Faculty of Computers and Artificial intelligence

Software Process and Quality Management

COURSE CODE: SCS253

Dr. Lamia Abo Zaid

l.abozaid@fci-cu.edu.eg

presented by: Dr. Amr Galal

amrgalal@aucegypt.edu

Course Contents

- ✓**Introduction**
- ✓**The Software Lifecycle**
- ✓**Software Engineering Development Models**

Course Contents (Cont.)
Software Engineering Development Models

- ✓**Waterfall Model**
- ✓**The “V” Model**
- ✓**Spiral Model**
- ✓**Rational Unified Process**
- ✓**Agile Processes**

Course Contents (cont.)

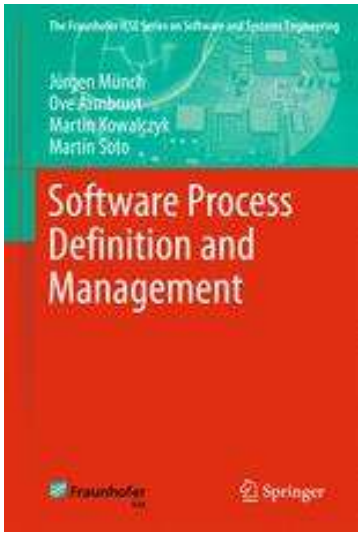
- ✓**Quality In The Software Process - Software Quality Metrics**
- ✓**Software Configuration Management**
- ✓**Open Issues in Process Management**

Grading System

- **Written Exam (60%)**
- **Class Assignments (40%)**
  - **Mid Term Exam (15)**
  - **Individual Lab Assignments /Project (15)**
  - **Assignments /Quizzes (10)**

Course Material

- Lecture Slides
- Text books:
  - Software Process Definition and Management,
- Other sources
  - Miscellaneous papers/sources
  - Materials will be on Acadox



Ground Rules

Mobile Silent

Punctuality

Participation

No Side Talks

Survey

- Survey URL:
- http://etc.ch/BH5L

- result:
- https://directpoll.com/r?XDbzPBd3ixYqg8UVNzkDfaO5k6AukzN2S1h7IwPyW
- https://directpoll.com/c?XDVhEt2yiKBkVDE0n97lIkvVnM8NqBfL

Why Process Management?

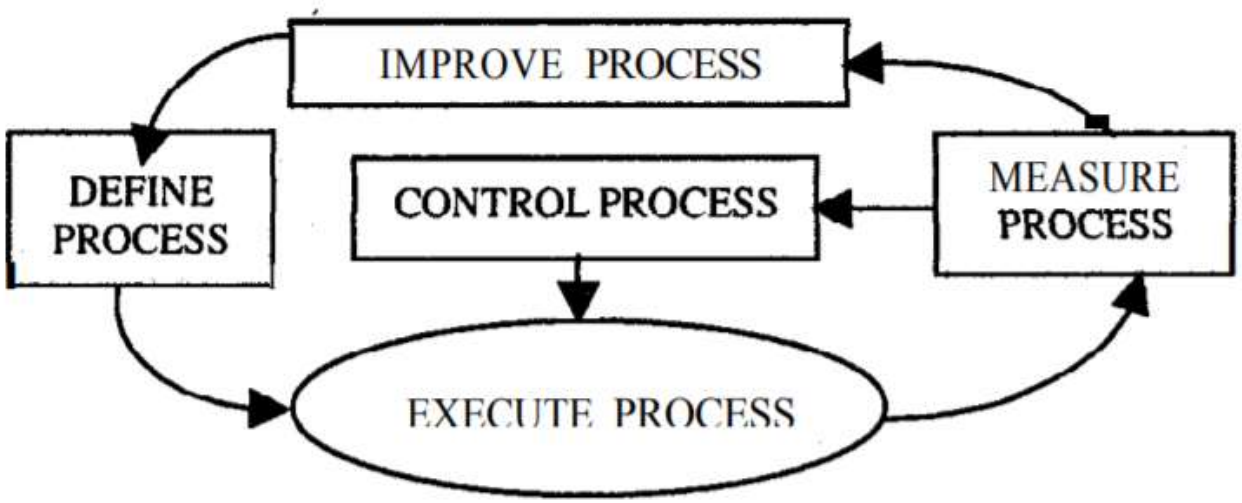
- Over Budget
- Late delivery
- Low Quality
- Under estimated resources

