CHAPTER I
INTRODUCTION
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This chapter reveals an overview of the research. It drafts the background of the study, the problem statement, the research objectives, the research questions and the outline of the thesis.

1.1 BACKGROUND OF THE STUDY

"Health is Wealth", "Health is like currency, and we never have a correct idea of its value until we lose it." - Josh Billings.

There is nothing in our life that is more precious than good health. Without health, there is no happiness, no peace, and no success. A person with bad health cannot enjoy the pleasure of being wealthy. Health is more important than money. Money cannot buy health and pleasure. But a healthy person remains in a state of bliss and happiness.

It is the general tendency of human beings to ignore their health, which results in health issues. Ignoring health also includes proper body posture. While performing any work, if proper body posture is not maintained, it results in eye strain, back, and neck pain, and so on. Maintaining good health at workplace ergonomics practices is required.

Ergonomics is the science of designing the workplace, keeping in mind the capabilities and boundaries of the worker. Poor worksite design leads to fatigued, bothered, and hurting employees. This rarely
leads to the most productive worker. More likely, it leads to a painful and costly injury, lower productivity and poor product quality.

A systematic ergonomics improvement process removes risk factors that lead to musculoskeletal injuries and allows for improved human performance and productivity. By making improvements to the work process, it is like removing barriers to maximum safe work performance. It is as good as providing workers with a job that is within their body's capabilities and limitations.

Sound ergonomics, can improve process can be a key contributor to your company's competitiveness in the marketplace and provide a better work experience for your people. In many industries, such as major hazards, defense, and transport, ergonomics is also called 'human factors'.

Ergonomics is a science concerned with the 'fit' between humans and their work. It puts people first, taking account of their capabilities and limitations. Ergonomics aims to make sure that tasks, equipment, information and the surroundings fit each worker.

Ergonomics can also reduce the potential for ill health at work, such as aches, pains and damage to the wrists, shoulders and back, noise-induced hearing loss and work-related asthma. Consider the layout of controls and apparatus – they should be positioned in relation to how they are used. Place those used most often where they are easy to reach without the need to bend down, enlarge or hunch. Making sure protective measures such as extraction hoods or respirators are easy and comfortable to use means they are more likely to be effective at reducing exposure to dangerous substances.
If you don't chase ergonomics principles, there may be serious consequences for people and whole organizations. Many well-known accidents might have been prevented if ergonomics and individual factors had been measured in designing people's jobs and the systems they worked.

Ergonomics is concerned with the "fit" between the user, equipment, and their environments. It takes reason of the user's capacities and restrictions in looking for to ensure those accountabilities, jobs, information and the environment comfortable for each individual employee.

To assess the fit among a person and the used skill, human factors specialists or ergonomists consider the job (activity) being done and the demands on the user; the equipment used (its dimension, shape, and how suitable it is for the task), and the information used (how it is presented, accessed, and changed). Ergonomics draws on many corrections in its study of humans and their environments, including anthropometry, biomechanics, mechanical engineering, industrial trade industrial plan, information design, kinesiology, bodily processes cognitive psychology, industrial and managerial psychology, and space psychology.

Office ergonomics serve significant function in preparing for and respond to, workplace dangerous incident. Workplace dangerous incidents are unexpected events that often are major enough to overcome normal coping response they vary in type and severity and can affect employees as well as management. Such incident can seriously affect the emotional, expressive and physical well-being of employees, employers, and the entire association.
Negative effects of the unsolved ordeal of a critical event in the workplace can contribute to overall lowered levels of efficiency, poor presentation, more frequent interpersonal conflict, increased absence, increased use of physical and mental health benefits, increased workers' reimbursement claims, higher earnings, higher rates of alcohol and other substance misuse and abuse, and lower overall employee contentment and morale.

Merriam Webster's dictionary defines it as "an functional knowledge concerned with design and organize things people use so that the people and things act together most capably and safely—also called human being engineering."

Because of the increasing number of injury caused by repetitive motion, excessive force, awkward posture, and the use of tools, ergonomics has become a critical factor in workplace safety. Therefore, ergonomics is the science that seeks to acclimatize tasks and apparatus to fit the person. It's a way of looking at the generally organization of the design of responsibilities, tools, equipment, and workplace layouts, with entity people to fit the job to the employee rather than the worker to the job.

Injuries from poor ergonomic conditions typically involve the skeleton, muscles, joints, tendons, and nerves. Even with the progress of many new ergonomically designed hand/power tools are being developed, some unceasing or cumulative trauma injuries are still caused by inadequate tools.

Ergonomics awareness has a substantial force on the industry, organization, management, employees and generally well-being of the system. Ergonomics is a scientific obedience concerning with the
understanding of interactions among humans and other fundamentals of a system and it will donate to job satisfaction. According to Musonda and Smallwood (2008), awareness is not only based on knowledge but also on the demonstration of behavior. Ergonomics awareness helps in ergonomics application and contributes appreciably to human wellbeing and safety due to an easier work environment and ergonomically designed tools, man-machine border design and suitable work method to human anatomy.

1.2 ERGONOMICS

What is ergonomics? Is it something connected to science or machine? Do you find yourself getting more fatigued at the end of the day? Are you hunch at your desk? Do you suffer from neck ache or back aching? Many employees don’t appreciate that the way you work at your desk can appreciably affect your well-being.

Ergonomics can be defined simply as the learning of work. More specifically, ergonomics is the knowledge of designing the job to fit the worker, rather than actually forcing the worker's body to fit the job. Adapt tasks, work stations, tools, and tools to fit the worker can help condense physical stress on a worker’s body and reduce many potentially serious, disabling work-related musculoskeletal disorder (MSDs). Ergonomics draws on a number of systematic disciplines, including composition, biomechanics, psychology, anthropometry, industrial sanitation, and kinesiology.

“Ergonomics is the scientific regulation concerned with the understanding of connections among humans and other essentials of a system, and the profession that applies assumption, principles, data
and methods to invent in order to optimise human well-being and general system performance." (International Ergonomics Association.)

The terms 'ergonomics' and 'human factors' can be used interchangeably, although 'ergonomics' is frequently used in relation to the physical aspects of the surroundings, such as workstations and control panels, while 'human factors' is often used in relation to the wider system in which individuals work. On this site, we generally use the term that hysteric most closely with the research or the production that we are discussing.

Ergonomics is a science-based regulation that brings together knowledge from other subjects such as anatomy and physiology, psychology, engineering, and data to ensure that designs complement the strength and abilities of people and minimize the effects of their limitations. Rather than expectant people to adapt to a design that forces them to work in a painful, stressful or dangerous way, ergonomists and human factors specialists seek to understand how an invention, workplace, or organism can be designed to suit the people who want to use it.

