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FACHHOCHSCHULE KÄRNTEN

PROJECT MANAGEMENT (ILV)

COST PLANNING, RISK MANAGEMENT

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Review Questions

- What does a work breakdown structure represent?
- In what basic ways can you design a PSP?
- What differentiates a project phase?
- How can project phases be linked in time?
- How is a work package differentiated?

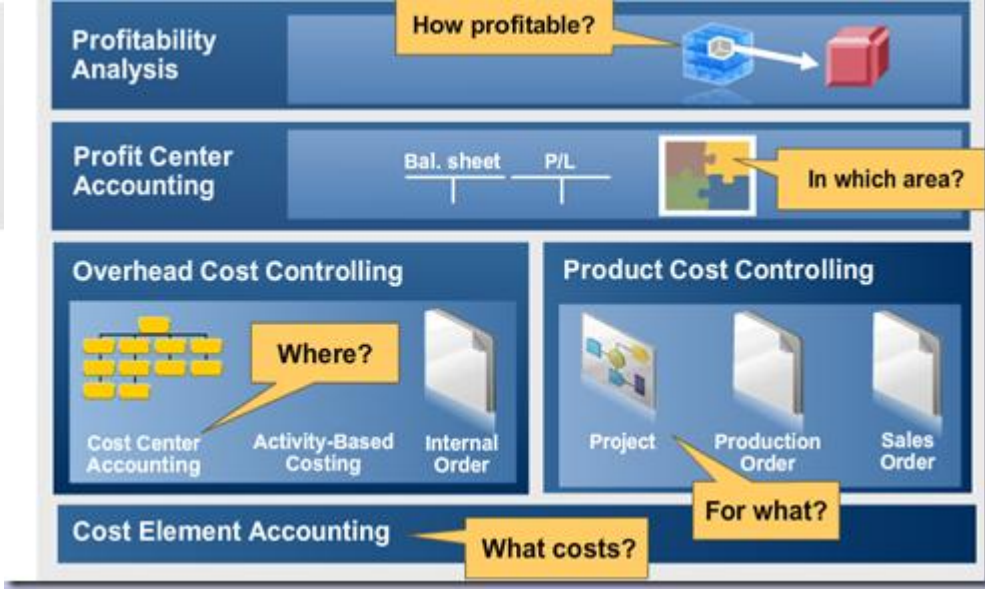
- What elements does the flowchart/bar chart contain and how is it structured?
- What types of dependencies can exist between 2 APs in the process planning?
- What is the critical path?
- A work package in the critical path shifts:
  - What is the consequence? What does the PM do?

- What does a good milestone definition include?
- What is the purpose of a milestone trend analysis?

- Difference between strategic vs. operational project controlling?
- What types of controlling can occur in a larger project?

- What is a project risk?
- What are the main risk criteria to be assessed?
- What is an FMEA and how does it work in PM?

Cost planning...
Cost accounting



Two-stage cost accounting

Costs are first allocated in regard to

- Cost Type then

then allocated to

- Cost Center and
- Cost Objects

Cost types are categories used to structure and transparently present a company's total costs
e.g., materials, personnel, etc.

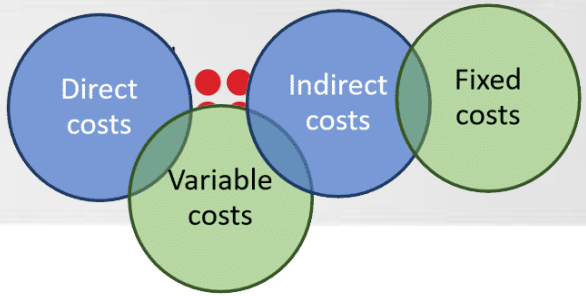
Cost centers are operational units/areas where costs are incurred
e.g., production, sales, etc.

Cost objects/units are the items to which the incurred costs are allocated
e.g., products, services, orders, projects, etc.

