

**ASSIGNMENT # 01**

**RISK AND DISASTER MANAGEMENT IN CONSTRUCTION**



**Submitted to:-**

**Engr.Yaseen Mahmood**

**Coordiantor of Civil Engineering Department INU Peshawar.**

**Submitted by:-**

**Waqar Ali**

**ID # 14749**

**Department of Civil Engineering, Iqra National University Peshawar.**

## QUESTION NO#1 DIFFERENCE BETWEEN HAZARDS AND THREAT? WITH EXAMPLE

### HAZARD

A hazard in safety management is a condition that poses danger to your organization, and can lead to an accident, incident, or other mishap if not mitigated.

A hazard satisfies ALL of the following conditions:

- Is a dangerous condition, such as an object, situation, circumstance, that poses an unacceptable level of danger;
- Occurs once in the safety mishap lifecycle;
- Can lead directly to risk occurrence (i.e., safety mishap, accident, etc.) if not mitigated; and
- Arise from hazard mechanisms, such as initiating actions and hazardous sources.

Though it is sometimes confused as other things, such as below, a hazard is NOT:

- Benign objects (birds, mountains, people), which are hazardous sources;
- Safety mishaps, which are another way of saying risk occurrences;
- Damages, which are a product of risk occurrence; and
- Dangerous actions, which are associated with initiating mechanisms.

### Threat:

- Anything that might exploit a vulnerability.
- Any potential cause of an incident can be considered a threat
- Closely related to hazard
- A threat is a hazard, but a hazard need not be a threat

### Two Types of Threats

There are two types of threats that are used differently in different contexts. They are:

- General threats: the amount danger in a given circumstance; and
- Specific threats: a specific object, situation, behavior, etc., that corresponds to a rising level of danger within a given context.

### General Threat

One type of threat is a general threat, which refers to the amount of danger in a given circumstance. It is used in the context of "threat level," such as:

- "There is no inherent threat in operations right now"; or
- "Given our current ERP, how much threat does a fire emergency pose?"; or
- "Terrorism is a [specific] threat that poses great [general] threat to aviation."

### Specific Threat

A threat can also be a generic term for a specific danger, such as an object, situation, behavior, etc. A specific danger can be identified as:

- Contributing to rising danger – such as a hazardous source or contributing factor; or
- Representing actualized danger – such as a hazard occurrence.

Some examples are:

- "In spring time, migrating birds are a threat we have to mitigate";
- "That moose is no threat because he cannot get over the perimeter fence"; or
- "We have no plan for a bomb threat in our ERP."

### Difference between Hazard and Threat

Sometimes, hazard and threat might be used interchangeably. Consider the example of a flock of birds flying close to an aircraft. This flock is both a hazard and a threat.

However, because the concept of a threat is vaguer than the concept of a hazard, a threat is not always a hazard. Consider the example of:



- migrating birds, which are a hazardous source but not an actual hazard, or
- Fatigue, which is a contributing factor.

The takeaway here is that a hazard occurs (is “actualized”) when your operations interact with hazard sources. A threat is simply a generic way to describe danger, whether the danger has actualized or not.

## **QUESTION NO#2**

### **DEFINE RISK AND PROVIDE CLASSIFICATION OF RISKBASED ON ITS SOURCES.PROVIDE AN EXAMPLE OF EACH SOURSES.**

#### **Definition:**

- Risk implies future uncertainty about deviation from expected earnings or expected outcome. Risk measures the uncertainty that an investor is willing to take to realize a gain from an investment.
  - Risks are of different types and originate from different situations.
  - We have liquidity risk, sovereign risk, insurance risk, business risk, default risk, etc.
  - Various risks originate due to the uncertainty arising out of various factors that influence an investment or a situation.

#### **Systematic Risk:**

- Market Risk :
  - Market Risk is the risk that the value of an investment will decrease due to movements in market factors. The reason for such uncertainty is market forces represent. in two markets, viz Bull Market and Bear Market
- Interest Rate Risk :
  - Interest rate risk is the possibility of an unexpected. change in interest rates prevailing in the market. which affects the value of an investment adversely. Generally the value of debt instruments like bonds. debentures, commercial papers. etc. is directly affect. by Interest Rate Risk.
- Purchasing Power Risk :
  - Purchasing power risk is the possible reduction in the purchasing power of the expect. returns. Due the high rate of inflation. there is erosion in the purchasing power of money, which results in decrease in the returns.