**Ergonomics is broadly divided into Three Parts**

*Types of Ergonomics  FigureNo.1.1*

- Physical Ergonomics
- Cognitive Ergonomics
- Organizational Ergonomics
• **Physical Ergonomics:**

Physical Ergonomics are concerned with the interface of the body with the tools and the tools, preparatory right from the chair to the computer. It also studies its effect on the body, for example, rhythmic disorder, workplace protection, health and layout, musculoskeletal disorder and bearing. Physical ergonomics is concerned with the impact of anatomy, biomechanics, physiology, and physical environment on physical activity. Areas of spotlight in physical ergonomics consist of the consequences of repetitive motion, workplace safety, and comfort in the use of portable devices, working postures, and the work environment.

• **Cognitive Ergonomics:**

Cognitive ergonomic emphasize the ways of information processing by the intellect and its presentation. It is associated to the motor function, workload, decision-making, and memory-usage. This helps in considerate the interaction and relation of the human mind with the data management.

• **Organizational Ergonomics:**

Organizational ergonomic working on complete optimization of the workplace, right from excellence management to teamwork. It includes management everything in the organization to make it a better position to work. Organizational ergonomics is related with the optimization of socio-technical systems, together with their organizational structures, policies, and processes.
Fields of ergonomics:  Figure No.1.2

- **Engineering Psychology:**

  Engineering Psychology working on the association between human and equipment and makes a constant effort to improve the relation. This might include altering the location of the workplace, modify the ways of using a machine or redesigning of the tools. In short, the main work of engineering psychology is to build the machines 'user-friendly' for the employees.

- **Macro-ergonomics:**

  Works on a wider aspect and emphasizes more on the organizational environment, history, objective, culture and design. It concentrates more on the physical invent and the surrounding environment. Its aim is to situate an efficient work system and consequently recover
the employee satisfaction, safety, health and efficiency in the association or workplace.

- **Seating Ergonomics:**

  Seating ergonomics can be defined as a restful working posture with a natural configuration of all your joints from head to toes. Before discussing on how to set your computer terminal let’s have a look at the concept of ergonomic seating (neutral body positioning). This method of Ergonomic Seating helps you reduce the anxiety and strain on the muscles, tendons, and emaciated system thus reducing the risks of developing ergonomic problems.

### 1.2.1 HISTORY OF ERGONOMICS

Christensen (1987) points out that the significance of a “good fit” between humans and tools was probably understood early in the development of the species. Australopithecus Prometheus selected pebble tools and made scoops from antelope bones in a clear demonstration of selecting/creating objects to make tasks easier to complete.

In the work environment, the selection and making of tools, machines, and work processes constant. Over centuries, the effectiveness of hammers, axes, and plows better. With the Industrial insurrection, machines such as the spinning jenny (a machine that produced thread to make cloth) and rolling mills (a method of flattening iron ore into flat sheets) were developed to get better work
processes. This is the same inspiration behind much of ergonomics today.

The association between occupation and musculoskeletal injuries was documented centuries ago. Bernardino Ramazinni (1633-1714) wrote regarding work-related complaints (that he saw in his medical practice) in the 1713 addition to his 1700 publication, “De Morbis Artificum (Diseases of Workers).”

Wojciech Jastrzebowski formed the word ergonomics in 1857 in a optimistic narrative, “based upon the truths drawn as the Science of Nature” (Jastrzebowski, 1857).

In the early 1900's, the manufacture of was still largely reliant on human power/motion and ergonomic model were developing to improve worker effectiveness Scientific Management, a method that better worker efficiency by improving the job method, become popular.

Frederick W. Taylor was a pioneer of this approach and evaluate job to determine the “One Best Way” they could be achieve. At Bethlehem Steel, Taylor dramatically increased employee creation and remuneration in a shoveling task by matching the shovel with the type of substance that was being moved (ashes, coal or ore).

Frank and Lillian Gilbreth made jobs more capable and less fatiguing through time motion testing and standardizing tools, materials and the job procedure. By applying this approach, the number of motion in bricklaying was condensed from 18 to 4.5 allowing bricklayers to enlarge their pace of laying bricks from 120 to 350 bricks per hour.
World War II prompted greater interest in human-machine communication as the efficiency of sophisticated military tools (i.e., airplanes) could be compromised by bad or confusing design. Design concept of fitting the machine to the size of the participant and logical/understandable control button evolved.

After World War II, the focus of concern expanded to include worker security as well as productivity. Research began in a variety of areas such as:

- Muscle force required to perform manual tasks
- Compressive low back disk force when lifting
- Cardiovascular response when performing heavy labor
- Perceived maximum load that can be carried pushed or pulled.

Areas of knowledge that involved individual behaviour and attributes became known as cognitive ergonomics or person factors. Areas of knowledge that involved physical aspect of the workplace and human ability such as force required to lift, vibration and reaches become known as industrial ergonomics or ergonomics.

The broad group spotlight and name duality continue at this time. Contributor to ergonomics/human factors concepts include trade engineers, industrial psychologists, occupational medicine physicians, business hygienists, and safety engineers. Profession that use ergonomics/human factors information contain architects, occupational therapist, physical therapists, occupational medicine nurses, and insurance loss manage specialists.

1.2.2 ORGANIZATIONAL ERGONOMICS

Organizational ergonomics is concerned with the optimization of socio technical systems, including their organizational structure policies,
and process.[5] (Relevant topics include communication, crew source management, work design, work systems, the plan of working times, teamwork, participatory design, population ergonomics, cooperative work, new work program virtual organizations, timework, and quality management.)

"Human Factors" redirects here. For the journal, see individual Factors (journal). Human factors and ergonomics, also known as comfort design, efficient design, and systems, is the practice of designing product, systems, or process to take appropriate account of the interaction among them and the community who use them. The field has seen offerings from numerous discipline, such as psychology, engineering, bio-mechanics, industrial design, physiology. In essence, it is the study of designing apparatus and devices that fit the human body and its cognitive ability. The two terms "human factors" and "ergonomics" are fundamentally synonymous.

The International Ergonomics Association defines ergonomics or human factors as below:

Ergonomics is the scientific faculty concerned with the understanding of relations between humans and other factors of a scheme, and the occupation that applies theory, principles, data and technique to plan in order to optimize human being well-being and largely system performance. HF&E is employed to complete the target of professional health, safety and productivity. It is appropriate in the design of such things as safe furniture and easy-to-use interface to machine and equipment.

Proper ergonomic design is essential to prevent rhythmic strain injuries and other musculoskeletal disorder, which can build up over time and can leads to long-term disability. Human being factors and
ergonomics are concerned with the "fit" between the user, apparatus and their environments. It takes relation of the user's capabilities and restrictions in seeking to make sure those tasks function, information and the atmosphere suit each individual.

To assess the fit among a human being and the used knowledge, human factors specialists or ergonomists consider the work being done and the demand on the user; the apparatus used (its size, shape, and how appropriate it is for the task), and the information used (how it is presented, access and changed). Ergonomics draw on several disciplines in its study of human and their environments, together through anthropometry, biomechanics, mechanical engineering, industrial engineering, manufacturing design, kinesiology, physiology, cognitive psychology, organizational psychology, and space psychology.

