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A CRITICAL REVIEW ON TECHNICAL OPERATION AND REDUCING HUMAN ERRORS

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Abstract: **Human errors may occur everywhere and have a variety of consequences. Errors may occur as a result of pressures and situations in industrial operations and maintenance. If the prediction is inaccurate, the forecaster may die. Human error can be said to be a deliberate and voluntary action by a human interacting with another system that exceeds established tolerances defined by that system. The damages done through human error encompasses a continuum that runs from no injury or loss to major damage and casualties, including fatal accidents or death, at times.**
Blaming someone else often merely moves the individuals back to the setting where the error was made. Unless and until the reasons for square measurement mistakes are identified and corrected, the issue may exist indefinitely. This research looked at human errors in engineering operations.
The action to be taken by the human involves the cognitive ability to decide between alternate courses of action based upon knowledge, skills, competencies, experience, and the combined external and internal inputs available to the human. The authors of this paper have made an attempt to do a review on human error in the context of engineering operations.

Key Words: **Human Error, Operation, Technical, Accident, Engineering, Reducing and Review**

I. INTRODUCTION:

When it comes to safety, having a solid knowledge of the machine-human relation is very necessary not only to the safety personnel but also to the supervisors who are looking after the engagement of various skilled workers. This is due to the fact that in recent years, lowering the probability of errors caused by humans has emerged as a top priority all over the world. It is required to build an appropriate relationship between engineering science, systems engineering, safety and the human component in order to avoid and reduce human and machine mistakes, as well as other forms of errors due to the complexity of the systems and processes involved in accident prone technical work. This partnership between machine work-safety-human components will not only assist to eliminate errors caused by humans, but it will also serve to enhance both the efficiency of the work process and the safety of the workers.
It is possible to define human error as an intentional and voluntary activity carried out by a person while interacting with another system that results in a violation of the tolerances that have been established for that system. The damages caused by human error contain a continuum that runs from no harm or loss to substantial damage and casualties, including tragic accidents or death, at times. This continuum ranges from no injury or loss to major damage and casualties. The action that is taken by the human requires the cognitive capacity to choose between alternative courses of action based on knowledge, skills, competences, experience, and the combined external and internal inputs that are accessible to the person.
"A precise sample of human factors error-based intervention for the safety of different technical workers was presented after the completion of a research on human factor error intervention and the evaluation of mixed human factors error approaches to workers safety. As a result, it is imperative that every effort be made to make human factor error applications in the field of workers safety a reality in the future.
There is no doubt that entire socio-technical systems are surely leading, but the majority of the part is complicated and expensive as well. However, system analysis and Systems thinking and design tools- have been practicing for a very long time.
The technical system now-a-days is made up of a wide variety of distinct and semi-independent or semi-autonomous components, which are connected to one another via an intricate network of individuals and groups of individuals. Those who collaborate effectively have a powerful, albeit dispersed, managerial presence when it

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comes to dealing with people and teams, regulations and policies, communications and relationships, equipment and gadgets, all of which take place in an environment that is both unpredictable and constantly evolving. Incorrect information is consistently being overlooked, according to the findings of an analysis of prospective and future employment software and technology.

Records of human longevity and accident rates may give the most compelling evidence of the inherent dependability of the human species. Even in the most perilous of conditions, humans are capable of carrying out an almost unimaginably large number of activities throughout the course of their lifetimes. In spite of this, when we compute the ratio, we find that the rate of accidents and fatalities is rather low.

II. REVIEW OF LITERATURE:

Different study says that mistakes are made when an activity that has been planned does not go as expected. There are a variety of literatures discussed on mistakes in engineering industry that focuses on workers who have been wounded and have given important insight into the degree of damage that is caused by errors. There is plethora of literature available to enhance knowledge about human error and its potential remedies. There are a great number of mistakes made by technical experts working inside the factory that are brought to the notice of the public and the worldwide community. Throughout the course of that technical wrap, safety consultants have been fallen a minimum of ten years behind in safeguarding the lives of human engaged in technical work. Their square measure includes a number of studies that suggest that the technical system requires a great deal of study in order to improve this case.

According to the prevailing school of thought, human mistakes and the factors that contribute to their occurrence are very common, and despite advances in scientific knowledge, there is no way to eradicate them entirely. The conventional thinking is that when it comes to their dealings with one another, humans naturally lack a sense of reliability. In this situation, multiple mistakes occur as a result of inattention, sloth, carelessness, or laxity, all of which are evidence of the belief that people are inherently unpredictable. In addition, this scenario provides proof of the idea that humans are inherently unpredictable.

