1. Meaning
2. Objectives of risk management
    - Pre-loss objectives
    - Post-loss objectives
3. Steps in the risk management process
4. Benefits of risk management
5. Personal Risk Management
6. IT risk management process

Meaning

Risk management (RM) is a process that identifies loss exposures faced by an organization and selects the most appropriate techniques for treating such exposures. Risk managers are extremely important to the financial success of business firms in today's economy and they are paid relatively high salaries. Because the term risk is ambiguous and has different meanings, risk managers typically use the term loss exposure to identify potential losses.

Pre-loss objectives

1. **Economy** - the firm should prepare for potential losses in the most economical way. This preparation involves an analysis of the cost of safety programs, insurance premiums paid, and the costs associated with different techniques for handling losses.
2. **Reduction of anxiety** - certain loss exposures can cause greater worry and fear for the risk manager and key executives. e.g.: the treat of a catastrophic lawsuit because of a defective product can cause greater anxiety than a small loss from a minor fare.
3. **Meeting legal obligations** e.g.: government regulations may require a firm to install safety devices to protect workers from harm, to dispose of hazardous waste materials properly, and to label consumer products appropriately. Workers compensation benefits must also be paid to injured workers. The firm must see that these legal obligations are met.

Post-loss objectives

1. **Survival of the firm** - means that after a loss occurs, the firm can resume at least partial operations within some reasonable time period.
2. **Continued operations** - for some firms, the ability to operate after a loss is extremely important. e.g.: a public utility firm must continue to provide service. Banks, dairies, bakeries, and other competitive firms must continue to operate after a loss. Otherwise, business will be lost to competitors.
3. **Stability of earnings** - earnings per share can be maintained if the firm continues to operate. However, a firm may incur substantial additional expenses to achieve this goal (such as operating at another location), and perfect earnings stability may be difficult to attain.

Post-loss objectives

4. **Continued growth** - a company can grow by developing new products and markets or by acquiring or merging with other companies. The risk manager must therefore consider the effect that a loss will have on the firm's ability to grow.

5. **Social responsibility** - minimize the effects that a loss will have on other persons and on society. A severe loss can adversely affect employees, suppliers, customers, investors, creditors, and the community in general. e.g.: a severe loss that shuts down a plant in a small town for an extended period can cause considerable economic distress in the local area.

A. Identify loss exposures.

↓

B. Measure and analyze the loss exposures.

↓

C. Select the appropriate combination of techniques for treating the loss exposures:

1. Risk control

Avoidance	Duplication
Loss prevention	Separation
Loss reduction	Diversification

2. Risk financing

Retention
Non-insurance transfers
Insurance

↓

D. Implement and monitor the risk management program.

A. Identify Loss Exposures

This step involves an exhaustive review of all potential losses. Important loss exposures include the following:

1. Property loss exposures
   - Building, plant, and other structures
   - Furniture, equipment, supplies
   - Computers, computer software, and data
   - Inventory
   - Accounts receivable, valuable papers, and records
   - Company vehicles, planes, boats, and mobile equipment
2. Liability loss exposures
   - Defective products
   - Environmental pollution (land, water, air, noise)
   - Sexual harassment of employees, employment discrimination, wrongful termination, and failure to promote
   - Premises and general liability loss exposures
   - Liability arising from company vehicles
   - Misuse of the Internet and e-mail transmissions
   - Directors' and officers' liability suits
   - Cyber liability (e.g., hackers gaining access to customer data)

3. Business income loss exposures
    - Loss of income from a covered loss
    - Continuing expenses after a loss
    - Extra expenses
    - Contingent business income losses
4. Human resources loss exposures
    - Death or disability of key employees
    - Retirement and unemployment exposures
    - Job-related injuries or disease experienced by workers
5. Crime loss exposures
    - Holdups, robberies, and burglaries
    - Employee theft and dishonesty
    - Fraud and embezzlement
    - Internet and computer crime exposures
    - Theft of intellectual property

6. Employee benefit loss exposures
    - Failure to comply with government regulations
    - Violation of fiduciary responsibilities
    - Group life, health, and retirement plan exposures
    - Failure to pay promised benefits
7. Foreign loss exposures
    - Acts of terrorism
    - Plants, business property, inventory
    - Foreign currency and exchange rate risks
    - Kidnapping of key personnel
    - Political risks, such as expropriation of property
8. Intangible property loss exposures
    - Damage to the company's public image
    - Loss of goodwill and market reputation
    - Loss or damage to intellectual property
9. Failure to comply with government laws and regulations

