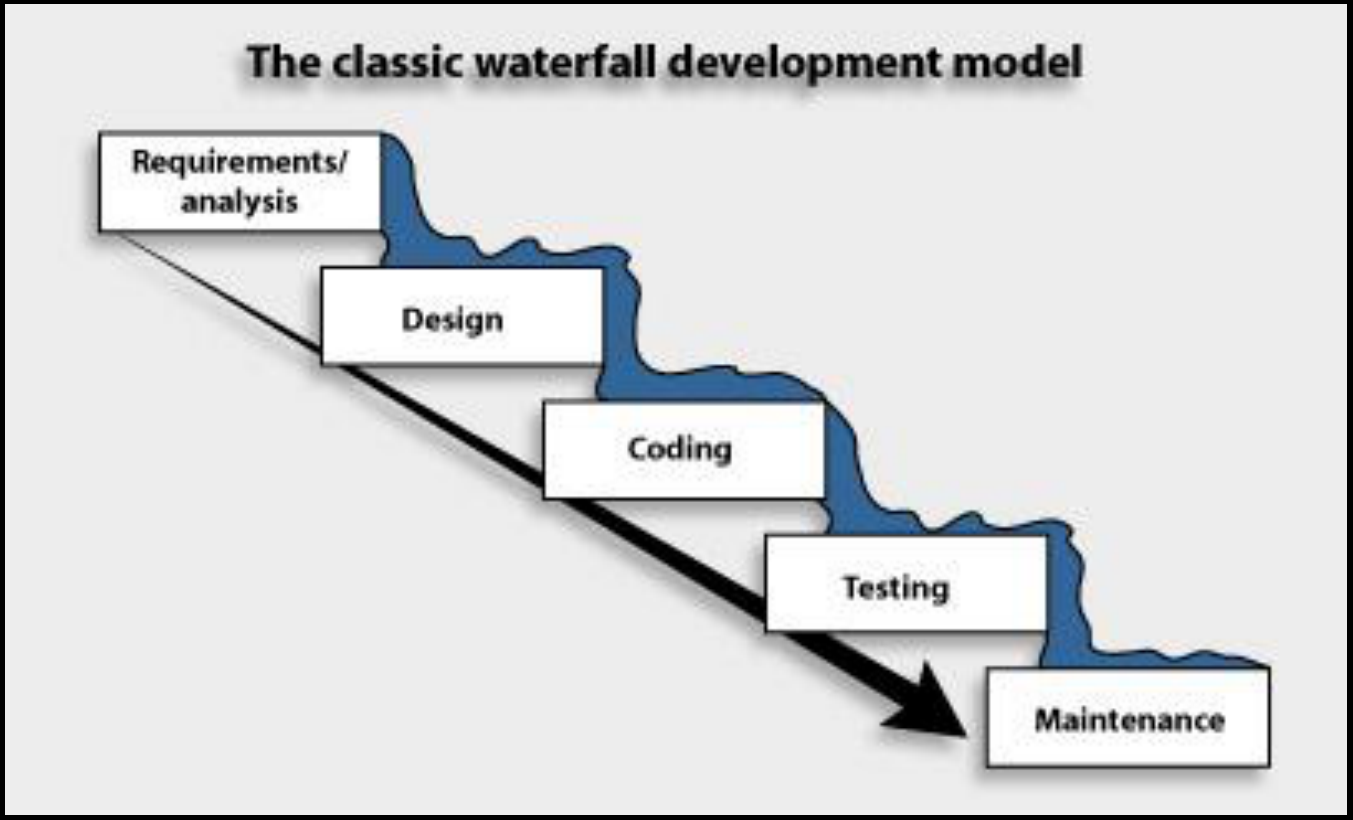
Software development models, spiral



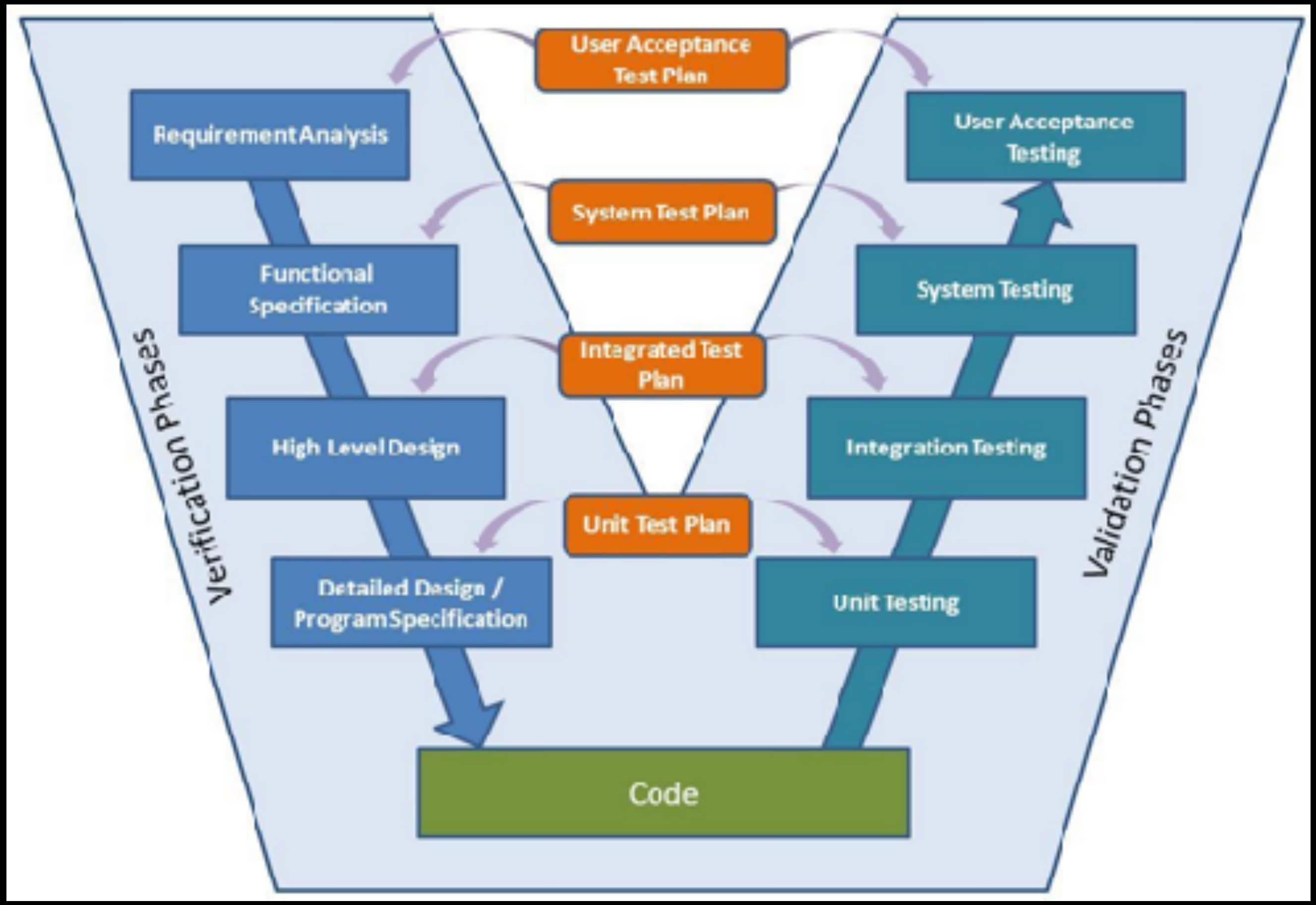
