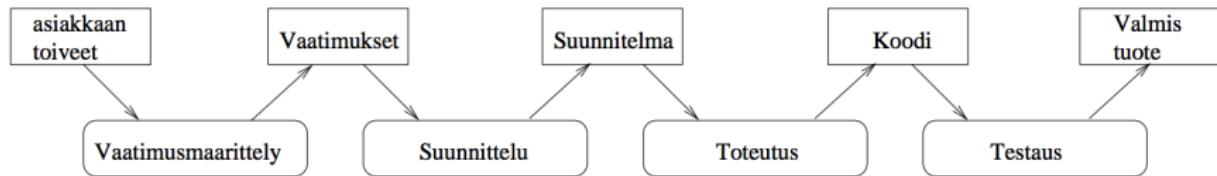


Ohjelmistotuotanto

Matti Luukkainen ja ohjaajat Kalle Ilves, Petri Suhonen, Oskari
Nuottonen, Tuukka Puonti

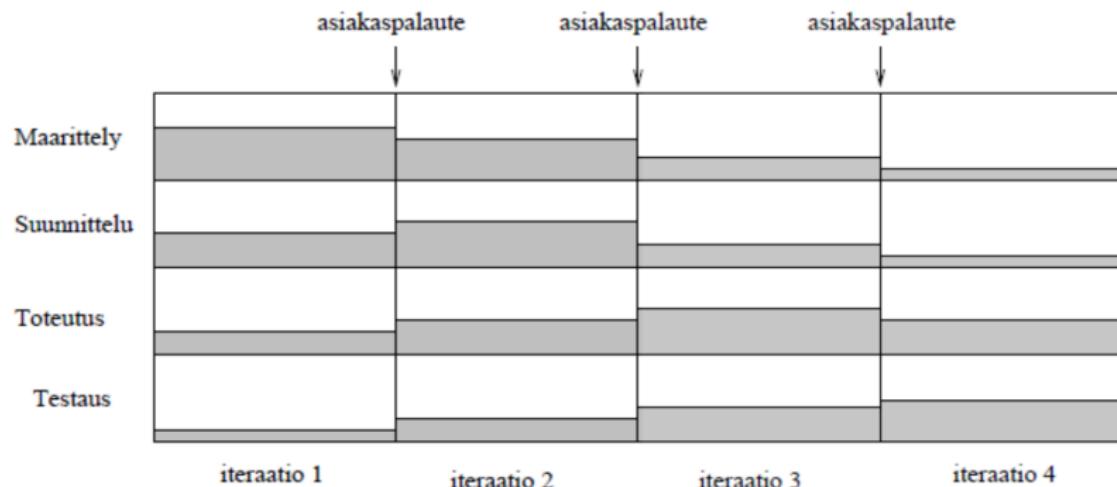
syksy 2022

Vesiputousmalli



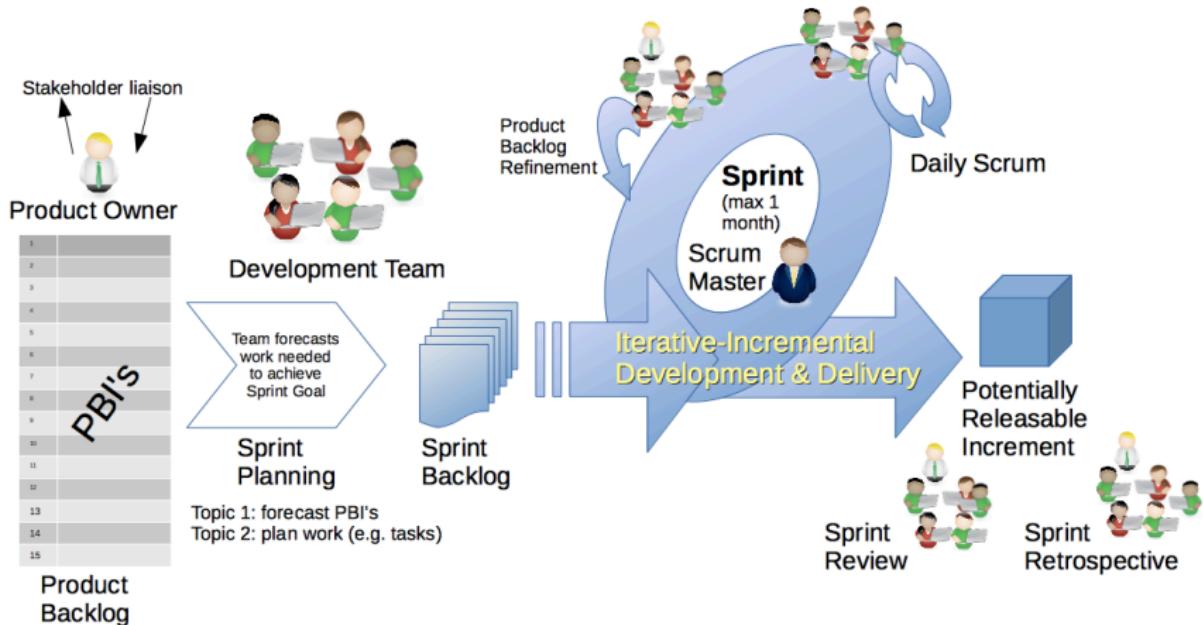
luento 1

Iteratiivinen ohjelmistokehitys



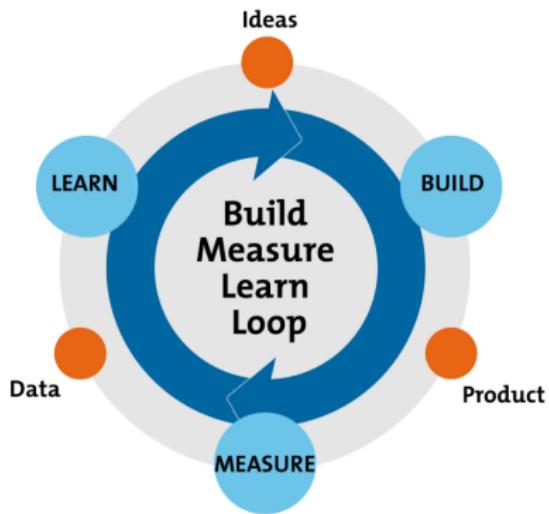
luento 2

Scrum



luento 3

Vaatimusmäärittely 2010-luvulla: Lean startup

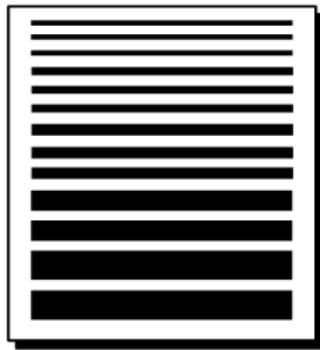


User story

- ▶ Mike Cohn:
 - ▶ *A user story describes functionality that will be valuable to either user or purchaser of software.*
- ▶ User stories are composed of three aspects:
 1. A written description of the story, used for planning and reminder
 2. Conversations about the story to serve to flesh the details of the story
 3. Tests that convey and document details and that will be used to determine that the story is complete

