

The Effectiveness of Office Spatial Application on Perumda Employee Performance Tirta Lestari Drinking Water, Tuban Regency

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ABSTRACT

The main facilities and infrastructure in an economic activity are offices. Spatial arrangement in office activities is one of the needs that must be considered by the company. In the preparation of this final task the research method used is descriptive qualitative with data collection techniques through interview results, direct religion, and documentation. The application of spatial planning in Perumda Air Minum Tirta Lestari Tuban Regency is an open office layout with a model of working table arrangement in the form of class and L. Conclusions that can be taken are most of the principles of spatial layout has been applied and the influence of the work environment on the performance of employees has met the needs of employees, but still needed improvements in terms of maintaining the cleanliness and neatness of the employee's work desk, the addition of a special archive room, procurement of bulkheads, making the room soundproof, limiting and adjusting the number of employees to the capacity of the room.

Keywords: *Effectiveness, office layout, ergonomics of the work environment.*

INTRODUCTION

Background of the Study

An office is a place for interaction and gathering between people who have the same vision, mission and goals so, that an organization is formed. An office will be organized and managed by paying attention to the parts within the organization. As the result, each part will be able to carry out the tasks that have become their responsibilities properly. Office layout is an important requirement and must be considered by the company. International architectural firm, (Gensler 2005) highlights the financial impact of poorly

designed offices claiming that poorly designed offices could be costing British business up to £135 billion every year. The research by Gensler (2005) identifies the impact the office working environment has on improving productivity (potentially a 19 per cent increase) and job satisfaction (79 per cent of respondents linked their environment to their job satisfaction).

According to Kusumawardhany et al (2018) "A nice arrangement of office layout will also facilitate the flow of communication and make it easier for leaders to carry out supervision. By considering the elements in the arrangement of office space, organizational goals can be achieved as expected". According to Anggraeni and Yuniarsih (2017) office layout has a positive influence on employee work effectiveness. This research shows that if the condition of the office layout is improved, the work effectiveness of employees will be increase, and vice versa. Therefore, is important for the company to require a plan in the arrangement of office space. A bad office space arrangement will result in the ineffectiveness of employee performance. Employees will feel less comfortable and get tired faster if they are worked in office space that does not pay attention to occupational health and safety aspects.

According to Ridwan et al. (2018), based on the results of data analysis and discussion on the effect of office layout on the performance of civil servants at the Central Statistics Agency office of South Sulawesi Province, it was concluded that the performance of employees at the Central Statistics Agency office of South Sulawesi Province was included in the very high category. This can be seen from the indicators of number of jobs, quality of work, punctuality, attendance, and ability to work together. According to Al Habib and Suratman (2018), the results of the analysis state that office layout affects the performance of secretariat employees at the Nganjuk Regency DPRD office, so that if the existing office layout is good and appropriate, it will improve employee performance. Spatial planning is the arrangement of office equipment and supplies in such a way that it does not cause difficulties and obstacles in the flow of work traffic in achieving goals effectively and efficiently (Ida Bagus et al., 2016).

A better arrangement of office layout will affect the employee's satisfaction and increase their productivity. As the result, it can improve their perform in accordance with the company's goals. This can be interpreted that the application of office layout is very important and have an impact in optimizing the performance of the company's office employees. This research will focus in the Tirta Lestari Regional Public Drinking Water Company, Tuban Regency. This company is provided by the Regional Owned Enterprise (BUMD) which is engaged in the service and provider of clean water services for the Tuban area. Therefore, it is interested in observing the implementation of office layout in the general section and knowing the implementation of the layout of the office.

LITERATURE REVIEW

The purpose of this research is to evaluate the research that claimed to connect office layout to occupant productivity. The open-plan office vs. cellular office issue, as well as the matching of the office environment to different work habits, will be discussed during the office layout discussion. Previous research is taken from reference articles or journals that are still relevant to this research.