Public domain image
Author: Marctroy

http://ultimatesdlc.com/spiral-model/?share=press-this

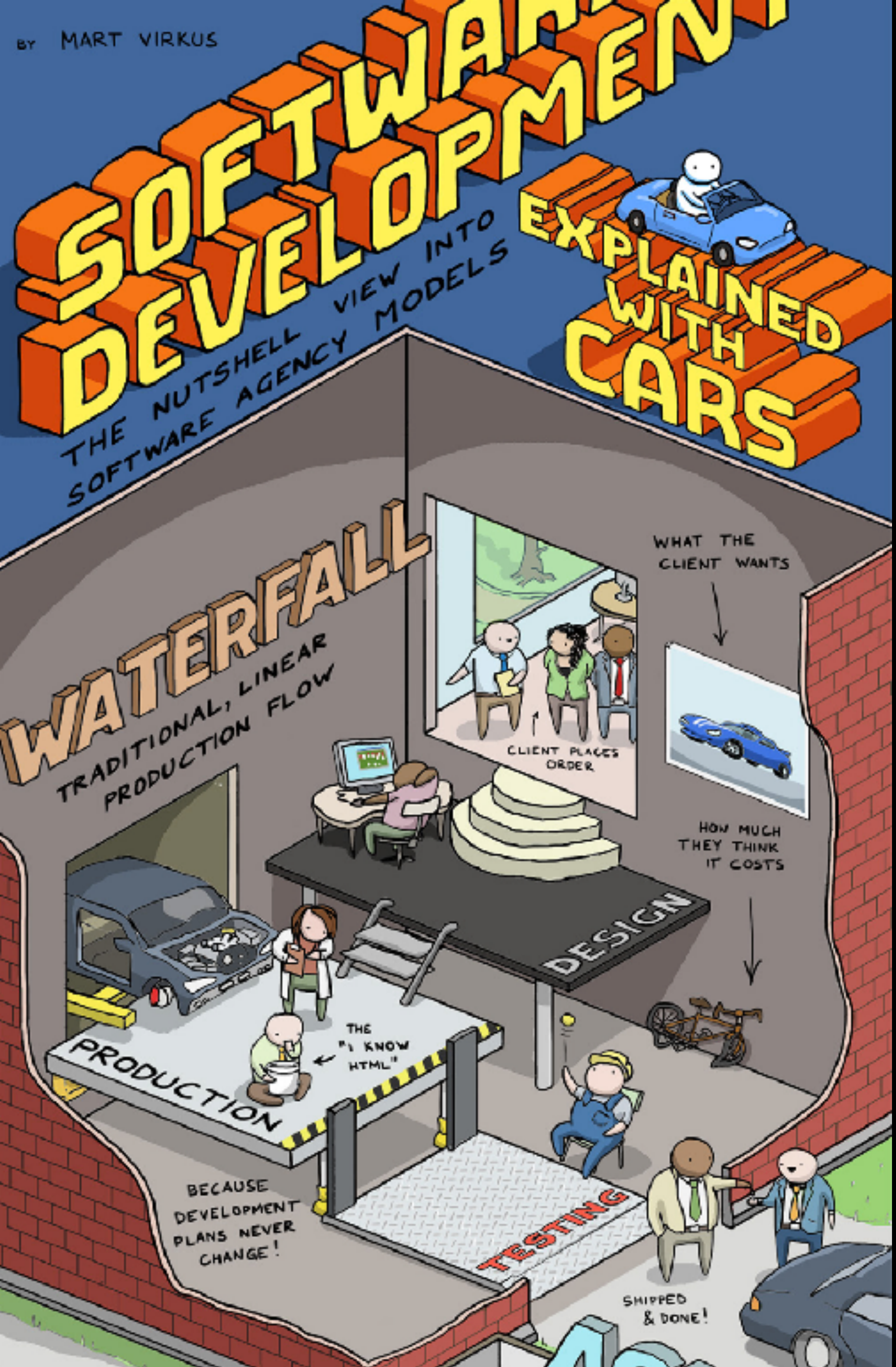
Software development models, waterfall and V

