ICEBIT

The 5th International Conference On Economics , Business and Information Technology

E-ISSN 3025-4892

August 24, 2024 pp. 484-490

EFFICIENCY AND EFFECTIVENESS OF PLANT LAYOUT FOR TIMBER MANAGEMENT COMPANIES IN ANTICIPATING THE GLOBAL ECONOMIC RECESSION IN LUMAJANG REGENCY

Emmy Ermawati
Institut Teknologi dan Bisnis Widya Gama Lumajang
emmy.ermawati01@gmail.com

Mimin Yatminiwati
Institut Teknologi dan Bisnis Widya Gama Lumajang
miminyatminiwati02@gmail.com

ABSTRACT

Lumajang Regency is one of the largest sengon or albizia wood producing areas in East Java Province. Of the 179,000 hectares (ha) area of Lumajang Regency, around 33 percent is state forest, then 32.6 percent is recorded as community forest. From the percentage of community forest area or the equivalent of approximately 50,000 ha, most of it has also been planted with sengon wood. Lumajang already has around 120 wood processing industries, and some industries have even penetrated the export market. This industry is also encouraged to become a supplier of muebel in the local area. Because sengon wood can also be the main substitute for natural wood such as teak to be processed into furniture products. The global recession conditions that hit the world have an impact or influence on market demand from abroad. Automatically, the export performance of wood industry companies to several countries will also be disrupted or it could be said that demand will fall. This impact also affects the workforce in wood management industrial companies. Of the many companies in Lumajang district, wood management companies are the biggest contributors to overcoming government problems, especially unemployment. This research aims to analyze the layout efficiency of wood management companies as a contributor to optimizing production capacity in anticipating a global economic recession. The next thing we have to do is implement this research by adapting theory and practice. The benefit of this research is that the company gets information and knowledge about how the company plans optimal factory layouts to develop production processes to be effective and efficient to increase production capacity. The next benefit is helping company management in making policies related to layout to formulate company strategy.

Keywords: Operational Management, Layout, Production Capacity

1. Introduction

Lumajang Regency is one of the largest sengon or albasia wood producing areas in the East Java Region. Of the 179,000 hectares (ha) of the Lumajang Regime area, around 33% is state forest, then 32.6 percent is recorded as regional forest. Most of the community forest area or around 50,000 ha has also been planted with sengon wood. There are approximately 120 wood processing businesses in Lumajang, some of which have even entered the export market. This industry is also urged to become a furniture provider in the surrounding environment. Because sengon wood can also be the main substitute for ordinary wood such as teak to be processed into furniture items. The global financial crisis that hit the world had an impact on market interest from abroad. As a result, the performance of wood industry companies' products in several countries will also be disrupted or it could be said that demand will fall.

This impact also affects the workforce in wood management industrial companies. Of the many wood management companies in Lumajang district, wood management companies are the biggest contributors to overcoming government problems, especially in terms of unemployment.

Executives are tasked with completing a series of tasks that, by converting inputs into outputs, produce rewards in the form of labor and products. Overall, large organizations around the world are implementing a variety of functional management strategies due to awareness of the importance of focusing on the creation cycle to increase value creation and gain benefits (1). (2) Operational interpretation is an explanation of how we measure a variable, and operational, or the notion of operational definition, is a comprehensive set of instructions about what to observe (observation) and how to measure a variable. This can also help us in categorizing specific variables from surrounding phenomena. This estimation can be done with certain numbers or properties. Operational management is the comprehensive management of the components that make up commodities that will later be sold to consumers. These components include labor, machines, raw materials, equipment and products.

