INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN BUSINESS & SOCIAL SCIENCES

Vol 14, Issue 1, (2024) E-ISSN: 2222-6990

Relationship Between Ergonomic Factors And Employee Performance Among Employees At Proton Holdings Berhad

Nazratul Ishmah Lokman, Nurul Fadly Habidin

Faculty of Management and Economics, University Pendidikan Sultan Idris, Perak, Malaysia,

Corresponding Author Email: nazraishmah@gmail.com

To Link this Article: http://dx.doi.org/10.6007/IJARBSS/v14-i1/20582 DOI:10.6007/IJARBSS/v14-i1/20582

Published Date: 11 January 2024

Abstract

This study aimed to identify the relationship between ergonomic factors (human, space, equipment, environment) and work performance among employees at Proton Holdings Berhad. In this study, a total of 380 sets of questionnaires were successfully collected for analysis. The samples used are operator workers and the sampling technique is random sampling. Correlation and regression tests were used to perform statistical analysis of study data. The correlation analysis findings showed a positive and significant relationship between equipment (r=0.596, p = 0.000), environment (r=0.383, p = 0.000), space (r=0.234, p = 0.000), and human (r = 0.215, p = 0.000) with work performance. Regression analysis shows that the R2 value of the model is 0.389 which is 38.9% of the variation in work performance is explained by ergonomic factors. The ANOVA test showed that the regression model was significant (p =0.000, F = 57.476). In addition, the study found that the factors of equipment (B=0.497, p = 0.000) and the environment (B=0.184, p = 0.000) significantly led to employee work performance. In conclusion, job performance is influenced by ergonomic factors, that is, the equipment and environment of the employee. The implication is that to improve work performance, management needs to focus on ergonomic factors, especially equipment, and environment.

Keywords: Ergonomic, Work Performance, Equipment, Environment, Space, Human

Introduction

Automotive is an important industry for the Malaysian economy. The sector contributes significantly to the economy including the manufacturing and services sectors. The automotive industry began with the import of vehicles, which later expanded to include the assembly and development of the automotive supply industry. Looking at the challenges faced by the automotive industry, in particular globalization, liberalization, and increasing competition, there is a need to review the strategic direction as well as the state of the local automotive sector framework. This is important to ensure that players in the automotive

sector are competitive and remain sustainable over a long period. To this end, the government will implement measures as it deems necessary. In return, the government will introduce new measures to replace existing measures that are no longer important for the country. As a result, these measures will continue to stimulate the development and progress of the car manufacturing industry. Hence, the government is committed to creating an environment that promotes the rapid development of the automotive sector and becomes a world-class industry (PMO.Gov. My, 2005).

Proton Holdings Berhad is a Malaysian automotive company and an active company in car design, manufacturing, distribution, and sales. Proton was established on 7 May 1983 as Malaysia's only national badge car company. Proton Holdings Berhad is a Malaysian automotive company that has managed to maintain its position as a major player in the country's car industry for many years. In line with the rapid development in technology and engineering, Proton continues to improve the quality and quality of its products to compete with international brands. Proton Holdings Berhad is a car manufacturer based in Malaysia. As one of the major companies in the automotive industry sector, Proton Holdings Berhad needs productive and efficient employees to carry out their work. Because of this, factors related to ergonomics are important in supporting the employee's work performance.

Ergonomics is an important aspect of improving work performance. Ergonomics is an interdisciplinary science that studies the interaction between humans and the working environment, including the equipment, systems, and procedures involved. Ergonomics supports the safety, health, and welfare of employees by paying attention to the efficiency and effectiveness of work in a safe and comfortable environment. Ergonomics is a work science that covers the way humans do things using tools, equipment, workspaces, and psychosocial aspects of working conditions (Stephen Pheasant, 2003). Furthermore, ergonomics is the study of human interaction with tasks, equipment, tools, and physical work environments (Mondy et al., 2002). This field is an interdisciplinary approach to designing equipment and systems that are simple and efficient for human use (Bohlander & Snell, 2004). Ergonomics also examines the relationship between humans and the work environment in dealing with various kinds of threats to employees. Also included are the various elements of human communication towards the use of facilities as well as elements around the workplace (International Ergonomic Association, 2018). The field of ergonomics is used to ensure that the health and safety of employees are at a satisfactory level as it is closely related to the workplace. Most employees do not realize that they are exposed to various health risks at work. Examples include mental and physical health risks, the use of substances that could be harmful to health and safety, and unsafe environments and workplaces for work.

Carayon (2015) says that ergonomics is a scientific discipline with a relevant understanding of the response between employees in the way they shape the system of work environment, work location, and work culture to maximize employee productivity. The main elements of the working location are workspace, computer, chair, lighting, noise level, working temperature, and others. All of this can be adjusted to improve the health, safety, and performance of employees as well as to be one of the elements in the field of ergonomics.