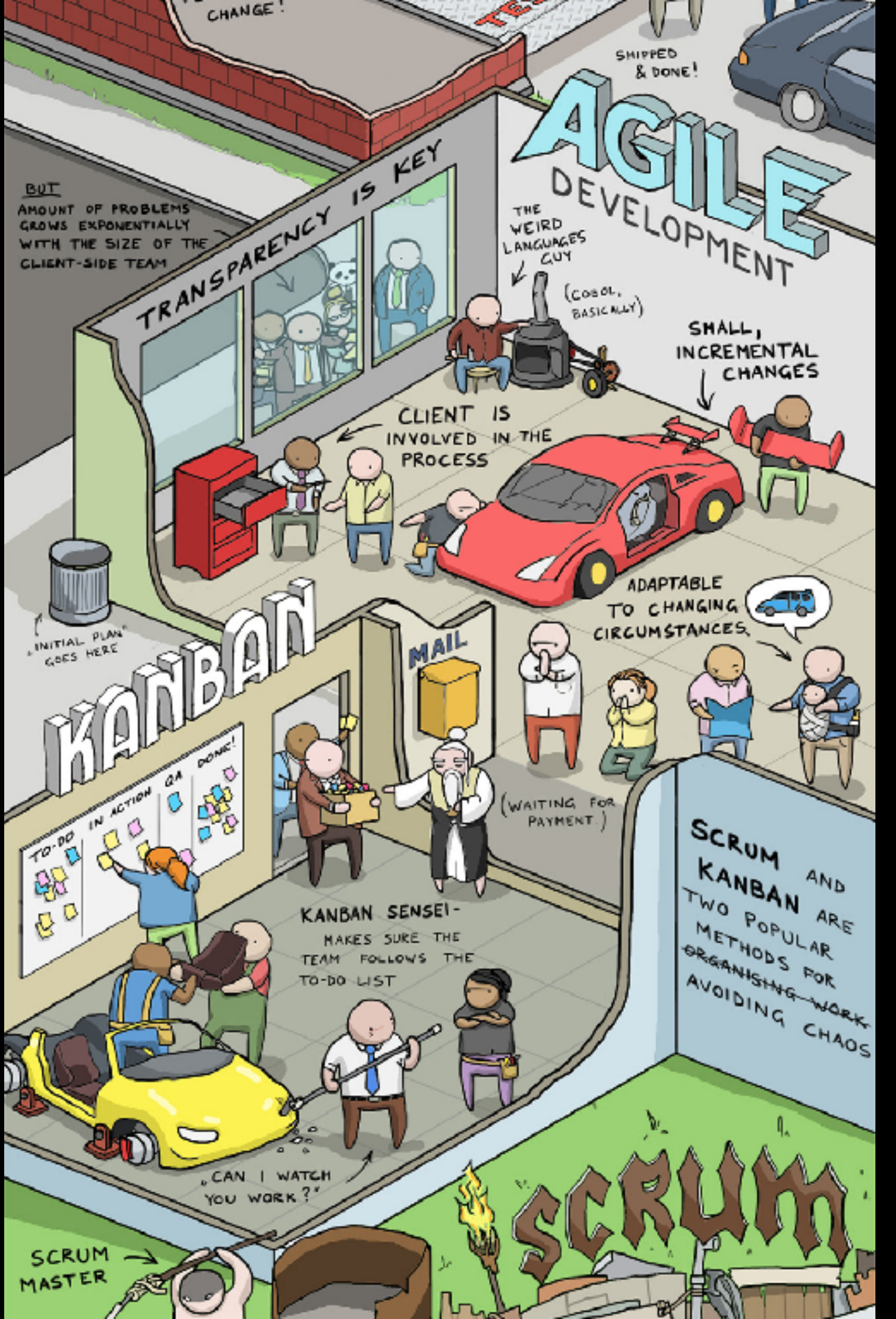


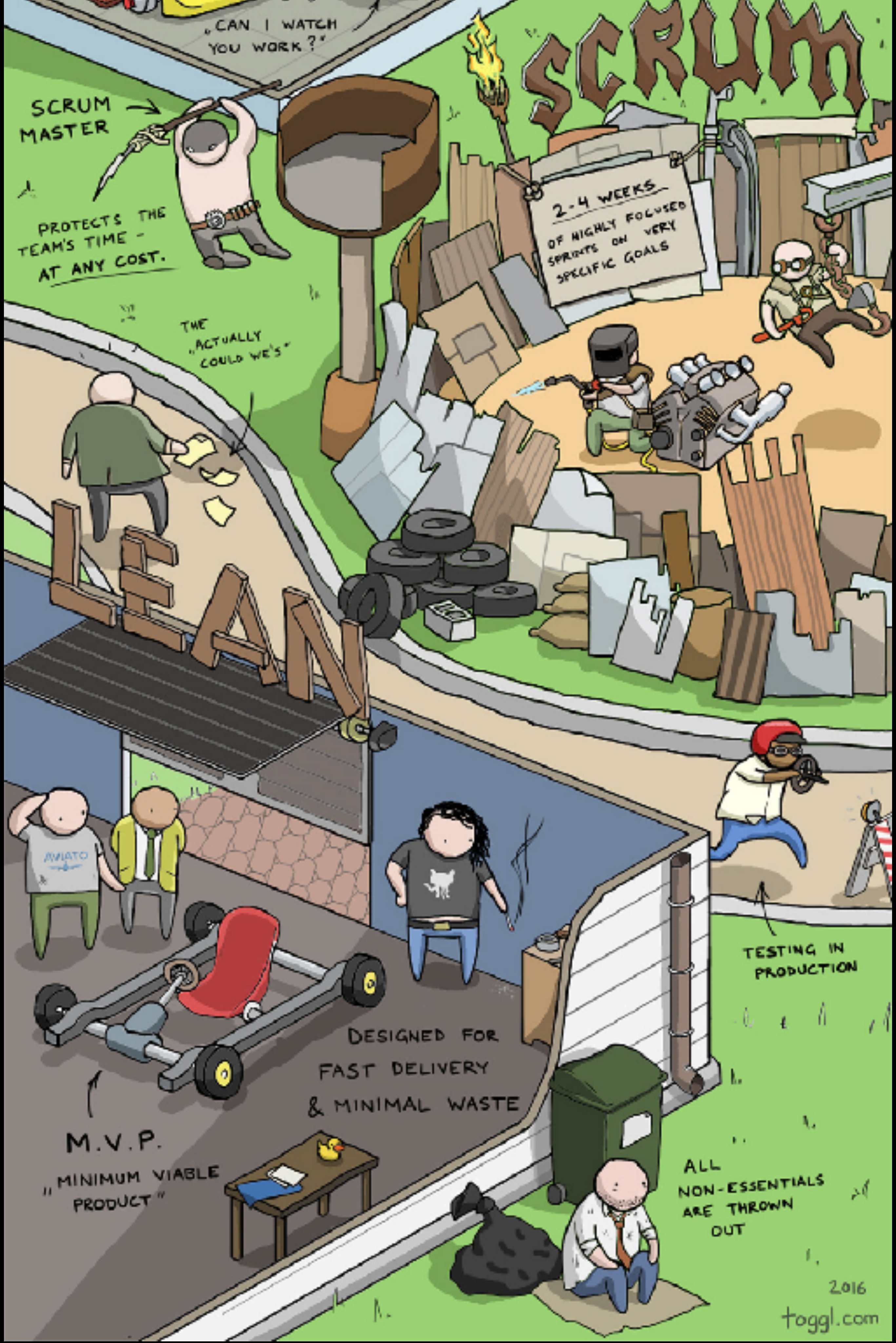
http://04126030sasd.blogspot.com/2011/07/waterfall-model.html



http://crackmba.com/v-shaped-model/


BY MART VIRKUS
SOFTWARE DEVELOPMENT
EXPLAINED WITH CARS
THE NUTSHELL VIEW INTO SOFTWARE AGENCY MODELS
WATERFALL
TRADITIONAL, LINEAR PRODUCTION FLOW
WHAT THE CLIENT WANTS
CLIENT PLACES ORDER
HOW MUCH THEY THINK IT COSTS
DESIGN
PRODUCTION
THE "I KNOW HTML"
BECAUSE DEVELOPMENT PLANS NEVER CHANGE!
TESTING
SHIPPED & DONE!


CHANGE!
SHIPPED & DONE!
AGILE
DEVELOPMENT
BUT AMOUNT OF PROBLEMS GROWS EXPONENTIALLY WITH THE SIZE OF THE CLIENT-SIDE TEAM
TRANSPARENCY IS KEY
THE WEIRD LANGUAGES GUY
(COBOL, BASICALLY)
SMALL, INCREMENTAL CHANGES
CLIENT IS INVOLVED IN THE PROCESS
"INITIAL PLAN" GOES HERE
ADAPTABLE TO CHANGING CIRCUMSTANCES
KANBAN
MAIL
TO-DO
IN ACTION
QA
DONE!
(WAITING FOR PAYMENT)
KANBAN SENSEI - MAKES SURE THE TEAM FOLLOWS THE TO-DO LIST
SCRUM AND KANBAN ARE TWO POPULAR METHODS FOR ~~ORGANISING WORK~~ AVOIDING CHAOS
"CAN I WATCH YOU WORK?"
SCRUM MASTER
SCRUM

