International Journal of Scientific Research and Management (IJSRM)
||Volume||13||Issue||12||Pages||10096-10107||2025||
Website: https://ijsrm.net ISSN (e): 2321-3418
DOI: 10.18535/ijsrm/v13i12.em07

Ergonomics Management for Work Design In the Workplace and Work Environment

Tjokorda Bagus Putra Marhaendra

Management Department, Faculty of Business and Tourism, University of Dhyana Pura, Badung, Bali.

Abstract
Recently, management science has grown and developed with the other applied sciences. These fields have become more enriched and improved, and this development is a never-ending process. As a result, economics, ergonomics, strategic management, and other applied sciences are inextricably linked since they all focus on work design for worker productivity and company performance, which is the study of physical jobs and cognitive tasks in a workplace. Each component requires a detailed, comprehensive, multidisciplinary, and interdisciplinary approach, also known as holistic approaches, such as work design in the workplace and its environment. Work design influences employee conduct in the workplace based on their mental (cognitive), physical, and sociocultural backgrounds. Human-machine interactions in the workplace and their work environment are vulnerable to human risk factors (e.g., limitations). Through ergonomics management, by participatory ergonomics, workers can identify risk factors earlier. This issue involves better spending management, reducing risk factors and the possibility of increased costs associated with worker health and safety issues. The holistic approach is a method for enabling ergonomics management through the interconnectedness and synergy of all applied sciences within the knowledge management system, resulting in increased worker productivity and company performance. And good practice involves the proper application of theories in alignment with established standards.

Keywords: ergonomics management, strategic management, work design, work environment.

1. Introduction

The essence of management lies in the ability to effectively oversee resources in order to achieve company objectives. To clarify this concept, three key phrases related to resource management are as follows: The first is proficiency, often known as expertise, which is the knowledge management of resources to keep them above average and growing. Second, several resources should be managed, including physical, financial, human, and technological. The third quality is wisdom, which comes from regulating the outcomes of internalising varied knowledge and experiences. However, making life choices can be complex for employees in the workplace because their decisions are intertwined with their capabilities, personalities, family backgrounds, sociocultural values, and the technology they utilise. This ethics consideration encompasses social justice and environmental. All these factors should uphold the fundamental values of human dignity while aiming for human well-being. Although there is an awareness of life choices, this also poses a challenge for individuals to exercise wisdom in their decision-making.

The challenge for managers is to optimize the benefits of ergonomics for business sustainability; ergonomics should integrate management knowledge with other related sciences to make comprehensive decisions, which involve economics, ergonomic principles, and other applied sciences. It is functional to utilize strategic management and cognitive components of work design to maximize the benefits of ergonomics for businesses. This method improves employee well-being and productivity while also contributing to long-term organizational resilience. By fostering a culture of continuous improvement and innovation, businesses can effectively leverage ergonomic practices to achieve their sustainability goals, where organizations are expected to prioritize both environmental and social responsibility. By integrating ergonomic principles into their core strategies, companies besides improving the quality of life for their employees but also enhancing their overall operational efficiency, ultimately leading to a more sustainable

future. A more sustainable future hinges on organizations' ability to adapt and innovate in response to evolving challenges. By embracing these principles, companies will not only bolster their brand reputation but also attract talent whose values are a commitment to sustainability and well-being. Effective communications and leadership to manage resources and human-machine interaction while keeping risk factors (*i.e.*, their limitations) to a minimum. Ergonomics is concerned with human activities such as health, safety, comfort, and productivity using tools and equipment in the workplace and their environment.

There is a lot of literature on ergonomics in industry, mostly focusing on mental and physical aspects such as work design, workplace design, equipment (tools), health, and safety, with no attention on the wider concept of ergonomics organisation (management) and its impact on corporate productivity and performance. Therefore, there is a research gap in the ergonomic field related to other applied science factors that have a substantial impact on company performance within strategic management in the workplaces and their environments. As a result, there is obviously a need for research that focuses on finding the human factors and ergonomics (HFE) aspects that are most relevant and influential within work systems and management systems in business companies. Even though earlier studies have individual relationship between ergonomics and productivity, as well as the impact of work design on job performance, no previous research has looked into the effects of work design on the relationship between ergonomics management, strategic management, and other applied sciences that are supported by the standards. Dul et al. (2012) revealed that the potential of HFE is still under-exploited, even though it can provide a solution when playing a role in system design to optimise the system, increase quality and efficiency, prevent illness, encourage work satisfaction, etc. As a result, it is critical to understand how these variables interact for developing a thorough the process by which ergonomics management influences the work system in organisations. Addressing these research gaps is critical for advancing knowledge management in the field of ergonomics management and its impact on firm performance in strategic management. By bridging these gaps, this study and review may offer advice to organisations in industry, empowering them to create work environments that improve job performance in the workplace and establish standards.

2. Method

Centralisation of the study involves reviewing the library and online searching to collect data from scientific publication sources as a desk research method. It also involves supporting some scientific researchers' publications to solve related issues. The analysis technique used is a descriptive-qualitative analogy. According to Flick (2013), qualitative data analysis is the classification and interpretation of linguistic (or visual) material to make statements about implicit and explicit dimensions and structures of meaning-making in the material and what is represented in it.

