Ergonomics Strategy to Create Work-Life Balance

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Abstract

As well as having an impact on human life and economic problems, pandemic COVID-19 also caused a new issue in work-life balance; the term "quiet quitting" has gone viral in the news. "Quiet quitting" is defined as doing the work essentially as specified in the job description (or less), nothing more. Work should benefit the family, community, corporations, and environment rather than the worker alone. However, as humans, workers have unique personalities; it looks like the butterfly wing effect. Beside physical, mental, and spiritual characteristics, every human being has intuitions that influence their consciousness in achieving life goals. As a result, ergonomics and human factors have found their niche in addressing work-life balance issues. Ergonomists take an approach to the three primary roles and the comprehensive role. The first is from the physical perspective with physical ergonomics, the second from the mental perspective with cognitive ergonomics, and the third from the strategic management perspective using organizational ergonomics. Finally, by combining those roles, macro-ergonomics, or holistic-ergonomics, can be used to influence corporate culture and the social environment. Since work design focuses on the worker (human center design), it would be more effective if ergonomics were actualized with the participatory ergonomics method.

Keywords: *Ergonomics; Strategic Management; Quiet Quitting Work; Work-Life Balance*

Introduction

The world changed when the pandemic struck continuously for nearly three years. People not only lose their work but also watch their loved ones and dearest friends pass away one by one. Several countries collapsed due to the economic disaster, along with its impact on human life and economic problems. Pandemic COVID-19 has caused a new issue in the term "quiet quitting" work. Even though in terms of work-life, not a new issue, it is a mere case issue in corporate. This is usually handled by the department or division in an organization and usually relates to the worker's matters. However, this term viral in the news and social media lately, it said that quiet quitting work to create work-life balance. The question, is this simply just by quiet quitting work to create work-life balance?

The "quiet quitting" work means doing exactly what the job descriptions require (or less), nothing more. These are the mindset changes that occur primarily among young workers as a result of their experiences with irregular and chaotic working hours during the pandemic, and the new approach to working is work from home (WFH). The idea of quiet quitting work is to create work-life balance. Even though it's not as easy as they imagine, especially when it comes to improving their careers and addressing issues that arise in the company's operations. It has a direct impact on the corporation's performance; this trend is detrimental to the corporation.

Research Methods

The focus of this study was on using the library as a desk research method, collecting data from online scientific publication sources, and reporting news from credible sources. And to solve the problems using some research and other related scientific publications. A descriptive-qualitative analogy technique is used to analyze it.

Literature Review

Ergonomics Voyage

Ergonomics evolved along with human activities, although the term was formally introduced around 1857. However, if one examines the history of anthropology from ancient times to the present, one will notice that the principles of science working have always accompanied every human activity. People lived in caves and began to build dwellings with a variety of equipment, the principle of which was to lighten the burden of activities when living in the open. Likewise with lifestyle, which initially eats raw food and then eats cooked food, along with living as a farmer, raising livestock, and living in society. All these developments cannot be separated from the role of the so-called "law principles of working". The ergonomics were there, although the term was not as well-known as it is today.

Ergonomics exists in the traditional values of human activity. For example, Marhaendra (2016) found the cultural values in the Balinese traditions as follows:

> "Balinese have a philosophy as the ways of life, named *Tri Hita Karana*. It means the interaction of people in harmony with the three (i.e., *Parahyangan*, *Pawongan*, and *Palemahan*) causal aspects of life: *Parahyangan*, harmony with God; *Pawongan*, harmony among people; and *Palemahan*, harmony with the environment. Balancing the three in physical and spiritual activity is essential for improving human well-being."

Marhaendra (2016) states, "One of the tools as a measurement named *gegulak* is made from a piece of bamboo in conformity with the plan to build a house or a temple." Interestingly, *gegulak*, as a measuring instrument, has similar functions to anthropometry in modern life. According to Stack *et al*. (2016), "Anthropometry: Greek - *Anthro*, man; and *pometry*, measure, literally meaning the measurement of humans." Moreover, Marhaendra (2016) revealed:

> "Anthropometrics is commonly used to design workstations, tools, machines, and other accessories of human life in general for gaining comfort interacting with the user. Meanwhile, *gegulak* is used to measure in a certain way for gaining the actual size and dimensions of the materials of a house or a temple concerning the size and dimensions of the parts of the body from the owner."

