

# Necessity of Suitable Ergonomics in IT Organizations for an Increased Employee Satisfaction with a special reference to udupi district

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**Abstract:** Ergonomics is the science of designing the workplace, keeping in minds the capabilities and limitations of the worker. A systematic ergonomics improvement process removes risk factors that lead to WMSD's (work related musculoskeletal disorders) and allows for improved human performance and productivity. While designing ergonomic hazards out of the workplace is ideal, other measures such as administrative controls (including training or employee rotation) and changes to work practices are necessary. A healthful environment brings safety to the employees with physical and mental capabilities in performing their jobs. Absence of these facilities usually leads to the employee distress, absenteeism, job stress, accidents and fatigue.

**Keywords:** Ergonomics, WMSD's (work related musculoskeletal disorders), job stress, accidents, distress, absenteeism and fatigue, employee rotation.

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## 1. INTRODUCTION

Ergonomics is related to the human work environment and human edge preventing injury and improving work performances.

“Ergonomics is the scientific discipline concerned with the understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data and methods to design in order to optimise human well-being and overall system performance.” International Ergonomics Association.

WMSD's (work related musculoskeletal disorders) are of muscle, tendon and nerves. Symptoms can be numbness, pain, aches, burning sensation, swelling, tingling sensation, weakness, cramping, loss of colour etc. It can turn out into employee Low back pain, Carpal Tunnel Syndrome, Cubital Tunnel Syndrome, De Quervain's Tenosynovitis, Trigger finger, Epicondylitis, Neck and shoulder pain. Musculoskeletal disorders main reasons are Employee forceful exertions, repetitive movements, awkward posture, static posture, vibrations.

### 1.1. Benefits of good ergonomics:

Safer & healthier work, Comfortable workplace, Minimize human errors, Less injury & illness, Maximize efficiency, Improve quality of work life.

### 1.2. Areas of Ergonomics:

Ergonomics has mainly three domain areas: Physical, Cognitive and Organizational.

**Physical** includes musculoskeletal including manual handling workstation designs & equipments.

**Cognitive** includes auditory & visual displays, control designs, human error and vigilance.

**Organizational** Ergonomics has shift work, rest, work breaks, workloads and job satisfactions.

Indoor building conditions are more related with health, comfort and wellbeing of workers. External stress factors such as incentive, supervision, job fear, promotion factor can influence the human nervous system, the resistant system and the endocrine system and this in result can affect both physical and mental effect.

Implementing ergonomic solutions can make employees more comfortable and increase productivity. Ergonomics is important because when you're doing a job and your body is stressed by an awkward posture, extreme temperature, or repeated movement your musculoskeletal system is affected.

### **1.3. Work Station Designs & Posture Training:**

#### **Auditory displays**

Auditory displays are described for several application domains: transportation, industrial processes, health care, operation theatres, and service sectors.

#### **Visual displays**

- accessing written or electronic information
- navigating unfamiliar workplaces and/or new tasks
- identifying workplace hazards; and/or Getting to a workplace via public transport during 'peak hour'

#### **Light facilities**

**Table 1: Ergonomical workplace illumination facility**

Recommended Illumination levels	
Type of Activity	Ranges of Illuminations
Computer only	300 - 500
Computer and paper document	500 -750 with auxiliary lighting
Paper document only	750-1000

#### **Physical Environment**

Temperature maintenance & clamour controls, need for the control of thermal environment is widely recognized. It is agreed that the control of local thermal environment is needed for the comfort and satisfaction of workers it controls room temperature as the main issues of the working condition and efficiency of the employees.

#### **Work Pace**

- improving the way the work is organised, the level of cooperation between departments, and the management composition
- improving internal communication
- promoting pleasant and friendly relations in the workplace
- providing training and coaching
- offering management skills training
- giving courses on handling stress
- practices
- career counselling
- adjusting schedules
- improving working conditions, for example by introducing ergonomic working

#### **Shift work / Rotational work**

- Limiting excessive overtime
- dividing up the work between different employees
- improving the job content, for example by rotating duties, giving employees
- Additional duties, making the work more interesting, giving employees more control over their work, and organising department or team meetings.