Employers who do not apply ergonomic principles to the organization will result in employees experiencing unwanted physical problems. This refers to the time, equipment, and design of

the workplace. The following are the physical issues faced by employees such as stress, tension, vibration, improper position of the legs, excessive energy consumption, or repetitive movement of the limbs. Therefore, employers should take seriously the impact or risk of ergonomic hazards in the workplace to avoid injuries and accidents that are harmful to employees.

The study focused on ergonomic issues and employee performance in the workplace. Ergonomics is the science of installing work to humans (Pao & Kleiner, 2001). Ergonomics is the relationship between workers and work. This aspect focuses on the design of work areas to improve work performance (Loy & Greer, 2002). Failure to address ergonomic issues will lead to repetitive stress injuries with carpal tunnel syndrome (CTS) being the most common (Mondy et al., 2002).

However, the performance of the company also depends on the performance of the employee. Therefore, ergonomic factors are considered very important in influencing the performance of a person's work. Ergonomic factors refer to the influence of the working environment on the physical and psychological of employees. This includes the design of working tools, lighting level, ambient temperature, noise, and cleanliness of the workplace.

In this regard, a good understanding of the ergonomic factors in the work environment will help improve the work performance of employees at Proton Holdings Berhad. This will be of great benefit to the company in increasing the productivity and welfare of its employees. A study on the relationship between ergonomic factors and job performance among employees at Proton Holdings Berhad was conducted to assess the extent to which ergonomic factors affect employee performance. This study is important to identify weaknesses in ergonomic management and human resource development at Proton Holdings Berhad as well as to take the necessary actions to improve employee performance.

Literature Review

Definition of Ergonomic

Ergonomics is the use of scientific information about objects, systems, and the environment for human consumption (a definition adopted by the International Ergonomic Association in 2007). Ergonomics comes from "ergo", which is a Greek word meaning work, and "nomos" means the rule. Ergonomics is a modern term that means employment law, briefly describing how work can be done safely. The word ergonomics was introduced by the Polish scientist Wojciech Jestrzebowski. He said the importance of the use of ergonomics in everyday life including work. In the United States (USA), the term human factor engineering describes the relationship between man and machine when doing work.

The definition of the International Ergonomic Society (IEA) in 1961 stated that the main purpose of ergonomics is the planning of work-oriented daily work. The effects of workplace discomfort such as unhealthy, unsafe, and unproductive can be avoided by considering the ability and ability of an employee to complete work. There are several ergonomically related definitions stating that ergonomics is used to "adapt work to employees" while the International Labor Organization (ILO) considers ergonomics as an applied human biological science and has a relationship with work techniques applied in the workplace to enable employees to increase their productivity and job satisfaction. This is an applied science of

equipment design that aims to maximize productivity by reducing employee fatigue and discomfort. This field is also called biotechnology, human engineering, and human factor engineering.

Ergonomics is a discipline of various sciences involving fields with information about humans such as psychology, anthropometrics, biomechanics, anatomy, physiology, and psychophysics. This field involves the study of human characteristics, capabilities, and limitations and the use of information to design and evaluate equipment and systems used by humans. The basic goal of ergonomics is to design the best equipment to be suitable for use by employees. In addition, ergonomics ensures that the safety of employees is guaranteed, for example, free from harm, injury, and loss. This area also ensures comfort, convenience, performance, and productivity efficiency or increased output/input to improve. The field of ergonomics is also called human engineering, human factor engineering, engineering psychology, or human-machine systems (human-machine interface design) (Bhise, 2011).

Dul & Bruder (2012) argues that the current situation, in which ergonomics is associated with health and safety should not be the only basis for applying ergonomics in the organization. It is suggested that if ergonomics contributes directly to the company's strategy, this will be more acceptable to business managers, more embedded in the organization, and possess its full potential as well as described in the IEA definition would be better (Dul & Neumann, 2009). Furthermore, it will be much easier to improve health and safety if managers understand that simultaneous ergonomic improvements will help them realize key strategic business goals. Currently, many managers and ergonomics specialists may not be used to thinking in terms of objectives and strategic opportunities in firms provided by ergonomics to help achieve the core goals of the business. In the paper, new opportunities and challenges are presented for ergonomics by explaining the possible relationship between ergonomics and the company's strategy. The goal is to present a broad overview of the possibilities of business strategies to which ergonomic research, education, and practice can be attributed. The paper also supports ergonomists in their efforts to develop a "business" language to enhance the ability to communicate with the business and management worlds.