The purpose of both is to make users of the product fit in safely and comfortably with activities, including work. According to this, Bedny and Bedny (2018) emphasize that, "Any equipment design solutions that are not based on the analysis of human behavior should be considered as pure engineering solutions and therefore not in line with ergonomics or human factors." Therefore, Marhaendra *et al*.

(2022) states that, "The ergonomics principles are to harmonize workers with their work tools, workstation, workplace, and work environment; this is directly connected to the worker's safety and health factors."

Wojciech Bogumil Jastrzebowski coined the term "ergonomics" in 1857 as "the science of work" (Jastrzebowski, 2006). Since then, ergonomics has grown and popular in Europe and around the world. Furthermore, Konz (2008) explains, "Ergonomics also comes from the Greek: *erg* (work) and *nomos* (study of). A more formal definition of ergonomics is a body of knowledge about human abilities, human limitations, and other human characteristics that are relevant to design." And Dempsey *et al*. (2006) state "the society is now called the Human Factors and Ergonomics Society (HFES)." The International Ergonomics Association (IEA) (2023), in the year 2000, stated that the domains of HFE are:

"*Physical ergonomics* is concerned with human anatomical, anthropometric, physiological and biomechanical characteristics as they relate to physical activity."

"*Cognitive ergonomics* is concerned with mental processes, such as perception, memory, reasoning, and motor response, as they affect interactions among humans and other elements of a system."

"*Organizational ergonomics* is concerned with the optimization of sociotechnical systems, including their organizational structures, policies, and processes."

With the three domains defined above, ergonomics supports maintaining the whole system of design interactions among the three (physical, cognitive, and organizational) from the plan, the process, and the outcome. Inevitably, this issue developed into a wider question. Just as Singleton (1989) said, "Ergonomics is sometimes confused by questions such as who is the ergonomist servicing – the employer or the worker? or, to whom is he ultimately responsible – the state, the employer, the producer, or the consumer?" However, regarding this issue, Singleton (1989) provides an elegant and impartial answer. "Fortunately, it is possible to dispose of these issues without taking up any particular political position. Ergonomics seems to flourish equally well in capitalist and socialist/communist systems, ergonomics activity can be sponsored with equal validity by employer's organizations and by worker's organizations." Furthermore, Singleton (1989) asserts that "There can be no good reason to object to this when it is recognized that efficiency incorporates personal factors such as safety, health, and quality of working life as well as system factors such as productivity and quality of work." Even though the answer was provided decades ago, it is still current and acceptable. Ergonomics is not only about the efficiency of the worker's activity; it is also about harmonizing the community and its environment as a whole system.

Efficiency and Effectiveness in Ergonomics

There seems to be a difference in the emphasis on work between ergonomics and corporations. The ergonomics side, represented by Singleton (1989), emphasizes that "efficiently is always better than conducting it inefficiently." Meanwhile, from the corporation's side, especially in organizational behavior within the corporation, authors such as Robbins *et al*. (2018) state that "Organizational behavior (OB) is a field of study that investigates the impact individuals, groups, and structure have on behavior within organizations, for the purpose of applying such knowledge toward improving an organization's effectiveness." Therefore, there are two emphases: efficiency (from the ergonomics side) and effectiveness (from the organization side), which both lead to one goal, namely productivity. However, there is a difference in emphasis between these two aspects, which means that maximizing productivity cannot be done at the highest level of both. Because maximizing efficiency will suppress or sacrifice the level of effectiveness, and vice versa. Therefore, it should be done through synchronization in optimizing each other to optimize the productivity of workers and organizations by increasing quality performance in both.