luento 4

High
Priority

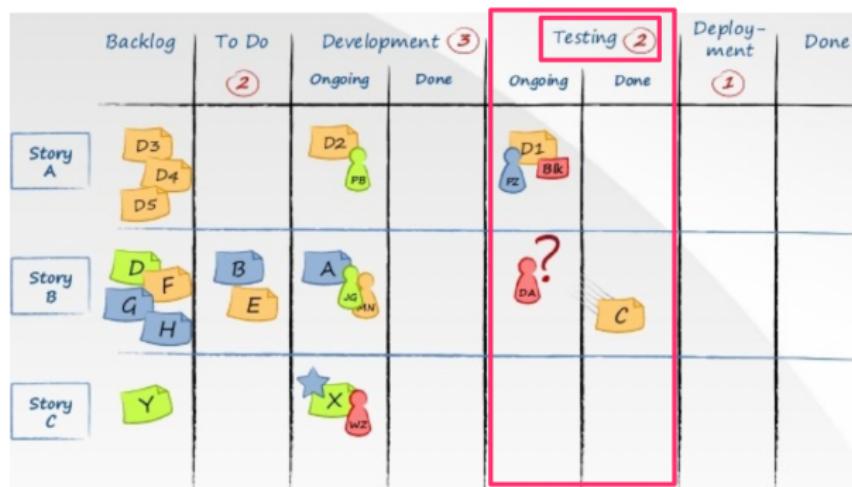


Fine-grained, detailed items ready
to be worked on in the next sprint

Low
Priority

Large, coarse-grained items

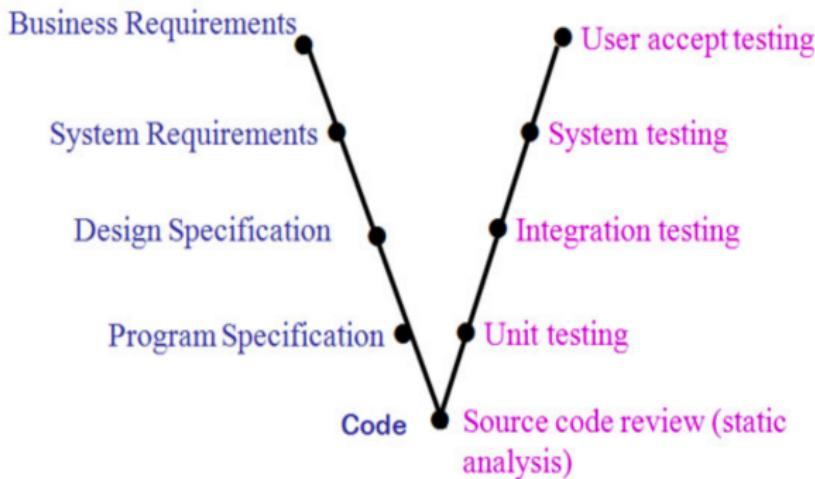
WIP-rajoitteet



PBI	TASKS	IN PROGRESS	BLOCKED	DONE
1. Add PBI to scope				✓
2. PRD and SPRINT				
3. Add PBI descriptions & complexity				
4. PRD				
5. Add PBI to backlog	Sub: Create JIRA and EPIC entries for each PBI Sub: Summarize PBI and add to backlog	Sub: Create JIRA and EPIC entries for each PBI Sub: Summarize PBI and add to backlog	Sub: Create JIRA and EPIC entries for each PBI Sub: Summarize PBI and add to backlog	✓
6. Planning PBI backlog	Sub: Create JIRA and EPIC entries for each PBI Sub: Summarize PBI and add to backlog	Sub: Create JIRA and EPIC entries for each PBI Sub: Summarize PBI and add to backlog	Sub: Create JIRA and EPIC entries for each PBI Sub: Summarize PBI and add to backlog	✓
7. Create PBI backlog	Sub: Create JIRA and EPIC entries for each PBI Sub: Summarize PBI and add to backlog	Sub: Create JIRA and EPIC entries for each PBI Sub: Summarize PBI and add to backlog	Sub: Create JIRA and EPIC entries for each PBI Sub: Summarize PBI and add to backlog	✓
8. Create PBI backlog				

luento 5

- ▶ *Yksikkötestaus* (unit testing)