When it comes to the upkeep of mechanical systems, humans make plenty of mistakes by accident. This is a common occurrence. Because of the increasing complexity of technology, it is becoming ever more difficult for human operators to accurately recognize the behavior of the system. (D.Pons.et al. 2015). Maintenance needs get increasingly intricate as the complexity of technologies used in production and industrial processes develops. As a result, technicians are required to possess a higher level of expertise and knowledge in order to do their jobs effectively. In addition, the chasm that exists between technical improvements and maintenance procedures creates room for a greater margin of error, particularly in situations in which management and planning are carried out inadequately. (Morag et al., 2018) According to, human error is defined as an accidental fault in the performance of work that results in abrupt system damage. Alternatively, human error may be a dormant or latent error that is classified as having the potential to harm the worthiness of a technological system (Virovac et al.2017).It is estimated that between 70 and 80 percent of accidents that occur on board airplanes are the result of human error, and research into the human element is increasing in importance in the context of safety-critical systems. Because it is not researched as much in the manufacturing and maintenance sectors and because, in general, operators are expected to not only run equipment but also execute maintenance and inspection activities, there is a need to examine human aspects (Shappell, S.A,2000).

According to the conclusions of Badenhorst and Van Tonder's study, the primary contributors to human error are a lack of knowledge and a propensity to disobey predetermined guidelines (F.W. Badenhorst, J et.al.2004).

It was mentioned that the expenses of plant maintenance in the US industry are projected to be somewhere around three hundred billion, and roughly eighty percent of this money is spent on the efforts of rectifying the failures of people, systems, and gear (Dhillon, B. S.et.al.2006).Human error and the human component account for about 20-45% of all failures in the Swedish vehicle industry. These mistakes are primarily the result of faulty equipment and machinery handling, insufficient preventative maintenance, and poor cleaning procedures (Salonen, A. 2019). Not only is it vital to offer ergonomic requirements during the construction phase of apparatus or machinery and equipment in order to avert downtimes caused by maintenance, but it correspondingly reduce the opportunity of staff members sustaining injuries (Sheikhalishahi, M.et.al, 2016). Inadequate communication, complacency, insufficient information, disruptions, poor cooperation, shortage of resources, pressure, the inadequacy of awareness, insufficient assertiveness, exhaustion, stress, norms, or cultures were shown to be the most significant contributors to errors (B. Foyle et.al.1995).In order to cut down on the financial losses that are associated with abandonment and unnecessary waste, human error needs to be taken into account and reduced as much as possible. As a result, the science of ergonomics and human components is considered to be a crucial practice area within the lean manufacturing ideas (Torres, Y.,et.al,2021).

Human mistake is responsible for between 75 and 96 percent of all mishaps that occur during marine operations (Rothblum, A. M. 2000).The employees and shipping staff's safety has been put in jeopardy as a result of an inadequate knowledge of the lessons that may be learned from incidents

that occurred during maritime operations (Celik, M. et.al.2009).

According to the findings of the research conducted by Latorella and Prabhu, a number of human factors that are responsible for the existence of human error have been identified. These human factors include time constraints, insufficient responses, challenging environmental parameters (an environmental factor), and the common erring factor of humans (K.A. Latorella et.al.2000).

