Project Management

Scalable Software Engineering

WS 2021/22

Enterprise Platform and Integration Concepts

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If not stated otherwise, images are taken from the SAP image library.
Agenda

Introduction to Project Management
1. Integration Management
2. Scope Management
3. Schedule Management
4. Cost Management
5. Quality Management
6. Resource Management
7. Communications Management
8. Risk Management
9. Procurement Management
10. Stakeholder Management
Project Management Body of Knowledge (PMBOK)

- Project Management Institute (PMI)
  - More than 600,000 members
  - Publisher of PMBOK Guide
  - Project Management Professional (PMP) certificate
  - Alternatives: IPMA, PRINCE2

PMBOK Guide 6th Edition (750+ pages)
- Basic source for effective project management
- Focus on methods, processes, and common terminology
- Incl. ANSI Standard (Best Practices)

PMBOK Guide 7th Edition (250+ pages)
- New in 2021 and complements the 6th edition
- Focus on principles and values to enable more flexibility
What Is a Project?

- Bridge construction: YES
- Car Manufacturing: NO
- Merger and Acquisition: YES
- Daily Operations: NO
- Software Development: YES
- Sleeping: NO
- Writing a Book: YES
- Maintenance: NO
- Olympic Games Orga: YES
What Is a Project?

The PMI defines project as:

“*It's a temporary endeavor undertaken to create a unique product, service or result.*”

Further properties

- Executed on all organizational layers
- Clear goals with defined start and end dates
- Creation of business value and enablement of business transformation
Example Project
Sapphire Fashion Showcase
T-1 month

T-1 day

SAPPHIRE’17

30+ * reused
Why to Start a Project?

- Fulfillment of regulatory, legal, or social requirements
- Fulfillment of requests or needs of stakeholders
- Creation, improvement, or repair of products, processes, or services
- Implementation or change of commercial or technological strategies

* One reason is enough for starting a project

Example: Create a compelling showcase presenting ML at SAP
The PMI defines project management as:

"It is the use of specific knowledge, skills, tools and techniques to deliver something of value to people."

- Application and integration of selected project management processes
- Effective and efficient execution of projects in order to:
  - Reach business goals and/or fulfill stakeholders’ expectations
  - Deliver right products at the right time
  - Solve business challenges
  - Optimize resource management
  - Identify and react on risks
  - Manage change
What Is a Project Manager?

The PMI defines project manager as:

“A person named by the organization to lead the project and being responsible for reaching the project’s goals.”

Project Management includes:
- Identification of project requirements
- Stakeholder communication and expectation management
- Resource management
- Handle competing project constraints

Competencies:
- Technical project management
- Leadership
- Strategic and business management
Example: Strategic Projects

- Highest priority
- Spontaneous and short in time
- High quality expected
- Large influence on business
- Any topic and sometimes political
- Broad project descriptions
- Most often no resource issues
Flughafen BER – „Wir brauchen schnell Geld, wir brauchen Cash“

Veröffentlicht am 30.10.2021 | Lesedauer: 2 Minuten

Bis 2026 brauche die Flughafengesellschaft des BER wenig Geld. Das sagt die neue Flughafenchefin Aletta von Massenbach. Auch zum Chaos in den Herbstferien an dem Berliner Airport.

Sources: [https://www.zdf.de/nachrichten/wirtschaft/flughafen-ber-milionen-verlust-100.html](https://www.zdf.de/nachrichten/wirtschaft/flughafen-ber-milionen-verlust-100.html)
A project can be in time, in scope and in budget but still failed because of missing goals or other business reasons. The same can be true vice versa.

Key performance indicators (KPIs) for time, cost, scope, and quality monitor success criteria for a project

But don’t forget about reaching goals
- Clarify with all stakeholders what is expected (and what not!)
- Document goals (follow SMART criteria)

Reaching goals is (most often) more important than project KPIs!
SMART Goals

Each goal should follow the SMART principle

Answer the following questions (from the beginning):

- How does success looks like in this project?
- How do we measure success?
- Which factors can influence the success?

Source: https://www.indeed.com/career-advice/career-development/smart-goals
Aside: Vision and Mission

A **vision statement** is an inspirational statement of an idealistic emotional future of a company or group.

*Example vision:* “To help the world run better and improve people's lives.”

A **mission statement** is a short statement of why an organization exists, what its overall goal is, identifying the goal of its operations.

*Example Mission:* “From back office to boardroom, warehouse to storefront, desktop to mobile device – SAP empowers people and organizations to work together more efficiently and use business insight more effectively to stay ahead of the competition.”

Sources: [https://mission-statement.com/sap/](https://mission-statement.com/sap/)
A stakeholder is a single person, group, or organization, who influence a project (also negative), profit from its results, or want to somehow involved with it.

**Internal stakeholders, e.g.:**
- Sponsor
- Program manager
- Project team members

**External stakeholders, e.g.:**
- Customer
- End users
- Government
- Competitors
- Shareholders
**Portfolio** is a collection of projects, programs, and subsidiary portfolios with a focus on having the right projects and programs.

**Program** is a group of similar projects or subsidiary programs with a focus on right execution.

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**Company/Unit Strategy**

- **Portfolio**
  - **Program A**
    - Project 1
    - Project 2
    - Project 3
    - Project 4
    - Project 5
  - **Program B**
    - Portfolio X

- **Joint Resources and Stakeholders**
Project Lifecycle

1. Initiating
2. Planning
3. Executing
4. Monitoring & Controlling
5. Closing
Knowledge Areas for Project Management Processes

1. **Integration Mgt:** Identify, define, combine, unify and coordinate processes through the project lifecycle
2. **Scope Mgt:** Ensure that the project works on the right things (and only on these)
3. **Schedule Mgt:** Ensure that the project delivers on time
4. **Cost Mgt:** Ensure that the project stays within budget
5. **Quality Mgt:** Ensure quality expectations of stakeholders
6. **Resource Mgt:** Identification, provisioning, and management of required resources
7. **Communications Mgt:** Creation, collection, distribution, storage, accessing, monitoring and deletion of project information
8. **Risk Mgt:** Analysis of risks, execution and monitoring of prevention mechanisms
9. **Procurement Mgt:** Procurement of external resources, results, or services
10. **Stakeholder Mgt:** Involvement of all stakeholders
# Project Lifecycle x Knowledge Areas

*Matrix is not complete. Terms in boxes are examples. No details means (project phase x knowledge area).*

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<thead>
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<tbody>
<tr>
<td><strong>Integration</strong></td>
<td>Project Charter</td>
<td>Project Management Plan</td>
<td>Manage project and knowledge</td>
<td>Control project work and change</td>
<td>Close project and follow ups</td>
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<tr>
<td><strong>Scope</strong></td>
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<td>Structure project</td>
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<td>Validate and control</td>
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<tr>
<td><strong>Schedule</strong></td>
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<td>Milestone plan</td>
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<td><strong>Cost</strong></td>
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<td>Estimate budget</td>
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<td><strong>Quality</strong></td>
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<td>Define expectations</td>
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<td><strong>Resource</strong></td>
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<td>Estimate resources</td>
<td>Team management</td>
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<td><strong>Risk</strong></td>
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<td><strong>Procurement</strong></td>
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<td><strong>Stakeholder</strong></td>
<td>Identify</td>
<td>Engage</td>
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</table>
Scrum Meets Project Management

Project Management Layer

1. Initiating
2. Planning
3. Executing
5. Closing

Focus on entire project and plan-driven

4. Monitoring & Controlling

Development Layer

Team A

Product Backlog

Daily Scrum
24 h

Planning

Team B

Product Backlog

Sprint Backlog

Sprint

Working increment of the software

2 weeks – 1 month

Review/Retrospective
If your only tool is a hammer, every problem looks like a nail.

- Law of the instrument, a cognitive bias that involves an over-reliance on a familiar tool.

“The right tool for the right job”
“Don't bring a knife to a gun fight.”
“You're only as good as the tools you use”
“A fool with a tool is still a fool!”

Good project managers do only what is necessary to get a job done!

- Requires a lot of experience and cannot be taught in a lecture
- Every project is different
- Reflect yourself and question if you need a tool or not
- Neither overengineer a project nor underestimate it
- PMBOK covers 132 methods but there are even more outside...
Knowledge Area
Integration Management

Image by Riverside Raid & Crazy Scientist from flickr: https://flickr.com/photos/le0nard0h0/14284345429/ (CC BY-NC 2.0)
Introduction to Project Management

1. Integration Management: Identify, define, combine, unify and coordinate processes through the project lifecycle
2. Scope Management
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10. Stakeholder Management
The project manager brings all results from the knowledge areas together and offers a full picture on the project

- Align schedule, scope, and cost with the project life cycle
- Create a project management plan to reach the goals
- Ensure the project has all the required resources and knowledge
- Adapt processes to project needs and plans to change
- Make decisions, resolve conflicts, and handle contracts
- Monitor and control project status
- Collect, analyze, and share project information with relevant stakeholders
- Finish all project tasks

A project manager cannot delegate these tasks
Project Lifecycle for Integration Management

1. Initiating
   - Project Charter

2. Planning
   - Project Management Plan

3. Executing
   - Manage project and knowledge

4. Monitoring & Controlling
   - Control project work and change management

5. Closing
   - Close project and follow ups
Develop a document that approves the projects, delegates power to the project manager and ensures access to organization’s ressources.

