



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

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## Introduction to Project Management SS2023

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Munich, April 2023



# 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



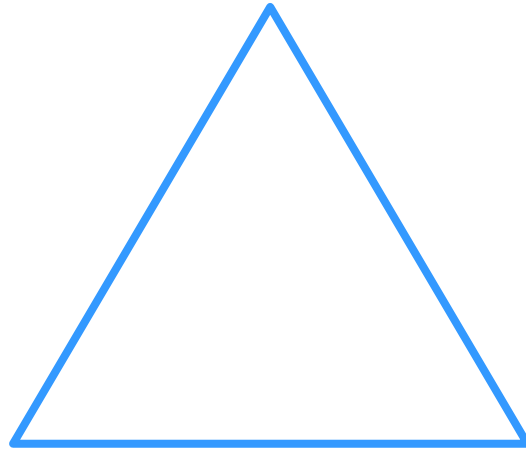
# Project Manager

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

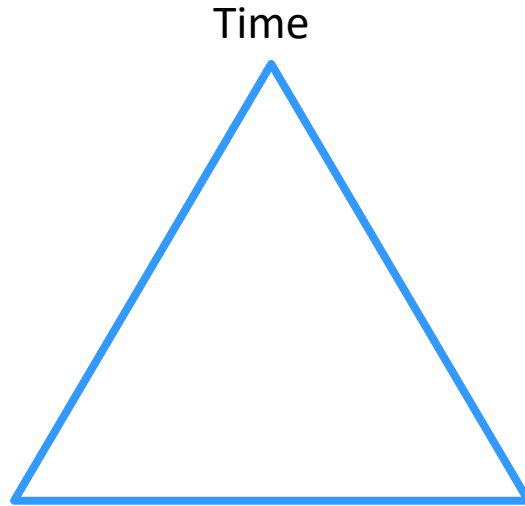
Any person or organization whose interests are affected by the project results is a **stakeholder**.



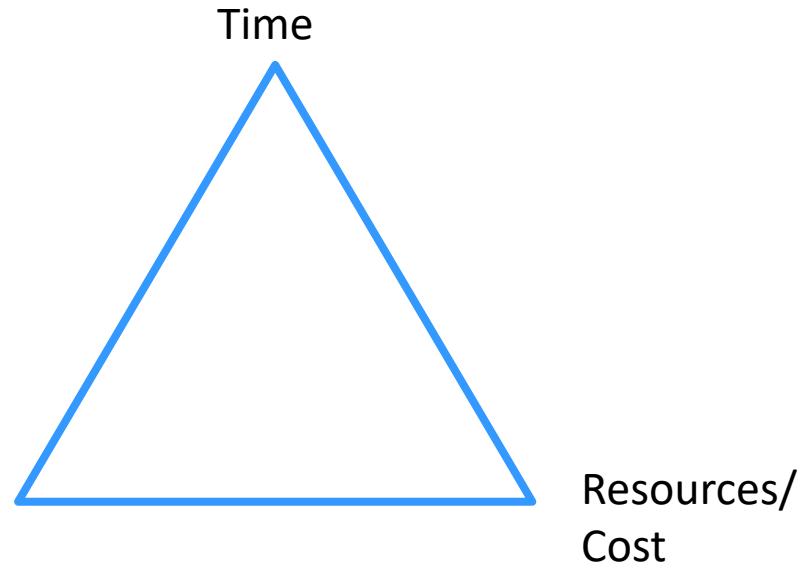
# Managing the Triple Constraints: The Magic Triangle