Apart from that, it is also important to see the definition of functional administration as a kind of study of the practical administration of organizations from the point of view of functional administration experts. (3) Functional Administration (Duties of Management) are various activities related to planning, changing training (tasks), and improving the framework that is capable of producing and delivering results provided by the organization, both workforce and products. In accordance with (4), there are four reasons behind the need to focus on functional administration, namely 1. The task of executives is considered to be to regulate how individuals organize themselves to obtain a useful organization. 2. Concentrate on functional administration to know how labor and products are created. 3. We concentrate on functional administration to understand what activities the head performs. 4. Study operational management because this is the part of the organization that costs the most. Most organizational costs lie in the duties of administrators, but the duties of executives provide opportunities to extend benefits and administration to local areas. Lay outThe factory is also considered as one of the contributors to the operational increase in production capacity of timber companies. From this problem we can help in optimizing the layout so that it becomes an incentive for every company to maximize its production and marketing. Some of the innovations that we will carry out in this research include:higher use of work office space, further developed work products or data, better work confidence and circumstances, expansion of organization and buyer connections, expansion of adaptability. With an efficient production period, the company's budget can be partially diverted to product marketing, especially via digital, so that the outside community knows that wood products in Lumajang district meet the requirements for export quality. Therefore, by optimizing the plant layout, it is hoped that the wood management industry entrepreneurs in Lumajang Regency will remain enthusiastic and sustainable amidst the threat of a global recession.

There is a need for research related to production planning, tools and layout efficiency to increase wood production capacity in Lumajang district.This research aims to achieve the following: maximize effective use of floor space, achieve employee satisfaction and work ability, organize production equipment and tools so that they can be used with a high level of efficiency, minimize costs associated with material handling. Office format configuration is the act of investigating, ideating, planning, and figuring out the framework for creating workforce and products. A highly organized office format will result in more interesting and productive work assignments. Optimal layout planning will have a significant impact on the scope of the wood management industry as well as analyzing the layout efficiency of wood management companies as a contributor to optimizing production capacity in anticipating a global economic recession.

Analysis, conceptualization, system design, and implementation of production systems are part of layout and facility planning. Office planning is usually described as an office plan, which is a concrete action (equipment, land, structure, and office) to improve relations between workers, product development, data development, and techniques necessary to achieve creation targets effectively, financially, and safely (5), Meanwhile (6) format is a fundamental premise in the modern world. Factory design or office format can be interpreted as a methodology for organizing processing factory offices which is expected to make manufacturing interactions smoother. This planning will use the area (space) for arranging machines or other supporting offices, goods capacity (capacity), both short term and long term, workforce, etc. There are two aspects of factory layout that need to be considered: how the machines work. is organized and how the departments in the factory are organized. A nice configuration of equipment and items is useless assuming that the design arrangement serves no purpose. Because the process of creating an industry usually takes a long time with designs that do not immediately change, every wrong step taken in design planning will cause losses for the organization (7)..

2. Research Method

Research that seeks to describe and analyze phenomena, events, social activities, attitudes, beliefs, and perceptions—individual or group thinking—as well as observing individuals in their environment, interacting with other people, and interpreting their opinions about the world around them. they are referred to as qualitative research. The stages of this research are structured in such a way that the implementation is focused and systematic.

According toSukmadinata, NS (2010), there are four stages in conducting research, namely as follows:

1. Pre-field stage (Proposing Team Leader)

   According toKunaifi, DA, & Setyawan, AA (2015)proposed by Kunaifi, A., and A. Setyawan A. (2015) defines research subjects as things, organizations, or things that are connected to research data or variables. Because it is common knowledge that there are problems that need to be solved, the aim and purpose of research is to solve these problems, and no research can be carried out without the subject by obtaining as much information as possible from informants, this can be achieved. The researcher carried out a preliminary survey by looking for subjects to use as sources for this survey. The researcher looked for data and information from the Lumajang Regency Forestry Service through field studies at the research location. Through scientific confirmation efforts, researchers also looked for supporting literature, books and references. Researchers prepare a research design that contains an outline of the research methods that will be used in the research and conduct a pre-survey by updating company data. The following methods will be used by researchers to obtain the data required for this research:

   a) In-depth interview with the operations manager of a logging company. A conversation with a specific purpose is an interview. The interviewer who asks the question and the interviewer who answers are the two parties involved in the conversation. N. Nilamsari (2014).
   b) Observation According to Hidayati, YM, and Septiani, T. (2016), observation is a way for someone to observe by using a real sensory or sensory work mat. As a result of this exercise, students were involved in writing with the help of the teacher, resulting in disagreements between students and teachers. Butar, MB (2017).

