

Hospital as a Business Institution in Covid-19 Pandemic

R Rismawati¹, Juni Iswanto², Rustem Adamovich Shichiyakh³, Komalasari⁴,
Ambo Dalle⁵

Abstract

In the Circular Flow model, a firm or business institution is one of the four factors forming the economic system in society. This section discusses the hospital as a firm because the hospital can be thought of as a place that produces health services from a variety of inputs. Thus, the concept of production can be used in hospitals because the managers are faced with the fact that to produce service products, the hospital can be said to be a production place that carries out the process systematically. The factory is very complex with complicated processes and is in an ever-changing environment. To understand this process can be seen in the case handling cases of Sectio Caesaria (SC) in a teaching hospital. Sectio Caesaria case handling is considered as a production line in the hospital. With medical names, these production lines are referred to as clinical pathways.

Keywords: business institution, hospital, healthcare, environment, health organization

¹Universitas Muhammadiyah Palopo, Indonesia. Email: rismal1@umpalopo.ac.id

²IAI Pangeran Diponegoro Nganjuk Jatim, Indonesia. Email: juniiswanto14@gmail.com

³Kuban State Agrarian University named after I.T. Trubilin, Krasnodar, Russian Federation

⁴Universitas Aisyah Pringsewu, Lampung, Indonesia.

⁵IAIN Parepare, South Sulawesi, Indonesia

Received: , Accepted:

1. Introduction

The production process of SC services starts with the entry of patients in the Accident and Emergency Clinic (IGD). Because it is an emergency measure, the Accident and Emergency Clinic (IGD) must gather a variety of other professions apart from obstetricians and gynecologists [1]. Anesthetists, pediatricians and laboratory personnel are needed for blood tests, officers from pharmacy-pharmacies, and nurses. In this case the Accident and Emergency Clinic (IGD) is the first production site for the Sectio Caesaria (SC) action [2]. From the Accident and Emergency Clinic (IGD), patients who have given birth

will enter the ward. For mother and child, will be separated at the beginning. The child born will enter the perinatal room while the mother is in the midwifery ward for treatment. In these two rooms, the next Sectio Caesaria (SC) service production process was carried out and received handling from various other officers, including nutritionists from the nutrition room. If without complications the mother and child are allowed to go home and also being deemed strong enough [3]. However, at home there is still further treatment, namely surgical wound control and various outpatient visits to the obstetrics polyclinic. This process was quite long, even before there was preparation for delivery in the antenatal care form [4].

As a firm that produces health services, a hospital certainly has various fundamental questions related to the provision of Sectio Caesaria (SC) services: how does the hospital produce Sectio Caesaria (SC)? Is it efficient or not? What is the cost and number of Sectio Caesaria (SC) services to be produced? What is the selling price to be paid by the patient. Does the patient pay in full or is there a subsidy from the hospital or other parties?

To answer these important questions, the hospital must have data about how much it costs to produce Sectio Caesaria (SC) surgical services. The costs are financial expenses required to carry out business activities, government agencies, or organizations involved in financial transactions [5].

The next questions are: is there the information about the cost to calculate Sectio Caesaria (SC) surgery services? If so, how are they calculated? Have you included all the components in the production process? These questions need to be emphasized because there are few hospitals in Indonesia, particularly government hospitals, that have information about production costs to provide services. This is inseparable from the historical influence of the hospital which is a social and religious service institution not as a business institution [6]. By using the production concept, the objectives of calculating costs can be stated as follows:

1. Provide an understanding of the clinical services and procedures provided at each production line, for example the production of Sectio Caesaria (SC) surgery. Thus, the calculation of costs is expected to provide data for hospital directors regarding the costs and expenses of a ward, division, or activity with the principle of maintaining control in financial transactions, and increasing efficiency.
2. Provide tools for monitoring and controlling costs. In this case, hospital expenses can be distinguished for patients, staff, or other things. In addition, it can be seen that the cost of outpatients is distinguished from inpatients. Thus, wasted expenses can be detected. For example, with a detailed cost analysis the source of inefficiency can be determined

whether the hospitalization is too wasteful or the administration of unnecessary drugs and various other things.