#### **Unsystematic Risk:**

- Unsystematic risk may be specification to an industry or company and is caused due to deficiencies in one or more of the following
  - Lack of managerial ability
  - Technological advancement in the process of production.
  - Procurement of raw materials
  - Lack of human resources
  - Change in consumer preference

#### **Business Risk:**

- Market business risk is a part of the unsystematic risk.
- Which basically comes from the operational activities of the business.
- Due to certain inbuilt deficiencies in the operations of the business.
- Due to certain inbuilt deficiencies in the operations of a company.

#### **Internal Business Risk :**

Internal risk is related to with the operational effectiveness of a company. The operational effectiveness of a company is measured in terms of the level of its targeted achievements and keeping the promises made to its investors.

1. Research and Development (R&D)
2. fixed Cost
3. Single Product
4. Sales variation
5. Personal management

#### **External Business Risk :**

External business risks are the risk caused by the circumstances. which are external to a company’s business. The company has no control over these circumstances or factors.

- 1) Social and Regulatory Factors: e.g. Telecommunication. Similarly the profitability of banks is affected by some of the regulatory directions issued on the lending policies.
- 2) Political risk : Frequent changes in the Govt and its policies have a negative impact on business environment.
- 3) Business cycle :boom and recession is the best example business cycle. Textile industry will be in boom for short period after that the demand will be decrease.

### Financial Risk :

- Financial risk is a function of financial leverage which is the use of debt in the capital structure.
- The presence of debt in the capital structure creates fixed payments in the form of interest which is a compulsory payment to be made whether the company makes profit or loss.
- This fixed interest payment creates more variability in the earnings per share(EPS) available to equity share holders.
  - Credit Risk
  - Currency Risk
  - Country Risk
  - Economic Risk
  - Liquidity Risk

### Measurement Risk :

- Risk in investment is associated with return.
- The risk of an investment cannot be measured without reference to return.
- The return, in turn, depends on the cash inflows to be received from the investment to return.
- The return in turn depends on the cash inflows to be received from the investment.
- Let us consider the purchase of a share.
- While purchasing an equity share.an investor expects to receive future dividends declared by the company.
- In addition he expects to receive the selling price when the share is finally sold.

### Example:

**Suppose a share is currently selling at Rs.120. An investor who is interest in the share anticipates that the company will pay a dividend of Rs. 5 in the next year. Moreover he expects to sell the share at Rs. 175 after one year. The expected return from this can be calculated as follows.**

### Expected Return

The expected return of the investment is the probability weighted average of all the possible returns. If the possible return are denoted by  $X_i$  and the related probabilities are  $p(X_i)$ . The expected return may be represented as

Key information to Reminder before

Possible returns = would indicate the expected return from the investment. (Denoted by  $X_i$ ) Probability of Occurrence = This indicates the risk of the investment. (Denoted by  $p(X_i)$ )

Example

A share is currently selling at Rs.50. It is expected that a dividend of Rs.2 per share would be paid during the year and the share could be sold at Rs. 54 at the end of the year. Calculate the expected return from the share.

Solution:  $R = \frac{\text{Forecast Dividend} + \text{Forecasted end of the period stock} - 1}{\text{Initial Investment}}$

Example (based on previous example)

Calculate expected return

Possible Returns (In %)	Probability of Occurrence
$X_i$	$p(X_i)$
30	0.10
40	0.30
50	0.40
60	0.10
70	0.10

Calculation of Expected Return		
Possible Returns (In %)	Probability of Occurrence	$X_i p(X_i)$
$X_i$	$p(X_i)$	
30	0.10	3
40	0.30	12
50	0.40	20
60	0.10	6
70	0.10	7
Here, the expected return is 48%		48

Risk

Expected returns are insufficient for decision-making. The risk aspect should also be considered. The most popular measure of risk is the variance or standard deviation of the probability distribution of possible returns.