Employee Performance

Each organization needs high-performing individuals to ensure competitive advantage and achievement of corporate goals. Therefore, the high performance of employees is one of the critical determinants of the level of productivity and achievement of the organization. Solving and performing tasks at a high level can be a source of satisfaction, with a feeling of domination and pride. In defining the concept of employee performance, Campbell et al (1993) as quoted in Sonnentag (2008), distinguishes between aspects of action, that is, behavior and performance outcomes. The behavioral aspect refers to the actions performed by an individual in a work situation. These include behaviors such as installing car engine parts, selling personal computers, teaching basic reading skills to primary school children, or performing heart surgery. The outcome aspect refers to the consequences or results of the behavior of the individual. The behavior described above may result in something such as the number of engines installed, the reading efficiency of pupils, sales figures, or the number of successfully dissected heart operations. In simple terms, employee performance can be

defined as the extent to which members of the organization contribute to achieving the goals of the organization.

Employee performance is the behavior of employees in employment that contributes to the goals of the organization. This behavior is officially evaluated by the organization as part of the employee's responsibility. To understand and finally predict the performance of the work, it is important to accurately define the term. Work performance is about behavior in employee control and not about results (effectiveness). Meanwhile, the costs involved in achieving results (productivity), results that can be achieved over a period (efficiency), or the value that the organization places at a given level of performance, effectiveness, productivity, or efficiency (utility) (Lennox, 2018).

Employee performance can also be understood as a person's ability to perform, something including the opportunity and willingness to perform. The meaning of readiness to perform means the desire of employees to put as much effort as possible towards their work. According to Dessler (2000), work performance refers to how individuals act and contribute to behaviors consistent with the goals of the organization. Whereas job performance refers to the responsibilities and tasks that a person needs to perform as individual tasks. According to Naharuddin et al (2013), he found that the performance of employees depends on the willingness and openness of the employee himself to do the work. It is also explained that, with the willingness and openness to get the job done, an employee can increase his productivity and lead to achievement.

According to Armstrong (2006), achievement is not only a matter of what people do but also how they do it. This means that the process of achieving goals is also an important part of work performance. While Elnaga & Imran (2013) interprets performance as fulfilling tasks determined by the employer. The goals of the organization are easy to achieve when the employee has a high result of work. A study by Roelofsen (2002) titled "The Impact of Office Environment on Employee Performance" explains that better performance translates to more diligent employees, less absenteeism, less early return, and no longer lunch breaks. This suggests that high-performing employees are more focused and interested in getting the job done. Employees are also able to perform quality work within the required hours. This indirectly increases the productivity of an organization.

Study Factor

Human Factor

From an ergonomic point of view, it is known as comfort design, functional design, and user-friendly systems. It is the practice of designing products, systems, or processes to consider the interactions between them and the people who use them. Working ergonomically in the design process requires standard definitions, verification methods, and value ranges. This can be obtained from tests, both tests by subject and virtual tests. Examples of tests with subjects are movement analysis, stress studies, physiological tests, usability tests, and comfort tests. Examples of virtual tests are modeling and simulation.

At the initial stage of the development project, the human factor and ergonomic testing can serve as part of the design of the work. Physical mock-ups, computer design tools, and simulations used in any type of situation are sometimes called development and evaluation

tests. Human factors and ergonomic testing usually have a significant impact on the design of new products, although users of the product do not care about this work effort. At the same time, this test can also cause the system, efficient, intuitive, and user-friendly products to not always be as clear as the test results should be interpreted. This can lead to the formation of cost overruns, implementation, and even the purpose of system design. Human factors and ergonomic needs are sometimes difficult to determine with measurable criteria and are very limited by the simple fact that a product or system should be user-friendly. Some requirements can be expressed either in terms of impact on the performance of human systems or in terms of certain design features.

Based on the Mutia Osni study (2012), there are two types of jobs in the workplace, namely static jobs, and dynamic jobs. Working in silence is a great way to get your work done. This happens because there is no change in the position of the body while performing work, standing, or not moving for a long time. Long periods while doing work can cause employees to be incompetent and experience pain in certain parts. Dynamic work, on the other hand, is a job that is done in a moving state and the position of the body is constantly changing. However, body movement is very important to avoid static work problems and reduce the risk of stress such as lifting, carrying, pushing, and pulling luggage. dynamic work that poses a serious risk to ergonomics.

Most employees are provided with a safe and healthy working environment, but they have some problems with high-vibration power to the detriment of work. Their work requires a stationary position for a longer period. This creates dissatisfaction among employees with the use of ergonomics in their workplaces. The risk of disease faced by workers in the automotive industry is due to repeated movements, positions, and limbs as well as labor pressures (Deros et al., 2010).

Next, Bosch et al (2011) found that doing repetitive work as a work cycle activity involves neck movements, such as turning your head to see something in another part of the room. Most studies suggest that recurrence or repetitive work can be a risk factor for causing pain or injury to the neck or shoulder.