3. Interrelationships Management with Other Sciences

This research aims to describe the connections (link, match, integration, and synergy) between ergonomics, strategic management, and other applied scientific principles within knowledge management and established standards. The ergonomics management strategy is to include internal and external aspects when making comprehensive decisions for work design in the workplace in order to achieve corporate performance, as demonstrated by worker productivity and corporate social responsibility. This interrelationship schema is shown in Figure 1. And followed part-by-part explanations of the correlations.

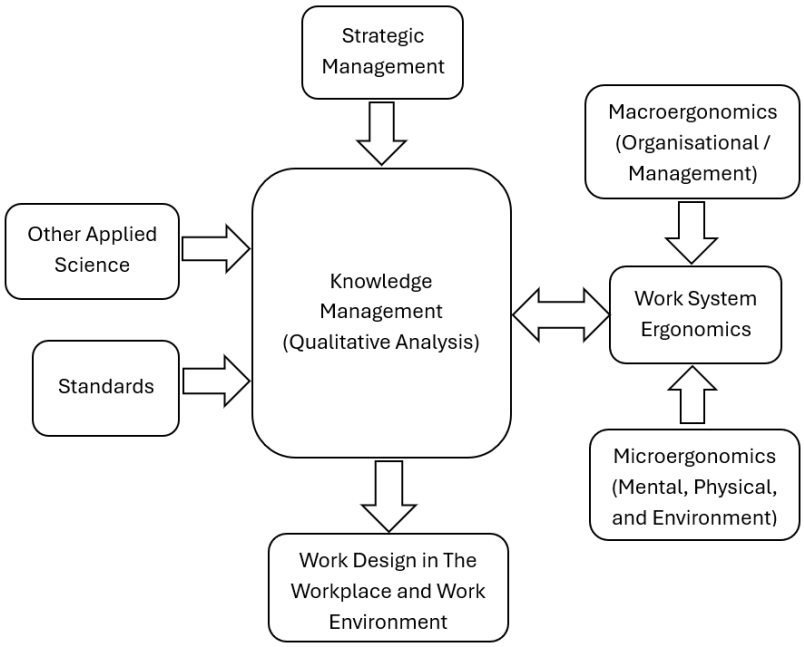

Figure 1. Interrelationship schema for work design in the workplace and their environment.

According to Daft (2016), "Management is the attainment of organisational goals in an effective and efficient manner through planning, organising, leading, and controlling organisational resources." The various applications of management must be effectively guided by knowledge management. There are several definitions of knowledge management, including strategies, cognitive aspects (learning and understanding), and systematic processes. Whereas, revealed by Dalkir (2011), "Knowledge management is the deliberate and systematic coordination of an organisation's people, technology, processes, and organisational structure in order to add value through reuse and innovation." Hajric (2018) also states, "Knowledge management is the systematic management of an organisation's knowledge assets for the purpose of creating value and meeting tactical and strategic requirements; it consists of the initiatives, processes, strategies, and systems that sustain and enhance the storage, assessment, sharing, refinement, and creation of knowledge." And for the goal of knowledge management, Dalkir (2011) stated, "This is achieved through the promotion of creating, sharing, and applying knowledge, as well as through the feeding of valuable lessons learned and best practices into corporate memory in order to foster continued organisational learning." Therefore, in light of these definitions, since solving problems of human activity cannot be done by just one field of science, it is essential for interrelated applied sciences, such as ergonomics, to consider this.

To guarantee a competitive advantage, business strategy should prioritise developing organisational culture as a form of tacit knowledge. Tacit knowledge is critical for driving innovation and improving team communication. By nurturing an organisational culture that values shared experiences and insights, companies can create a competitive advantage that is difficult for competitors to replicate. As stated by Wheelen et al. (2018), "Like tacit knowledge, reputation tends to be long-lasting and hard for others to duplicate." As Schein (2004) suggests, "When one brings culture to the level of the organisation and even down to groups within the organisation, one can see clearly how culture is created, embedded, evolved, and ultimately manipulated, and, at the same time, how culture constrains, stabilises, and provides structure and meaning to the group members." It is the manager's responsibility to handle tacit knowledge.

According to The Leadership Network, California (Templar, 2011), managers have different concepts of management in practice: "A manager is an employee who forms part of the organisation's management team and is accountable for exercising delegated authority over human, financial, and material management to accomplish the objectives of the organisation." Furthermore, Templar (2011) states, "Managers are responsible for managing human resources, communicating, practising, and promoting the corporate values, ethics, and culture of the organisation, and for leading and managing change within the organisation."

3.1. Ergonomics and Other Applied Science

On the other hand, the International Ergonomics Association (IEA, 2024) stated that the root of the word ergonomics is from the Greek *ergon* (work) and *nomos* (law); it simply means "the science of work." Furthermore, ergonomics science, which was adopted from the IEA in 2000, 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." It's defined circumstantially as the activities of industrial system management that are both economic and ergonomic to make human beings humane.

