

# The Challenges of Applying Ergonomics to Small Medium Enterprises

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**Abstract.** One of the important roles of small medium enterprise (SMEs) is to contribute to solving challenges in the field of employment through the provision of employment. The uptake of labor in SMEs is not far inferior to large-scale industries. With the ease of access to information today, some business actors have begun to be aware of the role of ergonomics in the production aspect. This is inversely proportional to the condition of workers in the scope of SMEs. Workers in the SMEs sector have a sense of reluctance in doing ergonomics-based work principles. This research aims to review the work patterns carried out by workers at the SMEs level and investigate how workers understand ergonomic aspects and review the challenges of applying ergonomics in the future. This research was conducted using qualitative methods of phenomenology using deep interview techniques to several workers at the SMEs level. In this study also used triangulation against data obtained. The results showed that workers have a mini understanding of ergonomics-based work principles. The challenges of applying ergonomics in addition to being faced by the quality of human resources, including human factor aspects and sustainable risk management.

## 1 Introduction

Economic independence owned by a country is one of the determining factors for success in realizing economic development and growth. Economic independence is one of the crucial factors in achieving the level of well-being [1]. Indirectly, the attitude of economic independence has a fairly broad scope and contribution in answering various challenges such as in the social, cultural, and political fields. In addition, economic independence also presents the concept of economic decentralization which is not limited to administrative aspects but also takes a role in aspects of social life [2].

One form and effort in realizing economic independence can be done through the presence of small medium enterprise (SME's). The existence of SMEs in a country can help in achieving the level of acceleration of solutions to various challenges and problems. The presence of SME has a specific function, role and contribution, because in addition to playing a role in economic growth also contributes to realizing sustainable economic development [3]. One of them is poverty alleviation, solving labor problems, efforts to use biological and non-biological resources and various other problems [4].

Given that the presence of SME's can support and contribute to the economic field, strong support and synergy are needed to support the increasing number of new businesses, especially micro-medium enterprises. The agenda in creating SME's is one of the many agendas that are encouraged by the government [5].

Therefore, a variety of initiation programs are needed to create new businesses that are qualified and competitive. Of course, support related to this can be achieved if there is a strong synergy between the government and all levels of society.

The contribution of medium-sized micro enterprises today also helps to solve problems, especially in terms of employment through the provision of employment. As a job provider agency, the SME's sector is considered able to respond more quickly in responding to job needs [6]. Respond is because the SME's sector is a sector that is informal and simpler in nature. A fairly simple informal work practice is carried out with the aim of reducing the cost burden [5].

Uptake of employment in the SME's sector often does not pay much attention to the background and special abilities possessed by prospective workers. The job recruitment process is more inclined to the decision of business owners in choosing the desired prospective workers [7]. So that education and previous skills are not the main requirements for workers in the SME's sector. The recruitment process that occurs in SME's can also be said to be very simple and flexible [7]. One of them is happening in the food industry sector. One of the industries that dominate the food industry sector based on SME's is one of the industrial sectors that contributes quite a lot to the dynamics of the Indonesian economy [8]. As a provider of people's primary needs, the SME's based food sector has developed quite well in recent years through a variety of products to meet market needs and strengthen national food security.

Along with the development in this industrial sector,

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of course, it also has an impact on the needs of workers. To meet this, it is not uncommon for many SME's owners to empower the surrounding community to work in their place of business. This practice is carried out in addition to reducing budget costs, hiring the surrounding community as well as a form of social responsibility. In addition, by recruiting the community around this process also shortens in finding labor, because basically work owners in the SME's sector they only tend to see the aspect of the will and willingness of prospective workers in working.

From the aspect of production, it can be reviewed that the production of the SME's sector has a production process that is still quite simple with the lack of specified standardization, except for some SME's who already have sufficient knowledge related to the field of production operations. The work process is mostly done using machine power as well as human power. Thus, a combination of technological and human aspects is still needed in achieving production productivity. Production activities carried out every day cannot be separated from the production schedule and daily production targets. In this case, if there is an increase in the amount of production then this will have an impact on the amount of working time and the needs of workers increase.

Currently, with access to the free market and the current dynamics of development and competition, SME's players are trying to improve quality, especially in the aspect of production. Reflecting on the need for aspects of production, SME's actors make many governance improvements in the field of production. One of them is through revamping facilities and standardizing work. Along with its development, it turns out that problems in the world of work, especially on the scale of SME's, also have some related obstacles in their implementation.