Interhuman technology with work took root from the very beginning, according to Hugo Munsterberg and the development of industrial psychology (Elnaga & Imran, 2013) and in the works of Fredrick W. Taylor, Frank B. Gilbreth, and others and the development of industrial engineering (Helander & Zhang, 1997). Industrial psychology is developed with the focus on studying both human capabilities and limitations as well as the need for employment to select people whose personal characteristics correspond to the specific job demands in question. Many methods and tools for studying human capabilities, limitations, and other characteristics and features of employment, such as talent tests and task analysis have been developed by H. W. Hendrick, an industrial psychologist discipliner. Similarly, most of the technologies for studying the methods and procedures of work were developed as part of the discipline of industrial engineering (Helander & Zhang, 1997).

Equipment Factor

A machine can be any man-made device that has a working capacity. A typical proto-source machine-source system is described by a car driver or machine operator in which the machine

components and the link between man and machine (display and control) are noticeable. The latest developments in information technology have attracted a lot of ergonomic attention to information systems. The system of work is abstract and does not have a unique spatial location. A piece of software on a computer network is an example of that machine. The local environment, on the other hand, may be the network itself and many users in different locations but can interact with the machine at the same time (Bridger, 2003).

Ergonomics work design has been built to develop human technology and its unique work. Among them are methods for developing work modules and incorporating modules into jobs to be made intrinsically motivated. Hence it is better to use human capabilities and avoid the stress of human limitations concerning things like physical and mental workload.

Many publications highlight and mention future scenarios in which companies will have automated, simple, and repetitive manual tasks. However, it is also stated that most automation technologies in the industry have limited flexibility (Kadir et al., 2019). Complex tasks that require flexibility and ad hoc problem-solving skills will remain the property of human workers, thus making them a necessity in future factories.

The implementation and integration of complex sociotechnical systems require a holistic understanding of changes in employee roles and responsibilities and approaches to designing work forms and work systems in the industry. To achieve this holistic understanding, it is important to identify and document the challenges and opportunities associated with human work. However, since the topic of the industry is relatively new, research on human labor in this context is still limited. Moreover, the research available in this narrow field is mostly focused on integrating human labor into manufacturing processes at lower operating levels. This ignores the superior level of dealing with decision-making, control, and scheduling. Therefore, using the HF/E approach may be very beneficial in terms of analyzing, understanding, and designing human work in the industry.

For decades, the HF/E field has been testing theories and developing tools, guidelines, and methods to ensure the well-being of human workers. The IEA defines HF/E as a scientific discipline related to the understanding of the interaction between humans with other elements of the system. In addition, it is also explained as a profession that uses theories, principles, data, and methods to design to optimize human well-being and overall system performance (IEA, 2018).

Space Factor

The workspace is a three-dimensional room, which is where work is carried out. In a simple work system, the workspace may be in the workplace that is being run at any time when moving from one location to another. In more complex systems, workspaces usually become fixed, and this introduces design issues such as the need to define workspace dimensions (Bridger, 2003).

Environment Factor

Many aspects of the physical environment can affect employees. Ergonomics involves those who influence using the way human components and machines interact. Noise, vibration, lights, and climate are most alarming in ergonomics. Environmental pollution is managed by

industrial hygienists since they are experts in the field of health regardless of other factors of the working system. However, awareness of this aspect is also important from an ergonomic perspective as it may have an impact on human abilities motivation, and health.

Ergonomics has emphasized various aspects of the physical environment as work stress including noise, lighting, temperature, air quality, and workplace layout. Noise is the most famous environmental stress that can cause an increase in arousal, blood pressure, and negative psychological mood. Environmental conditions, general air quality, and cleaning have been shown to affect energy expenditure, heat exchange, stress response, and sensory impairment which makes it more difficult to carry out tasks and increases employee stress levels as well as emotional irritation (Carayon & Smith, 2000).

A study conducted by Roelofsen (2002) found that improvements in the workplace environment had an impact on reducing employee complaints and absenteeism as well as improving productivity and performance. Employees with private workspaces were more satisfied with their workspaces than employees who did not have private space while working.

Weiss (2002) supports this, stating that environmental satisfaction contributes to job satisfaction. Floor configuration and furniture layout also have a direct influence on employee performance and satisfaction (Vischer, 2007). Modification of equipment that suits employees in the course of their duties can reduce occupational diseases and provide comfort to them. This will lead to increased productivity and quality of employment.

Method

Data Collection

The main method of data collection in this study was to use a questionnaire. However, before the actual data collection period, researchers conducted a pilot study to assess the reliability and validity of the study instruments used.