Also, the IEA in the year 2000 states the domain of HFE (Human Factors and Ergonomics, or HF/E) in the several aspect study, *i.e*., physical, mental (cognitive), organisational, and management ergonomics. Furthermore, IEA (2024) states, according to the IEA in 2000, each has branch topics of focus for studying, with these three aspects of ergonomics studies defined. Therefore, ergonomics existed in the whole system, from planning, processing, evaluating, and assessments that support interdisciplinary. It is revealed by Bedny and Bedny (2019) that "contemporary ergonomics, economics, and work psychology are tightly interconnected because the main purpose of these fields is the study of human performance and productivity." According to Bedny and Bedny (2019), "There are two basic areas of study of human performance." Moreover, Bedny and Bedny explained that "the first area is concerned with the study of physically demanding work; and the second area is associated with studying mentally demanding task performance where physical components of work are significantly reduced." As a result, synergies between dynamic mental and physical workloads are critical components in ergonomic analysis of a company's performance, as measured by worker productivity. Psychologists and ergonomists examine human cognition and behaviour at work, as well as interpersonal relationships and how people interact with appropriate instruments and equipment in a range of settings and their environment. However, "the justification of psychological and ergonomic innovations should normally be based on economic criteria" (Bedny and Bedny, 2019). Whereas the economic criteria are relations between cost and profit, salaries and risk coverage, and data analysis and evaluations for economic justification.

The idea is that, sooner or later, every organisation in a corporation must improve its performance in order to be sustainable. When studying workplace conduct, it is critical to understand the interrelationships and other elements that contribute to the structure of organisational behaviour. According to Mullins and Rees (2023), organisational behaviour is "the study and understanding of individual and group behaviour and patterns of structure and management in order to help improve organisational performance and effectiveness." However, Mullins and Christy (2016) said that "whatever the approach, the study of organisational behaviour cannot be undertaken entirely in terms of a single discipline; it is necessary to recognise the influences of a multidisciplinary, behavioural science perspective." Analogous to Arnold et al. (2005), "The same is true of psychologists working in other applied contexts such as education and health." In this regard, the synergy of all these fields of study lies in the urgent need for companies. This is emphasised by Karwowski and Zhang (2021), "It should be noted that the basic ideas of management (*i.e*., planning and decision-making, organising, leading, and controlling) are also essential to human factors and ergonomics (HFE)." More importantly, the implementation of various resource management standards has met the expectations of all research looking into productivity-enhancing actions. As a result, the inclusion of all connected disciplines in ergonomics refers to ergonomics as holistic, which combines multidisciplinary studies and adheres to standards to solve human (worker) and organisational problems.

3.2. Ergonomics Management in Strategic Management

Strategic management includes a decision support system for managerial choices and actions that affect a company's success. The manager and team should analyse internal and external factors to identify their strengths and weaknesses when making comprehensive decisions. Wheelen and Hunger (2012) stressed, "The study of strategic management, therefore, emphasises the monitoring and evaluation of external opportunities and threats in light of a corporation's strengths and weaknesses." While David and David (2017) state, "Strategic management is the art and science of formulating, implementing, and evaluating cross-functional decisions that enable an organisation to achieve its goals." According to those terms, strategic management should involve, firstly, ergonomics management in vital sectors and levels of the corporate, such as planning, formulating, implementing, and evaluating. Each stage also requires an ergonomic approach that is more detailed and comprehensive. Reliability in strategic planning must increase worker productivity and company performance. Therefore, ergonomics management should be part of

strategic management expertise. Ergonomics management is the observation, planning, designing, measuring, organising, evaluating, and analysing by ergonomics principles applied in human mental and physical activities, work systems, workplaces, and their environments as a whole system to achieve productivity and performance to attain human well-being and welfare.

On the other hand, ergonomists are frequently extensively involved in specific company challenges, and their involvement is usually limited to a temporary solution. According to Santos and Soares (2017), "In fact, most key people in companies do not think ergonomics should be included in the early phases of the product development process." Therefore, when a company faced a problem, they usually sought the advice from an ergonomic expert. Whereas, more than that, ergonomics management can take a systematic approach for a solution entirely as a part of strategic management. However, ergonomics appears to be used just as a problem solver rather than as part of a company's strategic planning. Although the company's issues are systemic, issues in one region or division may suggest vulnerabilities in other parts of the system. When it happens, ergonomists usually apply microergonomics that involve mental (cognitive), physical, and environmental ergonomics in their work system. While macroergonomics, which is organisational and ergonomics management, for whatever reason, was untouched. This is why managers are still confused about the actualisation of macroergonomics and microergonomics as an overall corporate decision support system.

3.3. Ergonomics Management Match the Standards

Many standardisations justify company performance, which is the official standard that should be acknowledged and accepted by the members who need the standards. According to Szopa and Karwowski (2021), "Standards provide quality control and support legislation and regulations to ensure equal opportunity and operating international markets. One of the main purposes of standardisation is to assure uniformity and interchangeability in each area of application." According to Szopa and Karwowski (2021), "the basis for worldwide standardisation in all areas is provided mainly by the following organisations: the ISO, the International Electrotechnical Commission (IEC), and the International Telecommunications Union (ITU). Standards related to human factors and ergonomics are mainly developed by the ISO and the European Committee for Standardisation (CEN)." Therefore, ergonomic standards should be references for both ergonomists and managers. Besides justifying them economically, they should practically and legally apply to the company.

