

IMPLEMENTASION OF FUZZY MAMDANI METHOD FOR DETERMINING QUANTITY OF PRODUCTION IN PRODUCTION INFORMATION SYSTEMS MANAGEMENT IN PT. MALLESSO INVESTAMA ABADI

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ABSTRAK

PT. Mallesso Investama Abadi is a company that was founded in 1996 and has 23 years of experience in the market. PT. Mallesso Investama Abadi itself is a company engaged in the food processing of meat processing which is famous in Bandung with the trademark "rose". This company manufactures its products every day according to orders and market needs. The products produced include chicken sausage, beef sausage, chicken base, beef base, mini meatballs, special meatballs (SPL) and nuggets. The company has a problem when determining the amount of production because the products produced have excess products so that excess products become piled up in the warehouse. The next problem is the absence of a sequence of products to be produced which results in the delay of the finished product. The Mamdani fuzzy method is used to determine the number of products to be produced by the company. Planning managers can determine the amount of production from product demand, product supply and previous production. From the results of research and testing it can be concluded that the application of the mamdani fuzzy method for determining the amount of production in the production management information system can help planning managers in determining the amount of production in accordance with the number of requests.

Kata kunci: sistem informasi manajemen produksi, manajemen produksi, fuzzy mamdani

1. PENDAHULUAN

PT. Mallesso Investama Abadi is engaged in food processing which is famous in Bandung with the trademark "Mawar". PT. Mallesso Investama Abadi is a company that produces 7 types of processed foods such as Beef Sausage, Chicken Sausage, Chicken Base, Cow Base, Mini Meatballs, Special Meatballs (SPL) and Nuggets made from chicken and beef with production types for supplies.

PT. Mallesso Investama Abadi, planning is done by looking at the availability of raw materials the

previous month for additional raw materials and for main raw materials such as beef and chicken to see the availability of the previous week. In planning the amount of production that is running, the planning manager is not right in determining the amount of production, because there is an excess of products in production, this excess is caused not to check the number of requests first. Judging from the product inventory data in 2017, there was an excess of products with an average of 170 bales per month consisting of 23bal beef sausage, 25bal chicken sausage, 24bal chicken base, 24bal beef base, 25bal mini meatballs, special meatball (SPL) 24bal and nuggets 25bal.

Problems that occur in scheduling the absence of a sequence of products to be produced first without regard to the number of requests resulting in the delay of the finished product.). Both of these processes show that the planning manager is not right in determining the amount of production because it is seen from the average excess final stock and the head of production is not right in scheduling production because of the delay in product supply.

The purpose of this research is as follows:

1. Assist Planning Manager in determining the amount of production of each type of product to be produced.
2. Assist the Head of Production in planning the production schedule of the number of requests.

2. ISI PENELITIAN

2.1 Pengertian Sistem Informasi Manajemen

Management information system is a group of interconnected subsystems, gathering together and forming a unit, sharing and connecting between one another with certain ways to manage data, receive input (input) in the form of data / facts, then process it (processing), and produce output (output) consists of information needed to obtain decisions that are useful and have a real value that can be accepted related to the good right then in the future, supporting operational activities, managerial, and organizational strategies, using various sources

power available and available for the function to achieve the goal [1].

2.2 Pengertian Manajemen Produksi

Production management is a science that comprehensively discusses how the company's production management uses scientific methodologies by directing and managing resources to achieve the desired production results [2].

2.3 Pengertian Proses Produksi

Production is an activity that aims to produce something, while the process is a method or way that is done. The production process can be interpreted as ways, methods and techniques to create or add to the use of an item or service using existing resources (labor, machinery, materials and funds) [3].

2.4 Model Manajemen produksi

Management is managing all forms with a predetermined goal. The actions taken are planning, the production process, and controlling .

2.5 Inferensi Fuzzy Mamdani

The Mamdani method is "a type of fuzzy inference where the fuzzy set which is a consequence of each rule is combined from each Fuzzy rule and then defuzzified to produce a specific output from a system". Fuzzy Inference System Mamdani Method is also known as the Max-Min method. "The Mamdani method works according to linguistic rules." This method was introduced by Ebrahim Mamdani in 1975 ..