Eventually, in different ways, there is a comprehensive opinion about lifestyle, that an inefficient work-life is rewarding for physical and mental health, revealed by James (2022, 6:07 – 6:54) on his

YouTube channel, under the title: "This ridiculous, over-working inefficient life." He describes some of his choices to work inefficiently with hand tools in his work-life activities:

> "… choosing to do this for me choosing to work inefficiently with hand tools … these things are all very inefficient, but to me they are rewarding in that. I get to spend time in nature, which I think most people are lacking. I think the more time we can spend in nature, the happier and more meaning we are going to find in our lives, the happier we are, and he's got that healthy aspect of that. So, the work, the exercise, and the fresh air, and the forest bathing, and all the other benefits of living with and closer to nature, there is that, and then there is the mental health aspect of that as well …"

Humans in Work-life

Humans alone have complex personalities, which are influenced by culture, from parenting in the family, community, and society. Besides physical and mental or spiritual experiences, each human has intuitions about the outcomes of their experiences that are stored in memories. These experiences are difficult to categorize and possibly a combination of present and past lives while subconsciousness. Intuition is defined by the Britannica Dictionary (n.d.) as: "a natural ability or power that makes it possible to know something without any proof or evidence: a feeling that guides a person to act in a certain way without fully understanding why." People's tendencies when making decisions and choices, as well as their level of consciousness in achieving life goals, are influenced by intuition. Therefore, global change certainly affects one's intuition, level of consciousness, emotions, and spiritual beliefs. Even though Hawkins (1995) classifies this level of human consciousness in "The Map of Consciousness" as lower (log 20) to higher (log 700–1000). However, humans have needs and desires that overlap and are difficult to distinguish. The relatively equal combination of physical and mental needs and desires, as well as the external factors influencing intuition and consciousness. That's why everyone is unique in the way they live, which affects workers in the workplace.

There are three stages of work: the first is physical and mental activity; the second has a purpose; and the third has a result (outcome), which leads to the meaning of the motive as the background of the worker. Therefore, the reason or motive that causes the activity is to satisfy the needs (or desires). However, in a sense, inspiration drives motive, usually using the term "motivation" in the way people work. Eventually, Pinder (2008) came up with the definition that states, "Work motivation is a set of energetic forces that originate both within as well as beyond an individual's being, to initiate work-related behavior, and to determine its form, direction, intensity, and duration."

Humans satisfy their needs or desires by doing something in exchange for the benefit of their activity. The ability to do certain things may result from learning by doing (trial-and-error, experiences) or learning from an expert (training, education). In other words, humans must have the skill to obtain a better outcome for more benefits to support their needs or desires. "The application of special skills in this way is called work. The ergonomist has to believe that work is a good thing and that conducting it efficiently is always better than conducting it inefficiently" (Singleton, 1989). Therefore, for people who live in a community with laws and social orders, there is the term of "work." As revealed by Singleton (1989), "There is an underlying necessary ethic that is best summarized as the social contract. An individual is a member of a community from which he obtains considerable benefits. In return, he develops special skills which he applies for the benefit of the community." That is, work benefits are not just for the worker alone, but also for the family, community, corporation, and environment. Therefore, workers should be aware that the soul of work does not come from an egoistic perspective; it applies to the vision and mission of a corporation.

Work is a part of life, and the balance is determined by each personality's values for controlling and adapting to work-life. Therefore, attaining work-life balance (WLB) depends on controlling internal factors and adapting to external factors, not the opposite. The Cambridge Dictionary (n.d.) defines WLB

as "the amount of time you spend doing your job compared with the amount of time you spend with your family and doing things you enjoy." One might be more understanding by imagining there is a clear division of time between work and life. This is not as simple as dividing the time as corporations do, which determines the shift work and working hours of eight (8) hours a day. Although some work less or more, it is possible for workaholics to exceed 12 hours. There is no proportionate standard acceptable to everyone. When determining the work-life balance, every worker, according to their abilities and limitations, has their own way to achieve WLB. It also depends on the corporate work system and regulations, standard references, payments, etc., that have been agreed upon with the worker's unions based on applicable legal provisions.