The International Standard Organisation (ISO, 2024) lists and publishes management system standards, which are used to implement standards management. "All ISO standards can be obtained at the ISO website (http://www.iso.org)." According to Szopa and Karwowski (2021), "The TC159/SC1 subcommittee focusses on the standards related to the basic principles of ergonomics. The ISO 6385:2016 standard specifies the objectives for ergonomics system design and provides the definition of basic terms and concepts in ergonomics." Furthermore, in Indonesia, the National Standardisation Agency (*Badan Standardisasi Nasional*, or BSN) has been assigned by Number 590/KEP/BSN/12/2021 about the Indonesian National Standard (*Standar Nasional Indonesia*, or SNI). The SNI 9011:2021 titled "Measurement and Evaluation of Potential Ergonomic Hazards in the Workplace". This SNI standard or BSN (2021) states that "an ergonomics method or way of measuring includes preparation, implementation, measurement, and evaluation of ergonomic measurement results." Therefore, standardisation in work organisation tries to make monitoring and evaluation of job performance easier, which has ramifications for both worker productivity and company performance.

After the ergonomics establish by its standards, the workers should perceive increased work-life prospects and view their company performance as better. It is alongside the management definition of Daft, which emphasises organisational goals effectively and efficiently. In other words, an effective and efficient manner means optimising performance as indicated by worker and company productivity. Because, theoretically and technically, effectively and efficiently cannot be maximised altogether. Management should strive to optimise the effectiveness and efficiency approached by its standards before they become mutually exclusive. Therefore, the equilibrium of effectiveness and efficiency optimisation is called optimal productivity.

3.4. Ergonomic Principles in Work Design and Work Environment

Ergonomics in work design should not be viewed as just an ergonomic intervention; rather, ergonomics should be included from the start to anticipate issues in the future that are produced by developing technology for workers in work systems in their workplace and environment. This is consistent with what Santos and Soares (2017) revealed: "Ergonomic design is understood as the appropriation of ergonomic principles into system design, which can be any work device, a piece of equipment, or even an entire work environment." There is a strong relationship between ergonomic concepts and work system design. It is a realistic combination of ergonomic principles and the most cost-effective job design analysis in the workplace. Therefore, Konz and Johnson (2016) revealed "the six ergonomic needs for job design: safety is first; make the machine user-friendly; reduce the percent excluded by the design; design jobs to be cognitive and social; emphasise communication; use machines to extend human performance." According to Santos and Soares (2017), "In fact, it is quite logical to assume that since ergonomics aims to adapt work means to worker needs, it might as well be powerful enough to address work systems as a whole." The adaptation of work design in the work system ergonomics is followed by changes in work behaviour that are consistent with the goals of work design, namely improved worker health and comfort, as evidenced by increased productivity at work.

Meanwhile, according to Colovic (2014), "significant individual approaches to designing workplaces are job rotation, where people are periodically moved from one specialised job to another in order to prevent monotony and boredom." This strategy is only relevant to related fields, skills, and workloads, such as the rotation of jobs in hospitals and hotel management. It is not necessarily can implemented in other work organisations since each workplace has levels of challenge that escalate work enrichment to increase productivity. "However, the real motivational potentials are best activated by the enrichment of work, which spreads vertically, including various tasks and skills, responsibilities, and autonomy" (Colovic, 2014). As consequences, worker should enrich their capability before adapt these conditions.

Work systems interact synergistically because they are designed to govern people (workers), facilities, work procedural, technology, and its environment. As a result, when designing the work system, each component should be considered interrelated. All contribute to ergonomic work design as part of the sustainability management system, taking into account the interrelationships between persons, technology, organisations, and work environment components. Work environment is all situations and conditions and everything surround that interaction affecting human activities. There are three factors of work environment that should be controlled and adaptable, such as: physical, biotics, and sociocultural. As a result, work design influences worker behavioural changes as they adjust to the new organisational work system in its environment. And everyone in the workplace understands the importance of involvement as teamwork; this is known as participatory ergonomics (PE). Figure 2 depicts the intertwining of ergonomics (HF/E) with the management system by the International Ergonomics Association (IEA, 2024).

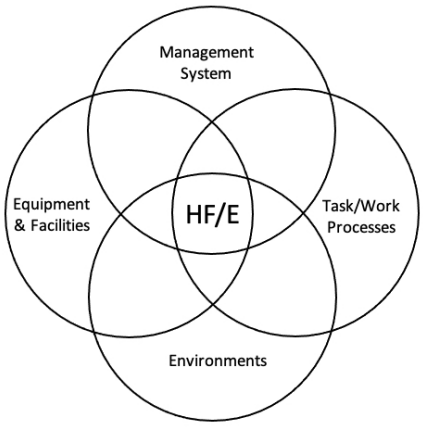

Figure 2. The intertwining of HF/E with the management system (IEA, 2024).

4. Results

Ergonomic management constitutes a vital aspect of strategic management, utilising ergonomic principles and standards in the management of resources, especially human resources, to achieve corporate objectives. The management has transitioned into a new stage of development. As noted by Dievernich (2015), to comprehend business management as a form of change management, it must be contextualised within specific variables, such as society and its organisations, both of which are in a state of constant change. It is evidently integrated into management sciences as a component of managers' expertise when they choose to

implement ergonomics management earlier within their work systems to enhance productivity and performance.

