

# DEVELOPMENT OF *FINANCIAL MANAGEMENT INFORMATION SYSTEM* AT GRHA MUTIARA SUBANG MATERNITY HOSPITAL

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## ABSTRACT

Grha Mutiara Subang Maternity Hospital has several problems in financial management, i.e. Treasurer difficulties to conduct budget planning monthly because at the moment the absence of budget planning month resulted in often not Between the income gained with the amount of expenditure, so the Treasurer often make credit to the bank. Phase to solve the company's problems by creating a financial management information system by doing a budget planning process using the Single Moving Average method by retrieving the previous 3 months history data to generate forecasting, as well as conducting the process of monitoring expenditures by generating recommends actions and in using the PDCA (Plan Do Check Act) cycle. The results of the research achieved, the built-in system can help the Treasurer of the budget planning each month by displaying the nominal budget plan for each month's hospital expenses and the built-in system helps Treasurer in monitoring hospital expenses such as operational costs, pharmacy and employee salaries, by recommending actions to be taken to be able to print approval letter of action.

**Keywords:** budget planning , financial management, financial Monitoring, PDCA analysis, Single Moving Average.

## 1. INTRODUCTION

Grha Mutiara Maternity Hospital is one of the private hospitals in the city of Subang, which stood since the year 2013 with ownership by Dr. Sholih Hamdani, SpOG. Based on observations at Grha Mutiara Subang Maternity Hospital and interviews with financial treasurer Grha Mutiara Subang Maternity Hospital, explained that the absence of financial budget planning every month resulted in capital Business activities taken from the previous month's income. Based on the monthly revenue data of the year 2017-2018 the capital used each month is the total hospital income from the previous month, due to the absence of budget planning every month then this can result in the next month Because the capital owned does not meet the needs of spending

in the next month. Therefore, less the balance between the income gained with the budget available This causes the hospital treasurer to often make credit to the bank by making a letter of loan submission that will be approved by the Director Hospital.

Due to lack of capital on the cash based on income data may 2018 hospitals suffered losses due to the production of THR employees at 61 million, so the hospital treasurer must have additional capital for the budget of June, this resulted in a decline in hospital profits compared to the previous month, and also influenced the existing budget posts so that the Treasurer had difficulty making the decision to make budget planning in order to meet each postal need. An existing budget.

Based on the problems described earlier, the financial management Information system will be built which can help the Treasurer to make financial budget planning every month, so that every hospital expense needs can be is fulfilled and can help the Treasurer to monitor the income of medical services, medicine, tools as well as monitoring the expenditure of purchasing tools, medicines, employee salaries, operational costs, and hospital taxes by recommending measures to help the Treasurer be Decide what to do. Based on previous research on the Journal of Financial Management Information system in Ngadirejan Village by (Atik Rusmayanti) [1] The study aims to produce a system of financial management that is faster, effective, and Efficient, and facilitate the generation of expense and revenue reports and can minimize errors and optimize data security.

## 2. FOUNDATION THEORY

### 2.1 Management Information System

Information system is a system in an organization that brings together the needs of daily transaction processing, supports operations, managerial and strategic activities of the Organization, and provides certain outside parties with Reports are required the information system is made up of components called building blocks as a system, the building blocks each interact with each

other forming a unity to achieve its target. The building blocks consist of [2].

#### 1. Input Block

Inputs represent the data entered into the information system. Input here includes methods and media to capture the data to be entered, which can be the basic documents [2].

#### 2. Model Block

This block consists of a combination of procedures, logic and mathematical models that will manipulate the input data and data stored in the database in a way that has been specified to produce the desired output [2].

#### 3. Output Block

Product of information system is output which is quality information and useful documentation for all levels of management as well as all system users [2].

#### 4. Technology Block

Technology is used to receive inputs, run models, store and access data, generate and transmit output and help control of the system as a whole consisting of 3 main parts, namely technicians (Humanware or brainware), software and hardware [2].

#### 5. Database Block

Databases are a collection of data related to one another, stored on the computer hardware and used software for manipulate it databases are accessed or manipulated using software packages called DBMS (Database Management Systems) [2].

#### 6. Controls Block

Some controls need to be designed and applied to ensure that the things that can damage the system can be prevented or if there are any errors can be immediately resolved quickly [2].