#### **1.4. Legislative standards of minimum work place comforts by law:**

The Occupational Safety and Health Administration (OSHA) was established by the Williams-Steiger Occupational Safety and Health Act (OSH Act) of 1970, which took effect in 1971. OSHA's mission is to make sure that every working man and woman in the nation is employed under safe and healthful working conditions. Nearly every employee in the United States comes under OSHA's jurisdiction. OSHA is an administrative agency within the United States Department of Labour and is therefore administered by an assistant secretary of labour. OSHA (Occupational safety & health administration) standards are rules that describe the methods that employers must use to protect their employees from hazards. There are four groups of OSHA standards: General Industry, Construction, Maritime, and Agriculture. The mission of OSHA is to save lives, prevent injuries and protect the health of America's workers maintaining a reporting and recordkeeping system to keep track of job-related injuries and illnesses, and providing training programs to increase knowledge about occupational safety and health.

**OSHA (Occupational safety & health administration)** has given commonly to be followed principles for organizations:

- Keep everything easy to reach.
- Work at proper heights.
- Reduce an excessive force.
- Work in good postures.
- Reduce excessive reappearance.
- Minimize exhaustion.
- Minimize direct pressure.
- Provide adjustability and change posture.
- Provide clearance and access.
- Maintain a comfortable environment.
- Enhance clarity and understanding.
- Improve work organization.

#### **OSHA record-keeping requirements**

OSHA requires all companies subject to its workplace standards to abide by a variety of occupational regulations. One of OSHA's major requirements is that companies keep records on facets of their operations relevant to employee health and safety. All employers covered by the OSH Act are required to keep four kinds of records:

- Records regarding enforcement of OSHA standards
- Research records
- Job-related injury, illness, and death records
- Job hazard records

#### **Indian Government Acts for the protection of the employees**

The Factories Act is not the only legislation that protects all kinds of workers in India. Government employees and Private Sector Employees: The rules and regulations governing the government employees stem from the Indian Constitution. All employees have basic rights in the workplace including the right to privacy, fair reimbursement, and freedom from favouritism. A job applicant also has certain rights even prior to being lent as an employee. In most states, employees have a right to privacy in the workplace.

#### **Termination procedures in India**

**Termination for cause** – Upon being found guilty of wilful rebelliousness or insubordination theft, fraud, or dishonesty, wilful damage to or loss of employer's goods; chipping in of bribes or any illegal indulgence; absence without leave for more than 10 days; habitual late attendance; disorderly behaviour during working hours or customary abandon of work. In case of the Ordinary termination it requires a 30 day's notice. The employer will have to notify the relevant government authority of a termination event, and courts may demand a fair investigation for the employee.

**Severance payment due** – This is in the case of average terminations. It is only owed in terminations where the employee has been with the company for at least two years and the reason for termination is laying-off. The severance package is calculated on a case-by-case basis, depending on the duration of employment, performance, and salary level. The right to an as much as necessary standard of living is recognized as a human right in international human rights instruments and is understood to establish a minimum entitlement to food, clothing and housing at an adequate level. The right to food and the right to housing have been further defined in human rights instruments. For all others cities the entitlement is 40% of the salary. For the purpose of calculating the HRA, the salary is defined as the sum of the basic salary, dearness allowances and any other commissions. If the employee is not receiving a dearness allowance or commissions then the HRA will be 50% to 40% of the basic salary.