1.2.3 BENEFITS OF ERGONOMICS

Excellent ergonomic habits have a trend to spread all through an organization. When one member of staff sees his or her collaborator typing away on a fancy modifiable ergonomic keyboard, they'll want one for their own desktop. Savvy staff members will take benefit of this "keeping up with the Jones' mentality" not only by giving ergonomic apparatus for all but also by providing ergonomic training workshop and arranging regular support group for at least their maximum risk employees, so that they can replace tips and offer support.

Employees who spend extra time concentrating on, you know, their work than their ache come up with better ideas and have high productivity and efficiency rate. What's more, an employee who follow ergonomic guidelines and who work with in fully ergonomic offices
have far lower rate of chronic injury, which keeps insurance deductibles and employees compensation claims low. An efficient ergonomics process can promote your organization in a number of different way.

In fact, Washington State Department of Labor and Industries review 250 case studies on the effects of ergonomics in a range of settings. They found that ergonomics may have a profound impact on organization, including the following benefits:

- **Ergonomics reduces costs:**

  By methodically reducing ergonomic risk factors, you can prevent expensive MSDs. With approximately Rs.1 out of every Rs.3 in workers compensation costs attributed to MSDs, this represents an opening for significant cost savings. Also, don't forget that indirect cost can be up to twenty times the direct cost of an injury.

- **Ergonomics improves productivity:**

  The best ergonomic solution will often get better productivity. By designing a job to permit for good posture, less exertion, fewer motion and better heights and reaches, the workstation become more efficient. Investing in ergonomics can boost the productivity of your employees. A 2003 study found in International Journal of Industrial Ergonomics found that a printed route legislative body factory implemented ergonomics improvement and as a result saved $574,560 in a year on rejection costs. In addition, they saw a fall in the rejection rate, an increase in monthly revenue, and improvement to productivity and quality.
Another study published in a 2003 edition of Ergonomics provides another look at the productivity-enhancing result of good ergonomics on a workplace. The study sought to evaluate the effects of ergonomics on the productivity of employees in a computer-intensive environment. Employees at a call center were split into a control set and three test groups of varying level of ergonomic intervention. The study found that output increased by 4.87% in the group of employees who had the ergonomic improvements made to their workspace, while the control group saw a 3.46% fall in output – meaning the group with improved ergonomics was 8.33% more useful than the control group.

- **Ergonomics improves quality:-**

Poor ergonomics leads to frustrated and fatigued employees that don’t do their best work. When the profession task is too physically taxing on the employee, they may not perform their job like they were trained. For example, an worker might not fasten a screw tight sufficient due to a high force condition which could create a product quality matter.

- **Ergonomics improves employee engagement:-**

Employees notice when the company is putting forth their finest efforts to ensure their healthiness and protection. If a worker does not experience weakness and discomfort during their workday, it can reduce turnover, decrease non-attendance, improve self-esteem and enlarge employee involvement.
• **Ergonomics creates a better safety culture:**

Ergonomics shows your organizations commitment to safety and health as a core value. The cumulative effect of the earlier four benefits of ergonomics is a stronger safety culture for your organization. Healthy employees are your most important asset; creating and nurturing the safety & health culture at your organization will lead to better human performance for your company. Safety is significant to keeping your operations running and your workers healthy – but it requires buy-in from employees as well as management. When you invest in ergonomics, you are demonstrating to your workers that you are committed to doing your responsibility to ensure, safe, healthy working condition, so they'll be more inclined to do theirs.

• **Decreased Employee Turnover:**

Another benefit of higher job pleasure for your employees is that they may be fewer likely to leave for a new position. A study available by the American Center for Progress found that the median cost of employees turnover to an employer was about 21% of an employee’s annual income. Investing in ergonomics can help you decrease your organization’s employee turnover cost.

• **Decreased injury risk:**

Ergonomics in the place of work has to do largely with the safety of workers, both long and short-term. Ergonomics can help decrease costs by improving safety. This would reduce the money paid out in workers' compensation. For example, over five million employees sustain overextension injuries per year.
• Decrease lost work days:-

Ergonomics is all about the comfort between worker and work furniture and facility supplier by the employer. Lost work days concept called place of work incidents is common and inevitable. Some injuries are negligible and some are major. Major injuries often mean time off work. This time phase in which the employee is not available for work but is still an employee is called lost days. After execution of ergonomics, these man days lost is decrease drastically.

• Broader Commitment to Safety:-

Safety is critical to keeping your operation running and your employees healthy – but it require buy-in from employees as well as an employer. When you spend in ergonomics, you are demonstrating to your workers that you are committed to doing your part to make sure safe, healthy working conditions, so they'll be more tending to do theirs.

WMSDs remain a widespread and growing issue of concern in automated industry. It is estimated that over five million employees sustain over extension injuries per year. During ergonomic intervention, workplaces can be designed so that employees do not have to overextend themselves and the production industry could save billions in employee’s compensation. Manufacturing industries once thought that there was a bottom-line trade-off among safety and efficiency. Now they embrace ergonomics because they have educated that designing a safe work atmosphere can also convert in greater efficiency and productivity. Recently, U.S. laws requiring a safe work atmosphere have stimulated great interest in Ergonomics- from ergonomic equipment to ergonomic training. But it is in the design of the place of work as a whole where the greatest impact can be seen for
equally safety and efficiency. The easier it is to do a job, the more probable it is to see gains in productivity due to better efficiency. The achievement of automated industries is based on the ergonomic design of CNC machines and their interfaces.

In the literature, the discussion on the impact of anthropometric factor on human performance figured prominently. Some of the studies worth mentioning are Kee and Karwowski (2004).

1.3 PRACTICES OF ERGONOMICS

Ergonomics is the study of the interaction among people and the objects they use and the environment they function in. If equipment, workstation and work method are designed to suit employees' capabilities and limitation, health, safety, and performance are maximized. Ergonomics is appropriate the task to the person. Ergonomics improve health and safety, reduces expenses from absences and reduced productivity, and ensures that social and legal obligation of worker to their employees is being met. Ergonomics is the science of designing work process and equipment for employees and should be measured when there are injuries, complaints, staff turnover or non-attendance from work. One method of solving an ergonomic difficulty or complaint is to regulate the employee's workstation.

**Ergonomics requires the following steps:**

- Recognizing the complaint or problem and documenting the job tasks.
- Evaluating the existing situation consulting resources/experts on best practice.
• Identifying mismatch between the existing condition and human Capabilities.
• Evaluating the achievement of the recommendations.
• Providing recommendations and implementing recommendations.

1.3.1 GENERAL GUIDELINES-BEST PRACTICES

The following guidelines are appropriate for office workers who sit at a desk and work on computers. These guidelines pertain to chairs, computer workstation, telephone/desk areas and best postures for working at this station.

Ergonomic Chair:

• In general, one is supposed to be able to sit in the chair with feet flat on the floor, knees, and hips at about 90 degree.
• The seat depth should allow around two fingers of space between knees and end the of the seat.
• The low back should be supported through the back of the chair. The curve in the back should match the curve in the chair.
• Some workers prefer additional support to the upper back area.
• Arms rests, if available, should allow for arms and elbows to relax comfortably, also at 90 degrees.
• It is significant that arms and shoulders are resting comfortably during typing.
• Armrests should be adjustable to avoid interference with the keyboard tray and to other responsibilities.
• Chairs should be adjustable to permit for tilting between 95 and 110 degrees. This allows one to push back and alternate positioning as needed for ease.

