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# Insurance & Risk Management

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***Abstract***
*Undoubtedly, our society and to large extent the entire world is dangerously exposed to different kinds of risk and uncertainties. The different components of insurance and the new insights of risk management trajectories are very much interacted. Hence, the insurance and risk management are the quantification of the statement of financial impact of the events which exclusively required by the stake holders. These attributes of insurance and risk management form a specific systematic order in whole to provide basic necessities to all its individuals.*
*Thus, concentration in insurance and risk management offers exposure to all areas of risk modelling such as market risk, credit risk, operational risk and liquidity risk.*
*Henceforth, the basic methods of risk management – avoidance, retention, sharing, transferring and loss and reduction and its application of mathematical and statistical modelling in determining appropriate premium cover can apply to all facets of individuals life and can pay offin the long run.*
*In this paper an attempt has been made to identify and analyse issues from different perspectives and encourage critical thinking and emphasizes disciplines needed in risk management and insurance. In this track gain, the analysis is strongly supplemented by a set of factors equally responsible in determining a global overview of business and can be equipped to make strategic business decisions. This paradox is the chief architect of the paper which reflect an indepth understanding of the real world insights of insurance and risk management as a wide variety ofmanagement roles.*
***Keywords:*** *Quantification, Risk modelling, Insurance and Riskmanagement, Premium cover, Mathematical and Statistical modelling.*

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## I. Introduction:

Insurance is a way of reducing uncertainty of occurrence of an event. Insurance is an investment. Since birth it has assumed many functions. Its basic purpose is to derive plans to counteract the financial consequences of unfavourable events. It formulates a financial mechanism which provides a pool to which the persons exposed to risk may contribute. The unfortunate few of this group who encounter the risk get compensation out of this pool. Hence insurance is based on the principle that a group of persons facing a particular risk join together and cooperate to form a pool. A few of them may be unfortunate (majority safe) and meet a loss. The persons who are fortunate and don't meet loss share the burden of the unfortunate sufferers. Thus it is a cooperative device to share the sufferings of fellow persons. This is a part of human nature. Therefore, we find human beings always live not in isolation but in a community. The modern-day insurance also applies this basic principle. The sophisticated calculation and application of cooperative principle is done behind the screen in a business form. The insurance company creates a group and an agreement (each with other) among all members of the group to share the loss of any member due to an uncertain event taking place. Insurance is a social device for eliminating or reducing the cost to society of certain types of risk (Mowbray and Blanchard).[1] The collective bearing of risks is insurance (Beveridge W).

"Insurance is a device, for the transfer to an insurer of certain risks of economic loss that would other wise be borne by the insured." (Allen Z. Mayerson).

"Insurance has been defined as a plan by which large numbers of people associate themselves and transfer, to the shoulders of all, risks attach to individuals." (Magee D.H.)

"Insurance may be defined as a social device providing financial compensation for the effects of misfortune, the payments being made from the accumulated contribution of all parties participating in the scheme." (D.S. Honbell).

"Insurance by lessening uncertainty, frees the individual from same element of risk." (RelphH.wheny

& Monroe Newman)

"Insurance is a contract by which one party, for a compensation called thepremium assumes particular risks of the other party and promises to payto him or his/her nominee a certain or ascertainable sum of money on a specified contingency." (E.W. Patterson)

**Objectives:**[2] These are following objectives of insurance:
1. Concept of Risk
2. Risk Vs. Uncertainty
3. Loss, Perils and Hazards
4. Types of Risks

**The Concept of Risk:** People express risk in different ways. To some, it is the chance or possibility of loss; to other's, it may be uncertain situations or deviations or what statisticians call dispersions from the expectations. Different authors on the subject have defined risk differently. However, in most of the terminology, the term risk includes exposure to adverse situations. The indeterminateness of outcome is one of the basic criteria to define a risk situation. Also, when the outcome is indeterminate, there is a possibility that some of them may be adverse and therefore need special emphasis. "Risk is a condition in which there is a possibility of an adverse deviation from a desired outcome that is expected or hoped for.[3] At its most general level, risk is used to describe any situation where there is uncertainty about what outcome will occur. Life is obviously risky.[4] The degree of risk refers to the likelihood of occurrence of an event. It is a measure of accuracy with which the outcome of a chance event can be predicted. In most of the risky situations, two elements are commonly found:

(a) The outcome is uncertain, i.e., there is a possibility that one or other(s) may occur. Therefore, logically, there are at least twopossible outcomes for a given situation.
(b) Out of the possible outcomes one is unfavourable or not liked by the individual or that analyst.