Overhead costs are costs that cannot be individually recorded or allocated (indirect costs)
e.g. electricity, insurance, ...

Overhead surcharges/rate are added onto direct costs (as a percentage or in absolute terms)

Cost planning...
Cost accounting / types



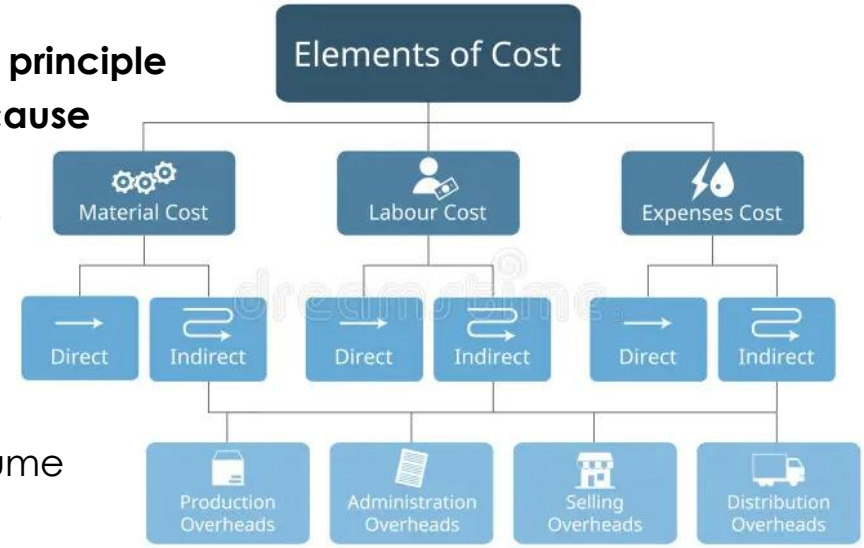
Cost types can be categorized according to various principles:

Cost types according to **production factors**

Material costs	Material, ext. / int. services, travel expenses,...
Labor costs	Wages/salaries, social costs, training,...
Operating costs	Machine wear and tear, building wear and tear, maintenance costs, maintenance contracts, energy costs, rent, office materials, ...
Capital costs	Interest on loans, taxes, fees, insurance,...

Cost types according to the **cost-by-cause/allocation principle**

- **Indirect costs: cannot be allocated according to cause**
  e.g. electricity, telephone,...
- **Direct costs: can be allocated according to cause**
  e.g. wages, material, ...



www.dreamstime.com

Cost types depending on the **reference value**

- **Fixed costs**
  expenses regardless of the level of production volume
  e.g. rent, wages, energy costs, internet, ...
- **Variable** costs
  expenses that directly related with production volume / services

CAVE: Fixed costs ≠ Indirect costs

- Fixed costs are always part of Indirect costs
- Variable costs can be direct or indirect costs

Cost planning...
Personnel costs

Personnel costs (PC) are divided into:

- Direct PC
  - Gross salary (including income tax)
  - Add. personnel costs
- Indirect PC / Non-wage / Non-salary labor costs