The research of Gensler (2005) highlights the influence of the office working environment on increasing productivity and job satisfaction. He conducted a poll of 200 middle and senior managers in the legal,

media, and financial industries. However, it is noted that the sample size is small, and the sample evaluates professional judgments rather than direct productivity data. Finally, the £135 billion cost to British enterprises was predicated on a 19% increase in the gross added value of the UK service industry. While the real cost of productivity loss is debatable, Gensler saw a definite need for research into the relationship between productivity and office architecture. This study highlights the intricacy that researchers must face in order to establish a relationship between office architecture and productivity through a concise literature assessment.

Office Layout and Organizational Performance

According to Hadiatna (2018: 3) office layout is a method or activity carried out to organize, arrange and place something according to its use to achieve a goal effectively and efficiently. Gustiani (2020:2) said that office layout is the procedure for arranging supporting equipment and office furniture in the available space.

Ilozor et al. (2002) tried to link the usage of creative work environments to enhanced organizational performance. The study used 102 work settings to test multiple null hypotheses on creative work settings and organizational performance for statistical differences using the Kruskal-Wallis H-test. Although it is unclear how the level of productivity was tested, he incorporated a productivity metric. He concluded that the more a work setting is seen to be creative in terms of supporting staff interaction, the greater the measurement of employee productivity and the level of productivity (Ilozor et al., 2002).

This conclusion serves as an example of how creative workspaces might promote increased engagement among workplace occupants. This result also begins to indicate the factors required when evaluating a creative and effective workplace. According to Ilozor et al. (2002), the physical features of office settings may be exploited to influence organizational effectiveness. This research suffers from the same basic criticism: the data appear to have been acquired from facilities managers rather than office tenants.

Changing the workplace environment as an aid to organisational change is supported by Allen et al. (2004). They evaluated a number of UK Government case studies and propose that the workplace layout can be used to increase collaboration and openness, thereby enabling improved organisational performance. The notion that the workplace should not hinder an organisation's ability to respond to the changing business world was developed by Bradley and Hood (2003). They developed the idea of workspace flexibility by proposing a minimalist approach to office design. Their main proposal was the need to keep the office free of clutter, which can restrict the organisation's ability to adapt and respond quickly to market forces. Nuraida (2018:174) proposed that to ensure the workplace improves corporate agility four golden rules should be adopted:

1. Lighting

Light is an important factor to improve employee work efficiency because it affects employee health and safety as well as smooth work. Good lighting is a vital thing needed by the sense of sight to carry out office tasks.

2. Colour

Colour is also an important factor to improve employee work efficiency. Colour has an important influence on office lighting. Companies can use light colours if they want to save on lighting costs. The use of colour schemes has a major effect on the psychological state or feelings of a person.

3. Air

Air in this case is seen more in terms of temperature, humidity, circulation, ventilation, and cleanliness.

4. Sounds

Especially for jobs that require concentration, the sound factor can affect work efficiency because loud noises can be annoying and can affect the health of workers.

5. Music

Music can affect the physical and mental state of employees.

Open-plan offices vs cellular offices

BOSTI associates, led by Michael Brill, have undertaken a masterpiece of research into the effects the workplace has on worker performance. His research took place between 1994 and 2000 and created a database of 13,000 cases. The research acknowledged four main trends that were driving workplace changes were identified as (Brill et al., 2001, p. 5):

- (1) Organisational structure and strategies.
- (2) Workforce attitudes and expectations.
- (3) Technology – its ever-increasing power and widespread deployment.
- (4) New recognitions about, and strategies for, the workplace.

This research also included the evaluations of individual performance, team performance and job satisfaction. Regarding office setting, the study collected data on single-occupant rooms, double-occupant rooms, and open-plan office. In addition, Gustiani (2020:2) proposed that the objectives of the office layout arrangement are as follows:

1. To facilitate the flow of communication and workflow.
2. To create good working conditions for employees.
3. To facilitate managers in supervising employees who are working.
4. To facilitate employees in communicating with other employees when they have to do work simultaneously.
5. To avoid the possibility of interfering with each other between employees.
6. Utilize the available space to be used as a workspace.
7. To separate the type of work that produces noise with the type of work that is quiet.
8. To get a positive impression from visitors who come to the company when they see the layout of the existing office.
9. To ensure assignments will be completed in an effective and efficient time.
10. To create a pleasant atmosphere when working.
11. To ensure the smooth running of the work process.
12. To ensure all rooms in the office can be used to meet work needs.
13. To maintain employee satisfaction and health.
14. To increase employee morale.

