Introduction to Software Engineering

SE-110

Risk Management

Lecture # 38
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Today's Outline

- **Risk Definition**
- **Risk Management**
- **Risk identification**
- **Risk projection (estimation)**
- **Risk mitigation, monitoring, and management**

What is Risk?

- **Risk is an uncertainty.**
- **We don't know whether a particular event will occur or no but if it does has a negative impact on a project.**
- **An example would be that team is working on a project and the developer walks out of project and other person is recruited in his place and he doesn't work on the same platform and converts it into the platform he is comfortable with. Now the project has to yield the same result in the same time span. Whether they will be able to complete the project on time. That is the risk of schedule .**

Understand Risk

- **Risk is the possibility that you may NOT achieve your planned targets because something unexpected occurs or something planned does not occur.**
- **All projects have some degree of risk because predicting the future with certainty is impossible.**
- **However, project *risk is greater* . . .**
  - **The longer your project lasts**
  - **The less experience you, your organization, or your team members have with similar projects**
  - **The newer your project's technology is**
- **Risks are events that are usually beyond the planner's control.**

Conceptual Definition of Risk

- **A risk is a potential problem – it might happen and it might not**
- **Conceptual definition of risk**
  - **Risk concerns future happenings**
  - **Risk involves change in mind, opinion, actions, places, etc.**
  - **Risk involves choice and the uncertainty that choice entails**
- **Risk provides an opportunity to develop the project better.**

- **Risk exposure= Size (loss)* probability of (loss)**

- **There is a difference between a Problem and Risk**
  - **Problem is some event which has already occurred but risk is something that is unpredictable.**

- **Two characteristics of risk**
  - **Uncertainty – the risk may or may not happen, that is, there are no 100% risks (those, instead, are called constraints)**
  - **Loss – the risk becomes a reality and unwanted consequences or losses occur**

Example: Risk Impact Assessment

- **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 percent (likely).**
- **Risk impact. Sixty 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, the overall cost (impact) to develop the components would be 18 * 100 * 14 = $25,200.**
- **Risk exposure. RE = 0.80 * 25,200 _ $20,200.**

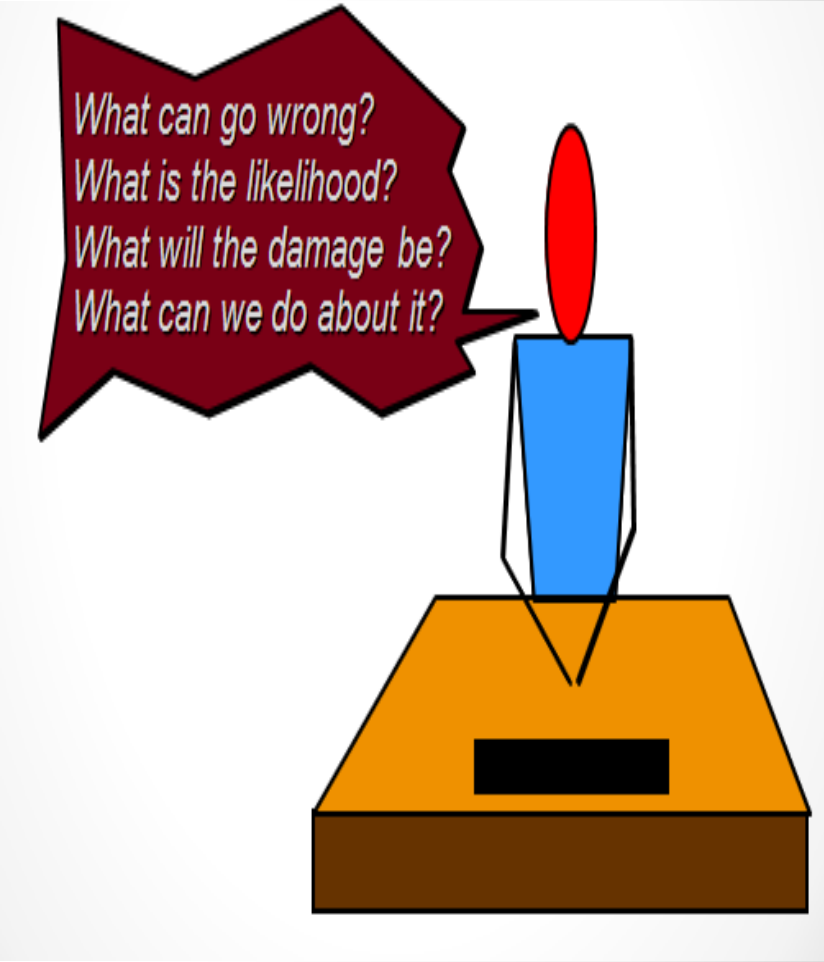
Compare RE for all risks to the cost estimate for the project. If RE is greater than 50 percent of the project cost, the viability of the project must be evaluated.

Risk Categorization

- **Project risks**
  - **They threaten the project plan**
  - **If they become real, it is likely that the project schedule will slip and that costs will increase**
- **Technical risks**
  - **They threaten the quality and timeliness of the software to be produced**
  - **If they become real, implementation may become difficult or impossible**
- **Business risks**
  - **They threaten the viability of the software to be built**
  - **If they become real, they jeopardize the project or the product**

Risk Management

- **The Risks we encounter in a project should be resolved so that we are able to deliver the desired project to the customer.**
- **The project should be managed in such a way that the risks don't affect the project in a big way.**
- **The art of managing of the risks effectively so that the WIN-WIN situation and friendly relationship is established between the team and the customer is called Risk Management.**
- **By using various paradigms, principles we can manage the risks.**



Reactive vs. Proactive Risk Management Strategies

- **Reactive risk strategies**
  - **"Don't worry, I'll think of something"**
  - **The majority of software teams and managers rely on this approach**
  - **Nothing is done about risks until something goes wrong**
  - **project team reacts to risks when they occur**
  - **fix on failure—resource are found and applied when the risk strikes**
  - **Crisis management is the choice of management techniques**

Reactive vs. Proactive Risk Management Strategies

- **Proactive risk strategies**
- **formal risk analysis is performed**
- **organization corrects the root causes of risk**
  - **Steps for risk management are followed**
  - **Primary objective is to avoid risk and to have a contingency plan in place to handle unavoidable risks in a controlled and effective manner**

Steps for Proactive Risk Management

1) **Identify** possible risks; recognize what can go wrong
2) **Analyze** each risk to estimate the probability that it will occur and the impact (i.e., damage) that it will do if it does occur
3) **Rank** the risks by probability an impact
   - Impact may be negligible, marginal, critical, and catastrophic
4) **Develop** a contingency plan to manage those risks having high probability and high impact

Contents of a Risk Table

- **A risk table provides a project manager with a simple technique for risk projection**
- **It consists of five columns**
  - **Risk Summary – short description of the risk**
  - **Risk Category – one of seven risk categories**
  - **Probability – estimation of risk occurrence based on group input**
  - **Impact – (1) catastrophic (2) critical (3) marginal (4) negligible**
  - **RMMM – Pointer to a paragraph in the Risk Mitigation, Monitoring, and Management Plan**

Risk Summary	Risk Category	Probability	Impact (1-4)	RMMM

That is all

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