The study was conducted at Proton Holdings Berhad in Tanjung Malim, Perak. The procedure under this study is that the researcher sends a letter to the management at Proton Holdings Berhad to conduct the study, please refer to Appendix B. In addition, the researcher has sent a total of 760 sets of questionnaires to the company for distribution to the respondent i.e., the production operator. Researchers also contacted the company to inform them about the need for the collection of records related to ergonomics occurring within the workplace environment.

Data collection in the final phase was fully implemented through questionnaires from November 2019 to December 2019. Researchers visited Syarikat Proton Holdings Berhad as a sample of the study, the researchers selected respondents from companies consisting of non-management workers, such as employees of production operators. For this study, the researchers distributed 760 questionnaires to Syarikat Proton Holdings Berhad and managed to collect 400 sets of questionnaires. A total of 380 questionnaires are clean and can be used for data analysis purposes.

Size and Sampling

This study's population was comprised of Proton Holdings Berhad employees. Determining the sample size requires some consideration, whether the place is large or small is considered when selecting a sample. The sample is small without biased elements and does not represent the population. Sampling means the process of selecting enough items from the population, and a sample of such items can represent the characteristics of the entire population (Sekaran, 2003). According to Gay & Airasian (2003), the study sample consisted of individuals, items, or events selected from a larger population. Next, Jankowicz (2013) explained that the sample is a set of individuals isolated to collect study data.

The sample of the study refers to the sample in the study, which is the group that is the source of the necessary information. What can be understood about the study sample is that part of the group came from a large population. Sampling can be based on probabilities, which occur randomly. According to Krejcie and Morgan (1970), the sample used in this study included 380, production workers at Proton Holdings Berhad out of a total population of 2,000 employees (Human Resources Division). The sampling method used is random sampling, i.e., the questionnaire is distributed to the respondents according to the proportion in the factory.

Demographic

This analysis explains the frequency and percentage found in the respondent's profile, namely education level, age, length of service, department, and shift work. The frequency distribution and percentage of respondent profiles according to demographic characteristics are described below. Table 4.1 is an analysis of the total and percentage findings based on the level of education. A total of 366 respondents were involved in this study. Through the education level of 193 people, equivalent to 52.7% had an SPM education level, an STPM/Diploma of 74 people equivalent to 20.2%, 19 respondents equivalent to 5.2% had a Master's/Master's/Ph.D. education level, and 80 people equivalent to 21.9% Certificate. As a result of this analysis, the highest percentage was the respondents with an SPM education level of 52.7%.

It can be concluded that most of the respondents are those with the highest level of education, namely SPM. This is because most of them do not have good academic achievement and the intention to continue their studies with higher education is not available. This manufacturing sector is one of the sectors that provide job opportunities to those with a minimum SPM education level only. They are more likely to pursue a career in the manufacturing industry and increase their knowledge in the automotive field.

Table 4.2 is an analysis of the number and percentage findings by age. Based on the above schedule, as many as 32 respondents 8.7% were aged between 18-24 years, 244 people 66.7% aged in the range of 25-35 years, 50 people simultaneously 13.7% aged 36-40 years, 28 people simultaneously 7.7% aged between 41-45 years, as many as 8 people simultaneously 2.2% aged 46-50 years, 2 people simultaneously 0.5% aged between 51-55 years and there were 2 people equivalent to 0.5 aged 56 years and over. Based on this analysis, the highest percentage of respondents aged 25-35 years, namely 66.7%.

In addition, in terms of the average age of those working in this manufacturing industry is in the range of 25 to 35 years. Most of the workers working in this manufacturing industry are

young people who have an interest in working. The average employer chooses these people because of their ability as young people who can do work that requires strong energy and a healthy body. This can be further reinforced by the findings of the study which have proven to show that the highest respondents are those aged 25 to 35 years.

Table 4.3 is an analysis of the findings of the number and percentage based on the length of service based on table 4.3 above of 48 respondents equivalent to 13.1% serving less than a year, 102 people equivalent to 27.9% serving 1-5 years, 91 people equivalent to 24.9% serving 6-10 years, 76 people equivalent to 20.8% serving 11-15 years, 27 people equivalent to 7.4% serving 16-20 years and finally 22 respondents equivalent to 6.0% serving between 21 years and above. Based on this analysis, the highest percentage of respondents served 1-5 years at 27.9%.

Table 4.4 is an analysis of total and percentage findings based on share. Based on Table 4.4 above 47 respondents equivalent to 15.4% in the Body Assembly, 23 people equivalent to 7.5% in the section of painting, 12 people equivalent to 3.9% in the engine Transmission Shop (ETM), 109 people equivalent to 35.6% in the Trim & Final (TF) section, 12 people equivalent to 3.9% in the Stamping section, 27 people equal to 8.8% in the Quality Control (QC) section, 36 people are equivalent to 11.8 in the Production Planning Control (PPC) division and the rest in the other division of 40 people is equivalent to 13.1%. Based on this analysis, the highest percentage of respondents was in the Trim & Final (TF) section at 35.6%.

