كلية المدربين التقنيين
Technical Trainers College

Electronics and Electrical Technology

Circuit Technology

Analogue electronics, BVF-6

Name:
Class:
ID-Nr.:

AS-4
Project management fundamentals

Target definition

The trainee will become familiar with the basic techniques for project management

The trainee will learn what are the four Project Phases (initiation, planning, execution and closeout).

The trainee is able to generate a project management plan using a structured, step by step process.

After the course **the trainee** is able to initiate, plan and execute his own projects.

THE BEST SOURCES OF HELP

Book:
Portny, Stanley. *Project Management for Dummies.* Chichester: Wiley, 2001.

Websites:
4pm: **www.4pm.com/articles**
Mind Tools: **www.mindtools.com**

AS-4 project management fundamentals

1. Introduction

2. The four project phases

2.1. initiating

2.2. planning

2.3. executing

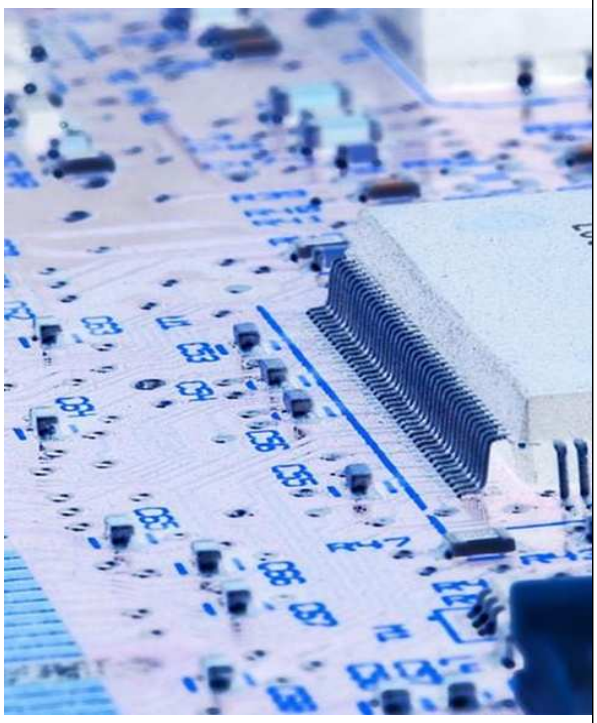
2.4. closing

3. Practical exercise (3 groups)

3.1 Develop a kit for digital systems

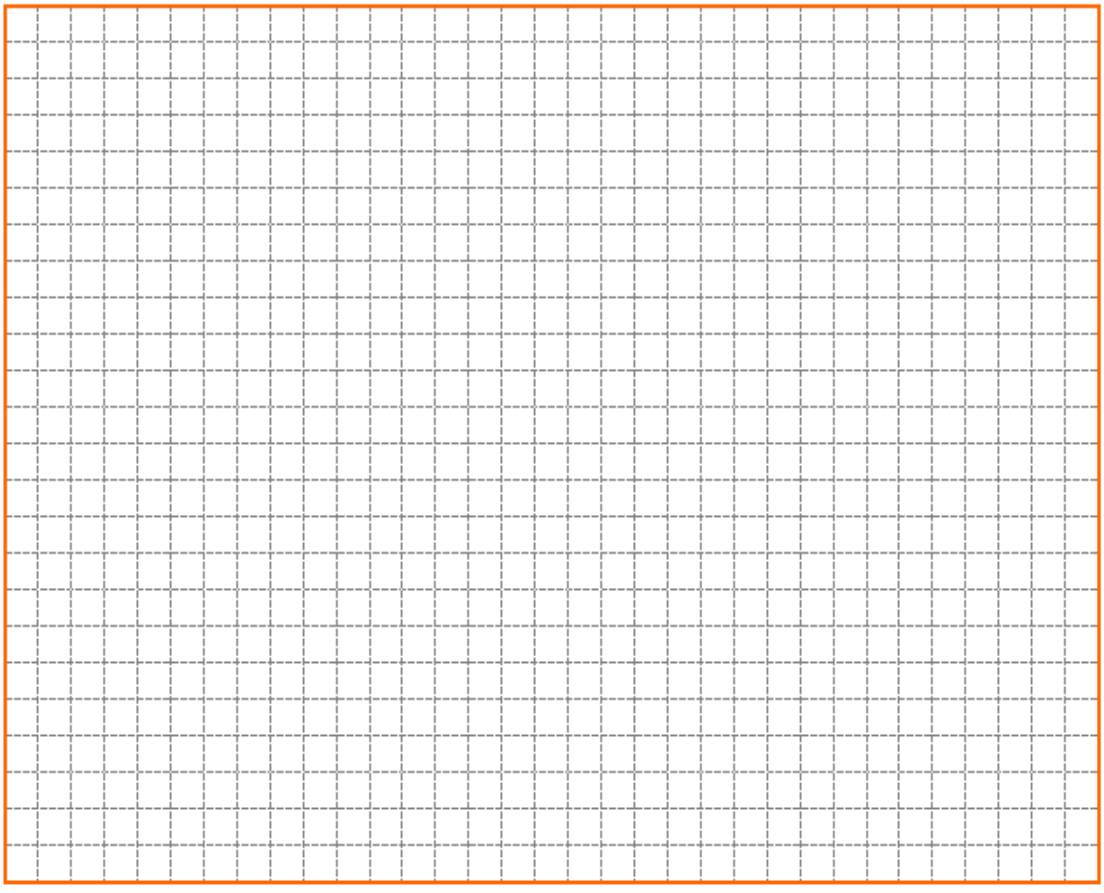
3.2 Develop a kit for a simple motor

3.3 Develop a kit for a power supply



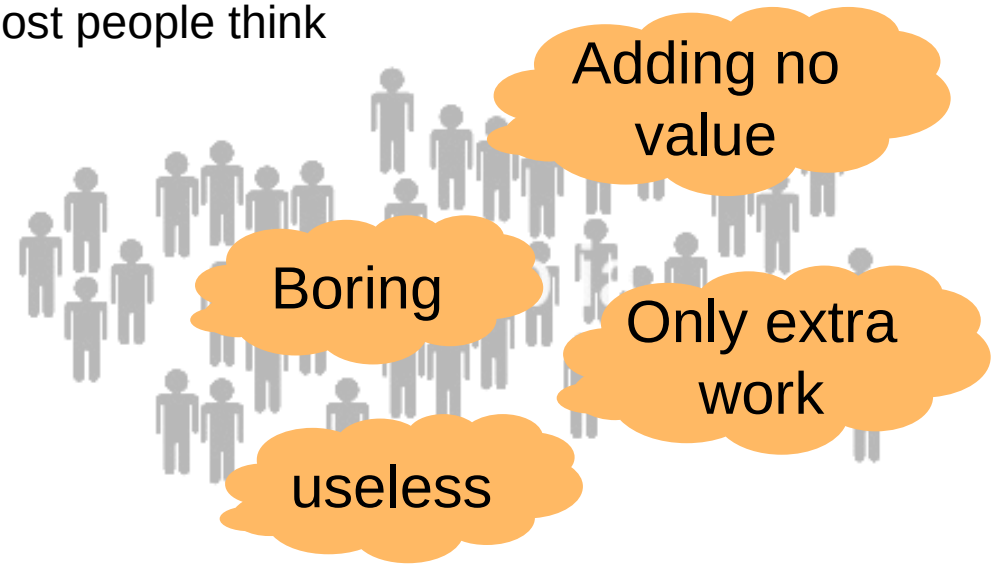
What we do in this unit?

Week	Content
1	Introduction, What is a project and what is project management?
2	Exercise “historical projects” and Introduction to the 4 project phases.
3	Introduction Project initiating, project goal. Exercises project statement.
4	Exercise evaluation “historical projects”, presentations
5	Group work project statement for the further practical project
6	Introduction project planning phases. Introduction project executing.
7	Introduction project closing, Preparation for a meeting (agenda).
8	Kick off meeting and project planning of the practical project.
9 – 15	Practical project, 3 groups, every week a meeting with report to the teacher.
16	Closing the project, final closure celebration



What is project management ?

The most people think



Introduction

For most projects, the real value of project management is in initiating, planning and closing.

2/3 of project problems are people related. You will find many operational leaders demonstrate a “just do-it” mentality. While that may be effective in some environments, this is NOT effective in managing change.

There will always be conflict over goals and scope, resources and between departments.

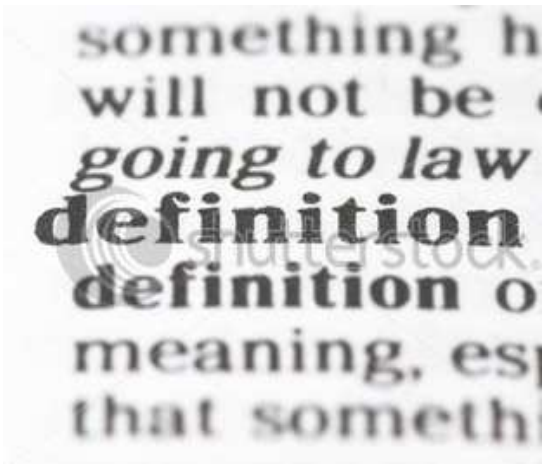
You are likely to find a lack of understanding basic project management methods.

1st exercise: Translate the text below to Arabic.

I wondered why some people with the same skills were poor, but some were rich. It turns out that this is totally normal. Whoever works without a plan will fail. However, whoever makes the effort to plan ahead of time will work faster, easier, and more cost-effectively.

From an ingenious man,
about 2000 years ago.

What is project management ?



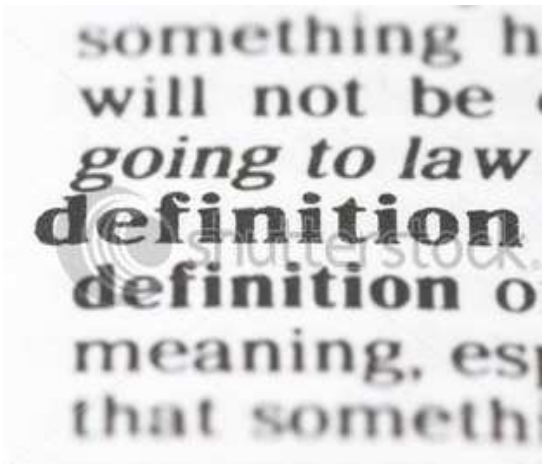
- **The application of knowledge, skills, tools, techniques, people, and systems focused on meeting or exceeding stakeholder needs.**
- **A discipline that will support the planning, implementation, tracking, and control of projects.**

What is project management?