A risk manager can use several sources of information to identify the preceding loss exposures:

- Risk analysis questionnaires and checklists require the risk manager to answer numerous questions that identify major and minor loss exposures.
- Physical inspection of company plants and operations can identify major loss exposures.
- Flowcharts that show the flow of production and delivery can reveal production and other bottlenecks as well as other areas where a loss can have severe financial consequences for the firm.
- Analysis of Financial statements can identify the major assets that must be protected, loss of income exposures, key customers and suppliers, and other important exposures.
- Historical loss data can be invaluable in identifying major loss exposures.

A. Identify Loss Exposures

Risk managers must keep abreast of industry trends and market changes that can create new loss exposures and cause concern. Major risk management issues include rising workers compensation costs, effects of mergers and consolidations by insurers and brokers, increasing litigation costs, financing risk through the capital markets, data breaches and hackers gaining access to customer information, supply-chain security, and climate change. Protection of company assets and personnel against acts of terrorism is another important issue.

B. Measure and Analyze the Loss Exposures

It is important to measure and quantify the loss exposures in order to manage them properly. This step requires an estimation of the frequency and severity of loss.

- Loss frequency refers to the probable number of losses that may occur during some given time period.
- Loss severity refers to the probable size of the losses that may occur.

Once the risk manager estimates the frequency and severity of loss for each type of loss exposure, the various loss exposures can be ranked according to their relative importance.

- e.g.: a loss exposure with the potential for bankrupting the firm is much more important in a risk management program than an exposure with a small loss potential.

In addition, the relative frequency and severity of each loss exposure must be estimated so that the risk manager can select the most appropriate technique, or combination of techniques, for handling each exposure.

- e.g.: if certain losses occur regularly and are fairly predictable, they can be budgeted out of a firm's income and treated as a normal operating expense. If the annual loss experience of a certain type of exposure fluctuates widely, however, an entirely different approach is required.

Although the risk manager must consider both loss frequency and loss severity, **severity is more important** because a single catastrophic loss could destroy the firm. Therefore, the risk manager must also consider all losses that can result from a single event. Both the maximum possible loss and probable maximum loss must be estimated.

- The maximum possible loss is the worst loss that could happen to the firm during its lifetime.
- The probable maximum loss is the worst loss that is likely to happen.
- e.g.: if a plant is totally destroyed by a flood, the risk manager estimates that replacement cost, debris removal, demolition costs, and other costs will total $50 million. Thus, the maximum possible loss is $50 million. The risk manager also estimates that a flood causing more than $40 million of damage to the plant is so unlikely that such a flood would not occur more than once in 100 years. The risk manager may choose to ignore events that occur so infrequently. Thus, for this risk manager, the probable maximum loss is $40 million.

B. Measure and Analyze the Loss Exposures

Catastrophic losses are difficult to predict because they occur infrequently. However, their potential impact on the firm must be given high priority.

In contrast, certain losses, such as physical damage losses to vehicles, occur with greater frequency, are usually relatively small, and can be predicted with greater accuracy. More information about risk measurement in the 5th week.

B. Measure and Analyze the Loss Exposures

1. Qualitative risk analysis is appropriate for the situation when it is difficult to gather enough data to quantify the risks such that this technique is followed when an organization has small time, less budget, and lack of expertise to do the formal mathematical analysis. You may not always have the necessary historical data to work out probability and cost estimates on IT-related risks, since they can change very quickly. It can be displayed visually with traffic light grid or similar method.

Risk assessment matrix:

Risk factor	Impact	Costs	Overall risk
Legacy Win9x clients			
Untrained staff			
No anti-virus sofware			

You can use your judgement to decide if the probability of occurrence is:

- low - unlikely to occur or impact your business - would lose up to half an hour of production
- medium - possible to occur and impact - would cause complete shutdown for at least 3 days
- high - likely to occur and impact your business significantly - would cause irrevocable loss to the business

2. **Quantitative risk analysis** is a more formal approach followed after qualitative risk analysis. It assigns a money value to risk. Its formal techniques are probability distributions, decision trees, and simulations.