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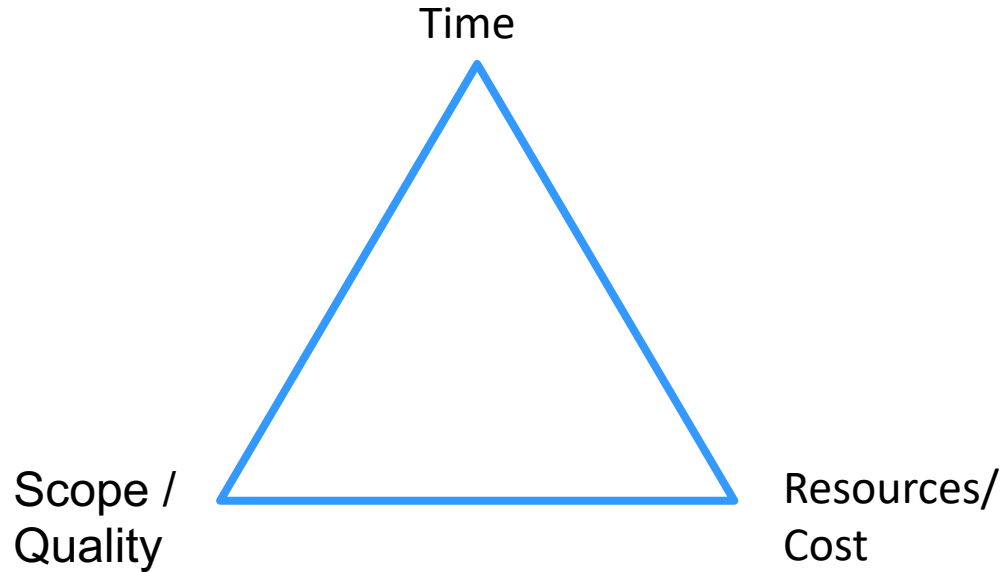


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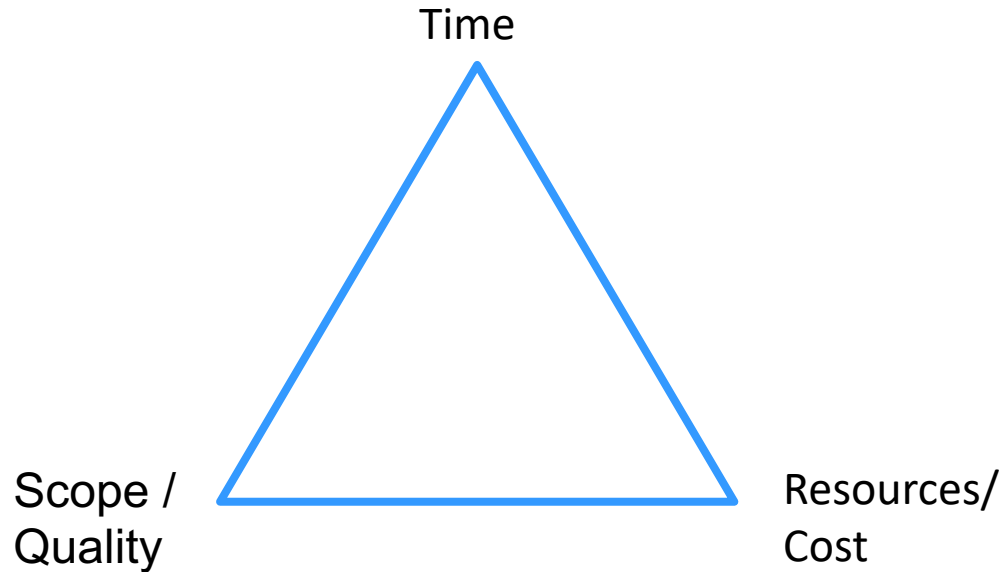




# Managing the Triple Constraints: The Magic Triangle



# 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

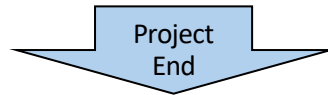


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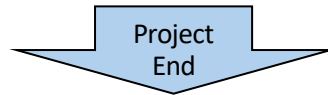
# A project can be divided into 5 process groups



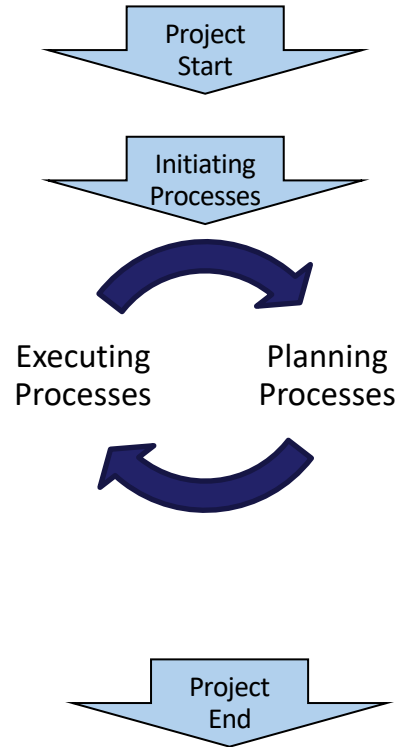
# A project can be divided into 5 process groups



