IN5140

Smart processes and agile methods in Software Engineering

Group session 3
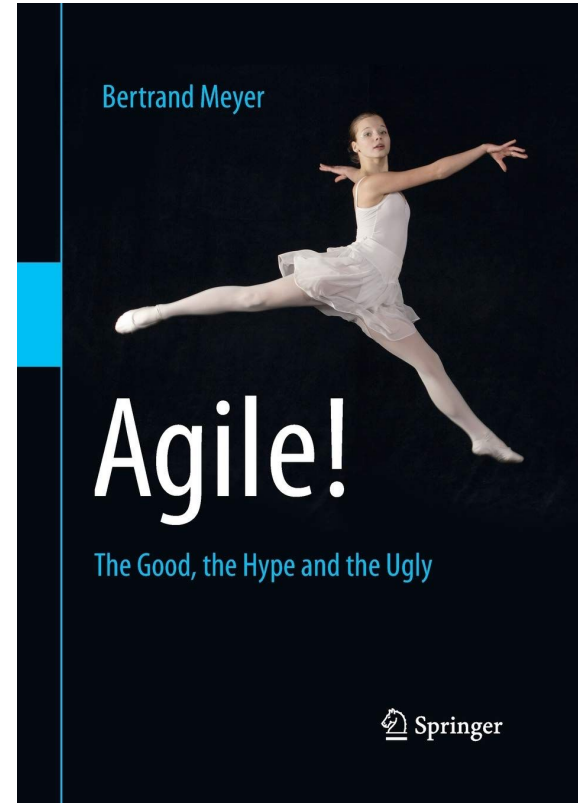
Agenda

First hour:

- Weekly exercises

Second hour:

- Weekly exercises?
- Information about the project
- Start working on Delivery 1

The book

- Available at Oria through your UiO account

Bertrand Meyer

Agile!

The Good, the Hype and the Ugly

Springer

Weekly exercises 3

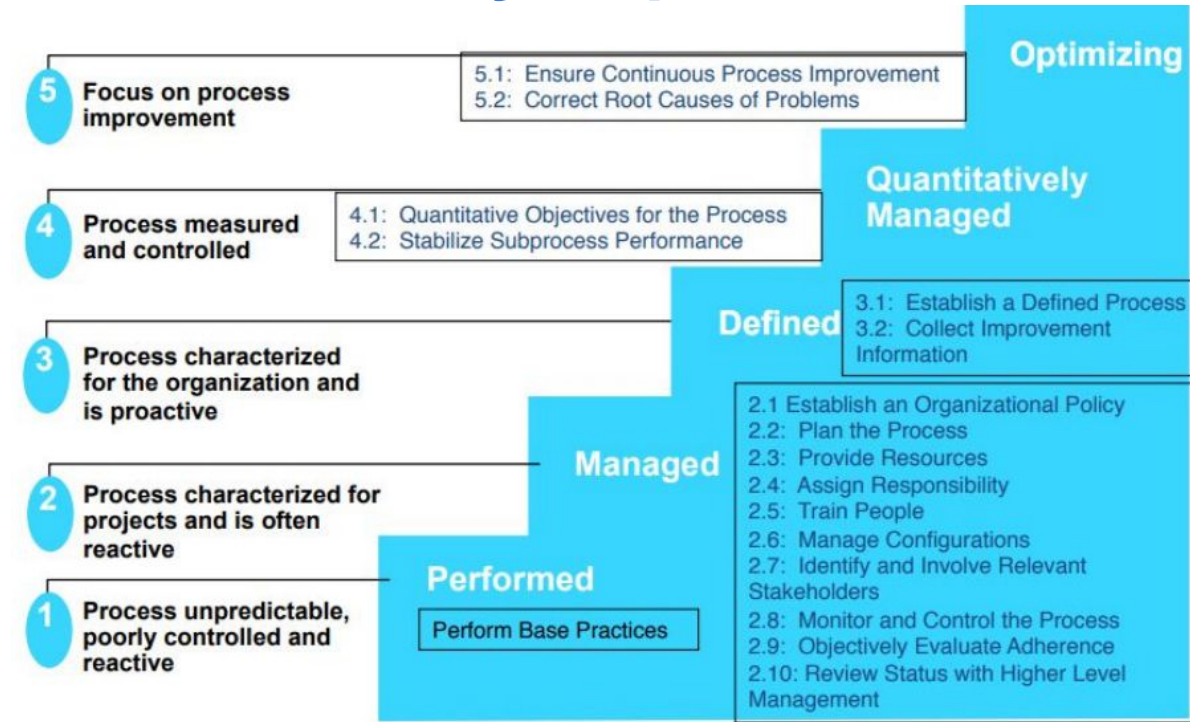# 1. Why are software process assessments performed?