In an example of server failure it would involve looking at:

- the asset value - the cost of a server or the revenue it generates
- the frequency of risk occurrence - how often does the server crash
- the probability of associated loss - the estimated loss incurred each time it crashed

From these values, you can work out several key calculations:

- single loss expectancy (SLE) - costs you would incur if the incident occurs once
- annual rate of occurrence (ARO) - how many times a year you can expect this risk to occur
- annual loss expectancy (ALE) - the total risk value over the course of a year, ALE = ARO x SLE

C. Select the Appropriate Combination of Techniques for Treating the Loss Exposures

Techniques for managing risk can be classified broadly as either risk control or risk financing. Risk managers typically use a combination of techniques for treating each loss exposure.

1. Risk control refers to techniques that reduce the frequency or severity of losses.

2. Risk financing refers to techniques that provide for the funding of losses.

More information about techniques of risk management in the 7th week.

D. Implement and monitor the RM program

1. a RM policy statement
   - effective risk management program
   - outlines the RM objectives of the firm, as well as company policy with respect to treatment of loss exposures
   - educates top-level executives in regard to the RM process
   - establishes the importance, role, and authority of the risk manager
   - provides standards for judging the risk manager's performance
2. RM manual
   - useful tool for training managers, supervisors, and new employees who will be participating in the RM program
   - writing the manual also forces the risk manager to state precisely his or her responsibilities, objectives, available techniques, and the responsibilities of other parties
   - includes a list of insurance policies, agent and broker contact information, who to contact when a loss occurs, emergency contact numbers, and other relevant information

Cooperation with other departments Other functional departments within the firm are extremely important in identifying loss exposures, methods for treating these exposures, and ways to administer the RM program. With the RM department they can cooperate in the RM process in the following ways:

1. Accounting
    - internal accounting controls can reduce employee fraud and theft of cash
    - can provide information on the tax treatment of risk finance alternatives and the availability of funds to pay for retained losses

2. Finance
    - information can be provided showing the effect that losses will have on the firm’s balance sheet and profit and loss statement
3. Marketing
    - accurate packaging and product-use information can prevent lawsuits
    - safe distribution procedures can prevent accidents
4. Operations
    - quality control can prevent the production of defective goods and lawsuits
    - effective safety programs in the plant can reduce injuries and accidents
5. Human resources
    - employee benefit programs, retirement programs, safety programs, and the company’s hiring, promotion, and dismissal policies

Periodic review and evaluation

- Determine whether the objectives are being attained or if corrective actions are needed.
- In particular, RM costs, safety programs, and loss-prevention programs must be carefully monitored.
- Loss records must also be examined to detect any changes in frequency and severity.
- Retention and transfer decisions must also be reviewed to determine if these techniques are being properly used.
- The risk manager must determine whether the firm's overall RM policies are being carried out, and whether the risk manager is receiving cooperation from other departments.

An effective RM program yields substantial benefits to the firm or organization. Major benefits include the following:

- A formal RM program enables a firm to attain its pre-loss and post-loss objectives more easily.
- The cost of risk is reduced, which may increase the company's profits. The cost of risk is a RM tool that measures the costs associated with treating the organization's loss exposures. These costs include insurance premiums paid, retained losses, loss control expenditures, outside RM services, financial guarantees, internal administrative costs, and taxes, fees, and other relevant expenses.

Benefits of risk management

- Because the adverse financial impact of pure loss exposures is reduced, a firm may be able to implement an enterprise RM program (More information in the 8th week.) that treats both pure and speculative loss exposures.
- Society also benefits since both direct and indirect (consequential) losses are reduced. As a result, pain and suffering are reduced.

- refers to the identification and analysis of pure risks faced by an individual or family, and to the selection and implementation of the most appropriate technique(s) for treating such risks
- considers other methods for handling risk in addition to insurance

Steps in Personal Risk Management:

1. Identify Loss Exposures

    Serious financial losses can result from the flowing:

    a) Personal loss exposures
        - Loss of earned income to the family because of the premature death of the family head
        - Insufficient income and financial assets during retirement
        - Catastrophic medical bills and the loss of earnings during an extended period of disability
        - Loss of earned income from unemployment
        - Identity theft

b) Property loss exposures

- Direct physical damage to a home and personal property because of fire, lightning, windstorm, flood, earthquake, or other causes
- Indirect losses resulting from a direct physical damage loss, including extra expenses, moving to another apartment or home during the period of reconstruction, loss of rents, and loss of use of the building or property
- Theft of valuable personal property, including money and securities, jewelry and furs, paintings and fine art, cameras, computer equipment, coin and stamp collections, and antiques
- Direct physical damage losses to cars, motorcycles, and other vehicles from a collision and other-than-collision losses
- Theft of cars, motorcycles, or other vehicles
- Theft or damage to watercraft

c) Liability loss exposures

- Legal liability arising out of personal acts that cause bodily injury or property damage to others
- Legal liability arising out of libel, slander, defamation of character, and similar exposures
- Legal liability arising out of the negligent operation of a car, motorcycle, boat, or recreational vehicle
- Legal liability arising out of business or professional activities
- Payment of attorney fees and other legal defense costs