### Conceptual Model of Ergonomics & Employee Satisfaction

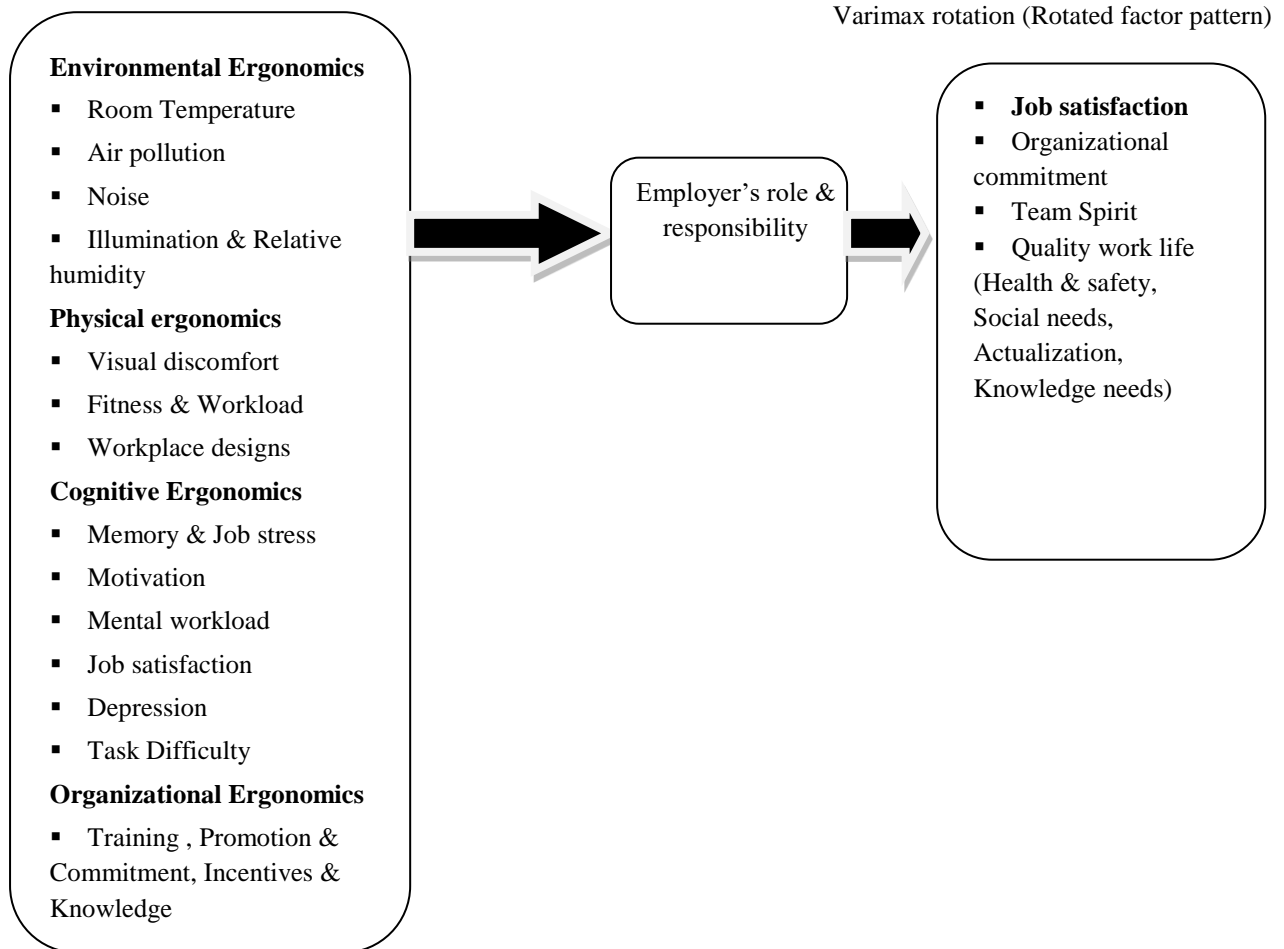


Figure 1: Conceptual model of Ergonomics & Employee satisfaction

## 2. STATEMENT OF THE PROBLEM

The main objective of this study is to know the necessity of suitable Ergonomics in the IT Organizations with reference to udupi for an Increased Employee Satisfaction. It is utmost important to understand the need and benefits of a good ergonomical structure in Indian firms where employees face every day issues and problems with respect to the work designs, equipments and machinery including ambience and basic facilities in the organizations.

## 3. OBJECTIVE OF THE STUDY

1. Need of good ergonomic designs for maximum job satisfactions in IT industries of udupi
2. Determine if the workstation and equipment designs are suitable for the job satisfaction of the employees.
3. Determine whether the work posture condition (sitting or standing) of the employees has any influence on their job satisfaction.