Some other definitions:

- Project management is about creating an environment conducive to getting critical projects done.
- Project management is about changing people's behavior.
- Project management is about decision making.
- Project management is about organization

What is a project ?



A project is a temporary endeavor undertaken to create a unique product or service.

It implies:

- ❑ **a specific timeframe**
- ❑ **a budget**
- ❑ **unique specifications**
- ❑ **working across organizational boundaries**

What is a project?

A project is a unique venture with specific start and end dates. This is different from an ongoing task that doesn't have an end date. Projects are run by people and often involve different parts of an organization. Constraints on project include cost, schedule, resources, and quality. There's a give and taken between these items i.e. you can't have it all. Usually projects are divisible in to stages or phases each with their own set of priorities and goals.

Why projects fail?

- Failure to align project with organizational objectives
- Poor scope
- Unrealistic expectations
- Lack of executive sponsorship
- Lack of project management
- …..

Introduction

Executing is not the only one. For most projects, the real value of Project Management is in Initiating, Planning & Closing. These areas are where projects go from success or failure

Project management is a combination of techniques, procedures, people, and systems focused on the successful completion of a project. It is also a discipline that will support the planning, implementation, tracking, and control of projects..

Why projects succeed?

- ❑ Good project charter
- ❑ Strong project management
- ❑ Good decision making structure
- ❑ Good communication
- ❑ Team members are working toward common goals

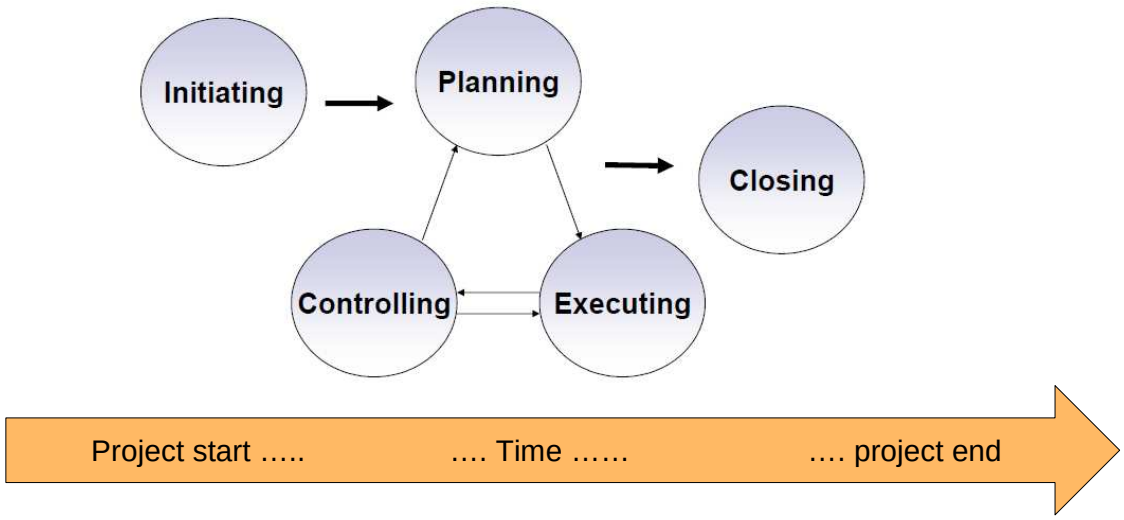
Give 5 examples of your own „historical“ projects.

Example:

number	Project and description
1	Develop a courseware for the unit “project management”, about 60 to 70 pages long for the semester summer 2012.
2	Develop a prototype of a device to control a camera tracking system. Input: RS232. Output: left, right, up, down, zoom in and zoom out till February 2006.
3	

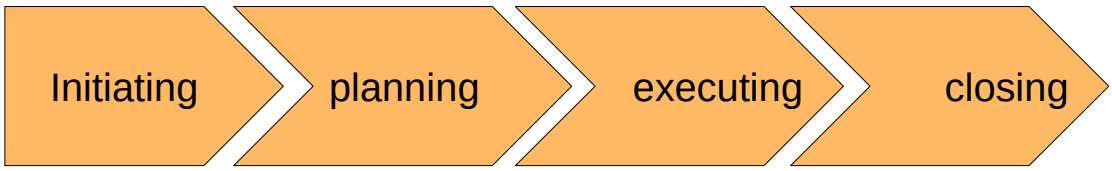
number	Project and description
1	
2	
3	
4	
5	

What are project phases?



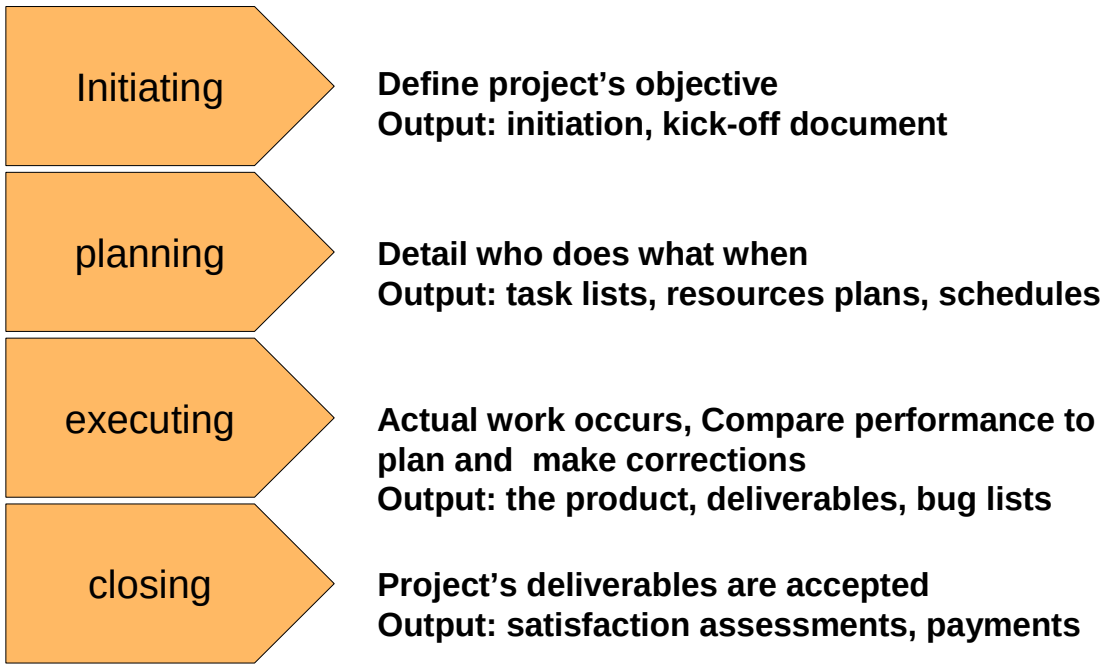
Laws of project management

- No major project is ever installed on time, within budget, or with the same staff that started it. Yours will not be the first.
- Projects progress quickly until they become 90% complete, then they remain at 90% complete forever.
- When things are going well, something will go wrong.
- When things just cannot get any worse, they will.



The project management process. If you invest more time to the first two phases, it will be the best chance of success for your project .

But very often is this the process in reality and often the project will fail, fail in parts or will be very expensive.


Initiating
Define project's objective
Output: initiation, kick-off document
planning
Detail who does what when
Output: task lists, resources plans, schedules
executing
Actual work occurs, Compare performance to plan and make corrections
Output: the product, deliverables, bug lists
closing
Project's deliverables are accepted
Output: satisfaction assessments, payments

Project initiating

Initiating

1. Describe the characteristics of the product or service expected from the project (project goal, project definition).
2. Analyze the project's requirements, identify potential solutions, determine the technical and economic feasibility of each, compare and select the best solution.
3. Develop the project proposal
   - ❑ What is to be done
   - ❑ Why is it to be done
   - ❑ How is it to be done
   - ❑ How much risk is involved
4. Approve the project, based on cost, resources and time.
5. Select a Project Manager, who is responsible for managing all aspects of the project.

Initiating → **planning** → **executing** → **closing**

Why are these a very important area?

Clear and accurate definition of a project is one of the most important actions you can take to ensure the project's success.

Initiating is where you formulate your "contract" with the client, customer, users or the management.

The clearer the target the more likely you are to hit it. Lack of agreement about what's important is the biggest cause for disagreement and scope Creep

Lack of understanding of the impact of changes is the biggest reason for escalating costs (in cost, in time and in quality terms)

What is a project goal?

The way to define a project is to ask a standard set of questions

- What is the project about in broad terms?
- Who wants it done and why?
- What is its title?
- What is it we want to achieve?
- When do we want to achieve it?
- What are our specific aims?
- Why are these goals essential to the project?

Initiating | planning | executing | closing

Why are these a very important area?

This definition process should culminate in the production of a Project Definition document, sometimes called a Project Charter.

As a minimum, the Project Definition should include a statement of the business need that the project seeks to address and the description of the product, service or deliverable business objectives that will be its output.

When a project is performed under a contract between seller and buyer, the signed contract may well serve as the project charter for the seller.

What is a project goal?