- ▶ *Integraatiotestaus* (integration testing)
- ▶ *Järjestelmätestaus* (system testing)
- ▶ *Käyttäjän hyväksymistestaus* (user acceptance testing)



Ohtuvarasto: tyhjä, puolitäysi, täysi

```
class Varasto:
    def __init__(self, tilavuus, alkusalto = 0):
        self.tilavuus = tilavuus
        self.saldo = alkusalto

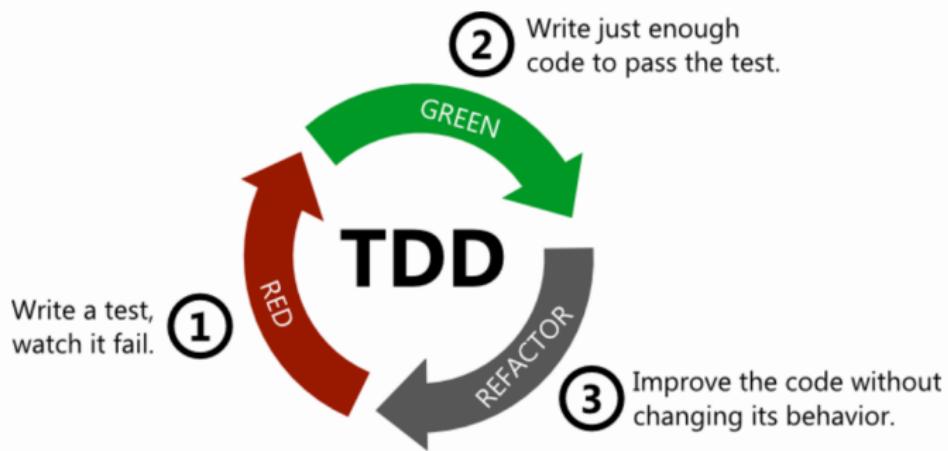
    def ota_varastosta(self, maara):
        if maara < 0:
            return 0.0

        if maara > self.saldo:
            kaikki_mita_voidaan = self.saldo
            self.saldo = 0.0
            return kaikki_mita_voidaan

        self.saldo = self.saldo - maara
        return maara
```

luento 6

Test driven development (TDD)



Riippuvuudet testeissä: dependency injection

```
class Laskin:
    def __init__(self, io):
        self._io = io

    def suorita(self):
        while True:
            lukul = int(self._io.lue("Luku 1:"))

            if lukul == -9999:
                return

            luku2 = int(self._io.lue("Luku 2:"))

            if luku2 == -9999:
                return

            vastaus = self._laske_summa(lukul, luku2)

            self._io.kirjoita(f"Summa: {vastaus}")

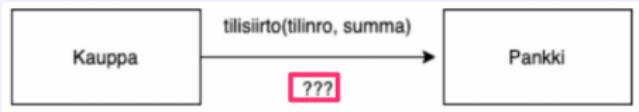
    def _laske_summa(self, lukul, luku2):
        return lukul + luku2
```

