Risk definition from PRINCE2

'The chance of exposure to the adverse consequences of future events.'

External risks include:

Government intervention

Cuts in resources, including staff

Reduction in financial support

Increased competition from rivals

Social developments

Identifying risks

Analyse what you already know - views, trends or constraints

Use prompts and checklists from aids to build initial list of risks. (Check textbooks, Application development documents, company standards, Google)

Review Barry Boehm's Top Ten Risks

Methods of gathering risk info

- Interviewing experts or stakeholders

- Brainstorming workshops w/stakeholders

- Searching past project documentation

Law of diminishing returns, do not assume that all generic risks will be relevant

Dismiss risks not project specific

Recognise root cause of the problem

Quantitative approaches to risk

Based on seemingly precise values

Probability is represented between 0-1 or %

Impact = $ loss should risk happen

Probability x impact = risk exposure $$$

Risk exposure value (REV) can be compared against insurance premium

REV helps assess effectiveness of risk reduction action

Risk reduction leverage (RRL) = (RE (before) – RE(after)) / cost of risk reduction

If RRL > 1.0 the action is worth while

Quantitative approaches to risk (cont)

Problems with quantitative risk assessment

- Without lots of data IDing probability is often guesswork

- Amount of damage usually guesswork

- Amount guessed might be less than actuality & risk fund may be exhausted

Probability impact grid (PIG)

Figure 7.2 Probability impact grid

With qual approach, risk tolerance line is drawn on PIG. Don't approve project with risks above this line. Take mitigative action to reposition risks by reducing risk probability &/or impact

Planning, monitoring and control

New risks ID'd any time, & secondary risks result from actions to reduce initial risks.

Monitoring is part of project control cycle

Monitoring = mixture of regular reviews and reviews after events, e.g. end of a stage.

Need a project risk plan to doc planning & facilitate monitoring & control process. Use a risk register/log, & list all the risks

Risk register management

For each risk in register, an individual risk record will be created

Risk record shows prob & impacts before *and* after mitigating action is taken

Risk plan

Plans of actions documented

Not always 1:1 between risk and plan

Risk owner manages risk plan & monitoring

Risk register management (cont)

If risk changes during process, revise plans

Adverse effects could be

Reduction in the value delivered

Project failure

Higher development costs

Delayed project completion

Reduced scope

Reduced performance

Completed system fails to deliver capability = original business case not realised

Risk Management Framework

Figure 7.1 Risk management framework
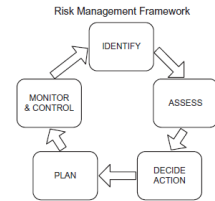
Barry Boehm's Top Ten Software Project Risks

1. Personnel shortfalls – capability/skill mismatches

2. Unrealistic schedules and budgets

3. Developing wrong functions & properties

4. Developing the wrong user interface

5. Gold-plating – development of unneeded functionality

6. Continuous stream of changes

7. Shortfalls in external components

8. Shortfalls in externally performed tasks

9. Real-time performance shortfalls

10. Straining capabilities – current technologies / expertise not developed to satisfy req's and project becomes a research project
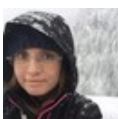
The qualitative approaches to risk

Because qualitative is mostly guesswork modern practice = qualitative approach

Approaches = interviewing stakeholders, experts and brainstorming

Qualitative descriptions of probability:

Extremely Likely, Very High, High, Medium, Low, Very Low, Improbable

Quantitative values expressed within a range, e.g. 20–50% probability. Then map to categories of probability and impact

Risk assessment similar to effort estimation, often done together

Prioritising risks

- Ensure effort used where needed most

- Use a probability impact grid (PIG)

- On the PIG #'s uniquely identify each risk

Mitigating actions decision considerations

Benefits should outweigh benefits of inaction – use the calc of risk reduction leverage

Decisions

- How many actions to approve

- In relation to which risks

- Focus first on the show-stoppers – that prevent completion of the project.

With quant approach, sum up risk exposure figures for an overall project risk exposure. Then plan actions to reduce risk to level acceptable. Alternatively address highest priority risks.

Risk register

Figure 7.3 Risk register

Risk register							
Id	Risk title		Risk owner	Post-risk management			PlanNo
				Prob.	Cost	Qual	Time	
1							
2							
3							
4							
5							
6							
7							
8							
9							

Internal risks include

staff changes

lack of policies to guide decision making

increased scope of changes

lack of developer experience

sabotage

Risk management: similar to any other activity

ID risks

Plan to deal with them

- Contingency

Execute project

Monitor and control

Cyclic process throughout project

Assessing the risk

Evaluate and then prioritise the risk

Evaluation criteria

- Probability risk will occur

- Impact that the risk could have

Risk exposure, magnitude of the risk

Risks may impact time, cost or quality, and will impact business case.

- Time: longer development time needed

- Quality: reduction in the scope or performance of the deliverable

- Costs: increase in the resources

A risk can be viewed as an opportunity

Proximity of the risk

- Risk magnitude vary – completed tasks risks disappear

- Time period when the risk may occur

- Uncertainty high at beginning due to unknowns. As knowledge increases uncertainty is reduced.

Mapping assessments of risk probability

Table 7.1 Mapping qualitative and quantitative assessments of risk probability

Index	Impact level	
4	High	Greater than 50% chance that the risk will occur
3	Significant	30–50% chance that the risk will occur
2	Moderate	10–29% chance that the risk will occur
1	Low	Less than 10% chance that the risk will occur

Table 7.2 Mapping qualitative and quantitative assessments of cost impact

Index	Impact level	
4	High	Greater than 20% above project cost tolerance
3	Significant	Up to 20% above the project cost tolerance
2	Moderate	Greater than 50% of the project cost tolerance but still within it
1	Low	Within 50% of cost tolerance

Deciding the appropriate actions

Consequence of mitigating action, update:

- project schedule

- development costs

- functional scope

- Performance of the deliverables

Accepting the risk

If prob low, impact low, & other actions not practical could accept risk and monitor it

Maybe cost of action outweighs impact

Preventing the risk aka 'risk avoidance'.

Reducing the risk

Action before the expected risk occurs

Transferring the risk to another party, outsource for eg
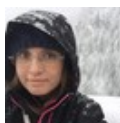
Contingency

No action before the risk occurs

Plan of action once risk occurs, or certain

Generally only incurs costs if risk arises

Costs

$ to manage risk and with creating the conditions in the contingency action plan

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