**Computer Workstation:**

• Computer monitor should be placed directly in front of the employee, approximately 18-24' from the body.

• Top of a monitor should be at about eye level, or slightly lower to avoid neck extension. The optimal viewing angle is 15-30 degrees below parallel to avoid neck, shoulder and eye fatigue.

• The monitor may require to be lower slightly below eye level height for bifocal wearers.

• Keyboard tray and keyboard should also be directly in frontage of the worker. While resting the on the home row, fingers, hand, wrists should be in a original or neutral location. Shoulders should be at rest, not hunched upwards as hunching upwards will face additional stress and fatigue on shoulders, neck and upper back area.

• Computer mouse should be at the same level as the keyboard and close sufficient to prevent over extended reaches.

• Employees may wish to consider alternating the computer mouse to the left - right side in order to alleviate the extreme or constant use of one hand to perform computer mouse work.

• Foot rests should be provided for seated works to provide a solid support for the feet in case the feet don't touch the floor surface.

• Document holder, placed on both side of the computer monitor will decrease forward flexion of the neck or further awkward neck posture. Document holder should be considered for those
who frequently types on to the computer from hand written document.

**Body Postures:**

- Shoulder, arm, and wrists should be in comfortable positions. While seated, arm should be at about 90 degree to the body, with shoulders relaxed and wrist in a neutral position.

- Holding tensed muscles in a stable or awkward position for long period of time is called static work. Static works result in a burning sensation discomfort and fatigue because there is decreased blood flow to the tensed muscle. Fatigue lead to a buildup of waste materials at a muscle levels, known as lactic acid. When fatigued the load is transferred to the tendons and ligament. With time, this can lead to cumulative injuries.

- Work heights have a major impact on job performance and musculoskeletal injury. Working too high, with arms held away from the body, and shoulders lift, contributes to static loading. Working too low results in workers bending forward which can direct to neck and back pain.

- For work at elbow level (i.e. desk and computer work station) reaching should be within 10 inches for frequently used item such as answering the phone. For irregularly reached for objects, say once every two minutes, reaching distance can be slightly longer at 20 inches from the body.

**Desk/Telephone Area:**

- Regularly used objects like telephone, binders, reference material, etc should be positioned within 10 inches 25 cm in front of the employee.
• Items occasionally reached for can be within 20 inches 50 cm in front of the employees. Occasional attain should be kept within 29.5 inches 75 cm in front of the employee.

• Employees who make everyday phones should consider using a head set. This will prevent cradling of the phone between ear and shoulder while difficult to take notes, or recover other information.

• Employees may need to regulate chair when relocating from computer work station to desk area as generally desk are positioned higher than are keyboard area. While working at a desk, arms should continue to remain at a comfortable and neutral position so that arms are at about 90 degrees at the desk, and shoulder is not hunched upwards.

![Office Syndrome FigureNo.1.3](https://www.123rf.com/photo_45890103_infographic-office-syndrome-template-design-concept-vector-illustration.html)
Diagram shows that many employees spend hours a day in front of a computer without thinking about the impact on their body. Physical stress can happen daily without even realizing it by extending wrist, slouching and sitting without foot support and straining to look at poorly placed monitor.

These practices can lead to cumulative trauma disorder or repetitive stress injuries, which generate a life-long impact on health. Symptom may include pain, muscle fatigue as well as loss of sensation, tingling and reduced performance.

Ergonomics is a field of study that attempt to reduce strain, fatigue, and injuries by improving products design and workplace arrangement. The goal is a comfortable, relaxed posture. Every time you work you should take the time to adjust workstations in order to minimize awkward and frequently performed movements.

- **Adapt Laptops:**

  Laptops are not ergonomically designed for prolonged use. The monitor and keyboard are so close together that they cannot both be in good position at the same time. It’s best to add a separated monitor and keyboard. The laptop can be placed on any object such as books so the top of the screen is at eye level, then use an external keyboard so that your elbow can rest at 90° by your side.

- **Modify Your Body Mechanics:**

  If you wear eyeglasses then make sure they fit properly to avoid tilting your head. Type with light strokes, and try to keep your muscles in relaxed position. Sit “tall,” aligning your ears, shoulder, and hips.
When you sit, think about making yourself an inch taller. If you are able, switch hands when using a mouse, completely rest your wrist during breaks, including taking your hands off the mouse.

1.3.2. PROCESS OF ERGONOMICS PRACTICES

Ergonomics process flow chart:-

Begin your ergonomics process with awareness training, and start applying ergonomic philosophy as early in the process as you can, especially if you are purchasing new apparatus or setting up new workstations. Refer to the flow plan to help you decide the level of effort to put into the analysis and development of solution. If no problems exist, training in the principles of ergonomics is still a suitable preventive measure.

Ergonomics Process Flow Figure No.1.4

Advantages of a Workplace Ergonomics Process

Here are 5 of the proven benefits of a strong workplace ergonomics process:

I. Ergonomics reduces costs.

By systematically reducing ergonomic risk factors, you can prevent costly MSDs. With approximately Rs.1 out of every Rs.3 in employees compensation costs attributed to MSDs, this represents an chance for significant cost savings. Also, don't overlook that indirect costs can be up to.

II. Ergonomics improves productivity

The best ergonomic solutions will often get better productivity. By designing a job to allow for good posture, less exertion as well as fewer motions and better height and reaches, the workstation become more efficient twenty times the direct cost of an injury.

III. Ergonomics improves quality

Poor ergonomics leads to frustrated and fatigued employee that don't do their best work. When the job task is too physically taxing on the employee, they may not perform their jobs like they were trained. For example, an employee might not fasten a screw tight enough due to a more force requirement which could create a product quality issue.

IV. Ergonomics improves employee engagement.

Employees notice when the organization is putting forth their best efforts to ensure their health and safety. If an employee does not experience fatigue and discomfort during their work day, it can reduce
turnover, decrease absenteeism, improve morale and increase employee's involvement.

V. Ergonomics creates a better safety culture.

Ergonomics shows your organization's commitment to safety and health as a core value. The cumulative effect of the previous four benefits of ergonomics is a stronger safety culture for your organization. Healthy employees are your most priceless asset; creating and fostering the safety & health culture at your organization will lead to better human performance for your organization.