The top two-workplace qualities relate to the specific work processes. Office workers want to be able to undertake distraction-free solo work, but also value the opportunity to have an informal interaction with colleagues. Haynes (2007b) provided supporting evidence by identifying distraction as the component to be having the most negative impact on perceived productivity and interaction to be having the most positive impact on perceived productivity.

Effectiveness as defined by (McCORMICK, 1981) is a measure of the success in achieving a clearly stated objective. Effectiveness can be assessed only in relation to defined objectives, and the achievement of goals only can be assessed by the cumulative monitoring of effectiveness in achieving special objectives. According to Sunarmin (2019) the effectiveness of a concept that can be used as a means to measure the success of an organization that can be realized by taking into account the factors of cost, energy, time, facilities and infrastructure and still paying attention to the risks and circumstances faced, while according to Chandra et al. (2020) effectiveness is a measure of the success or failure of achieving the goals of an organization in achieving its goals. If an organization achieves its goals, the organization has been running effectively. Effectiveness indicators describe the range of effects and impacts (outcomes) of program outputs in achieving program objectives. The greater the contribution of the resulting output to the achievement of the specified goals or objectives, the more effective the work process of an organizational unit.

According to Hartono (2020) employee performance is another meaning of performance which means the work of employees, a structural method, or an agency, so that in this way the results of work can be shown with concrete evidence and can be assessed (compared to the provisions that have been confirmed). (Chatzoglou, 2018) added that in specific it underlines the crucial roles that management support, organizational climate, job environment, adaptability, and intrinsic motivation play in determining Employee Performance.

Clearly there can be tensions in an office environment to allow individual private working to co-exist with collaborative team-based working. Brill et al. (2001, p. 26) explored the issue of distraction further by investigating the amount of distraction by office type. Research by Michael Brill and his associates show that despite all the furniture, technical and social fixes that been tried to render cubicles more acceptable to employees, on the whole cubicles flunk (Becker, 2004, p. 25). Moreover, According to Gustiani (2020:2) office layout is the procedure for arranging supporting equipment and office furniture in the available space. The layout of the office must also be adapted to the field of office work, so that this office layout can assist employees in carrying out their work

Previous research has a different point of view from the writing of this final project. With the aim of being a comparison and helping in showing the originality of the research. The following are references to previous research as follows:

Researcher	Research Objectives	Results
Gensler (2005)	Work environment, human resources, and business strategy	Working environment has a fundamental impact on recruitment, retention, productivity and ultimately on the organisation's ability to achieve its business strategy

Ilozor et al. (2002)	Innovative work setting and improved organisational performance	The more a work setting is perceived to be innovative in terms of fostering staff interaction, the greater the measuring of staff productivity and the level of productivity
Brill et al. (2001)	Workplace and worker performance	The really groovy, wide-open office, with folks shown interacting informally all day is a visually seductive myth. Research shows it doesn't support work very well and, in fact, can incur significant losses in individual and team performance and job satisfaction
Haynes (2007b)	Work environment, individual private working, and team-based working	Distraction as the component to be having the most negative impact on perceived productivity and interaction to be having the most positive impact on perceived productivity.

RESEARCH METHODOLOGY

This research is used descriptive qualitative research methods. The location of the research is the general part of the Regional Public Company for Drinking Water Tirta Lestari, Tuban Regency, which is located on Jalan Dr. Wahidin Sudirohusodo No. 34, Sidorejo, Tuban District, Tuban Regency, East Java. The location selection was based on observations during the work internship which will be held from 1 February - 30 April 2021. The data collection techniques used for writing the final project are as follows:

Sampling

The sampling was carried out by researchers in the general section of the Tirta Lestari Regional Public Water Company, Tuban Regency with the intention of obtaining and obtaining data and information directly, which was carried out through:

a. Interview (Interview)