A project goal must be

- **S** specific
- **M** measurably
- **A** acceptable
- **R** realistic
- **T** time sensitive (scheduled)

Initiating | planning | executing | closing

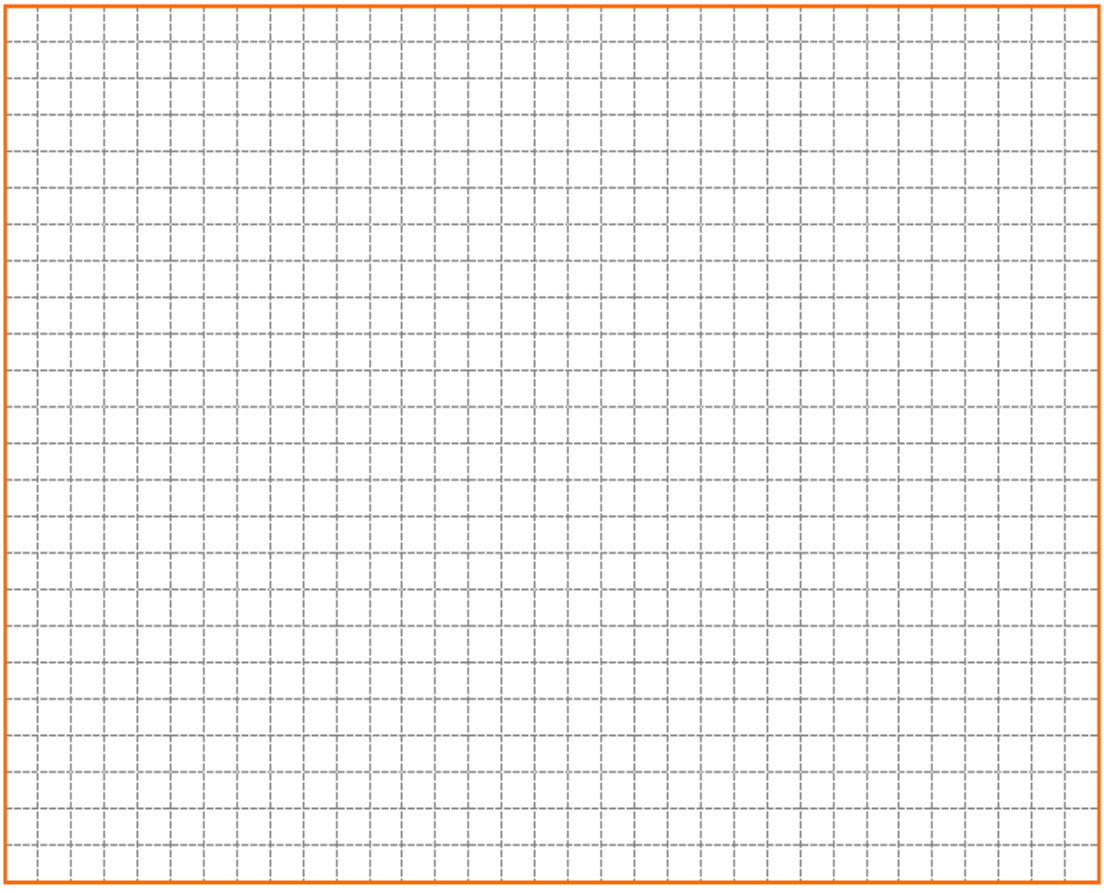
Project goal statement

This is a short statement (around 50 words or less) that accurately reflects what the project is setting out to do. It also outlines the conditions in which it is being done and defines constraints of the project. This statement should not get in to details of implementation. It should just cover what is going to be implemented and when.

What is a project goal?

My project goal is	Yes	No
.... Specific (no space for interpretations)		
.... Measurably		
.... Acceptable		
.... Realistic		
.... Time sensitiv, scheduled		

Initiating | planning | executing | closing



Do you remember of your own five „historical“ projects? Check these projects if they are SMART?

Example:

number	Project and description	SMART
1	Develop a courseware for the unit “project management”, about 60 to 70 pages long for the semester summer 2012.	Specific: YES Measurably: YES Acceptable : YES Realistic : YES Time sensitive: YES

Initiating | planning | executing | closing

number	Project name and SMART evaluation
1	
2	
3	
4	
5	

Present one of your evaluations on the question before to the class and discuss the result.

Example:

number	Project and description	SMART
1	Develop a courseware for the unit “project management”, about 60 to 70 pages long for the semester summer 2012.	Specific: YES, because …. Measurably: YES, because …. acceptable : YES, because …. realistic : YES, because …. time sensitive: YES, because ….

Initiating | planning | executing | closing

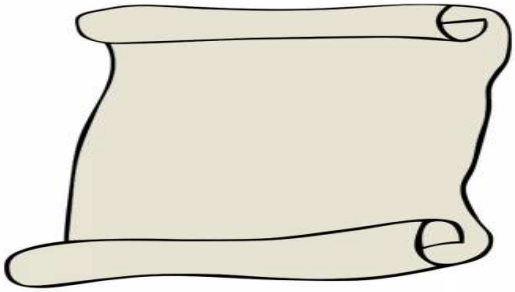
Is this a well written project goal statement?

On April 27th, the 25 volunteers will build a playground with three swings, a sliding board, and a jungle gym in eight hours.

Initiating | planning | executing | closing

Is this a well written project goal statement?

Sixteen weeks from the kick-off meeting, the project team will hand over a design document to engineering.



Initiating | planning | executing | closing

Is this a well written project goal statement?

The group A (Mohammad, Faisal and Jasem) will complete the software with all the 15 features and zero bugs.

group work

1.Divide the class into three teams.

2.See the following pages and assign one scenario to each group.

3.At the end of the 30 minutes, each group will have 5 to 10 minutes to present its own project goal statement to the rest of the class.

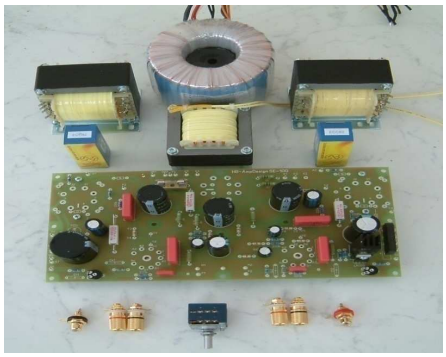
4.After all the groups have presented, conduct a debriefing discussion with the class, using these questions.

- ❑ What were the most difficult parts of this exercise?
- ❑ What worked well in your group?

Group work group 1

The task is to develop a prototype construction kit for digital electronics 2nd semester.

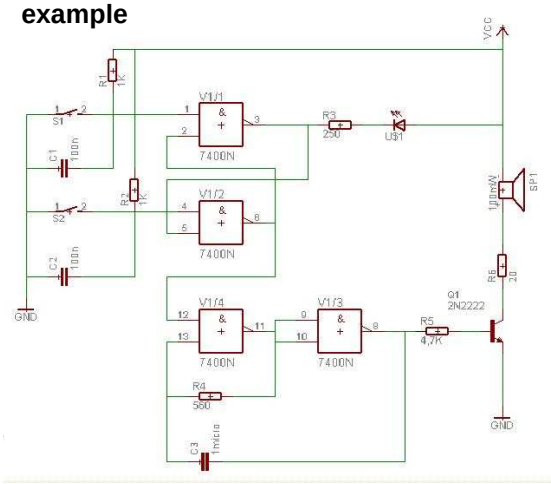
Define the project goal and write a short statement (around 50 words). Present your result to the class.



Initiating | planning | executing | closing

More information for the projcet group 1

example

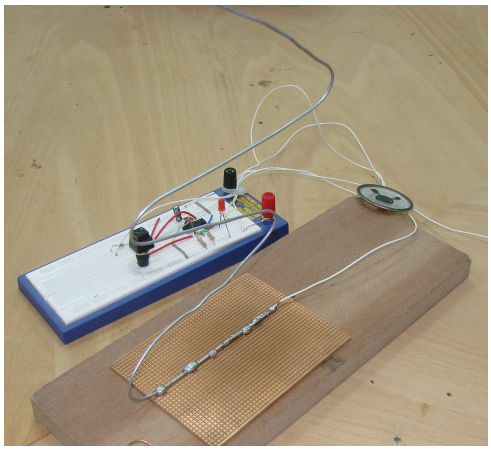


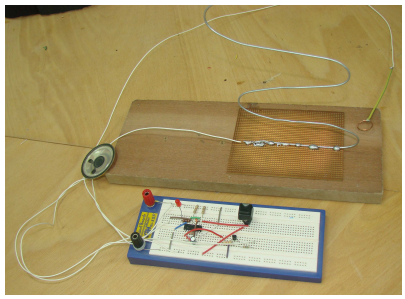
The task of this project is:

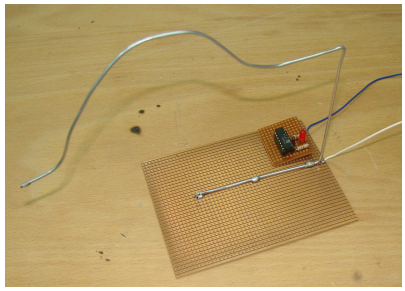
- ❑To develop an application for students 2nd semester. They have to learn how to work flip flops and how to work NAND gates.
- ❑Design a prototype of an assembling kit including all units (resistors, capacitors, IC's, PCB, mechanical parts …
- ❑Create a documentation including how the application works, the parts list, how to produce the kit and how to assemble the kit.

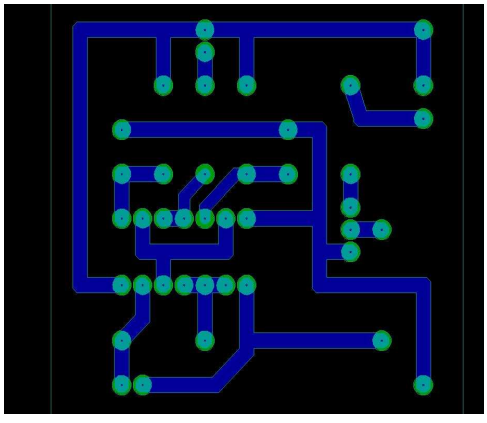
Initiating | **planning** | **executing** | **closing**

8/22/2010 page 26









Here you can some pictures from an experiment to demonstrate how a flip flop with 2 NAND and a multivibrator with 2 NAND are working.

Group work group 2

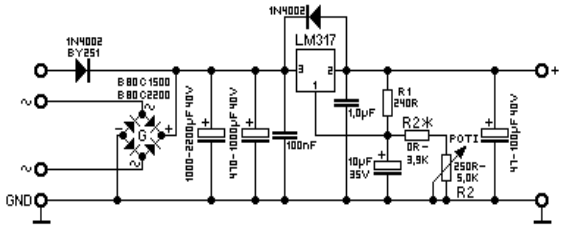
The task is to develop a prototype construction kit for a 12V/3A power supply.

Define the project goal and write a short statement (around 50 words). Present your result to the class.