3. Determine the production place that gives profit or causes losses. After comparing with existing rates, the existence of good cost data allows the benefits calculation when patients are in inpatient or outpatient care. Likewise, existing losses can be calculated. In hospitals that receive subsidies, the amount of this subsidy is calculated from the production costs and income received by the hospital from patients.
4. With the availability of production cost data, it is possible to compare production costs with competitors based on differences in service quality, costs, delivery methods, and price fixing.

In addition, information on production costs can be used as a guide for planning purposes in the budgeting, policy formulation and forecasting needs.

2. The Cost Concept and the Application in Hospital

The first step in developing a cost calculation based on a production line is to classify related services according to strategic production groups. This group is based on the performed by SMF such as surgery, internal medicine, eye diseases. This grouping can be in the form of Diagnostic-Related-Groups (DRG) which is based on disease. Another approach is based on group installations such as the Clinical Laboratory Installation and Accident and Emergency Clinic (IRD). If possible, the production lines should reflect the hospital's main outputs and production as the patient wants. Once a production line has been identified, a calculation system should be established to identify direct and indirect patient costs [7].

By using the hospital concept as a production line, cost analysis is important. Today the hospital has become a socio-economic institution so that cost analysis is a strategic measure [8]. However, there are various questions, what is called a cost analysis? What are the objects and advantages of cost analysis measures in relation to finance and hospital accounting?

The cost calculation is described as a systematic record of detailed transactions related to various hospital activities with a view to obtaining the calculation of total expenses and unit costs for wards, departments, and activities [9]. With the availability of data on costs, various managerial questions can be more easily analyzed to find solutions. These questions are:

- Is it profitable to increase the capacity of VIP ward?
- Can waste in the kitchen be reduced by contracting out to outside catering?

- Has the established VIP room rate made a profit?
- Is the nursing academy in the hospital beneficial or detrimental?
- Is it profitable to upgrade Class I rooms to VIP rooms?
- Is it profitable to have a working relationship with PT Askes Indonesia which offers a package system of payments?
- Is it cheaper to have your own generator than to subscribe to PLN?
- Is it more profitable to develop your own clinical laboratory than cooperating with a private clinical laboratory?
- Is the current tariff under cost (loss) or above cost (profitable)?
- Can the hospital offer various services in the packages form such as birth services, appendicitis surgery services, heart surgery services, such as general check-up packages?

3. Pre-requisites for Conducting a Cost Analysis

Cost analysis and control activities are not an easy process. There are three absolute requirements before a cost analysis is carried out, namely: (1) a good hospital organizational structure; (2) a proper accounting system; and (3) there is sufficient statistical information. These three conditions are interrelated. For example, without a clear hospital structure, it will be difficult to develop an accounting system.

If a cost analysis is expected to have a meaningful impact and management is needed, the hospital must have a clear organizational structure. It is absolutely necessary to have a clear division of duties and authority by dividing it into wards, sections, installations, or other work units [10]. The organizational structure should define the duties and responsibilities of its personnel. The form of organization may vary depending on the type of hospital. Importantly, the organization should be organized on the principle that cost centers and revenue centers can be clearly identified.

The second pre requisite in cost analysis is a good accounting system. Based on the accrual system, hospital accounting must be able to state the costs source used by a unit. Income must also be classified according to the organizational units that produce it. In other words, expenses and income must be linked to the units contained in the hospital structure. The approach to building a hospital financial accounting system in Indonesia is still very difficult because the number of skilled accountants is still very few and the financial accounting system has not been well developed [11]. It is interesting to note that a popular approach is to calculate unit costs based on the *ad hoc* concept, for example by researching or

inviting consultants who are experts in calculating unit costs. Consequently, whenever there is a change in input-production prices or a change in staff and hospital structure, this approach has to be repeated [12]. You can imagine how expensive the system is and how difficult it is to make this approach. Therefore, it is recommended to build a financial accounting system with accountants who are able to manage it in each hospital.