#### 4. HYPOTHESES

The main aim of the research is to determine achievement of Employee satisfaction by getting over issues of ergonomics, by a desirably designed ergonomical structure and accessories in firms.

(H0) There is no relationship between the nature of work facilities and employee productivities, performance and satisfactions with minimized risks

(H1) There is a strong relationship of work facilities and employee performances in the two industries IT Education

(H2) Comfortable Ergonomical setups for the workers lead to the worker satisfaction

(H3) Good Ergonomical setup helps in reducing risk and minimizes accidents in IT Education sectors

(H4) Expectation of the work performing facilities by the employees is must for an ergonomically satisfied organizations leading to ultimately workers satisfaction

Test Possibilities

$H_0 \neq 0$  (Two Tailed)

$H_1 = 0$

$H_2 \geq 0$  (Upper tailed)

$H_3 \& H_4 \leq 0$  (Lower Tailed)

The research model in this study is composed of three main constructs such as: Organizational Ergonomics, Issues, influences & insights of it and Employee satisfaction. As per previous studies in this field this will be an additional solution to the issues of ergonomics in firms. This research proposed model will give not only a perspective of ergonomical issues and insights but also suggest suitable measures to get over the ergonomical discomforts of the employees in computer related & retail fields. This study is directly proportional to the good ergonomical setups & resultant employee satisfaction.

#### Result of hypothesis built

Outcome: H1, H2, H3, H4 is true & H0 to be false

Therefore, H0 Null Hypothesis can be rejected and H1 alternate hypothesis can be accepted.

#### Evaluation of the validity

##### Data collection

Survey has been done for the employees of selected service company of udupi. Questionnaires and Surveys had been conducted for the employees. Well designed Questionnaire helped a lot in judgment information from the employees of the IT Company been surveyed. IT Company MICE has been considered for the study and for data collection.

##### Reliability

Any similar service organizations can rely for use and reuse of this study report for their results and applications. Thus this study has a universal application in service organizations where the employee comes across similar problems almost every day.

#### Factor procedure rotation method - VARIMAX ROTATION (Rotated factor pattern)

Factor loading	1	2	3
Room Temperature	0.02094	0.23916	<b>0.85870</b>
Air pollution & Relative humidity	0.43779	<b>0.54654</b>	0.16575
Noise & Illumination	<b>0.82910</b>	0.12707	0.13692
Visual discomfort	0.03056	<b>0.70151</b>	0.13929
Workplace designs	<b>0.65220</b>	0.28916	-0.02801
Job stress & Motivation	<b>0.73354</b>	-0.09437	-0.11727
Depression & Task Difficulty	<b>0.73811</b>	0.43173	0.15040
Training	0.30101	<b>0.64571</b>	0.09856
Promotion /Incentives	-0.02226	<b>0.65075</b>	-0.55112
Original Variances of factors	5.6169	3.2978	1.2136
		1.2136	1.1055

**Table 2: Original variances of selected factors of ergonomics & employee satisfaction**

Rotated Variances of each factors		
1	2	3
2.4798022	1.9834933	1.1535892

Final estimates total=5.616885

**Interpretation of values**

Higher values are highlighted above, which shows more effectiveness compared to others.

Factor 1: Noise & Illumination, Job stress & Motivation, Depression & Task Difficulty & Workplace designs

Factor 2: Visual discomfort, Training, Promotion /Incentives, Air pollution & Relative humidity