Initiating | planning | executing | closing

More information for the projcet group 2

example



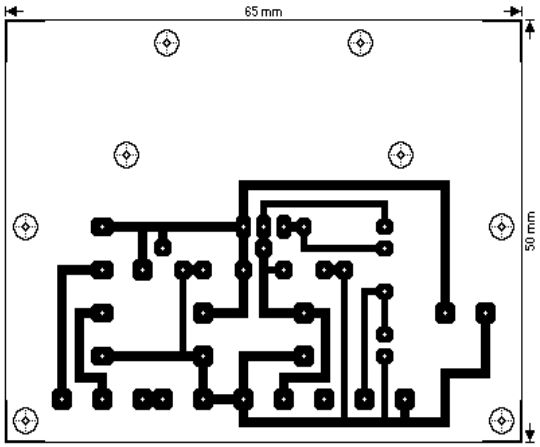
$$V_{OUT} = 1{,}25\,V\left(1+\frac{R2}{R1}\right) + I_{ADJ}\,(R2)$$

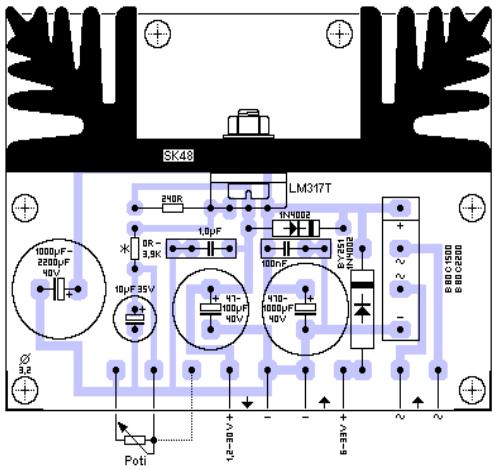
The task of this project is:

- To develop an application for students 4th semester. They have to learn how to work a power supply output 0 ..15V, maximal 1.5 A including transformer and voltmeter (to control the output).
- Design a prototype of an assembling kit including all units (resistors, capacitors, IC's, PCB, mechanical parts …
- Create a documentation including how the application works, the parts list, how to produce the kit and how to assemble the kit.

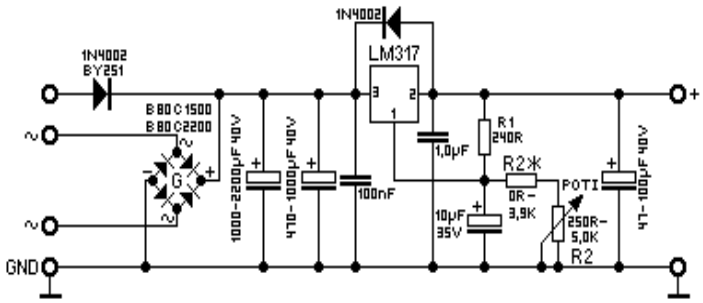
Initiating | **planning** | **executing** | **closing**

8/22/2010 page 28





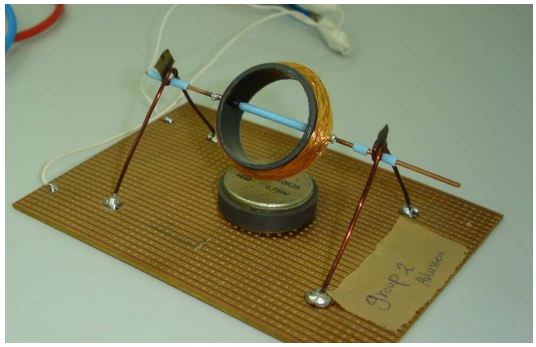
Here you can see an example of a circuit, and a PCB layout for the power supply with variable output.



Group work group 3

The task is to develop a prototype assembly kit for a small motor 4th semester, electrical machines.

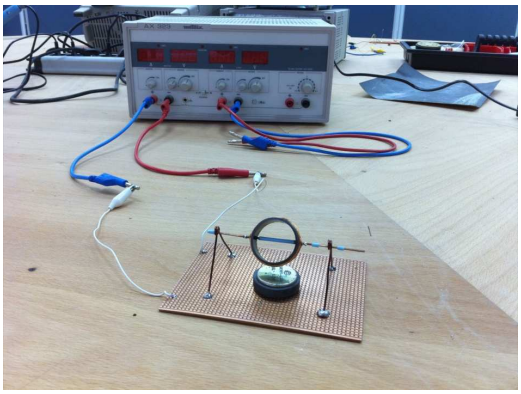
Define the project goal and write a short statement (around 50 words). Present your result to the class.



Initiating → planning → executing → closing

More information for the projcet group 3

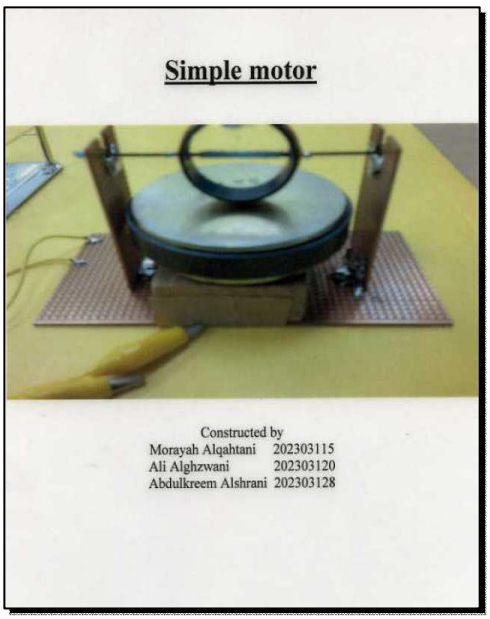
example



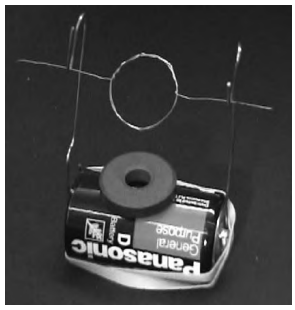
The task of this project is:

- ❑To develop an application for students 4th semester. They have to learn how a motor is working.
- ❑Design a prototype of an assembling kit including all units (wire, mechanical parts, housing)
- ❑Create a documentation including how the application works, the parts list, how to produce the kit and how to assemble the kit.

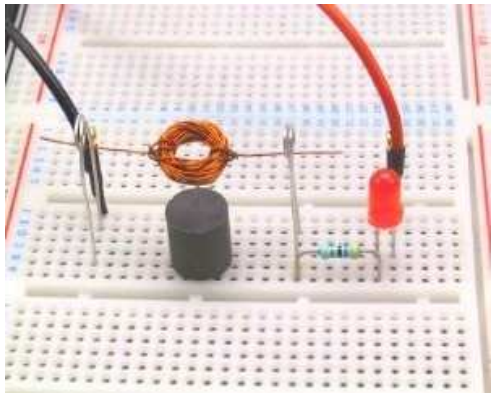
Initiating | **planning** | **executing** | **closing**



For more information and an 1st example from 2011 ask your teacher for the document “simple motor documentation summer 2011.PDF”



For more information see also “the paperclip motor” and the Lucas Nuelle experiment “the 5 minutes motor”: Building something with our own hands often provides a new quality of insight, not to mention fun. With a few inexpensive materials, you can build your own DC electric motor.



Project planning

planning

Define an arrangement of activities and resources to deliver the product or service.

1.Begin by outlining all tasks (the work)

2.Identify the resources (people, hardware, software or services) required for all tasks

3.Organize the tasks into a schedule

4.Develop a spending plan within the budget

5.Arrange to procure external resources

6.Identify all stakeholders and how, how often and what of communications to them

7.Analyze risks and decide what can be done about them

8.Determine how to measure success

Initiating | **planning** | **executing** | **closing**

Why are these a very important area?

The point of Planning is NOT to follow the plan, but to gain a better understanding of what needs to be done.

“In preparing for battle, I have always found that plans are useless, but planning is indispensable” – Eisenhower

The other purpose of a plan is for communication – your stakeholders care about whether you are on-track/late/etc

Project planning

structure and organization of the project.

Personnel reporting structures:
- ❑ Part-time team members
- ❑ Full time team members
- ❑ Project stage leaders
- ❑ Project managers
- ❑ Programmer
- ❑ Project sponsor

Communications:
- ❑ Meetings
- ❑ Progress reporting

Validation:
- ❑ Project work review
- ❑ Performance testing
- ❑ Quality evaluation

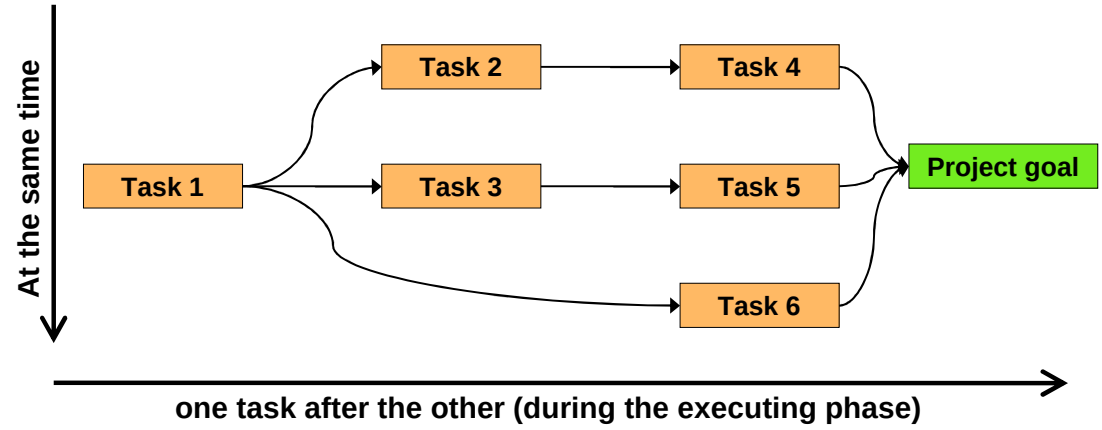
Initiating | planning | executing | closing

Depending on complexity, project plans can contain:

- ❑ Work Breakdown Structure
- ❑ Resource Breakdown Structure
- ❑ Schedule
- ❑ Budget and Spending Plans
- ❑ Performance Plan
- ❑ Risk Management Plan
- ❑ Procurement Plan
- ❑ Communications Plan
- ❑ Change and Configuration Management Plan
- ❑ Quality Management Test Plan
- ❑ Quality Management IV&V Plan

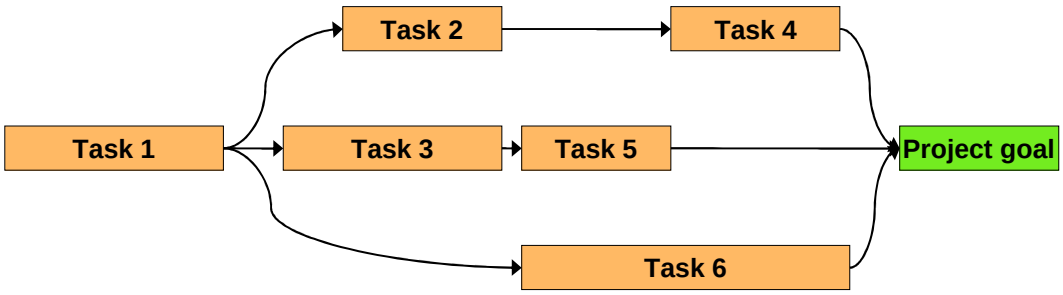
The Project Plan is used to guide project execution and project control.