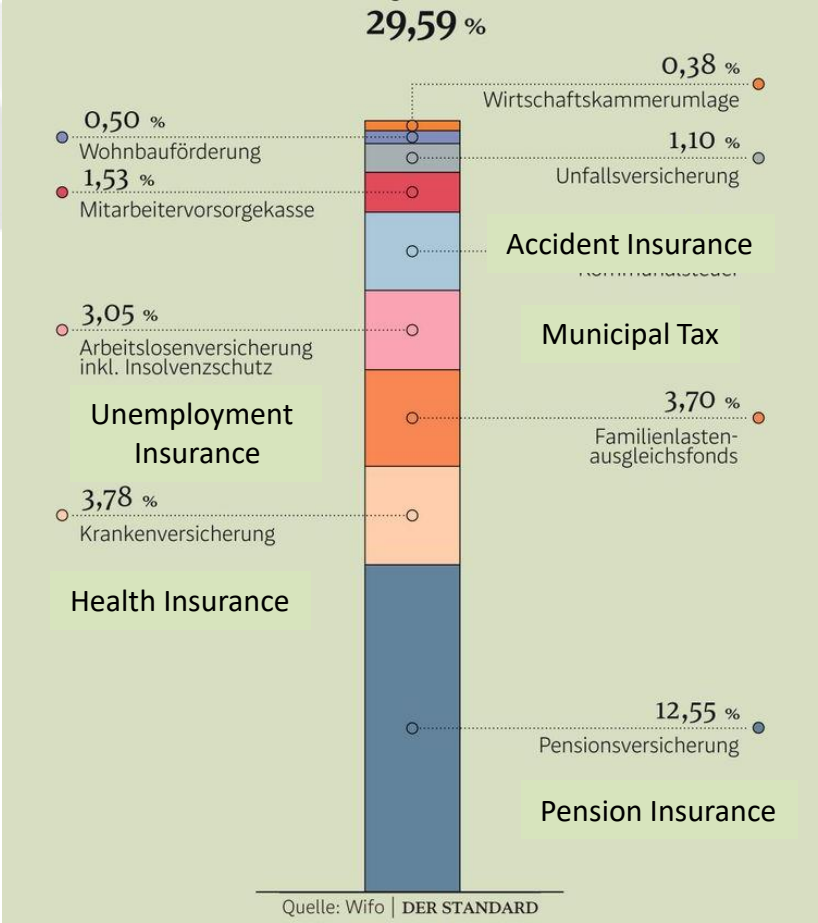
Non-wage/Non-salary labor costs (statutory)

- Social security ~22%
  Accident-, Health-, Pension-, Unemployment-Insurance
- Municipal tax ~3.0%
- ...

→ **Employer payed contributions ~30%**
on top of gross-salary

Additional Personnel Overhead Costs …

- Overtime Pay
- Sickness & Vacation
- Special allowances (incentives, hazards,, ...)
- Training & Qualification costs
- Travel expenses
- Recruitment costs
- Work Place costs (PC, Desk,…)



Hourly rate / Full cost calculation

+Gross salary / month
+non-wage/ non-salary labor costs
+Add. Personnel Overhead Costs
+Profit

Total costs / Productive hours per month

Working days per year	hours per year	hours per month	Productive hours
~225	~1800	~150	100..140 /month 1200..1680/year

Cost planning

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What are the objectives of cost planning?

- Planning / breakdown of all project-specific costs → Cost transparency and awareness
- Recognizing potential (personnel) bottlenecks → Risk management
- Identification of (critical) cost drivers → Risk management, cost optimization
- Evaluation of the economic viability of the project
- Basis for periodic project controlling

COST PLANNING PROCESS

1.Determination of full personnel cost rates → **Hourly rates** incl. overhead rate for each team role

2.Planning **costs at WP level**

a) Subdivision into prod. related cost types → **Material costs, ext. costs...**

b) Determination of personnel cost details → **Hours per WP → Personnel costs**

3. Determination of project phase costs and total project costs

4. Comparison with available budgets

5. Liquidity & Resource Allocation planning

Cost planning...
... Project cost plan

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COST MANAGEMENT PLAN / Project Budget Plan

- Overview of cost types per WP
- Total costs at project phase and work package level