The other perspective of change management is an all-encompassing assessment of human behaviour and organisational, sociocultural, and environmental factors; it is not a single-time occurrence, nor is it a one-off or temporary incident, but it is a never-ending process (Dievernich, 2015). Furthermore, Dievernich (2015) explained that two key aspects drive business management: the focus on current operations and the necessity to plan for the future, ensuring that visions remain aligned with both ongoing challenges and the development of solutions for future organisations. However, when the developed systems are changing, they affected the factors in them in the future since it will continue to change (Kim, 2015). Based on this perspective, management, in general, is a sustainable process, and all management is changing management. The only matter is the direction of that change, for the sake of balance in system management, or whether it will bounce off competition. As a result, many companies develop their business through share market segment analysis that aligns with their vision and mission, and also assess their competitiveness. The analysis of risk factors has been overlooked, overshadowed by other concerns related to promotion and marketing aimed at enhancing competitiveness. This oversight has led to a significant increase in risk factors. Therefore, HFE can support design systems that are suitable and comfortable for people to achieve well-being and performance outcomes in future systems (Kim, 2015).

There has previously been much research on the risk factors for human activities resulting from commercial competitiveness. According to Roth (2024), one of the areas of study in the late 20th century that changed in the economic orientation of the examination was from a price-based to a risk-based model. Therefore, to detect workplace risk factors, the company's specialised examinations apply HFE standards. Managing risk factors through ergonomics involves a trade-off between economics and ergonomics. Furthermore, Roth (2024) states, by reducing the risk, it eliminates the prospect of additional costs and labour difficulties while also managing and controlling the solution's spending. Risk can be transferred through a variety of techniques, including insurance coverage. However, this will be difficult to execute at first because occupational governance on corporate accountability and workplace risk factors is unclear. As a result, the trade-off approach increases employees' confidence in their work and motivation. As a result, the organisation cultivates a culture of performance and productivity. It is strategic management for the long-term benefits that the corporation will derive from dealing with future dynamic change.

5. Discussion

All ergonomics definitions involve the following terms: workplace, work environment, workloads, tools, workers, jobs, health, and comfort. Furthermore, the equation includes human action as an operator. Industries vary widely in how tasks relate to the people (workers), making it difficult to change working conditions or establish an ergonomic workplace. Therefore, ergonomists should be involved when corporations start to design and plan for the first time. For example, corporate workspace planning should detail who works there, how many employees are there, the size of the area, job descriptions (connected to workloads), and some checklists to fill in. Therefore, the worker who utilises the workplace is required to measure their body. Human body measurement techniques were engaged in the early stages of ergonomic design, particularly for workplace design. This method in ergonomics is known as anthropometry, which literally means the measurement of humans (Herron, 2006). According to Annis & McConville (2011), in ergonomics design, anthropometry is an essential tool to carry out the knowledge of human dimensionalities. Although at the same time, the ergonomics of work activity are usually overlooked by designers (Santos & Soares, 2017). Designers do not seek to make products cheaper or more expensive; instead, they consider compliance with the limitations of humans (users), as ergonomists do. However, according to Santos & Soares (2017), unfortunately, in general, among all HFE activities, the least used by organisations is ergonomics design. That is why, after a long time, some workers faced difficulty or awkward positions in the workplace. And managers do not understand the real cause and tend to pressure workers who are considered negligent. It is what then causes negative stress for the worker in the workplace. And in this situation, Santos & Soares (2017) state, the behaviour of most people toward ergonomics develops a lack of and unclear understanding of what ergonomics really is; it is cultural and not wise. However, in another world, people have been living traditionally by ergonomic values.

There are traditional practices for living ergonomically in ancient cultures. For instance, in Bali, elderly Balinese construct houses or temples that are designed and built using traditional anthropometry,

referred to as "Balinese metrics" or "*Gegulak*." According to Marhaendra (2016), Balinese metrics, or *gegulak*, are used to measure the body of the owner of the house or temple to gain dimensionalities of the material part to build the house or temple. Moreover, Balinese in design, their house and temples still maintain respectful harmony with their environment. Marhaendra (2016) stated that the Balinese have a way of life by the name of *Tri Hita Karana*, a concept of living in harmony with the causal aspects of life, which are *Parahyangan*, *Pawongan*, and *Palemahan*. Whereas *Parahyangan* is living in harmony with God, Goddess, and their ancestors; *Pawongan* is living in harmony among the people; and *Palemahan* is living in harmony with its environment. Balinese also have their own main standards according to the level of achievement or type of event, as revealed by Marhaendra (2016), that Balinese also understand the standards that are used to measure achievement, which are *nista*, *madya*, and *utama*. Whereas the term "*nista*" is small or modest, "*madya*" is middle or medium, and "*utama*" is large or prime. It is this cultural background of life that shapes the work behaviour of Balinese people. Therefore, when cultural life changes, the behaviour of work changes, vice versa. Balinese may not recognise that their traditional practices, which have persisted through time, embody principles of ergonomics, despite not using modern ergonomic terminology.