Table 4.5 is an analysis of the total and percentage findings based on shift work Based on Table 4.5 above 77 respondents equivalent to 25.2% of working shifts and the remaining 229 respondents equivalent to 74.8% of non-working shifts. Based on this analysis, the highest percentage of respondents working shifts was 74.8%.

Variables/ Dimensions		Frequency	Percentage (%)
Education	SPM	193	52.7
	STPM/Diploma	74	20.2
	Bachelor/Master/PhD	19	5.2
	Certificate	80	21.9
Age	18-24 Year	32	8.7
	25-35 Year	244	66.7
	36-40 Year	50	13.7
	41-45 Year	28	7.7
	46-50 Year	8	2.2
	51-55 Year	2	0.5
	56 Year and up	2	0.5
Duration of service	Less a Year	48	13.1
	1-5 Year	102	27.9
	6-10 Year	91	24.9
	11-15 Year	76	20.8
	16-20 Year	27	7.4
	21 Year Up	22	6.0
Department	Body Assembly	47	12.8
	Painting	33	9.0

	Engine & Transmission Shop (ETM)	12	3.3
	Trim & Final (TF)	125	34.2
	Stamping	12	3.3
	Quality Control (QC)	29	7.9
	Production Planning Control (PPC)	54	14.8
	Miscellaneous	54	14.8
Shift Work	Yes	91	24.9
	No	275	75.1

Correlation Analysis

Pearson Correlation Analysis is used to analyze the relationship between ergonomics and job performance. The purpose of this analysis is to determine the existence of relationships, relationships that are positive or negative, and relationships that are significant or insignificant.

Analysis of the relationship between ergonomic factors (human, space, equipment & environment) and work performance among employees at Proton Holdings Berhad.

Pearson's Correlation Analysis aims to test the relationship between ergonomic factors (human, space, equipment & environment) and work performance among employees at Proton Holdings Berhad. At the same time, this analysis also answers the objective of the second study which is to determine the relationship between ergonomic factors (human, space, equipment & environment) and work performance among employees at Proton Holdings Berhad. The hypothesis to answer the second study was developed which are:

H1: There is a significant positive relationship between ergonomic factors (human, space, equipment & environment) and work performance among employees at Proton Holdings Berhad.

Table 4.13
Correlation between ergonomics and work performance

Pearson Correlation	Work performance
Human	.215**
Space	.234**
Equipment	.596**
Environment	.383**

**. Correlation is significant at the 0.01 level (2-tailed).

Table 4.13 shows the correlation between ergonomics and work performance. A Pearson correlation test has been used to look at the human relevance, space, equipment, environment, and work performance of automotive companies. The findings showed humans p = 0.215, space p = 0.234, equipment p = 0.596, and environment p = 0.383. The correlation table shows the correlation between the checked variables. The correlation between the ergonomics of the dependent variable equipment and the work performance of independent variables indicates a very strong positive relationship (r = 0.596), while the ergonomic correlation of the dependent variable with the work performance of the independent variable indicates a very strong positive relationship (r= 0.596) positive (human, r = 0.215, space r =

0.234 and environment, r = 0.383) Therefore, the hypothesis one is accepted for having a significant relationship between ergonomics and work performance at the automotive company. The findings have a positive correlation between ergonomics and work performance. Overall, there is a modest correlation between ergonomics and job performance at the automotive company. According to the Rule of Thumb, 0.511< r < 0.70 is a moderate correlation. Therefore, the correlation findings show that it is a moderate correlation.

Table 4.14
Summary of Hypothesis Testing Decisions1

Hypothesis	Results
H1: There is a significant positive relationship between ergonomic factors (human, space, equipment & environment) and work performance among employees at Proton Holdings Berhad.	Supported

Regression Analysis
Double regression analysis is a set of statistical techniques used to predict the value of one or more non-dependent variables. The purpose of this test is to establish a relationship between a continually dependent variable and a variety of continuous independent variables. (Samat et al, 2006).

Analysis of significant influences between ergonomic factors (human, space, equipment & environment) and work performance among employees at Proton Holdings Berhad.

This regression analysis is carried out to test the second objective of the influence between ergonomics and the performance of the work of the production operators of the automotive company. Through this regression analysis, H2 can be tested through this analysis, which is H2: There is a significant influence between ergonomic factors (human, space, equipment & environment) and work performance among employees at Proton Holdings Berhad.

Table 4.16
Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Human	.780	1.282
	Space	.771	1.297
	Equipment	.681	1.469
	Environment	.778	1.285

Table 4.16 shows the Coefficients. The Variance Inflation Factor (VIF) value is 1,282 for humans, 1,297 for space, 1,469 for equipment, and 1,285 for the environment which is between values 1 and 10 indicating no multicollinearity problems. The tolerance value also exceeds 0.1.