Start of a project by external sponsor or documents such as a business case:
- A project charter is *not* a contract.
- Ensure project sponsor has access to ressources.
- Collect input for project charter via:
  - Brainstorming
  - Focus and expert groups
  - Interviews with important stakeholders
## TEMPLATE Project Charter

Subject to Change, <DATE>

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Timeline and Key Milestones</th>
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<table>
<thead>
<tr>
<th>In Scope</th>
<th>Out of Scope</th>
<th>Project Organization</th>
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</thead>
<tbody>
<tr>
<td>• ...</td>
<td>• ...</td>
<td>Lead</td>
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<td>Stakeholder</td>
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<thead>
<tr>
<th>Business Needs</th>
<th>Benefits</th>
<th>Assumptions</th>
<th>Constraints/Risks</th>
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### Effort Estimation & Budget

<table>
<thead>
<tr>
<th>Total</th>
<th>GFA</th>
<th>IT</th>
<th>3rd Party</th>
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# Sapphire Fashion Showcase

Subject to Change, 01.03.2017

## Objectives
Create a compelling showcase for Sapphire presenting Machine Learning (ML) at SAP.

## In Scope
- Integrate 1-2 SAP Machine Learning solutions in a real customer case
- Show relation to SAPs core product (e.g., SAP S/4HANA)
- Interactive booth instead of pure displays

## Out of Scope
- A real productive solution (Mock-ups are ok)
- Building new ML solutions

## Benefits
- Convince customers to move to the intelligent enterprise and invest into data-driven solutions

## Assumptions
- Booth will be moderated by SAP
- Easy onboarding to showcase for visitors and presenters

## Constraints/Risks
- Use-case is too far away from SAPs core business
- Solution is too general and not realizable afterwards

## In Scope
- Integrate 1-2 SAP Machine Learning solutions in a real customer case
- Show relation to SAPs core product (e.g., SAP S/4HANA)
- Interactive booth instead of pure displays

## Out of Scope
- A real productive solution (Mock-ups are ok)
- Building new ML solutions

## Business Needs
- SAP has several ML solutions as part of their products but most of them are boring (only better numbers).
- Build a showcase that highlights the potential of ML for business users

## Benefits
- Convince customers to move to the intelligent enterprise and invest into data-driven solutions

## Assumptions
- Booth will be moderated by SAP
- Easy onboarding to showcase for visitors and presenters

## Constraints/Risks
- Use-case is too far away from SAPs core business
- Solution is too general and not realizable afterwards

## Timeline and Key Milestones
- 01.04.2017 Finalize Mock-up
- 01.05.2017 Finish software development
- 16.05.2017 Sapphire Showfloor Live

## Project Organization
**Lead**
- Michael

**Project Manager**
- Bernhard

**L1 Manager**
- Jürgen

**Stakeholder**
- Supervisory Board
- Executive Board

## Effort Estimation & Budget

<table>
<thead>
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<th>Total</th>
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Definition, preparation, and coordination of all planning components and their consolidation into a project management plan

A summarizing and comprehensive document as foundation for all future project tasks

- At least, defines scope, time, and costs
- More documents are defined by knowledge areas
- There is no one template but it strongly depends on your organization, existing checklists, other projects and the project’s complexity
- Plan is updatable but requires a change management process
Project Execution

- Use only tools that are required in your project

- Pay attention that you are not overengineering your project management!

- Rule of thumb: Be pragmatic and also question your project manager from time to time
Ensure that competencies, experiences, and expertise can be used during and after a project

- It’s not only about documenting and storing knowledge
- Explicit (codified in documents) vs. implicit (only in heads) knowledge
  - Explicit often misses context
  - Implicit is not documented
- Ensure a trustful environment that people are motivated to share knowledge
- Should be done continuously
- Start with personal interactions and switch to virtual later

Some tools (besides presentations and storing files): Networking, virtual coffees, focus groups, shadowing, workshops, or story telling
Collect, measure, and evaluate to identify project items that need attention and to start corrective actions

- Target-actual comparison (project state with project management plan)
- Recommendation of project changes
- Review of project risks
- Deliver information for reporting purposes
- Monitoring of approved changes
- Ensure that the project is still fulfilling the business case
Change Management

Change is not a gut decision but should be an aligned process too

- Written change request by any stakeholder (triggered external) at any time
- Review of change requests and evaluate consequences of change
- Revise project plans (Costs, schedule, ...)
- Approval by responsible person(s) (PM, Executive, Change Control Board)
- Communicate decision and execute (disagree but commit)

Change is the only constant

Source: https://awhooker.com/resources/cost-changes/
Archive knowledge, finish latest project work, and release resources

- Don’t underestimate the closing of projects
- Check project management plan to ensure all tasks are finished!
- Final report and retrospective with team
- Try to receive feedback from all stakeholders
- Celebrate independent of success-level
- Plan handover and follow-ups
Knowledge Area
Scope Management

Image by Filler Brick from flickr: https://flickr.com/photos/4c65676f/48820367682/ (CC BY-NC 2.0)
Introduction to Project Management
1. Integration Management
2. Scope Management: Ensure that the project works on the right things (and only on these)
3. Schedule Management
4. Cost Management
5. Quality Management
6. Resource Management
7. Communications Management
8. Risk Management
9. Procurement Management
10. Stakeholder Management
Ensure that the project works on the right things (and only on these)

- Scope is defined on product- or project-level
  - Anticipated (full scope defined at the beginning, everything else is change)
  - Adaptive/agile (scope defined per iteration)
  - Result is defined in product requirement document or project management plan
- Ensure that also out-of-scope items are defined
- In agile development, we can stick to user stories, iteration planning, backlogs etc.
Project Lifecycle for Scope Management

1. Initiating
   1. Plan scope management
      2. Collect requirements
      3. Define scope
      4. Create project structure plan

2. Planning
   - Use Scrum and agile development methodology

3. Executing
   5. Validate scope
   6. Control scope

4. Monitoring & Controlling

5. Closing
Project Lifecycle for Scope Management

1. Initiating
2. Planning
3. Executing
4. Monitoring & Controlling
5. Closing

Classic requirements analysis methods such as interviews, brainstorming, competitor analysis, surveys, benchmarking, prototypes, requirements-traceability-matrix

1. Plan scope management
2. Collect requirements
3. Define scope
4. Create project structure plan
5. Validate scope
6. Control scope
### Requirements-Tracability-Matrix

<table>
<thead>
<tr>
<th>ID</th>
<th>Category</th>
<th>Requirement</th>
<th>Priority</th>
<th>Source</th>
<th>Business Objective</th>
<th>Deliverables</th>
<th>Test Case</th>
<th>Owner</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Shopping Window</td>
<td>Recognize emotions of visitor</td>
<td>Very High</td>
<td>SVB/Klaus</td>
<td>Showcase AI in Business</td>
<td>PoC on Github incl. deploy script</td>
<td>1001</td>
<td>Thomas</td>
<td>In progress</td>
</tr>
<tr>
<td>2</td>
<td>ERP Mockup</td>
<td>Show how the collected data influences S/4HANA</td>
<td>High</td>
<td>S/4HANA team</td>
<td>Connect showcase with SAP portfolio</td>
<td>PowerPoint with S/4 screenshots</td>
<td>Evaluate with S/4</td>
<td>Stephan</td>
<td>Finished</td>
</tr>
<tr>
<td>3</td>
<td>Sapphire Setup</td>
<td>Connect with social media account of visitor</td>
<td>Medium</td>
<td>Comms</td>
<td>Connect showcase with SAP portfolio</td>
<td>Generated QR code connected with LinkedIn</td>
<td>---</td>
<td>---</td>
<td>Out of scope</td>
</tr>
</tbody>
</table>

- Overview helps you to keep track of large projects (Big Excel or dashboards)
- Required for change management and reporting
- Adapt template to your project needs!
1. Initiating
   1. Plan scope management
   2. Collect requirements
   3. Define scope
   4. Create project structure plan

2. Planning
   1. Collect requirements
   2. Define scope
   3. Create project structure plan

3. Executing
   1. Plan scope management
   2. Collect requirements
   3. Define scope
   4. Create project structure plan
   5. Validate scope
   6. Control scope

4. Monitoring & Controlling

5. Closing
   1. Validate scope
   2. Control scope

Decide which requirements will be part of the scope!
Project structure plan (PSP) is a hierarchical partitioning of the project scope

- Split delivery items into smaller components which are easier to handle
- It is complete - 100% rule per layer (neither missing nor needless items)
- On the lowest level, work packages are defined (e.g., user stories, EPICs)
- Work packages can have different templates, size, and complexity

Setup a PSP

- Top down method or bottom up approach
- Can be based on phases, objectives, deliveries, or teams
- Pay attention for dividing it to fine-granular (as well to coarse-grained)
- Future deliveries can be added later
Project Structure Plan (Delivery-based)

1. Plan scope management
2. Collect requirements
3. Define scope
4. Create project structure plan

**Sapphire Fashion Showcase**

**Project Management**
- Business development for the intelligent window
- Keep stakeholders in the loop
- Find resources and postpone other projects
- Find and coordinate with stand builder

**Shopping Window**
- Face and emotion recognition
- Projection on mannequins
- Recommendation of shopping items

**ERP Mockup**
- Create and align mockup screenshots
- Conversational AI and have a storyflow

**Sapphire Setup**
- Order hardware for booth
- Organize VIP visits
- Onboard colleagues
1. Initiating
   1. Plan scope management
   2. Collect requirements
   3. Define scope
   4. Create project structure plan

2. Planning
   1. Plan scope management
   2. Collect requirements
   3. Define scope
   4. Create project structure plan

3. Executing

4. Monitoring & Controlling
   5. Validate scope
   6. Control scope

5. Closing
   Acceptance of deliveries (e.g., Customer meeting, Steering Committee)

Maintain scope throughout the project (e.g., Change requests, backlog items, next iteration)
Knowledge Area
Schedule Management

Image by Pascal from flickr: https://flickr.com/photos/pasukaru76/3998273279/ (CC BY-NC 2.0)
Agenda

Introduction to Project Management
1. Integration Management
2. Scope Management
3. Schedule Management: Ensure that the project delivers on time
4. Cost Management
5. Quality Management
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10. Stakeholder Management
Ensure that the project delivers on time

- Create a detailed *project schedule* how and when a project delivers on scope items (incl. milestones as essential points or events in a project)
- Communicate and manage expectations with stakeholders
- Foundation for reporting and steering the project

- Keep the project schedule flexible in order to adapt it to new insights, risks, or results
- Don’t underestimate the dependencies between procedures, resources, and domain knowledge – in large projects, a team is required to set realistic deadlines

Example: Semiconductor crisis in automobile industry
User stories and sprints allow for a rolling plan; But long-term schedules require additional conservative methods.
Project Lifecycle for Schedule Management

1. Initiating
   1. Plan schedule management
   2. Define procedures
   3. Determine procedure order
   4. Estimate procedure time
   5. Develop project schedule

2. Planning
   - Define procedures
   - Determine procedure order
   - Estimate procedure time
   - Develop project schedule

3. Executing
   - Control project schedule

4. Monitoring & Controlling
   - Involve team for better results
   - Identify milestones

5. Closing

Based on the project structure plan, split scope items into procedures for estimation, planning, execution, and controlling:
- Involve team for better results
- Identify milestones

ML Sapphire Showcase

- Project Management
  - Business development for the intelligent window
  - Keep stakeholders in the loop
  - Find resources and funds for other projects
  - Train and coordinate with team builder