Mock-kirjastot

- ▶ Kaupan metodin *maksa* pitää tehdä *tilisiirto* kutsumalla *Pankin* metodia

```
my_net_bank = Pankki()
viitteet = Viitegeneraattori()
kauppa = Kauppa(my_net_nank, viitteet)

kauppa.aloita_ostokset()
kauppa.lisaa_ostos(5)
kauppa.lisaa_ostos(7)
kauppa.maksa("1111")
```



Testit asiakkan kielellä

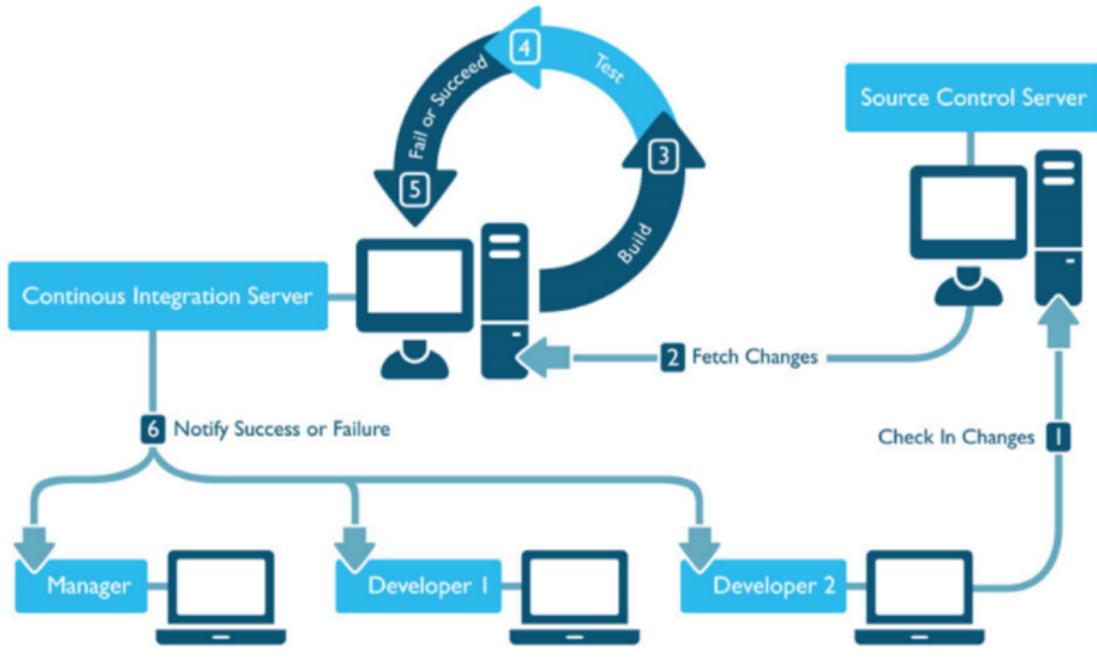
```
*** Test Cases ***
Register With Valid Username And Password
    Input Credentials  kalle  kalle123
    Output Should Contain  New user registered

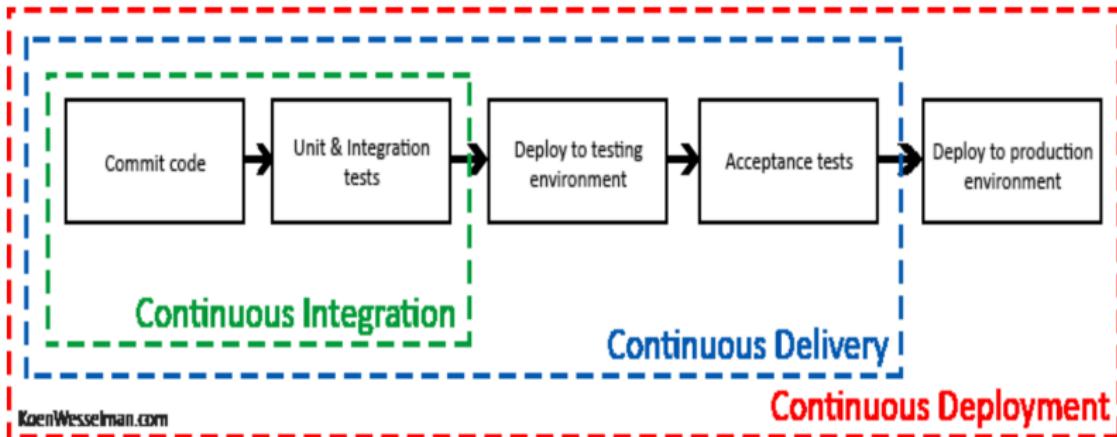
Register With Already Taken Username And Valid Password
    Input Credentials  kalle  kalle123
    Input Register Command
    Input Credentials  kalle  foobarfoo1
    Output Should Contain  User with username kalle already exists

Register With Too Short Username And Valid Password
    Input Credentials  k  kalle123
    Output Should Contain  Username too short

Register With Valid Username And Too Short Password
    Input Credentials  kalle  k
    Output Should Contain  Password too short
```