Project ID	Project Stages	Avg Material Cost	Avg Required Quantity	Average Labour Cost	Average Labour Hrs	Per Unit Utility Cost	Total Cost Per Unit
1.1	Stage 1.1	$ 40.00	3	$ 5.00	1.4	$ 3.00	
1.2	Stage 1.2	$ 55.00	4	$ 6.00	1.2	$ 4.00	
1.3	Stage 1.3	$40.00	3	$ 8.00	1.5	$ 6.00	
	Stage #1 Total	**$ 135.00**	**10**	**$ 19.00**	**4.1**	**$13.00**	**$ 460.00**
2.1	Stage 2.1	$ 50.00	6	$ 7.00	2	$ 9.00	$400.00
2.2	Stage 2.2	$ 70.00	8	$10.00	2.8	$ 5.00	$800.00
	Stage #2 Total	**$120.00**	**14**	**$ 17.00**	**4.8**	**$ 14.00**	**$ 1200.00**
	Total	**$255.00**	**24**	**$ 36.00**	**8.9**	**$ 27.00**	**$ 1660.00**

This slide covers the cost estimates split across different sections which would be involved while bringing the project in to action. You can modify these sections and estimates as per the requirements

Cost planning...
...personnel cost detail plan

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RESOURCE MANAGEMENT PLAN / Resource Allocation Plan

- Personnel deployment per WP and reporting period

Resource Assignments	3/22/2015	3/29/2015	4/5/2015	4/12/2015	4/19/2015
Sara Davis	**0h**	**0h**	**0h**	**0h**	**0h**
Intranet Rollout	0h	0h	0h	0h	0h
ERM Software Implementation	0h	0h	0h	0h	0h
Susan Miller	**0h**	**24h**	**40h**	**40h**	**40h**
ERM Software Implementation	0h	0h	0h	0h	0h
Operating System Upgrade	0h	24h	40h	40h	40h
Tim Glory	**0h**	**24h**	**40h**	**40h**	**40h**
Intranet Rollout	0h	0h	0h	0h	0h
IT Vendor System Rollout	0h	24h	40h	40h	40h
Adam Barr	**0h**	**80h**	**80h**	**80h**	**0h**
Data Parsing Tool	0h	80h	80h	80h	0h
Amy Strande	**0h**	**0h**	**0h**	**40h**	**40h**
Data Parsing Tool	0h	0h	0h	40h	40h
July Tenner	**0h**	**0h**	**0h**	**0h**	**0h**
Operating System Upgrade	0h	0h	0h	0h	0h
Adam Street	**0h**	**24h**	**40h**	**40h**	**16h**

Project functions diagram

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ROLES & RESPONSIBILITIES MATRIX (RRM)

→ Instrument for planning / controlling the distribution of tasks

- Quick overview of responsible persons
- Starting point: WBS, PEA and P-organization
- Basis for target agreements
- Instrument for conflict management

Better: Name and role instead of just PTM xx

	Responsible Party					
Activity	Project Manager	Database Analyst	Accounting Supervisor	CFO	Lead Systems Analyst	Inventory Control Supervisor
Task 1	R	I	A	A	C	C
Task 2	A	C	C	R	C	C
Task 3	R	C	C	A	I	C
Task 4	R	C	C	C	R	I
Task 5	C	R	I	C	I	I

Legend: R = Responsible
A – Approval
C – Consult or review
I = Inform or act as SME

Only ONE person is responsible for the D(execution) per WP

I (Information) only if necessary!

Task...
Project Controlling

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According to the project plan, you should only have spent € 60,000 by key date X. However, you discover that € 70,000 has already been spent.

1) **What can you conclude from this?**
2) **What next steps / measures should you take?**

The reporting date analysis only indicates that the actual costs are higher than planned.

- It says nothing about the progress of the project
- It says nothing about cash flow

→ Check performance progress

→ if this is above plan, there is no need for control....

→ Check liquidity planning

→ Planned advance payments may have been made

How much does an employee cost you per month with a gross wage of €100/hour and a GKZ=50% (before tax, without 13th/14th salary)?

40 hrs / week * 52 weeks = 2080 hrs → 2080 hrs/12 months=173 hrs/month to be paid
(100€ +30%LNK+50%GKZ)*173 hours/month → 195EUR*173hours=33.735€

You want to schedule this employee for a project. Calculate the project-related hourly personnel rate at 10% profit and a productive workload of 130 hours/month.