Information systems. Management is a collection of. Sub-sub systems. Mutually relate to each other and cooperate harmoniously for. Reaching one. The purpose of processing. Data becomes the information required by the management in the process. Decision making when implementing its functions [2].

### 2.2 PDCA Cycle

PDCA, a language abbreviation. The English from "Plan, Do, Check, Act" (Plan, Work, check, follow up), is a four-step troubleshooting process commonly used in control quality. PDCA is known as a "cycle Shewhart", because it was first proposed by Walter Shewhart A few decades ago. But in its development, the analysis methodology. PDCA is more Often called the "Deming cycle". This is because Deming is the one who popularized its use and expanded its application. However Deming himself always referred to this method as the Shewhart cycle, from Walter's name A. Shewhart, who is often regarded as a controlling father statistical quality. Later Deming modifies PDCA as PDSA ("Plan, Do, Study, Act") to better describe its recommendation. With whatever name it is called,

PDCA. is a useful tool to make repairs continuously without stopping. [3].

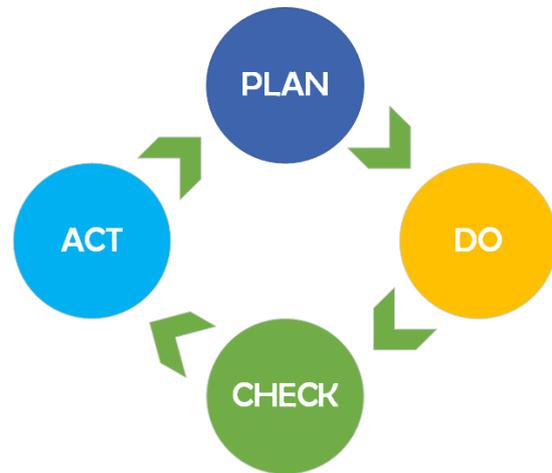


Figure 1. Cycle PDCA

### 2.3 Single Moving Average

The Moving Average method is used when historical data is volatile, It has no trend patterns and has no seasonal pattern, the way this method works is. Data patterns. Historical with Merata-ratakan data [4].

Single Moving average. is a method. Forecasting done by taking a bunch of observation values, look for those average values as forecasting for the future period [5].

Single Moving method. Averages have special characteristics that are ;

To determine forecasts. In the forthcoming period requires historical data over a specified period of time. For example, with 3 months moving average, then. The new 5th month forecast is made after the month. to 4 finishes/ends. If the new moon moving average month to 7 can be created after the 6th month expires. The longer the term. Moving averages,. The effect of the Pelicinan increasingly visible in divination or resulting in a smoother moving average.

## 3. METODE PENELITIAN

The research methods conducted in this study will be depicted on Figure 2 [6].