One of the current obstacles that many faces is related to work processes that are not based on ergonomics. This is much complained about, especially by business people. On the other hand, business people today, especially in the food sector, have tried to provide facilities that support work. The facilities provided have certainly also been adjusted to the level of comfort and security of users. One of them is such as a desk designed specifically for cutting, workstation division, and various other facilities. However, this is still not well utilized by workers. So sometimes this triggers various problems, especially musculoskeletal disorders and decreased work productivity.

Not infrequently business actors also often conduct inspections in every production activity, but still employees are reluctant to do work in accordance with work standards that have been adjusted to the principle of ergonomics-based work. The impact of a lack of work discipline among workers in addition to causing musculoskeletal disorders also sometimes triggers injuries.

From this phenomenon, the human factors aspect has a very specific role in carrying out its functions. Therefore, this research discusses how the implementation and understanding of ergonomics-based work principles carried out by employees at the micro-medium business level. This research was conducted

aimed at (i) reviewing work patterns carried out by workers in the pandemic sector (ii) investigating how far it is related to workers' understanding of ergonomic-based work principles and (iii) showing obstacles and challenges related to the application of ergonomics-based work.

## 2 Literature review

Ergonomics as an operational part of the business plays a role in controlling production and human activities in it, in addition to ergonomics is as a form of approach in a discipline [9]. As an important part of this, the principle of ergonomics work is a device that can support in supporting production productivity. Currently, with open access to information makes business actors to apply this principle to their business. There is a push in using ergonomic principles in addition to aiming to use all capital also aims to achieve maximum productivity and reduce the risk of work accidents and disturbances caused by human factors. Studies conducted related to ergonomics basically in addition to aiming to make system improvements also play a role in the condition of improving the health level of workers [10].

The principle of applying ergonomics-based work, cannot run without the various factors that accompany it. Factors for the availability of adequate facility are the main factors that must be met. The lack of facilities provided by the company can have an impact on the emergence of health problems [11]. The fulfilment of these needs is based on usage as well as needs. Equipment that supports during production activities must be considered both from the aspect of utility and comfort for users. Adequate equipment reflects the adoption of technology that can be used in a friendly manner [12]. This needs to be done because both the human and equipment aspects are related to each other. So that if this is not fulfilled with each other, it will have an impact on maximum performance achievement.

Absolute fulfilment of requirements is not only supported from the aspect of equipment alone, there needs to be fulfilment in terms of humans. The readiness of the workforce in implementing the ergonomic work culture must be in line with the vision and mission to be achieved. In this case the necessary readiness such as the willingness to learn and comply with all regulations and sustainable implementation. This basis can make workers have excellent work behavior and minimize the possibility of the risk of work accidents and musculoskeletal disorders after work. Of course, to achieve this, providing encouragement and explanations for why workers should do ergonomics-based work principles is a responsibility for all parties who play a role in the business.

The application of ergonomics helps in reducing disturbances caused by errors in the work position. So that this can affect the aspect of worker productivity. Basically, the principle of ergonomics is a principle in creating dynamic space for workers and comfort. So it is expected that through the application of this, productivity and effectiveness and efficiency are

achieved. Ergonomics in industry will always be needed during the work process there is human and equipment interaction. In the era of the industrial revolution 4.0, the digitization process also created an impact on ergonomics, especially in terms of the creation of ergonomic systems that prioritize aspects of modernity [13].

### 3 Methods

To answer the problems in this phenomenon, this research uses a combined method using qualitative studies and literature studies. Qualitative methods in this study are used to look deeper and analyze further related aspects of understanding and work motives carried out by workers [14]. To obtain a data source, the first research is done by determining research objects that meet several criteria. The conditions met in this case are that the business already has facilities that are tailored to the needs and have standardization in each workmanship. In this study, researchers used triangulation methods, by combining interview results and observations to obtain relevant information. Observations are made to observe whether the work behavior carried out is in accordance with the information provided by the informant [15].

### 4 Data collection

Participants in this study were none other than workers spread across 6 sectors of the food industry. In order to get actual data sources, a series of interview stages were conducted with workers located in the SMEs food industry sector in Batu City, East Java, Indonesia. Interview activities are carried out by providing questions related to tasks and roles in production, work habits, and work patterns. In the interview activity, researchers also gave questions related to the application of working principles that have been used. Table 1 shows the research participants.