### QUESTION NO#3

#### How would you assess the performance of transportation system of a city?

##### Introduction

Over the last few years, the public transport industry in many developing countries has been involved in a process of deep transformation. At present, personal mode usage is more than public transport mode, causes. Series of problems in daily life like, traffic congestion, delay, air pollution, noise pollution and large amount of energy wastage which has a negative impact on environment as well as on public health. Mobility requirements in metropolitan cities causes continuous growth of personalized vehicles leading to pollution and traffic congestion. To reduce the current pollution level, congestion and make the cities environment friendly, it is necessary to encourage the commuters to use the public transport system. To provide the desired service delivery level for public transport, it is essential to evaluate the existing transport systems using a reliable performance evaluation technique which can eventually help in enhancing the transit service delivery to their trusted passengers.

##### Performance Evaluation

Performance evaluation of public transport system requires to understand the terms on behalf of performance of the system to be evaluated. The evaluation can be done in two ways

- i) based on present perception of users about the service delivered
- ii) Based on the feedback provided by experienced evaluation team.

**Performance evaluation is defined** as the technique to evaluate how well or bad is the performance of a transit service is under the prevailing operating condition. The performance of transit system can be enumerated based on two distinct dimensions i.e., Service and Service quality. Service is described as "the business transaction that take place between a donor (Service provider) and Receiver (Customer) in order to produce an outcome that satisfies the customer". Whereas, Service quality gives the measure of how well the service level delivered to the commuter's as per their expectation. Parasuraman (1988) and Gronroos, (1984) defines service quality as a comparison between customer expectation and perception of service

##### Factors Effecting Service Quality

Estimation of service quality in terms of user perception is purely based on psychological behavior of the commuters. It is necessary to understand the key parameters upon which transit performance depends, as these factors internally and externally affect the user perception and creates a perception of the transit system in the user's mind. The selection of factors differs from one public mode to another.

Various number of factors to define the service quality. The different service attribute dimensions are described in Table 1:

Researcher's Name	Type of Transit System	Service Quality Attributes
Parasuraman et al.(1985)	Bus, Train, Metro	Reliability, Assurance, Tangibles, Empathy and Reliability
TRB USA (1999)	Buses, Tram, Metro and Rail	Reliability, Competence, Access, Courtesy, Communication, Credibility, Security, Understanding of customer and Tangibles.
Chang, Hepu and Yu-Hern (1999)	Bus transit system	Safety, Comfort, Convenience, Operation, Social duty (Vehicle air pollution level, Vehicle noise level)
Y. Tyrinopolus and Antoniou (2008)	Bus and Metro	Service frequency, Service hour, Time table info, Behavior of personnel , Distance and time to access and regress trip, Waiting condition at stop ,Driver behavior, Information in vehicle, Accessibility w.r.t Disabilities, Transfer distance, Transfer waiting time, Info regarding transfer
Margarita Friman (2009)	Buses	Frequency, Travel time, Punctuality, price, Information, Cleanliness, Bus comfort, Staff behavior, Seat availability, Bus stop security, Safety from accident, On board security, Bus stop condition and Info bus stop
Eboli and Mazzulla (2009)	Buses	Route characteristics, Service characteristics, Service reliability, Comfort, Cleanliness, Fare, Information, Safety and security, Personnel and Customer service

Sudin Bag and Som Sankar Sen (2012)	Metro	Air condition & lighting, Seating and free space, Inside atmosphere, Parking space, Smart card and multi ride facilities, Staff behavior, Management attitude, Helpfulness of staff, Attentiveness and resolve quarries,
Marta Rajo, Harnan, Luigi and Angel (2012)	Bus and Train transit system	Journey time, frequency, Condition of vehicle, Route , Number of intermediate stop, Bus stop location, Connection with other transport mode, Time table info, Possibility of buying ticket at home, Journey distance, Cost of journey, Number of delay bus and train services, Average speed of journey,
Adris.A.Putra (2013)	Bus Transit System	Safety, Accessibility, Affordable Tariff, Capacity, Regularity, Swift and fast, On time, Integration, Efficent, Easyness, Orderly, Security, Cozy, Low Pollution,

#### **Method of collecting user perception data**

Surveys and interviews are the most popular methods of primary data collection. The User perception data can be collected by conducting a Station/Stop Survey or Workplace survey by direct face to face interview or by using alternative (telephonic interviews) indirect techniques. Paper-and-Pencil Interview (PAPI) is very popular for data collection, in which an enumerator asks questions to the respondent by holding a printed set of questions.