(33,735€ + 10% profit) / 130 hours = 285.5€

Working days per year	hours per year	hours per month	Productive hours
~225	~1800	~150	100..140 /month 1200..1680/year

Task...
Project Controlling

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As a PM, you notice that the project is at risk : 30% of the work is still to be completed, only 10% of the originally planned time is still available.

What measures could you as a PM take in this situation to complete the project without extending it and what negative consequences could each of these measures have?

1. More resources:
   a) Reduction of the remaining lead time due to overtime/extra hours (more personnel)
      NT: Increase in project costs, drop in quality due to overuse of employees, ...
   b) External assistance (outsourcing, temporary workers,...)
      NT: Increase in project costs, risk of getting more problems than help in the short term due to uneducated / unknown workers,...
2. Reduction in the scope of services:
   a) Restriction of the project objective or project quality
      NT: Customer dissatisfaction, subsequent financial losses, ...
   b) Reduction of administrative effort (risk prevention, documentation, etc.)
      NT: Achievement of the project objective may be jeopardized,
      lack of documentation only reduces effort in the short term,...

... Don't forget: it's time for communication with all share-& stakeholders !

Task...
Cost planning and controlling

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Cost controlling task: 10 days were planned for a telephone survey of 500 customers at an hourly rate of €25 per hour. (incl. LNK & GKZ). Mr. K. is to handle the telephone calls (MO-FR, 8 h/d).
After 5 days (status date), Mr. K. has worked 10 hours of overtime and conducted 400 interviews.

What are the planned costs on the status date?
5 d x 8 h x 25 € = 1000 €

What are the actual costs on the status date? What is the cost overrun percentage?
(5 d x 8 h +10 h) x 25 € = 1,250 € → +250 € / 25% cost overrun

What is the current degree of completion of the operation? How far behind / ahead of schedule is it?
400 calls / 500 calls = 80% (plan at status date =50%) → +30% degree of completion

How high should the costs be for the realized output? How much was saved?
80% * (10 d x 8 h x 25 €) = 1,600 € → 350 € savings realized

When is the process expected to be completed? (Assumption lin. progress, 10 h/d)
80% in 50 h → 100% in 62.5 h → on Tuesday morning → > 3 d time saving →Project Plan Adpation?

How high are the total costs likely to be? How high are the total savings?
62.5 h * 25 € = 1,562 € → 438 € / 22% savings Costs realized

What is incorrect / unrealistic about the above example?
...overtime allowance not taken into account

Task...
Cost planning personnel costs

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(Project-related) overhead rate calculation (GKZ)

Two groups are working on an R&D project:

- Gr. 1: 5 employees full-time with €100/h wage costs each (incl. LNK): 200h total planned
- Gr. 2: 2 employees 50% part-time with 70€/h wage costs each (incl. LNK): 40h total planned

Gr. 1 & 2 occupy a lab for 1 week with the following overheads: rent + electricity + internet = 1150€

What can an overhead surcharge model look like?