Preliminary Planning Of A Software Project

- An initial software development plan will be developed that usually contains the following:

- The vision of the project
- The main authority/decision maker
- The objectives of the project
- The main risks
- Personnel needs
- Estimated duration of the project

Process Management



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Advantages Of Systematic Process Modelling

1. Better transparency of software engineering activities.
2. Reduced complexity of large development efforts.
3. The ability to perform process measurement.
4. The ability to undergo process assessments.
5. Predictability with respect to the process characteristics and the characteristics of the results is only achievable with explicit models.

Process Vs. Process Model

Software Process

- A goal-oriented structured set of activities required to develop a software system, consists of:
  - Specification
  - Analysis, design and implementation.
  - Validation
  - Evolution

Software process model

- An abstract representation of a process.
  - It presents a description of a process from some particular perspective

Process Vs. Process Model

- While a process is a vehicle for solving problems and achieving development goals, a process model is a specification on how this is done.
- A process model can describe a process on different levels of abstraction (e.g., lifecycle process level, engineering process level, atomic step level).
- Process models can be used for different purposes, e.g., for coordinating, synchronizing, monitoring, and improving software development, maintenance, and operation activities.

Process Models

Main elements of a process model are :

1. A description of an identifiable activity or a group of activities
2. A description of the product flow (i.e., input and output products for activities)
3. A description of the control flow between processes (i.e., the enactment or execution sequence)
4. A description of a refinement (i.e., the definition of a hierarchy of processes)
5. A description of the relationships to techniques, methods, tools
6. A description of the relationship to roles

Important Process Terminology 1

- An atomic process (synonym: process step) is a process that does not allow further structuring in the form of sub-processes.
- Process enactment is the performance of process steps undertaken to reach a given goal. The process performer (i.e., "agent") can be a human or a machine. In case of a machine, the term "process execution" is usually used.
- A process definition is a description of a process that is enactable.

Important Process Terminology 2

- A process script is a description of a process that is suitable for interpretation by humans. A process script should be tailored to the needs of the process performer
- A process program is a description of a process that can be interpreted by machines.
- A process schema (synonym: process metamodel, process architecture) is a conceptual framework for the consistent description of process models and their relationships.
- A process schema describes, on the one hand, building blocks and their relationships that form a process model, and, on the other hand, constraints on their composition.

Important Process Terminology 3

- A process agent (synonym: process performer) is a person or machine that enacts/executes the process in order to reach the process goal(s).
  - Humans interpret process scripts, machines interpret process programs.
- A process owner is a human or organizational entity that sets the goals of a process and is responsible for their achievement.
- A process engineer is a person who pursues one or several goals of process modelling (e.g., defining, extending, maintaining, improving process models).

A Project

- A project is a unique endeavour, which is limited by a start date and an end date and should achieve a goal
  - A project phase (short: phase) is a collection of logically separated project activities, usually culminating in the completion of a major deliverable or the achievement of a major milestone.
  - Phases are mainly completed sequentially, but can overlap in some project situations
  - Phases can be subdivided into sub-phases
  - A phase is always defined by a start date and an end date.
  - Typical examples of phases are the elaboration phase, the construction phase, or the transition phase. Phases are usually used when looking at a project from a management perspective

A Project Plan

- A project plan is a specification of the necessary resources for the execution of a process definition, the relationships between these resources and processes, the produced products including the product flows, and restrictions of any type concerning the execution of the process.

Questions ?

Thank you