**Risk Vs. Uncertainty:** Uncertainty is often confused with the risk. Uncertainty refers to a situation where the outcome is not certain or unknown. Uncertainty refers to a state of mind characterized by doubt, based on the lack of knowledge about what will or what will not happen in the future.[5] Uncertainty is said to exist in situation where decision makers lack complete knowledge information or understanding concerning the proposed decision and its possible consequences. Risk is sometimes defined as an implication of a phenomenon being uncertain – that may be wanted or unwanted.

**(a) Loss and Chance of Loss:** Loss has been defined in many ways. Loss, in accounting sense, means that portion of the expired cost for which no compensating value has been received.[6] Loss refers to the Act or instance of losing the determined or a disadvantage resulting from losing.[7] Loss means being without something previously possessed.[8]

The chance of loss refers to a fraction or the relative frequency of loss. The chance of loss in insurance sense is the probability of loss. The chance or probabilities of loss estimation requires accounting for causes of losses popularly characterized as perils and hazards.

**(b) Perils:** A peril refers to the cause of loss or the contingency that may cause a loss.[9] In literary sense, it means the serious and immediate danger.[10] Perils refer to the immediate causes of loss. Perils may be general or specific, e.g., fire may affect assets like building automobile, machinery, equipment and also, humans. Collusion may cause damage to automobile resulting in a financial loss.

**(c) Hazards:** Properly conditions – consists of those physical properties that increase the chance of loss from the various perils.
**(d) Intangible Hazards:** Attitudes and culture – Intangible hazards are more or less psychological in nature. These can be further classified as follows:

**(i) Moral Hazard:** Fraud – These refer to the increase in the possibility or severity of loss emanating from the intention to deceive or cheat. For example, putting fire to a factory running in losses. With an intention to make benefit out of exaggerated claims, deliberately indulging into automobile collusion or damaging it or tendency on part of the doctor to go for unnecessary checks when they are not required. Since the loss will be reimbursed by the insurance company.

**(ii) Morale Hazard:** Indifference – It is the attitude of indifference to take care of the property on the premise that the loss will be indemnified by the insurance company. So, it is the carelessness or indifference to a loss because of the existence of insurance contract for example, smoking in an oil refinery, careless driving etc.

**(iii) Societal Hazards:** Legal and cultural – These refer to the increase in the frequency and severity of loss arising from legal doctrines or societal customs and structure. For example, the construction or the possibility of demolition of building in unauthorized colonies.

**Types of Risks[11]**

**(1) Financial and Non-Financial Risks:**

Financial risk is concerned with financial loss. In financial risk, output can be measured in monetary terms. Financial, losses occur in case of material damage to property theft of property or loss of business profit because of fire, etc. These losses can be measured in monetary terms. Non-financial risks may be during the selection of a career, the choice of marriage partner, etc. These may or may not have any financial implications. These types of risks are difficult to measures. Insurance also insures against financial risks but not against non-financial risks generally.[12]

**(2) Individual and Group Risks:**

A risk is said to be a group risk or fundamental risk, if it affects the economy or its participants on a macro basis. These are impersonal in origin and consequence. They affect most of the social segments or the entire population. These risk factors may be socio-economic or political or natural calamities, e.g., earthquake, flood, wars unemployment or situations like 11th September attack on U.S. etc.

Individual or particular risks are confined to individual identities or small groups. Thefts, robbery, fire, etc. are risks that particular in nature. Some of these are insurable. The methods of handling fundamental and particular risks differ by their very nature, e.g., social insurance programmes may be undertaken by the government to handle fundamental risks. Similarly, fire insurance policy may be bought by an individual to prevent against the adverse consequences of fire.

**(3) Pure and Speculative Risks:**

Pure risks are those risks which have only two outcomes i.e., loss or no loss. Whereas speculative risks involve the situation where there is a possibility of gain, e.g. investment in shares. This investment may result in a loss or breakeven position, but the reason it has made was for the prospect of gain.[13]

**(4) Static and Dynamic Risks:[14]**

Static Risks – Static risks result from losses due to the destruction of an asset or changes in its possession as a result of dishonesty or human failure. These losses may occur even without any changes in the economic environment. These losses are not useful for the society. They arise with a degree of regularity over time and as a result are generally predictable.