2. Field work stage (Proposing Team Member)

   Purwanto, H., & Salim, AA (2021),Purposive samples are samples chosen because they are a source and contain a lot of information about the phenomenon you want to research. The researcher's decision about which aspects

and whom to focus on at any given time and throughout the research forms the basis for this sampling. Purposive sampling is based on a focused objective at a particular time. This research uses 120 populations of wood management business actors and their operational managers as sources. On this occasion, researchers mapped the locations of IPHHK (Industry Timber Forest Products Management) and Integrated IPHHK companies after collaborating with the Forestry Service regarding data collection on timber management businesses.

3. Data analysis stage (Proposer team member)

   Data analysis according toNasution, HF (2016)is the procedure of arranging data sequences into categories, basic units of description, and patterns. G. as stated by Bogdan and Biklen Melinda According to R. (2017), data analysis is a process that involves working on data, organizing, sorting it into manageable units, synthesizing, looking for patterns, determining what is important and what is must learn, and decide what to tell others. Data analysis is the third step in this research. At this stage, researchers carried out a series of data analysis processes, starting with tabulating questionnaire data and creating company-specific models. Analyze the data you have collected. In addition, researchers used data triangulation methods compared with library theory. In May to June 2023, the data analysis stage will be completed. This research data analysis method is based on the ideas of Rijali, A. (2019), namely an interactive model that divides data analysis into three steps:

   a) data reduction (Data Reduction) The process of sorting, simplifying, abstracting and transforming rough data obtained from field notes is known as data reduction. The research report contains data reduction in the form of interview results.
   b) Data presentation (Data Display) This data arrangement allows for the possibility of making conclusions and taking action. In previous qualitative data, narrative text was the most common format.
   c) Making conclusions (verification) The importance of the data collected will be demonstrated in this research. This data will produce tentative, vague, rigid and doubtful conclusions; therefore, this conclusion must be verified.

4. Evaluation and reporting stage

   Research instruments according to Rahardjo, M, (2011)is a tool used by researchers in collecting data. On the other hand, as stated by Suharsimi Arikunto in the previous edition, it is a means or tool used by researchers to collect data to make their work easier and produce better, more accurate, complete and systematic results. At this point, the researcher produces a progress report that is evaluated by reviewers through internal monitoring and evaluation. Create financial reports regarding program implementation costs and fulfillment of obligations in the form of mandatory outputs, as well as produce final reports that are evaluated by external reviewers. from July to September in 2024.

5. Layout strategies (layout strategies)is another choice that operational managers must make to increase the effectiveness and efficiency of the process of converting resources into products in various business operations, such as:
   a) Make sure there is enough space for work and maintenance.
   b) Create a space that functions well.
   c) Reduce investment and production costs.
   d) Material flow increases.
   e) low level of transportation of materials and products

3. Results

By converting inputs into outputs, operations management is a series of activities that produce value in the form of goods and services. Due to awareness of the importance of paying attention to the production process in the process of increasing production value and gaining profits, large companies throughout the world on average implement various operational management strategies. Emmy, UE (2021). Operational definition, also known as operational definition concept, is a comprehensive set of instructions about what to observe (observation) and how to measure a variable. This can help us in classifying surrounding phenomena into different variable categories. Operational according to Ibrahim, A. (2016) is an explanation of how variables can be measured. This can be measured using certain numbers or characteristics. Comprehensive management of elements such as labor, machines, raw materials, equipment and products that make up commodities that will later be sold to consumers is known as operational management. According to the views of operational management experts Efendi, S., Pratiknyo, D., and Sugiono, E., it is also necessary to study the meaning of operational management as a type of company functional management science. (2019). The term "operations management" refers to the collection of activities related to the design, transformation activities (operations), and improvement of systems to produce and deliver a company's output, which can be goods or services. According to Render, B., and Heizer, J. (2004), studying operational management is necessary for four reasons: 1. The purpose of studying operations management is to study how individuals organize themselves to create productive businesses. 2. Study the production process of goods and services by studying operational management. 3. To understand what operations managers do, we study operations management. 4. Study operational management because this is the part of the organization that costs the most. Operations management accounts for a large portion of a company's costs, but also offers opportunities to increase profits and contribute back to society.