Three interviews were conducted by researchers to respondents in this research. Data was collected by asking a number of questions in order to obtain the data needed in this research. Interviews who were conducted are Mrs. Arum Ardiani as Head of Sub-Division of General Administration, Mr. Rudi Hartoyo as Head of Sub-Division of Warehouse, and Mr. Budi Prasetya as Staff of the Personnel Section in the general section of the Regional Public Company for Drinking Water Tirta Lestari, Tuban Regency.

b. Observation (Observation)

This observation or observation is a data collection technique in which the researcher makes an observation that is carried out directly at the research location. Observation is used as a supporter of interview and

documentation techniques. This technique is carried out by observing and seeing directly the activities in the general section of the Tirta Lestari Regency Water Supply Company Tuban.

c. Documentation

Documentation is used as written evidence or pictures of activities at the research site. Documentation is accurate evidence in the form of archives, photos of activities, supporting data that can complement and support research.

Literature Study

The literature study is used as a basis of reference for researchers through theories that are still relevant to the discussion of the final project. This information can be obtained through scientific works, books, internet, previous researchers and other sources.

FINDINGS

The Level of Employee Effectiveness in Regional Public Company for Drinking Water Tirta Lestari

The first research question was to find the level of employee effectiveness in Regional Public Company for Drinking Water Tirta Lestari. Measurement of work performance used in this study was to determine the extent of the effectiveness and efficiency of employees' work in producing a result. In assisting work effectiveness, this research used the following question, which was scale either yes or no, in their assessment on the effectiveness of office layout. The question is:

Has the application of office layout in the general area been effective in supporting the performance of its employees?

From this question, all respondents said that the application of office layout has been effective in supporting their performance. While this question appears to offer evidence for a more effective workplace, further questions need to be taken in how far the results can be generalised. First, the question was scale either yes or no and there is no effectiveness measurement questions regarding the relationship between work performance and office layout. Second, the sample only interviewed three person and all of them have a position in this company. It will be more accuracy if the sample are all employees that worked in Regional Public Company for Drinking Water Tirta Lestari. This research was line with Ilozor et al. (2002) that stated the more a work setting is perceived to be innovative in terms of fostering staff interaction, the greater the measuring of staff productivity and the level of productivity.

Application of Office layout

The application of office layout in the general section of the Tirta Lestari Regional Public Water Company, Tuban Regency has the following spatial arrangements:

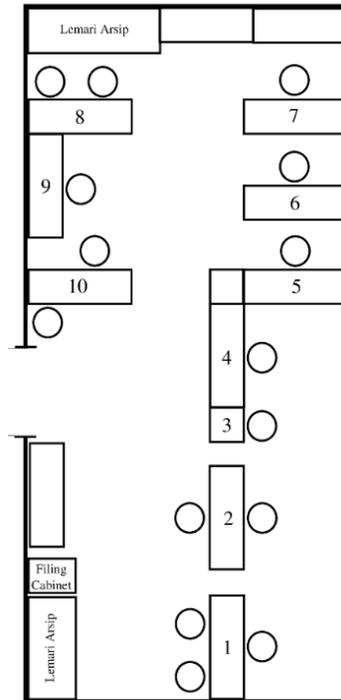


Fig 1 General Office Layout

Source: Data processed (2021)

Figure 1 is a form of office layout that is applied to the general section of the Tirta Lestari Regional Public Water Company, Tuban Regency. In the table numbering, the executors are:

1. The executor of the task is Mr. Agus as the head of the general section.
2. The executor of the task is Mrs. Sumiyati as the head of the sub-section of personnel.
3. The executor of the task is Mr. Fikar as the warehouse sub-section staff.
4. The executor of the task is Mr. Rudi as the head of the warehouse sub-section.
5. The executor of the assignment is an intern student.
6. The executor of the task is Mr. Budi as the civil service staff.
7. The executor of the task is Mr. Edy as staffing staff.
8. The executor of the task is Mr. Lukman and Adistya as staff General Administration.
9. The executor of the task is Mrs. Arum as the head of the general administration sub-section.
10. The executor of the assignment is an intern student.

In the application of an open office layout in the general section of the Tirta Lestari Drinking Water Regional Public Company, Tuban Regency, namely there is no partition between division heads, sub-section heads, and employees. All office activities are carried out together in one room. The application of the spatial layout is in accordance with the theory according to Hadiatna (2018: 6) that the open layout is a form of office where there are no barriers or barriers between the employee's workplace and other employees, so that in the implementation of work employees can communicate with each other easily, supervise each other, socialize and share office equipment easily.