Dynamic Risks – Dynamic risks result from the reasons like changes in the price level, demand and wants of consumers, income, output and development of technology. These risks mainly involve financial losses. These losses affect the society and public. Dynamic risks are the best indicators of progress to society because they are the results of adjustment to misallocation of resources.

**(5) Fundamental and Particular Risks:**

Fundamental risks are those risks which are there because of the problems relating to the major factors such as changes of economic, social, cultural and political environments. Whereas fundamental risks are unemployment, war, inflation, earthquakes, flood, drought, famine, etc. Particular risks occur because of individual events, e.g. burning of house, robbery, etc.[15]

**(6) Business and Personal Risks:[16]**

Business Risk – It is concerned with possible reduction in business value from any source. Unexpected changes in future net cash flows are a major source of fluctuations in business value. Unexpected reductions in cash inflows or increase in cash outflows can significantly reduce business value. These risks may be further divided into: Price Risk and Credit Risk.

Personal Risks – Personal risk are the risks faced by individuals and families. There are a number of personal risks like earning risk, medical expense risk, liability risk, physical asset risk, financial asset risk and risk of longevity. Risk of earning may be there because of the declined in the value of a income earner's productivity due to death, disability, ageing or due to any other problem. Any health risk, etc. may also cause uncertainty in the expenses of the family. A family also has the risk of loss or decrease in the value of the physical assets that it owns. Physical assets may be lost, stolen or may get damaged. Financial assets values also are subject to fluctuations due to changes in inflation and changes in the real values of stocks and bonds. Longevity risk is the possibility that retired people will outline their resources.

Nature of Insurance – The insurance has the following characteristics which are, generally, observed in case of life, marine, fire and general insurances.[17]

1. Sharing of Risk – Insurance is a device to share the financial losses which might befall on an individual or his family on the happening of a specified event. The event may be death of a bread-winner to the family in the case of life insurance, marine
– perils in marine insurance, fire in fire insurance and other certain event in general insurance, e.g., theft in burglary, accident in motor insurance etc. The loss arising from these events if insured are shared by all the insured in the form of premium.
2. Cooperative Device – The most important feature of every insurance plan is the cooperation of large number of persons who, in effect, agree to share the financial loss arising due to a particular risk which is insured. Such a group of persons may be brought together voluntarily or through publicity or through solicitation of the agents. An insurer would be unable to compensate all the losses from his own capital. So, by insuring or underwriting a large number of persons, he is able to pay the amount of loss. Life all cooperative devices, there is no compulsion here on anybody to purchase the insurance policy.
3. Value of Risk – The risk is evaluated before insuring to charge the amount of share of an insured, herein called, consideration or premium. There are several methods of evaluation of risks. If there is expectation of more loss, higher premium may be charged. So the possibility of loss is calculated at the time of insurance.
4. Payment at contingency – The payment is made at a certain contingency insured. If the contingency occurs, payment is made. Since the life insurance contract is a contract of certainty, because the contingency, the death or the expiry of term, will certainly occur, the payment is certain. In other insurance contracts, the contingency is the fire or the marine perils etc. may or may not occur. So, if the contingency occurs, payment is made, otherwise no amount is given to the policy holder. Similarly, in certain types of life policies, payment is not certain due to uncertainty of a particular contingency within a particular period. For example, in term-insurance the payment is made only when death of the assured occur within the specified term, may be one or two years. Similarly, in Pure Endowment Payment is made only at the survival of the insured at the expiry of the period.
5. Amount of Payment – The amount of payment depends upon the value of loss occurred due to the particular insured risk provided insurance is there up to that amount. In life insurance, the purpose is not to make good the financial loss suffered. The insurer promises to pay a fixed sum on the happening of an event. If the event or the contingency takes place, the payment does fall due if the policy is valid and in force at the time of the event, like property insurance, the dependents will not be required to prove the occurring of loss and the amount of loss. It is immaterial in life insurance was the amount of loss at the time of contingency. But in the property and general insurance, the amount of loss, as well as the happening of loss, are required to be proved.
6. Large Number of Insured Persons – To spread the loss immediately smoothly and cheaply, large number of persons should be insured. The cooperation of a small number of persons may also be insurance but it will be limited to smaller area. The cost of insurance to each member may be higher. So, it may be unmarketable. Therefore, to make the insurance cheaper, it is essential to insure large number of persons or property because the lesser would be cost of insurance and so, the lower would be premium. In past years, tariff associations or mutual fire insurance associations were found to share the loss at cheaper rate. In order to function successfully, the insurance should be joined by a large number of persons.
7. Insurance is not a gambling – The insurance serves indirectly to increase the productivity of the community by eliminating worry and increasing initiative. The uncertainty is changed into certainty by insuring property and life because the insurer promises to pay a definite sum at damage or death. From a family and business point of view all lives possess an economic value which may at any time be snuffed out by death, and it is as reasonable to ensure against the loss of this value as it is to protect oneself against the loss of property. In the absence of insurance, the property owners could at best practice only some form of self-insurance, which may not give him absolutely certainty. Similarly, in absence of life insurance saving requires time; but death may occur at any time and the property, and family may remain unprotected. Thus, the family is protected against losses on death and damage with the help of insurance. From the company's point of view, the life insurance is essential non-speculative, in fact, no other business operates with greater certainties. From the insured point of view, too, insurance is also the antithesis of gambling. Nothing is more uncertain than life and life insurance offers the only sure method of changing that uncertainty into certainty. Failure of insurance