The Fuzzy Mamdani Inference System, four stages are needed namely [4] :

1. Formation of fuzzy sets (Fuzzyfication).

In the Mamdani method both input variables and output variables are divided into two or more fuzzy sets.

2. Function implications.

In the Mamdani Method, the implication function used is max-min.

1. The composition of the rules.

The method used in performing fuzzy system inference is the Max-Min Method. Generally can be written:

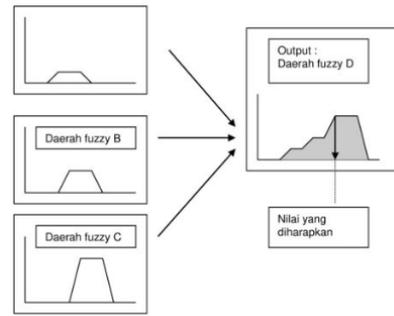
$$\mu_{sf}[X_i] = \max(\mu_{sf}[X_i], \mu_{kf}[X_i]) \quad (1)$$

Dengan :

$\mu_{sf}[X_i]$ = fuzzy solution membership value until rule i

$\mu_{kf}[X_i]$ = fuzzy constant member membership value to i

2. Defuzzification.



Gambar 1. Proses defuzzifikasi

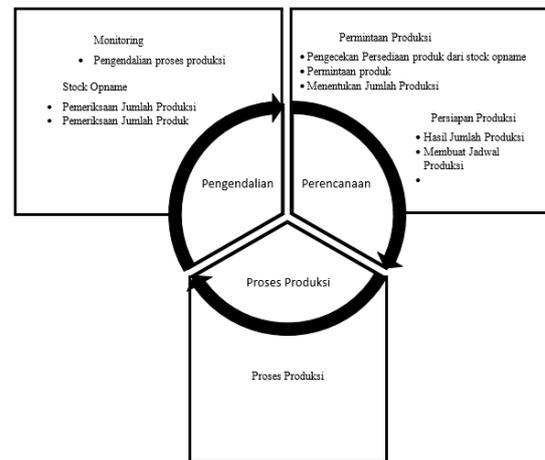
2.6 Analisis Masalah

Based on the results of interviews conducted at PT. Mallesso Investama Abadi to Mr. Iwan Kurniawan as the production manager stated that at present the company still has the following constraints:

1. Planning Manager is not right in determining the amount of production.
2. The head of the production department is not quite right in planning the production schedule.

2.7.1 Analisis Sistem Informasi Manajemen Produksi di PT. Mallesso Investama Abadi.

The Production Management Information System Model aims to provide an overview of each management process in the production management information system at PT.Mallesso Investama Abadi.



Gambar 2. Model Sistem Informasi Manajemen Produksi

2.7.1.1 Analisis Sistem Informasi Manajemen Produksi

1. Planning (Perencanaan)

At this stage to set targets or targets to be achieved in the improvement of the process or problem to be solved, then determine the methods to be used to achieve the targets or targets that have

been set. Following is the process that is in the planning stage.

a. Product request

- Checking product availability from the results of the inventory taking.

Tabel 1. Data persediaan produk 2017

Jumlah Persediaan 2017							
Tanggal	Sosis		Basis		Bakso Mini	Bakso SPL	Nugget
	Ayam	Sapi	Ayam	Sapi	Sapi	Sapi	Ayam
Jan-2017	20	17	19	16	19	20	20
Feb-2017	14	13	19	15	18	14	19
Mar-2017	25	29	26	31	32	29	33
Apr-2017	18	15	21	19	20	22	17
Mei-2017	26	30	29	25	30	27	27
Jun-2017	10	15	17	18	17	18	14
Jul-2017	23	19	22	24	22	20	23
Agu-2017	28	29	31	28	32	25	27
Sep-2017	28	24	27	23	26	29	30
Okt-2017	27	25	24	26	28	30	28
Nov-2017	30	32	29	33	31	29	33
Des-2017	30	31	29	30	31	27	32
Jumlah	279	279	293	288	306	290	303

- Product request

This process is carried out to find out which products have many requests so they can be produced first.