Table 4.20
Model Summary[b]

Model	R Square
1	.389

Based on the results of the regression analysis shown in Table 4.20, the R2 value of the model is 0.389. This means that 3.89% of the variation in work performance (dependent variable) can be explained by four non-dependent variables man, space, equipment, and environment. Thus, at least one of the three independent variables tested had a significant linear relationship with the dependent variable. In other words, at least one of the factors tested, that is, the human factor, space, equipment, and environment will have a significant association with the performance of the work.

Therefore, the results of the study support all the hypotheses tested. A summary of the results of the hypothetical test is presented in Table 4.18. To explain the third goal, the results showed that human, space, equipment, and environmental factors have a positive and significant impact on work performance, with equipment factors being the most dominant factor over space, environmental and human factors.

Table 4.21
Anova[a]

Model		F	Sig.
1	Regression	57.476	.000b
	Residual		
	Total		

a. Dependent Variable: Work Performance_t
b. Predictors: (Constant), Environment_t, human_t, space_t, equipment_t

Table 4.21 above shows the results of the ANOVA Test for ergonomic factors and work performance. The result shows a value of F = 57.476 and a value of p = 0.000 where the value of p is higher than the set level of $p < 0.05$.

Table 4.23
Summary of Hypothesis Testing Decisions2

Hypothesis	Decision
H2: There is a significant influence between ergonomic factors (human, space, equipment & environment) and job performance among employees at Proton Holdings Berhad.	Supported

Implication
Theory
In terms of theoretical implications, the most important empirical contribution to this study shows there is a significant correlation between humans, equipment, space, and environment with work performance. This supports the study of the theory used, that is, the theory of ergonomic workstations in which the variables used correspond to the above theory. Researchers also added a learning variable in the use of this theory. In addition, this theory

has been expanded in the use of research to elaborate and confirm the applicability of the theory in determining, predicting, and understanding the belief factors that affect the study. Based on the theoretical perspective, it is indicated that the ergonomic factors discussed in this study cover the concept of ergonomic models. This model shows how ergonomic factors affect human resources in an organization. This is the essence of the researchers' findings in this study.

Practical

With the introduction of modern technologies and the intention to reduce the operating costs of employees, industrial social workers should intervene to ensure that cost reduction does not affect them. For example, employment decisions should be made to make investments in the quality of life of employees. In addition, the physical environment in the workplace should improve the health of employees. This will come from the quality of the interior (open office space), ergonomic furniture, and lighting.

Industrial social workers need to support good lighting in the workplace as investment in lighting is aimed at improving safety. Accident rates greatly reduce the payment of lower insurance premiums, reducing absenteeism because of fewer accidents. This is nothing but an improvement in the well-being of workers. Workplace features are designed to promote cooperation and good interpersonal relationships without compromising output. Industrial social workers need to test it as this supports coaching, problem-solving, routine communication, and information sharing. The open environment is social, spontaneous, and productive.

Industrial social workers should advise management to look at the need to create an attractive working environment and nurture and motivate their workforce. This is aimed at making employees enjoy what is done creating job satisfaction, feeling like they have a goal orientation goal, are proud of what is done in the achievement of work, and can reach their potential.

Conclusions and Discussion

As a result of the results of this study, it can be concluded that all the objectives of this study have been achieved, with the variables of workplace and environmental equipment being the factors that most influence the critical success of ergonomics and the work performance of employees among employees of automotive companies. Factors such as space and humans also influenced the results of this study. Therefore, the researchers hope that this study will benefit all special employers with many employees. This study also supports employers in improving the quality, productivity, and work performance of employees through the implementation of ergonomic practices in the workplace.

This study can help in providing awareness of the ergonomic effects faced by employees. This aspect has a significant impact on the lives of individuals both within and outside of working hours. Knowledge and information from extensive organizations will help reduce the ergonomic impact faced by employees. Immediately, this will improve the effective rate of performance and quality of work of employees. Awareness of this ergonomic issue can also reduce the medical costs incurred by the relevant organization. The impact of disseminating

knowledge and information presented will cause employees to be more cautious and able to improve their quality of life.

In addition, the government can also make it a reference material for each organization. In addition, employers should consult proper ergonomic usage guidelines to reduce the level of stress faced by both public and private employees. This refers to how important it is that ergonomics can help employees in the workplace so that they can improve their quality of life, quality of work, and work performance. This is also capable of triggering the ideas and motivations of other researchers to do ergonomic research.

References

Armstrong, M. (2006). A handbook of human resource management practice. Kogan Page Publishers.