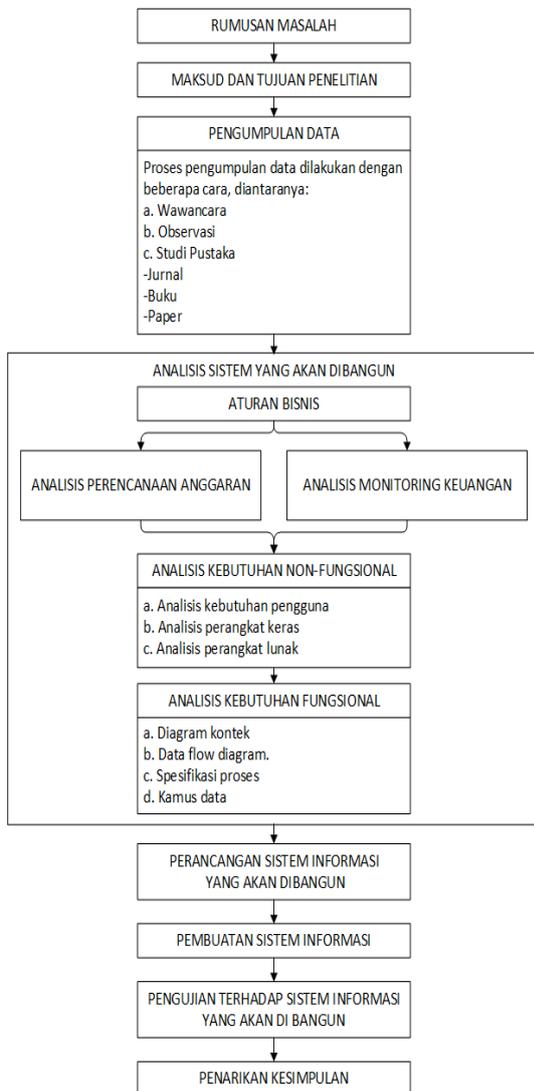


Figure 2. Research Methodology

## 4. CONTENTS OF RESEARCH

### 4.1 Budget Planning Analysis

Budget planning analysis is done to her the problems of the planning of each year at Grha Mutiara Subang Maternity Hospital using a PDCA analysis approach with analyst stages ranging from planning, working, evaluation, and Action.

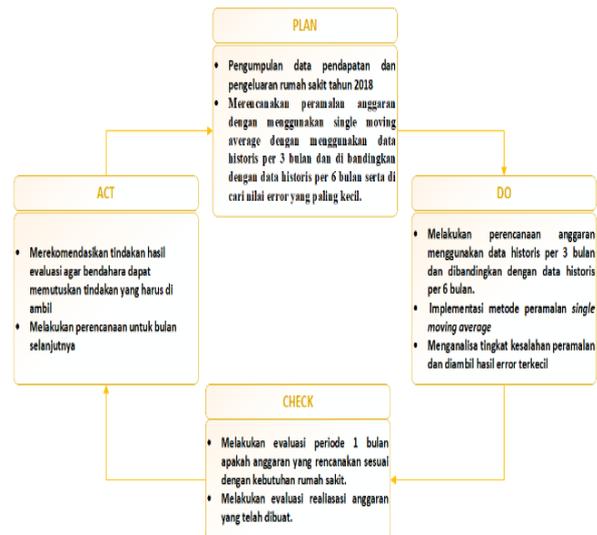


Figure 3. PDCA budget planning cycle

#### a. Plan

To do. Planning to use hospital spending data as the basis of budget planning, using the single moving average method of forecasting using historical data 3 months in advance to find the average data moving[4] And can be described as below formula:

$$M_t = F_{t+1} = \frac{Y_t + Y_{t+1} + Y_{t+2} + \dots + Y_{t+n+1}}{n}$$

$M_t$  = Moving Average for T period

$F_{t+1}$  = Forecast for T+1 period

$Y_t$  = Real value period to T

$n$  = Number of limits in moving averages

#### b. Do

To forecast budget planning on used sample data to calculate budget planning forecasting for the month of April 2019.

Calculate budget expenditure planning

$$M_t = \frac{360,214,585 + 395,221,153 + 411,556,235}{3} = 416,101,123$$

So to plan the expenditure of maternity hospital Grha Mutiara should provide a budget of Rp.416,101,123 for April 2019. After the hail forecasting is known it will be sought error values on forecasting so that the results can be measured based on the evaluation result of Mean absolute Error (MAE) and Mean absolute Percentage Error

(MAPE). Results of a comparison of MAE and MAPE errors for planning income and expenses in April 2019.

Table the error value of the expense forecasting result for April 2019 can be seen in table 1.

**Table 1** Error value of forecasting result

| The value of the result of budget planning results Error April 2019 |             |             |             |            |          |
|---|-------------|-------------|-------------|------------|----------|
| Month   | Expenses    | Forecasting | Value Error | MAE        | MAPE (%) |
| Jan-19  | 360,214,585 | 362,387,476 | 12,827,109  | 12,827,109 | 3%       |
| Feb-19  | 395,221,153 | 379,971,076 | 15,250,077  | 15,250,077 | 4%       |
| Mar-19  | 411,556,235 | 397,330,658 | 24,225,577  | 24,225,577 | 6%       |
| Apr-19  | 413,525,980 | 416,101,123 | 15,424,858  | 60,269,764 | 4%       |

From the comparison of the expense forecasting error value in table 3.1 The result of Mean absolute Error (MAE) and Mean absolute Percentage Error (MAPE) is for forecasting per 3 months MAE = 60,269,764 and MAPE = 4%.