**Table 1.** Research participants.

Report	Age	Education	Length of work
P1	24	Vocational	4 <a href="#">year</a>
P2	18	Vocational	6 <a href="#">month</a>
P3	36	Junior school	5 <a href="#">year</a>
P4	43	Elementary	5 <a href="#">year</a>
P5	39	Junior school	8 <a href="#">year</a>
P6	41	Junior school	3 <a href="#">year</a>
P7	37	Elementary	4 <a href="#">year</a>
P8	19	Vocational	5 <a href="#">year</a>
P9	18	Vocational	9 <a href="#">month</a>
P10	22	High school	3 <a href="#">year</a>
P11	30	Vocational	4 <a href="#">year</a>
P12	38	High school	5 <a href="#">year</a>

Source: Processed Primary Data, 2022

The data obtained during the next interview is converted into transcript form. The purpose of creating transcripts is to facilitate the process of coding data. Before conducting the data coding process, researchers also reduce data that is less relevant during the study. Data coding in this case is done to find the theme. To make it easier to obtain the theme from the transcript results, axial coding is done to sort related to fragments that can become unity. So that from the theme obtained can be drawn a common thread that is useful in answering the phenomenon encountered. The results of the theme obtained during the data processing activities are then carried out syntactically by conducting literature studies. This study was conducted to support the results of research and expand perspectives related to the depth of analysis carried out.

## 5 Results and discussion

### 5.1 Aspects of human factors in ergonomics-based work behavior

The application of ergonomic-based work behavior cannot be separated from the human factor aspect. In this case, the human factor aspect plays an important role in efforts to reduce work risk factors. The interactions that occur between humans and other elements must run in a balanced manner [16]. The interaction that occurs between tools and humans can run well if both humans and equipment have conformity.

**Table 2.** Data coding results with the theme human factors.

Data Coding Results with the Theme Human Factors
<ul style="list-style-type: none"> <li>● Salvation</li> <li>● Compliance</li> <li>● Use of machines</li> <li>● Damage</li> <li>● Repair</li> <li>● Grips</li> <li>● Accelerate</li> <li>● Danger</li> <li>● Conformity</li> <li>● Ease</li> <li>● Comfort</li> <li>● Adaptation</li> <li>● Security</li> </ul>

Source: Processed Primary Data, 2022

Based on the Table 2, the data coding results has shown several theme about human factors, there are salvation, compliance, use of machine and etc. The selection of equipment tailored to the needs of workers, can help in the work process optimally. In addition to this, it is also necessary to pay attention to the ease of use of equipment. The more complicated the equipment used in the work, this will trigger workers to be able to use it with a high enough concentration power. So that

when this happens, workers have pressure in concentration. Concentration carried out over a long enough range can trigger fatigue for workers so that this can also affect employee work productivity.

In addition to needing to pay attention to the aspect of the equipment used, consideration in paying attention to the human aspect also needs to be done. This consideration must be based on the ability and frequency of interactions that occur. It's good before choosing to use equipment, both from business actors also provide knowledge of how to properly use and explain its function in detail. By showing how the tools used work, workers can have an idea of how to use and adapt for use in work activities. In addition, the workforce must be equipped related to the risk of using the wrong equipment, so that from the beginning they have vigilance and careful nature in their use.

The combination of the two factors between humans and equipment in addition to considering in terms of utility must also consider from the aspect of comfort and safety for users. The use of equipment must also be adjusted to safety, ergonomic criteria and protection from hazards [17]. If the equipment used has a design and specifications that are safe to use, it will help in reducing risk factors in the event of a work accident.

### 5.2 Work culture as part of a developing country's society

Cultural aspects indirectly affect the characteristics of society in work. This aspect is formed as part of the existence of habits and emotional feelings. People's habits of having a work culture are often identical to where they come from. Thus this causes each organization to strive to build a different approach [18]. Aside from habits, work culture can also be influenced by the level of education and motivation. Bound cultural factors also make society more different, so various considerations are needed in dealing with this kind of culture [19].

**Table 3.** Data coding results with the theme of work culture.

Data Coding Results with the Theme of Work Culture	
●	Every day
●	Routine
●	Collaborate
●	Difference
●	Communication
●	Focus
●	Family
●	A sense of reluctance

Source: Processed Primary Data, 2022

Based on the Table 3, the higher the level of education possessed by a person, then this will help in coordinating and having the ability to understand the instructions given. The practice of receiving instruction can be achieved if a person has a focus on receiving and understanding the information provided. Meanwhile,

when viewed clearly, workers within the scope of SMEs are workers who have a basic education level. So this is quite difficult for them in having a good enough work culture.