How to organize the project? 1st phase: structure logic



Initiating | planning | executing | closing

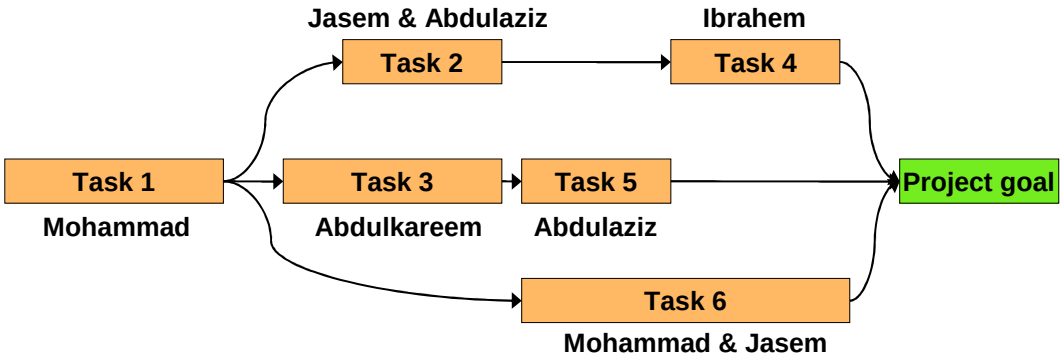
How to organize the project? 2nd phase: scheduling



1st week	2nd week	3rd week	4th week	5th week	6th week

Initiating → planning → executing → closing

How to organize the project? 3rd phase: assign to persons

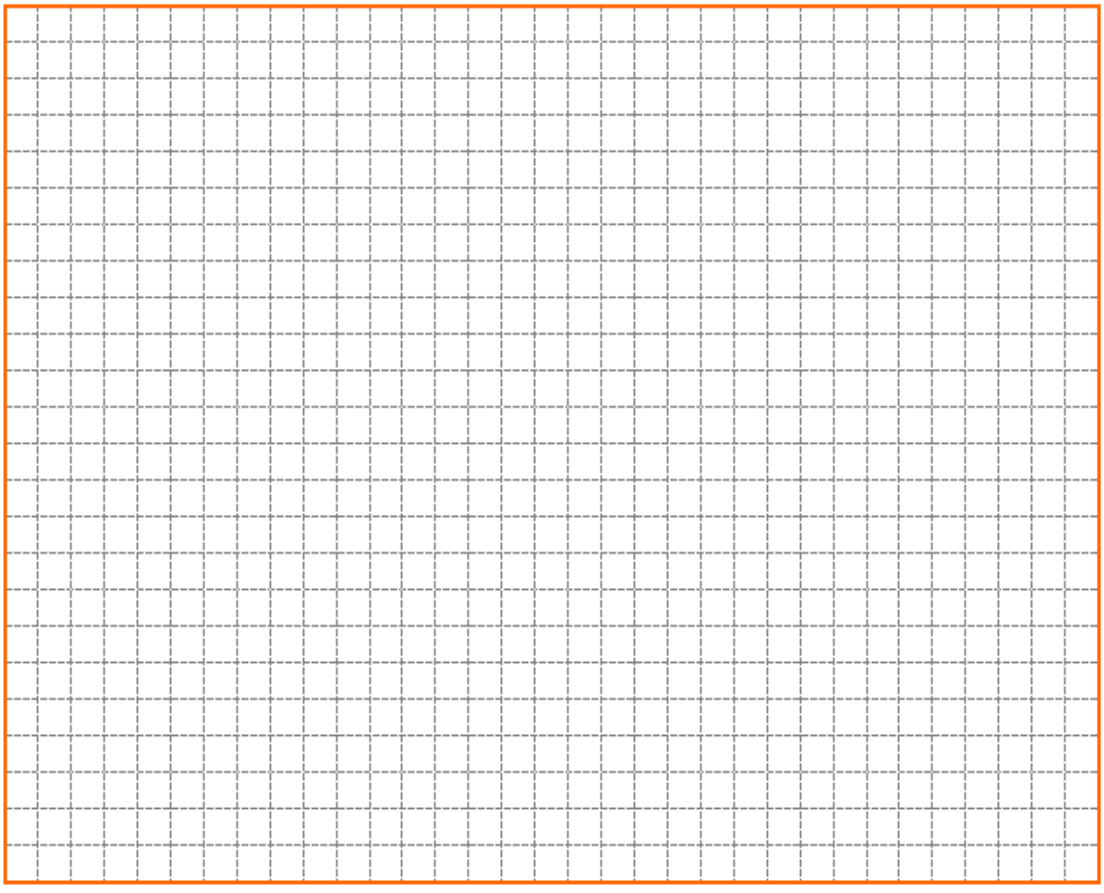


Initiating | planning | executing | closing

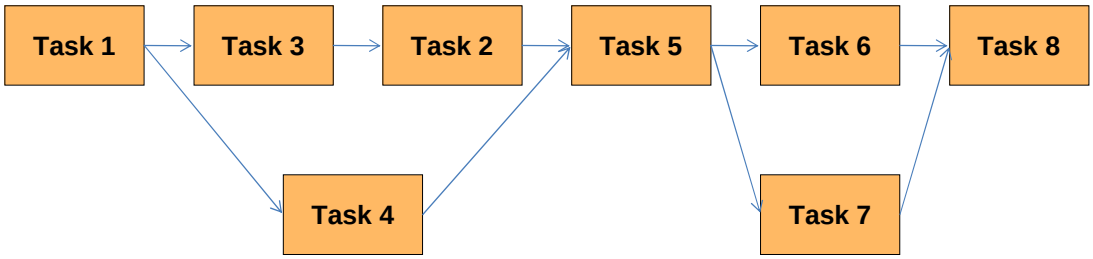
Example how to design a project plan to produce a podcast.

description	task	duration	Preceding tasks
Idea	1	1 week	
Design example exercises	2	1 day	3
Collect information	3	1 week	1
Design the rough concept	4	1 week	1
Design the fine concept	5	3 weeks	4 and 2
Produce the PPT slides	6	2 weeks	5
Produce the audio files	7	1 week	5
Edit the final movie	8	2 weeks	6 and 7

Initiating → planning → executing → closing



Example how to design a project plan to produce a podcast.

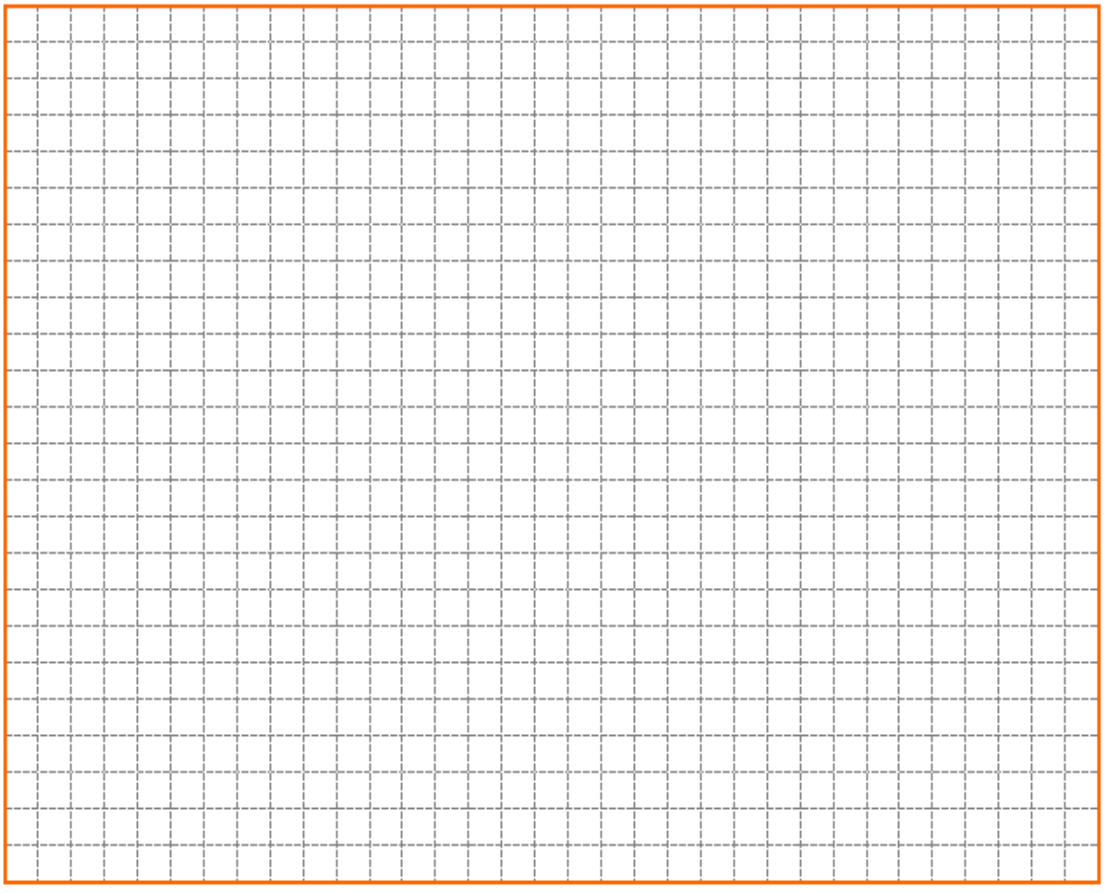


Initiating | planning | executing | closing

Develop a project plan. Structure the logic, schedule the tasks and assign the tasks to team members.