- Perform a feasibility study
- Create a project charter
- Identify key stakeholders
- Select project management tools



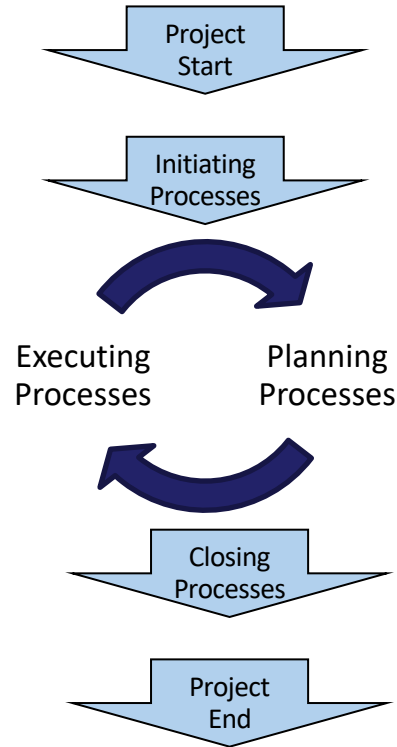
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- Create a project plan
- Develop a resource plan
- Define goals and performance measures
- Communicate roles and responsibilities to team members
- Build out workflows
- Anticipate risks and create contingency plans