1.3.3. Impact of ergonomics practices on the employee

The ergonomics process at Ford has been successful at altering the engineering process to better engage the human element in job design. Reducing ergonomic risk on jobs has been correlated with a consequent increase in product quality. Launching a new vehicle assembly line required less re-work of the workstations and an overall reduction in worker non-attendance and worker injury. Bradley S. Joseph (2003)

The employees perceived work in the oilrig in the desert atmosphere as work in extreme environmental condition and with a diverse schedule. Major ergonomic issues recognized were an adverse environment, long shifts, a diverse schedule, and hard physical work. Employees were extremely tired at the end of the work day and they considered work to exceed their capacity. Ashraf A. Shikdar (2004)

In this paper it has been observed that organizations begin to tackle the work-related musculoskeletal issue, they go through 3 levels of maturity: Reactive, Proactive and Advanced. This view of ergonomics prevents organization managers from advantage from what true
ergonomics can do for them, their people and their profits. Mallon, James (Jan 2010)

Experiments revealed that ergonomic change are able to bring about improvement in job accuracy by over 25% in the errors committed which is high, while this was not observed in the control group. The impact of environment on performance is found to be in the form of lower accuracy, whereas, certain researcher hitherto believed that only the rate of work may suffer. Not only does the human body go all the way through have on and destroy due to improper working condition, it also affect the performance adversely. Alok Saklani & Shweta Jha (2011). The Author focuses that after implementation of ergonomics in the organization performer job easier and keep your work force healthy.

Safer Roth, Cynthia (2011). The results of these survey showed that nine out of ten believed that a workspace quality affect the attitude of employee and increase their productivity. Staff members in different organizations have different office design, every office has unique equipment and spatial arrangement, lighting, and heating arrangements and different levels of noise. The intention of this study is to analyze the impact of the office design factors on workers’ productivity. The study reveals that good office design has a positive effect on employees’ efficiency. Shruti Sehgal (2012).

The sustainable ergonomics program, from our perspectives, is seen as an extension of ergonomics which it enriches about the philosophy of corporate social accountability. The expected advantage of the application of sustainable ergonomic programs in company practice is creating such operational conditions, where employees will be capable to submit the required work performance in a long-term sustainable standard. Successful sustainable ergonomic program based on the
participate principle can, on the one hand, get better the efficiency of human work, and on the other hand,, it can decrease the occurrence of health problems and diseases as linked with cumulative trauma disorders (CTDs). Petra Marková, Rastislav Beňo, Karol Hatiar (2012).

The results from the study prove that office ergonomics absence at the Petroleum House is impacting unconstructively on the routine of the employee. From the findings of the study, which identify substantial office ergonomic laps such as inadequate office illumination, use of un-ergonomic furniture as well as appreciable noise level and pockets of safety hazards. It is obvious that GNPC is yet to leverage on its work place environment as a means of motivating and enhancing the performance of its worker. Asante Kingsley (2012).

The study is emphasized on employees views on nature of job, wok environment and their current job postures at work. It interpret that employees of Puducherry manufacturing concerns are provided with the best working environment but they also confront with works involving vibration and static sitting postures for the longer period. It reveals that workers are moderately satisfied with the current ergonomics at their workplace. Mr. Baig Mansur Ibrahim, Dr. K. Tamizhjyothi (May 2013).

The research paper spotlight on employee health and well-being will enable employers to build up a more dynamic workforce. This study is to provide a larger formation on the relevance of ergonomics in Indian economic sector keeping in view the current technological and infrastructural changes. Sunil, S K; Nair, Vinith kumar (2013).
1.4 PRINCIPLE OF ERGONOMICS

- Work in Neutral Posture
- Reduce extreme Force
- Keep Everything in Easy Reach
- Work at Proper Height
- Reduce Excessive Motion
- Minimize Fatigue and Static Load
- Pressure Points Provide Clearance Move, , Stretch and Exercise
- Maintain Comfortable Environment

Principles of Ergonomics Figure No.1.5

www.occupationalfitnesssolutions.com.au
In accordance with the universal principles of prevention, developed inside the legislative frameworks of the protection of employees, a risk analysis must be carried out in the entire of the manufacturing facilities. Inside the enterprise COTITEX of Batna, this principle of avoidance is very little applied and one can partly assign this absence of the application to the fact that the methods of analysis suggested are not well modified to this factory. To this end, a comparative study of several risk analysis methods issued from the "reliability" movement is undertaken, in order to choose the one whose field of application would answer improved to our criterion engagement, namely the triptych: Man-Installation-Environment. The risk analysis method retained is MADSMOSAR which present a framework basing its approach on the concept of "system". We also carried out an ergonomic analysis of the hard conditions induced by the technology transfer making use of the RENAULT method. We analyzed these blockings of disparate appearance then and could allot mostly their causes to a conflict of values among the COTITEX and the institutions of prevention.

On Jan 15, 2014, Robert Pater, managing director of SSA/MoveSMART, presented "Leading a Concentric Ergonomic Culture to Achieve Multiple Returns." According to Pater, ergonomic principles of preventing cumulative trauma may be applied to overall safety and to organizational change. In term of ergonomics, cumulative trauma is generally caused by a pressure concentration on a body part through work activities and results in joint and muscle weakness. For example, when one's occupation involve continuous sitting, cumulative trauma can be prevented by periodically shifting position during the day.
In IT, ergonomics refers to refining the design of IT equipment or accessories to optimize for human use to minimize side effects by using it.

This may be related any feature of a product such as height and weight, sight and hearing, distance and even temperature, affecting normal life of a user by using it. Many citizens tend to use this equipment for a longer period in their work or even at residence. So each design of this equipment or accessory must not hinder the ordinary life of a user while using it. May be poorly designed accessories may result in stress, injury, fatigue or unnecessary pain or inconvenience to a user. Ergonomics studies these factors to ensure that each product is made according to accepted standard to preserve the normal life of users.

The growth and some characteristics of information technology (IT) are outlined, and the significance of ergonomics in the design of IT systems is illustrated. Few immediate questions for the next 7 years are discussed, including research gap and needs, the development of design procedures, a recommended ergonomics framework, and a few industrial design aspect. Long-term question discussed are the passing of paper, the reduction of writing, the victory of influence and the energetic society. Finally, some of the significant broader issues are declare and the need for collaborative synergy by ergonomists, computer professionals, architects and industrial designers is emphasized.

This review of Ergonomics in Information Tech. in Europe was done in three stages, (i) Scientific papers and addresses of other persons/groups were requested from 52 persons/grouping primarily contacted, (ii) Visits were complete to the more important groups in nine European countries, and use was made of opportune visits to the
U.S.A. (iii) The papers received, and the general data assemble through the visits, were appraise and the review report was written.

Growth of research in ITE is documented. The domains and sub domains of ITE are after discussing the importance of ergonomics in information technology (IT), and outlining the interrelation of human-factor aspects to the total IT system, the growth of research in ITE is documented. The domains and sub domains of ITE are then described and the state of research in this domain is reviewed; at least half of the sub domains of ITE are little investigate as yet in Europe. The principal research gaps are documentation.

The current state of ITE in Europe and the U.S.A. is then reviewed and compared. As a result, it is suggested that a Strategic Programme for Research in ITE is needed. Such a co- will greatly expand the scope of such research in Europe, will develop collaboration among researchers and, especially, will increase the researchers' contact with and value for the European IT industry.