Tabel 2. Data permintaan produk 2017

Jumlah Permintaan 2017							
Tanggal	Sosis		Basis		Bakso Mini	Bakso SPL	Nugget
	Ayam	Sapi	Ayam	Sapi	Sapi	Sapi	Ayam
Jan-2017	3327	3207	2527	2327	4427	4543	3378
Feb-2017	3017	2931	2375	2287	4405	4510	3130
Mar-2017	3217	3107	2237	2325	4599	4629	3338
Apr-2017	3169	3127	2437	2410	4361	4287	3487
Mei-2017	3127	3176	2647	2334	4575	4370	3398
Jun-2017	3220	3117	2639	2532	4649	4587	3254
Jul-2017	3207	3231	2238	2325	4599	4629	3338
Agu-2017	2867	2817	2687	2312	4430	4654	3500
Sep-2017	3117	2931	2537	2350	4405	4510	3130
Okt-2017	3127	2927	2395	2357	4644	4431	3129
Nov-2017	2997	2973	2257	2335	4647	4466	3075
Des-2017	3207	3067	2554	2729	4601	4467	3635

- Determine the amount of production

This process is carried out to determine the amount to be requested based on the recapitulation of demand and supply of chicken sausage products in 1 year. At this stage, it is determined for a 1-year chicken sausage production plan with monthly application.

Tabel 3. Data Permintaan dan Persediaan 2017

No	Periode Tahun 2017	Jumlah Produksi		Jumlah Permintaan		Jumlah Persediaan	
		Sosis		Sosis		Sosis	
		Ayam	Sapi	Ayam	Sapi	Ayam	Sapi
1	Januari	3341	3221	3327	3207	20	17
2	Februari	3033	2947	3017	2931	14	13
3	Maret	3246	3136	3217	3107	25	29
4	April	3188	3146	3169	3127	18	15
5	Mei	3155	3204	3127	3176	26	30
6	Juni	3236	3133	3220	3117	10	15
7	Juli	3229	3275	3207	3231	23	19
8	Agustus	2896	2846	2867	2817	28	29
9	September	3144	2958	3117	2931	28	24
10	Oktober	3154	2954	3127	2927	27	25
11	November	2987	2957	2997	2973	30	32
12	Desember	3237	3097	3207	3067	30	31

1. Formation of a set

Determine the variables related in the process to be determined and the corresponding fuzzification function. In this case, there are 3 variables to be modeled, namely:

- a. Demand (x) (pmt), which consists of 2 fuzzy sets, i.e. DOWN and UP. Based on the demand data for the biggest chicken sausages and the smallest chicken sausages in 2017 can be seen in table 2, the membership function is as follows:

Variable membership function (x) Request:

pmtDown

$$= \begin{cases} 1 & ; x \leq 2997 \\ 3327 - X & ; 2997 \leq x \leq 3327 \\ 0 & ; x \geq 3327 \end{cases} \quad (x)$$

pmtUp

$$= \begin{cases} 0 & ; x \leq 2997 \\ x - 2997 & ; 2997 \leq x \leq 3327 \\ 1 & ; x \geq 3327 \end{cases} \quad (y)$$

By using the function above, if the demand for chicken sausage is 3217, then the membership value is as follows:

$$\text{pmtDown}(3217) = \frac{3327-3217}{3327-2997} = 0,333$$

$$\text{pmtUp}(3217) = \frac{3217-2997}{3327-2997} = 0,667$$

- a. Inventory (y) (psd), consists of 2 fuzzy sets, namely LITTLE and MANY. Based on the stock of the most chicken sausages and the smallest sausage in 2017 can be seen in table 1. then the membership function is as follows:

Variable membership function (y) Inventory

psdLittle

$$1 \quad ; x \leq 10 \quad (y)$$

$$= \begin{cases} 30 - y & ; 10 \leq x \leq 30 \\ 30 - 10 & ; x \geq 30 \\ 0 & \end{cases}$$

$$\text{psdMany} = \begin{cases} 0 & ; x \leq 10 \\ x - 10 & ; 10 \leq x \leq 30 \\ 30 - 10 & ; x \geq 30 \\ 1 & \end{cases} \quad (y)$$

If inventory is 30, membership values can be obtained as follows:

$$\text{psdLittle}(30) = \frac{30-30}{30-10} = 0$$

$$\text{psdMany}(30) = \frac{30-10}{30-10} = 1$$

- a. Production (z) (Prod), consists of 2 fuzzy sets, which are REDUCED and ADDED. Based on the number of maximum chicken sausage production and minimum chicken sausage in 2017 can be seen in table 3, the membership function is as follows:

Membership function for variable (z) Production

$$\text{Reduced production} = \begin{cases} 1 & ; x \leq 2896 \\ 3341 - z & ; 2896 \leq x \leq 3341 \\ 3341 - 2896 & ; x \geq 3341 \\ 0 & \end{cases} \quad (z)$$

$$\text{prodBertambah} = \begin{cases} 0 & ; x \leq 2896 \\ x - 2896 & ; 2896 \leq x \leq 3341 \\ 3341 - 2896 & ; x \geq 3341 \\ 1 & \end{cases} \quad (z)$$

If you know the production of 3246 bales, with the membership function above. Then the membership value can be calculated as follows:

$$\text{psdSedikit}(3246) = \frac{3341-3246}{3341-2896} = 0,2$$

$$\text{psdBanyak}(3246) = \frac{3246-2896}{3341-2896} = 0,8$$

1. Aplikasi fungsi implikasi
 - (R1) If Permintaan TURUN and Persediaan BANYAK THEN Produksi Berkurang.
 $\alpha \text{ predikat1} = \text{pmtTurun} \cap \text{psdBanyak} = \min(\text{pmtTurun}(3217) \cap \text{psdBanyak}(30)) = \min(0,333 ; 1) = 0,333$
 - (R2) If Permintaan TURUN and Persediaan SEDIKIT THEN Produksi barang Berkurang.
 $\alpha \text{ predikat2} = \text{pmtTurun} \cap \text{psdSedikit} = \min(\text{pmtTurun}(3217) \cap \text{psdSedikit}(30)) = \min(0,333 ; 0) = 0$
 - (R3) If Permintaan NAIK and Persediaan BANYAK THEN produksi barang bertambah.
 $\alpha \text{ predikat3} = \text{pmtNaik} \cap \text{psdBanyak} = \min(\text{pmtNaik}(3217) \cap \text{psdBanyak}(30)) = \min(0,667 ; 1) = 0,667$
 - (R4) If Permintaan NAIK and Persediaan BANYAK THEN produksi barang bertambah.

$$\alpha \text{ predikat4} = \text{pmtNaik} \cap \text{psdSedikit} = \min(\text{pmtNaik}(3217) \cap \text{psdBanyak}(30)) = \min(0,667 ; 0) = 0$$

2. Composition Between Rules

From each rule the results of the application of the implication function are used the MAX method to do the composition between all the rules. Then, the results can be seen as shown below:

In the picture the result area is divided into 3 parts, namely A1, A2, A3. Next look for the value of A1 and A2.

$$(a1 - 2896)/3327 = 0 \rightarrow a1 = 2896$$

$$(a2 - 2896)/3327 = 0,6 \rightarrow a2 = 3192,815$$

From these results can be obtained, the membership function for the results of this composition are:

$$0 \quad ; z \leq 2896$$

$$(z) = \begin{cases} z - 2896 & ; 2896 \leq z \leq 3327 \\ 3327 & \end{cases}$$

$$0,6 \quad ; z \geq 3327$$

3. Affirmation (defuzzy)

The assertion method used is centroid. So, the first is to calculate the moment of each region.