Accidents that are the result of human error can also occur in the nuclear power generating business due to the fact that personnel in that industry are exposed to radiation, which causes them to carry out their jobs in an unstable manner (Jeong, K.,et.al.2016). The majority of aviation accidents are not the consequence of technological failure but rather the result of human error (Kelly and (Efthymiou 2019). Human mistakes in upkeep and in engineering operations is examined later, to the point where there arelimited scholars have taken an endeavor to analyse the causes of human error and what are the numerous steps that might be accomplished to eradicate them (Salonen, A. 2018).According to the findings of the study conducted by Kovacevic et al., the primary causes of the occurrence of human error are a failure to understand the work activities, a failure to fulfill the technical instructions for maintenance, poorly organized or integrated procedures and techniques, inadequate equipment for prognosis, and a non-fulfillment of the technical instructions for maintenance (S. Kovacevic,et.al 2016).Because of advances in technology, the number of mistakes that are the product of human error has grown in maintenance, but people aren't aware of the factors that contribute to this problem or how they may assist reduce it. Many studies have identified the majority of different sorts of human mistakes that may occur in maintenance, but there have been no attempts made to fill the vacuum left by incorrect actions such as inspection of flaws (Sheikhalishahi, M.et.al,2016). According to the findings of research conducted by Dunn, there is a significant influence on job performance, maintenance costs, equipment safety and dependability, and equipment availability. The following consequences result from mistakes made by humans: the substantial societal and economic cost, as well as concerns about device safety, performance measurements effectiveness and efficiency, system output, incidents and accidents, and fatalities (S. Dunn. 2004).Throughout their research of what caused the catastrophes at Three Mile Island, David Besse, and other nuclear power plants in the United States, those working in the nuclear sector came to the realization that this was one of the most essential lessons they could have possibly learnt. Even if you find the person who was responsible for an error and punish them for their actions, it does not guarantee that another person will not make the same mistake in the future (William E. B. 2019). According to the findings of a study conducted by Latorella and Prabhu, human errors have the most significant impact, as they are the primary cause of accidents and the loss of life, as well as delays in the availability of equipment and obstructions to the productive output of equipment and the effectiveness of operations. It has been demonstrated that improper maintenance caused by human error has a significant influence on the occurrence of accidents and incidents (K.A. Latorella et.al.2000 and A. Hobbs. 2008).

.Human error and human limitations both play a role in aviation accidents however, it should not be treated as the same phenomenon. He also concluded that developing a narrower definition of human error may allow future researchers to develop specific strategies to reduce the impact of true human error in accidents. The antecedents and consequences of human error were also discussed by the researcher and a definition of human error is offered by him (Hansen Frederick, 2006).

Most accidents in the enterprise production are due to human error; to be precise, relevant data shows that more than 80% of the accidents are due to human error. Their study also concluded that accidents are generally caused by the unsafe behavior of the people and the unsafe state of objects and the latter is ultimately caused by human factors. They came up with the various reasons of human error which are complicated, such as employees' own psychological and physiological factors, enterprise training, imperfect management system and poor social environment. Their study came up with strategies to combat human errors like, strengthening basic management to ensure good working conditions; enhancing safety awareness of leadership by strengthening exemplary role models, improving the overall quality, and training security awareness of staff personnel (Shi Wenwenet al 2011).

in the construction industry seeks to determine the major factors influencing human errors associated with the urban construction industry. The study incorporated three rounds of Delphi survey with 17 experts engaged in construction site safety management. The members were selected using a targeted snowball sampling method. According to the results of the Delphi survey, about 35 significant factors were identified and collated which were found to be leading the incidence of human errors in the UCI. In addition, their study also concluded with the top five most significant factors, which included improper work and safety culture, violation of safety regulations, low level of technology deployed for equipment and safety protection, rushing to do work, and lack of a proper education system in the organization(Chan Daniel et al (2022).

(Admiral Hyman Rickover, 1982), a former head of the Nuclear Navy, is credited as having said, "All mistakes are human." (Govt. leaders.org) This may take place at any point throughout the process of selecting materials or designing a product, as well as at any moment during the process of manufacturing or training.

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III. OBJECTIVES:

1. To have a discussion on the factors that lead to human error in different industries.
2. To have a discussion about the few predictable processes that may help to reduce the human errors.

IV. RESEARCH METHODOLOGY:

This qualitative approach places a high premium on the theoretical investigation of human mistakes in maintenance and industrial processes; hence, the secondary data resource will be used to get the required information. The decision to take this approach was made after it was discovered that the existing body of research contained a significant lacuna in terms of identifying the factors that underlie human errors and conducting research into the various ways in which numerical methodologies can be applied to the estimation of human mistakes.

V. DISCUSSIONS:

As a part of the attempts to characterize distinctions between such dependability models, literature from a variety of industries is studied, and it is discovered that the success and accuracy of such approaches are influenced by expert assessment. Human mistakes may be caused by a variety of circumstances, and these factors vary depending on the application; nonetheless, communication and following processes correctly are the primary ones.

In most cases, stakeholders will look to conventional wisdom for guidance about how to prevent future breaches in trustworthiness. This may entail tracking down and confronting the offender, in addition to making efforts to rectify any misbehavior that is still going on. The offender receives a formal warning, more training, and a monetary penalty, the loss of benefits, or any combination of these, as well as other corrective actions, depending on the severity of the infraction. Serial offenders run the danger of having their employment suspended and, in some instances, terminated. In the aftermath of an event, prompt action is usually taken, and in some circumstances, prompt action may help an organisation avoid anger and shame. Criticizing another person and pointing the finger at the system are both fruitless activities because, despite the fact that they may temporarily ease tension, they ultimately result in poor decision making and inappropriate conduct on the part of the individual. When it comes to the management of errors, adhering to a conservative perceptual philosophy is the same as failing to recognize a basic fact. The fact of the matter is that the vast majority of the mistakes that individuals make can be traced back to external factors such as forgetfulness or a lack of attention to their surroundings.

