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THE DEVELOPMENT AND USE OF STANDARD ERGONOMIC PRODUCTS INCREASES PRODUCTIVITY

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Abstract: *Workers need safety and comfort when using equipment at work. Every human being really does not want accidents in his life. However, not every human being is necessarily able to make or choose ergonomic products, one of which is to result in safety, increased comfort and productivity. Therefore, in order for this to be achieved, it must be designed ergonomically. In scientific writing, the method used is descriptive from the study of literature. The conclusion is that the development of ergonomic products since before the century AD until now the application of ergonomics is growing; with ergonomic products and doing work that is healthy, safe, comfortable or easy, does not cause harm, productivity will improve (increase).*

INTRODUCTION

Every human being definitely needs comfort in using equipment or in working. Every human being really does not want accidents in his life. However, every human being is not necessarily able to make or choose ergonomic products, one of which is to make them comfortable. All of that must be designed ergonomically so that optimal productivity works. As a sign that comfort and ergonomics are needed in designing work equipment and tools in the work space, according to Nisa Destiana (2022) "If you feel that the angle of your computer screen or the height of your desk is not appropriate? As a result, your eyes feel uncomfortable or your wrists feel sore after work. That means that ergonomics principles have not been applied in the environment where you work."

In carrying out life, it requires comfort and safety in the world and preparing for the hereafter. Specifically for ergonomics, it discusses human balance in using or choosing equipment in today's world.

Studying ergonomics before making human materials and equipment is very helpful in designing and making equipment that suits human needs. The science of ergonomics has been studied by humans for hundreds of years, even since the first century BC. Even though at that time humans definitely mentioned ergonomics, when they were making buildings or maintenance they had thought about how to make the buildings and equipment suitable for the conditions of the human body, comfortable and easy for humans to use.

The effect if ergonomic factors are ignored, then the risk will increase. As said by Farairuz Haritsah et al (2023) "If the ergonomics factor is ignored, it will increase the risk factors for MSDs (Musculoskeletal disorders), namely impaired function of the muscles,

ligaments, nerves and tendons, joints and spine. This can happen when working perform unergonomic actions for a long time. Unergonomic actions may often be carried out in our daily work. This will have an impact on health if it has accumulated and become a habit. The following is an example of an ergonomic attitude at work.

Therefore, in order to avoid MSD disturbances, equipment must be compatible with human users, so that productivity is optimal. Thus, all necessary egonomic standards.

METHODOLOGY

This paper aims to find out that ergonomic standards in its development can reduce musculoskeletal diseases, are safe, and increase productivity. In scientific writing, the method used is descriptive from the study of literature. From various opinions, then analyzed and discussed. From the analysis and discussion, it can be concluded.

DISCUSSION

Ergonomic Product Development

In terms of history that the use of an ergonomic approach is increasingly needed. The following is in table 1 the history of ergonomics from year to year.

Table 1. History of Ergonomics from Year to Year (Khoiri, 2021)

Sejarah Ergonomi dari Tahun Ke Tahun	
Abad 1 sebelum Masehi	Vituvius di Roma melakukan pengukuran pusar sebagai pusat tubuh manusia
Tahun 1200	Al Jaziri membuat wastafel ergonomis
Tahun 1633	Bernardino Ramazzini melakukan penelitian tentang kondisi kerja dengan patologi
Tahun 1831	Trackrah mengamati interaksi penjahit dengan meja kerja yang tidak ergonomis
Tahun 1857	Wojciech Jastrzebowski membuat buku "*An outline of Ergonomics, or the Science of Work*"
Tahun 1898	FW.Taylor Mengajarkan empat prinsip manajemen secara ilmiah
Tahun 1911	Frank Bunker Gilberth membuat buku motion study.
Tahun 1918	Negara inggris mendirikan badan penelitian tentang kelelahan industri
Tahun 1921	Seorang berkebangsaan jepang bernama Kan-ichi tanaka membuat buku Ergonomi dalam bahasa jepang dengan judul "*Research of efficiency : Ergonomics.*"
Tahun 1933	Elton mayo dan teman kerjanya di perusahaan listrik Chicago mengjumlahkan pengaruh dari variable fisik
Tahun 1949	Di Negara Inggris terbentuk masyarakat peneliti ergonomi (*The Ergonomics research society*) yang melibatkan berbagai professional di bidang ergonomi
Tahun 1957	Terbentuk perkumpulan ergonomi internasional di amerika serikat

Ergonomic product data that has been marketed in general in several countries in the world is taken from various sources in online media. In fact, each country has more than one business that produces or markets it. The sample data can be seen in table 2 below.

Table 2. Examples of Ergonomic Products in Several Countries in the World.

No	Name of Business	Country of	Product	Address
1.	ALESHA babyshop	Indonesia	Gendongan bayu ergonimis: airsling, baju renang	yulianabakrie@gmail.com