The result of the expenditure planning for April 2019 is Rp. 416,101,123 The value will be used as budget planning for the month of April 2019 and in the axis of each budget post. Proportion of budget posts can be seen in table 2.

**Table 2** Budget post proportions

| Budget post proportions |             |                    |
|-------------------------|-------------|--------------------|
| Month                   | Percentage  | Proportions (Rp)   |
| Operating costs         | 19%         | 79,059,213         |
| Employee salaries       | 50%         | 208,050,562        |
| Pharmaceutical          | 31%         | 128,991,348        |
| <b>Total</b>            | <b>100%</b> | <b>416,101,123</b> |

#### c. Check

At this stage will be evaluated to supervise the results of the financial expenditure of hospitals. Based on the results of the budget planning research will be determined the success indicators of the research with the appropriate and inappropriate results presented in table 3.

**Table 3** Budget Realization Evaluation Results

| Budget Realization Evaluation Results |                  |                     |                 |
|---------------------------------------|------------------|---------------------|-----------------|
| Month                                 | Expense planning | realization Expense | result          |
| January -19                           | 362,387,476      | 360,214,585         | Appropriate     |
| February -19                          | 379,971,076      | 395,221,153         | Not appropriate |
| March -19                             | 397,330,658      | 411,556,235         | Not appropriate |
| April-19                              | 416,101,123      | 413,525,980         | Appropriate     |

Based on the table above the revenue realization is a hospital income without additional from the

previous month net, and for the realization of expenditure can be realized that the budget realization in April 2019 according to forecasting Budget planning. Then the budget planning evaluation for April 2019 is :

1. If the budget is planned in April 2019 according to budget planning then budget planning is said to be successful.
2. If the planned expenditures in April 2019 do not exceed the specified budget planning then the remaining budget will be deposited on the cash for the next month's planning. And,
3. If the planned budget in April 2019 exceeds the specified budget plan then the Treasurer should take the expenditure reduction action on the budget post which exceeds the budget planning.

#### d. Act

In the process of action, planning of expenditure budget that has been done is to take action on the evaluation result that has been done. Based on the results of the analysis in April 2019 the Treasurer can take several action recommendations. Can be seen the result of budget realization evaluation for April 2019 in table 4.

**Table 4** Budget planning Evaluation Results

| Budget planning Evaluation Results |                   |                      |                 |                                      |
|------------------------------------|-------------------|----------------------|-----------------|--------------------------------------|
| Month                              | Planning Expenses | Realization Expenses | Result          | Action                               |
| Januari-19                         | 362,387,476       | 360,214,585          | Appropriate     | No action required                   |
| Februari-19                        | 379,971,076       | 395,221,153          | Not appropriate | Lending for the next month's capital |
| Maret-19                           | 397,330,658       | 411,556,235          | Not appropriate | Lending for the next month's capital |
| April-19                           | 416,101,123       | 413,525,980          | Appropriate     | No action required                   |

The conclusion of the action results carried out in April 2019 is that the Treasurer does not need to take action because expenditures do not exceed the planned budget expenditures so that the remainder of budget budgets can Saved for the next month's budget planning.

#### 4.2 Expenditure Monitoring analysis

Expenditure monitoring analysis was conducted to her financial control and monitoring problems at Grha Mutiara Subang Maternity Hospital using a PDCA analysis approach with analyst stages ranging from planning, working, evaluation, and actions.

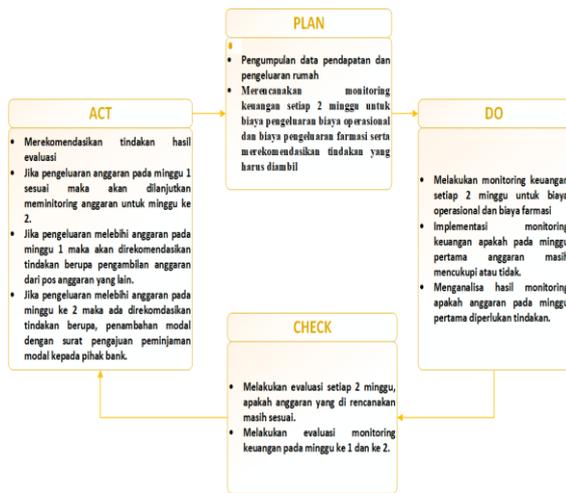


Figure 4. PDCA cycles of expense Monitoring

**a. Plan**

At this stage will be made planning monitoring expenditures that will be conducted every 2 weeks that will be carried out by the Treasurer for the expenditure of April 2019, the Treasurer will conduct monitoring after administration staff input data into the system, The benefit of monitoring is as an evaluation material so that the Treasurer can determine the basis of the decision of the action taken to prevent the hospital expenditure from exceeding the specified budget plan.