- Shopping Window
  - Face and emotion recognition
  - Projection on mannequins
  - Recommendation of shopping items

- ERP Mockup
  - Create and align mockup screenshots
  - Conversational AI and have a storyline

- Sapphire Setup
  - Order hardware for booth
  - Organize VIP visits
  - Onboard colleagues
Project Lifecycle for Schedule Management

1. Initiating
   - Plan schedule management
   - Define procedures
   - **Determine procedure order**
   - Estimate procedure time
   - Develop project schedule

2. Planning
   - Plan schedule management
   - Define procedures
   - Determine procedure order
   - Estimate procedure time
   - Develop project schedule

3. Executing
   - Control project schedule

4. Monitoring & Controlling
   - Control project schedule

5. Closing

Identify the logical order of all procedures to find the most efficient setup of executing working packages.
Precendence Diagramming Method

**Logical Sequences**
- Finish-to-Start (FS, normal)
- Finish-to-Finish (FF, successor can only finish after predecessor is done)
- Start-to-Start (SS, successor cannot start before predecessor started)
- Start-to-Finish (SF, successor cannot finish before predecessor started)

**Numbers**
- Lead time (negative, successor can start earlier)
- Follow-up time (positive, delay until successor has to start)

Think about dependencies and best practices!
Precedence Diagramming Method

Logical Sequences
- Finish-to-Start (FS, normal)
- Finish-to-Finish (FF, successor can only finish after predecessor is done)
- Start-to-Start (SS, successor cannot start before predecessor started)
- Start-to-Finish (SF, successor cannot finish before predecessor started)

Numbers
- Lead time (negative, successor can start earlier)
- Follow-up time (positive, delay until successor has to start)

Think about dependencies and best practices!
Agile methods such as planning poker work very well. But also think about motivation, technical progress, number of resources, and previous experience. Sometimes, it can also be helpful to distinguish between time most likely (tM), time optimistic (tO), and time pessimistic (tP).
Project Lifecycle for Schedule Management

1. Initiating
   1. Plan schedule management
   2. Define procedures
   3. Determine procedure order
   4. Estimate procedure time
   5. Develop project schedule

2. Planning
   - Iterative process
   - Includes milestone planning
   - Review project schedule with stakeholders

3. Executing

4. Monitoring & Controlling
   - Agile release planning is limited to the current release and the product roadmap (w/o timing)

5. Closing

6. Control project schedule
### Critical Path Method

#### Identify the earliest and latest project end
- Assume no resource restrictions in the beginning, adapt schedule later
- Identify riskful paths and acceleration possibilities (What-if analysis and simulation)
  - Crashing (adding resources) leads to higher costs
  - Fast tracking (overlap working packages) increases risk
  - Change estimates, lead and follow-up times

#### Procedure Name

<table>
<thead>
<tr>
<th>Start</th>
<th>Length</th>
<th>End</th>
<th>Earliest Start</th>
<th>Length</th>
<th>End</th>
<th>Delayed Start</th>
<th>Buffer</th>
<th>End</th>
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<td>0</td>
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<td>6</td>
<td>0</td>
<td>15</td>
<td>6</td>
<td>10</td>
<td>15</td>
</tr>
</tbody>
</table>

**Critical Path**

- Onboard colleagues
- Organize VIP visits

---

Scalable Software Engineering — WS 2021/22
Don’t use PowerPoint for such charts!
1. Initiating

1. Plan schedule management
2. Define procedures
3. Determine procedure order
4. Estimate procedure time
5. Develop project schedule

2. Planning

3. Executing

4. Monitoring & Controlling

6. Control project schedule

Maintain the project schedule continuously, which is done in agile projects via sprint planning and retrospectives automatically
- Target-actual comparison
- Influence of external and internal project factors
- Use reserved time buffer
- Roll out changes in schedule

5. Closing
Knowledge Area
Cost Management

Image by WRme2 from flickr: https://flickr.com/photos/111441268@N03/29763540926/ (CC BY-NC 2.0)
Introduction to Project Management
1. Integration Management
2. Scope Management
3. Schedule Management
4. Cost Management: Ensure that the project stays within budget
5. Quality Management
6. Resource Management
7. Communications Management
8. Risk Management
9. Procurement Management
10. Stakeholder Management
Ensure that the project stays within budget

1. Costs for resources which are required to finish the project
2. Influence of project decisions on (repeatable) costs for usage, maintenance, and support of deliveries, e.g., limit quality assurance to save primary costs
3. Forecasting cost-benefit of final product can be part of the project itself

Budgeting is a topic on its own

- Usually, guidance from company (templates, budget presets, controller,...)
- Different stakeholders, different cost measurements, e.g., personal costs (FTEs), internal vs. external costs, types of budgets
- Agile projects often apply simplified estimates, have more iterations and only a high-level forecast BUT struggle with long-term, risks, and exceptions
Project Lifecycle for Cost Management

1. Initiating
   - Plan cost management
2. Planning
   - Estimate costs
   - Determine budget
   - Defined by company and accounting
   - Start-ups keep it lean and compliant
   - Initial budget see project charter
3. Executing
4. Monitoring & Controlling
   - Control costs
5. Closing
Forecast the project's financial needs and get approval for budget

- Based on project structure plan
- Iterative process incl. refinements
- Estimate **all costs** of a project
- Look for alternatives to save costs

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Plan</th>
<th>Type</th>
<th>Risk</th>
<th>Risk reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Sapphire Setup</td>
<td>€ 136,500,00</td>
<td></td>
<td>€ 11,000,00</td>
<td></td>
</tr>
<tr>
<td>4.1</td>
<td>Order hardware for booth</td>
<td>€ 136,000,00</td>
<td></td>
<td>€ 10,000,00</td>
<td>Higher setup costs</td>
</tr>
<tr>
<td></td>
<td>Projector</td>
<td>€ 12,000,00</td>
<td>Material</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mannequin</td>
<td>€ 4,000,00</td>
<td>Material</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Computer</td>
<td>€ 5,000,00</td>
<td>Material</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Displays</td>
<td>€ 10,000,00</td>
<td>Material</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Booth</td>
<td>€ 100,000,00</td>
<td>External costs</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>IT Setup</td>
<td>€ 5,000,00</td>
<td>External costs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2</td>
<td>Organize VIP visits</td>
<td>€ -</td>
<td></td>
<td>€ 1,000,00</td>
<td>Add. expenses of VIPs</td>
</tr>
<tr>
<td></td>
<td>tickets</td>
<td>€ 500,00</td>
<td></td>
<td>€ -</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>€ 500,00</td>
<td>(internal) Labor costs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Add risk costs - the known unknown

Project Budget = cost basis + risks costs + mgt. reserve = 160k€

Always have a management reserve! (Should be unknown to project manager)

Excel is a powerful tool

Sum up estimated costs

Forecast the project's financial needs and get approval for budget based on project structure plan, iterative process incl. refinements, estimate all costs of a project, and look for alternatives to save costs.
### Project Lifecycle for Cost Management

#### 1. Initiating
- Plan cost management

#### 2. Planning
- Estimate costs
- Determine budget

#### 3. Executing
- Control costs
  - Maintain cost basis and continuously compare target-actual costs and delivered results
  - Control and adapt cost basis
  - Ensure budget stays in limits
  - Budget increase is part of a change request (Much effort)!

#### 4. Monitoring & Controlling
- Maintain cost basis and continuously compare target-actual costs and delivered results

#### 5. Closing
- Project budget
- Planned costs
- Cost basis
- Management reserve
- Financial requirement
- Expenses
- Cumulative costs
- Time
Knowledge Area
Quality Management
Introduction to Project Management
1. Integration Management
2. Scope Management
3. Schedule Management
4. Cost Management
5. Quality Management: Ensure quality expectations of stakeholders
6. Resource Management
7. Communications Management
8. Risk Management
9. Procurement Management
10. Stakeholder Management
Principles of Quality Management

Ensure quality expectations of stakeholders

- Non-fulfilment of quality can lead to project fail
- Quality management involves *all* stakeholders
- Prefer prevention over inspection (The earlier you find an issue the cheaper)
- Continuously improve project management and processes as well (retrospectives)
- Ensure enough resources for quality assurance
- Quality is measurable and should be reported

- Quality (degree of how a requirement is fulfilled) vs. product class (same functionality different implementation)
Project Lifecycle for Quality Management

1. Initiating
   - Plan quality management
2. Planning
   - Identify requirements and standards as well as tools and methods for ensuring quality of external as well as internal project results
3. Executing
   - Manage quality
   - Ensure that project deliveries are complete and fit to stakeholder expectations
   - Control quality
4. Monitoring & Controlling
   - Apply test and evaluation methods
     - Build trust that expected quality and results can be delivered
     - Improve efficiency and effectivity
5. Closing
Quality Key Performance Indicator (KPI)

“A quality KPI defines a project or product attribute which will be verified during process “control quality”.

Examples

- Number of (non-)delivered features, tasks, or work packages
- Service level agreements (Up-time, run-time, latency, throughput)
- Failure rate of product or number of failures per line of code
- Customer satisfaction (Net-Promoter-Score (NPS))
- Test coverage

Keep in mind that KPIs will have tolerances.
Test Pyramid?!
Quality Costs

**Conformity costs**
Costs to prevent failures

- **Prevention costs**
  (Produce a high quality product)
  - Training
  - Document processes
  - Necessary resources
  - Time to do it right

- **Appraisal costs**
  (Estimate quality)
  - Execute tests
  - Inspection
  - Crash and chaos tests

**Non-conformity costs**
Costs due to failures

- **Internal failures**
  (Identified by project team)
  - Rework
  - Trash

- **External failures**
  (Identified by customers)
  - Liabilities
  - Warranties
  - Business losses
Example: Creation of a new Strategic Project

- Create Strategic Projects Ticket (based on template)
- Create new ticket in L1 unit portfolio (link to project ticket)
- Save mission initial e-mail
- Add new project to goals and OKRs (Objectives and Key Results)
- Communicate new project in next team meeting (team and management)
- Find people who want to work on it (adapt ticket in strategic projects)
- Create Follow-ups (e.g., put slides or add demo link to our JAM page, add a new Kaleidoscope entry, LinkedIn Post)
- Define how to measure success (not only done)
- Opt. create project charter and setup project

Remark: Audits are structural and independent processes which will use (public) checklists to ensure compliance with company or outside practices.