Globalization Changes World

The world changed, and advanced technology in telecommunication, information, and transportation interconnected almost everything under the one term "globalization." Wheelen *et al*. (2018) state, "Globalization, the integrated internationalization of markets and corporations, has changed the way modern corporations do business." People in their work, communities, societies, and nations are affected as a result of globalization processes and automation technologies in their lifestyles. However, when the desire became a need, this human improvement was not enough; it evolved and involved all the best and newest methods and technology in business. As revealed by Wheelen *et al*. (2018), "Innovation, as the term is used in business, is meant to describe new products, services, methods, and organizational approaches that allow the business to achieve extraordinary returns." As a result of globalization and innovation, work lives and lifestyles have changed. Therefore, corporations should have methods to achieve sustainability. Since those aspects have many variables that relate to the other disciplines, they should be carried out by multidisciplinary approaches. These approaches pose challenges and opportunities for ergonomics as a part of work systems through work design. According to Malik (2018), "work design principles should motivate employees as well as meet the organizational goals."

While in strategic management, there are challenges to business sustainability revealed by Wheelen *et al*. (2018), which is the "triple bottom line" as follows: "Traditional Profit/Loss, People Account (The social responsibility of the organization), and Planet Account (The environmental responsibility of the organization)." Therefore, performance workers should be important to maintain the goals of the corporation: profits, development (growth), and sustainability. This is emphasized by Wheelen *et al*. (2018), "Sustainability refers to the use of business practices to manage the triple bottom line." This means that, in order to maintain sustainability, corporate organizations must consider "people and planet" in addition to profit as a benefit for all. Besides that, it is necessary to understand business ethics, such as David & David (2017) revealed, "Business ethics can be defined as principles of conduct within organizations that guide decision making and behavior. Good business ethics is a prerequisite for good strategic management; good ethics is just good business!"

However, to guide decision-making and behavior technologically in business, it's also ethically required to empower self-leadership among the workers. Even though productivity is measured not only economically but also in terms of health-related activities, people are now realizing that life is not only about seeking job satisfaction. It's also a transition from welfare to well-being. People use technology and its systems to compensate for human limitations, but technology should still be under human control. Therefore, society should be enlightened about technology and not be exploited by it or use it excessively.

Meanwhile, ILO and IEA (2021) published the document under the heading: "Principles and guidelines for human factors/ergonomics (HFE) design and management of work systems." Joaquim Pintado Nunes, chief of the team work, states that this document outlines, "the role of ILO instruments as a central pillar for the promotion of occupational safety and health." In the document, ILO and IEA (2021) revealed that, "These guidelines describe what should be done for HFE design and management of work systems to ensure worker safety and health and to enhance worker and organizational effectiveness

and sustainability." Unfortunately, it seems most overlook that document. Most people are unaware that uncontrolled globalization and innovation in business impact "people and planet," as described before. According to Dul *et al*. (2012), "Corporate Social Responsibility (CSR) means going beyond fulfilling the minimum legal expectations regarding planet and people." In addition, Dul *et al*. (2012) revealed that "poor or minimum standards in health and safety may damage a company's image concerning CSR, which would be a direct threat to the value of the CSR effort and the continuity of the business." However, this has happened now, and the personal, social, cultural, environmental, and technological aspects of globalization and innovations have changed the world rapidly and dynamically.

When the natural environment changes, everything changes, and living beings change to survive. However, this is not the case for those who change nature for the sake of extraordinary returns from their competitiveness. According to the United Nations (n.d.), this is caused by "human activities have been the main driver of climate change, primarily due to burning fossil fuels like coal, oil and gas." Even though Hourdequin (2015) explained, "Environmental ethics is not about halting progress or stopping change. It is, however, about reflecting on what constitutes progress, the kinds of changes we should pursue, and how we should respond to the inevitable losses we produce through our actions." And related to business, David & David (2017) state that "Good ethics is good business. Bad ethics can derail even the best strategic plans." Therefore, when businesses ignore environmental ethics, this triggers unavoidable natural laws of cause-and-effect and reaction flows, such as naturally occurring nuclear chain reactions that have unpredictable results as they chain and change. It begins with small issues until it spreads and becomes a big issue, and at the moment, nothing can control or stop it. This happens when COVID-19 spreads in globalization and innovation, as revealed by Marhaendra *et al*. (2021):

> "This tiny living being, its size in the micron and imperceptible for ordinary eyes, has been identified by experts and named Coronavirus (COVID-19). Then spread around the world, infecting people …. Naturally, people try surviving as well as COVID-19, and it is a habitual behavior. Since the human effort to make it, Coronavirus reacts more adaptive than before, like regenerating and mutating themselves with many variants."