Wood is a type of forest product that is often used by humans for various purposes, including building materials, furniture, interior materials for ships and buildings, carvings, and everyday items such as matches and soap boxes. As a building material, wood is assumed to have certain advantages, especially in terms of its physical and mechanical properties. Customers will choose the appropriate type of wood for their application if they know its strength. The important physical/mechanical properties of wood are real gravity, greater shrinkage, water content and mechanical

strength. Chemical and mechanical properties, as well as physical and mechanical properties, are unique to each type of wood. Due to differences in the state of the wood set, for example, fast-growing wood species have weaker mechanical properties than non-fast-growing wood species. One of the factors that influences the increase in operational production capacity of a woodworking company is the layout of the factory. We can help optimize the layout due to these problems so that it becomes an incentive for every business to maximize production and marketing. In this research, we will try new things such as using more space in workforce facilities, providing better information about goods or labor, improving working conditions and morale, improving interactions between businesses and customers, and increasing flexibility. The company's budget can be partially diverted to marketing products during efficient production, especially through digital channels, so that the public knows that the wood products produced in Lumajang district meet export quality standards. Therefore, wood management industry entrepreneurs in Lumajang Regency are expected to remain enthusiastic and sustainable in facing the global recession by optimizing factory layouts.

To increase wood production capacity in Lumajang district, research is needed regarding production planning, tools and layout efficiency. This research aims to achieve the following: maximize effective use of floor space, achieve employee satisfaction and work ability, organize production equipment and tools so that they can be used with a high level of efficiency, minimize costs associated with material handling. Analyzing, developing ideas, designing, and implementing production systems are all part of facility layout design. The work process will be more effective and efficient if the facility layout is well organized. Analyzing the efficiency of the layout of wood management companies as a contributor to optimizing production capacity in anticipating a global economic recession will have a significant impact on the scope of the industry. Analysis, conceptualization, system design, and implementation of production systems are part of layout and facility planning. Typically, facilities planning is referred to as a facilities plan, which is a physical arrangement (equipment, land, buildings, and facilities) designed to optimize the relationship between workers, the flow of goods, the flow of information, and the means necessary to achieve those goals. achieve production targets effectively, cost-effectively and safely., MS, W., and Jungck While S. Wignjosoebroto (1990) (2009). In the industrial world, layout is the main foundation. The term "factory layout" or "facility layout" can be interpreted as a way of arranging factory facilities with the aim of expediting production. This area (space) will be used to place machines or other supporting facilities, temporary and permanent product storage, workers, etc. There are two aspects of factory layout that need to be considered: the way the machines are arranged and the way the departments in the factory are arranged. If the layout planning is haphazard, good equipment and product design are meaningless. Mistakes made in layout planning will result in losses for the business world because production activities in a sector usually last for quite a long period of time with the layout not always changing.

The production process begins with the initial raw materials, namely wood in the form of balken and logs. The wood will be received in the receiving area; logs will be sent to the sawmill; Balken wood will be sorted based on size and quality before entering the drying process or oven. This process aims to dry the wood. Both balkenwood and logs go into the drying or oven process. The wood will undergo an air drying process (drying chamber) after completion of the drying process. This process aims to stabilize the wood's temperature and moisture content before production. The balken wood will be transported to the production area to be processed into barecore after completing the air drying stage. The wood will be cut first using a jumping saw machine, then the pieces that have been made will be smoothed using a double planner machine. After the wood is smoothed, it will be cut to produce thinner and smoother wood. The wood that is processed usually also has a slightly loose or imperfect shape, so the next step is to sort the wood according to predetermined criteria after processing it on the gang rip machine. After that, the gluing and pressing process will be carried out to ensure the wood sticks well to the glue and continues with the pressing process. The wood will be moved to the finishing area after the pressing process is complete. Here, the finished barecore wood will be checked again for defects. The processed wood will then go through a putty process to repair the damaged parts. Before shipping, the finished barecore wood products are packaged and stored in the warehouse in the finishing area