$$M1 = \int_0^{2896} (0)zdz = \frac{0^{1+1}}{1+1} = 0 \quad z^2 \Big|_0^{\dots} = 0$$

$$M2 = \int_{2896}^{3327} \frac{(z-2896)}{3327} z dz = \int_{2896}^{3327} \left(\frac{1}{3327} z^2 - \frac{2896}{3327} z \right) dz$$

$$= \int_{2896}^{3327} (0,000040866 z^2 - 0,93040 z) dz$$

$$= \frac{0,000040866}{2+1} z^{2+1} - \frac{0,93040}{2} z^2 \Big|_{2896}^{3327}$$

$$= 0,000013622 z^3 - 0,4652 z^2 \Big|_{2896}^{3327}$$

$$= (0,000013622(24470)^3 - (0,000013622(22767)^3 - (0,4652(24470)^2 - (0,4652(22767)^2$$

$$= (199591841 - 160752708) - (278552875 - 241130042)$$

$$= (38839133) - (37422833)$$

$$= 5283305,1883669$$

$$M3 = \int_{2896}^{3327} (0,6)zdz$$

$$= 0,3z^2 \Big|_{2896}^{3327}$$

$$= 0,3(24470)^2 - 0,3(22767)^2$$

$$= 179634270 - 155500887$$

$$= 322899.16082096$$

Next we calculate the area of each region:

$$A1 = 2896 * 0 = 0$$

$$A2 = (0 + 0,6) * (3327 - 2896) / 2$$

$$= (0,6) * (1703/2)$$

$$= 8261,1935665449$$

$$A3 = (3327 - 2896) * 0,6$$

$$= 98,839395$$

Then the central point can be obtained as

follows:

$$Z = \frac{5606240,3491878}{1832,6441975} = 3059,0795293683$$

From the results of the Mamdani method it was found that the amount of production for January 2017 was 3059.0795293683 rounded up to 3059 Bal.

Then it can be concluded that in January 2017 PT. Mallesso Investama Abadi is recommended to produce 3059 bales of chicken sausage which must be produced.

- Make a Production Schedule

This process is carried out after planning the amount of production and the results of the plan will be made a production schedule.

Tabel 4. Jadwal Produksi

Jadwal Produksi Bulan Juli 2019					
No	Nama Produk	Jumlah Produk	Durasi	Tanggal Mulai	Tanggal Selesai
1	Sosis Ayam	3059	3 hari	01/07/2019	03/07/2019
2	Sosis Sapi	3107	3 hari	04/07/2019	06/07/2019
3	Basis Ayam	2520	3 hari	08/07/2019	10/07/2019
4	Basis Sapi	2270	2 hari	11/07/2019	12/07/2019
5	Bakso Mini	4770	5 hari	13/07/2019	18/07/2019
6	Bakso Spesial	4548	5 hari	19/07/2019	24/07/2019
7	Nugget	3306	3 hari	25/07/2019	27/07/2019

2. Production process

The production process is the stages - the process of making products from raw materials to finished materials. In the production process has the following stages:

Tabel 5. Proses produksi

Proses Produksi				
Kode Mesin	Nama Mesin	Nama Produk	Status	Aksi
GR01	Grading	Sosis Ayam	C B H	Selesai
MX01	Mixing	Sosis Ayam	C B H	Selesai
ST01	Stuffing	Sosis Ayam	C B H	Selesai
MA02	Mauting	Sosis Ayam	C B H	Selesai
BL01	Blower	Sosis Ayam	C B H	Selesai
CT01	Cutting	Sosis Ayam	C B H	Selesai
PC01	Packaging	Sosis Ayam	C B H	Selesai

3. Controlling

The stage in which all activities of the production process are controlled or can be interpreted as supervision, which at the same time can take several actions for improvement.

a. Monitoring

- Control of the Production Process

Control of the production process to determine the existing processes in the production process in the event of a disruption.