	CUDDLIME KERAWANG		Gowswin.	+82111282301
2.	CV. ANUGRAH ABADI	Indonesia	Meja kursi sekolah bendtuk ergonomis, dll	Ibnu.tholaba@gmail.com CV.anugerah.abadi86@gmail.com
3.	LG ELECTRONIC Global – Tech360.tv	Perusahaan Multinasional Korea Selatan - GLOBAL	OLED TV, UHD TV, Home Theater, Audio Video, Refrigerator, Washing Machine, Microwafe. LG DualUp Ergo Monitor.	http://www.tech.360tv http://www.lg.com/id
4.	Indachi – Furniture	Indonesia	Beberapa jenis meja dan kursi ergonomis. Ruangan ergonomis.	https://indache.co.id/
5.	Ergo-sofy	Portugis	Kecantikan, kosmetik dan perawatan diri	http://www.sofy.pt/
6.	Ndl Finds	Inggris	The eco-friendly and ergonomic pillow is now available: sleeper, music, meditation, ear, soft. Etc seni dan kerajinan.	https://www.etsy.com/uk/
7.	ANYISHEN– Carrie Chan	Foshan, central Guandong, China	Manufacturebfurniture: Office chair, ergonomic chair, etc	http://www.foshan.gov.cn/
8.	Pillow illow	Belgium and Germany Tecnology	Ergononimicpillow: Batal, latex, medik, tempat tidur comfortable, etc.	http://www.Pillow-willow.com/
9	HERGO HUMAN ERGONOMIC	Bangkok Filiphina	Ergonomicdesk, ergonomic chair, hergo timber peak, plane lamp, etc.	https://www.facebook.com/hergodelivery
10.	8 SOLUTIONS	**Thailand**	Heman miller, aeron chair, embody authorized reseller of hawoth, adjustable desk engineerd now an other ergonomic solution.	https://goo.gl/maps/Uzaprvitj2gagrtH6
11.	Zhongrul Heavy Industry co, ltd.	Shade international, Xinhua distri, shijiahuang city, Beijing, **Tiongkok**.	ERP cable pipe, ventilation duct, ERP pultuded profile, ERP tank, ERP container, etc, all produk recommended by ergonomic expert.	http://www.zhongruizg.com/

Based on some of the data above, it can be concluded that: before the century AD to

the present, the application of ergonomics is growing. And, more and more products use ergonomic products, because they are less expensive, safe, comfortable, healthy, non-harmful, and can increase productivity.

Feel Safe, Increased Productivity and Ergonomic Standards

Currently, the results of Nadiyah Rahmalia's research (2012) found that "good ergonomics can reduce musculoskeletal diseases by 59%, incident rates by 56%, compensation costs by 68%, and labor costs by 43%. The application of proper ergonomics will be able to increase productivity by up to 25%. As many as 75% of company employees in a study stated that they feel safer in a workplace with good ergonomics.

Several other opinions, that the application of ergonomics can increase productivity. Supriyanta (2007) said that "ergonomics will be able to increase productivity and on the other hand will provide comfort and safety at work so that employees can work calmly, safely, comfortably, not get tired quickly or feel disturbed at work". In line with that, I Nyoman Dana (2016) said that "efforts to improve it so that the productivity of the company's workforce can achieve optimal results, the supervisors and managers of the company need to know the application of ergonomics."

Then, ergonomics is a multidisciplinary science. Therefore, ergonomic standards involve several sciences, namely biomechanics, anthropometry, psychology, physiology, and humans. See figure 1 below.

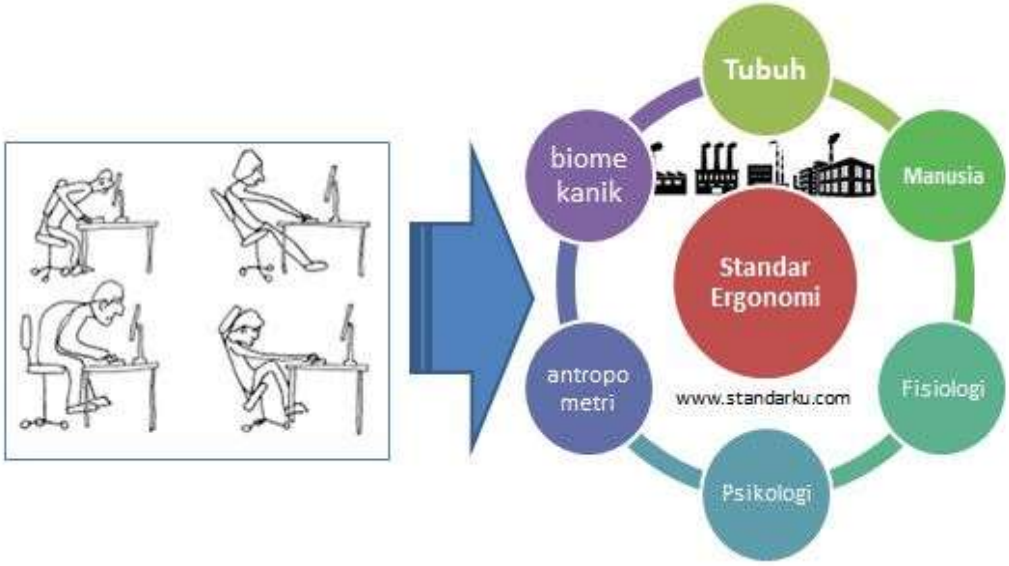

Figure 1. Ergonomic Standards
(https://standardku.com/standard-ergonomics/)

Ergonomics is a multidisciplinary science that involves:

Biomechanics	: the science of calculating skeletal muscle movements using mechanics.
Anthropometry	: is a measure of human dimensions.
Psychology	: the science of studying human behavior, mental functions, and mental processes through scientific procedures.
Physiology	: the study of the normal functioning of the physical organs of living

	things
Humans	: regarding the vertical and horizontal range of humans, as well as the psychological range of the eye.
Body	: Physical and spiritual human, including health, comfort, safety at work. Ergonomic products are very close to the above ergonomic standards. The manufacture of ergonomic products requires knowledge of product design (engineering). With ergonomic products and doing work that is healthy, safe, comfortable, or easy, productivity will be good (increased), and not harmful.

CONCLUSION

1. Since before the century AD until now the application of ergonomics is growing.
2. With ergonomic products and doing work that is healthy, safe, comfortable or easy, does not cause harm, productivity will improve (increase).

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