1.6 CURRENT PRACTICES OF ERGONOMICS IN BANKING SECTOR

This research which focused on job stress in the workplace at the Banking Supervision Department proved that ergonomic workstations on body postures and health influence the stress outcome at the workplace. Weaknesses in both of this factor also brought about somatic complaints, job dissatisfaction, and intention to quit. This research finding also gives implication onto the organizational management. The management must assess both the body posture and health factors related to stress outcome in the research because it could minimize the negative effect of work stress. Detail assessment
should be done onto human resource health factor, as this factor is significantly related with the stress outcomes at the workplace (p<0.01). The multiple regression analysis strengthens this finding by indicating that 47.2 percent of the stress outcomes change is due to the ergonomic workstation factors related to body postures and health issues. A solution to all problems related to somatic complaints, fatigue, burnout, job dissatisfaction, and intention to quit could be reached once the management takes into account improving employees’ work flow. Other solutions include having comfortable and suitable arrangements of employees’ workstation to avoid congestions, sharing health hazard programmers on less bending over and long standing hours to overcome body posture issues, and investing in new ergonomically designed working chairs to help overcome stress factors at workstations.

The health status of employees has a direct behavior on employee performance. Research shows that civilizing employee healthiness and well-being will enable employers to build up a more productive workforce. Ergonomics is the function of human being sciences to the optimization of people’s functioning environment. As Literature review reveals, its application was limited mainly to the manufacturing sector till the recent past. But now, service industry also views its importance seriously and Ergonomics is turning out to be a major element for their HR strategies. Yet, it is not an intrinsic part of organizational culture in many cases. This study is to provide larger framework on the relevance of Ergonomics in Indian economic sector keeping in view the modern technological and infrastructural change. Also, the study aims to find out the correlation among the work place condition and the employee performance. Data for this study was collected from Employees and HR managers in financial organizations in Banking and non banking sector so as to determine whether there is any perceived system based on sound ergonomic
principles in such companies. Various Statistical tools have been utilized to analyze the data for arriving at the conclusion.

Increased personal control and comfort need of employees triggered the concern among organizations to provide them with an atmosphere and office design, which fulfills the workers' needs and helps to boost their productivity. The main motive of this study is to find out the relationship between office design and productivity. For this purpose, thirty one bank branches of 13 banks were contacted and studied. The findings of this study show that office design is very vital in terms of increasing workers productivity. Relaxed and ergonomic workplace design motivates the employees and augments their performance substantially.

In today's competitive world, everyone want to be the best and to keep up the job people need to expend more time at workplace for more growth in terms of better learning and performance. And that is the time when people just start getting physical issues, it could start with a head ache or back ache which people usually ignore at the age of 20s and 30s. For a quicker solution they start taking medicines on their own and if problems still resist, they consult different doctors just to know that they need to change the sitting posture, standing posture and walking style. The present study is conducted to analyze
the employee satisfaction keeping various areas in mind it can be working hours, office furniture etc. A workplace is becoming one of the assessing points for the branding. As we earlier would say workplace ethics is mandatory. Paper has more emphasis on the socio-technical quality of work. Employee participation in the development and improvement of their own work activities and every day construction tasks has been strongly emphasized by the "quality movement". From this point of view, the quality perspective, and in particular progress work, are accommodating of improved working conditions and ergonomics. Ergonomics is a kind of science that specifically focuses on designing and creating an environment where people experience the least amount of stress. The preamble of development work was found from a theoretical point of view to be consistent with improvement in the characteristics that represent good and rewarding work. The study of ergonomics doesn't just stop at how good the furniture and fixtures are? But above that, the stress level too is taken into consideration. In this study, a survey is conducted of employees working in banks irrespective of Private or Public Banks. The objective of the study is to know the importance of ergonomics in work place and impact of technically designed tools on the quality of work performed by the employee.

1.7 WORKPLACE INJURY

Workplace Injury is not only related to accident or major hazards but it happens with sitting job an injury is 'a personal injury arising out of, or in the course of, employment if the employment is a significant contributing factor to the injury.

Injuries can happen at work, traveling to and from work or while on a break from work. Injuries can also take place if you are traveling for
work, or visiting other workplaces or sites for the purposes of your job.

WMSD include moderate to rigorous work related pain and wound and most often affect the low back, neck, shoulder, wrist and hand.

MSD: Affect the muscles, nerves, blood vessels, ligaments, and tendons. Workers in many dissimilar industries and profession can be exposed to risk factors at work, such as stimulating heavy items, twisting, reaching overhead, pushing and drag heavy loads, working in uncomfortable body postures and performing the same or related tasks repetitively. Exposure to these known risk factors for MSDs increases a worker's risk of injury.

Work-related musculoskeletal disorders can be prevented. Ergonomics right a job to a person helps lessen muscle fatigue, increases productivity and reduces the number and severity of work-related MSDs.

**Examples of Musculoskeletal Disorders (MSDs)**

- Tendinitis
- Muscle strains and low back injuries.
- Epicondylitis (affects the elbow)
- Carpal tunnel syndrome
- Trigger finger
- Rotator cuff injuries (affects the shoulder)

**Impact of MSDs in the place of work**

Work associated Musculoskeletal Disorders are between the most frequently reported causes of lost or classified work time. According to
the BLS in 2013, Musculoskeletal Disorders cases accounted for 33% of all worker injury and illness cases. Work injuries can take many forms, ranging from violently catastrophic to seemingly unnoticeable.

- Overexertion:

Overexertion is the major reason cause of workplace injuries and typically happen from carrying, lifting, pushing heavy substance. Over exertion always results in musculoskeletal disorders such as sprains and strains, particularly in the back. Businesses pay millions of dollar each year, according to Liberty Mutual’s 2010 Workplace Safety Index.

- Falls:

Falls are an important cause of workplace injuries, according to the professional Safety and fitness Administration. Falls can be deadly regardless of whether a employee falls from a great height (such as from a roof or scaffolding) or on a slippery flat floor. Injuries from falls frequently include broken bones, brain injuries, and neck injuries.

- Struck-by proceedings:

Serious injuries can happen when a worker is hit without warning by a moving object, such as a piece of heavy equipment or machinery. Struck-by accidents are scheduled as one of the “Big Four” hazards on structure sites and accounted for eight of all structure deaths in 2010, according to OSHA.
• **Crush injuries:**

Like struck-by accidents, crush injuries normally occur on construction sites or in spaces that use weighty machinery, such as warehouses. These types of injuries can be especially debilitating and may even result in amputation of the affected limb.

• **Bodily response:**

Position as the third most costly type of work-related injury scheduled in the 2010 Workplace Safety catalog, bodily reaction injuries result from behavior such as bending, mountain climbing, reaching, standing, session, or slipping or elegant without falling.

• **Highway accidents:**

Auto accidents are a leading cause of workplace death, and not just to truck drivers. Even a pizza rescue driver may be eligible for workers' comp benefits in South Carolina as long as he or she was performing work duties when the accident occurred.

