

Research Insight: Research Avenues for Ergonomics and Human Factors in Real life Man-Machine Systems

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BACKGROUND

The real life systems now a day are on the path of continuous improvement and updating. The legacy of version improvement and other branding techniques is not only running as a part of marketing and corporate strategy but also for a consumer's ease and comfort. There is continuous focus on minimizing and curtailing the role of man in modern systems. The concepts like automatic systems, sophisticated sensors and self-monitoring systems are now a days on a full swing.

DEFINITION OF ERGONOMICS/ HUMAN FACTORS

Human Factors can be defined as the person's physical, psychological and the environmental factors which affects his biological behavior with the real life systems. Cognitive ergonomics studies cognition in work and operational settings, in order to improve human well-being and system performance. It is a subset of the larger field of human factors and ergonomics.

Cognitive ergonomics is a branch of ergonomics that deals with the cognitive or mental ergonomic aspects. These aspects include understanding how the senses work and how the person perceives through them. It also includes how the brain processes information. Cognitive ergonomics subjects include human-computer interaction, work stress, mental workload, decision-making, reliability and training requirements.

Ergonomics is the plan and engineering of human-machine classifications for the determination of enhancing human activities with parallel care of safety and health. Ergonomics is the scientific study of human work conditions, particularly the relations between man and machine. Ergonomics is a term taken from the Greek work "ergon," meaning work, and "nomos," meaning natural laws. The objective of ergonomics is to make work more comfortable and to improve both health and productivity. It is a multidisciplinary science of designing the job, products, and place to fit the worker, from perspective of safety, psychology, industrial engineering, computer science, and biomechanics.

NEED AND SCOPE OF RESEARCH IN AREA OF ERGONOMICS

The real world is full of man machine systems, where machine is the prime mover and man is the personality who operates the machine. Though the automation is now a day a huge area of development and improvement, somewhere and somewhat the human intelligence is superior as compared to artificial intelligence. In ultra-sophisticated automated systems, at least the supervisory and monitoring control is needed by an operator. In such cases, ergonomics comes into a picture. Initially the ergonomics was considered as an area of social domain.

It was concerned under the influence of human rights, labor laws, company laws, government protocols and regulations, etc. But it is the fact that ergonomics or human

factors are not only in the social domain but it is inherently associated with professional attributes. The ergonomics highly affects the comfort of an operator and eventually affects the quality and productivity of work.

*“Comfort and Pleasure are not only requirement of work
But actually it is a fuel in a journey
towards improved health and
productivity!!!!”*

Specific Areas Where There Is an Emerging Need for Research and Development Especially Under the Domain of Ergonomics

As far as the areas are concerned where ergonomics plays a vital role, there is no such area where the ergonomics does not exist. But here some of the major areas are identified and discussed.

- The ergonomics research is needed in the area of Road Safety. There are large number of accidents occur daily in India. The statistics provides a shocking figure for casualties and death during a road mishap. What can be the ergonomic factors which affects the driver’s comfort and his control decision which causes an accident? There may be a combine effect of external and vehicle factors but the whole system is under the control of a driver. He may control and prevent the accident if he is aware and spontaneous.
- Another area of research is the industrial shop floor. There are some typical industries dealing with particulates such as cement, asbestos, silica and steel industries. In such industries, pulmonary disorder and respiratory problems are very prevalent among workers. It is very necessary to evaluate the effect of such working conditions on the health of operator as well as on the productivity and quality.
- The ergonomic problems are also reported in the simple corporate office jobs. The jobs with prolonged sitting posture and repetitive work lead to large amount of discomfort. This discomfort is replicated in their work. An uncomfortable worker is a symptom of huge corporate disease.
- Apart from this, there is also a role of ergonomics especially in women. There are several women factors which are responsible for health related problems. The women factors such as pregnancy, menstruation, and menopause causes severe comfort related problems.
- There is a need for research in the policy making of human resource department for selection of an appropriate worker according to the task and its degree of difficulty. Selection of worker according to age, experience, health and physical working capacity can be done so that the overall working system is improved.
- Last but not the least, there is a need for research under ergonomic mainstream in army, navy and defense sector. The arms, ammunition and defense equipment are to be designed according to ergonomic aspect.

Apart from these, more areas can also be explored. Many organizational support systems are available for funding and assistance to such research. Keep one thing in mind,

*“Human is the most dynamic and uncontrollable factor
Health and comfort are the fuel for the
journey towards excellence.”*