**What Is the Definition of Risk in Software Engineering?**

Very simply, a risk is **a potential problem**. It's an activity or event that may compromise the success of a software development project.

“Risk is an uncertain future event with a probability of occurrence and potential for loss”

There are three main classifications of risks which can affect a software project:

1. Project risks
2. Technical risks
3. Business risks

**1. Project risks:** Project risks concern differ forms of budgetary, schedule, personnel, resource, and customer-related problems. A vital project risk is schedule slippage. Since the software is intangible, it is very tough to monitor and control a software project. It is very tough to control something which cannot be identified. For any manufacturing program, such as the manufacturing of cars, the plan executive can recognize the product taking shape.

**2. Technical risks:** Technical risks concern potential method, implementation, interfacing, testing, and maintenance issue. It also consists of an ambiguous specification, incomplete specification, changing specification, technical uncertainty, and technical obsolescence. Most technical risks appear due to the development team's insufficient knowledge about the project.

**3. Business risks:** This type of risks contain risks of building an excellent product that no one need, losing budgetary or personnel commitments, etc.

**There are five sub-categories of the business risk:**  
**1. Market risk -** Creating an excellent system that no one really wants.  
**2. Strategic risk -** Creating a product which no longer fit into the overall business strategy for companies.  
**3. Sales risk -** The sales force does not understand how to sell a creating product.  
**4. Management risk -** Loose a support of senior management because of a change in focus.  
**5. Budget risk -** losing a personal commitment.

## Other risk categories

These categories suggested by Charette.  
  
**1. Known risks :** These risk are unwrapped after the project plan is evaluated.  
**2. Predictable risks :** These risks are estimated from previous project experience.  
**3. Unpredictable risks :** These risks are unknown and are extremely tough to identify in advance.

[**Risk Management**](https://www.geeksforgeeks.org/software-engineering-risk-management/)

[Risk Management](https://www.geeksforgeeks.org/software-engineering-risk-management/) is an important part of project planning activities. It involves identifying and estimating the probability of risks with their order of impact on the project.

**Risk Management Steps:**   
There are some steps that need to be followed in order to reduce risk. These steps are as follows:

1. **Risk Identification:**   
   Risk identification involves brainstorming activities. it also involves the preparation of a risk list.

Brainstorming is a group discussion technique where all the stakeholders meet together. this technique produces new ideas and promotes creative thinking.

Preparation of risk list involves identification of risks that are occurring continuously in previous software projects.

The checklist is used for risk identification and focus is at the subset of known and predictable risk in the following categories:  
  
1. Product size  
2. Business impact  
3. Customer characteristic  
4. Process definition  
5. Development environment  
6. Technology to be built  
7. staff size and experience

**2. Risk Analysis and Prioritization:**   
It is a process that consists of the following steps: 

* Identifying the problems causing risk in projects
* Identifying the probability of occurrence of problem
* Identifying the impact of problem
* Assigning values to step 2 and step 3 in the range of 1 to 10
* Calculate the risk exposure factor which is the product of values of step 2 and step 3
* Prepare a table consisting of all the values and order risk on the basis of risk exposure factor

For example,

TABLE (Required) 

| **Risk No** | **Problem** | **Probability of occurrence of problem** | **Impact of problem** | **Risk exposure** | **Priority** |
| --- | --- | --- | --- | --- | --- |
| R1 | Issue of incorrect password | 2 | 2 | 4 | 10 |
| R2 | Testing reveals a lot of defects | 1 | 9 | 9 | 7 |
| R3 | Design is not robust | 2 | 7 | 14 | 5 |

**3. Risk Avoidance and Mitigation:**   
The purpose of this technique is to altogether eliminate the occurrence of risks. so the method to avoid risks is to reduce the scope of projects by removing non-essential requirements.

**4. Risk Monitoring:**   
In this technique, the risk is monitored continuously by reevaluating the risks, the impact of risk, and the probability of occurrence of the risk.   
This ensures that: 

* Risk has been reduced
* New risks are discovered
* Impact and magnitude of risk are measured

## Risk Mitigation, Monitoring and Management(RMMM) Plan

In most cases, a risk management approach can be found in the software project plan. This can be broken down into three sections: risk mitigation, monitoring, and management (RMMM). All work is done as part of the risk analysis in this strategy. The project manager typically uses this RMMM plan as part of the overall project plan.

Some development teams use a Risk Information Sheet(RIS) to document risk. For faster information handling, such as creation, priority sorting, searching, and other analyses, this RIS is controlled by a database system. Risk mitigation and monitoring will begin after the RMMM is documented and the project is launched.

### Risk Mitigation

Risk Mitigation is a technique for avoiding risks (Risk Avoidance).

The following are steps to take to reduce the risks:

* Identifying the risk.
* Getting rid of the causes that lead to the production of risk.
* Controlling the relevant documents regularly.
* Conducting timely reviews to accelerate the process.

### Risk Monitoring

Risk monitoring is an activity used to track a project's progress.

The following are the critical goals of the task.

* To see if the risks that were anticipated actually happen.
* To verify that the risk aversion steps defined for risk are adequately implemented.
* To gather information for future risk assessments.
* To determine which risks generate which problems throughout the project.

### Risk Management and Planning

Risk management and planning are based on the assumption that the mitigation effort failed and the risk has become a reality. When a risk becomes a reality and produces serious problems, the project manager is in charge of this responsibility. It is easier to manage risks if the project manager successfully implements project mitigation to eliminate risks. This demonstrates how a manager will respond to each risk. The risk register is the key objective of the risk management plan. This risk register identifies and prioritizes potential dangers to a software project.

## Drawbacks of RMMM

* It raises the cost of the project.
* Time will be needed more.
* A larger project's implementation of an RMMM could prove to be a time-consuming process in and of itself.
* RMMM cannot guarantee a project will be risk-free; in fact, hazards could materialise after the project has been delivered.
* Not All Organisations Should Use RMMM.
* Data security is an issue for RMMM.
* Focus Loss from Automation