• **Repetitive motion injuries:**

Unlike the other injuries listed above, repetitive motion injuries occur over time. The most well-known example of a repetitive motion injury is carpal tunnel syndrome, a painful situation of the hand over and wrists caused by damage from due to excess. Typists, painters, and people who work at checkout counters frequently suffer from repetitive motion injuries and can receive employees recompense
payments to cover any medical costs associated with action and physical therapy.

- **Work-related illnesses:**

One of the most notorious examples of a place of work sickness is mesothelioma, a unusual form of cancer that is cause by exposure to asbestos. Exposure to asbestos – a material frequently found in elderly building insulation, ceiling and flooring tiles, and other material – is the only known cause of mesothelioma. It is commonly exposed in people who have had work-related exposure to asbestos in construction, manufacturing, and shipyard work. If you are suffering as a consequence of a job-related injury or sickness in Manning, Summerton or Kingstree, South Carolina workers’ reimbursement benefits can help you cover up the cost of medical bills, hospitalizations, lost earnings and other disabilities that are a result of the accident.

### 1.8 ORGANIZATIONS WORKING FOR ERGONOMICS

- **OSHA: Occupational Safety and Health Administration**

In 1970, the United States Congress and President Richard Nixon created the Occupational Safety and Health Administration (OSHA), a national public health organization devoted to the basic proposal that no employee should have to choose between their life and their job. Passed with bipartisan support, the creation of OSHA was a historic moment of co-operative nationwide reform. The OSHA law makes it comprehensible that the correct to a safe workplace is a basic individual right.
OSHA’s Mission: Congress created OSHA to assure safe and healthful circumstances for working human beings by setting and enforcing standards and provided that training, outreach, and education and compliance support.
Under the OSHA law, employers are responsible for providing a safe and healthful workplace for their workers.

- **ILO**: International Labour Organization

Promoting Jobs, Protecting People ILO is a specialized agency of the United Nations. The International Labour Organization (ILO) is devoted to promoting social justice and internationally recognized individual and labour rights, pursue its founding mission that community justice is essential to universal and lasting peace. The only tripartite U.N. agency, since 1919 the ILO brings together government, employer and workers representatives of 187 member States, to set labour standards, develop policies and devise programmes promoting decent work for all women and men.

- **IEA – International Ergonomics Association**

The International Ergonomics Association (IEA) is the federation of ergonomics and human factors societies around the world entitled as international association founded in Zurich (Switzerland) pursuant to article 60 et seq of the Swiss Civil Code. Currently IEA is officially registered in the municipality of Thônex, Canton of Geneva, Switzerland.
The mission of the IEA is to elaborate and advance ergonomics science and practice, and to expand its scope of application and
contribution to society to improve the quality of life, working closely with its constituent

The main goals of this association:-

- To develop more effective communication and collaboration with federated societies.
- To advance the science and practice of ergonomics at an global level.
- To enhance the involvement of the ergonomics discipline to global society

**JES -Japan Ergonomics Society**

The Japan Ergonomics Society founded in 1964 to encourage research and related businesses on ergonomics. The society has now around 2,000 members. These members consist of specialist in many unlike fields, from specialists at colleges or research institute to practitioners in industry, and have been conducting broad, interdisciplinary activities.

**Mission and goals of the society:-**

Ergonomics is an inter-disciplinary, practical science that can meet the needs of the current age, i.e., the diversified and sophisticated requirements for safety, security, comfort and health, through complete approaches base on its cross disciplinary specialty. Studies on ergonomic theory and activities practicing ergonomics are now being carried out all over the world.

(https://www.ergonomics.jp)
ISE – Indian Society of Ergonomics

The Indian Society of Ergonomics was established in 1983 and is the only professional body representing ergonomics / human factors professionals in India. It is associated to the International Ergonomics Association and nominate members to its committees. The idea of founding an Ergonomics Society had been actively pursued ever since the First National Seminar on Ergonomics, which was held at Calcutta from 22-25 February, 1972, under the auspices of the Life Science Centre of the University of Calcutta - organized by the Department of Physiology of the same University.

Aims and Objectives of the society:

• To promote and enhance Ergonomics and allied studies, research and training particularly in India, for the benefit of the people at work, to improve their welfare and quality of life.

• To facilitate substitute of ideas, professional experience among persons on India and overseas interested in ergonomics for the advancement of science, technology and art of man at work.

• To arrange and manage lectures, debate, seminars, training courses, symposia, workshops, conferences etc. for the achievement of knowledge and exchange of views and ideas.

(http://www.ise.org.in)

1.9 RELEVANCE OF THE STUDY

To HR Managers:

• Identify the need for ergonomics plan.
• Attracting better employees
• Reducing the rate of absenteeism and time lost
• Reducing the health problem for employees
• Enhancing on-the-job performance and decision making
• Help in studying the benefits of Worksite Employee Ergonomics activity which will bring more of co-operation among the employees.
• Help in making Ergonomics Plans for setting up of employee ergonomics Committees.
• Will assists in setting goals, objectives, and designs which could be best suited in the organization.
• Developing a timely budget for the Employee Ergonomics activities.
• In acquiring ergonomics activity support.
• Making the ergonomic plan available at the right cost, time and place.
• Implementing and then evaluating the ergonomic.

To The Employers:-
Encouraging your employees to do follow this Ergonomics plan will bring a number of economic benefits:
• Increased efficiency from fit, healthy employees.
• Reduced absenteeism.
• Reduced injuries and workers' compensation claims.
• Reduced sick leave But there are also some intangible benefits.
• It shows your employees that the organization is interested in them personally.
• An Ergonomics activity will generate good will and encourage self-responsibility in the workforce.

To Society:-

Employee Ergonomics activity will help in bring the technological changes in the Society; Technological development: - Work will be dependent more on Technology as people will prefer working on
computers and the laptops for 24 hours and more than that in IT sectors. Creating an ergonomic workstation in every IT Industries is a must. Healthy society: - As ergonomic is going to focus on the health and wellbeing issues thus it will curb the deteriorating health of the employees due to chronic diseases. It will help the employees to take care of their health before the injuries condition remains their life. Thus causing a healthy society.

**To the Researchers:**

- It will help researchers to probe into the causes of absenteeism.
- Make an analysis of Health care cost.
- To study the return on investment which is been made.
- Find out the main causes which bring about the injuries in the employees. It will help to initiate researchers to take up the challenge in finding more solutions in employee ergonomics.

If you suffer from persistent back, neck and shoulder pain, you are just one of millions all across the world who happen to be in the same boat for one reason or another. Improper ergonomics is quickly becoming one of the primary causes of these issues. Ergonomics refers how you sit, stand, posture, and move around as you do tasks. It is important to educate yourself on how to practice proper ergonomics whether you work in a factory lifting and moving substance all day, sit at a computer in an workplace or cubicle and spend most of your day typing and writing.

Many people are surprised to learn that their recurring back, neck and shoulder problems stem from how they sit at the computer. You would think that a job in front of a computer would be safe and easy, but every year more and more people are stricken with irreversible spinal damage simply because they didn't know how to sit and type.
properly. Nowadays, the public is starting to catch on to the importance of proper ergonomics both at home and in the workplace.