Tabel 6. Pengendalian Proses Produksi

Proses Produksi				
Kode Mesin	Nama Mesin	Nama Produk	Status	Aksi
GR01	Grading	Sosis Ayam	C B M	S T
MX01	Mixing	Sosis Ayam	C B M	S T
ST01	Stuffing	Sosis Ayam	C B M	S T
MA02	Mauting	Sosis Ayam	C B M	S T
BL01	Blower	Sosis Ayam	C B M	S T
CT01	Cutting	Sosis Ayam	C B M	S T
PC01	Packaging	Sosis Ayam	C B M	S T

a. In Stock

- Inspection of the amount of production

This process is to check the amount of production in accordance with the amount of planning.

Tabel 7. Jumlah Produksi

Tanggal	Sosis		Basis		Bakso Mini	Bakso SPL	Nugget
	Ayam	Sapi	Ayam	Sapi	Sapi	Sapi	Ayam
Jan-2017	3427	3307	2557	2387	4457	4543	3378
Feb-2017	3117	3031	2375	2287	4405	4510	3130
Mar-2017	3277	3107	2237	2325	4599	4629	3338
Apr-2017	3169	3127	2437	2410	4361	4287	3487
Mei-2017	3127	3176	2647	2334	4575	4370	3398

- Product Number Check

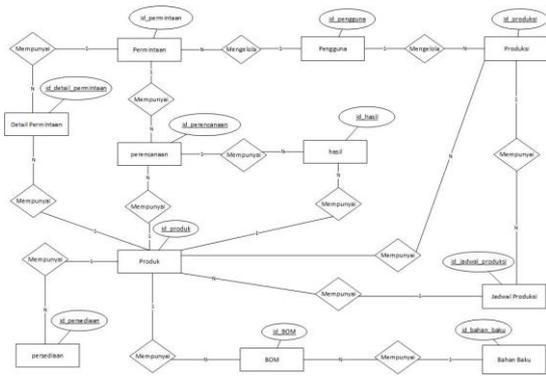
This process checks the amount of inventory of finished products.

Tabel 8. Jumlah Persediaan Produk

Tanggal	Sosis		Basis		Bakso Mini	Bakso SPL	Nugget
	Ayam	Sapi	Ayam	Sapi	Sapi	Sapi	Ayam
Jan-2017	20	17	19	16	19	20	20
Feb-2017	14	13	19	15	18	14	19
Mar-2017	25	29	26	31	32	29	33
Apr-2017	18	15	21	19	20	22	17
Mei-2017	26	30	29	25	30	27	27

2.8 Analisis Basis Data

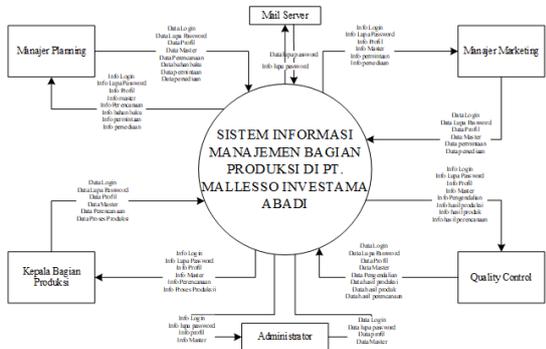
Database analysis on human resource management information systems in Miski Aghnia Corporation will be built using Entity Relationship Diagrams (ERD) and data dictionaries that aim to describe the design process or picture data that are interconnected and stored in the system.



Gambar 3. Diagram ERD

2.9 Diagram Konteks

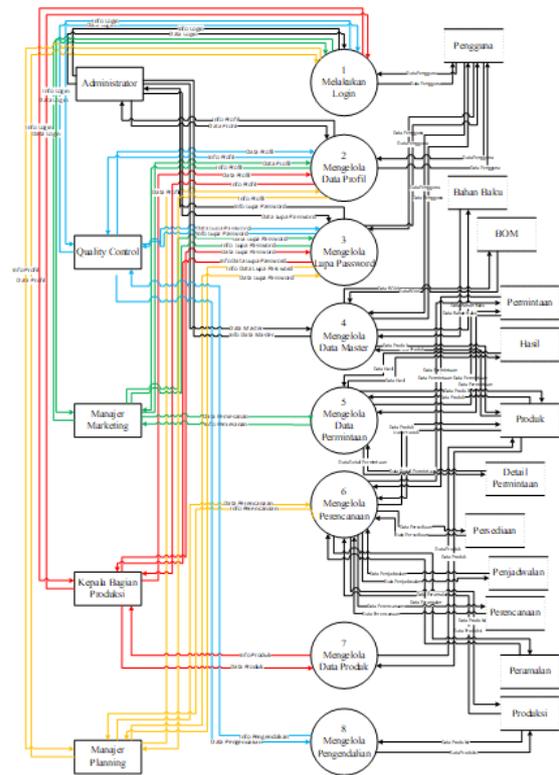
Rainy context diagram to illustrate the relationship between external entities, input and output of the system being built, also used to describe the system for the first time in outline.