### 5.3 Ergonomically based work behavior adaptation

To adapt work behavior in addition to taking time, also requires habits. The adaptation process carried out by workers can take place quickly and slowly, this in addition to taking time is also caused by the capture power possessed by workers. Most work adaptation processes will be passed by workers in their early working days. In addition to being introduced to the jobdesk, workers are also introduced to the equipment used as well as how to use and how to work correctly. Proper implementation of adaptations can have an effect on effectiveness in work activities [20].

The process of adaptation of work carried out in addition to being process-oriented also applies to the equipment used. So that the adaptation process that takes place repeatedly can produce a repertoire of work [21]. If a worker does not have both, it can be ascertained that in the process of working a person will have difficulty in completing the responsibilities given. In this adaptation process, workers are also faced with forming habits. So that at this stage, it takes deployment efforts, especially in the process of working. Table 4 shown the results data coding with theme of work culture.

**Table 4.** Data coding results with the theme of work culture.

Data Coding Results with the Theme of Work Behavior	
●	Time
●	Habit
●	Adjustment
●	Job Desk
●	Briefing
●	Simplicity
●	Comfort
●	Skills
●	Conformity
●	Risk
●	Desire
●	Motivation

Source: Processed Primary Data, 2022

The production part, is one of the important parts in carrying out business operations. Of course, every part of production there are workstations in accordance with their respective functions and roles. In this case, the work behavior in each workstation also has its own way and its own equipment. Therefore, reliability in work and skills also need to be owned by workers.

Basically the principle of ergonomics-based work, is a work principle based on attitude and efforts in reducing risks due to work activities carried out and oriented to security [22]. Ergonomic work principles in

addition to being oriented towards risk reduction also aim to achieve productivity in work and improve the quality of work [10]. To get this, standardization is needed both from the aspect of equipment and work processes. So, as the main goal in forming ergonomic-based work behavior, it is very important to do habituation and monitoring of all aspects of work activities.

#### 5.4 Management and work risk in realizing ergonomics-based work principles

One of the things that are quite important to create ergonomic-based work behavior, in addition to creating standardization is to do ergonomically based work management and risk management. Management and risk measurement are carried out as an effort to discipline workers in using ergonomics-based work principles. Management and risk must be continuous to be able to produce a good work culture that is oriented towards ergonomic work principles. Table 5 shown the data results coding with theme of work risk.

**Table 5.** Data coding results with the theme of work risk.

Data Coding Results with the Theme of Work Risk	
•	Management
•	Governance
•	Discipline
•	Compliance
•	Work safety
•	Control
•	Work risk
•	Work accident
•	Security

Source: Processed Primary Data, 2022

Especially for SME's -scale workers, on average they tend to have a relatively low level of discipline. Discipline in ergonomics can be influential in producing comprehensive safe properties [19]. So, this is necessary to monitor work and efforts in disciplining workers. In addition to functioning in disciplining workers, management and risk management can also prevent work risks caused by worker negligence.

#### 5.5 The role of psychological aspects in shaping ergonomic work behavior

Efforts to realize ergonomic-based work behavior can not only be supported through external factors alone, but internal factors are also key in creating ergonomic-based work behavior. Related to this, the role of psychological aspects plays a very crucial role. Psychological aspects play a role in shaping values, beliefs, and goals [23]. The role of psychological aspects can provide encouragement and motive for workers to perform ergonomic-based work principles by forming perceptions.

**Table 6.** Data coding results with the theme of work behavior.

Data Coding Results with the Theme of Work Behavior	
•	Motivation
•	Belief
•	Suggestion
•	Regulation
•	Health
•	Salvation
•	Work accident
•	Musculoskeletal disorder
•	Habit
•	Adaptation
•	Comfort
•	Obedient
•	Sometimes
•	Fatigue

Source: Processed Primary Data, 2022

Based on the Table 6, the perception of workers in this case can be created by giving more attention and understanding, why they are obliged to use ergonomics-based work principles and explain the risks of work done by ignoring ergonomic principles. Support in the psychological aspect provided can also have an effect on work motivation and form a humanist and conclusive work culture. Psychological elements also play a role in shaping security and comfort [24].

## 6 Conclusion

For the most part, micro-medium enterprises today have an awareness in building the business ecosystem by pursuing ergonomic-based work principles. The efforts made by business actors are inversely proportional to the conditions in the field, where workers are still reluctant to use ergonomics-based work principles. Understanding ergonomics in the scope of workers can be said to be still very minimal. In addition to the aspect of understanding, aspects such as work culture, are also aspects of why workers are reluctant to do ergonomics-based work principles.

To create an understanding of ergonomics-based work principles among workers, it is necessary to make a number of efforts such as looking at human factors both from human resources and equipment, conducting sustainable management and risk management.

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