Bhise, V. D. (2011). Ergonomics in the automotive design process. CRC Press.

Bohlander, George & Snell, Scott. (2004). Managing Human Resources. (13th Ed). United States of America: South-Western.

Bosch, T., Mathiassen, S. E., Visser, B., Looze, M. D., & Dieën, J. V. (2011). The effect of work pace on workload, motor variability and fatigue during simulated light assembly work. Ergonomics, 54(2), 154-168.

Bridger, R. S. (2003), Introduction to Ergonomics. London: Taylor &Francis.

Carayon, P., & Smith, M. J. (2000). Work organization and ergonomics. Applied ergonomics, 31(6), 649-662.

Carayon, P., Hancock, P., Leveson, N., Noy, I., Sznelwar, L., & Van Hootegem, G. (2015). Advancing a Sociotechnical Systems Approach to Workplace Safety–Developing the Conceptual Framework. Ergonomics, 58(4), 548-564.

Deros, B. M., Daruis, D. D., Ismail, A. R., Sawal, N. A., & Ghani, J. A. (2010). Work-related musculoskeletal disorders among workers' performing manual material handling work in an automotive manufacturing company. American Journal of applied sciences, 7(8), 1087.

Dessler, G. (2000). Human Resource Management London: Prentice HallFrancis, Dave Dan Young, Don 1992 Improving Work Group a Practical Manual for Team Building California: Pfeiffer & Company

Dul, J., & Weerdmeester, B. (2008). Ergonomics for Beginners.

Dul, J., & Neumann, W. P. (2009). Ergonomics contributions to company strategies. Applied ergonomics, 40(4), 745-752.

Dul, J., & Bruder, R. (2012). Ergonomics for beginners: a quick reference guide. CRC press.

Elnaga, A., & Imran, A. (2013). The effect of training on employee performance. European journal of Business and Management, 5(4), 137-147.

Gay, L. R., & Airasian, P. (2003). Educational Research: Competencies for Analysis and Application. (Seventh Edition Ed.). Upper Saddle River, NJ: Pearson Education.

Helander, M. G., & Zhang, L. (1997). Field studies of comfort and discomfort in sitting. Ergonomics, 40(9), 895-915.

International Ergonomic Association. (2018). https://www.iea.cc/

Jankowicz, A. D. (2013). Business research projects. Springer.

Kadir, B. A., Broberg, O., & da Conceicao, C. S. (2019). Current research and future perspectives on human factors and ergonomics in Industry 4.0. Computers & Industrial Engineering, 137, 106004.

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. Educational and psychological measurement, 30(3), 607-610.

Loy, B., & Greer, J. A. N. (2002). Ergonomics in the Workplace: A Resource Guide.

Osni, M. (2012), Gambaran Faktor Risiko Ergonomi Dan Keluhan Subjektif Terhadap Gangguan Musculoskeletal Disorders (MSDs) Pada Penjahit Sektor Informal, Sarjana Kesehatan Masyarakat, Departmen Keselamatan Dan Kesehatan Kerja, Fakultas Kesehatan Masyarakat, Universitas Indonesia

Naharuddin, N., & Sadegi, M. (2013). Factors of workplace environment that affect employees' performance: A case study of Miyazu Malaysia. International Journal of Independent Research and Studies, 2(2), 66-78.

Niati, D. R., Siregar, Z. M. E., & Prayoga, Y. (2021). The effect of training on work performance and career development: the role of motivation as intervening variable. Budapest International Research and Critics Institute (BIRCI-Journal): Humanities and Social Sciences, 4(2), 2385-2393.

Pao, T. H., & Kleiner, B. H. (2001). New developments concerning the occupational safety and health act. Managerial Law, 43(1/2), 138-146.

PMO.Gov.My. (2005) Rangka Dasar Automotif Nasional

Roelofsen, P. (2002). The impact of office environments on employee performance: The design of the workplace as a strategy forproductivity enhancement. Journal of facilities Management, 1(3), 247-264.

Sekaran, U. (2003) Research method for business: A skills building approach (Second Edition). Toronto: John Wiley & Sons.

Sonnentag, S., Volmer, J., & Spychala, A. (2008). Job performance. The Sage handbook of organizational behavior, 1, 427-447.

Pheasant, S. (2003). Body Space Anthropometry, Ergonomics and the Design of Work. (2nd Ed). Taylor & Francis.

Vischer, J. C. (2007). The effects of the physical environment on job performance: towards a theoretical model of workspace stress. Stress and Health, 1 (23), 175-184.

Lennox, W. (2018). Occupational Ergonomics. Larsen & Keller Education, 3-4.

Weiss, H. M. (2002). Deconstructing job satisfaction: Separating evaluations, beliefs and affective experiences. Human resource management review, 12(2), 173-194.