# A project can be divided into 5 process groups

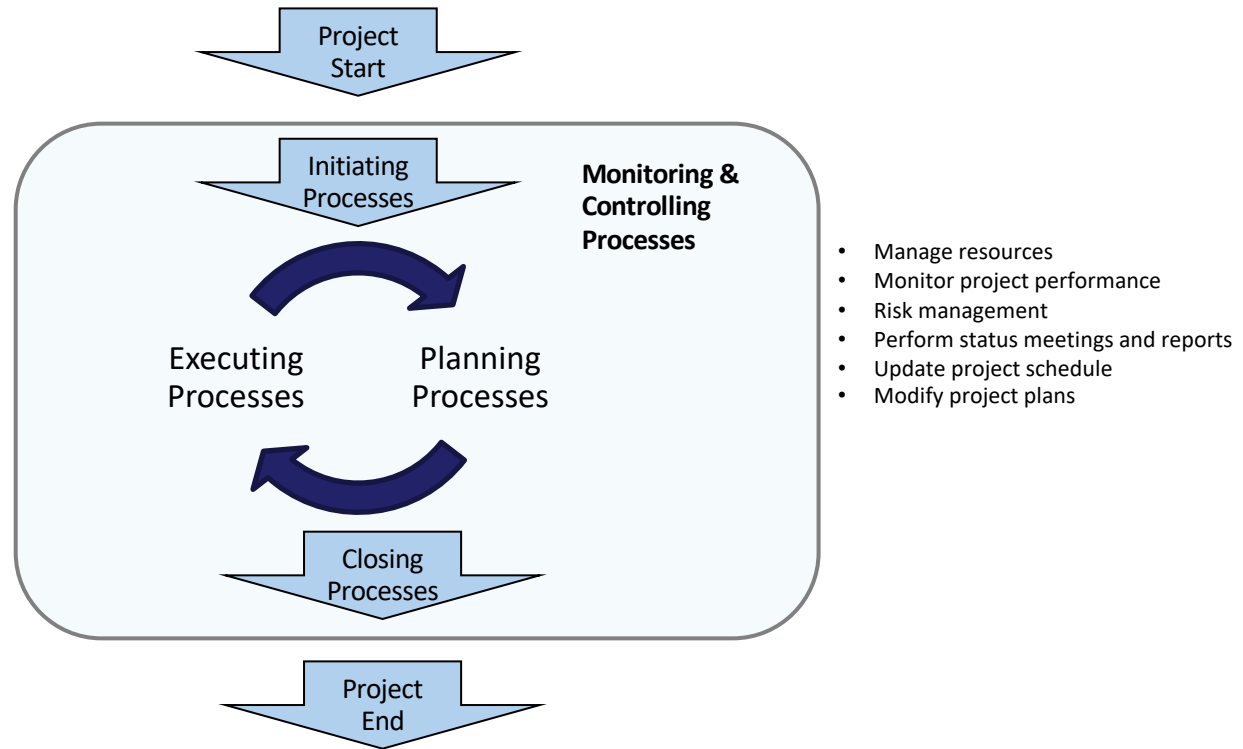


- Take inventory of all deliverables
- Tie up any loose ends
- Hand the project off to the client or the team that will be managing the project's day-to-day operations
- Organize all project documents in a centralized location
- Communicate the success of the project to stakeholders and executives
- Celebrate project completion and acknowledge team members





# A project can be divided into 5 process groups



# 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:** who, what, where, when, why
  - **Measurable:** how to quantify
  - **Achievable:** resources and capabilities
  - **Realistic:** are you able to commit
  - **Time-Bound:** urgency



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  - **Time-Bound:** urgency
  - **Evaluated:** ~~“set it and forget it”~~
  - **Reviewed:** rethink the goal?