#### **Performance Evaluation Models**

Major works on "performance evaluation" began after 1970, many of the transportation planners and researchers had started trying different approaches and techniques for developing different models to estimate the transit system performance in terms of user perception. Since service quality is a qualitative parameter hence modeling of qualitative parameters creates more difficulties.

#### **SERVQUAL Model**

Parasuraman (1985) suggested a model for measuring service quality by measuring the gap between the service delivered and service received. It is mostly used by market researchers to identify customer satisfaction on behalf of service delivered. This model represents the service quality in terms of 10 dimensions namely, Reliability, Responsiveness, Competence, Access, Courtesy, Communication, Credibility, Security, understandability and Tangibles. But after 1988, these ten components were merged to formulate five distinct dimensions namely, Reliability, Assurance, Tangibles, Empathy, Responsiveness. These components are collectively called RATER. However, limitation of this model is SERVICE QUALITY (SERVQUAL) factors are inconsistent and it is not incomprehensible for different applications

#### **Impact Score Technique (IST)**

Federal Administration of the U.S (1999) developed a simple and effective measurement method to evaluate customer satisfaction for transit services termed as Impact Score Technique. The IST approach determines the relative impact of attributes on user satisfaction by measuring relative decrease in user satisfaction when there is a problem with the attributes. For each attribute the whole sample is divided into two categories, user who faced a recent problem and those who haven't faced any problem (within past 30 days). The gap between mean overall ratings of two groups is known as "Gap Score". A composite index is found out by multiplying gap score to problem incident rate.

#### **Important Performance Analysis (IPA)**

IPA was first introduced by Martilla (1977). IPA is also known as quadrant analysis which is used in many areas due to its ease of identification of different quality parameter that can lead to the improvement in Service quality.

#### **Q: 04 DEFINE SECURITY VULNERABILITIES OF A UNIVERSITY CAMPUS?**

**Answer:** A **vulnerability** is defined in the ISO 27002 standard as "A weakness of an asset or group of assets that can be exploited by one or more threats".

Vulnerability Management (VM) is the process in which vulnerabilities in IT are identified and the risks of these vulnerabilities are evaluated. This evaluation leads to correcting the vulnerabilities and removing the risk or a formal risk acceptance by the management of an organization (e.g. in case the impact of an attack would be low or the cost of correction does not outweigh possible damages to the organization). Vulnerability management is the process surrounding vulnerability scanning, also taking into account other aspects such as risk acceptance, remediation etc.

## **Security Vulnerability of university campus Examples**

A Security Vulnerability is a weakness, flaw, or error found within a security system that has the potential to be leveraged by a threat agent in order to compromise a secure network.

**There are a number of Security Vulnerabilities, but some common examples are:**

**Broken Authentication:** When authentication credentials are compromised, user sessions and identities can be hijacked by malicious actors to pose as the original user.

**SQL Injection:** As one of the most prevalent security vulnerabilities, SQL injections attempt to gain access to database content via malicious code injection. A successful SQL injection can allow attackers to steal sensitive data, spoof identities, and participate in a collection of other harmful activities. Such as Sarkhad University data was blocked by Indian engineer.

**Cross-Site Scripting:** Much like an SQL Injection, a Cross-site scripting (XSS) attack also injects malicious code into a website. However, a Cross-site scripting attack targets website users, rather than the actual website itself, which puts sensitive user information at risk of theft.

**Cross-Site Request Forgery:** A Cross-Site Request Forgery (CSRF) attack aims to trick an authenticated user into performing an action that they do not intend to do. This, paired with social engineering, can deceive users into accidentally providing a malicious actor with personal data.

### **Scope:**

Vulnerability Management Program activities shall cover all University information assets, data, and relevant third-party assets as defined in The Standard and the CTS Data Governance Service Requirements.

In order to ensure that Vulnerability Management Program activities are adequately accounting for all critical assets and data, the Information Security Team shall have access to an asset inventory and network diagrams in accordance with The Standard.

### **The university campus vulnerability benefits:**

All systems connected to the campus network are scanned, so all members of the campus community can benefit, including:

- Researchers using the network for storage and transmission of research data
- Students using electronic resources to complete their coursework
- Staff supporting University administrative functions requiring information technology resources
- University administration meeting legal and ethical requirements to protect private information
- Individuals with private information on campus information technology systems