Factor 3: Room Temperature

**5. REVIEW OF LITERATURE**

**Ergonomical Programmes**

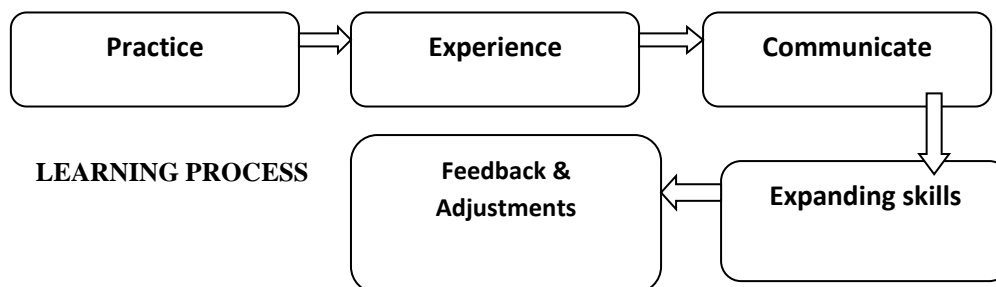
**1. Management Commitment and Policy**

The adoption of a Quality Management System (QMS) should be a strategic decision made by the organisation's top management. Top management must provide evidence and demonstrate their commitment to the QMS and continual improvement by Ensuring that quality objectives are established. Performing management review.

**2. Employee Involvement**

Employee involvement is creating an environment in which people have an impact on decisions and actions that affect their jobs. Employee involvement is not the goal nor is it a tool, as practiced in many organizations. It is a management and leadership philosophy about how people are most enabled to contribute to continuous improvement and the ongoing success of their work organization.

**3. Training and Education**



**Figure 2: Learning process**

Training is a program that helps employees learn specific knowledge or skills to improve performance in their current roles. Development is more moderate and focuses on employee growth and future performance, rather than an immediate job role.

**4. Hazard Identification**

Hazard identification is an ongoing process that is a critical component of any health and safety program. Regardless of the workplace hazard, the goals for utilizing hazard identification include Identification of workplace hazards presenting unacceptable risk to employee health, safety and productivity.

**5. Workplace Monitoring, Reporting and Medical Management**

The Federal Privacy Act, formally known as the Privacy Act of 1974, regulates what personal information the federal government can gather about its citizens as well as how that information is gathered and used.

The Electronic Communications Privacy Act of 1986 (ECPA) regulates the gathering and use of information obtained electronically, such as by telephone or computer. It aims to prevent unauthorized access to private communications conducted electronically.

### **Methods of Workplace Monitoring**

With advancements in technology in the past few decades, there's abundance in the number of ways to monitor employees. Let's look at some of the most common methods by which employers conduct workplace monitoring:

**Telephone:** Employers can monitor or record telephone conversations made on business phones, including personal calls. While the ECPA (Electronic Communications Privacy Act) allows this, some states require that both parties are made aware of the monitoring, either by a message or special tone.

**Computer:** Employers can use software that allows them to access employee's computer screens during use, view hard drives and even monitor keystrokes to determine productivity. Generally, this is legal, as the equipment belongs to the employer. However, union negotiators may limit what employers can do, and federal employees have some protection under the Fourth Amendment. Additionally, specific California laws allow some protection to employees regarding employer access to computers.

**Mobile Devices:** Employers can monitor communications made on mobile equipment they provide to their workers, such as cell phones, smart phones, and laptops. Since this is the employer's equipment, it is legal in most circumstances.

**Email:** Employers can monitor communications made via email when the email tools are provided by the employer. In some cases, even a private email account can be monitored when it is used on a company computer.

**Social media:** Employers may monitor workers' activity on social media sites, and there are no federal laws prohibiting this type of monitoring. Some companies have social media policies that allow them to reprimand workers for posting certain information on social media sites. However, some states prohibit employers from disciplining workers over social media activity.

**Video:** Video monitoring is a common way to deter theft and encourage productivity in the workplace. There are no federal regulations preventing video monitoring in the workplace, with or without the employee's consent. However, some states and negotiated union contracts specify areas where employers are not allowed to monitor, such as locker rooms and bathrooms.

**Geo location:** This is relatively new method of monitoring. Employers are using Global Positioning Systems in employer-owned vehicles to track the location of their employees. Since the vehicle is the property of the employer, it is completely legal, though new regulations may arise as the method becomes more common.

Medical Management is a comprehensive approach to managing health care costs, care coordination, and intervention for plan members. Early access to Medical Management services provide members with the education and support necessary to maintain and enhance their level of wellness and quality of life.