**b. Do**

To perform the financial monitoring every 2 weeks that is already in the Tetepkan hold Plan. Monitoring will be conducted according to the week budget post 1 & 2 done on the 1st to 15th and for Week 2 is done on 16 S/d 30 end date adjusting with the month, Monitoring expenditure per 2 weeks the data used is sample data Can be seen in table 5.

Table 5 Expense Monitoring

| Expense Monitoring    |                   |                  |               |                       |
|-----------------------|-------------------|------------------|---------------|-----------------------|
| Time                  | Budget post       | Budget fees (Rp) | Expenses (Rp) | Remaining budget (Rp) |
| Week 1-2 (date 1-15)  | Operating costs   | 39,529,607       | 41,546,987    | -2,017,380            |
|                       | Pharmaceutical    | 64,495,674       | 62,469,851    | 2,025,823             |
| Week 3-4 (date 16-30) | Operating costs   | 39,529,607       | 33,214,586    | 6,315,021             |
|                       | Pharmaceutical    | 64,495,674       | 66,012,354    | -1,516,680            |
|                       | Employee salaries | 208,050,562      | 202,568,791   | 5,481,771             |

**c. Check**

At this stage will be conducted evaluation to supervise the results of the financial expenditure of hospitals, so it can be known whether the budget planning for a period of 2 weeks is already in accordance with the realization of expenses incurred

by evaluation Expense monitoring can be seen on table 6.

Table 6 Evaluation Monitoring evaluation

| Expenditure Monitoring Evaluation April 2019 |                   |                  |               |                       |                 |
|--|-------------------|------------------|---------------|-----------------------|-----------------|
| Time   | Budget post       | Budget fees (Rp) | Expenses (Rp) | Remaining budget (Rp) | Status          |
| Week 1-2 (date 1-15)                         | Operating costs   | 39,529,607       | 41,546,987    | -2,017,380            | Not appropriate |
|  | Pharmaceutical    | 64,495,674       | 62,469,851    | 2,025,823             | Appropriate     |
| Week 3-4 (date 16-30)                        | Operating costs   | 39,529,607       | 33,214,586    | 6,315,021             | Appropriate     |
|  | Pharmaceutical    | 64,495,674       | 66,012,354    | -1,516,680            | Not appropriate |
|  | Employee salaries | 208,050,562      | 202,568,791   | 5,481,771             | Appropriate     |

**d. Act**

In the process of action, actions are based on the evaluation result as the basis of decision making in the process of taking action:

- If in Week 1 & 2 expenditures do not exceed the budget that is already planned then it will take action 2 i.e. the remaining budget can be used by another budget post.
- If in Week 1 & 2 expenditure exceeds the budget already defined meal will be taken action 1 ie reduce the expenditure in Week 3 & 4.
- If at week 3 & 4 The expenditure does not exceed the already planned budget then the action will be taken 2 i.e. the remaining budget can be used by another budget post.
- If in Week 3 & 4 expenditure exceeds the already planned budget meal the Treasurer should apply for a loan to cover the expense of expenses.