Results

A mapping of the issues is necessary to obtain adequate results. The mapping issue revealed complex dependent variables for which it was impossible to obtain a single solution. An ergonomics multi-approach was required to find solutions for each multi-issue. However, with the mapping issue, each discipline in the ergonomics area knows what to do on its part. And in a certain aspect, there will be overlapping interests. Therefore, coordinating and consolidating are necessary for leading sectors to obtain the best solution.

Ergonomics practitioner's strategies use three primary, specific, and comprehensive approaches. The first is from physical ergonomics; the second is from cognitive ergonomics; and the third is from organizational ergonomics. Finally, a hybrid of the three influences their corporate culture and social environment through a macro-ergonomics or holistic-ergonomics approach. This ergonomics strategy solves the worker's issues in three areas of the corporation. However, it also influences other internal and external corporate factors, which have cause-and-effect relationships with each other. Therefore, ergonomics also has methods to counterbalance the issues.

Issues of Human Performance and Work-life Balance

Human performance is the strategic ability to manage multiple resources internally in order to achieve the best possible outcome from activities. Knowledge of good business ethics, planning, formulae, procedures, organizational control, and adaptation comprise strategic ability. With those contexts, worker performance refers to the strategic ability driven by motivation to complete jobs and

tasks with quality and on time. Therefore, work performance should have a certain method of assessment with results that are compared to the standard reference.

The standard reference for work design is based on the corporate vision and mission, as well as on good business ethics to achieve its goals. This corporate policy should be communicated to the workers to match workloads and performance. To maintain work performance that is righteous for workers and corporations, employers mostly apply punishment and reward policies, or, in the other sense, pay based on performance. As a result, their work-life ethics are consistent with their workload. Workers should know and be aware of their limitations and adapt to other life activities in balance, such as maintaining health and fitness, family, and community, as well as enjoying doing useful things.

Work-life balance involves many variables that are synergetic and dependent on each other to influence human characteristics in personality and to achieve human performance. The analogy of the worker's personality looks like a butterfly that flies in the air to seek nectar. When a butterfly catches sight (with its two eyes) of flower nectar (welfare and well-being), it must fly to achieve it by flapping its two wings (which have many dependent layers on both physical and mental levels) in harmony. There is little difference between welfare and well-being, which is welfare in the sense that the level of spirituality is transition to well-being. The two wings must be balanced and able to lift the body weight (workload and performance). If one layer of wings has a problem or the weight increases (unmatched workload for performance), then all the wings will be affected; this will affect the ability to fly and human welfare or well-being, as the ultimate goal will be difficult to attain. To achieve the goal, these two wings and weights should be actively adaptive in synergy with each other, as shown in Figure 1.
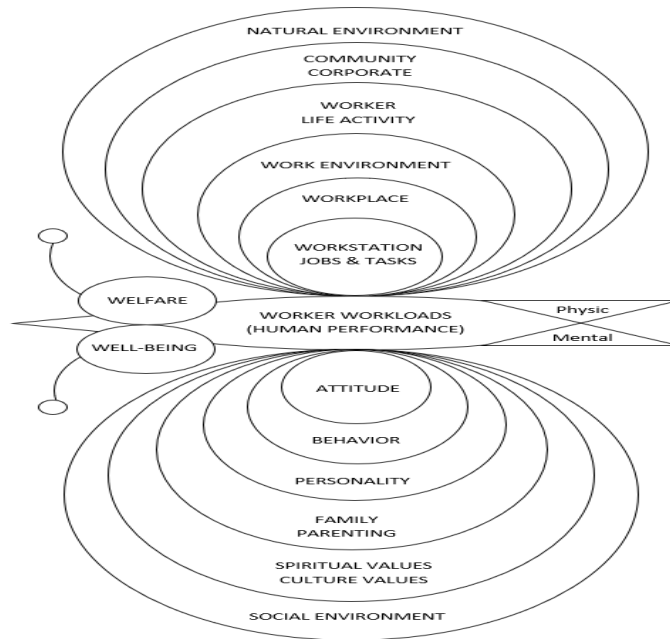

Figure 1. The butterfly wing effect of the worker's personality on work-life balance.