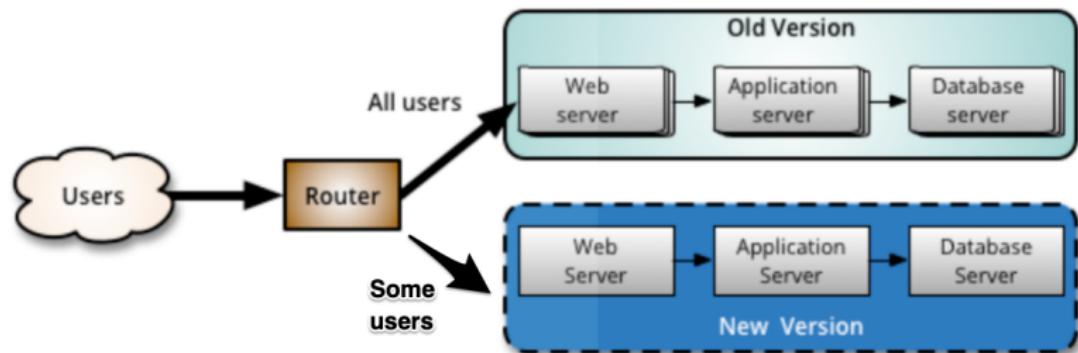
- ▶ *Input Credentials, Output should contain ym avainsanoja*





Luento 7

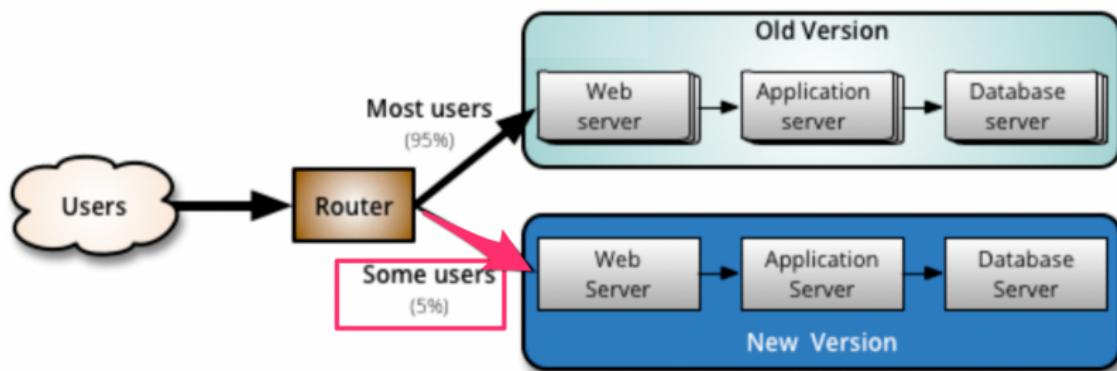
Blue-green-deployment



- ▶ Uusi ominaisuus deployataan ensin passiiviseen ympäristöön
- ▶ ja sitä testataan
 - ▶ osa liikenteestä ohjataan aktiivisen lisäksi passiiviseen ympäristöön ja varmistetaan, että toiminta odotettua

Canary release

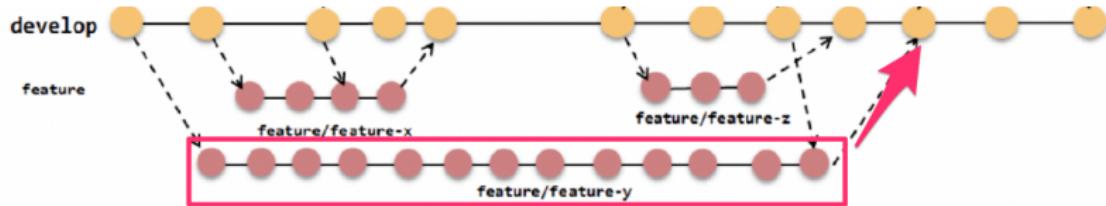
- ▶ *Canary-releasessa uuden ominaisuuden sisältävään ympäristöön ohjataan osa järjestelmän käyttäjistä*



- ▶ Uuden ominaisuuden sisältämää versiota *monitoroidaan*
 - ▶ jos ei ongelmia ohjataan kaikki liikenne uuteen versioon
- ▶ Ongelmatilanteissa palautetaan käyttäjät aiempaan, toimivaksi todettuun versioon