Recommendation action result of evaluation can be seen in table 7

Table 7 Recommended actions

| Tindakan Monitoring Pengeluaran April 2019 |                   |                  |                       |                         |   |
|--|-------------------|------------------|-----------------------|-------------------------|---|
| Time                                       | Budget post       | Budget fees (Rp) | Remaining budget (Rp) | Action 1                | Action 2  |
| Week 1-2 (date 1-15)                       | Operating costs   | 39,529,607       | -2,017,380            | Need to reduce spending | Need to reduce spending                                 |
|  | Pharmaceutical    | 64,495,674       | 2,025,823             | No action required      | The remaining budget can be used by another budget post |
| Week 3-4 (date 16-30)                      | Operating costs   | 39,529,607       | 6,315,021             | No action required      | The remaining budget can be used by another budget post |
|  | Pharmaceutical    | 64,495,674       | -1,516,680            | Need to reduce spending | Need to reduce spending                                 |
|  | Employee salaries | 208,050,562      | 5,481,771             | No action required      | The remaining budget can be used by another budget post |

**4.3 NON FUNCTIONAL NEEDS**

The analysis of non-functional needs is done to generate details about the things that the system does when implemented. As for some parts that are

included in the analysis of Non functional needs, namely the analysis of hardware needs, analysis of software needs and user analysis[7].

**a. Hardware analysis**

The hardware used for the servers in the current GRHA Mutiara Subang Maternity Hospital can be seen in Table 8.

**Table 8** Hardware analysis for servers

| No | Hardware           | Current specifications | Minimum Specifications |
|----|--------------------|------------------------|------------------------|
| 1  | Processor          | Core i3 1,8 Ghz        | Quad Core 1,6 Ghz      |
| 2  | RAM                | 8 GB                   | 4 GB                   |
| 3  | Hardisk            | 500 GB                 | 256 GB                 |
| 4  | Monitor            | Monitor 1024x768       | Monitor 1024x768       |
| 5  | Supporting devices | Keyboard, Mouse,       | Keyboard, Mouse,       |

The hardware used for clients at the Grha Mutiara Subang Maternity Hospital is currently viewable in Table 9.

**Table 9** Hardware analysis for Client

| No | Hardware           | Current specifications | Minimum Specifications |
|----|--------------------|------------------------|------------------------|
| 1  | Processor          | Quad Core 1,6 Ghz      | Dual Core 1,2 Ghz      |
| 2  | RAM                | 4 GB                   | 2 GB                   |
| 3  | Hardisk            | 500 GB                 | 256 GB                 |
| 4  | Monitor            | Monitor 1024x768       | Monitor 1024x768       |
| 5  | Supporting devices | Keyboard, Mouse        | Keyboard, Mouse        |

**b. Software analysis**

The software used for the server of Grha Mutiara Subang Maternity Hospital can be seen in table 10. As follows:

**Table 10** Software analysis for Server

| No | Software         | Current specifications  | Minimum Specifications  |
|----|------------------|-------------------------|-------------------------|
| 1  | Operating system | Windows 10              | Windows 7               |
| 2  | Web Browser      | Mozilla Firefox, Chrome | Mozilla Firefox, Chrome |
| 3  | PDF              | Adobe Reader 9          | Adobe Reader 9          |
| 4  | Apache           | Apache 2.2              | Apache 2.2              |
| 5  | Mysql            | Mysql 5                 | Mysql 5                 |

The software used for the client Grha Mutiara Subang Maternity Hospital can be seen in table 11. As follows:

**Table 11** Software analysis for Client

| No | Software         | Current specifications  | Minimum Specifications  |
|----|------------------|-------------------------|-------------------------|
| 1  | Operating system | Windows 7               | Windows XP              |
| 2  | Web Browser      | Mozilla Firefox, Chrome | Mozilla Firefox, Chrome |
| 3  | PDF              | Adobe Reader 9          | Adobe Reader 9          |

**4.4 BASIS DATA ANALYSIS**

Database analysis is a step to describe the system that will be built in the form of relationships between the entities involved in the financial management Information system at GRHA Mutiara Subang Maternity Hospital. These relationships are depicted in a diagram called the Entity Relationship Diagram (ERD).[8]. ERD Financial Management Information Systems Grha Mutiara Subang Maternity Hospital can be seen in Figure 5.



**Figure 5** Entity Relationship Diagram (ERD)

**4.5 DATABASE DESIGNING**

In the database designing will describe the data flow in the system so that it can be seen the flow of existing data [9].