Financial accounting information will be difficult to use in conducting cost analysis if it is not supported by hospital records (statistics) as a third requirement that the hospital must have. In this cost analysis, information is absolutely necessary regarding, for example: how many servings of food are produced by the kitchen each day, how many kilograms of ingredients are in the laundry section, and so on.

4. Some Important Cost Concepts

Cost behavior is important for cost analysis and control. Several factors such as expenditure level and the amount of production have an impact on costs [13]. Thus some costs remain unchanged in varying production volumes, while other costs will change.

- *Fixed Costs*

An understanding of fixed costs can be seen from the case of Kencana Husada VIP ward which has fifteen beds. Apart from the fact that the Kencana Husada ward had a BOR of 80% or 20%, the hospital had to pay a monthly fee of IDR 2,000,000. This fee is called Fixed Cost. In the long run, all fixed costs become variable so that the concept of fixed costs is only used for short-term analysis.

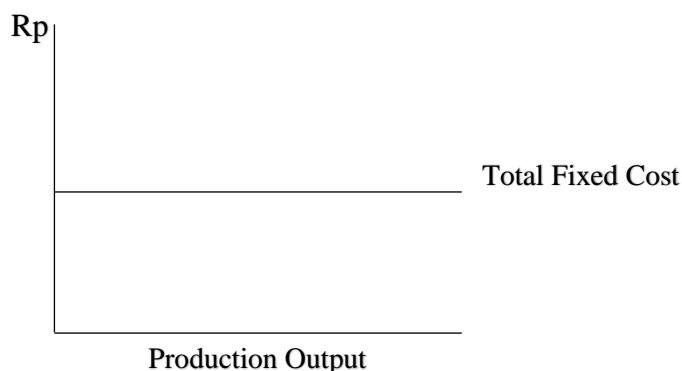


Figure 1. Chart of *Total Fixed Cost*

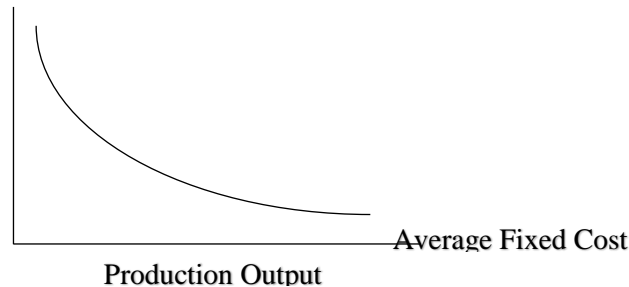


Figure 2. Chart of *Average Fixed Cost*

Figure 1 illustrates the overall Fixed Cost (Total Fixed Cost). It can be seen that the costs are constant even though the production output varies. In Figure 2, information on Fixed Cost is also described but as the Average Fixed Cost which is based on each production unit. the average Fixed Cost will decrease with increasing amount of production.

- ***Variable Costs***

Variable costs is vary according to changes in output. Thus, Variable Cost is a function of changes in output. In the case of the Husada Kencana VIP ward, the Variable Cost will relate to the number of patients treated each day. Included in Variable Cost are expenses for raw materials, medicines, medical services for medical personnel, food, and others. The price of foods are variable. If to cook 1000 portions of food it costs IDR 5,000,000, then the cost per portion is IDR 5,000. If the VIP ward is only filled with 10 people per day, then the cost of food is $10 \times 3 \text{ meals a day} \times \text{IDR } 5,000.00 = \text{IDR } 150,000$. If 15 beds are filled, the cost of eating a day is $15 \times 3 \times \text{IDR } 5,000.00 = \text{IDR } 225,000.00$. Thus the number of patients (volume of activity) has a direct effect on food costs proportionately.