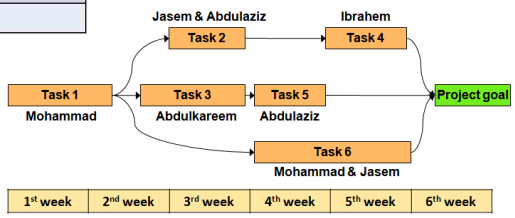
description	task	duration	Preceding tasks
Developing of the circuit, definition, theory, functionality	1	5 days	
Test the circuit on a test board and improve the circuit	2	2 days	1
Design the PCB layout and produce the PCB	3	2 days	2
Buy the units (resistors, capacitors, battery, transistors, …)	4	2 days	2
Soldering	5	1 day	3 and 4
Documentation	6	1 day	3

Initiating → planning → executing → closing



The project goal is to equip a office room with PC, telephone, table, chair and a whiteboard. Develop a project plan including all tasks. Draw the project chart.

description	task	duration	Preceding tasks



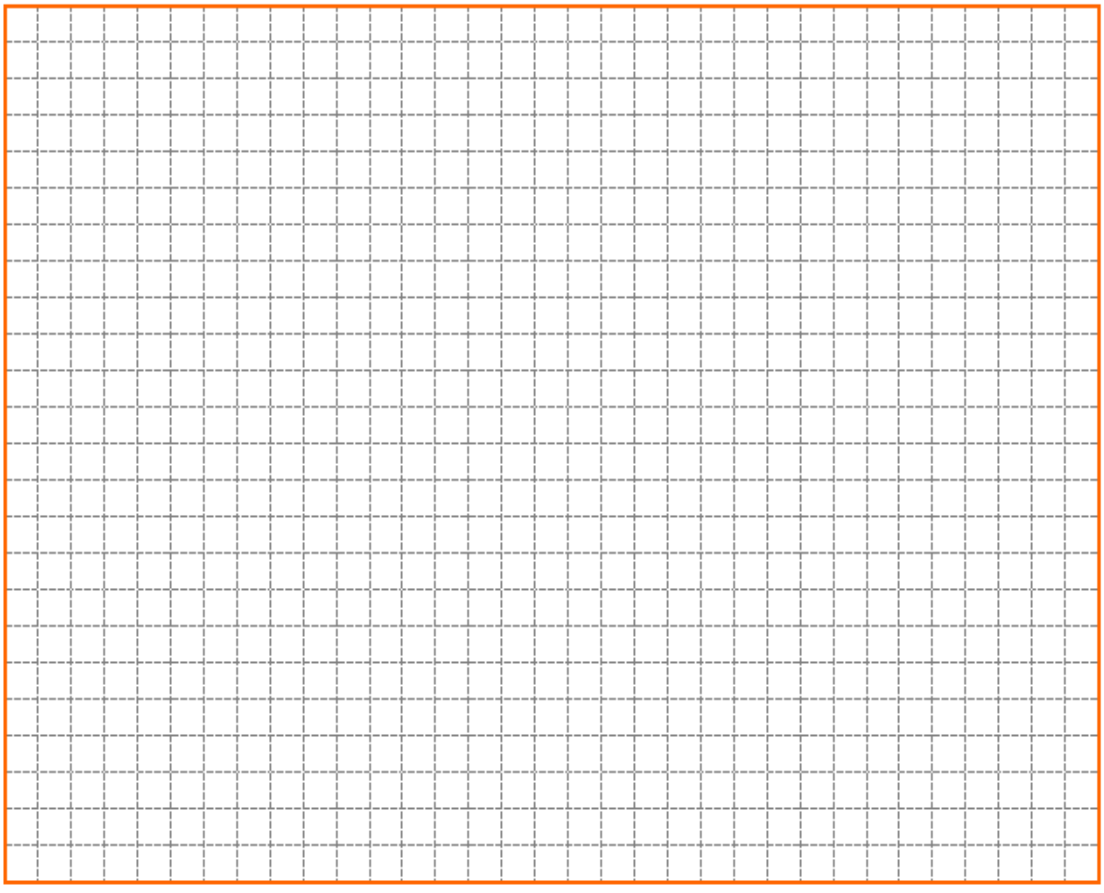
Initiating | planning | executing | closing

description	task	duration	Preceding tasks

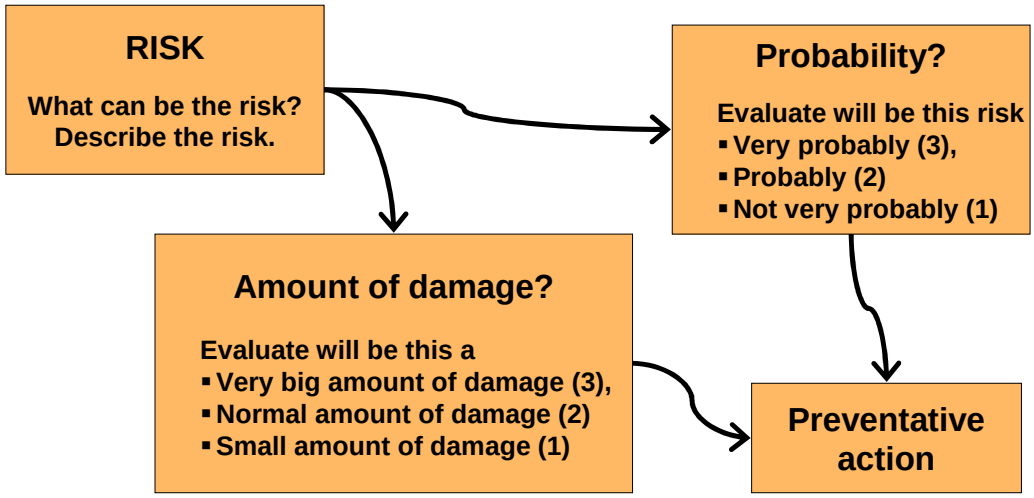
How to organize the project? 4th phase: risk analysis

types of risk	
Risk in time	Exist a time schedule? Fit this plan to the cost and resources plan?
Risk in cost	Exist a cost plan? Fit this plan to the time plan and resources plan?
Risk in acceptance	Is there the support from all stakeholders?
Risk in organization	Do all team members know what they have to do?

Initiating → planning → executing → closing



How to organize the project? 4th phase: risk analysis

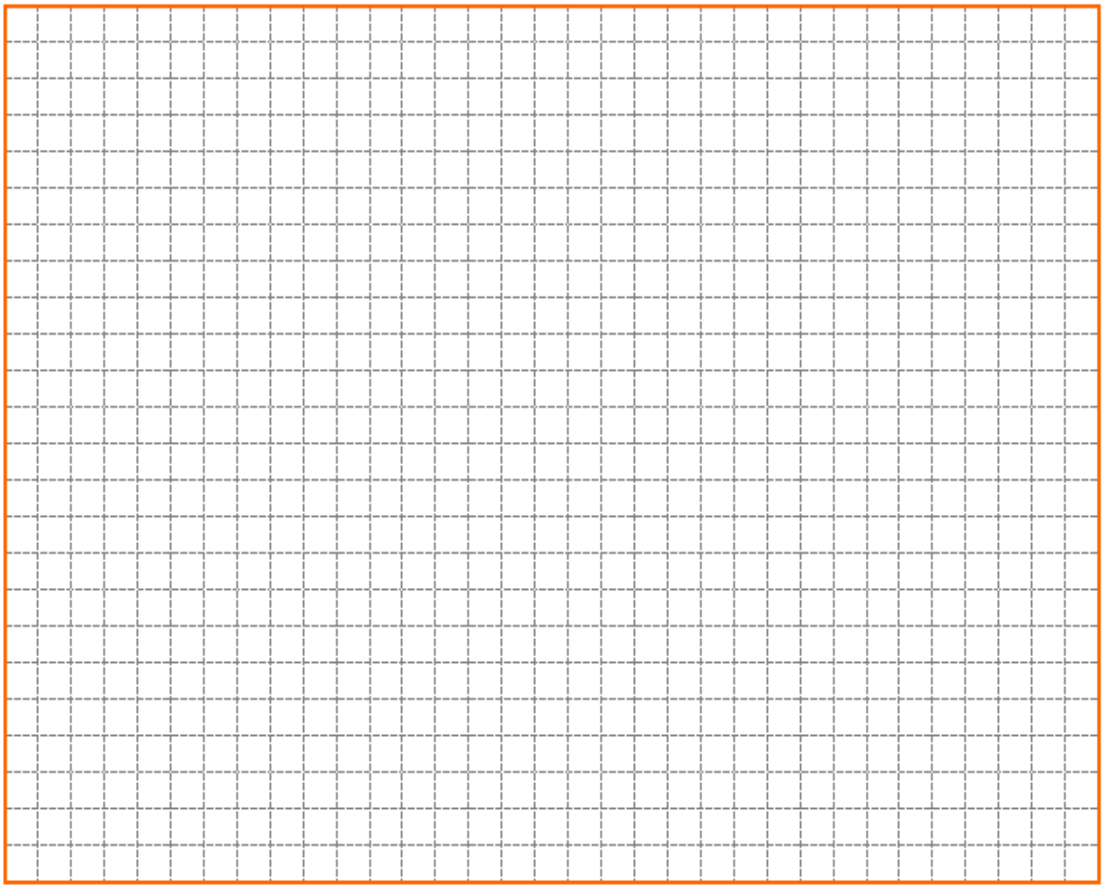


Initiating | planning | executing | closing

How to organize the project? 4th phase: risk analysis

Risk analysis, How to do?

1.Define and describe all possible risks during the project.
2.Evaluate, how probability will be this risk
    3 = very probability, …., 1 = not very probability
3.Evaluate, how big can be the amount of damage?
    3 = big amount of damage, …., 1 = small amount of damage
4.Determine the priority. Multiply probability and amount of damage.
    High numbers = high priority
5.Find possible preventative actions for the risks with high priority



How to organize the project? 4th phase: risk analysis

Example of a risk analysis

RISK	Amount of damage	Pro-bability	Priority (DxP)	Possible preventative action
A meeting is not possible, because the school will be closed, (because rain)	1	**2**	**2**	▪ **2nd appointment** ▪ **Objectives during the next meeting**
The completed prototype will be damaged during the transport from home to school.	3	**2**	**6**	▪ **Do not transport** ▪ **Have spare parts** ▪ **Produce two prototypes**

Initiating | **planning** | **executing** | **closing**

Group work

Divide the class into five groups for the exercise at the following page. At the end of a 45 minutes group work, each group will have 5 to 10 minutes to present its own risk analysis to the rest of the class.

After all the groups have presented, conduct a debriefing discussion with the class, using these questions.

- ❑ What were the most difficult parts of this exercise?
- ❑ What worked well in your group?
- ❑ What are the risks with the highest priority?

Group work

The school need a new lab room for Physics. The equipment is bought in Germany. A external team has to install the equipment after it comes out from the customs. Do a risk analysis and find in minimum 5 risks. Evaluate the risks and find possible preventative actions.