Feature branchit

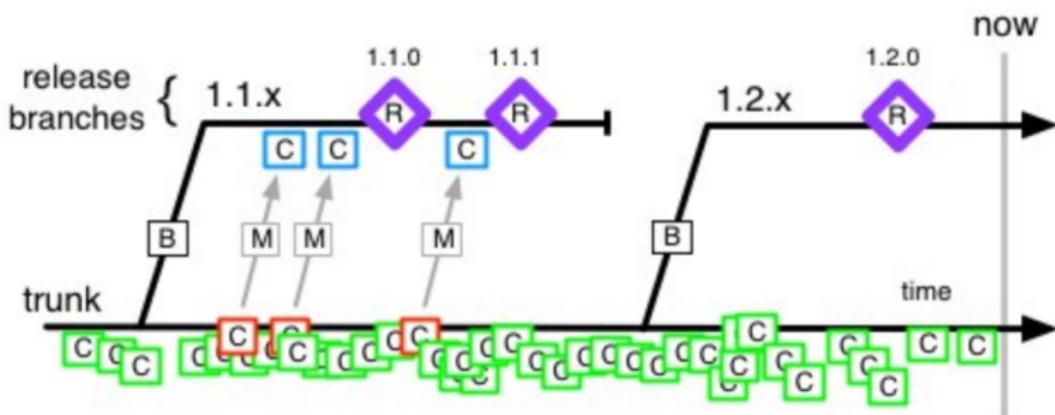
- ▶ Uusi ominaisuus, esim. user story toteutetaan ensin omaan versionhallinnan haaraansa



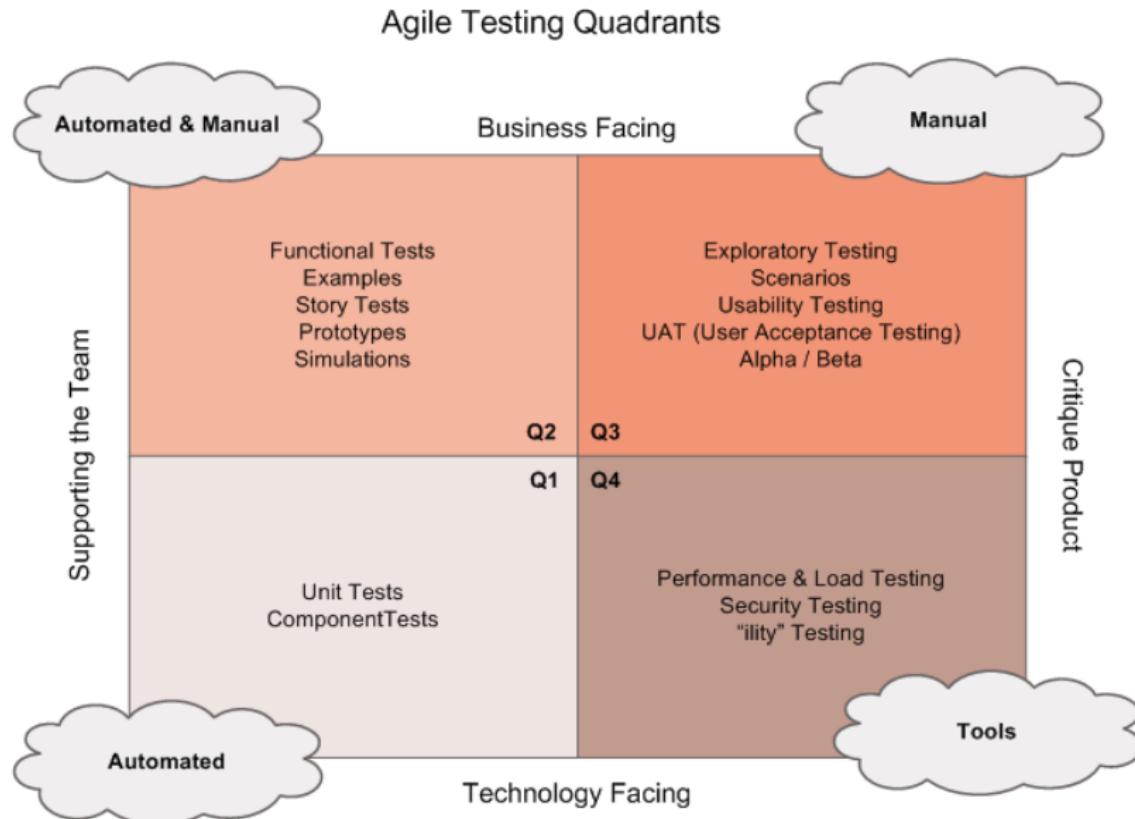
- ▶ ja ominaisuuden valmistuttua haara mergetään pääkehityshaaraan

Trunk based development

- ▶ Uusi trendi *trunk based development*: pitkäikäisiä feature brancheja ei käytetä ollenkaan
 - ▶ Kaikki koodi suoraan pääkehityshaaraan
 - ▶ ... josta käytetään nimitystä *trunk*