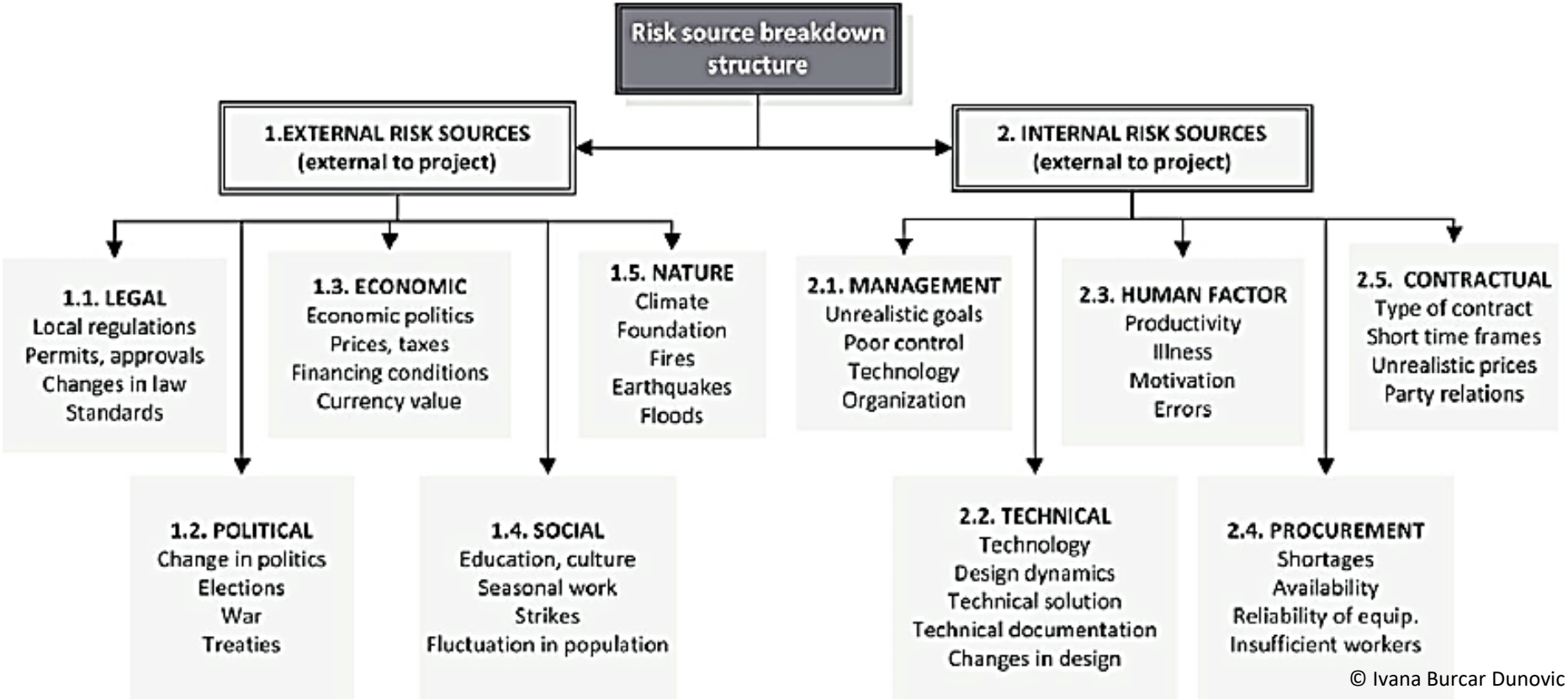
Var. 1: proportional to the **total working hours** → GKZ: 1150€ / (200h + 40h) = 4,8€/h
Var. 2: proportional to the **number of persons** → GKZ: 1150€ / (5MA + 2MA) = 164€/MA
Var. 3: proportional to the **total personnel costs** → GKZ: 1150€ / (200h * 100€ + 40h * 70€) = 5.0%

What percentage of overhead rate per P-hour do P-workers have in variants 1 & 2?

Var 1.) Gr. 1: 100€ + 4,8€ = 104,8 € 4,8% GKZ
Size 2: 70€ + 4,8€ = 74,8€ 6,8% GKZ
Var 2.) Gr. 1: (100€ *200h +164€ * 5) / 200h = 104,1€ 4,1% GKZ
Gr. 2: (70€ * 40h + 164€ * 2) / 40h = 78,2€ 11,1% GKZ
Var 3.) Gr. 1 and Gr. 2 each have 5.0% GKZ

Which system is best?