Sounds obvious but will help a lot! Or you will forget something.
Root Cause Analysis

Remember

Projection doesn’t show up on mannequins

T-1 day
To find root causes, follow infection chains from observable failures back

If you remove a root cause, then all observable failures are gone and won’t happen again – if not, it was not the (only) root cause.
Knowledge Area
Resource Management

Image by James Garcia from flickr: https://flickr.com/photos/thereeljames/50360415618/ (CC BY-NC 2.0)
Introduction to Project Management

1. Integration Management
2. Scope Management
3. Schedule Management
4. Cost Management
5. Quality Management
6. Resource Management: Identification, provisioning, and management of required resources
7. Communications Management
8. Risk Management
9. Procurement Management
10. Stakeholder Management
Identification, provisioning, and management of required resources
Ensure that right resources are available at the right time and at the right place

Human resources
- Project team consists of persons with different roles and responsibilities
- Humans are different (skills, character, needs, history and future)
- Leading is more than managing (motivation, empowerment, role model, development of an effective group, and trust to get the job done)

Physical resources
- Material, equipment, digital assets, utilities,…
- Efficient and effective use of resources (today and in the future)
- Risk source

Use lightweight methods in projects which are difficult to predict
Define how human and physical resources are estimated, provided, assigned, managed, and used. It needs to be ensured that sufficient resources are available to finish the project in time, scope, cost, and quality.

Determine team size and roles as well as physical resources that are required for the project.

Tightly couple with scope, cost, and schedule management.
Identify required resources per project or working package
- Hierarchical view on categories and types of resources (Excel is the tool of choice)
- Required for acquiring and monitoring resources

**People (14 FTEs)**
- 1 Project Lead
- 1 Project Manager
- 1 Business Developer
- 1 Project Assistant
- 1 Development Architect
- 6 Developers
- 2 UX Designer
- 1 UI Designer

**Equipment**
- 1 Sapphire Booth
- 1 Projector
- 2 Mannequin
- 2 Computers
- 4 Displays

**Services**
- 1 Booth Builder
- 10 Account Executives

For software development, we focus on human resources
Based on Project and Resource Structure Plan (Alternative as table)

- Add involved persons and teams with defined roles and responsibilities
- Clarify authority, escalation, and reporting paths
- Setup basic cooperation patterns

**Project Organigram**

---

**Project Management**
- **Lead:** Bernhard (PM)
- **Strategic Development Projects**
  - Business Developer: Klaus
  - Assistant: Kathleen

**Shopping Window**
- **Lead:** Thomas (Dev Architect)
- **Strategic Development Projects**
  - Developer: Silvana
  - Developer: Thomas K.

**ERP Mockup**
- **Lead:** Stephan (Design Lead)
- **Showcase Team**
  - UX Designer: Daniel
  - UI Designer: Martin

**Sapphire Setup**
- **Lead:** Bernhard (PM)
- **Strategic Development Projects**
  - Booth builder contact
  - Account executives

**Steering Committee**
- **Members:** Gerd (EB), Jürgen (L1), Michael (Project Lead), Bernhard (PM), Markus (Head of AI), Maggi (Sapphire), Rolf (Customer lead)

**Sapphire Fashion Showcase**
- **Project Lead:** Michael
  - **Substitute:** Bernhard
  - **Strategic Projects**

---

Scalable Software Engineering — WS 2021/22
Assign project resources and their responsibilities to each working package

- R = Responsibility, A = Accountable, C = Consult, I = Inform
- Transparency for the entire project team in order to prevent conflicts, uncertainties, and overloading of resources
- High maintenance effort and confusing for finest level of granularity

<table>
<thead>
<tr>
<th>Working Package</th>
<th>Steering Committee</th>
<th>Jürgen (L1 Manager)</th>
<th>Michael (Lead)</th>
<th>Bernhard (PM)</th>
<th>Strategic Dev Team</th>
<th>Showcase Team</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business development for the intelligent window</td>
<td>I</td>
<td>A</td>
<td>R</td>
<td>R</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>Face and emotion recognition</td>
<td>I</td>
<td>A</td>
<td>R</td>
<td>R</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>Create ERP Mockup</td>
<td>I, C</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>A, R</td>
</tr>
<tr>
<td>Order hardware for booth</td>
<td>A</td>
<td>R</td>
<td></td>
<td></td>
<td></td>
<td>C</td>
</tr>
</tbody>
</table>

Ideally, only one R and A in one resource per task. Preferably few C and I.
Define when and where resources are available

- Physical resources will include a lot of logistic
- Human resource planning requires the identification of part-time requirements, working days and times, weekends, vacations, and public holidays
- Plan for substitutes or adapt estimations
- Ensure that reporting can take place

<table>
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<th></th>
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<th>CW10</th>
<th>CW11</th>
<th>CW12</th>
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<th>CW14</th>
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<th>CW16</th>
<th>CW17</th>
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<tr>
<td>Michael</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bernhard</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thomas</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stephan</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1. Initiating
2. Planning
3. Provide resources
4. Develop team
5. Manage team
4. Monitoring & Controlling
6. Control resources

Acquire team members, facilities, equipment, materials, supplies, and other resources which are required for realizing the project
- Project manager should be able to influence resource negotiations (e.g., who joins the project)
- If not all requested resources are provided, change project management plan, look for alternatives (e.g., training), or cancel it in the worst case
Selection criteria to be considered:

- Availability
- Cost
- Skills, experiences, and knowledge
- Mindset and attitude
- Diversity
- Remote working

There is always an (even internal) competition around employees. So, you will need a lot of **negotiation and political skills** to ensure that scarce resources will be **assigned to and stay with** your project!

**Pro tip:** Talk with potential team members instead with just their managers

**Another one:** Be selective!

"You can't always get what you want
But if you try sometime *you'll find*
You get what you need"

- **The Rolling Stones**
**Project Lifecycle for Resource Management**

1. Initiating
   - Plan resource management
   - Estimate required resources

2. Planning
   - Provide resources
   - Develop team
   - Manage team

3. Executing

4. Monitoring & Controlling
   - Control resources

5. Closing

Finally, lead the team, assign (demanding) project tasks, and appreciate the results in order to improve project performance:
- Motivate people, resolve conflicts, and ensure a stable team
- Facilitate interactions between people
- Create an open and trustful team environment
- Improve skills and expertise
- Evaluate performance, give feedback, and change team setup to further optimize project outcome.
- Find a proper leadership style incl. social competencies, conflict management, decision making, emotional intelligence, and stakeholder engagement.
How to Build a Great Team?

Development of an effective project team is one of the primary responsibilities of a project manager

- Create a dynamic, cohesive, and collaborative team culture
- Open and effective communication
- Team building events
- Build trust between all team members
- Constructive feedback and resolving of conflicts
- Foster joint solution thinking and decision making
- Transparent knowledge exchange
- Identify and close skill gaps of all team members

*But be neither a best buddy (there will be tough decisions) nor a badass boss (there is no I in team)!*
Leader vs. Manager

Manager
- Drives employees
- Places blame for the breakdown
- Takes credit
- Says, "Go"
- Depends on authority
- Inspires fear
- Knows how it is done
- Uses people

LEADER
- Coaches them
- Generates enthusiasm
- Fixes the breakdown
- Shows how it is done
- Develops people
- Asks
- Says, "Let's go"
- On goodwill
- Says, "We"
- Gives credit

Sources: https://entrepreneurcaribbean.com/2020/02/26/leadership-versus-management/
https://slidemodel.com/leadership-vs-management-key-differences/leader-vs-manager-key-comparison/
Phases of Team Development

Forming, Storming, Norming, Performing, and Adjourning — based on group development model by Bruce Tuckman

All phases are necessary and inevitable for a team to grow, tackle problems, find solutions, plan work, and deliver results.

Copyright © 2008-2021 Scott M. Graffius. All rights reserved. For permission requests, contact scott@scottgraffius.com.
Conduct activities that encourage the inner team spirit and create an open and trustful environment

- From daily stand-ups to external and professional events
- Especially important for remote teams, organize regular retreats
- Informal communication and activities are very important for building trust and good working relationships
- Each project should start with a kick-off
- Work together in the same room
- (Public) appreciations and rewards
Talent management is critical for a project success

- Professional trainings such as HPI academy
- Massive open online courses such as openHPI
- Pair programming
- Mentoring, Coaching, or Shadowing
- Informal education, e.g., observations, conversations, performance evaluations

Include expected training costs into budget (time and money)
Analyze strengths and weaknesses of team members, entire team, project, organization, and yourself!

- Surveys
- 1:1 meetings
- Structured interviews
- Performance tests
- Skip-level meeting
  - Upper-level manager talks directly with team
  - Without project manager
  - Three questions: What do you like, what you don’t like, and what you hate?)
Project Lifecycle for Resource Management

1. Initiating
2. Planning
   1. Plan resource management
   2. Estimate required resources
3. Executing
   3. Provide resources
   4. Develop team
   5. Manage team
4. Monitoring & Controlling
   6. Control resources
5. Closing

This process is only about physical resources and ensures the scheduled availability of required items, monitors their project usage, releases not required resources, and if necessary triggers corrective actions.
Knowledge Areas
Communication Management
Introduction to Project Management
1. Integration Management
2. Scope Management
3. Schedule Management
4. Cost Management
5. Quality Management
6. Resource Management
7. Communications Management: Creation, collection, distribution, storage, and deletion of project information
8. Risk Management
9. Procurement Management
10. Stakeholder Management
Principles of Communication Management

Creation, collection, distribution, storage, and deletion of project information
Ensure information needs of stakeholders, while preserving project requirements
- Most time-consuming task in project management
- Build relationships for project success
- Train your communication skills
  (Motivation, coaching, convincement, negotiations, conflict resolution)

Communication is the (not) intended exchange of information
- Form: Written, verbal, (in-)formal, gestures, via media, wording
- To whom: Intern/extern, hierarchical direction, (in-)official
- Kind: Meetings, presentations, e-mails, social media, reports, and documentation
Project Lifecycle for Communication Management

1. Initiating
   - Plan communication

2. Planning
   - Manage communication

3. Executing
   - Monitor communication

4. Monitoring & Controlling
   - Monitor communication

5. Closing

Plan information needs based on stakeholders’ interest, organization’s resources, and project requirements in order to present relevant insights in time.
- Early phase in project
- Check regularly as information needs and communication methods change
- Also important storage, documentation, and deletion of information

Start with a central document storage as single source of truth
# Communication Management Plan

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Communication Need</th>
<th>Information requirements</th>
<th>Frequency</th>
<th>Method</th>
<th>Responsible Person</th>
<th>Last Update</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supervisory Board</td>
<td>Keep them informed that project works</td>
<td>1 slide, blockers?</td>
<td>On request</td>
<td>Phone call</td>
<td>Michael (Project lead)</td>
<td>N/A</td>
</tr>
<tr>
<td>L1 Manager (Jürgen)</td>
<td>Needs to make sure that project will be delivered as requested by SVB</td>
<td>Project progress and risks</td>
<td>Regular, once per month</td>
<td>Written update in monthly reporting</td>
<td>Michael (Project lead)</td>
<td>April update (15.04.)</td>
</tr>
<tr>
<td>Project Lead (Michael)</td>
<td>Steers the project and needs all relevant information</td>
<td>Evaluate ideas, Project progress and risks</td>
<td>Regular, weekly, steering meeting, ad-hoc if necessary</td>
<td>Steering meeting (in-person) and ad-hoc</td>
<td>Bernhard (Project manager)</td>
<td>22.04.</td>
</tr>
<tr>
<td>Project Team Member</td>
<td>Overall project picture and alignment with other work packages</td>
<td>Contiously exchange with team members</td>
<td>Weekly Sprint meetings, bi-weekly project team meeting</td>
<td>In-person (virtual) meetings</td>
<td>Bernhard (Project manager)</td>
<td></td>
</tr>
</tbody>
</table>

It's fine to ask stakeholders what they want and need!