amount gambling because the uncertainty of loss is always looming. In fact, the insurance is just the opposite of gambling. In gambling, by bidding the person exposes himself to risk of losing, in the insurance, the insured is always opposed to risk, and will suffer loss if he is not insured. By getting insured his life and property, he protects himself against the risk of loss. In fact, if he does not get his property or life insured he is gambling with his life on property.

8. Insurance is not charity – Charity is given without consideration but insurance is not possible without premium. It provides security and safety to an individual and to the society although it is a kind business because in consideration of premium it guarantees the payment of loss. It is a profession because it provides adequate sources at the time of disasters only by charging a nominal premium for the service.

**Risk Management:** Risk management is emerging an important area of insurance. The insurer succeeds if he is able to manage the risk properly. The risk may be insurance or uninsurable. Insurer transfers the risk to reinsurance companies. Risk is uncertainty or loss or profit. It may arise because of hazards routine business and dynamic functions. The risk may be financial and non-financial. Business risks and individual risks are also insured. Business risks include profit, price, credit and other risks. Personal risks include property risk and liability risk. The risk management involves loss control, loss financing and risk reduction. Loss control is loss prevention method which reduces frequency of loss. Control devices to prevent loss are installed in property to prevent fire. Loss financing is done through retention insurance hedging and risk transfers. Risk reduction is possible through better forecasts anddiversification.[18]

**Need and Objectives:** Risk management is essential to present financial disasters and achieve the objectives of capital management. The success must be sustainable, for which risk has to be prevented and managed. The aspiration of insurance customers can be easily met if the risk is properly managed. It helps right things performances and assists carrying out the duties of care, loyalty and good faith. The competition is beaten over by proper planning of risks.[19] When we consider individual risk management, the objective is to minimize individual's cost of risk. And if we consider public policy risk management decisions, the objective is to minimize society's cost of risk. Another important objectives of risk management are: Protecting employees from accident, effective utilization of resources, minimizing cost of handling risk, to maintain good relations with society and public.[20]

**Identification of Risk:[21]** Risk identification is a prime functions of underwriting and marketing management. The employees and agents of insurance companies are trained to identify the risk and also quantify the amount of risk. Identification of risk is determination of risk where does it lie. The risk may be relating to property, life, liability and nature, fire, theft, damage, natural calamities are the various hazards.

**Property Loss:** The factors responsible for loss are identified and evaluated for the purpose. The insured and uninsured perils are identified. Replacement possibilities and operational expenses of business, revenue loss, normal levels of production, pre-loss situation and post-loss situation are studied to identify the risk.

**Life Risk:** Human life is exposed of several risks e.g., old age, death, health, accident and so on. Some responsibilities such as education and marriage of children, starting of their career, business responsibilities, key men employees, etc. are also attached with human life. Life insurance policies, health insurance, key man insurance etc. are prevailing to minimize the loss of human life.