FEW INSTANCES OF FACTORS FOR HUMAN ERROR

A vast amount of information has been gleaned from the theory, research, and practical application of human mistake over the course of the last 15 years. To begin, academic labs have been of great use in assisting us in acquiring a comprehensive grasp of the nature of human mistake at its most basic level. Errors may manifest themselves in a select number of different ways, some of which are as follows: Despite the fact that mistakes may occur in a wide variety of contexts, the most essential thing to keep in mind is that just a few number of behavioural processes seem to be accountable for human errors. In addition, several studies have shown that people's perceptions, communication, decision-making, and problem-solving processes, as well as their behaviour, all reflect similar patterns of inaccuracy. This has been proved both theoretically and empirically.

One further thing that we have realized is that the human, when liberated from the shackles of technology, can be an extraordinarily dependable stand-alone system. Every single person commits errors and gaffes that cannot be traced back to any one external factor. Yet, intrinsic faults like inappropriate actions and a forgetful attitude are also important contributing elements.

Technology, its surrounds and circumstances, principles, and activities all contribute to a significant number of errors made by humans. When humans and technology work together, there are bound to be difficulties. Failing designers, managers, and planners may "set up" people to make errors by failing to take into consideration what is now known about human behaviour and how to apply that information to error-reducing designs. This can lead to individuals being more likely to make mistakes.

There are many other aspects that have contributed to the current predicament. There are several pieces of Engineering equipment and mechanism that do not conform to standards; those that are identified as not functioning in accordance with the requirements are labeled as such. The development of equipment, utensils, and apparatus does not adhere to the principles of human-factors design, and as a consequence, the products do not perform the tasks that their users had envisioned for them. It is not uncommon for the methods for operating and maintaining equipment to be inefficient, difficult to comprehend, and difficult to adhere to.

For instance, Errors in the interpretation of pictures:

Mistakes in other fields A recent study of the literature on human error in technical for many years revealed the following other instances:

- The improper administration of operation may sometimes lead to a number of different types of mistakes.
- Failing to appropriately fill out the paperwork for various records.
- "Mismanagement" and incorrect diagnosis are responsible for a significant number of engineering blunders.

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There are instances when a large number of mistakes occur as a result of a breakdown in the communications that lie under the surface. These errors may have been avoided with the proper training. It is well knowledge that the performance of engineering undergraduates and postgraduate students, interns, and the rest of the technical staff might suffer when they are subjected to high workloads, lengthy or rotating work shifts, stress, and tiredness.

FEW INSTANCES OF REDUCTION PROCESS

It may be possible to eradicate and solve the problem of human error by simply replacing people with robots. The promotion of this strategy demonstrates a firm belief in the usefulness of engineering abilities, with automation functioning as a means to prevent people from making mistakes as the primary purpose of the technology. This is at the very least a questionable assumption given the extreme incapacity of automated systems to cope with uncertain situations and unpredictability in the world around them.

Research on human mistake was seen as a topic that included mental processes that could not properly be examined by behavioral psychology from the year 1912 until the year 1970. In 1970, there were two significant occurrences that started to break through this barrier. In the beginning, modern cognitive psychology developed approaches that were supported by good scientific evidence for researching human cognition. We now have a distinct picture of how people think and how they act as a direct outcome of decades of study and theoretical development in this area. In response to an increasing number of industrial disasters in which human error played a significant role, this prompted a variety of different industries and governments around the world to conduct research into the various human errors and to develop practical policies and procedures for error management. This was done in order to prevent further catastrophes.

Mistakes are more likely to occur in activities that need the application of a rule or procedure, such as driving, rather than in activities that are still based on or automated, such as driving. Tasks that involve the application of knowledge to solve new difficulties are the ones that are most prone to human error. This is because information has to be decoded before it can be properly applied to real-world situations. During the changeover, there is the potential for errors to occur.

When work procedures and equipment are built with knowledge of cognitive psychology in mind, it is generally possible to prevent these mistakes or at least limit the ramifications that they have. When an inherent mistake has the potential to create significant impacts, it is a good idea to adopt error-absorbing designs to limit the implications. This is a notion that comes from the field of human factors.