Meanwhile, according to David & David (2017), "All organisations have at least four types of resources (or assets) that can be used to achieve desired objectives: (1) financial resources, (2) physical resources, (3) human resources, and (4) technological resources." The crucial component of resource allocations is that they include the regular distribution of the organisation's 'assets' between products, divisions, and segments, depending on priorities established by the company's goals. One of the four assets is human resources, which is human capital. According to Roth (2024), human capital is human resources that are capitalised by education, training, or medical treatment; an individual can invest in it to gain income that is partly determined by the rate of return to human capital of their own. Furthermore, human resources are a dynamical stock of assets that are not only owned by themselves but also by the company. Since through investment and ergonomics policy, the company encourages the workers to aim for better performance by increasing their ability through training and education. Therefore, employees should take opportunities to improve their competencies and adaptability as human capital in order to negotiate better positions within the organisation. However, this should be complemented by a clear and accountable career path for employees in the workplace that is designed in accordance with the company vision and objective, such as a merit system.

Therefore, strategies to improve the quality of human resources development, knowledge management, and discussions regarding workers in company culture are needed. Some businesses act on this understanding. Because workers are dynamic resources, not just physical assets (e.g., machines and tools) that are easy to replace, their abilities can improve to support company performance. This long-term corporate investment is one of the company's strategies to secure its assets and costs. According to Roth (2024), the companies that implement 'knowledge management' deliver information to changes in corporate cultures, and it can be technology-driven methods of accessing and controlling for cost savings. The external factors within the company might be able to support the company's internal actions, such as demographics, sociocultural factors, government policies, and environmental factors. The strategy of ergonomics management is needed to mitigate human risk factors in corporations that originate from internal and external sources. Thereupon, the companies can create opportunities to survive and grow. Similarly, as humans, workers attempt to reduce the risks associated with their professions in order to attain work-life balance.

The fundamental thing ergonomists should also be aware of when preparing strategic planning is organisational behaviour. Because it is related to studying worker behaviour in an organisational environment. That involves understanding, predicting, and controlling human behaviour with the mental (spiritual), social, and cultural background. Mullins & Christy (2016) stated the general definition of organisational behaviour is the study and understanding of behaviour and structural patterns of individuals and groups to help improve organisational performance and effectiveness. However, David & David (2017) remind us that it must also be remembered that in organisations, all step decisions of strategy from formulation, actualisation, evaluation, and auditing have ethical ramifications. Therefore, ethics are the fundamental principles of manager and worker behaviour in corporate organisations and are the primary responsibility of leaders, strategists, and business owners in ensuring that ethical values are implemented in the workplace. As cultural ideals change, today's discretionary tasks could become tomorrow's ethical responsibilities (Wheelen et al., 2018). It is rarely acknowledged, or perhaps it is too late to realise, that all

good formal legal systems are founded on human values and ethics. Mostly leaders prioritise legalistic formal outcomes over conscience and ethics, which ends up negatively impacting corporate social responsibility (CSR).

Ergonomics training is required to raise awareness of occupational hazards among technical personnel and departmental staff members in manufacturing, maintenance, budgeting, health and safety, and other areas. When technical personnel understand ergonomics and use the participatory ergonomics method to build specific solutions to minimise or even eliminate risk factors, the chain of events becomes apparent, and employees can recognise risk factors early. Including work posture analysis in the workplace enables the identification and anticipation of the long-term risk potential associated with work activities. By eradicating risk and ending potential additional costs and labour issues, it is possible to manage and control spending on solutions. Otherwise, there would be serious problems between workers and management when hazards were detected and potentially became realities that no one could address. Therefore, a good and correct mixed method of theory and practice is needed. According to Arnold et al. (2005), a good theory should be good at describing, explaining, and predicting actions, ideas, or emotions that have significant consequences. Furthermore, Roth (2024) claimed that the ability to put ergonomics information into practice is one of the key prospects for large cost reductions, significant achievements in human performance, and competitive advantage. However, Edward & Anyieni (2016) showed that the quick pace of change makes it difficult for any organisation or manager to keep contemporary, properly forecast the future, and still maintain consistency in direction. Therefore, to counterbalance the dynamic uncertainty of the future, it should be ready to face changes by continuing to monitor, evaluate, and audit the organisation regularly before balancing actions.

Ergonomics consultants consistently aim to promote ongoing organisational enhancements, leveraging their expertise and standards to transform corporate culture via the information transfer approach. The training covers all divisions through participatory ergonomics in processes, such as the engineering staff of the organisation, product design, product manufacture design, adapting tools and equipment, supply chain mechanisms, facilities, and work environment maintenance. Monitoring, evaluating, and auditing the quality of every part of work can produce various benefits for workers and the company. However, Bedny & Bedny (2018) highlight that any solutions design of equipment and tools that are not based on the understanding of human behaviour should be considered pure engineering solutions and hence not in accordance with EHF. It can be supervised by examining the job risk factors rather than using a price-based model. As a result, the examination was assessed by standards to enable quality assurance as a rationale for all parties involved, including human-machine interaction in the work system organisation. It is consistent with the management system standards list assigned by the ISO.