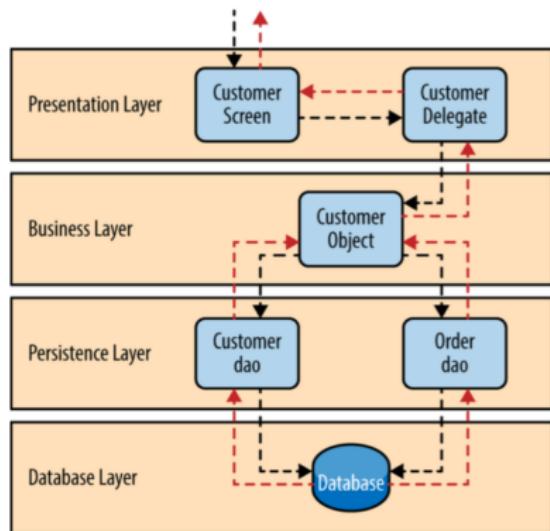
Yhteenvetö - ketterän testauksen nelikettä



Luento 8

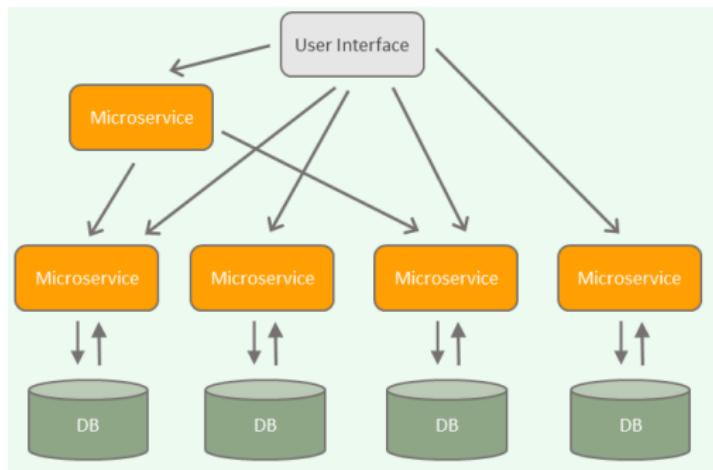
Kerrosarkkitehtuuri

- ▶ Kerros on kokoelma toisiinsa liittyviä olioita, jotka muodostavat toiminnallisuuden suhteen loogisen kokonaisuuden



Mikropalveluarkkitehtuuri

- ▶ sovellus koostataan useista (jopa sadoista) pienistä verkossa toimivista autonomisista palveluista



Laadukas koodi

- ▶ Laadukkaalla koodilla joukko yhteneviä ominaisuuksia, tai *laatuattribuutteja*, esim. seuraavat:
 - ▶ kapselointi
 - ▶ korkea koheesion aste
 - ▶ riippuvuuksien vähäisyys
 - ▶ toisteettomuus
 - ▶ testattavuus
 - ▶ selkeys