Gambar 4. Diagram Konteks

2.10 Data Flow Diagram

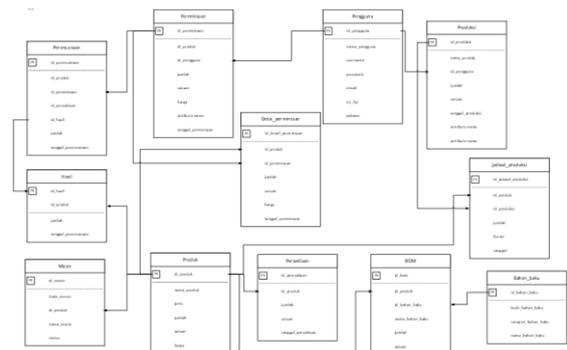
DFD is used to present a graph that illustrates the flow of information and transformation of information that is applied as data flowing from the input (input) and output (output) in each process that is connected with the data flow.



Gambar 5. Data Flow Diagram (DFD) Level 1

2.11 Skema Relasi

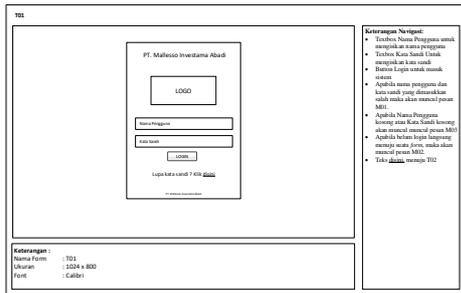
Relationship schemes are relations that exist between tables that have the same primary key, so the data in that table are interconnected because of the same key. The following is the relation scheme that will be built on the production management information system at PT.Mallessso Investama Abadi:



Gambar 6. Skema relasi

2.12 Perancangan Antarmuka

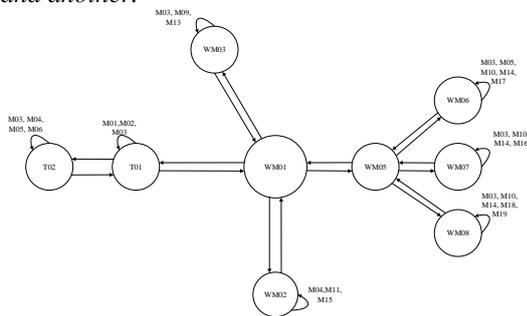
The design of this interface serves to describe the appearance of the program that will be used by users to interact with the system that will be built. Following is the design of the interface on the production management information system at PT.Mallessso Investama Abadi:



Gambar 7. Tampilan Login

2.13 Jaringan Semantik

Semantic networks are made to illustrate the connectedness of menu navigation between one page and another.



Gambar 8. Jaringan semantik Manajer Planning

2.14 Pengujian Sistem

System testing is the most important thing done with the intention of finding errors - mistakes or deficiencies in the information system being tested. Testing also has the aim to find out whether the system that has been made is in accordance and meets the needs of the information system design goals. This system testing is based on two tests namely blackbox testing and end user testing. Blackbox testing is done by observing the results of execution through test data and focusing on the functional requirements of the software, while the end user testing is carried out to determine the results and the extent of the quality of the software that has been built. The research method used is the interview method that will be submitted to prospective users to see whether it is in accordance with the objectives of the research conducted, namely Planning Manager.