The ergonomics management method is relevant at many levels of work organisation and management system models utilised by diverse companies. According to ISO (2024), a management system is the way by which a firm controls the interconnected areas of business in order to achieve its goals. These objectives can relate to a multitude of areas, including product or service quality, operational efficiency, environmental performance, workplace health and safety, and many more (ISO, 2024). Recognised by management system standards (MSS) internationally, ergonomics management is going through understanding in any country. Since the criteria are average, there is flexibility in the minimal requirements that correspond. The level of complexity of the assessment system will be decided by the specific circumstances faced by each level of organisation. However, according to ISO (2024), for smaller organisations, it may simply be having strong leadership from the business owner, providing a clear definition of what is expected from each individual employee and how they contribute to the organisation's overall objectives, without extensive documentation. In fact, strong leadership is not only needed by smaller organisations; it is also needed by the whole level of organisations in the company.

Related to the use of technology as a substitute for workers. There are numerous tasks that humans can do better than machines; yet, there are some duties that are either insufficient or dangerous to human safety and should be transferred to machines wherever possible. This decision about the job activities that humans can perform better would account for the ultimate costs of replacing them with machines against any expected operational benefits. Therefore, artificial intelligence (AI) applications, robotics engineering, and computerisation should be manageable by technical and EHF principles based on humanities and sociocultural values. Strategic management is also in line with the vision and mission of the corporation in the work design and job analysis, which ergonomics is a part of; this is beneficial as a solution to company

operations issues. According to Karwowski & Zhang (2021), job design is usually regarded as the first building block of an organisational structure, while job analysis, as a systematic examination of jobs inside an organisation, helps us to define an individual's work-related obligations. As a result, a corporation should create and develop an ergonomic culture to ensure the long-term viability of ergonomic reform in the workplace and their environment.

The ergonomics assessment should be the foundation of the work design, the choice of technology, and the condition of company resources, especially in developing countries. The decision to use the technology depends not only on an individual's ability to access it but also on the demographics of the local population, as well as sociocultural, educational, gender, and productive-age factors. Individual workers should seek to make decisions that promote well-being, strengthen their ability to be well adapted to new technology, and improve their work-life balance. Ergonomic management is crucial in these situations as a counterbalancing measure. According to Marhaendra (2023), "Ergonomists should observe and evaluate to discover the chain of events that could potentially harm human activity in workstations, workplaces, and work environments from the beginning." Demographic development remains a gradual and unsustainable process. If technology is not selected with care, it tends to absorb only a limited amount of labour with specific and high competencies. The consequences of a jump in hi-tech impacts are increased financing, unemployment, and social inequality, and it is difficult to adapt, which might create sociocultural shock and an unstable work environment. Except at each stage, adequate competency improvement was accommodated for the company's resources. Therefore, when a business develops extensive strategic plans, the manager should include ergonomists in the first stages of organising the company. Which is human resources development, work design, job analysis, workplace design, and work environment; all of them are developed. Particularly in terms of organisational structure, many businesses have recently formed departments or business development divisions dedicated to management consultants, ergonomics, and safety.

6. Conclusion

Fortunately, economics, ergonomics, and other related applied sciences excel at the mutualism of strategic management and play important roles in both the corporate world and society. These disciplines' interrelationship for work design not only enhances employee productivity but also contributes to corporate performance and sustainability. By fostering a collaborative environment, they enable companies to adapt to changing demands while ensuring a healthy workplace for their employees. Likewise, the definition of ergonomics management, where ergonomic principles is parts of strategic management and match the standards which are inclusive of knowledge management, is the basis for comprehensive decision-making to attain company goals. It indicates that theory-driven practices will evolve into new theories derived from practical application. Consequently, best practices entail the accurate application of theory in accordance with the standards established by their constituents. Therefore, by making ergonomics management a key part of strategic management that is supported by sociocultural values and environmental ethics, corporations can lower and even remove risks from human activities by using technology appropriately. It represents an ergonomics management approach that employs participatory ergonomics (PE) processes to enhance workplace health. It also offers optimal opportunities at reasonable costs and promotes a work-life balance that fosters human welfare and well-being. This study ultimately proposes an ergonomics management approach that addresses human activities within their social contexts, along with practical solutions tailored for businesses.

Conflict of Interest: No conflicts declared.
Funding: The author received no financial support for the research, authorship, and/or publication of this article.

References

1. Annis, J. F. and McConville, J. T. (2011). Anthropometry. In Bhattacharya, A., & McGlothlin, J. D. (Eds.). *Occupational Ergonomics: Theory and Applications* (2nd ed., pp. 4–52). CRC Press. DOI: https://doi.org/10.1201/b11717
2. Arnold, J., Silvester, J., Patterson, F., Robertson, I., Cooper, C., and Burnes, B. (2005). *Work psychology: Understanding human behaviour in the workplace* (4th ed.). Pearson Education Limited.