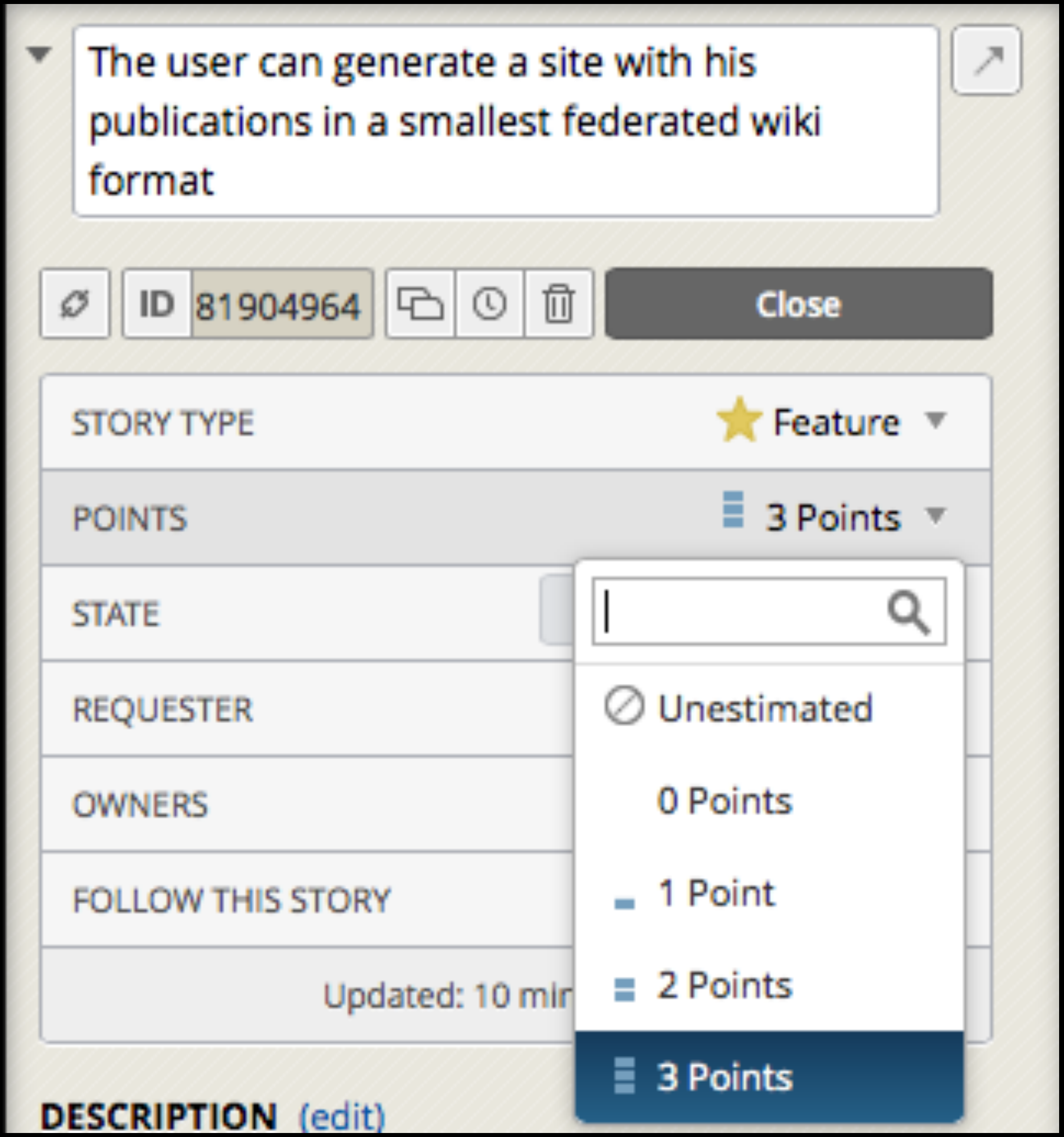

„CAN I WATCH YOU WORK?"
SCRUM
SCRUM MASTER
PROTECTS THE TEAM'S TIME - AT ANY COST.
THE „ACTUALLY COULD WE'S"
2-4 WEEKS OF HIGHLY FOCUSED SPRINTS ON VERY SPECIFIC GOALS
LEAN
AVIATO
TESTING IN PRODUCTION
DESIGNED FOR FAST DELIVERY & MINIMAL WASTE
M.V.P. „MINIMUM VIABLE PRODUCT"
ALL NON-ESSENTIALS ARE THROWN OUT
2016
toggl.com

https://toggl.com/developer-methods-infographic

Take notes, now!