Example

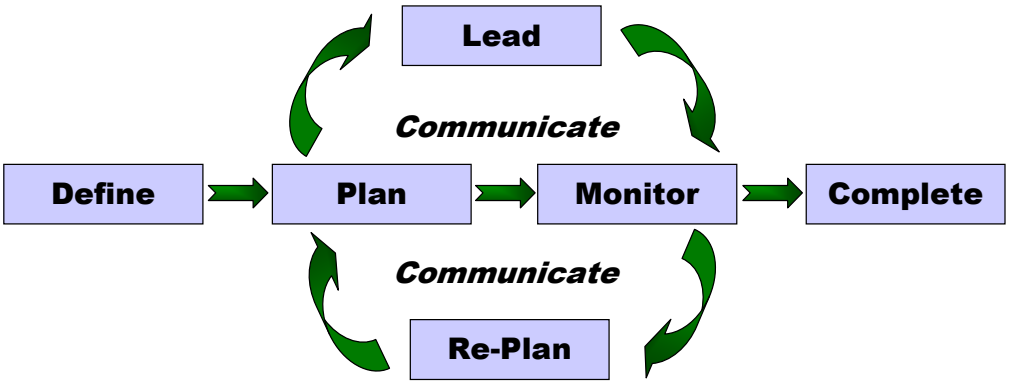
RISK	Amount of damage	Pro-bability	Priority (DxP)	Possible preventative action
Some parts from the equipment are not delivered, but the external team will install it.	2	**2**	**4**	**Make in minimum 2 working phases with the external team.**

Initiating → **planning** → **executing** → **closing**

RISK	Amount of damage	Pro-babilit y	Priorit y (DxP)	Possible preventative action

executing

The project managers role.

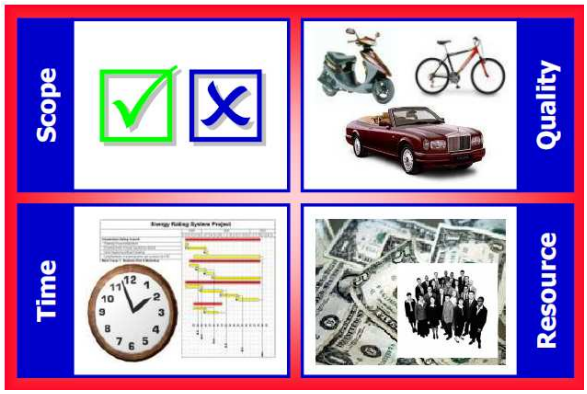


Initiating | planning | executing | closing

What the project manager also has to do:

- Project Managers produce regular Status Reports for key stakeholders
- Not meeting scheduled dates, exceeding spending plans, unresolved issues and requests for changes should be reported to stakeholders and addressed immediately
- Outputs of Execution and Control Phase are the Project Deliverables.

Project executing



Execution of the Project Plan is the act of performing tasks and activities that result in the production of project deliverables.

Performance must be monitored against the plan

- Schedule Deviation (time)
- Cost Overruns (resources)
- Project Issues (quality)
- Change Requests (scope)

Initiating | planning | executing | closing

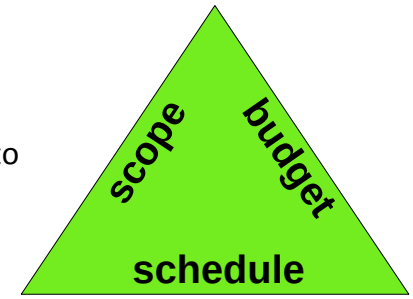
Some other things to keep in mind include:

- Do not accept poor quality estimates. Try to get the person who will actually do the work also provide the estimate.
- Provide enough time to come up with estimates i.e. give people enough time to think.
- Make it clear that estimates will be noted and compared to when the project completes. This is part of the ongoing project management improvement process.
- A well-informed team will provide better estimates.
- Don't forget to take in to account different skill levels of different team members. Junior team members will likely be slower than senior team members.

The trilogy of project management

Defines what the project will do and what it won't.

PM must know how to say NO!



Highly visible measure of Project Managers

Requires constant monitoring, immediate corrective action

Most likely to change

Unexpected events can and do occur

Initiating | planning | executing | closing

Project closing

closing

Output of Closeout Phase is User Acceptance

Closeout occurs when the sponsor accepts the project deliverables and the project's oversight authority concludes the project has met all goals

New systems are turned over to operations, project documentation is archived, lessons learned are cataloged, any staff and resources are returned

Initiating | planning | executing | closing

Why are these a very important area?

Closing is important because go-live is not the end of your project

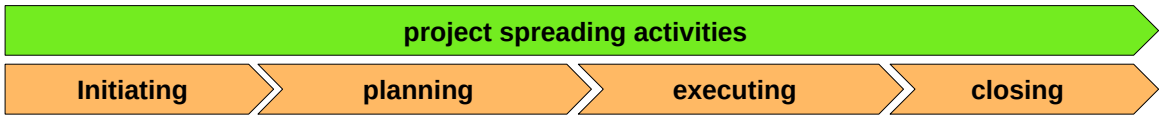
Your project is finished when you have sign-off (agreement) from stakeholders that it is finished

If you treat launch as the end of the project, then you will get "undead" stakeholders – coming back from the past all the time with new requirements/fixes

Many tools for project managers are available

- Microsoft Project
- www.dotproject.net
- Microsoft Excel
- Oracle's White Paper Library
- Web-based Project Management
- Mainstream Microsoft Project
- The Project Map
- MSProject.com

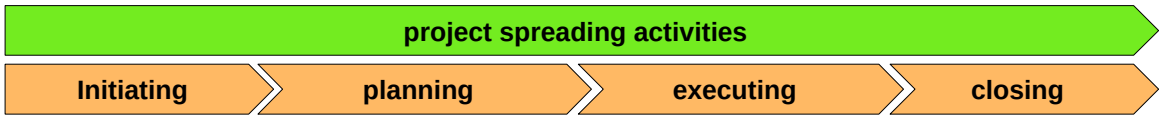
…. but a tool is only a tool and can not replace people ….



Meeting management

Develop Ground Rules early

- ❑ Assign facilitator
- ❑ Assign reporter and reporting structure
- ❑ Start and end times
- ❑ Frequency of meetings
- ❑ Focus of meetings Information sharing, Agenda building, Issues for substantive discussion



Example of an agenda:

Meeting Agenda

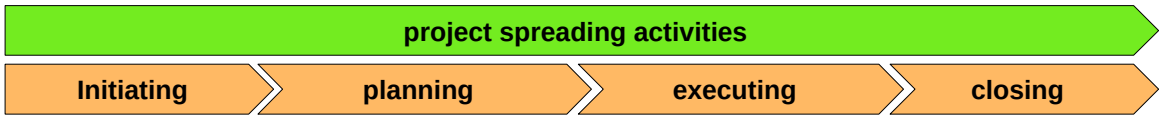
Meeting Date: _____ **Leader**: _____ **Time Keeper**: _____
Project Name: _____ **Attendance**: _____ _____
Location: _____ _____ _____
AIM: _____ _____ _____
_____ _____

Objective(s) of the meeting {record additional attendance on opposite side}
1. _____
2. _____
3. _____

Item	Minutes Allocated	Topic	Summary of conclusions, decisions, Assignments, and next steps
1.	2	Review agenda	Add, modify or delete items. Allocate time needed for each item.
2.			

Meeting management

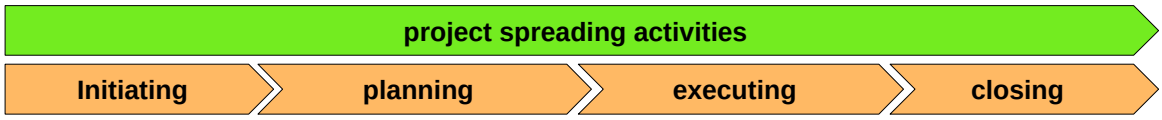
- Start- and end times are real
- Civility required
- Confidentiality
- What is going to be reported, what isn't.
- Agree to bring all issues to the table
- Agree to debate issues



Decision making structure

Levels of responsibility should be spelled out for each group.

Define layers, like executive, project manager, project team or sub teams



Some hints to make decisions

- ❑Projects force decisions by leaders
- ❑Clarify who makes what decisions
- ❑Establish structure for rapid decision making
- ❑Communicate decisions
- ❑Log or track decisions for future reference

- ❑Consensus may be desired, but is not required
- ❑Lack of consensus does not mean no decision
- ❑While everyone may not agree with all decisions, it's important that team members agree to support the decisions

Class room discussion

For the practical project start conduct a debriefing discussion with the class, using these questions.

- What will be the total project time for all groups?
- On which day all the projects will be closed?
- Who is the project leader of each group? (He is not involved or responsible for the tasks, but he have to organize the team)
- How often (and when) the project team will give a report about the project status to the teacher.

group work

1.Divide the class into the same three teams like before.

2.Now the teams have to develop an agenda for a meeting to develop the project plan. This agenda includes

- ❑ Start and End time,
- ❑ Objectives (items)
- ❑ Time allocation for each item

3.If the groups are not finished during the regular lesson time, this task will be the homework.

4.At the next lesson, each group will have this meeting.

Remember what is an organized meeting? An organized meeting is explicit about its objectives, the agenda and time allocation. Clarity in organization makes meetings more productive and efficient in several ways.

❑Objectives indicate the purpose of the meeting and its priorities.
❑Objectives inform members on the most important things that they should have by the end of the meeting.
❑An agenda keeps the meeting on tract.
❑Time allocation prevents tangential side-discussions not pertinent to the business at hand.
❑Optimal use of personal time is respectful and decreases costs.
❑A set of ground rules specifies the leadership style and member participation that distinguish the culture of the meeting.

group work

1.Now the teams have a meeting to develop a project plan including the

- ❑ tasks (the actions),
- ❑ Scheduling and
- ❑ involved team members per task.

2.If the groups are not finished during the regular lesson time, this task will be the homework.

3.At the next lesson, each group will have 10 to 15 minutes to present its own project plan to the rest of the class.

Use the following chart to develop the tasks for your project and fill in the table below. Develop a chart with a timeline, all the tasks and the responsible persons. If you have more tasks, use another paper.

Nr.	Task (short statement to the goal of this task)	Who is involved	Timeframe (how long is the task)

Class room discussion

After each group has presented, conduct a debriefing discussion with the class, using these questions:

- ❑ Is the project goal of this group clear and understandable?
- ❑ Are all the tasks and responsibilities are clear?
- ❑ Is the timeline well defined?
- ❑ Is clear, who all are involved at the project team, and what their own functionality?
- ❑ Are communication and report way fixed?
- ❑ Are team rules fixed?

Now the project will start !