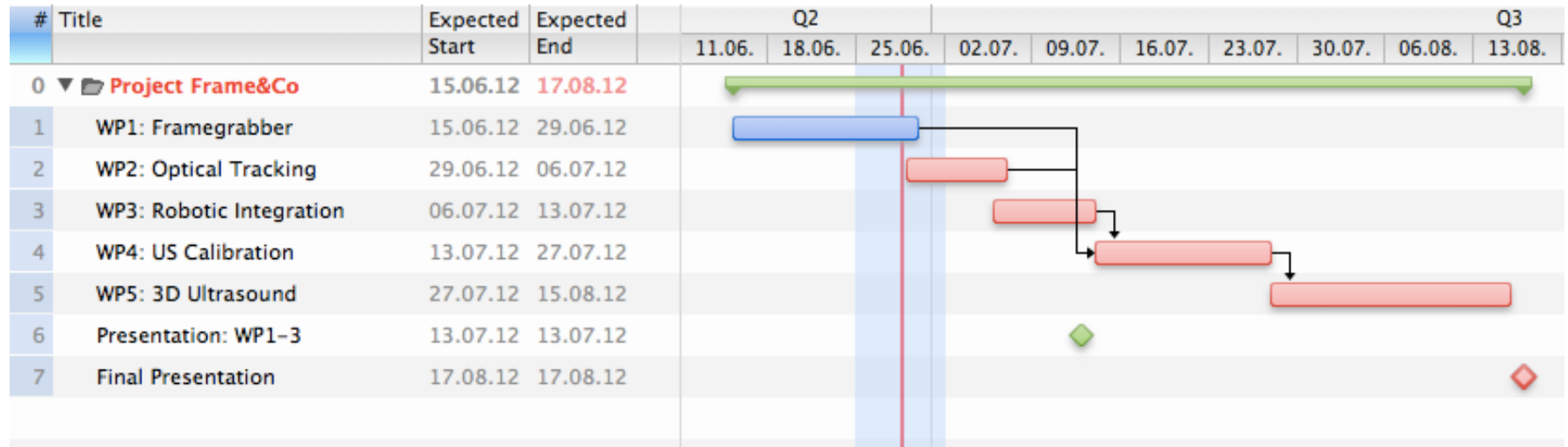


# Planning Consists of Establishing the Total Scope

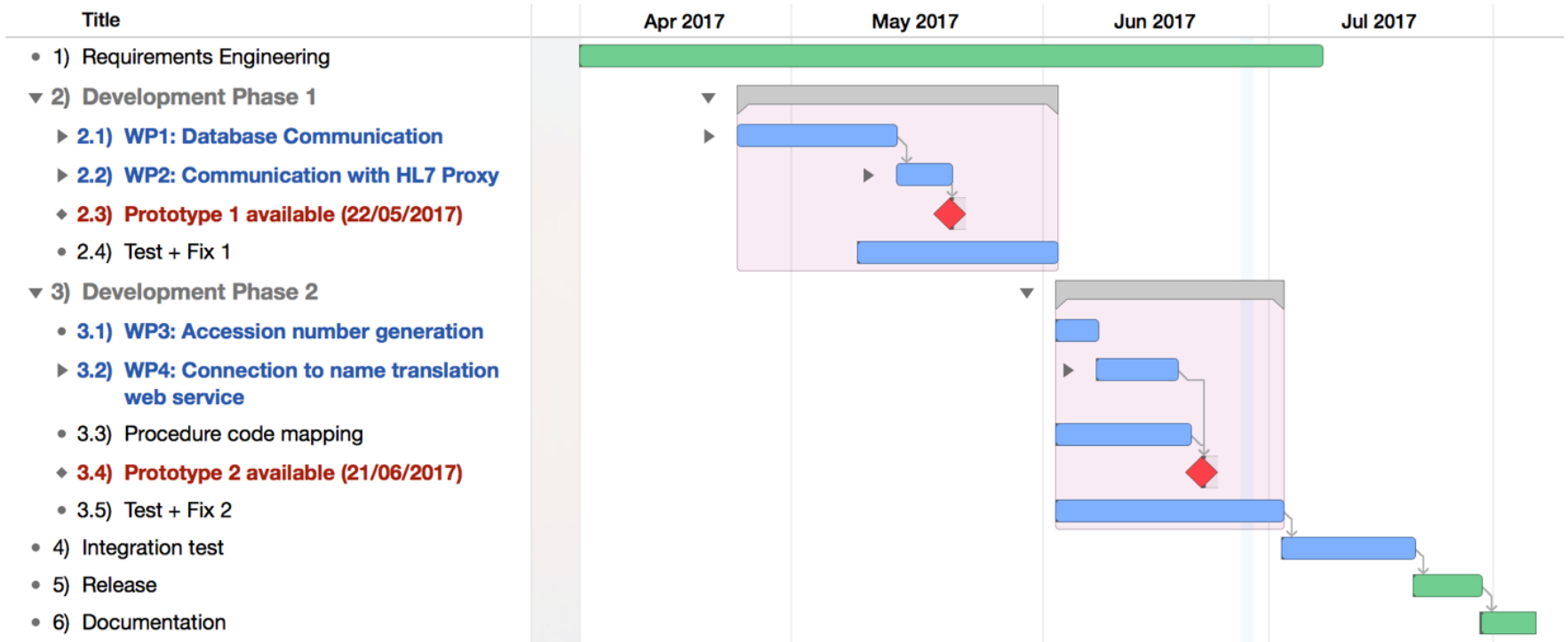
- Project management plan: Decide how you will handle and update all relevant processes
- Define scope: Done by and with your supervisor
- Collect requirements, identify respective tasks, define breakdown structure of work items (requirements presentation!)
- Define activities, sequence activities, estimate activity durations to finally develop a schedule (**GANTT chart!**)



# GANTT chart examples



# GANTT chart examples



# Project Milestones

- represent decisive steps during the project
- define certain phases of your project and the corresponding costs and results