- ***Semi-Variable Cost***

The difference between Fixed Cost and Variable Cost are sometimes unclear. Some of the costs change according to variations in the activity volume. However, these changes in operating costs are not proportional to changes in volume. For example: a kitchen employee

can serve 125 servings of food per day. If the kitchen produces 300 servings a day, it cannot be said that the cost will increase 2 times (100%) if each day produces 600 portions. The calculation is as follows: a serving of 300 portions will require three serving employees. Additional power is only needed if the total production is over 375 servings. If 600 portions are produced it only takes two additional new energies, to five people. Thus, although there was an increase in the activities volume by 100%, the increase in serving employees was only 66.66% (from 3 to 5 people). This figure shows that the overall cost behavior has a tendency to increase with the activity volume. However, his behavior also tends to be Fixed Cost. For example, on a serving volume of between 251 and 375 servings, the costs are constant because they still 3 serving employees. Theoretically, if the serving activity exceeds 375 and is less than 501 then one additional serving employee is needed. The changes effect in the volume of services at nutrition installations on Fixed Cost, Variable, and Semi-Variable Cost can be illustrated in the following table (not related to the graph).

Table 1. The effect of volume changes on Costs

Costs	5000 portions		6000 portions	
	Total Cost	Cost per portion	Total Cost	Cost per portion
Fixed	Rp 5.000.000,00	Rp 1.000,00	Rp 5.000.000,00	Rp 833,00
Variable	Rp 4.000.000,00	Rp 800,00	Rp 4.800.000,00	Rp 800,00
Semi Variable	Rp 2.000.000,00	Rp 400,00	Rp 2.200.000,00	Rp 360,00
Total	Rp 11.000.000,00	Rp 2.200,00	Rp 12.000.000,00	Rp 1.993,00

If the total cost is observed, the amount increases from IDR 11,000,000.00 to IDR 12,000,000.00. However, the number of servings produced increases by a larger proportion. As a result, the total cost per serving is decreased. This is due to the more economical use of Fixed Cost.

Short Term Cost Curves

Fixed and Variable Costs affect short-term costs, for example organizing VIP wards. A short term cost curve is shown in Figure 3. It is clear in the figure that the total cost (TC) is the sum of Total Fixed Cost and Total Variable Cost.

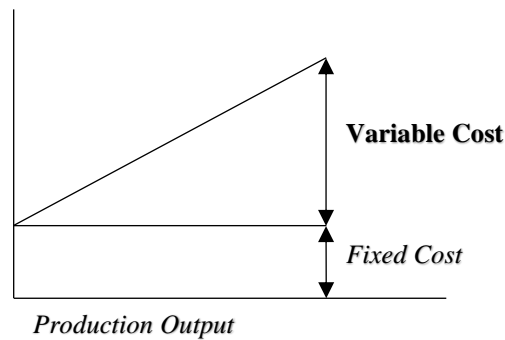


Figure 3. Short Term Cost Curves

5. The Cost Center at the Hospital

A significant cost center in the analysis and determination of hospital costs are:

1. Installation and parts in hospitals, for example: wards, laboratory radiological installations, household sections, maintenance, and others [14].
2. Service units that are identifiable sources of hospital production costs, for example room fees, average costs for each routine blood check, average costs per patient in per polyclinic visit, average cost of drugs per patient at per day of hospitalization. For the record, in order to achieve the "service unit" cost calculation, it must first be done counting the parts in the hospital.
3. Center costs based on disease diagnosis. This method was introduced in the United States in the form of Diagnostic Related Groups (DRG).

a. Break-Even Analysis

The behavior of fixed and variable costs, as well as their meaning for financial planning, can be learned from the break even analysis. This analysis requires data on income [15]. The main characteristic of return analysis is because fixed costs remain at various levels of activity volume, so these costs remain even though the total income is zero. As implementation activities increase, total revenue will also increase so that at one point, Fixed Costs will be exceeded; and at a later point, revenue will exceed total costs. This means that the activity is profitable.

Case:

The Kencana Husada VIP Ward at the Jatiwangi District Hospital has 15 beds. The fixed cost for running a VIP ward is IDR 24,000,000.00 per year. The variable cost for each bed occupied is IDR 16,000 per day. The rate for each bed a day is IDR 40.00.00.

There are several questions:

1. How many day the bed must be used for a minimum in order to achieve break-even?
2. How much profit is made if X day-beds are sold?
3. If only X day-beds are filled, what rate should be charged?