**Liability:** Liability mainly legal liabilities arise because of contractual relationship. Third party insurance of motor insurance, product liability and professional liability and many new liabilities are added in recent years.

**Other Risks:** There are several other risks which influence the cost and production. Profit insurance is taken for the purpose. Machine breakdown and crop insurance etc. are the recent examples of other risks which are separately insured to reduce the loss can used by such risks.

**Significance of Risk Management:[22]** Risk management is of great significance for individuals and business because everyday we are exposed to risk. Risk management helps not only in prevention of risks but also in its reduction when risk is stopped or reduced; it is profitable to individuals and business which ultimately helps in the social, political and economic development of the country. Risk management has following significance:

1. To evaluate to risks of the business.
2. To formulate the appropriate corporate policies and strategy.
3. To effectively manage the people and Process.

4. To formulate plans and techniques to minimize the risks.
5. To give advices and suggestions for handling the risks.
6. To mane the people aware about the various types of risks.
7. To economies the handling of risks.
8. To decide about which risks are to be avoided and which to bepursued according to analysis.
9. To fix the sum assured under the policy and to decide on whetherto insure or not.
10. To select the appropriate technique to manage the risks.

**Principles of Risk Management:** The Principles of risk management includes top level involvement, culture of accountability, risk prevention, appropriate control, discipline and forecasting negative events. Investment and accountability are important factors of risk management[23].

**Methods of Risk Management:** Risk management has following three mutually exclusive methods[24]:

**1. Loss control:** Loss controls are those actions which reduce expected cost of losses by reducing the frequency of losses and / or the severity of losses that occur. Those methods which are used for controlling the frequency of losses are known as 'loss prevention Method's where as those methods which are used for controlling the severity of losses are known as 'loss Reduction Methods'. Loss control process helps in reducing both the frequency and severity of losses. Loss control can be done in two ways:
(i) Reducing the level of risky activity
(ii) Increasing precautions against loss for activities undertaken. Possibility of loss can very much be reduced by avoiding all the risky activities. This Process of reducing the level of risky activities firstly affect the frequency of losses. The main cost of this strategy is that it forgoes any benefits of the risky activity that would have been achieved apart from the risk involved. Exposure to losses can be completely eliminated by reducing the level of activity to zero, that is by not engaging in the activity at all. This strategy is called "Risk Avoidance".

The second way to control loss is to increase the amount of Precautions (level of care) for a given level of risky activity. It helps in making the activity safe and thus to reduce the frequency and / or severityof losses.

**2. Loss Financing:** Loss financing are the methods used to obtain funds to pay for or offset losses that occur. Following methods are used for loss financing:

**(a) Retention:** A business or individual retains the obligations to pay for part or all of the losses, e.g. any transport company may decide to retain the risk that cash flows will drop due to increase in the Price of oil. When retention is done with a formal plan to fund losses for medium to large business, it is called self-insurance. These retained losses can be paid by the firm either internally or externally. Internally funds are the funds which include cash flows from ongoing activities and investment in liquid assets that are dedicated to financing losses. External sources of funds are borrowing, issuing share, debentures, etc.

**(b) Insurance:** Insurance contracts are the second major method of financing of losses. Insurance contact requires the insurer to provide funds to pay for specified losses in exchange for reviving a premium from the purchases at the inception of the contract. Insurance Contract reduces risk for the insurer by transferring some of the losses risk of losses to the insurer. Insurer reduces riskthrough diversification.

**(c) Hedging:** It is another important method of financing the losses. Instruments like financial derivatives, e.g. forwards, futures, options and swaps are used to hedge risk, i.e. they many be used to offset losses that can occur from changes in interest rates, commodity prices, Foreign Exchange Rates, etc. Individuals and small business do relatively little hedging with derivatives.

**(d) Other contractual Risk Transfers:** The fourth major method of financing of losses is to use one or more of a variety of other contractual risk transfers that allow business to transfer risk to another party. Like insurance contracts and derivatives, the use of these contracts is also pervasive in risk management.