Table 1
Perusahaan Kayu di Kabupaten Lumajang

No	Nama Perusahaan	No	Nama Perusahaan	No	Nama Perusahaan
1	PT. Dharma Satya Nusantara	41	UD. Kebonsari	81	UD. Sengon Baru Jaya
2	Perusahaan Putra Dunia/Suyitno	42	UD. Kharisma	82	UD. Sumber Agung Jaya
3	CV. Agrotama Indonesia	43	UD. Mandiri	83	UD. Bersama
4	CV. Al-Hikmah	44	UD. Mandiri 717	84	CV Amanah
5	CV. Amanah	45	UD. Maya	85	CV Anugerah Alam Abadi
6	CV. Langgeng Makmur Bersama	46	UD. Padang Jaya	86	UD Kayu Mas Sejahtera
7	CV. Mitra Multi Sejahtera	47	UD. Perdana	87	UD Putra Jaya III
8	CV. Papan Jaya Raya	48	UD. Prajawari	88	UD Semeru Jaya
9	CV. Silva Agro Indonesia	49	UD. Prakarsa Tunggal	89	UD Agus Putra
10	CV. Terus Maju Bersama	50	UD. Purnomo	90	UD Akar Semi
11	PT. Dharma Satya Nusantara	51	UD. Putra Jaya	91	UD Su'udhi Putra
12	PT. Galaxy Surya Panelindo	52	UD. Putra Mandiri	92	UD Sumber Alam

No	Nama Perusahaan	No	Nama Perusahaan	No	Nama Perusahaan
13	PT. Harum Kayu Lestari	53	UD. Ridho Ilahi	93	UD Timber Makmur
14	PT. Kanawood Indo Makmur	54	UD. Rosi Jaya	94	UD Wono Joyo
15	PT. Kutai Timber Indonesia	55	UD. Sakinah	95	UD Super Galaxi
16	PT. Purim Sejahtera Wood	56	UD. Sama Jaya	96	UD Sella AR
17	PT. Tri Tunggal Laksana	57	UD. Samijoyo	97	UD Sampurno
18	PT. Wana Cahaya Nugraha	58	UD. Sanjaya	98	UD Lestari Jaya
19	UD. Alam Manunggal	59	UD. Shallum	99	UD Lumajang Bangkit
20	UD. Alam Sejahtera	60	UD. Sinar Mulya	100	UD Alfara
21	UD. Aneka Rimba Alam	61	UD. Sinar Sejahtera	101	UD Maisoesik
22	UD. Arjuna	62	UD. Sumber	102	UD Rizna
23	UD. Bagong Jaya	63	UD. Sumber Abadi	103	UD HM Barokah Sejati
24	UD. Berkah	64	UD. Sumber Agung	104	PT Matahari Jaya Internasional
25	UD Berkah	65	UD. Sumber Agung Jaya	105	PT Sengon Hijau Lestari
26	UD. Berkah Sengon Agung	66	UD. Sumber Alam	106	CV. Mirai Alam Sejahtera
27	UD. Berkat Bersama	67	UD. Sumber Artha	107	PT. Mustika Bahana Java
28	UD. Hasil Rimba	68	UD. Sumber Barokah	108	PT. Mustika Buana Sejahtera
29	UD. HM. Barokah Lestari	69	UD. Sumber Citra	109	PT. Prima Sejahtera Internasional
30	UD. Indah Sengon	70	UD. Sumber Jaya	110	PT. Wana Cahaya Nugraha
31	UD. Jati Diri 007	71	UD. Sumber Jaya	111	PT. Papan Jaya
32	UD. Jaya Abadi	72	UD. Sumber Rejeki	112	UD. HM Barokah Group
33	UD. Jaya Binangun	73	UD. Sumber Rejeki	113	PT. Nankai Indonesia
34	UD. Jaya Fathoni	74	UD. Surya Papan	114	PT. Gema Lestari Indonesia
35	UD. Jaya Makmur	75	UD. Tatal Mas	115	CV. Wana Indo Raya
36	UD. Jaya Makmur Abadi	76	UD. Tri Tunggal Makmur	116	PT. Kelinci Mas
37	UD. Kama Jaya	77	UD. Tri Tunggal Makmur II	117	CV. Mustika Karyajaya Sakti
38	UD. Karya Barokah	78	UD. Waluyo Jati	118	PT. Semeru Makmur Kayunusa
39	UD. Karya Bersama 2	79	UD. HM Barokah	119	CV. Langgeng Makmur Bersama
40	UD. Karya Jaya	80	UD. Alam Manunggal II	120	CV. Langgeng Makmur Bersama