The chart of break-even point analysis can be described as follows:

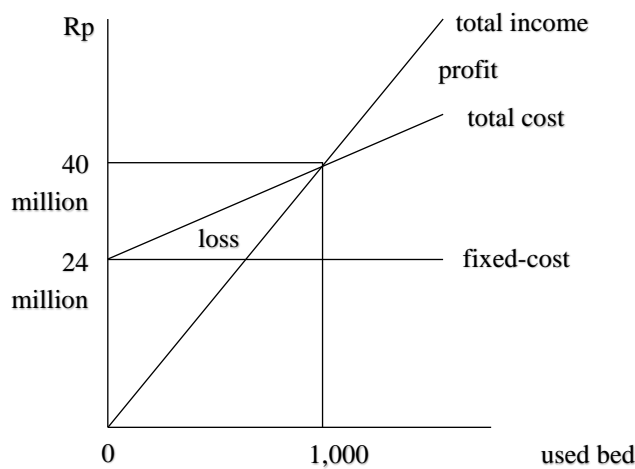


Figure 4. The chart of *Break Even Point*

Figure 4 shows that before reaching 1,000 days of used beds in a year, Kencana Husada ward still lose. If it reaches 1,000, the total income is IDR. 40,000,000.00 while the cost is IDR. 24,000,000.00 + (1,000 x IDR. 16,000.00). The principal return analysis can be done algebraically as follows. The break-even point formula is:

$$S = FC + VC$$

S = Income

FC = *Fixed Cost*

VC = *Variable Cost*

This equation is used to answer the questions above.

1. How many days-minimum the bed must be used in order to reach the break-even point?

$$S = FC + VC$$

$$\text{IDR } 40.000.000,00 = \text{IDR } 24.000.000,00 + (1.000 \times \text{IDR } 16.000,00)$$

Thus, as many as 1,000 day-beds must be filled during the year in order to break even.

2. How much benefit if the 1,500 day-bed is used for a year?

Profit can be included as one of components that affect income, as written below:

$$\begin{aligned} S &= FC + VC + P \\ P &= S - FC - VC \end{aligned}$$

$$= (1.500 \times \text{IDR } 40.000,00) - \text{IDR } 24.000.000,00 - (1.500 \times \text{IDR } 16.000,00)$$

$$= \text{IDR } 12.000.000,00$$

If only 600 days-beds are filled in a year (BOR is approximately 15%), what rate must be set to reach the break even point?

$$S = FC + VC$$

$$S = \text{IDR } 24.000.000,00 + (600 \times \text{IDR } 16.000,00) = \text{IDR } 33.600.000,00$$

The minimum receipt must be IDR 33.600.000,00. Thus the rate per bed is

$$\text{IDR } 33.600.000,00 \text{ divided by } 600 = \text{IDR } 56.000,00 \text{ per day.}$$

Note

This break-even point analysis is greatly simplified. The cases that occur in the field are certainly more complicated and difficult because the division of Fixed and Variable Costs may not be too clear.

The points presented above are the basic concepts of using production cost data in hospitals. As mentioned, one of the requirements for calculating costs is the existence of a good accounting system. Without a good accounting system it is impossible to carry out the cost calculation process [16]. In this section, it is assumed that the accounting system in the hospital is running well. The accounting system needs to be studied on its own. In this calculation, various methods are known, such as the Allocation Model and the Activity Based

Costing (ABC) Model. Currently, many are recommended to calculate activity based costs (ABC).

The activity-based cost system (ABC system) is designed on the premise that the resulting product or service requires activity. The activities in the form of resource consumption. This is shown in Figure 5.