The sorts of mistakes that occur very routinely in incident reports, research studies, malpractice claims, and other types of documents are instructive to investigate and analyze in detail. It would have been possible to avoid making such mistakes if one had given further thought to ongoing operations such as training, correct processes, and the design of the necessary equipment.

Training: The necessary task-specific training and chances for supervised practice those are required for individuals are not provided to them in a timely manner. Some of the problems that have been addressed in other systems may not be solvable in the technical profession at particular points in time due to the nature of the work that is done.

Alarm: Think about using audio enunciator alarms to inform operators of faults in equipment or processes, as is common practice in many different kinds of systems. They may be quite persistent and exceedingly loud, to the point where operators are forced to turn them off or dial down the level to the point that they are no longer heard anywhere other than in close proximity to the source of the alarm. There have been fatalities at power plants and on trains as a direct consequence of the suppression of alarms in situations quite similar to this one. Given that individuals receiving home care can range in age from infants to the very elderly, and that they may be affected by a variety of disabilities, including language, visual, hearing, and physical impairments, it is surprising that research on this topic is only reported on a regular basis in the literature. It is encouraging to see that attempts to enhance the usability of engineering devices have been driven in some circumstances by the lessons that have been gained from other types of systems.

VI. FINDINGS:

After reading over a variety of pieces of research and literature, it has become clear that people are an ever-ubiquitous and crucial component of the overall picture in the operational system. Humans, in contrast to the mechanical parts that make up a building, vary widely from one another in practically every mental and physical quality that can be identified. This is because people are not interchangeable. There is only one person who, when presented with a situation that is comparable to another person's, does not automatically respond in the same way as the other individual; this person is the exception.

Accidents are often caused by both risky acts of persons and hazardous circumstances of the goods involved, with the latter being ultimately caused by human factors. They proposed a number of complicated factors for human error, including employees' own psychological and physiological characteristics, company training, flawed management systems, and poor social situations. The human factor is one of these reasons. Their study led to the creation of ways to lessen the risk of human-caused mistakes. They include

strengthening basic management in order to enhance working circumstances; increasing management safety awareness via the formation of good role models; enhancing overall quality; and coaching, training, and mentoring staff safety awareness.

While there is a wide range of variation in individual performance, the reliability of the technique used to offer engineering treatment is contingent on the hundreds of thousands of people that comprise the system. The factory is surrounded by a variety of engineering personnel, including operation research experts, administrators, technicians, aides, orderlies, pharmacists, accountants, engineers, and maintenance technicians, amongst others. These workers have a close working relationship with the engineering equipment, and as a result, they play an important part in assuring the device's reliability, consistency, and safety. The factory system, in contrast to other systems in which technology is at the core of the system and humans operate solely as equipment monitors and supervisors, is oriented on people and is driven by people, rather than technology. This is in contrast to other systems. All types of engineering equipment, including machines such as inclined plane, wedge lever, wheel and axle, pulley tools used in machines, diagonal snips Pliers-locking pliers, Multi-purpose bits, Hammers- ball-peen hammer, metal bits, hole saws, forstner bits, countersinks, needle nose pliers, flush cutters, etc., flat-head, claw hammer, are connected to one another and maintained by a wide range of specialists who adhere to a predetermined set of protocols and guidelines in order to guarantee the well-being of technical workers.

Negligence on the part of workers is the cause of a significant number of accidents each year. Explosions, fires, and chemical releases are only few examples of the many incidents and failures of the technical system that have the potential to be catastrophic, resulting in property damage, fatalities, and other repercussions.

Accidents and unfavourable outcomes in chemical engineering are unfortunately rather frequent, yet they pose a significant threat to one's health. They are underreported in statistics on accident complications and are only reported in the press on a very seldom basis, unless they are the subject of a lawsuit alleging Engineering misconduct. There are micro catastrophes occurring all across the technical system of engineering factory. The majority of their designs are one-of-a-kind, and they are available in a wide variety of styles.

In part due to this disconnect, defects that begin in the technical system as a result of human or equipment failure do not propagate throughout the system or result in catastrophic failures such as the challenger space shuttle accident. Instead, these defects remain localized to their point of origin and do not affect other parts of the system. There is no question that, to some degree, there are mistakes here, a committee of bungles there, an accident here, and a casualty there in addition to other things. There is also no question that there is a casualty here. More than one hundred thousand of these occurrences take place every single year, which is a significant quantity.