From Figure 2 it shows that the application of the existing office layout in the general section of the Tirta Lestari Regional Public Water Company, Tuban Regency is an open office layout with a class and L-shaped work desk arrangement model.



**Fig 2 Office space for the General Division of the Water District Public Company
Drink Tirta Lestari, Tuban Regency**

Source: Processed data (2021)

The arrangement of the work desk in the general section of the Tirta Lestari Drinking Water Regional Public Company, Tuban Regency is in accordance with the theory presented by Hadiatna (2018: 8). In Figure 1 the arrangement of the class table is arranged in a row and in its application the employees will turn their backs on each other. The arrangement of an L-shaped table is arranged for employees who have many document files, making it easier for these employees to do their work. Figure 1 is an example of the application of an L-shaped work desk arrangement, but the application of the table arrangement can also be said to be a U-shaped work desk arrangement if there are no interns at the left table.

Obstacle in Applying Office Layout

When we asked about the obstacle of applying office layout, almost all the respondents said that they found some problems. Most of them got difficulty found some items since the size of the office's room is small compared to the members of the employee and the room was not organized well. Some of them suggest to adding more storage to make their office more organize.

In carrying out office activities, employees must also pay attention to the cleanliness and tidiness of the work desk. In the observations made, some employees still pay less attention to the cleanliness and tidiness of the work desk.



Fig 3 Employee Work Desk Condition

Source: Processed Data 2021

It can be seen from Figure 3 that the documents and office equipment are not well organized and the storage of documents under the desk causes employee discomfort so that the performance of employees decreases. This is due to the high activity of employees and the lack of storage space for documents in the general section. Another problem faced with open office spaces is the lack of privacy from employees, so it is quite difficult to talk about confidential matters in the room.

Based on the observations made, the principles of spatial planning that are applied to the general part of the Tirta Lestari Regional Public Water Company, Tuban Regency are as follows:

1. The principle of the shortest distance: has been implemented, in the implementation, employees are easy to coordinate with the respective sub-heads because the places are not far apart.
2. The principle of a series of work: has been implemented, in the implementation of all the tools needed by employees have been placed according to need.
3. The principle regarding the use of the entire room: has been implemented, in its implementation the general section has maximized the use of space, but due to the addition of employees and internships from outside parties, the room becomes full. Coupled with a lot of documents because in the general section there are 3 (three) sub-sections and each has important files and archives, so there are still many documents that have no place and pile up on and under the employee's desk.
4. The principle of changing the composition of the workplace: has been implemented, in its implementation several changes have been made to the spatial layout of the Tirta Lestari Regency Public Water Supply Company Tuban because of its open office layout and no partitions in the room makes it easy to rearrange the room without big costs.
5. The principle of activity integration: has been implemented, in the implementation of activities between sub-sections in the general section it is quite easy. The general section of the Tirta Lestari Regional Public Water Company of Tuban Regency also has easy access in coordinating with other departments and directors.
6. The principle of security and job satisfaction for employees: in the implementation related to security, it has been implemented, but in terms of comfort it is a little less comfortable because there is no privacy between employees.

Overall, the implementation of office layout in the general section of the Tirta Lestari Drinking Water Regional Public Company, Tuban Regency is arranged based on the needs and in accordance with the wishes of the employees. The work desk arrangement that is implemented also makes it easier for employees to coordinate and use office equipment. This is in accordance with previous research according to Al Habib and Suratman (2018) the results of the analysis state that office layout affects employee performance.

Work Environment Factors in Terms of Ergonomics

Based on the results of interviews with employees conducted to measure the influence of an ergonomic work environment on the performance of employees in the general section of the Tirta Lestari Regional Public Water Company, Tuban Regency, the following results were obtained:

1. Lighting

According to the three sources, the quality of lighting in the general section of the Tirta Lestari Drinking Water Company, Tuban Regency is quite good and in accordance with the needs of employees. The source of room lighting is obtained through natural lighting sources in the form of sunlight and artificial lighting in the form of lamps. In the general section of the Tirta Lestari District Public Water Company, Regency Tuban is supported by many windows so that sunlight can into the room and reduce the use of electricity. Good room lighting can improve the quality of work for employees.