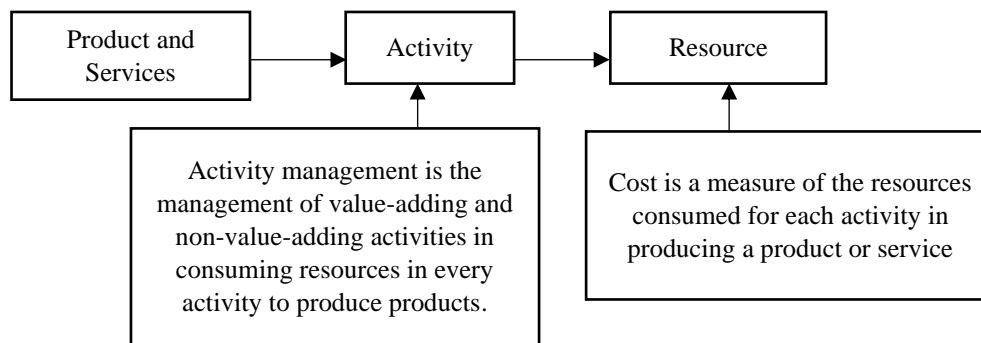


Figure 5. ABC System

The ABC system concept is generally applied to increase the effectiveness and efficiency in the use of costs in various organizations which is reflected in the creation of a cost system that refers to activities. This system is an information system about work (or activity) consumes resources and produces value for consumers. This concept aims to improve the company's competitive ability. The ABC concept states that in order to achieve the efficiency and effectiveness of an organization, the cost system used must be based on activities that occur in order to create or produce something. However, the implementation of an activity-based costing system across organizations will vary depending on what sector the organization is in.

For health organizations, this concept is very good for supporting their social mission. Because with this concept will create efficiency and effectiveness in terms of cost consumption which in turn will benefit the poor by lowering the overall tariff for health services. However, due to the complexity of service activities and intangible outputs in health organizations, especially hospitals, the application of ABC concept takes time to be implemented. The application of ABC concept in the hospital must begin with designing a system (mapping activities) that allows the concept to be carried out because without a supporting system, ABC is impossible to implement. However, the hospital is a very complex organization, it would take a long time to build a system that would allow ABC to be implemented.

6. Conclusion

Economies of scale describes that the unit cost tends to decrease with increasing service production. With the increasing number of VIP ward in the Husada Kencana hospital, the cost of patients per day can decrease. There are various factors that can reduce the unit cost when increasing the activity volume. The first is Economies of increased dimension. In this case the mode of maintenance costs, and other costs will increase but under the increase in service production. For example, the addition of cleaning fees for 15 new VIP ward does not double when the number of ward is 15. The second factor is the existence economies of specialization. With the larger the ward, the easier it will be as an organization to increase efficiency. This is because skilled nurses and medical personnel are cheaper on a per-room basis than before the expansion. Furthermore, with the Economies of marketing, more production results in supplies being purchased in larger quantities with the possibility of many discounts and special attention from suppliers. Marketing costs also do not increase as high as the activity volume increases. In addition, the fourth possible factor appears, namely by increasing the number of rooms in technology, the use of new technology can be used. Ultimately, this will reduce the cost per unit.

Conversely, an increase in production amount after passing a certain point can actually increase the cost per unit. This situation is caused by reduced efficiency in the use of production factors. The first factor is decreased managerial efficiency. This is because increased production can cause management to become increasingly complicated. Decisions will take longer to reach, communication between staff will be more difficult, and coordination problems will be bigger.

The second factor is the relationship with employees. If the production capacity becomes greater, the relationship with employees becomes more formal because the management hierarchy can become longer. This formal relationship costs more. The third factor is various technical factors. In an effort to increase production, after passing a certain point and the special technical problems will arise so, the result in an increase in the cost of production per unit. For example, with the increasing number of VIP wards, it is necessary to purchase one large integrated AC unit to cover these rooms.