Source : Dinas Kehutanan tahun 2023

Long-term operational effectiveness is greatly influenced by layout decisions. Because layout determines a company's competitiveness in terms of capacity, processes, flexibility, costs, quality of work environment, contact with customers, and company image, layout has many strategic implications. The main goal of facility layout design is to reduce the cost of moving materials as quickly as possible.

Facility design activities are often used in the factory and industrial sectors. In general, an efficient factory layout determines whether a business will survive or be successful or not. Mistakes made in layout planning will result in quite large losses because usually industrial production activities have to take place over a long period of time and the factory layout does not always change. In essence, the main goal of designing a factory layout is to reduce total costs.

3.2 Wide Data and ARC

For wood processing companies that have a land area of 9,989 m2. Where 4,996 m2 is used for open space and the rest is used for buildings. The details of the area of each production facility in table 3.1 are as follows:

Table 2
Example of Land Area for Open Space and Buildings

No	Room	P(m)	L(m)	Area (m2)
1	Production	42	31.24	1,312

No	Room	P(m)	L(m)	Area (m2)
2	Finishing	42	40.05	1,682
3	Office	24	5	120
4	ReceivedArea	36	31.5	1,134
5	Warehouse	16.5	4	66.5
6	Oven	38.09	38.09	1,451
7	Wood Cutting	9.33	6	56
8	Boilers	31.06	11.49	357
9	Prayer room	12	12.5	105
10	Medical room	3.54	5	12.54
11	Security guard	2.5	2.5	6.25
12	Parking	22.86	5.25	120
	Total area			6,422.29

Source: data processed by researchers in 2024

By using the ARC concept, it is necessary to determine the proximity relationship between work stations before developing a new layout design. The relationship criteria in ARC facilities at processing companies are used to subjectively determine whether a work station is close or not. Examination of the design results is carried out at this stage after improvements have been made through making a map of the future state. The analysis includes a map of the current and future state. The difference between the company's current situation and the ideal situation that may be implemented in the company through future state design will be visible when the current state map and the future state map created are compared. Initial layouts, layouts created with Lean Manufacturing methods, and layouts created with the Simulated Annealing Algorithm were subject to additional analysis. The layout with the lowest displacement moment value is the best.

The layout of production facilities for wood management can create production time efficiencies

Based on the findings of this research analysis, complete wood processing by reducing the number of work stations in the production facility. Initially, the layout of the production facility belonging to this lumber company in Lumajang Regency had several work stations. The distance between each work station and the product process cycle time indicate that the layout rearrangement uses several methods to create workstations with minimal idle time. The level of production efficiency can be measured by subtracting the efficient production time in hours from the total production time in hours/shift and idle time from the total production time due to rearranging the layout of production facilities. Researchers are still paying attention to the findings of this research, namely that maximum production time efficiency has not been achieved. This is because there are factors or variables that also influence the level of production time efficiency as observed by researchers, namely the level of employee work discipline and maintenance of production machines. Even though it is able to create production time efficiency, this level of efficiency was obtained from the results of this research. This is supported by the fact that the business produces once a day, five days a week. Consistency is also lacking, and there are no production supervisors who continuously monitor the production process, nor any mechanism to carry out supervision during the production process