Issues of Ergonomics and Work-life Balance

Ergonomics systematically counterbalances the process of attaining the ultimate goals of workers and corporations. Relationships with work-life balance are dependent on worker efficiency in using tools and equipment for jobs and tasks, as well as worker comfort in their workstation, workplace, work environment, community, social, and natural environments. This influences their health, safety, and productivity. Ergonomics can take on comprehensive roles (observation, evaluation, and intervention)

through macro-ergonomics or holistic-ergonomics, and three primary cases (physics, mental or cognitive, and organization) through micro-ergonomics.

Ergonomics observation, evaluation, and intervention are applied in the three areas by the three ergonomics approaches. The first is from a corporate perspective in strategic management for work design using an organizational ergonomic approach. The second is from the physical workload's perspective with the physical ergonomics approach. And the third is from the mental or cognitive workload's perspective with the cognitive ergonomics approach. There are many documents and tool kits to support the assessment, evaluation, and measurement. The evaluation of ergonomics for the workers is measured by two methods of measurement that can be used to evaluate their workloads and performance; it depends on the tendencies of the worker's activity. Workloads are typically measured objectively if they are physical; otherwise, workloads are typically measured subjectively if they are mental or cognitive. The separation of measurements is intended to obtain valid data as a basic decision for strategic management to improve the effectiveness of work designs and to adjust appropriate workloads to meet workers' and corporations' performance. This influences ergonomics intervention for the improvement of workstations, workplaces, and work environments; it also affects organizational behavior and changes corporate culture. These ergonomics approaches are expected of the workers; they have more time in balance to maintain their health and fitness, their families, and their communities, and they enjoy doing something useful. This is the basic worker's need to create a work-life balance that leads to human well-being; see Figure 2.
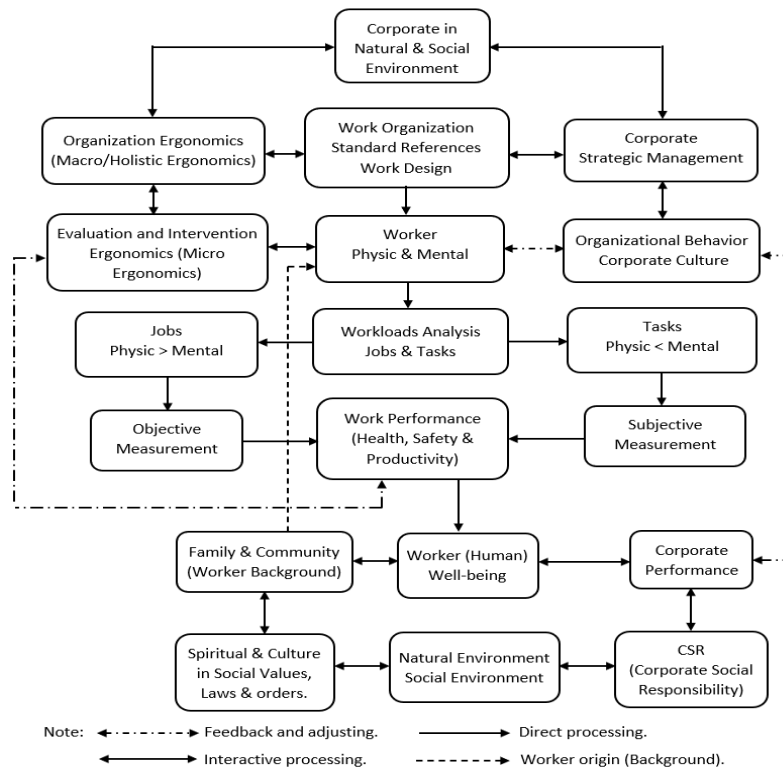

Figure 2. The contact area of ergonomics and strategic management

Discussion

The existence of the quiet quitting work phenomenon has been defined before, as the impact of the pandemic also illustrates workers' disappointment. There are various reasons; one of them is that a worker's performance and income are not commensurate. For example, to reduce the cost of operating

their business due to the pandemic, corporations decrease salaries with the same workload, maybe even more, which is one of the reasons they work from home (WFH). This one-sided decision seems to ignore that what happened during the pandemic also had an impact on workers, families, and the community. This condition makes workers face a difficult choice. If they quit and look for a new job with this condition, it is increasingly difficult; if they endure, their income will decrease, even though the demands of life are increasingly expensive. Due to the difficulties of the economy, they were forced to think pragmatically and take "quiet quitting" without considering the career they had to achieve. Even though there is mistrust in the worker's mind, the corporate intention is to utilize those situations to push them into quitting by themselves, namely by "quiet firing" them. Therefore, when implementing corporate policies to avoid the distrust of the worker, corporations should consider human characteristics and performance as the base evaluation factors to compensate employees.