**Benefits of Ergonomics**

While ergonomic improvements to the work environment are primarily used to create a safer and more healthful work environment, your organization may experience other benefits, including:

- Increased productivity
- Increased work quality
- Reduced turnover
- Reduced absenteeism
- Increased morale
- Reduce health insurance charges.

**Proper Posture Figure No.1.6**

https://northernbeachesphysio.files.wordpress.com/2015/01/ergonomics1.gif.
This diagram shows the proper position of sitting in the office as per ergonomically correct. Proper distance maintains between computer screen and eyes, adjustable chair, computer mouse position, headphone position because in the some IT sectors are providing the head phone for calling purpose.

### 1.10 NEED OF THE STUDY

The study will be benefited in the following way:-

- It will furnish information about the existing Employee Ergonomics Practices in the IT Industries in Pune.
- It will also bring to the periphery the exact expectation of the employee working in the IT Industries in Pune with regards to their wellbeing in the organization in the INDIAN scenario.
- It will help the management of the IT Industries in Pune firms to bridge the gap between employee expectation about employee wellness practices and those which are provided at the present.
- Support Hr function of organization, particularly in policy formulation and working environment with respect to Retention and motivation.
- Help government and non-government bodies in framing the policies. Assists the legal and regulatory bodies in making of newer laws.
- It will help the management in Banking sector to improve performance of their employees and reduce gap between customers and employees.

### 1.11 PROBLEM STATEMENT

Creating a work environment which promotes the wellbeing of employees and increases individual performance is viewed as a strategy for enhancing company efficiency and productivity. An
employee normally has an expectation and will demand a workplace environment that facilitates them to perform their work optimally. When this is sufficiently provided, it can boost organizational competitiveness (Heath, 2006).

Information technology companies and banks institutions make significant investments in designing, building and ultimately recruiting knowledgeable personnel. Their work environment in terms of actual physical layout and design of an office is extremely important when it comes to maximizing individual performance. Poorly designed workstations, unsuitable furniture, lack of ventilation, inappropriate lighting and excessive noise adversely affect employee performance (Becker, 2002). In addition, incongruent psychosocial factors the non-physical aspects of a workplace, such as working conditions, impacts negatively on employees' performance. The organization of work-life is also now a major consideration in Banks as they attempt to spur exceptionally high performance (Smith, 2010). To institutionalize the right practices in work-life balance, the right policies and programs have to be put in place. Inadvertently, an imbalance between workplace environment factors and employees needs, abilities and expectations, is being manifested in different banks and companies, prompting diverse actions.

1.12 OBJECTIVES OF THE STUDY

Based on the research problem and extensive review of literature, the study progressed with the following research objectives.

- To analyze the organizational ergonomics awareness in I.T. Sector and Banking sector.
• To study the organizational ergonomics practices in I.T. and Banking sector.
• To study the office ergonomics and workplace injuries.
• To study the relationship between organizational ergonomics practices and training.
• To come up with the suggestion about ergonomic practices.

1.13 SCOPE OF THE STUDY

The purpose of this research is to study the Ergonomics practices and awareness in the IT and Banking sector. Scope of ergonomics is very vast in different type of industry. Employer or an employee in the manufacturing, construction, maritime, and agricultural industries and Information technology and Banking Sector employees’ work activities and job conditions. Ergonomics provide better working environment to the employee so it is impact on performance. Employer provides through ergonomics practices to the employee healthy work culture in the organization. The study aim to observe the Ergonomics practices in IT and Banking Sector.

1.14 LIMITATIONS OF THE STUDY

Despite the previous justification of the chosen research methodology and scope of the research, there are, however, some limitations associated with the research work. These are mentioned below.

• The study is limited to the I.T. companies and Banks in Pune City Only.
• The study and conclusions thereof were based on primary data, which were basically the responses of the respondents.
• The IT industry units taken for the study were listed under Maratha Chamber of Commerce, Industries & Agriculture (MCCIA).
• The IT Units and banks were not segregated geographically into Pune City.
• The Banking Sector taken for the study was listed under Martha chambers of commerce, Industries & Agriculture (MCCIA).
• The Private Banks and Public Banks were taken into consideration.
• The Banks were not segregated into private or national they were taken randomly.

1.15 RESEARCH HYPOTHESES

The research advanced on the following hypotheses. Accordingly, the study tested following null and alternative hypotheses.

H₁ The population proportion of awareness in I.T. sector is greater than the population proportion of awareness in the Banking sector.

H₀ The population proportion of awareness in I.T. sector is equal to the population proportion of awareness in the Banking sector.

H₂ The Organizational Ergonomics practices are followed in I.T. sector and banking sector.

H₀ The Organizational Ergonomics practices not followed in I.T. sector and banking sector.

H₃ The correlation coefficient between the office ergonomics & workplace injuries is significant.
**H₀** The correlation coefficient between the office ergonomics & workplace injuries are not significant.

**H₄** There is a cause-effect relationship between office ergonomics and workplace discomfort.

**H₀** There is no cause-effect relationship between office ergonomics and workplace discomfort.

**H₅** There is positive relationship between organizational ergonomics practices and training.

**H₀** There is no positive relationship between organizational ergonomics practices and training.

### 1.16 ORGANIZATION OF THESIS

The thesis is divided into seven chapters consisting of Introduction, Information Technology: an overview, review of Literature, research methodology and data collection, Data analysis, and result, conclusion, and recommendations.

**Chapter – 1: Introduction**

It gives the historical development of Ergonomics. The further discussion on the classification of Ergonomics, Banking sector, Information technology sector, advantages of ergonomics and challenges to Employee issue. Aim & objective, hypothesis, research methodology, and limitation of the study are formulated in this chapter.
Chapter – 2: Literature review:

This chapter gives a review of literature survey undertaken for the research study. Various reports, article and research studies are reviews to understand the present scenario of ergonomics, ergonomics present in different sectors. The further information's on employee ergonomics in various organizations and Industries.

Chapter – 3: Research Methodology and data collection

Chapter consists of meaning and best suitable sequence of research methodology of this research. Research design, sampling, data collection method and data analysis procedure are explained step by step with tables, figures and the interpretations for the same.

Chapter – 4: Data Collection, Data analysis, Interpretation and Testing of Hypothesis

Data collected are tabulated in required form using Microsoft excel sheet. The hypotheses formulated were tested based on the information collected with the appropriated statistical test using SPSS. Since the researcher was based substantially on Z test for equality of two proportions o ns, The Karl Pearson's correlation coefficient, t-test for the significance of the correlation coefficient, Confidence interval for a population proportion.

Chapter – 5: Finding

In this chapter, the overall finding is drawn on the basis of literature survey, research results. It also presents the observation made on the
data analysis and various recommendations along with an area of further study and research contribution.

Chapter – 6: Suggestions

In this chapter, the overall observation is drawn from the Literature review, data analysis, interpretation, and interview. Collect the view's and given the suggestions to the banks and IT Companies about ergonomics practices.