3. Bedny, G. Z. and Bedny, I. S. (2019). *Work Activity Studies Within the Framework of Ergonomics, Psychology, and Economics* (1st ed.). CRC Press. DOI: https://doi.org/10.1201/9781351125000
4. *BSN (Badan Standarisasi Nasional).* (2021). *Keputusan Kepala Badan Standardisasi Nasional Nomor 590/KEP/BSN/12/2021*. *BSN., Jakarta*.
5. Colovic, G. (Ed.). (2014). *Ergonomics in the Garment Industry* (1st ed.). Woodhead Publishing India Pvt. Ltd. DOI: https://doi.org/10.1201/9780367805357
6. Daft, R. L. (2016). *Management* (12th ed.). Cengage Learning.
7. Dalkir, K. (2011). *Knowledge Management in Theory and Practice* (2nd ed.). MIT Press.
8. David, F. R. and David, F. R. (2017). *Strategic Management: Concepts and Cases* (16th ed.). Pearson Education Limited.
9. De Winter, J. C. F., & Eisma, Y. B. (2024). Ergonomics & Human factors: fade of a discipline. Ergonomics, 1-9. DOI: https://doi.org/10.1080/00140139.2024.2416553
10. Dievernich, F. E. P. (2015). The Rediscovery of the Human Being and the Future of Change Management. In Dievernich, F. E. P., Tokarski, K. O. and Gong, J. (Eds.). *Change Management and the Human Factor*. (pp. 9–18.). Springer International Publishing. DOI: 10.1007/978-3-319-07434-4.
11. Dul, J., Bruder, R., Buckle, P., Carayon, P., Falzon, P., Marras, W. S., ... & Van der Doelen, B. (2012). A strategy for human factors/ergonomics: developing the discipline and profession. Ergonomics, 55(4), 377-395. DOI: http://dx.doi.org/10.1080/00140139.2012.661087
12. Edward, O. M., & Anyieni, D. A. G. (2016). Effectiveness of Management of Change in an Organization (Case of Kenya Power Ltd., Central Rift, Nakuru County). *European Journal of Business and Management*. Vol.8, No.11, 21-31
13. Flick, U. (2013). Mapping the Field. In Flick, U. (Ed.). *The SAGE Handbook of Qualitative Data Analysis* (pp. 1-18). Sage. DOI: https://doi.org/10.4135/9781446282243
14. Hajric, E. (2018). *Knowledge management: A theoretical and practical guide for knowledge management in your organization*. https://helpjuice.com/pdfs/Knowledge_Management_A_Theoretical_And_Practical_Guide_Emil_Hajric(PDF).pdf
15. Herron, R. E. (2006). Anthropometric Databases. In Karwowski, W. (Ed.). *International Encyclopaedia of Ergonomics and Human Factors* (2nd ed., Volume 1., pp. 243-245). CRC Press. DOI: https://doi.org/10.1201/9780849375477
16. International Ergonomics Association (IEA). (2024, May 28). *What is Ergonomics (HFE)?* https://iea.cc/about/what-is-ergonomics/
17. International Organization for Standardization (ISO). (2024, August 7). *Management system standards*. https://www.iso.org/management-system-standards.html
18. Karwowski, W., and Zhang, W. (2021). The Discipline of Human Factors and Ergonomics. (Chapter 1). In Salvendy, G., and Karwowski, W. (Eds.). *Handbook of Human Factors and Ergonomics* (5th ed.). (pp. 1-37.). John Wiley & Sons. DOI: 10.1002/9781119636113.
19. Konz, S., Johnson, S. (2016). *Work Design: Occupational Ergonomics* (7th ed.). CRC Press. DOI: https://doi.org/10.1201/9780203733714
20. Kim, I. J. (2015). Knowledge gaps and research challenges in the contemporary ergonomics. *J Ergon*, 5(2). DOI: 10.4172/2165-7556.1000e134
21. Marhaendra, T. B. P. (2016). Striving for Modernized Balinese Metrics (*Gegulak*). *Journal of human ergology*, 45(1), 1-10. DOI: https://doi.org/10.11183/jhe.45.1_1
22. Marhaendra, T. B. P. (2023). Ergonomics Strategy to Create Work-Life Balance. *International Journal of Social Science Research and Review*, 6(7), 575-585. DOI: https://doi.org/10.47814/ijssrr.v6i7.1347
23. Mullins, L. J. and Christy, G. (2016). *Management and Organisational Behaviour* (11th ed.). Pearson Education Limited.
24. Mullins, L. J. and Rees, G. (2023). *Management and Organisational Behaviour* (13th ed.). Pearson Education Limited.
25. Roth, C., (2024, June 7). *What ergonomics really means to business*. Cardinus Risk Management. https://www.cardinus.com/insights/ergonomics/importance-ergonomics-business-management-tool/

26. Santos, M. S. e and Soares, M. M. (2017). Ergonomics Design Thinking: A Project Management Model for Workplace Design. In Soares M. M. and Rebelo, F. (Eds.). *Ergonomics in Design Methods & Techniques* (pp. 267-280). CRC Press.
27. Schein, E. H. (2004). *Organizational Culture and Leadership* (3rd ed.). John Wiley & Sons.
28. Szopa, A., and Karwowski, W. (2021). An Overview of International Standardization Effort in Human Factors and Ergonomics. In Karwowski, W., Szopa, A., & Soares, M.M. (Eds.). *Handbook of Standards and Guidelines in Human Factors and Ergonomics* (2nd ed., pp. 3-43). CRC Press. DOI: https://doi.org/10.1201/9780429169243
29. Templar, R. (2011). *The Rules of Management*. Expanded Edition. Pearson Education, Inc.
30. Wheelen, T. L., Hunger, J. D., Hoffman, A. N., and Bamford, C. E. (2018). *Strategic Management and Business Policy: Globalization, Innovation, and Sustainability* (15th ed.). Pearson Education Limited.