Further information, e.g., form, language, escalations, next update
## Meeting and Reporting Plan

<table>
<thead>
<tr>
<th>Meeting</th>
<th>Purpose</th>
<th>Participants</th>
<th>Frequency</th>
<th>Responsible Person</th>
<th>Preparation Lead</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Steering Meeting</strong></td>
<td>Present progress with Executives and discuss blockers and risks</td>
<td>Project Lead, L1 Manager, One Executive Board Member</td>
<td>2 weeks after start, 2 weeks before Sapphire</td>
<td>Michael (Project lead)</td>
<td>Bernhard (Project manager)</td>
</tr>
<tr>
<td><strong>Weekly Sprint Meeting</strong></td>
<td>Define next steps of project work stream</td>
<td>Sub-teams per work stream</td>
<td>Weekly, Monday morning</td>
<td>Bernhard (Project manager)</td>
<td>Product Owners</td>
</tr>
<tr>
<td><strong>Project Team Meeting</strong></td>
<td>Ensure that the entire project team knows what the other work streams are doing</td>
<td>All project members</td>
<td>Bi-weekly, Wednesday, 13h CET</td>
<td>Bernhard (Project manager)</td>
<td>Bernhard (Project manager)</td>
</tr>
<tr>
<td><strong>L1 Reporting</strong></td>
<td>Report briefly on overall progress and mark risks and blockers</td>
<td>L1 Manager and his/her office, maybe will be forwarded to Executive Board</td>
<td>Monthly, mid of month</td>
<td>Michael (Project lead)</td>
<td></td>
</tr>
</tbody>
</table>

*Use such tables as checklists and set reminder in schedule!
Project Lifecycle for Communication Management

1. Initiating
2. Planning
3. Executing
4. Monitoring & Controlling
5. Closing

1. Plan communication
2. Manage communication
3. Monitor communication

Collect, create, distribute, store, access, manage, monitor, and finally remove project information in time and proper manner.
- Efficient and effective information sharing between project team and stakeholders
- Suitable technologies, methods and processes

Ensure that information needs of stakeholders are fulfilled and the desired project effects are happening.
Effective meetings are needed to reach project goals:

- Agenda and optional pre-reads should be sent before
- Meeting should stay in time!
- Ensure that the right people attend (and no one more)
- Stick to the topic (moderator can help)
- Resolve expectations, problems, and conflicts during the meeting
- One person should write a protocol to document Actions/Information/Decisions incl. due dates and responsible persons

Ask yourself after a meeting, how could it be improved. Many meetings can be a waste of time.
Michael’s Reporting Survival Guide

Why do we need a survival guide?

• Understand expectations and needs by Executives better
• Present results in a compact, pragmatic, and consumable way
• Reduce revisions and be prepared for questions
• Get what you want, by saying what you need
• Learn from examples
• Take all advices with a grain of salt

Executives are the most difficult audience because they are low on time, have often a strong opinion (even w/o having much background), they decide about your project.
1. **Portfolio reporting**
   - Reporting sums up KPIs of your project
   - Be aware that sooner or later these slides will be used to judge your project and its future

2. **Action reporting**
   - The only purpose of this reporting is that people see the urgency of a topic and act on it immediately
   - Usually, leads to a lot of PowerPoint slides from all over the company.
   - They are rarely read but it is often a comparison between departments (who has delivered more than the other)

3. **Protocol reporting**
   - Live recording of a meeting, note taker
   - Filter discussion from decisions, important infos, and action items
   - Fill gaps by yourself and fix wrong statements (e.g. unprecise revenue numbers)
   - Special form – oral protocol, e.g. TSC
   - Stick to templates

4. **Reporting classes**
   - Can also be mixed!

5. **Real reporting**
   - The requestor (or a substitute) is really reading your input
   - You will receive guidance and comments on your reporting
   - Be aware that imprecise statements will lead to questions that you cannot answer immediately (they will call you directly when they read it! anywhere on earth), send mail, or you receive comments later

6. **Preread reporting**
   - Meeting with executive already scheduled
   - Depending on the meeting, you should provide a preread
   - Most executives don't read it but other colleagues of the meeting will do – be aware that they will reach out to you
   - You can change things until the meeting, final report will be provided after the meeting
   - Have a good mix of content and readability (not too much nor too less)

7. **Verbal reporting**
   - No write up but prepare notes!
   - Know what you want and talk precisely! You have no time to think about your words. If you are unsure try it out first.
   - Usually there are also no slides.

---

What kind of reports do we have?
- **Guided Update**
- **Preread**
- **Verbal**
- **Execution**
- **Protocol**
- **Portfolio**
**Engineering SLT - Meeting Protocol**

### Name of the Meeting
- Monthly Engineering SLT Call

### Location
- Monthly Call

### Date
- Oct 15, 2019

### Participants

### Guest

### Not in attendance

### Minutes

<table>
<thead>
<tr>
<th>#</th>
<th>D/I/A</th>
<th>Topic</th>
<th>Details</th>
<th>Due Date</th>
<th>Responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I</td>
<td>Opening</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>A</td>
<td>Opening</td>
<td></td>
<td>Oct 25</td>
<td>All,</td>
</tr>
<tr>
<td>3</td>
<td>A</td>
<td>Opening</td>
<td>Call for content for Q4 Engineering SLT offsite (Nov 20-21) – provide specific topics/content to</td>
<td>Oct 30</td>
<td>All,</td>
</tr>
</tbody>
</table>

**Protocol includes Actions/Infos/Decisions**

- Think about due dates and responsible person (have one main stakeholder)!
- Keep it compact, imperative and try to answer W* questions so that context is clear even weeks after meeting. Many AIs will be forwarded to non-participants who miss the context.
Focus on results (and blockers)
Most important message first
As much as needed, as less as possible
Show progress with Key Performance Indicators
## Executive Summary:

[Blank]

### Strategic Projects

**Michael P.**

- **All TechEd keynotes** delivered with very positive feedback.
- **DKOM keynote** prepped on track.
- **Hasso’s ICIS keynote** now based on his own outline! We delivered extended abstract, revised full paper, and prep slides together with Gerrit’s team.

- **SAP Graph** presented at T&I AHM and TechEd BGN; Revised strategy and team setup and set goals for 2020 (1. Build solid Graph runtime and tooling, and 2. Enable rapid API development including sandboxing for the Intelligent Enterprise E2E scenarios). Interest after TechEd remains high (730 applications for private beta only 265 by SAP colleagues)) - newsletter created to keep interested persons informed.

### KPIs

- **Work of ~50 FTEs for one month condensed in ½ slide**
- **Questions should be answered afterwards**
- **Highlight important terms**
- **KPIs to show success, risk as well as proposed solution**

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Be honest – No water melons!
Be aware of traffic lights?!
You are just the messenger
Be prepared for answering questions

How much info can you process?
“I don’t know yet” is a valid answer
<table>
<thead>
<tr>
<th></th>
<th>NOT STARTED</th>
<th>IN PROGRESS</th>
<th>DONE</th>
<th>BUGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>VACATIONS</td>
<td></td>
<td></td>
<td>3L</td>
<td></td>
</tr>
</tbody>
</table>

1. minify will
2. Factory deploy
3.
Cleaning up
**Project “Sapphire Fashion Showcase”**  
Status as of April 10, 2017

<table>
<thead>
<tr>
<th>Management Attention Required</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Lead</td>
<td>Michael</td>
</tr>
<tr>
<td>Report Date:</td>
<td>April 10, 2017 Week 14</td>
</tr>
<tr>
<td>Overall status</td>
<td>14</td>
</tr>
<tr>
<td>5 week rolling trend by CW</td>
<td>🌈</td>
</tr>
</tbody>
</table>

### Scope

**Create a compelling showcase for Sapphire presenting Machine Learning (ML) at SAP.**
- Integrate 1-2 SAP Machine Learning solutions in a real customer case
- Show relation to SAP's core product (e.g., SAP S/4HANA)
- Interactive booth instead of pure displays

Business case (Fashion Showcase) has been defined, presented and approved by Steering Committee. Most difficult software artefact is done (Face and emotion recognition) all other are in good shape. Discussion with stand builder have started but required capacity still unclear.