It also happens as a reflective experience of being victims of the pandemic and how painful it is to watch and lose friends, relatives, wives, husbands, and children almost at the same time. With these experiences, the worker as a human fully realizes the meaning of friendship, brotherhood, family, and eventually the meaning of life. Their condition makes them constantly besieged by the various demands of family life. It is later used as an excuse to claim that "quiet quitting" work creates a work-life balance. Although, in reality, it is not that simple to achieve a work-life balance, its implications affect their workstation, workplace, work environment, and community's health, safety, efficiency, productivity, and comfort. As a result, workers' decisions to quiet quitting work are temporally motivated by life's concerns.

On the other hand, the impact of pandemics changed the values of the social environment and impacted the community and natural environment. The changes begin with methods for preventing the virus' spread, such as washing hands, keeping a distance, and using masks. The augmented corporation has a policy of implementing work from home, and schools require students to study from home. Yet not every worker or student is ready for it, and while the infrastructure of information technology has not been evenly distributed, this follows and adds to their cost of living. If these methods are applied for a long period of time, although the goal is for the common good, they will certainly have a major impact on everyone's social behavior. As with changing one layer of the wing of a butterfly, the impact will spread to other layers. This chain reaction will naturally continue until the butterfly achieves balance, at which point it will be able to fly smoothly and energetically again to its destination.

The pandemic experience made clear that the ultimate goal of ergonomics is worker performance for the sake of human well-being. Because ergonomics refers to achieving work-life balance through good work design as a principle of conduct in organizations, it encourages workers to produce higher-quality results from jobs or tasks by working more efficiently, safely, comfortably, and productively. Work-life balance is expected of employees as a basic requirement for achieving human well-being. While the quality of worker productivity has an impact on corporate performance, reflection on increasing benefits, growth, and sustainability, it also has a positive impact on corporate social responsibility (CSR).

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. Those four influences are combined by corporate culture and the support of their environment with a macro-ergonomics or holistic-ergonomics approach. Therefore, participatory ergonomics (PE) would be more successful in bringing ergonomics into reality, given the contemporary situation where every aspect influences other and because work design focuses on the user or worker (human center design), which aims to obtain the best worker performance. This implies that each employee actively participates in their area or department as a team member.

Conclusion

When the COVID-19 pandemic struck continuously for nearly three years, the world changed. Besides its impact on human life and economic problems, it has been causing a new issue in people's work lives. It is going viral in the news with the term "quiet quitting" at work. The quiet quitting employee is only doing what the job descriptions require (or less), nothing more. Even though work benefits are not just for the worker alone, they are also for the family, community, corporations, and the environment. With these conditions, which are hurting and powerless against economic difficulty, workers face a difficult choice. Eventually, workers choose to quiet quitting at work to survive, hopefully creating a work-life balance. Although, in reality, it is not that simple to achieve work-life balance, it depends on controlling internal factors and adapting to external factors that affect worker performance. Also, the impact of pandemics changed the values of the social environment and impacted the community and natural environment. Therefore, ergonomics refers to the understanding that good corporate ethics in work design encourage workers to do their work efficiently, safely, comfortably, and productively. And three benefits for corporations: profit, growth, and sustainability, which have a positive impact on corporate social responsibility (CSR). For those reasons, ergonomists should observe and evaluate the chain of events that potentially harm human activity in workstations, workplaces, and work environments from the beginning. However, since work design focuses on the workers (human-centered design), it would be effective to implement the participatory ergonomics (PE) method to attain ergonomic actualization. These strategies are expected of the worker, as they are the basic needs for attaining a work-life balance that leads to human well-being.

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