- **Understand** existing software processes and how the organization works
- **Identify** strong and weak aspects and key areas for improvement

- What to base assessments on?
  - Organization needs and goals
  - Benchmark compared to other similar organizations

2. Define the terms formal and real process

- <u>Formal process:</u> An abstract representation of a process. The model describes the process from a certain perspective such as formal process is presenting what we say we do or **what we should do**. e.g. "Cooking recipe", "Delivery route".

- <u>Real process:</u> Activities that are carried out in a development project such as execution of processes that describes **what we actually do**.

3. Select three activities or subprocesses of your overall study process at the university Which level in CMMI would you put them?

Optimizing

5 Focus on process improvement
- 5.1: Ensure Continuous Process Improvement
- 5.2: Correct Root Causes of Problems

Quantitatively Managed

4 Process measured and controlled
- 4.1: Quantitative Objectives for the Process
- 4.2: Stabilize Subprocess Performance

Defined
- 3.1: Establish a Defined Process
- 3.2: Collect Improvement Information

3 Process characterized for the organization and is proactive

Managed

2 Process characterized for projects and is often reactive
- 2.1 Establish an Organizational Policy
- 2.2: Plan the Process
- 2.3: Provide Resources
- 2.4: Assign Responsibility
- 2.5: Train People
- 2.6: Manage Configurations
- 2.7: Identify and Involve Relevant Stakeholders
- 2.8: Monitor and Control the Process
- 2.9: Objectively Evaluate Adherence
- 2.10: Review Status with Higher Level Management

Performed

1 Process unpredictable, poorly controlled and reactive

Perform Base Practices

Exercise 3

- **Maturity Level 0 – Incomplete:** At this stage work "may or may not get completed." Goals have not been established at this point and processes are only partly formed or do not meet the organizational needs.
- **Maturity Level 1 – Initial:** Processes are viewed as unpredictable and reactive. At this stage, "work gets completed but it's often delayed and over budget." This is the worst stage a business can find itself in — an unpredictable environment that increases risk and inefficiency.
- **Maturity Level 2 – Managed:** There's a level of project management achieved. Projects are "planned, performed, measured and controlled" at this level, but there are still a lot of issues to address.
- **Maturity Level 3 – Defined:** At this stage, organizations are more proactive than reactive. There's a set of "organization-wide standards" to "provide guidance across projects, programs and portfolios." Businesses understand their shortcomings, how to address them and what the goal is for improvement.
- **Maturity Level 4 – Quantitatively managed:** This stage is more measured and controlled. The organization is working off quantitative data to determine predictable processes that align with stakeholder needs. The business is ahead of risks, with more data-driven insight into process deficiencies.
- **Maturity Level 5 – Optimizing:** Here, an organization's processes are stable and flexible. At this final stage, an organization will be in constant state of improving and responding to changes or other opportunities. The organization is stable, which allows for more "agility and innovation," in a predictable environment.

page 45 in the book gives a similar description

4. For each of the three activities / subprocesses specified in task 3:

- Define a goal for improvement.
- Define a variable (measurement) that would help answering the questions defined above.

5. Discuss how different cultural aspects may affect what processes are suitable in projects with people in different countries?

- You can have a look at this: https://www.hofstede-insights.com/country-comparison/japan,the-netherlands,norway,switzerland/
  - Note that there may be larger individual differences among the people within a country than between the stereotypes in the Hofstede model.

Exercise 6: Multiple choice

a) What is the correct order of activities in a systematic approach to Software Process Improvement (SPI)?

    i)   Check, act, do, and plan

    ii)   Plan, do, check, and act

    iii) Act, check, do, and act

    iv) Plan, act, check, and do

Exercise 6: Multiple choice

a) What is the correct order of activities in a systematic approach to Software Process Improvement (SPI)?

i)   Check, act, do, and plan

ii)   **Plan, do, check, and act**

iii) Act, check, do, and act

iv)   Plan, act, check, and do

- **PLAN** what you want to accomplish over a period of time and what you might do, or need to do, to get there
- **DO** what you planned to do
- **CHECK** the results of what you did to see if the objective was achieved
- **ACT** on the information – standardize or plan for further improvement