Time

To control time, we need to manage task estimations…



The user can generate a site with his publications in a smallest federated wiki format

ID 81904964

STORY TYPE: Feature

POINTS: 3 Points

STATE

REQUESTER

OWNERS

FOLLOW THIS STORY

Updated: 10 mir

DESCRIPTION (edit)

story = task

Estimating by

- Allocating points to tasks
  - starting with a simpler three-point scale
  - ground in concrete situation (work done in an ideal day)
- Measuring the number of points per iteration
- Finding out team velocity (the average number of points per iteration)

Product backlog

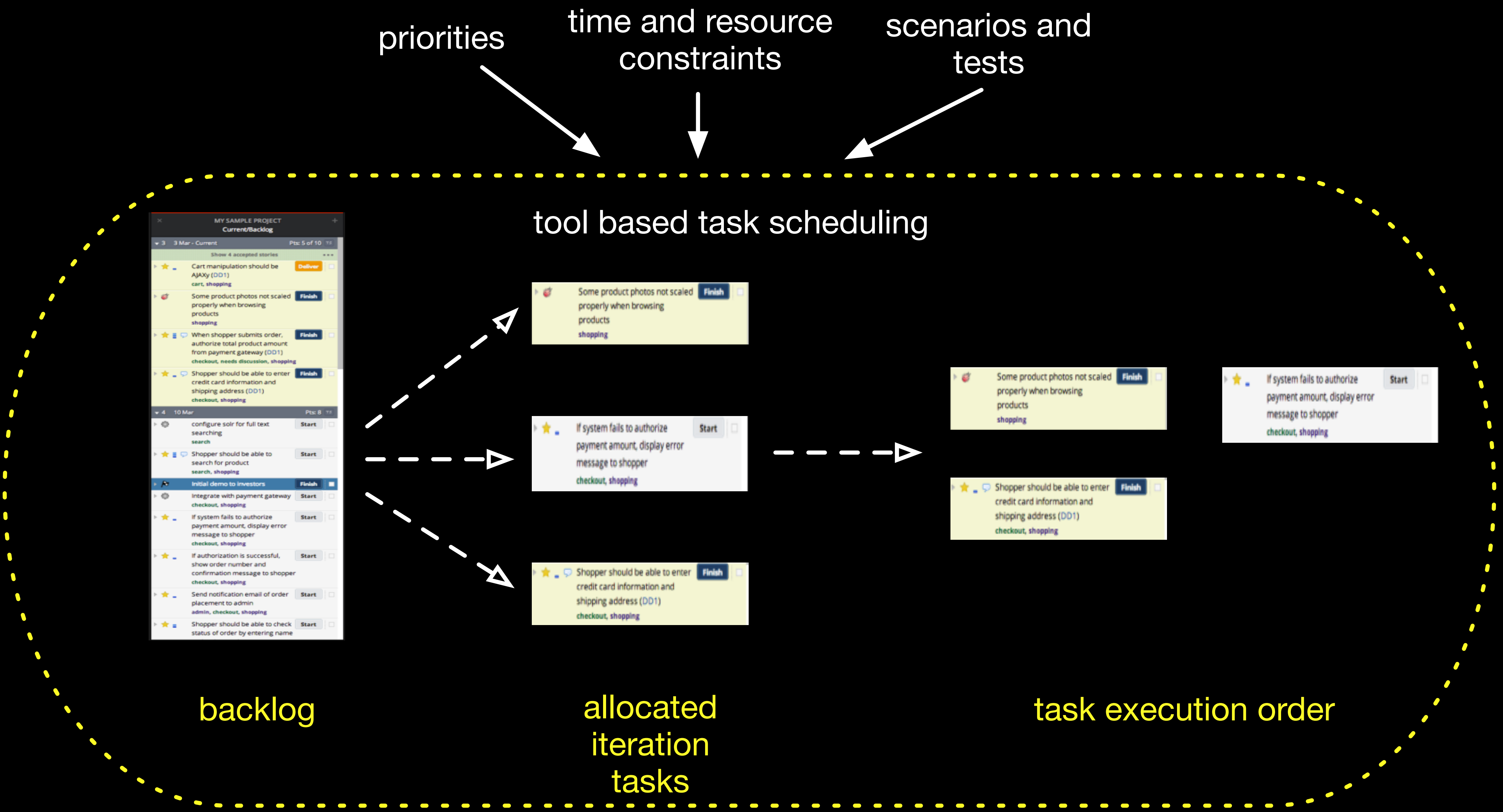
- Tasks with requester, estimation and priority
- Created by the product owner (represents stakeholders interests)
- Never complete, changed as needed by any team member
- Priority tasks described in more detail
- Epics help associate tasks to macro features