### Key Deliverables

<table>
<thead>
<tr>
<th>Key Deliverables</th>
<th>Responsible</th>
<th>Due Date</th>
<th>Status</th>
<th>Complete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business development for the intelligent window</td>
<td>Klaus (Business Developer)</td>
<td>31.03.</td>
<td>Business model approved by steering committee</td>
<td>🌈 🌈 🌈 🌈 🌈</td>
</tr>
<tr>
<td>Shopping window incl. face and emotion recognition, projection on mannequins and recommendation of shopping items</td>
<td>Bernhard (Project Manager)</td>
<td>01.05.</td>
<td>Most critical part (face recognition) implemented; other software development on track.</td>
<td>🌈 🌈 🌈 🌈 🌈</td>
</tr>
<tr>
<td>ERP Mockup incl. ConversationalAI control</td>
<td>Stephan (Team Lead ERP)</td>
<td>01.05.</td>
<td>UX designed, control flow defined, to be implemented</td>
<td>🌈 🌈 🌈 🌈 🌈</td>
</tr>
<tr>
<td>Sapphire setup incl. booth and organization of VIP visits</td>
<td>Bernhard (Project Manager)</td>
<td>15.05.</td>
<td>Negotiations with stand builder started; Unclear if they have capacity for us on top</td>
<td>🌈 🌈 🌈 🌈 🌈</td>
</tr>
</tbody>
</table>

### Key Issues & Decision Needs

<table>
<thead>
<tr>
<th>Key Issues &amp; Decision Needs</th>
<th>Plan of Action</th>
<th>Responsible</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Clarify budget constraints for Sapphire booth</td>
<td>• Decide on our upper budget limit for the booth</td>
<td>• Executive board</td>
<td>15.04.2017</td>
</tr>
</tbody>
</table>

**Sapphire Project Reporting**
Use spell checkers!
Double-check before submitting
Exceptions
Knowledge Areas
Risk Management

Image by Kevin Hackert from flickr: https://flickr.com/photos/kevinhackert/25996069087/ (CC BY-NC 2.0)
Introduction to Project Management

1. Integration Management
2. Scope Management
3. Schedule Management
4. Cost Management
5. Quality Management
6. Resource Management
7. Communications Management
8. Risk Management: Analysis of risks, execution and monitoring of prevention mechanisms
9. Procurement Management
10. Stakeholder Management
Is This a Risk for a Project?

Should we do something against it?

Source: https://gallantgold.com/tag/noreen-wise/
Analysis of risks, execution and monitoring of prevention mechanisms
Increase probability of positive risks and decrease probabilities of negative risks
- All projects have risks and if they are ignored the plan will differ and outcome is at risk
- Project constraints, assumptions and stakeholders expectations can change at any time
- Keep them tolerable (define clear risk thresholds)

Individual project risk
An uncertain event or condition that, if it happens, will influence positive (*Chance*) or negative (*Threat*) one or more project goals

Overall project risk
Sum of uncertainties from all sources and their influence on stakeholder expectations
1. Initiating

2. Planning

3. Executing

4. Monitoring & Controlling

5. Closing

1. Plan risk management
2. Identify risks
3. Conduct qualitative risk analysis
4. Conduct quantitative risk analysis
5. Plan risk responses

6. Implement risk responses

7. Monitor risks

Define how risk management should be conducted during the project
- Ensure adequacy of risks in relation to importance of project
- Start early in project and repeat it continuously
- Create a risk management plan incl. methods, tasks and responsibilities, funding, scheduling, risk categories, risk willingness by stakeholders, risk probabilities and consequences, reporting formats, and tracking
## Risk Categories (Examples)

<table>
<thead>
<tr>
<th>Risk Structure Plan Level 0</th>
<th>Risk Structure Plan Level 1</th>
<th>Risk Structure Plan Level 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>0. All sources of project risks</td>
<td>1. Technical risks</td>
<td>1.1 Definition of scope</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.2 Technical interfaces</td>
</tr>
<tr>
<td></td>
<td></td>
<td>etc.</td>
</tr>
<tr>
<td></td>
<td>2. Management risks</td>
<td>2.1 Project management</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.2 Organisation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>etc.</td>
</tr>
<tr>
<td></td>
<td>3. Commercial risks</td>
<td>3.1 Contract conditions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.2 Internal procurement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>etc.</td>
</tr>
<tr>
<td></td>
<td>4. External risks</td>
<td>4.1 Legislation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.2 Foreign exchange rates</td>
</tr>
<tr>
<td></td>
<td></td>
<td>etc.</td>
</tr>
</tbody>
</table>
## Definition of Risk Probability and Impact (Example)

<table>
<thead>
<tr>
<th>Range</th>
<th>Probability</th>
<th>Time</th>
<th>Cost</th>
<th>Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>&gt;50%</td>
<td>&gt; 3 months</td>
<td>&gt; 100,000 €</td>
<td>Disruptive changes to functionality</td>
</tr>
<tr>
<td>Medium</td>
<td>25-50%</td>
<td>1-3 months</td>
<td>10,000-100,000€</td>
<td>Major changes to functionality</td>
</tr>
<tr>
<td>Low</td>
<td>5-25%</td>
<td>&lt; 1 month</td>
<td>&lt; 10,000 €</td>
<td>Minor changes to functionality</td>
</tr>
<tr>
<td>Null</td>
<td>&lt;5%</td>
<td>No delay</td>
<td>No change</td>
<td>No change</td>
</tr>
</tbody>
</table>
Project Lifecycle for Risk Management

1. Initiating
   - Plan risk management
   - Identify risks
   - Conduct qualitative risk analysis
   - Conduct quantitative risk analysis
   - Plan risk responses

2. Planning
   - Determine and document individual and the overall project risk(s)
   - Use of brainstorming, checklists, interviews, and SWOT analyses
   - Include as many as possible stakeholders as well as external experts in the risk analysis
   - Create awareness, commitment, and solution-thinking about risks

3. Executing

4. Monitoring & Controlling
   - Implement risk responses

5. Closing
   - Monitor risks

Scalable Software Engineering — WS 2021/22
These lists are not complete but a good start for software projects.
Software Risk Checklists


(C) Customer Related Risks

Following generic risks are associated with different customers

<table>
<thead>
<tr>
<th>Sr.</th>
<th>Check Point / Defect Statement</th>
<th>Check Mark (Y) the Appropriate Column</th>
<th>Check Mark (N) the Appropriate Column</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Have you worked with the customer in the past?</td>
<td>Y</td>
<td>N or N/A</td>
</tr>
<tr>
<td>2</td>
<td>Does the customer have a solid idea of what is required? Has the customer spent the time to write it down?</td>
<td>Y</td>
<td>N or N/A</td>
</tr>
<tr>
<td>3</td>
<td>Will the customer agree to spend time in formal requirements gathering meetings to identify project scope?</td>
<td>Y</td>
<td>N or N/A</td>
</tr>
<tr>
<td>4</td>
<td>Is the customer willing to establish rapid communication links with the developer?</td>
<td>Y</td>
<td>N or N/A</td>
</tr>
<tr>
<td>5</td>
<td>Is the customer willing to participate in reviews?</td>
<td>Y</td>
<td>N or N/A</td>
</tr>
<tr>
<td>6</td>
<td>Is the customer technically sophisticated in the product area?</td>
<td>Y</td>
<td>N or N/A</td>
</tr>
<tr>
<td>7</td>
<td>Is the customer willing to let your people do their job—that is, will the customer resist looking over your shoulder during technically detailed work?</td>
<td>Y</td>
<td>N or N/A</td>
</tr>
<tr>
<td>8</td>
<td>Does the customer understand the software engineering process?</td>
<td>Y</td>
<td>N or N/A</td>
</tr>
</tbody>
</table>

Note: If the answer to any of these questions is “No,” further investigation should be done to assess the risk.

These lists are not complete but a good start for software projects
Software Risk Checklists


These lists are not complete but a good start for software projects.

### Technical Issues

<table>
<thead>
<tr>
<th>Sr.</th>
<th>Check Point / Defect Statement</th>
<th>Check Mark in the Appropriate Column</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Are facilitated application specification techniques used to aid in communication between the customer and developer?</td>
<td>Yes  No  N/A</td>
</tr>
<tr>
<td>2</td>
<td>Are specific methods used for software analysis?</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Do you use a specific method for data and architectural design?</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Is more than 90 percent of your code written in a high order language?</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Are specific conventions for code documentation defined and used?</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Do you use specific methods for test case design?</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Are software tools used to support planning and tracking activities?</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Are configuration management software tools used to control and track change activity throughout the software process?</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Are software tools used to support the software analysis and design process?</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Are tools used to create software prototypes?</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Are software tools used to support the testing process?</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Are software tools used to support the production and management of documentation?</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Are quality metrics collected for all software projects?</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Are productivity metrics collected for all software projects?</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** If majority of the above questions is answered "No," software process is weak and risk is high.

### Technology Related Risks

Following generic risks are associated with the technology to be built:

<table>
<thead>
<tr>
<th>Sr.</th>
<th>Check Point / Defect Statement</th>
<th>Check Mark in the Appropriate Column</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Is the technology to be built new to your organization?</td>
<td>Yes  No  N/A</td>
</tr>
<tr>
<td>2</td>
<td>Do the customer’s requirements demand the creation of new algorithms, input or output technology?</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Does the software interface with new or unproven hardware?</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Does the software to be built interface with vendor supplied software products that are unproven?</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Does the software to be built interface with a database system whose function and performance have not been proven in this application area?</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Is a specialized user interface demanded by product requirements?</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Do requirements for the product demand the creation of program components that are unlike any previously developed by your organization?</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Do requirements demand the use of new analysis, design or testing methods?</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Do requirements demand the use of unconventional software development methods, such as formal methods, AI-based approaches, artificial neural networks?</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Do requirements put excessive performance constraints on the product?</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Is the customer uncertain that the functionality requested is &quot;do-able&quot;?</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** If the answer to any of these questions is "Yes," further investigation should be done to assess the risk.
Software Risk Checklists


These lists are not complete but a good start for software projects.

(F) Development Environment Risks

Following generic risks are associated with development environment.

<table>
<thead>
<tr>
<th>Sr.</th>
<th>Check Point / Defect Statement</th>
<th>Check Mark (Mark the Appropriate Column)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1)</td>
<td>Is a software project management tool available?</td>
<td>Yes</td>
</tr>
<tr>
<td>2)</td>
<td>Is a software process management tool available?</td>
<td>Yes</td>
</tr>
<tr>
<td>3)</td>
<td>Are tools for analysis and design available?</td>
<td>Yes</td>
</tr>
<tr>
<td>4)</td>
<td>Do analysis and design tools deliver methods and approaches for the product to be built?</td>
<td>Yes</td>
</tr>
<tr>
<td>5)</td>
<td>Are compilers or code generators available and appropriate for the product to be built?</td>
<td>Yes</td>
</tr>
<tr>
<td>6)</td>
<td>Are testing tools available and appropriate for the product to be built?</td>
<td>Yes</td>
</tr>
<tr>
<td>7)</td>
<td>Are software configuration management tools available?</td>
<td>Yes</td>
</tr>
<tr>
<td>8)</td>
<td>Does the environment make use of a database or repository?</td>
<td>Yes</td>
</tr>
<tr>
<td>9)</td>
<td>Are all software tools integrated with one another?</td>
<td>Yes</td>
</tr>
<tr>
<td>10)</td>
<td>Have members of the project team received training in each of the tools?</td>
<td>Yes</td>
</tr>
<tr>
<td>11)</td>
<td>Are local experts available to answer questions about the tools?</td>
<td>Yes</td>
</tr>
<tr>
<td>12)</td>
<td>Is online help and documentation available and adequate?</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Note: If a majority of the above questions are answered “No,” the software development environment is weak and risk is high.

