

Risks

Risk is a possibility of an event in the future which has negative consequences. **Level of risk** is the likelihood of the event and the harm from that event.

Product Risks

The possibility that a work product (specification, component, system, or test) fails to satisfy the legitimate needs of its users and/or stakeholders. If product risk is associated with specific quality characteristics of a products (functional suitability, reliability, performance efficiency, usability, security, compatibility, maintainability, and portability), it is also called **quality risk**.

Examples of product risks:

- Software might not perform its intended functions according to the specification
- Software might not perform its intended functions according to user, customer, and/or stakeholder needs
- A system architecture may not adequately support some non-functional requirements
- A particular computation may be performed incorrectly in some circumstances
- A loop control structure may be coded incorrectly
- Response-times may be inadequate for a high-performance transaction processing system
- User experience (UX) feedback might not meet product expectations

Project Risks

Situations that may have a negative effect on a project's ability to achieve its objectives. Project risks may affect both development activities and test activities.

Examples of project risks:

* Project issues

- Delays may occur in delivery, task completion, or satisfaction of exit criteria
- Inaccurate estimates, reallocation of funds to higher priority projects, or general cost-cutting across the organization may result in inadequate funding
- Late changes may result in substantial re-work

* Organizational issues

- Skills, training, and staff may not be sufficient
- Personnel issues may cause conflict and problems
- Users, business staff, or subject matter experts may not be available due to conflicting business priorities

* Political issues

- Testers may not communicate their needs and/or the test results adequately
- Developers and/or testers may fail to follow up on information found in testing and reviews (not improving development and testing practices)
- There may be an improper attitude toward, or expectations of, testing (not appreciating the value of finding defects during testing)

* Technical issues

- Requirements may not be defined well enough
- The requirements may not be met, given existing constraints
- The test environment may not be ready on time
- Data conversion, migration planning, and their tool support may be late
- Weakness in the development process may impact the consistency or quality of project work products such as design, code, configuration, test data, and test cases
- Poor defect management and similar problems may result in accumulated defects and other technical debt

* Supplier issues

- a third party may fail to deliver a necessary product or service, or go bankrupt
- contractual issues may cause problems to the project

Risk-based Testing and Product Quality

Risk is used to focus the effort during testing. It is used to decide where and when to start testing and identify areas that need more attention.

Testing is used to reduce the probability of an adverse event occurring, or to reduce the impact of an adverse event. In other words, **testing is used as a risk mitigation activity**, to provide information about identified risks, as well as providing information on unresolved risks.

Risk-based approach to testing provides proactive opportunities to reduce the levels of product risk. It involves **product risk analysis**: the identification of product risks and the assessment of the level of each risk.

The resulting product risk information is used to guide:

- test planning
- the specification
- preparation and execution of test cases
- test monitoring and control

Results of product risk analysis are used to:

- Determine the test techniques to be employed
- Determine the particular levels and types of testing to be performed (security testing, accessibility testing, etc.)
- Determine the extent of testing to be carried out
- Prioritize testing in an attempt to find the critical defects as early as possible
- Determine if any activities in addition to testing could be employed to reduce risk (providing training to inexperienced employees, etc.)

To ensure that the likelihood of a product failure is minimized, risk management activities provide a disciplined approach to:

- Analyze what can go wrong (risks)
- Determine which risks are important to deal with
- Implement actions to mitigate those risks
- Make plans to deal with the risks should they actually occur

Testing may identify new risks, help to determine what risks should be mitigated, and lower uncertainty about risks.