Project executing phase

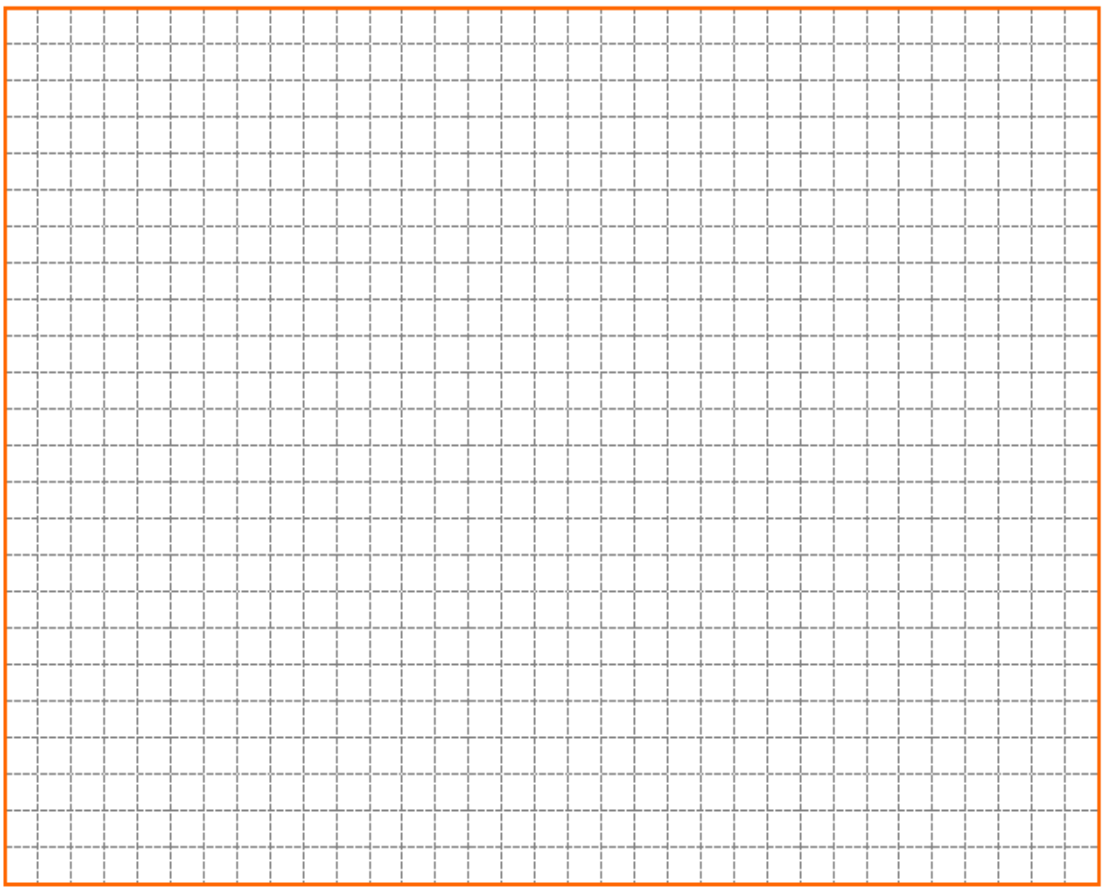
8	Kick off meeting and project planning of the practical project.
9 – 15	Practical project, 3 groups, every week a meeting with report to the teacher.
16	Closing the project, final closure celebration

Now the project is over.

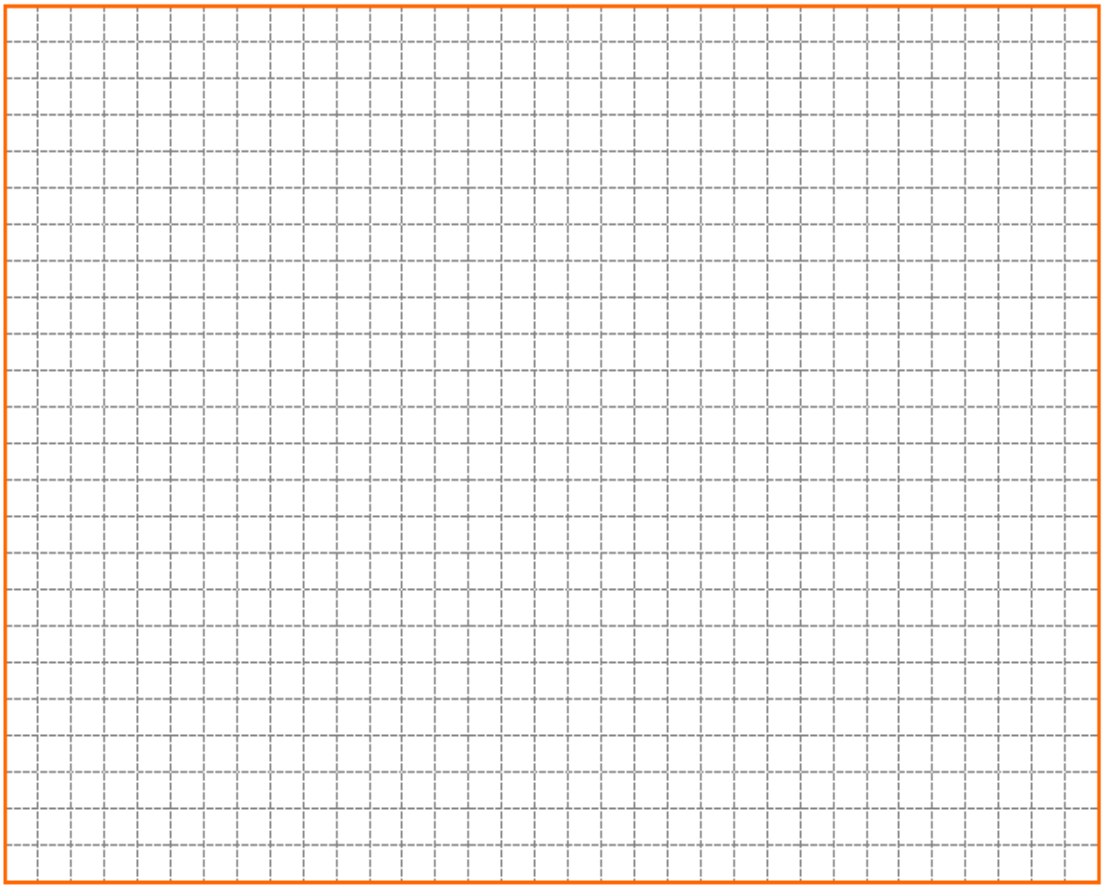
To do the closeout phase the teams have to organize a small celebration. Discuss who to invite to this event.

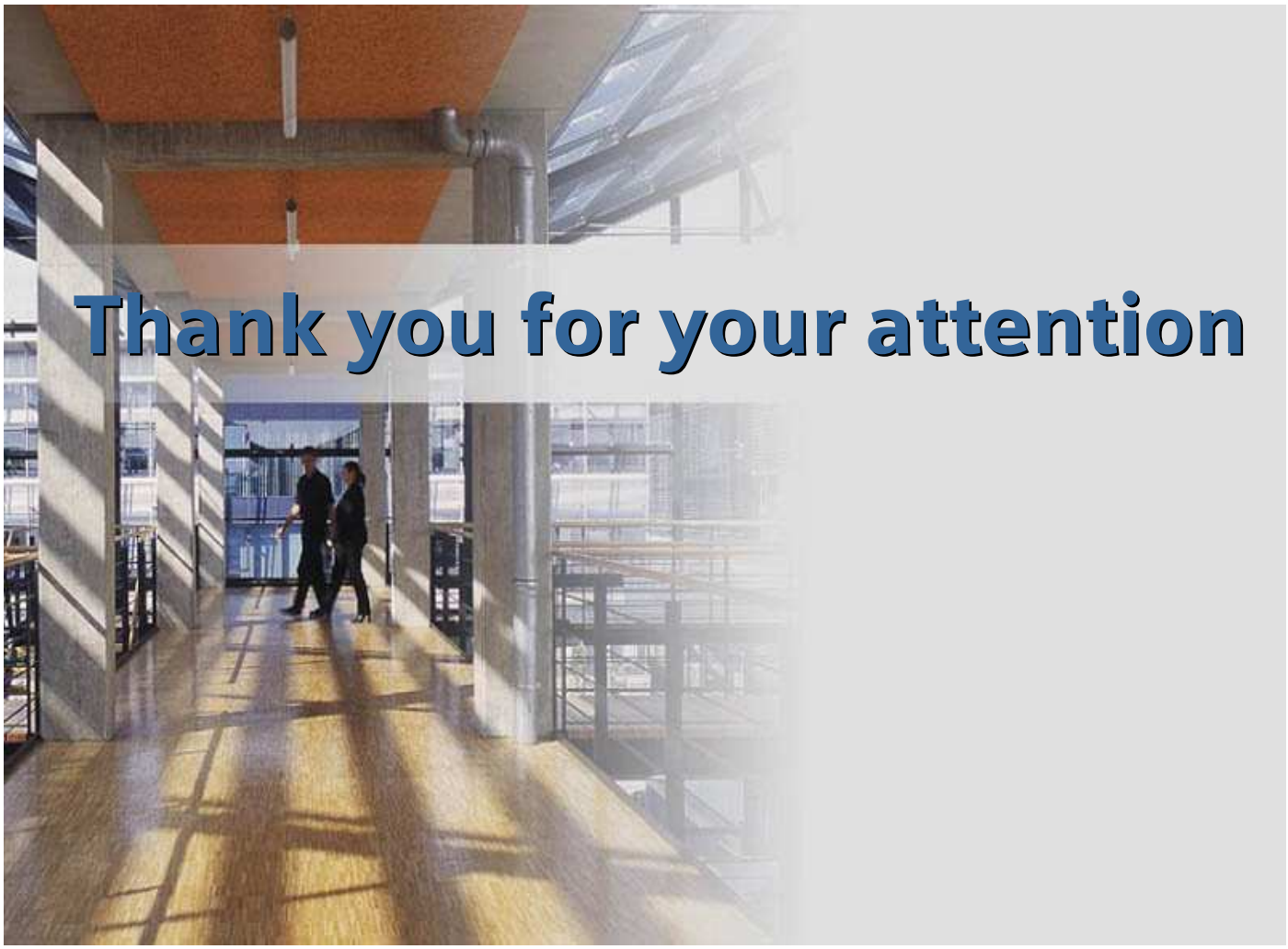
Every team has

- ❑to present the final product,
- ❑to present the documentation about the final product,
- ❑to present the final closure document (final report)
- ❑to give a short presentation about challenges at the project.



Final report of the project	Date:
Team leader:	Project name:
Project statement:	
Is the goal is reached? If no, why:	
How we can improve the project execution?	
Challenges at the project time:	
Which things are still to do?:	
Signature team leader:	Signature buyer/client/customer:





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