Risk management
...sources of risk

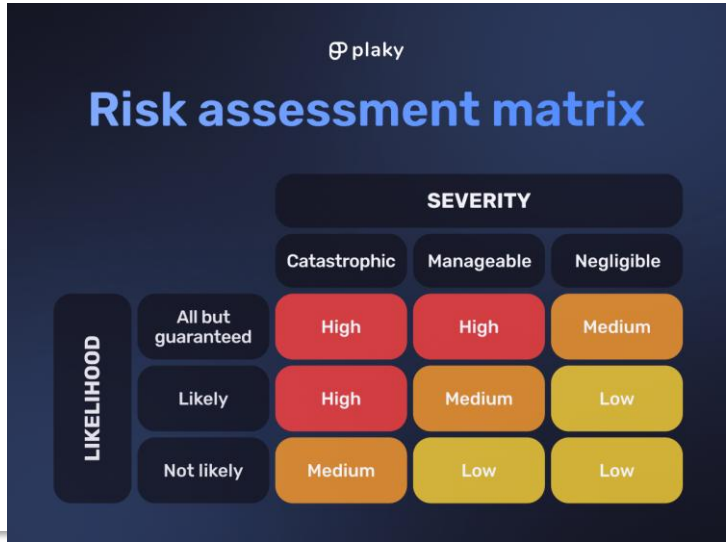


Risk management ...risk assessment

RISK MAP	LIKELIHOOD	IMPACT	RISK RATING	RESPONSE (ACTION)
Absence of warning signs on the heavy machinery can cause severe accidents	3	4	12	Warnings signs must be placed and explained to the employees.
Water leakage can cause injuries due to falls (bruises, broken limbs)	1	3	3	Equip employees with slip-resistant boots and place "Wet floor" warning signs.
Noise level coming from the quipment is above acceptable criteria and can cause hearing loss and stress	2	4	8	CE markings must be requested for equipment. Noise level must be checked. The level must not be higher than 85 dBA.
Non-qualified machinery operators with insufficient experience can cause injuries and fatalities	2	5	10	Qualifications of the operators must be checked.
Electrical leakage can cause severe accidents and fatalities	5	5	25	Wiring of equipment must be inspects before each use. Damaged or frayed electrical cords must be replaced immediately. Enforce safe work practices every time electrical equipment is used.

RISK MANAGEMENT PROCESS

1. **IDENTIFY** risks using…
    1. Checklists
    2. Brainstorming methods
    3. Structured surveys (e.g. of experts,...)
    4. Evaluations of completed projects
2. **QUALIFY & QUANTIFY** identified risks on **Likelihood & Impact**
   → classification into risk classes, Risk Map, Delphi method, ...
3. **COUNTERACT** risks by defining measures:
    - **Avoid risks** → Exclude **risks** through planning
    - **Reduce risks** → Reduce probability of occurrence/damage
    - **Shifting risks** → Transfer, insure
    - **Bear risks** → Regular reassessment, residual risk
4. **CONTROL** risks by periodic controlling
   (and communication)



Task Project Risk

You are the project manager of the "New waste incineration plant" project - unfortunately this is located within sight of a village. Your stakeholder analysis has identified the following interest groups, among others: (a) local residents in the village (b) environmentalists

You are now working on the risk analysis in the initial phase of the project.
Find 2 risks per interest group / 2 construction risks / 2 commercial risks / 2 general risks. Define a measure for each.

Residents (a):

- Construction delay due to manipulation □Sicherheitsdienst
- Construction delay due to residents' protests □Projekt-Marketing

Environmentalists (b):

- Influence on politics / building permit (construction stop, delay,...) → Project marketing
- Enforcing higher standards (additional costs) → Reserve budget

Commercial:

- Insolvency of a construction company / service provider → Insurance
- Structural damage in the surrounding area (roads, houses,...) → Contractually passing on to partner companies

In general:

- Refusal of acceptance by the competent authority → Reserve in AP "Acceptance"
- Weather-related construction delays → Insurance