References

- [1] Dobransky, J., Gartke, K., Pacheco-Brousseau, L., Spilg, E., Perreault, A., Ameen, M., ... & Poitras, S. (2020). Relationship Between Orthopedic Surgeon's Empathy and Inpatient Hospital Experience Scores in a Tertiary Care Academic Institution. *Journal of Patient Experience*, 2374373520968972.
- Alejo, G., Ruiz, M., Hernandez-Ochoa, A., Ortiz, C., & Huerta, S. (2020). Differences in treatment strategies in the management of acute appendicitis in a county hospital in Guatemala and an academic teaching institution in the United States. *Tropical Doctor*, 0049475520981231.
- [2] Noviantoro, R., Maskuroh, N., Santoso, B., Fahlevi, M., Pramono, R., Purwanto, A., ... & Munthe, A. P. (2020). Did Quality Management System ISO 9001 Version 2015 Influence Business Performance? Evidence from Indonesian Hospitals. *Journal Scopus*.
- [3] Mohammed, E., Daybaso, H. A., & Habtewold, E. M. (2020). Job Satisfaction, Engagement and Associated Factors among Employees Working at Adama Hospital Medical College, Adama, Oromia Regional State, Ethiopia: Institution Based Cross Sectional Study.
- [4] Wang, Y., Bao, H., Zhang, X., & He, A. (2020, November). The Reform Progress and Practical Difficulties of State-Owned Hospitals Under Information Age—Case Analysis Based on the Reform in a Medical Institution of a Group in China. In *International Conference on Machine Learning and Big Data Analytics for IoT Security and Privacy* (pp. 243-250). Springer, Cham.
- [5] Gan, W. H., Lim, J. W., & David, K. O. H. (2020). Preventing intra-hospital infection and transmission of COVID-19 in healthcare workers. *Safety and Health at Work*.
- [6] Thomas, W. S., & Hoey, M. (2020). Hospital Inter-Professional Collaboration: A Clinical Librarian's Experience. *Journal of Hospital Librarianship*, 20(1), 87-94.
- [7] Sunder M, V., Mahalingam, S., & Krishna M, S. N. (2020). Improving patients' satisfaction in a mobile hospital using Lean Six Sigma—a design-thinking intervention. *Production Planning & Control*, 31(6), 512-526.
- [8] Liow, M. H. L., Tay, K. X. K., Yeo, N. E. M., Tay, D. K. J., Goh, S. K., Koh, J. S. B., ... & Tan, A. H. C. (2020). Ensuring business continuity of musculoskeletal care during the COVID-19 pandemic: experience of a tertiary orthopaedic surgery department in Singapore. *JBJS Open Access*, 5(2), e0050.
- [9] Maseleno, A., Huda, M., Jasmi, K. A., Basiron, B., Mustari, I., Don, A. G., & bin Ahmad, R. (2019). Hau-Kashyap approach for student's level of expertise. *Egyptian Informatics Journal*, 20(1), 27-32.

- [10] Astha, K. C., Schaefer, M. K., Stone, N. D., & Perz, J. (2020). Characterizing healthcare delivery in the United States using Census Bureau's County Business Patterns (2000–2016). *Infection Control & Hospital Epidemiology*, 41(6), 723-728.
- [11] Okonkwo, U., Ekpeyoung, B., & Ndep, A. (2020). Perceived important managerial competencies for healthcare managers at a tertiary healthcare institution in Calabar, Cross River State, Nigeria. *Journal of Hospital Administration*, 9(1).
- [12] Yu, J., Ouyang, W., Chua, M. L., & Xie, C. (2020). SARS-CoV-2 transmission in patients with cancer at a tertiary care hospital in Wuhan, China. *JAMA oncology*.
- [13] Mueller, E. L., Jacob, S. A., Cochrane, A. R., Carroll, A. E., & Bennett Jr, W. E. (2020). Variation in hospital admission from the emergency department for children with cancer: A Pediatric Health Information System study. *Pediatric Blood & Cancer*, 67(6), e28140.
- [14] Amalia R, Gunawan A. 2020. Transfer Pricing and Mangerial Ownership Against Tax Avoidance in Manufacture Companies on The Indonesia Stock Exchange. Proc 3rd Int Conf Adv Sci Innov. doi: 10.4108/eai.20-6-2020.2300633.
- [15] Maya S, Noermijati N, Rofiaty R, Rofiq A. 2020. The Resilience of Micro, Small and Medium Enterprises towards Economic Turbulansi: Is Entrepreneur Orientation a Determinant? (Literature Review Based on Intelligent Software). Proc 3rd Int Conf Adv Sci Innov. doi: 10.4108/eai.20-6-2020.2300707.
- [16] Indrasari M, Riyadi S, Purnomo BR. 2019. Implementation of empowerment program for person with disability in indonesia. *J Adv Res Dyn Control Syst* 11(7):298–303.