**3. Internal Risk Reduction:** Business can reduce risk internally toothrough following two methods
(i) Diversification, and
(ii) Investment in information

Diversification means not putting all your eggs in one basket. Individuals reduce risk by investing their savings in different investment options. The ability of shareholders to reduce risk through portfolio diversification is an important factor affecting insurance and hedgingdecision of the firm.

Another method of reducing risk is to invest in information to obtain better forecast of excepted losses. Investment in information can produce more accurate estimates or forecast of future cash flows which help in reducing variability of cash flows near to the value predicted. Insurance companies reduce risk by specializing in the analysis of data to obtain accurate forecast of losses. Medium to large businesses find it advantageous to reduce pure risk in this manner.

**Risk Management in Life InsuranceSolvency Margin**

The insurance makes assumptions into future for parameters such as mortality, morbidity, expenses, interest etc. sub regulation (b) of Regulation 5 of insurance Regulatory and Development Authority (1RDA) Regulation (Assets, Liabilities and Solvency Margin for insurers) 2000: specifies that the best estimate assumption shall be adjusted by an appropriate Margin for Adverse Deviation (MAD) which is dependent upon the degree confidence. The purpose of MAD is to build a buffer for mis-estimations of the best estimation or adverse fluctuations. But it does not cover for volatility and catastrophe risks for which a separate excess asset known as solvency Margin should be provided by the insurer.[25]

**Risk Based Capital**

Risk based capital includes asset default risk, mortality morbidity risk, volatility risk, catastrophe risk, margin risk and fund risk. Each company needs to develop implement and maintain appropriate and effective procedures to manage its capital position, ie, on going minimum capital requirements, and future capital requirements. The capitalmanagement planning identifies the quantity, quality and sources of additional capital required, availability of any external sources, estimating the financial impact of raising additional capital, taking into account the plans and requirements of various business units of the company.[26]

**Risk Management in General Insurance[27]**

**Solvency Margin Formula:** IRDA'S relevant regulationsprescribe required solvency margin (RSM) at 20% of the not premiums or30% of net increased claims which ever in higher.

**Risk Based Capital**

Risk Based Capital (RBC) formula comprises asset risk, credit risk, underwriting loss, underwriting premium risk and off balance sheet risk.

**Reserving**

The importance of proper reserving can not be overemphasized. The failure to provide adequately for future claims is attributed to 'under reserving or 'under provisioning; Reserves can be classified as unearned premium reserves (UPR), unexpired Risk Reserve (URR) outstanding claims reserve (OCR), chain Ladder Method, is Average cost per claim Method (ACPC) and incurred but not reported Reserve (IBNR).

**Alternate Risk Management**

These are several alternate Risk Management strategies such as risk transfer (reinsurance), risk hedging through interest ratio etc. longevity binds and managing financial market risks.

## II. Conclusion

The modern industrialized society is exposed to various kinds of uncertainties and risks, which are of different degree and range from the unavoidable to those assumed by choice. The annual losses to individuals and business man from premature deaths, fire, water, accident, wind storm, sea perils, earthquakes, floods, dishonesty, negligence unemployment, lightning, etc. are beyond estimation and indicate the importance of recognizing and meeting them intelligently. In order to avoid or minimize these losses, man has devised various plans to protect himself against these unexpected and unfortunate calamities. Insurance is one of such methods. It is a form of co-operation through which all those who are subject to certain risk and losses pool their resources to compensate those who actually suffer losses [28]

Risk management is a plan to prevent operations of earnings from becoming intolerably impaired by an event that destroys company owned assets or contributing resources. It represents continuous effort to be aware of operational uncertainties and to minimize the loss potential. It unplanned incidents or losses should occur, the adverse effect upon the firm's fiscal integrity and current operations will be minimized. Risk management provides a precise plan for such contingencies.[29]

Insurance and risk management is the assessment and quantification of the likelihood and financial impact of events that may occur in the customer's world that require settlement by the insurer. And the ability to spread the risk of these events occurring across other insurance underwriter's in the market. Risk Management work typical involves the application of mathematical and statistical modeling to determine appropriate Premium corer and the value of insurance risk to 'hold' vs 'distribute.[30]

Insurance and Risk management are forces for restoration and protection for people, communities and companies. They make people whole again after tragedy, providing a safety blanket for workers, offering security for companies to stay in business and protecting fromthe numerous threats out there.[31]

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