Exercise 6: Multiple choice

b) The questions such as, "How do we get there?", "Where are we today?" are asked in which of the following phases of a systematic approach to SPI?

i)   Do

ii)   Act

iii)   Plan

iv)   Check

Exercise 6: Multiple choice

b) The questions such as, "How do we get there?", "Where are we today?" are asked in which of the following phases of a systematic approach to SPI?

   i)   Do

   ii)   Act

   iii)   Plan

   iv)   Check

Exercise 6: Multiple choice

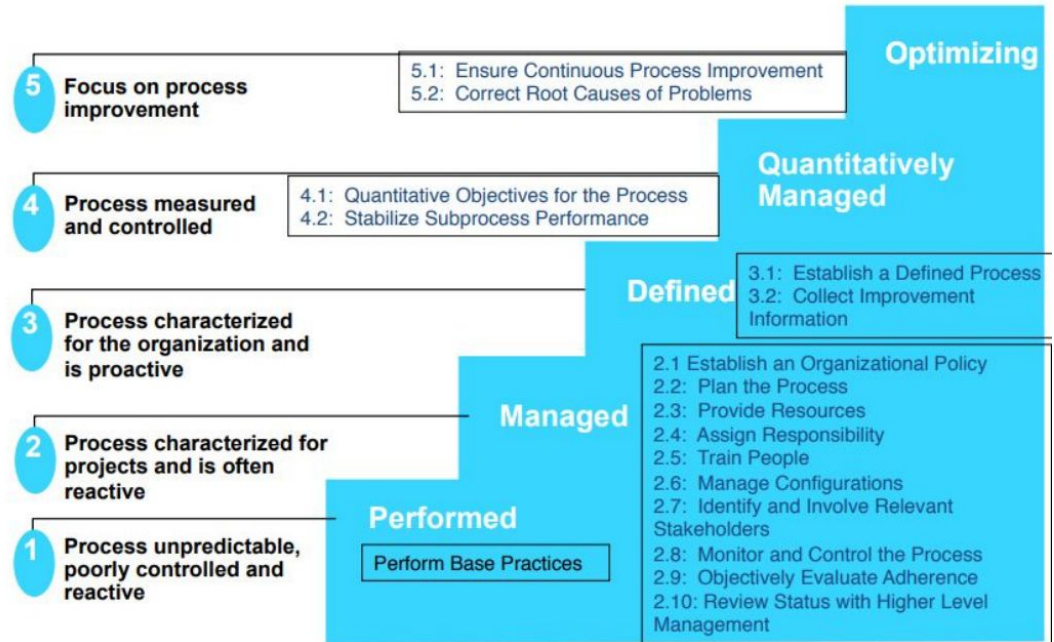**c)** According to CMMI, the level with focus on process improvement is at which of the following maturity levels?

     i)   Defined

     ii)   Managed

     iii)   Performed

     iv)   Optimizing

Exercise 6: Multiple choice

c) According to CMMI, the level with focus on process improvement is at which of the following maturity levels?

    i)   Defined

    ii)   Managed

    iii)   Performed

    iv)   Optimizing

Exercise 6: Multiple choice

d) The focus on ITIL (IT Infrastructure Library) is on which of the following area?

      i)   Continuous improvement

      ii)   Service management or operations

      iii)   Software development, integration, deployment and maintenance

      iv)   Application development, ICT infrastructure projects

Exercise 6: Multiple choice

d) The focus on ITIL (IT Infrastructure Library) is on which of the following area?

     i)   Continuous improvement

     ii)   **Service management or operations**

     iii)   Software development, integration, deployment and maintenance

     iv)   Application development, ICT infrastructure projects

Standard framework for IT service management. Focuses on:
- Customer satisfaction
- Service quality and time
- Cost efficiency

Break until 13:18 ☕

Let's talk about your project

- Now that you have a group ➜ choose a case / organization
- Here is all the information you need:
  https://www.uio.no/studier/emner/matnat/ifi/IN5140/h22/project-and-deliverables/

Group problems

You can always contact us if there are any problems with your group. 👩🏼‍💻👩🏻‍💻

- Group not responding
- Teamwork problems
- Or anything else

Case 1

Problem: An organization is working on a project regarding a software system, which is their main product. There are in total 10 teams working on the software, with 6-9 persons on each team. The teams are autonomous/self-organizing. The project is distributed, and of the 10 teams, 4 of them are located in India, 6 in Norway. During the Corona-situation, the teams had to work from home. After coming back, some team members have continued working from home, while others began working from the office. This has made the teams themselves distributed. The management of the organization feel like the teams are working in different directions, without a common goal. This has resulted in project deliveries often being delayed. They have also received feedback that the teams find it difficult to co-operate for several reasons, including using different working methods, documentation methods and other aspects of their processes. The management is worried that the communication difficulties will affect the quality of the product in the long run.