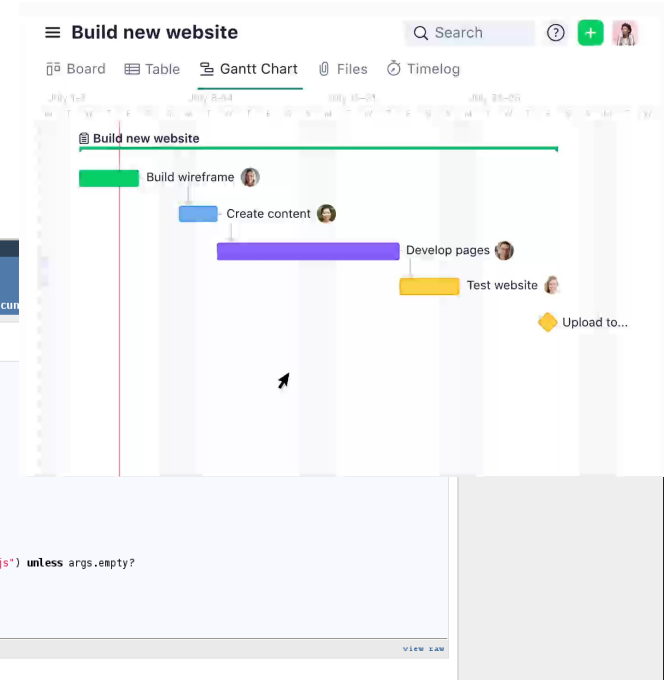
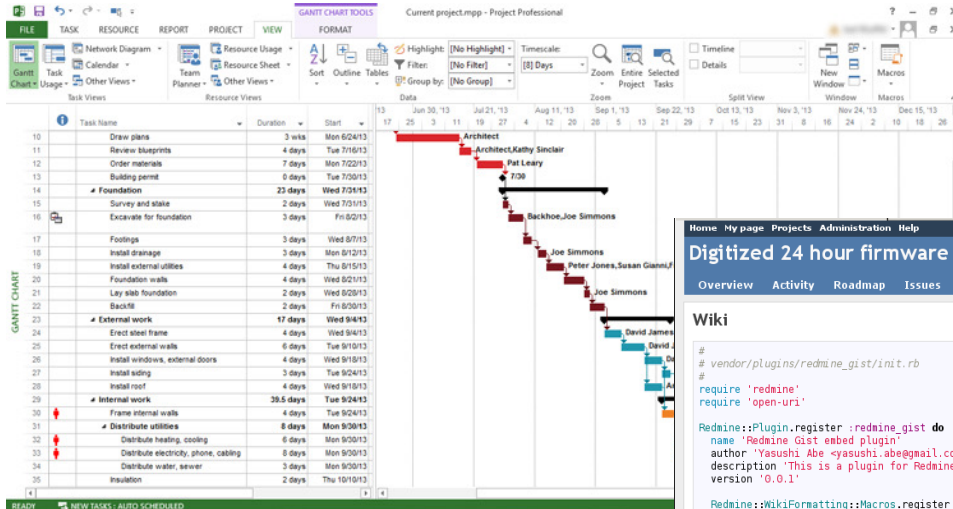
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# Project Management Tools, e.g. for GANTT Charts

- MS Project \*



ProjectLibre (projectlibre.com)

GanttProject (ganttproject.biz)

TeamGantt (teamgantt.com)

etc.

(\* 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

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



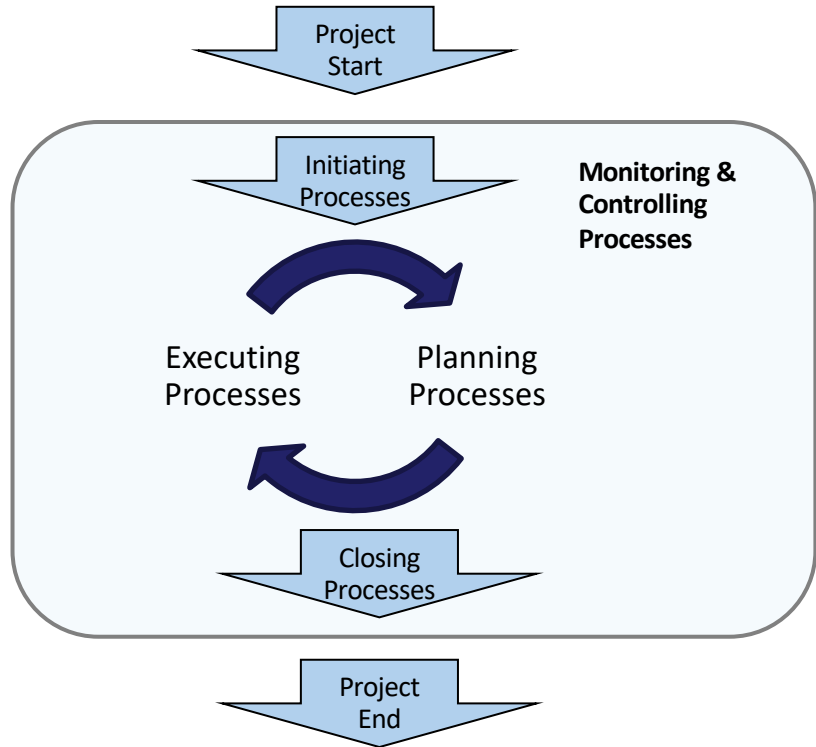
# Closing Consists in Concluding All Activities

- 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!**

Munich, April 2023