2. Colour

According to the three sources, the application of colour in the general part of the Tirta Lestari Drinking Water Company, Tuban Regency is appropriate and comfortable so that it does not disturb the employees' psychology. Colours on the walls, floors, and ceilings of the room use a neutral colour, namely white. The use of these colours is quite commonly used in office spaces.

3. Air

According to the three sources, the air circulation in the room is good and in accordance with the needs of employees. Every morning the room window will be opened to facilitate air circulation and is equipped with 2 (two) Air Conditioners (AC) so that the temperature in the room can be adjusted to the needs of employees.

4. Sound

According to the informant, there is a sound that is a little disturbing in carrying out work activities, namely the sound of a large truckload, some employees are used to the sound of a large truck so that it does not interfere with work activities. This is because the position of the office is on a connecting road between provinces that is often used by large cargo trucks. The incoming voice is more clearly heard when the office window is open.

5. Music

In the general section of the Tirta Lestari Regional Public Water Company, Tuban Regency, there are employees who play music quite often. According to the sources, the music does not interfere with the work activities of employees and the music helps to reduce boredom at work.

Based on the description above, the influence of the work environment on employee performance at the General Section of the Tirta Lestari Drinking Water Company, Tuban Regency, has mostly met the needs of employees and assist employees in concentrating on their respective tasks. This is in accordance with previous research according to Al Habib and Suratman (2018) that the results of the analysis state that office layout and work environment jointly affect employee performance.

CONCLUSION

Having gone through this process, it was felt that the application of office layout was effective to increase the performance of the employees at Perumda Airminum Tirta Lestari, Tuban Regency. This result was based on the effectiveness of measurement indicators which included by: timeliness, accuracy of cost calculations, accuracy in measurement, accuracy in making choices, accuracy in thinking, accuracy in carrying out orders, accuracy in setting goals, and targeting accuracy. Moreover, there are some other factors that effect the performance of employees likes ergonomics environmental. For example, lighting, colour, air, noise, and music. From all of the factors, most of it have met the standards desired by employees.

This result was in line with (Haynes 2008), changing emphasis allows consideration to be given to understanding how office occupiers use space. This view of office environments from the occupier perspective opens an appreciation of the behavioural environment (Haynes, 2007d). It is starting to emerge that any theoretical framework for office productivity must consist of both the physical environment and the behavioural environment, and in addition must accommodate the different work patterns that office occupiers can adopt.

Overall, Perumda Airminum Tirta Lestari, Tuban Regency has already adopted the efficiency of office layout that increased the performance of the employees. There are some recommendations that the author added in this research. There are:

1. General Division employees should always maintain the cleanliness and tidiness of the employee's work desk by not storing document files under the desk so that employees feel comfortable in working and carrying out office activities.
2. The Head of the General Section, it is better to create a document archive room in the General Section so as to minimize the occurrence of archive loss and recover files. Let employees search for the files they need. Adding space, The archive also minimizes archives piling up in the room so that employee activities are disrupted.
3. The Head of the General Section, it is better to add a bulkhead to the work desk of the Head of the General Section so that there is privacy and increase the comfort of the employees in the room.
4. The head of the general department should make the room soundproof to minimize noise from outside the room so that employees feel comfortable and are not disturbed by noises coming from outside the room.

5. The Head of the Sub-Division of Personnel should limit and adjust the number of employees to the capacity of the room so that employees feel comfortable in carrying out indoor activities.

ETHICS STATEMENTS

This material is the authors' own original work, which has not been previously published elsewhere. The paper is not currently being considered for publication elsewhere. The paper reflects the authors' own research and analysis in a truthful and complete manner.

AUTHOR STATEMENTS

Lydia Apriliani wrote the problem statement, literature review and the methodology. Amaliyah wrote the introduction, finding and conclusion. Moh. Ibnu Sima performed the data collection and data analysis.

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DECLARATION OF INTERESTS

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this article.

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