Description of organization: The roles involved in the project mainly consist of managers, developers, testers and scrum masters. The organization uses Scrum as their process model, with emphasis on the teams being agile and self-organizing.

How the problem was identified: Management realized that there was a large delay between the estimated and released product. When investigating the problem, they were told that the teams had too much to do and were therefore not able to meet the deadlines. Management decided to investigate further and found that the teams were doing a large amount of unnecessary, overlapping work. The teams had little to no contact in the beginning of the sprints, but suddenly had to familiarize themselves with large amounts of other team's code and tests at the end, and thus had to adjust their own work. This caused not only delays, but also stress on the employees.

Goal: Reduce the delays and other waste by improving communication both between and within the project teams. The teams should work towards a common goal, while minimizing time spent on overlapping work.

Current process: The process for the teams resembles Scrum. Every sprint begins with the team having a sprint planning where they go through the backlog. Then, development and testing starts. In the last week of the sprint, a sync meeting is required between the teams. The meeting often results in adjustments needed to be made to the code, new tests, etc. If the team is not able to finish the tasks in their backlog, those tasks are moved to the next sprint.

Case 2

Problem: An organization has a large number of systems that are continuously maintained. Maintenance is defined as the work involved in user support, handling change requests, error correction and small functional enhancements and the deployment of new versions of the systems to its users. The organization experiences that there is a growing backlog of change requests from the users and feels that the current maintenance process is too time consuming.

Description of organization: Approximately 50 people work on maintaining 6 different systems. They are organized in 2 groups, each with of 3 teams. One group handles 3 systems, and the other group handles the other 3 systems. Each group has a manager and each team has a team lead. The teams are 1. User support who handles questions and requests from the users of the systems, 2. Requirements and test with functional specialists who specify new requirements for the system and subsequently test that these are fulfilled, and 3. Development with developers who correct errors and implement the required changes.

How problem was identified: The organization was compared to other similar organizations in a benchmarking, and a result of the benchmarking was that it became clear that this organization spends a lot more effort than other similar organizations on software maintenance. In particular, much effort is spent on communication between the teams about the change requests and on sending these back and forth between the teams. Furthermore many defects slip through testing.

Goal: The goal is a more efficient maintenance process where less time is spent on communication and defects are detected earlier.

Current process: The current process is very similar to the V-model.

Current roles, activities, artifacts and tools: The change requests, called CRQs, are registered by User support in a system called Repair. Each CRQ contains a description of the problem and a suggested solution in the form of new requirements. When Development has implemented the requirements they tick off a box for development completed. Correspondingly a box for test completed is ticked off by Requirements and test when they have completed testing.

Case 3

Problem: A company maintains software for a product line of access control systems. When software is to be developed for a new kind of lock, a new project is set up. The company has no formalized process for requirements handling, so each new project tends to define their own way of documenting and handling requirements. This also means that requirements are not transferred in a systematic way when the system is set in production and the software is transferred to maintenance. Many requirements are similar across projects, but due to the lack of a formalized process for handling requirements the reuse of requirements from one project to another depends on the people who are involved. The company has recently experienced tougher competition and is looking at ways to become more competitive.

Description of organization: The company primarily consists of project managers, developers and product specialists, organized in projects. In addition some people are employed in administrative functions.

How problem was identified: The company recently hired a new employee who told the management that in his former company requirements management was done in a more formalized way and that increased their competitiveness.

Goal: A formalized process for requirements handling that reduces time-to-market for new software products, and in particular reduces the necessary effort to start a projects.

Current process: Scrum is used in development, but scrum relies on a backlog of requirements, for example in the form of user stories, and does not incorporate requirements handling.

Current roles, activities, artifacts and tools: Each project has a project backlog in the tool Jira with user stories and tasks to be performed in the project.

What is next?

- Work with Deliverable 1
  - Choose a case, or make one yourselves!
  - Start on your BPMN

  https://www.uio.no/studier/emner/matnat/ifi/IN5140/h22/project-and-deliverables/

Help with Deliverable 1 🙋‍♂️

Weekly tasks, etc.

Thank you for today!