### a. Skema Relasi

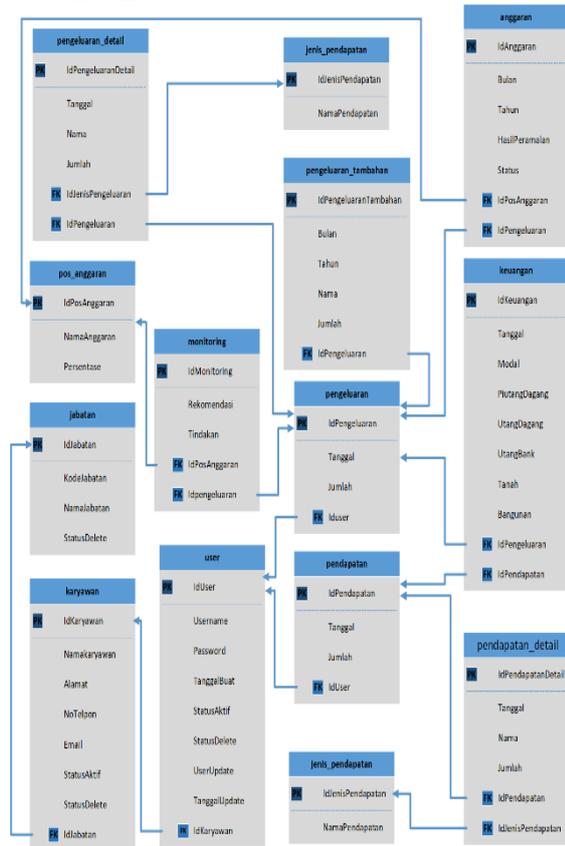


Figure 6 Relationship schemes

### 4.6 INTERFACE DESIGN

Interface planning is the reference view of the development of financial management information System of GRHA Mutiara Subang Maternity Hospital as below can be seen in the Figure 7-8[10].

#### a. Design Interface Dashboard

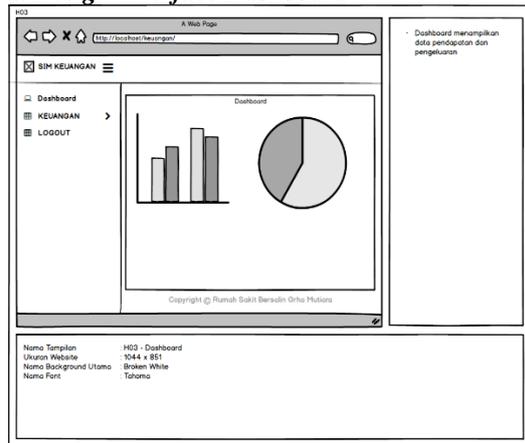


Figure 7 Design Interface Dashboard

### b. Financial interface Design

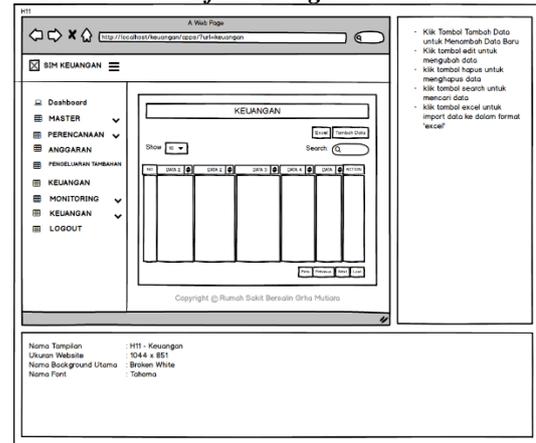


Figure 8 Financial interface Design

## 5. CLOSING

Based on research and test results that have been done to the financial management system in maternity hospital Grha Mutiara Subang, can be drawn some conclusions as follows:

1. The Financial management information system that is built can help the Treasurer to budget planning each month by displaying the nominal budget plan for the cost of the hospital expenditure each month.
2. The Financial management Information system, which is built to assist the Treasurer in monitoring hospital expenses such as operational costs, pharmacy and employee salaries, recommends that action be taken to be able to print letters Approval of actions.

Based on the results of the system test, there are suggestions that can be considered further development:

1. The Financial management information system will be better if integrated with an outpatient information system, hospitalization, so that all business processes that are in the hospital can be automated and to reduce the occurrence of human error.
2. Need to be conducted periodically evaluation and development of financial management information system built. This is done in case of changes in the procedure or rules to enable the system to adapt and still be well-functioning. So it is able to meet hospital needs.

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