(G) Risks Associated with Staff Size and Experience

Following generic risks are associated with Staff Size and Experience.

<table>
<thead>
<tr>
<th>Sr.</th>
<th>Check Point / Defect Statement</th>
<th>Check Mark (Mark the Appropriate Column)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1)</td>
<td>Are the best people available?</td>
<td>Yes</td>
</tr>
<tr>
<td>2)</td>
<td>Do the people have the right combination of skills?</td>
<td>Yes</td>
</tr>
<tr>
<td>3)</td>
<td>Are enough people available?</td>
<td>Yes</td>
</tr>
<tr>
<td>4)</td>
<td>Are staff committed for entire duration of the project?</td>
<td>Yes</td>
</tr>
<tr>
<td>5)</td>
<td>Will some project staff be working only part-time on this project?</td>
<td>Yes</td>
</tr>
<tr>
<td>6)</td>
<td>Do staff have the right expectations about the job at hand?</td>
<td>Yes</td>
</tr>
<tr>
<td>7)</td>
<td>Have staff received necessary training?</td>
<td>Yes</td>
</tr>
<tr>
<td>8)</td>
<td>Will turnover among staff be low enough to allow continuity?</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Note: If the answer to any of these questions is “No,” further steps should be done to assess the risk.
Main tool for risk management and following activities

- List of identified risks, assessment, and mitigations
- Describe as much as necessary, as less as possible
- Be clear about cause and effect
- Unified template; further attributes are possible

### Risk Register

<table>
<thead>
<tr>
<th>ID</th>
<th>Category</th>
<th>Risk</th>
<th>Probability</th>
<th>Impact</th>
<th>Mitigation</th>
<th>Responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Scope</td>
<td>Business case is not convincing enough for SVB, EB, or VIP customers</td>
<td></td>
<td></td>
<td></td>
<td>Michael</td>
</tr>
<tr>
<td>1.2</td>
<td>Scope</td>
<td>Supporting team for ERP Mockup does not deliver in time</td>
<td></td>
<td></td>
<td></td>
<td>Bernhard</td>
</tr>
<tr>
<td>2.1</td>
<td>Staff</td>
<td>Long-time sick leave of one or more developers would lead to a delay</td>
<td></td>
<td></td>
<td></td>
<td>Michael</td>
</tr>
</tbody>
</table>
Project Lifecycle for Risk Management

1. Initiating
   - Plan risk management
   - Identify risks
   - Conduct qualitative risk analysis
2. Planning
   - Conduct quantitative risk analysis
   - Plan risk responses
3. Executing
   - Implement risk responses
4. Monitoring & Controlling
   - Monitor risks
5. Closing
   - Identify and resolve remaining issues

Prioritize individual risks for further analysis and responses by estimate probability and impact.

This is a very subjective process. Be aware of preoccupation.
Probability and Impact - Risk Matrix

<table>
<thead>
<tr>
<th>ID</th>
<th>Category</th>
<th>Risk</th>
<th>Probability</th>
<th>Impact</th>
<th>Mitigation</th>
<th>Responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Scope</td>
<td>Business case is not convincing enough for SVB, EB, or VIP customers</td>
<td>Medium</td>
<td>High</td>
<td></td>
<td>Michael</td>
</tr>
<tr>
<td>1.2</td>
<td>Scope</td>
<td>Supporting team for ERP Mockup does not deliver in time</td>
<td>Medium</td>
<td>Medium</td>
<td></td>
<td>Bernhard</td>
</tr>
<tr>
<td>2.1</td>
<td>Staff</td>
<td>Long-time sick leave of one or more developers would lead to a delay</td>
<td>Low</td>
<td>High</td>
<td></td>
<td>Michael</td>
</tr>
</tbody>
</table>

Probability and impact will change during project progression.
1. Initiating
   1. Plan risk management
   2. Identify risks
   3. Conduct qualitative risk analysis
   4. Conduct quantitative risk analysis
   5. Plan risk responses

2. Planning
   1. Plan risk management
   2. Identify risks
   3. Conduct qualitative risk analysis
   4. Conduct quantitative risk analysis
   5. Plan risk responses

4. Monitoring & Controlling
   1. Plan risk management
   2. Identify risks
   3. Conduct qualitative risk analysis
   4. Conduct quantitative risk analysis
   5. Plan risk responses
   6. Monitor risks

Numerical analysis of individual risks and combined impact for overall project risk
- **Optional process** only required for very large projects or if explicitly requested
- Requires high-quality data for risks but also project management
- High effort that needs to be included in cost and schedule planning
- Possible methods: Simulation, sensitivity analysis, decision tree analysis
1. Initiating
   1. Plan risk management
   2. Identify risks
   3. Conduct qualitative risk analysis
   4. Conduct quantitative risk analysis
   5. Plan risk responses

2. Planning
   1. Plan risk management
   2. Identify risks
   3. Conduct qualitative risk analysis
   4. Conduct quantitative risk analysis
   5. Plan risk responses

3. Executing
   1. Plan risk management
   2. Identify risks
   3. Conduct qualitative risk analysis
   4. Conduct quantitative risk analysis
   5. Plan risk responses
   6. Implement risk responses

5. Closing

Develop options, methods, and strategies to handle individual project risks:
- Risk responses should be relevant for the risk, affordable, realistic, accepted by stakeholders, and owned by a responsible person
- Have alternatives if an option is not effective
- New (secondary) risks can arise
- Will influence the project management plan
Risk Response Strategies

**Threats**
- Escalate: Resolve outside project
- Prevent: Neutralize threat
- Transfer: Third-party responsibility
- Lower: Minimize probability or impact
- Accept: Do nothing

**Chances**
- Escalate: Resolve outside project
- Use: Improve your project
- Share: Third-party responsibility
- Increase: Maximize probability or impact
- Accept: Do nothing

<table>
<thead>
<tr>
<th>ID</th>
<th>Category</th>
<th>Risk</th>
<th>Probability</th>
<th>Impact</th>
<th>Mitigation</th>
<th>Responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Scope</td>
<td>Business case is not convincing enough for SVB, EB, or VIP customers</td>
<td>Medium</td>
<td>High</td>
<td>Find another business developer and create a new story (reuse existing technology pieces)</td>
<td>Michael</td>
</tr>
</tbody>
</table>
| 1.2| Scope    | Supporting team for ERP Mockup does not deliver in time | Medium     | Medium  | a) Remove part from showcase  
b) Build new PowerPoint Mockup if time allows | Bernhard    |
| 2.2| Staff    | Long-time sick leave of one or more developers would lead to a delay | Low        | High    | a) Overstaffing would come also with more overhead  
b) Escalate, find replacement and onboard ASAP. | Michael     |
Project Lifecycle for Risk Management

1. Initiating
   1. Plan risk management
   2. Identify risks
   3. Conduct qualitative risk analysis
   4. Conduct quantitative risk analysis
   5. Plan risk responses

2. Planning
   1. Plan risk management
   2. Identify risks
   3. Conduct qualitative risk analysis
   4. Conduct quantitative risk analysis
   5. Plan risk responses

3. Executing
   6. Implement risk responses

4. Monitoring & Controlling
   7. Monitor risks

Realize agreed risk responses in order to minimize threats and maximize chances.

Make the risk level visible to project team and stakeholders by tracing risks, monitoring risk responses, analyzing new risks, and evaluating the overall risk management process.

These steps are often “forgotten” in projects!
Knowledge Area
Procurement Management

Image by Andreas from flickr: https://flickr.com/photos/photography-andreas/6275352289/ (CC BY-NC 2.0)
Agenda

Introduction to Project Management
1. Integration Management
2. Scope Management
3. Schedule Management
4. Cost Management
5. Quality Management
6. Resource Management
7. Communications Management
8. Risk Management
9. Procurement Management: Procurement of external resources, results, or services
10. Stakeholder Management
Why Should It Be Difficult to Buy Something?

"Click buy" and done?

- What happens if it is not delivered in time?
- What if it doesn’t work as expected?
- What if the power is not strong enough?
- Who will install it for us?
- Will it work together with the rest of our hardware?
- Does the price work within our budget?
- Will it work 24/7?
- Am I allowed to buy this?
- Do we have the time to evaluate alternatives?
- ...
Principles of Procurement Management

Procurement of external resources, results, or services
- Creation and management of contracts, letters of intent, or service level agreements etc.
- Be aware of legal constraints (e.g. compliance rules, non-disclosure agreements, local laws, publicly-funded projects)

Vendee and supplier relationship from simple ordering to complex contracts
- Clear description of deliveries, conditions, and results
- Everything that is not stated in a contract cannot be expected

If possible, involve company’s procurement and legal unit
- Approval process, e.g., who is allowed to sign which contract?
- Management of contract lifecycles
- Procure from an internal company unit
1. Initiating

Procurement decision, determine solution approach, and identify potential suppliers. If so,
• What, how, and when to purchase/deliver?
• Internal vs. purchase order

2. Planning

1. Plan procurement management

3. Executing

2. Conduct procurements

4. Monitoring & Controlling

3. Control procurement

Obtain supplier offerings, choose supplier, negotiate contract, and place an order

Manage supplier relationship, monitor fulfillment of contract, change requests, and termination of contract:
- Communicate with supplier
- Know the legal-side of the contract
- Keep compliance in mind
- Payments
- Clarify claims
- Inspection and audits of supplier
- Documentation is important!
How to Procure Something?
Typical Process Steps

Be aware:

- Specifications need to be more formal than user stories, complete and precise, difficult to change later due to contracts
- Organizations often define this process and guide the project (Pre-selected suppliers, formal regulations, different form of contracts (fixed price, reimbursement of expenses, time- or material-based))

Make-or-buy analysis

Draft requirements specifications

Estimate cost and check budget

Identify potential suppliers (Market research)

Publish invitation to bid or request for information / quotation

Evaluate submissions of candidates incl. quality, costs, and compliance

Revise project management plan (esp. schedule and structure)

Finalize evaluation, chose one offer, and start negotiation

Sign contract between vendee and supplier

We started “here” and negotiations were one-way due to time constraints

For the showcase, we had to accept the existing supplier
A bullet-proof contract is the foundation to take legal actions:

- Requirements specification and important deliveries
- Schedule and milestones
- Pricing and terms of payment
- Performance report
- Non-disclosure agreements and Intellectual Property (IP) regulations
- Inspection, quality and acceptance criteria
- Warranty and future product support
- Bonus-malus regulation
- Assurances and guaranties
- Permissions for subcontractors
- General business terms
- Change management
- Termination clause

Selected Contract Items
Knowledge Area
Stakeholder Management

Image by BRICK 101 from flickr: https://flickr.com/photos/fallentomato/15243811625/ (CC BY-NC 2.0)
Introduction to Project Management
1. Integration Management
2. Scope Management
3. Schedule Management
4. Cost Management
5. Quality Management
6. Resource Management
7. Communications Management
8. Risk Management
9. Procurement Management
10. Stakeholder Management: Involvement of all stakeholders
A stakeholder is a single person, group, or organization, who influence a project (also negative), profit from its results, or want to somehow involved with it.