2.14.1 Pengujian BlackBox

This management information system testing uses test data based on data contained in PT. Mallesso Investama Abadi.

Tabel 9. Pengujian Login

Kasus dan Hasil Uji (Data Benar)			
Data Masukan	Yang diharapkan	Pengamatan	Kesimpulan
Username : "admin" Kata Sandi : "admin"	Memasukan data login yang telah terdaftar	Muncul Pesan "Login Berhasil"	[√] diterima [] ditolak
Kasus dan Hasil Uji (Data Salah)			

Data Masukan	Yang diharapkan	Pengamatan	Kesimpulan
Username : "admin" Kata Sandi : "qwerty"	Muncul pesan "username / kata sandi salah"	Muncul pesan "username / kata sandi salah"	[√] diterima [] ditolak
Username : "qwerty" Kata Sandi : "admin"	Muncul pesan "username / kata sandi salah"	Muncul pesan "username / kata sandi salah"	[√] diterima [] ditolak
Kasus dan Hasil Uji (Data Kosong)			
Data Masukan	Yang diharapkan	Pengamatan	Kesimpulan
Username : "admin" Kata Sandi : " "	Muncul pesan "username / kata sandi salah"	Muncul pesan "username / kata sandi salah"	[√] diterima [] ditolak
Username : " Kata Sandi : "admin"	Muncul pesan "username / kata sandi salah"	Muncul pesan "username / kata sandi salah"	[√] diterima [] ditolak
Username : " Kata Sandi : " "	Muncul pesan "username / kata sandi salah"	Muncul pesan "username / kata sandi salah"	[√] diterima [] ditolak

2.14.2 User Acceptance Test (UAT)

Newly built applications will be tested through the User Acceptance Test (UAT) as a condition to prove that the application has been accepted by the user / user. The application testing process will be addressed to company representatives, namely to the Planning Manager at PT. Mallesso Investama Abadi

Tabel 10. Pengujian User Acceptance Test (UAT)

No	Deskripsi Pengujian	Prosedur Pengujian	Keluaran yang Diharapkan	Hasil yang didapatkan	Status
1	Pengujian Login User	<ul style="list-style-type: none"> Klik menu login Masukkan nama pengguna dan kata sandi Tekan tombol masuk 	User dapat masuk ke halaman utama user	User dapat masuk ke halaman utama user	[√] Diterima [] Ditolak [] Diterima dengan catatan

2.14.3 Pengujian Pengguna Akhir

End-user testing aims to determine the quality of the system that has been built, whether it is in accordance with the objectives of the research conducted or not. The steps taken for testing this end user are by conducting interviews or giving questions to prospective users of the software in accordance with the existing goals.

Based on the results of interviews with Mr. Iwan Kurniawan through face to face to face, are as follows:

1. Is this production management information system able to help the planning manager in determining the amount of production in the company?

Answer:

According to Mr. Iwan Kurniawan as the Production Manager is, this system is enough to help the company, especially planning managers in

determining the amount of production because this system is able to meet the needs of the company in carrying out activities to determine the amount of production.

3. PENUTUP

This chapter will discuss the conclusions obtained after conducting analysis, system design, and implementation of software that has been built before, as well as suggestions that are built for the improvement and further development of software.

3.1. Kesimpulan

After analyzing, designing, and testing. Then a conclusion can be drawn towards the Production Management Information System at PT. Mallesso Investama Abadi is as follows:

- 1. Production Management Information System at PT. Mallesso Investama Abadi can assist the Planning Manager in determining the amount of production in accordance with the number of requests for each product.*
- 2. Production Management Information System at PT. Mallesso Investama Abadi can assist the Head of Production in scheduling the production of each type of product based on the largest number of requests.*

3.2. Saran

Based on the results of system testing, obtained some suggestions that can be taken into consideration. Suggestions that can be considered include during an interview with the Production Manager including:

- 1. Production management information system needs to be developed like a display to make it more attractive.*
- 2. Production management information system needs additional menu distribution.*

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