4. Conclusion

The Lumajang Timber Entrepreneurs Association will be our audience to discuss the format of this research findings. Regarding this problem, a Discussion Group Forum (FGD) is needed. The results of this research are a benchmark for whether the results of design creation through this exploration are feasible and can be applied to every wood management organization in the Lumajang area. Of course, we will invite and collaborate from a number of agencies, including the Environmental Service, Public Works Service and Forestry Service. In this research, two stages of analysis will be carried out. The first step is to carry out a basic analysis of the company's condition by examining the production system and layout. Next, researchers will evaluate the results of applying the line balancing concept and carrying out line balancing on the layout and production system of wood processing companies in Lumajang district in the second stage. Multiple work station options are provided by the plywood production line design with the balancing method. The level of efficiency and time can be seen if the production process layout design applies the idea of line balancing. Of the total production time, the efficiency level is 92%, and idle time is 8% of the total production time. Companies need to carry out in-depth studies of factors or other variables that influence the smooth running of a production process, such as machine maintenance and human resources. In addition, companies need to use line balancing methods to organize the layout of production facilities

References

Apple, M. W., & Jungck, S. (1990). “You don't have to be a teacher to teach this unit:” Teaching, technology, and gender in the classroom. American Educational Research Journal, 27(2), 227-251.

Butar, MB (2017). The relationship between assertive behavior and juvenile delinquency in students at SMP Negeri 6 Tebing Tinggi City. School Education Journal PGSD FIP Unimed, 7(4), 525-532.

Efendi, S., Pratiknyo, D., & Sugiono, E. (2019). Operational Management: UNAS University Publishing Institute.

Emmy, E.U. (2021). Supply Chain Management to Improve the Distribution Efficiency of Puli Crackers in UD. Gangsar Jaya Lumajang. Supply Chain Management, 4(6).

Febriana, S. (2021). Analysis of Bad Credit Settlement in Cooperatives: Thesis.

Hidayati, YM, & Septiani, T. (2016). Study of teacher readiness to implement the 2013 curriculum in integrative thematic-based learning in elementary schools throughout Colomadu sub-district for the 2014/2015 academic year. Elementary Education Professions, 2(1), 49-58.
Ibrahim, A. (2016). Analysis of the implementation of quality management from operational performance in the extractive industry in North Sulawesi. EMBA Journal: Journal of Research in Economics, Management, Business and Accounting, 4(2).
Kunaifi, DA, & Setyawan, AA (2015). The Influence of Product Quality and Brand Image on Consumer Satisfaction with Eiger Products in Surakarta. Muhammadiyah Surakarta university.
Melinda, G.R. (2017). Emotional control in students who have an introverted personality type in Yogyakarta. Guidance and Counseling Student Research Journal, 3(7), 279-292.
Nasution, HF (2016). Research instruments and their urgency in quantitative research. Al-Masharif: Journal of Economics and Islam, 4(1), 59-75.
Nilamsari, N. (2014). Understanding document studies in qualitative research. WACANA: Scientific Journal of Communication Sciences, 13(2), 177-181.
Purwanto, H., & Salim, AA (2021). Automatic Object Counting Technology Using Ultrasonic Sensors and Arduino Uno Microcontroller. Journal of Business Computing, 14(2), 29-33.
Rahardjo, M. (2011). Qualitative research data collection methods.
Render, B., & Heizer, J. (2004). Principal of administration of operations. Ciudad de México: Pearson Educación, 166.
Rijali, A. (2019). Qualitative data analysis. Alhadharah: Journal of Da'wah Science, 17(33), 81-95.
Sukmadinata, NS (2010). Development of a culture-based integrated learning model to increase students' appreciation of local culture. Educational Horizons(2), 81228.
Wignjosoebroto, S. (2009). Factory layout and material movement. Surabaya: Guna Widya.
Zeki, M. (2012). Redesign of the CV Wood Refinery Factory Layout. X. Bung Hatta University Industrial Engineering Journal, 1(2).