Software Risk

- Anticipated unfavorable event
- When risk turns to reality it hampers successful and timely completion of project

Risk

Basic Characteristics of Risks:

*Uncertainty***: Risk** may or may not h**appen**

- *Loss*: **If risk becomes a reality** *losses* **will occur**

RISK

categories of risks are:

a. **Project Risk:**
b. **Technical Risk** :
c. **Business Risk** :
d. **Known Risk:**
e. **Predictable Risk :**
f. **Unpredictable Risk** :

Project Risk

- ***Project risks*** threaten the project plan.
- If project risks become real, it is likely that the project schedule will slip and that costs will increase.
- Project risks identify potential budgetary, schedule, personnel (staffing and organization), re- source, stakeholder, and requirements problems and their impact on a software project.

Technical Risk

- Technical risks identify potential design, implementation, interface, verification, and maintenance problems.
- In addition, specification ambiguity, technical uncertainty, technical obsolescence.

Business Risk

Top Five **Business risk** are

- **Market risk**: system that no one really wants
- **Strategic risk**: product no longer fits into the overall business strategy
- **Sales risk**: the sales force doesn’t understand how to sell the product
- **Management risk:** losing the support of senior management
- **Budget risks:** losing budgetary or personnel commitment

Known Risk

- *Known risks* are those that can be uncovered after careful evaluation of the project plan, the business and technical environment in which the project is being developed, and other reliable information sources (e.g., unrealistic delivery date, lack of documented requirements or software scope, poor development environment).

Predictable Risk

- *Predictable risks* are extrapolated from past project experience (e.g., staff turnover, poor communication with the customer).

Unpredictable

- *Unpredictable risks* are the joker in the deck.
- They can and do occur, but they are extremely difficult to identify in advance.

RISK

- **Reactive and Proactive Risk Strategy**

Proactive Approach

- Being proactive means that you identify risks before they happen and figure out ways to avoid or alleviate the risk.
- Proactive risk management seeks to reduce the risk potential of the hazard or even better prevent the threat altogether.

Reactive Approach

- The reactive approach is stressful and costly as the management makes the decisions as the events unfold.

RISK MANAGEMENT PROCESS

- **Risk identification**

– Identify project, product and business risks

- **Risk analysis**

– Assess the likelihood and consequences of these risks

- **Risk planning**

– Draw up plans to avoid or minimize the effects of the risk

- **Risk monitoring**

– Monitor the risks throughout the project

Risk Identification

- The different categories of risk (project, technical, business, known, predictable, and unpredictable) can be further divided as:

a) ***Generic risks**:*

b) ***Product-specific risks:***

Generic Risk

- ***Generic risks*** are a potential threat to every software project

Product Specific

- ***Product-specific risks*** can be identified only by those with a clear understanding of the technology, the people, and the environment that is specific to the software that is to be built.
- To identify product-specific risks, the project plan and the software statement of scope are examined, and an answer to the following question is developed: “What special characteristics of this product may threaten our project plan?”
- Method for identifying risks is to create a risk item checklist.

Risk Identification

One method for identifying risks is to create a **risk item checklist**; we need to identify the following area from where risk will appear:

- *P**roduct size***—risks associated with the overall size of the software to be built or modified.
- ***Business impact***- risks associated with constraints imposed by management or the marketplace.
- ***Process definition***—risks associated with the degree to which the software process has been defined and is followed by the development organization.
- ***Development environment***—risks associated with the availability and quality of the tools to be used to build the produce
- ***Technology to be built***—risks associated with the complexity of the system to be built and the “newness” of the technology that is packaged by the system.
- ***Staff size and experience***—risks associated with the overall technical and project experience of the software engineers who will do the work.

Risk assessment

- Rank risk in terms of their damage causing potential

- **The overall risk exposure, RE**

Risk Exposure (RE) = r **X** c

- **Here**, r **is** probability of occurrence **for a risk, and c is** cost to project **should risk occur.**

CASE STUDY

For example, assume that software team defines a project risk in as follows:

- **Risk Identification**: Only 70 percent of the software components scheduled for reuse will, in fact, be integrated into the application. The remaining functionality will have to be custom developed.
- **Risk Probability**: 80% (likely)
- **Risk Impact**: 60 reusable software components were planned. If only 70 percent can be used, 18 components would have to be developed from scratch (in addition to other custom software that has been scheduled for development). Since the average component is 100 LOC and local data indicate that the software engineering cost for each LOC is $14.00

CASE STUDY

- Overall cost (impact) to develop the components would be 18 x 100 x 14 = $25,200.
- **Risk Exposure**. RE = 0.80 x 25,200 ~ $20,200.

Class Work

- **Risk Identification**: Only 60 percent of the software components scheduled for reuse will, in fact, be integrated into the application. The remaining functionality will have to be custom developed.
- **Risk Probability**: 70%
- **Risk Impact**: 80 reusable software components were planned. If only 60 percent can be used other components would have to be developed from. Since the average component is 350 LOC and local data indicate that the software engineering cost for each LOC is RS. 20.00