Tool demo

Allocating tasks in a iteration by

- Observing priorities (business value and risks)
- Avoiding dependencies and conflicts
- Defining task interfaces
- Defining the right team size (4 to 9 people)
- Choosing the right people for each task
  - technical, experience, collaboration and personality dimensions

Inferring task dependencies to schedule tasks…



priorities

time and resource constraints

scenarios and tests

tool based task scheduling

MY SAMPLE PROJECT
Current/Backlog

3 3 Mar - Current Pts: 5 of 10

Show 4 accepted stories

Cart manipulation should be AJAXy (DD1) Deliver
cart, shopping

Some product photos not scaled properly when browsing products Finish
shopping

When shopper submits order, authorize total product amount from payment gateway (DD1) Finish
checkout, needs discussion, shopping

Shopper should be able to enter credit card information and shipping address (DD1) Finish
checkout, shopping

4 10 Mar Pts: 8

configure solr for full text searching Start
search

Shopper should be able to search for product Start
search, shopping

Initial demo to investors Finish

Integrate with payment gateway Start
checkout, shopping

If system fails to authorize payment amount, display error message to shopper Start
checkout, shopping

If authorization is successful, show order number and confirmation message to shopper Start
checkout, shopping

Send notification email of order placement to admin Start
admin, checkout, shopping

Shopper should be able to check status of order by entering name Start

backlog

Some product photos not scaled properly when browsing products Finish
shopping

If system fails to authorize payment amount, display error message to shopper Start
checkout, shopping

Shopper should be able to enter credit card information and shipping address (DD1) Finish
checkout, shopping

allocated iteration tasks

Some product photos not scaled properly when browsing products Finish
shopping

Shopper should be able to enter credit card information and shipping address (DD1) Finish
checkout, shopping

If system fails to authorize payment amount, display error message to shopper Start
checkout, shopping

task execution order

How to minimize conflicts and development effort?

- Define interfaces
- Need to change interfaces should be first discussed
- Same approach for the need to add new interfaces
- Automated testing

Interfaces as a means to achieve independent development

Quality

To control quality, we need to…

- test the system
- review artifacts
- pair programming
- measure quality attributes
- reduce technical debt

Separate environments for different activities

- Development
- Testing (integration, system, etc.)
  - Daily build and smoke test
- Execution (deployment)

Costs

To control costs, we need to…

- control scope and quality, avoiding increased scope and quality expectations
- control time, avoiding delivery anticipation
- manage productivity
- cost estimation = team size for a given period (no promises of delivered features)

Checklist

- Define tasks and epics with clear focus, and granularity corresponding to a group of related scenarios
- Carefully estimate and measure velocity
- Daily meetings (at least virtual meetings at the slack channel)
- Plan ahead, early report delays

Take notes,
now!

Project management research at CIn

- Team motivation: Fabio
- Software process: Alexandre Vasconcelos and Hermano
- Task scheduling: Paulo

Hands-on!

Check assignment

To do after class

- Answer questionnaire (check classroom assignment), study correct answers
- Finish exercise (check classroom assignment), study correct answers
- Read, again, parts of chapters 7 and 10 in the textbook
- Evaluate classes
- Study questions from previous exams

Questions from previous exams

- Como um gerente de projetos que segue metodologias ágeis, explique brevemente o que você faria para controlar o tempo de desenvolvimento de um software sob responsabilidade da sua equipe.
- Explique brevemente o que é "velocity" e como a mesma pode ser usada para estimativas.
- Quais as vantagens de desenvolver o software em iterações ou sprints curtas?
- Explique quais as dimensões que um gerente de projeto tem que controlar, e cite duas consequências negativas de não conseguir controlá-las adequadamente?

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