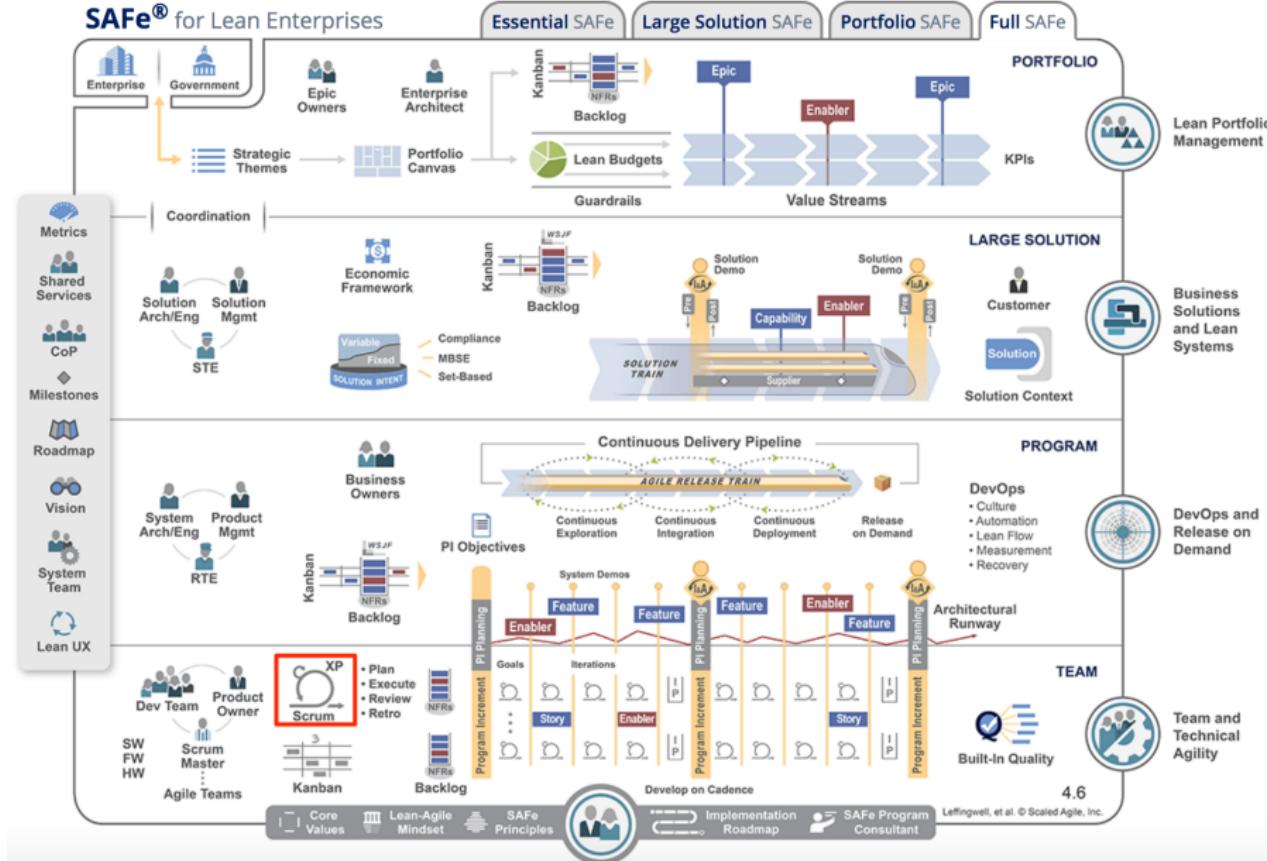
luento 9

Lean thinking houston

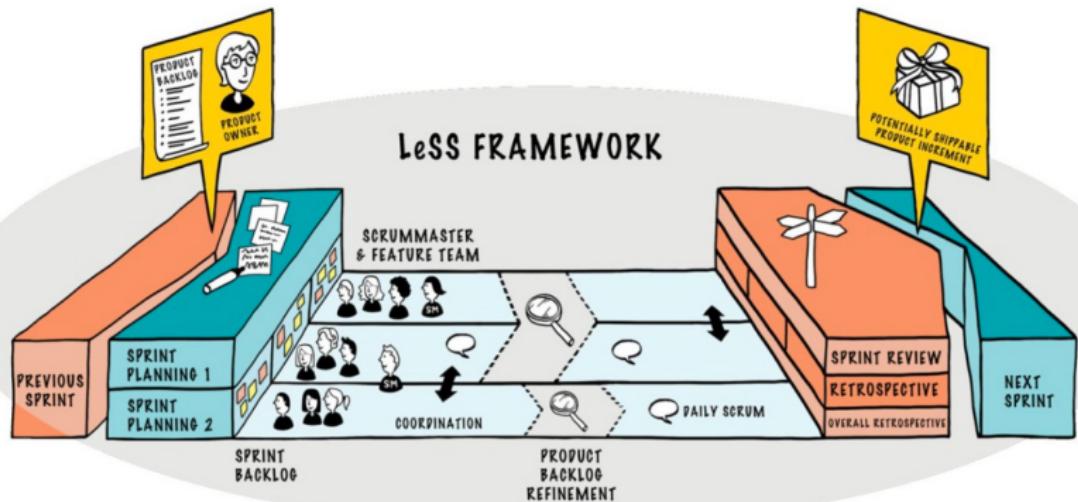
Sustainable shortest lead time, best quality and value (to people and society), most customer delight, lowest cost, high morale, safety		
<p>Respect for People</p> <ul style="list-style-type: none">- don't trouble your 'customer'- "develop people, then build products"- no wasteful work- teams & individuals evolve their own practices and improvements- build partners with stable relationships, trust, and coaching in lean thinking- develop teams	<p>Product Development</p> <ul style="list-style-type: none">- long-term great engineers- mentoring from manager-engineer-teacher- cadence- cross-functional- team room + visual mgmt- entrepreneurial chief engineer/product mgr- set-based concurrent dev- create more knowledge <p>14 Principles</p> <ul style="list-style-type: none">long-term, flow, pull, less variability & overburden, Stop & Fix, master norms, simple visual mgmt, good tech, leader-teachers from within, develop exceptional people, help partners be lean, Go See, consensus, reflection & kaizen	<p>Continuous Improvement</p> <ul style="list-style-type: none">- Go See- kaizen- spread knowledge- small, relentless- retrospectives- 5 Whys- eyes for waste<ul style="list-style-type: none">* variability, overburden, NVA ... (handoff, WIP, info scatter, delay, multi-tasking, defects, wishful thinking..)- perfection challenge- work toward flow (lower batch size, Q size, cycle time)
Management applies and teaches lean thinking, and bases decisions on this long-term philosophy		

luento 10

SaFe



LeSS



Spotify