2. Analyze the Loss Exposures
    - The frequency and severity of potential losses should be estimated so that the appropriate techniques can be used to deal with the exposure.
    - e.g.: the chance that your home will be destroyed by a fire, tornado, or hurricane is relatively small, but the severity of the loss can be catastrophic. Such losses should be insured because of their catastrophic potential. On the other hand, if loss frequency is high, but loss severity is low, such losses should not be insured (such as minor scratches and dents to your car). Other techniques such as retention are more appropriate for handling these types of small losses.
    - e.g.: minor physical damage losses to your car can be retained by purchasing collision insurance with a deductible.

3. Select Appropriate Techniques for Treating the Loss Exposures
   a) Avoidance
      - e.g.: you can avoid liability for dog bites by not owning a dog. You can avoid the loss from the sale of a home in a depressed real estate market by renting instead of buying.
   b) Risk control
      - reduce the frequency or severity of loss
      - e.g.: you can reduce the chance of an auto accident by driving within the speed limit, taking a safe driving course, and driving defensively. Car theft can be prevented by locking the car, removing the keys from the ignition, and installing anti-theft devices.
      - reduce the severity of a loss
      - e.g.: wearing a helmet reduces the severity of a head injury in a motorcycle accident. Wearing a seat belt reduces the severity of an injury in an auto accident. Having a fire extinguisher on the premises can reduce the severity of a fire.

c) Retention

- means that you retain part or all of a loss
- active risk retention means you are aware of the risk and plan to retain part or all of it
- e.g.: you can retain small collision losses to your car by buying an auto insurance policy with a deductible for collision losses. Likewise, you can retain part of a loss to your home or to personal property by buying a homeowners policy with a deductible.
- Risk can also be retained passively because of ignorance, indifference, or laziness. This practice can be dangerous if the retained risk could result in a catastrophic loss.
- e.g.: many people are not insured against the risk of long-term disability, even though the adverse financial consequences from a long-term permanent disability generally are more severe than the financial consequences of premature death. Thus, people who are not insured against this risk are using risk retention in a potentially dangerous manner.

d) Noninsurance transfers

- methods other than insurance by which a pure risk is transferred to a party other than an insurer
- e.g.: the risk of damage to rental property can be transferred to the tenant by requiring a damage deposit and by inserting a provision in the lease holding the tenant responsible for damages. Likewise, the risk of a defective television can be transferred to the retailer by purchasing an extended-warranty contract that makes the retailer responsible for labor and repairs after the warranty expires.

e) Insurance

- Common purchases include life insurance, health insurance, homeowners insurance, auto insurance, and a personal umbrella liability policy.

4. Implement and Monitor the Program Periodically

    - At least every 2 to 3 years, you should determine whether all major loss exposures are adequately covered. You should also review your program at major events in your life, such as a divorce, birth of a child, purchase of a home, change of jobs, or death of a spouse or family member.

How to manage IT risks?

Managing various types of IT risks begins with identifying:

- the type of threats affecting your business
- the assets that may be at risks
- the ways of securing your IT systems

In business, **IT risk management** entails a process of identifying, monitoring and managing potential information security or technology risks with the goal of mitigating or minimising their negative impact.

Examples of potential IT risks include security breaches, data loss or theft, cyber attacks, system failures and natural disasters.

1. Identify risks - determine the nature of risks and how they relate to your business.
2. Assess risks - determine how serious each risk is to your business and prioritise them.
3. Mitigate risks - put in place preventive measures to reduce the likelihood of the risk occurring and limit its impact.
4. Develop incident response - set out plans for managing a problem and recovering your operations.
5. Develop contingency plans - ensure that your business can continue to run after an incident or a crisis.
6. Review processes and procedures - continue to assess threats and manage new risks.

Thank you for your attention!