**Internal stakeholders, e.g.:**
- Sponsor
- Program manager
- Project team members

**External stakeholders, e.g.:**
- Customer
- End users
- Government
- Competitors
- Shareholders
Principles of Stakeholder Management

Involvement of all stakeholders
Determine all persons, groups, or organizations that can influence the project or are involved with it (positively as well as negatively).
- Analyze stakeholders’ expectations
- Prioritize stakeholders as not each one is equally important
- Integration of stakeholders into decisions and their execution

Stakeholders can make a project successful or fail
- Stakeholder satisfaction should be part of project goals
- Continuously understand expectations, problems, conflicting interests, and engage them
- Stakeholders are coming and going
- *Agile projects live on continuous transparency and joint work with their stakeholders*
Project Lifecycle for Stakeholder Management

1. Initiating
   - 1. Identify stakeholders

2. Planning
   - 2. Plan stakeholder engagement

3. Executing
   - 3. Manage stakeholder engagement

4. Monitoring & Controlling
   - 4. Monitor stakeholder engagement

(Regular) analysis of relevant stakeholder information:
- Interest on project
- Engagement
- Dependencies
- Impact on project success/fail

1. Initiating

January 31, 2022
Scalable Software Engineering — WS 2021/22
# Stakeholder Register

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Project Role</th>
<th>Requirements</th>
<th>Expectations</th>
<th>Power</th>
<th>Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Michael (Strategic Projects Manager, internal)</td>
<td>Project lead</td>
<td>Handle this project on top of keynote preparation</td>
<td>Satisfy our executives and customers</td>
<td>Everything that is necessary to make this project successful</td>
<td>Satisfy our executives and deliver a great showcase</td>
</tr>
<tr>
<td>Supervisory Board (Chairman, internal)</td>
<td>Project sponsor</td>
<td>“Create a compelling showcase presenting Machine Learning at SAP”</td>
<td>High quality showcase with a strong business case/story</td>
<td>Highest committee at SAP</td>
<td>Convince customers and make more deals with this proof point</td>
</tr>
<tr>
<td>Showcase Guest (VIP, external)</td>
<td>Visitor</td>
<td>Content should keep him 5 min engaged</td>
<td>Should be convinced on SAP AI expertise</td>
<td>Public visibility and/or influence on deal decision</td>
<td>Entertainment but also making the connect to business</td>
</tr>
</tbody>
</table>

**More attributes:**
- Identification: **Name**, **Position**, Contact Information, **Project role/task**
- Assessment: **Requirements**, **Expectations**, Influence, Contributions, Knowledge
- Classification: **Internal/External**, **Power**, **Interest,**...
Stakeholder Analysis
Power-Interest Matrix

Keep satisfied

Executive Board
Engage closely and influence actively
Project Lead

Monitor (Minimum effort)
L1 Manager

Keep informed
Project Team Member

VIP Guest / Account Executive
Project Lifecycle for Stakeholder Management

1. Initiating
2. Planning
3. Executing
4. Monitoring & Controlling
5. Closing

1. Identify stakeholders
2. Plan stakeholder engagement
3. Manage stakeholder engagement
4. Monitor stakeholder engagement
5. Close stakeholder engagement

Plan the engagement with your stakeholders and keep in mind not each and every stakeholder is equally important or needs to know everything about the project (Confidential, aggregated, or irrelevant information)
### Stakeholder Engagement Matrix

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Power/Interest</th>
<th>Unaware</th>
<th>Resistant</th>
<th>Neutral</th>
<th>Supportive</th>
<th>Leading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Lead</td>
<td>high / high</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C D</td>
</tr>
<tr>
<td>Supervisory Board</td>
<td>high / low</td>
<td>C</td>
<td></td>
<td></td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>Executive Board</td>
<td>high / medium</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C D</td>
</tr>
<tr>
<td>L1 Manager</td>
<td>medium / medium</td>
<td></td>
<td></td>
<td></td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>VIP Guest / Account Executive</td>
<td>low / low</td>
<td>C</td>
<td></td>
<td></td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>Project Team Member</td>
<td>low / high</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C D</td>
</tr>
</tbody>
</table>

- **C – Current**
- **D – Desired**

The gap describes the need for improving stakeholder engagement:

- **Everything is fine**
- **Hard to get time with them**
- **Just another project on top**
- **Can be fixed later**
- **Convince them for the project**
Project Lifecycle for Stakeholder Management

1. Initiating
   1. Identify stakeholders

2. Planning
   2. Plan stakeholder engagement

3. Executing
   3. Manage stakeholder engagement

4. Monitoring & Controlling
   4. Monitor stakeholder engagement

Communicate with stakeholders and work together in order to continuously understand expectations, problems, and (conflicting) interests:
- Increase support
- Decrease resistant
- Resolve challenges

Useful PM skills:
- Conflict management
- Cultural insights
- High emotional intelligence
- Negotiating and communication skills
- Political Understanding
Project Lifecycle for Stakeholder Management

1. Initiating
   - 1. Identify stakeholders

2. Planning
   - 2. Plan stakeholder engagement

3. Executing
   - 3. Manage stakeholder engagement

4. Monitoring & Controlling
   - 4. Monitor stakeholder engagement

5. Closing

Reflect on effectivity and efficiency of project’s stakeholder engagement.
- What changed in the project or with stakeholders’ interest?
- Is each engagement still necessary or do we need other forms?
- Are there external events that will influence the engagement, e.g., remote work due to Covid-19?
Stakeholder Management Plan

Based on stakeholder register and communication plan plus the following columns:

- Best way to manage
- Action Items

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Project Role</th>
<th>...</th>
<th>Best Way to Manage</th>
<th>Action Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Michael (Strategic Projects Manager,</td>
<td>Project lead</td>
<td></td>
<td>Slack for short requests</td>
<td>▪ Setup weekly workstream reporting</td>
</tr>
<tr>
<td>internal)</td>
<td></td>
<td></td>
<td>Mail for official communication</td>
<td>▪ Grant access to Github</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Phone if it is really urgent</td>
<td></td>
</tr>
<tr>
<td>Supervisory Board (Chairman, internal)</td>
<td>Project sponsor</td>
<td></td>
<td>Top-down communication</td>
<td>▪ Build a one slide pitch deck</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Expect short-notice inquiries</td>
<td>▪ Define blockers and risks</td>
</tr>
<tr>
<td>Showcase Guest (VIP, external)</td>
<td>Visitor</td>
<td></td>
<td>Via account executive (AE)</td>
<td>▪ Present showcase to AE and plan time during VIP tour at Sapphire</td>
</tr>
</tbody>
</table>
Project Management
Personal Recommendations and Conclusion

Image by Trev Grant from flickr: https://flickr.com/photos/trevgrant/14405948082/ (CC BY-NC 2.0)
Transparent projects overview

Per project
Start: End:
Project Lead:
Contributors:
Mission:
Status:
Ticket:
Task:
Resources:
Contacts:
Result:

Scrum and Agile Development

Kick-offs

Checklists

Setup biweekly sync meeting with key contributors & stakeholders 2
Create dedicated Dls (core team, demo support, …) 1
Identify and list core contacts
e.g. event, stage, and customer lead; don't rely on wannabe experts, directly contact the responsible persons and make them aware, always define a main person from the keynote team who stays in contact 3
Track all contributors
Note down name and email (optional: direct manager) + short description of the contribution for every contributor. Doing this later on increases the chances of missing someone. 1
Involve SAP colleague as early as possible
Especially take care of non-PST located colleagues and find main contact 2
Keep the file management infrastructure clean and lean
Try to separate large files (e.g. videos) from the main content, make contribution for external team members as easy as possible, but insist on using ONE file sharing approach 3
Define an overall standard for file naming
Ideally start with <year><month><day>/<…> 3

Lack of (test) internet connection? If that happens, try to organize a calm sprint. Even if possible, be prepared to exchange things by USB sticks etc.
Reading Tips

- Radical Candor
  - Will help you inspire teams to do the best work of their lives
  - Sheryl Sandberg
  - Kim Scott

- The First 90 Days
  - Proven strategies for getting up to speed faster and smarter
  - Michael D. Watkins
Personal Recommendations

■ **Structure your working day**
  □ Meetings just 25/50 minutes
  □ Ensure breaks
  □ Use meeting requests
  □ Block working and private time

■ **Centralize document storage** (incl. collaborative editing)

■ **Prioritize your communication channels**
  □ Mail (can wait), VIP Mail, Discord/Slack (short requests), Meetings, mobile (decide who has this number, don't be pushy), short messages (outside working hours or important notes during meetings)
  □ Turn on video
  □ Limit notifications (each one is an interruption)!
Personal Recommendations

- Take care of your physical health
- Take care of your mental health
  - Virtual coffees and off-work events with colleagues
  - Keep a good routine going
- How to lead a remote team
  - 1:1s are the most important management method
  - Check in with your team regularly
  - Don’t be afraid to overcommunicate
  - Request (more often) feedback
    (about employees, yourself, team and company)!
  - Keep having fun, learn serious small talk and active listening
Recommendations for Remote Work

- **Provide the right hardware**
  - Paperless office
  - Ergonomic desk, monitors, keyboards, wireless earphones
  - Where to keep your backup disk?
  - Always have a good internet connection (upload is the key!)
  - Don't forget remote work security (stable VPN)
Lessons Learned: “Structured Agility”