

Development of Computer Assisted System for Ergonomic Risk Assessment Tools

Harshita Chawda

Student, Department of Industrial & Production Engineering, P.D.A.College of Engineering,
Kalaburagi, India
harshitachawda2799@gmail.com

Qutubuddin S.M

Associate Professor, Department of Industrial & Production Engineering, P.D.A.College of
Engineering, Kalaburagi, India
syedqutub16@gmail.com

Mohammed Touseef Anwar, Md.Quddus Ahmed and Vijaylaxmi C.

Students, Department of Industrial & Production Engineering, P.D.A.College of Engineering,
Kalaburagi, India
touseef44anwar@gmail.com, mohammedquddus18@gmail.com, preetichillal1@gmail.com

Abstract

Ergonomics has created a lot of interest and is being increasingly applied in manufacturing and service organizations. The research output from academia has highlighted the relationship between ergonomics and productivity, health and safety and quality. For small and medium industries, the application of ergonomics is a hurdle as necessary information, guidelines and training for risk assessment tools is seldom available from a single source. Therefore it is proposed to develop a Computer Assisted System for Ergonomic Risk Assessment (CASERA), which is user-friendly. The proposed system is developed in Visual Basic .NET (VB.NET). The proposed system is divided into three modules, information, assessment and standards. The information module educates the user about ergonomics, applications, principles, anthropometry, workstation design guidelines, awkward postures, musculoskeletal risks etc. In the assessment module, most popular ergonomic assessment tools such as Rapid Upper Limb Assessment (RULA), Rapid Entire Body Assessment (REBA), Quick Exposure Checklist (QEC), Ovako Working posture Assessment. System (OWAS), NIOSH lifting tool and Strain Index (SI) are included. The step by step information given along with images of postures makes it easy for the user to perform assessments. In each tool, the workers preliminary information, job/tasks assessed and other details can be stored and retrieved. In this module provision is made to add further assessment tools. The standards module gives an overview of all environment standards about noise, heat, illumination; workspace, checklists, questionnaires, ergonomic controls, list of ISO and other standards and links for further information. Hence the proposed system is a complete package aimed to assist the owner/engineer/supervisor in understanding about ergonomics and carry out preliminary assessments for identifying the level of risks, designing workstation and applying standards. The CASERA software has been validated by carrying out RULA assessment for 100 postures from different occupations. The results of assessment from the software are on par with the manual assessments done by RULA scoring sheet. The system is user-friendly, and saves times in assessments, and all information is easily stored and retrieved for further analysis. Especially for the small scale industries, CASERA can be used to increase the awareness and application of ergonomics.

Key Words

Ergonomics, RULA, REBA, OWAS, NIOSH

Bibliographies

Harshita Chawda, Mohammed Touseef Anwar, Md.Quddus Ahmed and Vijaylaxmi C, are final year undergraduate students in Industrial & Production Engineering Department, P.D.A.College of Engineering, Kalaburagi. Apart from academics they are a part of the research group in Human Factors and Ergonomics Laboratory. They are also actively involved in organizing various events and local industrial visits under IEOM student chapter, and have competed in Best Student Chapter competition at 11th Annual IEOM International Conference at Singapore. 7-11 March 2021. Harshita has presented a paper at 18th International Conference on Humanizing Work and Work Environment (HWWE2020) 10th -12th Dec 2020.

Dr. Qutubuddin S.M., presently working as Associate Professor, Industrial and Production Engineering Department, P.D.A.College of Engineering, Kalaburagi. He has more than 29 years experience in teaching and research and has published more than 35 papers in International and National journals and Conferences. Under his supervision 01 research scholar has completed PhD and 02 are undergoing. His research interest include Human Factors and Ergonomics, Occupational Health and Safety; Production/Operations Management. He has introduced the course Human Factors and Ergonomics in the curriculum in under graduate engineering and has developed laboratories such as Industrial Engineering Laboratory, Human Factors & Ergonomics Laboratory and Quality Control Laboratory. He was actively involved in getting NBA accreditation for the department. He is a life member of ISTE, IIPE, IAENG and IEOM Society USA. He has started a student chapter of Industrial Engineering and Operations Management Society (IEOM) Michigan, USA in the institute. The chapter was awarded the best student chapter in the year 2019 at IEOM International conference in Bangkok, and in 2020 at IEOM International conference held at DUBAI. He is serving regularly in various capacities as a Reviewer, Track Chair, Session Chair and Technical Committee member in IEOM International conferences since 2015. Under his guidance UG students have participated and presented papers in International Conferences in India and abroad.