Lab Course / Praktikum: 
*Project Management and Software Development for Medical Applications*

Introduction to Project Management – 13/04/2021
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Project Management – Definition

*Project*: A *temporary* efforts undertaken to create a *unique* product, service or results

*Project management:*

The application of *knowledge, skills, tools and techniques* to project activities to meet the project requirements *(ISO 21500:2012)*

The process of creating, organizing, and executing a *plan* in order to achieve business *objectives*
Fail to Plan, is Planning to Fail.

- Benjamin Franklin (1706-1790)
Project Management is the Key to Your Success

Learn!

- Self-management
- Use of planning tools
- Team-working
- Communication skills
- Presentation skills

Gain!

- Well-prepared for master's thesis and PhD
- Ready to enter industry
Project Manager

The main task of a project manager is to fulfill the stakeholders' expectations towards the project goal.

Any person or organization whose interests are affected by the project results is a stakeholder.
Managing the Triple Constraints: The Magic Triangle
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Time

Resources
Managing the Triple Constraints: The Magic Triangle

- Time
- Scope / Quality
- Resources
Managing the Triple Constraints: The Magic Triangle

Keeping up with deadlines (time) might require overtime or additional staff, this increases cost.

To assure quality of the project results, additional testing is implemented, increasing the required time.

At a capped budget, development of some features might be cancelled, decreasing the quality or scope.
Why Do Projects Fail?

Missing Focus
- unclear objectives
- lack of business focus

Content issues
- shifting requirements
- technical complexity

Skill Issues
- unaligned team
- lack of skills

Execution Issues
- unrealistic schedule
- reactive planning
The Project Lifecycle
A project can be divided into 5 process groups
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- Project Start
- Initiating Processes
- Executing Processes
- Planning Processes
- Project End
A project can be divided into 5 process groups

1. **Project Start**
2. **Initiating Processes**
3. **Executing Processes**
4. **Planning Processes**
5. **Closing Processes**
6. **Project End**
A project can be divided into 5 process groups

- Initiating Processes
- Planning Processes
- Executing Processes
- Monitoring & Controlling Processes
- Closing Processes
- Project Start
- Project End
Initiation Defines a New Project

WHAT?

Project scope, objectives and milestones

WHO?

Stakeholders, i.e. all important parties involved

Your tasks for this course?

Develop project charter
Project description
Identify stakeholders

you, your technical supervisor, your course tutors

who else (clinical partner, industrial partner, potential users…)?
SMART Project Goals

When you and your stakeholder(s) define the project goals, use the SMART paradigm:

**Specific**

**Measurable**

**Achievable**

**Realistic**

**Time-Bound**
SMART Project Goals

When you and your stakeholder(s) define the project goals, use the SMART paradigm:

Specific
Measurable
Achievable
Realistic
Time-Bound
Evaluated
Reviewed
Planning Consists of Establishing the Total Scope

Project management plan: Decide how you will handle and update all relevant processes

Define scope: Done by and with your supervisor

Collect requirements, identify respective tasks, define breakdown structure of work items (requirements presentation!)

Define activities, sequence activities, estimate activity durations to finally develop a schedule (**GANTT chart!**)*
GANTT chart examples
GANTT chart examples

1) Requirements Engineering

2) Development Phase 1
   - 2.1) WP1: Database Communication
   - 2.2) WP2: Communication with HL7 Proxy
   - 2.3) Prototype 1 available (22/06/2017)
   - 2.4) Test + Fix 1

3) Development Phase 2
   - 3.1) WP3: Accession number generation
   - 3.2) WP4: Connection to name translation web service
   - 3.3) Procedure code mapping
   - 3.4) Prototype 2 available (21/06/2017)
   - 3.5) Test + Fix 2

4) Integration test
5) Release
6) Documentation
Project Milestones

represent decisive steps during the project

define certain phases of your project and the corresponding costs and results

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Project Management Tools, e.g. for GANTT Charts

MS Project *

ProjectLibre (projectlibre.com)
GanttProject (ganttproject.biz)
TeamGantt (teamgantt.com)

Redmine (redmine.org)

(* free for TUM students @ studisoft.de)
Planning Consists in Establishing the Total Scope

Plan Quality Management: How do you document? How do you test?

Plan, analyze and mitigate risks: Which risks (sickness, schedule, code, compatibility…)?

Plan communication management: Who? How often? In which form?

Plan Stakeholder Management: How much do you engage the stakeholders?
Execution Consists in Completing the Work Items

DO!

Getting stuff done…

PMSD

Direct and manage project

Perform Quality Assurance: Test and document code

Manage Communications: Hold project meetings, give course presentations

Manage Stakeholder Engagement: Make sure everybody is informed and involved to the right level

```cpp
/*! A test class */

class Test
{
  public:
    /*! An enum type.
    * The documentation block cannot be put after the enum!
    */
    enum EnumType
    {
      int EVal1, /**< enum value 1 */
      int EVal2 /**< enum value 2 */
    }
    void member(); //!< a member function.

    protected:
      int value; /**< an integer value */
};
```
Closing Consists in Concluding All Activities

Finish your project

- Obtain acceptance by supervisor
- Review project
- Archive all documents
- Document lessons learned

PMSD

*Close project:*

- Finish project and final tests
- Deliver code / tool / documentation to supervisor
- Give final presentation
Project Management is Crucial to Success!

Define your scope and objectives and stick to them!

Spend time monitoring your project

Document what you do!

Communicate efficiently
Thank you!