### **6. Implementation of Control Measures**

- ✓ Assess the risk controls for any hazards that may result from their implementation and conduct a risk assessment.
- ✓ Advise affected workers of the control and train them in the procedures surrounding the control.
- ✓ Amend checking, reporting and auditing documents to reflect the new control (e.g. maintenance records).
- ✓ Review the control regularly to determine whether it is working to eliminate or reduce the original risk.
- ✓ Provide adequate supervision to ensure controls are being implemented correctly.

## **6. METHODOLOGY**

Survey was done among these employees with the help of a designed set of 25 questions related to employee's ergonomical happiness and distress. Service organizations are selected for observation and study. A sample chosen randomly is meant to be an unprejudiced representation of the total population. If for some reasons, the sample does not represent the population, the variation is called a sampling error. Each member of the workforce has an equal opportunity of being chosen because all the employees which were chosen to be part of the survey were selected randomly.

### Sample Size for study

200 Employees of Service sector of udupi district

### Population (Service Sectors)

2000 Employees

### Scale of measurement

5-Point Likert scale ranging from 1 to 5. Indicated as Never (1), Rarely (2), Occasionally (3), Often (4) and Very often (5).

Productivity of employees can be maximized by achieving improved indoor environmental quality and climate.

### Validity of data

Good Sample size represents the trueness of data analysed and studied here.

## 7. TESTING OF THE HYPOTHESIS

Degree of freedom = 4

Table value = 9.488

Formula for the chi technique is

$$\chi^2 = \sum \frac{(O-E)^2}{E}$$

Calculated value = 10

### Decision rule

Hence the calculated value  $\chi^2 = 10$  which is higher than the table value 9.488, null hypothesis is thus rejected, chi square value is more than table value thus alternative hypothesis is selected.

H0 Rejected & H1 Accepted

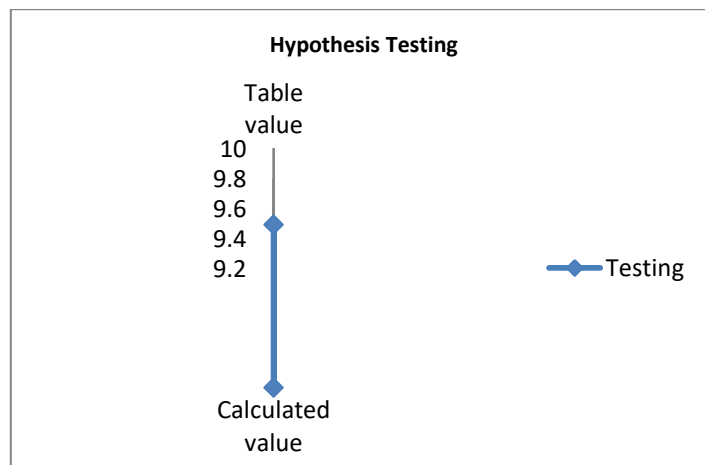


Figure 3: Hypothesis testing represented through graphical line

## 8. CONCLUSION AND RECOMMENDATIONS

The study demonstrates the importance of ergonomics and related employee satisfaction, which can be stated to be good in many areas as per the IT sector company undertaken for this study. It also indicates towards various other facts covered under the ergonomical dimensions of any service organizations of udupi district, India. Employer's good & comfortable provision of various facilities in these industries to the workers. It also encourages the reader to learn and analyse the role of the most important to the least important variable of ergonomics under observation in the IT industry's from employee point of view.



### **Evaluation and Review**

Evaluation is when you assess whether what you have been doing is really making the difference that you intended it to. It tends to happen less frequently, for example annually or at the end of a longer-term project. Review is when you look at the results of an evaluation and decide whether it needs to change.

### **About the Authors**

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### **ACKNOWLEDGEMENT**

Visveswaraya technological university Belagavi encourage and support their research scholars for publishing such research papers during their research studies. VTU is one of the largest universities in India with 212 colleges affiliated to it with an intake capacity of over 467,100 undergraduate students and 12,666 postgraduate students. The university encompasses technical and management fields which offer 30 undergraduate and 71 postgraduate courses.

VTU has 13 QIP centres and 17 extension centres. Its affiliated colleges offering postgraduate courses. It has around 2,305 departments recognized as research centres which are spread across its affiliated institutions in cities of Karnataka.

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