In a socio-technical system, technical system may be affected by both events that are extrinsic to the system and events that are internal to the system. Examples include public pressure, legal and regulatory constraints. Even though it is difficult to assess the quantity and nature of these extra influences and their impact on the reliability of machinery, they still need to be examined. This is necessary in order to prevent placing an excessive amount of emphasis on the significance of the technical aspects.

VII. CONCLUSIONS AND SUGGESTIONS:

Over the course of the last few years, an increasing number of technical professionals and practitioners of tools and equipment’s have started paying more attention to the issue of engineering errors. Despite this, it has already been shown, through the use of a great many studies that a sizeable number of people lose their lives as a consequence of mistakes that were made in the technical field.

1. Human mistake is seen as a significant issue in today's complex and technologically advanced world. This is because of the many dimensions involved. It is particularly important in light of the vast size and complexity of the technical delivery system, as well as the general high quality of the system.
2. Accidents are often caused by both risky acts of persons and hazardous circumstances of the goods involved, with the latter being ultimately caused by human factors. There are numbers of complicated factors for human error, including employees' own psychological and physiological characteristics, company training, faulty management systems, and poor social situations. The human factor is one of the significant reasons. That led to the creation of ways to lessen the risk of human-caused mistakes. Many organizations include strengthening basic management in order to enhance working circumstances; increasing management safety awareness via the formation of good role models; enhancing overall quality; and coaching, training, and mentoring staff safety awareness.
3. There are many elements that contribute to human errors that can be addressed, and a great deal of change can be achieved through the authority and discretion of the management power. One such aspect that contributes to human errors is making mistakes by accident.
4. The most significant factors were a lack of adequate quality education within the company, an improper working environment and culture, a violation of safety standards, a violation of safety standards, a poor degree of technology implemented for equipment and safety

protection, a haste to complete work, and a haste to complete work.

5. Workplaces must have the potential to be enhanced with sufficient time and effort. The results of training should be observable and tangible.
6. The incorporation of human-factors designs principles into the creation of working environments, instruments, and other types of machinery may all be beneficial.
7. The knowledge that is currently available on the impact that disruptions to circadian rhythms have on performance might be used to create shift-changing and resting work sequences that are more effective.
8. A worker's skills and abilities might be evaluated in relation to the needs of the job for which they are engaged, and then those workers could be allocated to roles depending on the results of that evaluation. Because these corrective procedures have been used successfully over the past decade on a wide variety of systems, including nuclear power plants, aircraft design, as well as all types of engineering and industrial equipment and consumer products, amongst others, they have the potential to reduce the number of errors that are caused by humans.
9. On the other hand, in the field of computer, the fact that computer software has the potential to cut down on the number of occasions when these kinds of mistakes occur is an encouraging message that should be conveyed to workers.
10. The process of assessing the amount to which human error impacts maintenance and economic operations.
11. The act of shifting blame to another person does not solve the issue; rather, in many instances, all it does is move the actors inside the situation in which the error was committed. Pointing the finger at another person is not an effective solution to the issue.
12. If the factors that contribute to an incorrect square measurement that are not identified and corrected, it is possible that the error will continue to be produced until the end of time. This is because there is no way to determine which factors contribute to the inaccuracy.
13. The development of effective mechanisms for reporting human mistakes in order to ensure the availability of sufficient data for human error analysis and management is needed.
14. The society we live in now has access to apparently extraordinary choices for mistake avoidance as a result of recent technical breakthroughs and modifications to software programs. As a consequence of this, the whole of the Engineering community is quite optimistic, and they are of the opinion that there is the possibility for considerable improvement in this field in the not-too-distant future.
15. Errors caused by humans have long been acknowledged as a problem in the technical field by experts in the engineering industry. The technical society has become increasingly aware human-factors problems as a result of a surge in the frequency of what seem to be systematic human mistakes in human-machine interactions, procedure usage, and other technical activities in recent years. We may anticipate the establishment of a joint venture between technical and human aspects to solve human and other flaws, and this can be expected very soon.
16. Using human factors concepts in the formulation of maintenance policy and strategy will help firms correctly begin the process of decreasing and better controlling human error.
17. The process of establishing or improving methods for assessing the possibility of errors occurring in each sector in order to priorities preventive and predictive measures to be done.
18. It is important that training programs to be designed to aid in raising awareness of the influence that human error may have from both an individual and a group perspective.

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