V-model (VDI 2206)
...waterfall software development model

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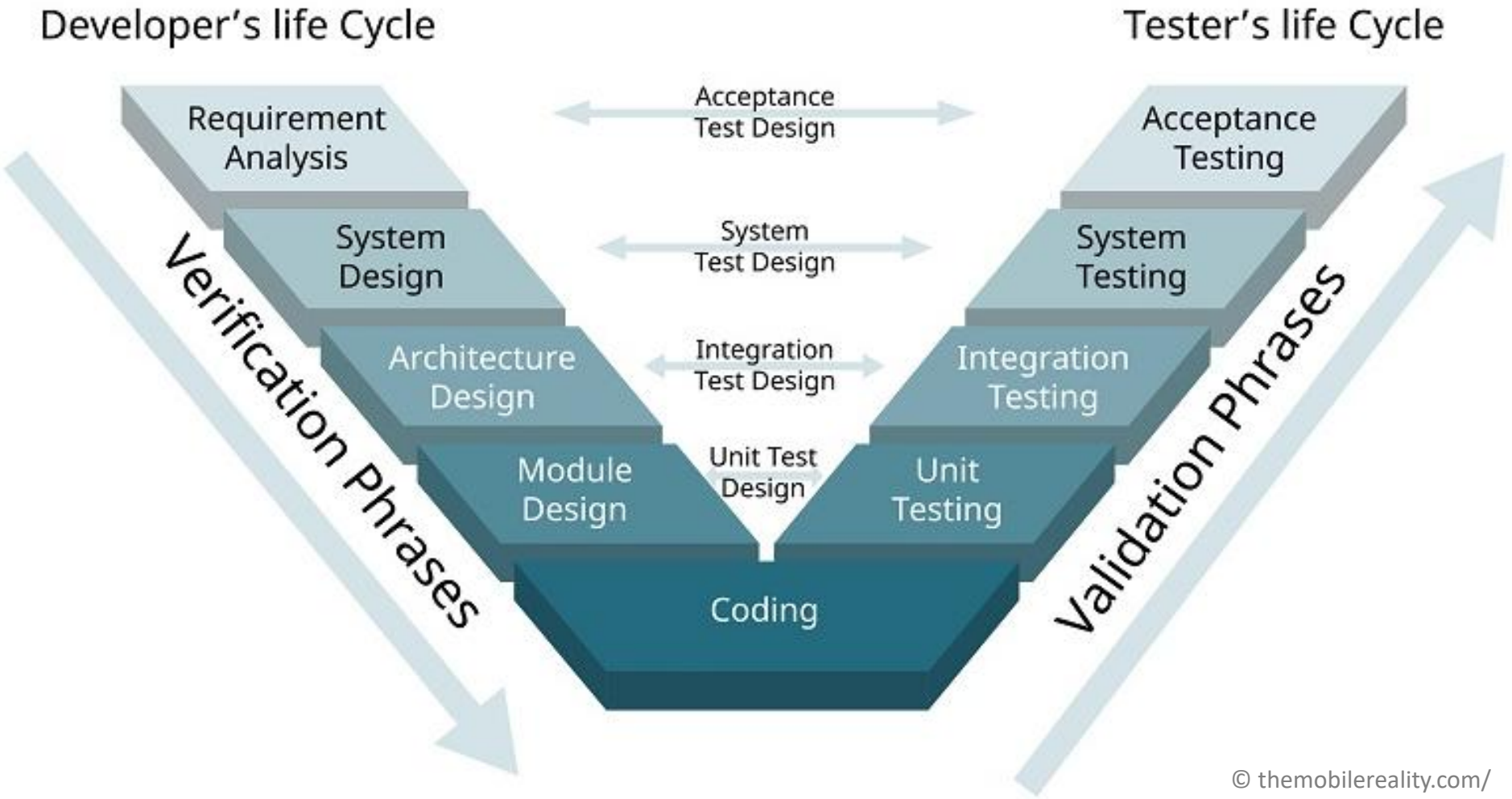

Thank you for your attention...

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