

# Implementation of Data Warehouse for Food Sales Strategy Using Snowflake Schema Model

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## Abstract

Waroenk kids collage is a restaurant that sells various types of food menus and is located in Indonesia, Jakarta. This restaurant has data that accumulates and accumulates without any continuation of that data. This is not supported by the final report. Therefore, it is necessary to build a data warehouse that can be used as information for waroenk restaurant owners for college children. One of the important processes in the operation of the data warehouse is the process of copying data from the operational database. Before the data enters the data warehouse, the ETL (extract, transform, load) process is carried out on the data. This scheme is designed for the data warehouse at Waroenk Anak Kampusan using the Snowflake Schema model. The results of the research show that the Waroenk Anak Kampusan data warehouse has four tables (product table, price table, service table and customer dimensions), has one real table, namely the Sales table. All sales data can be monitored by the owner and can find out the total sales data.

**Keywords:** Data Warehouse, Sales Strategy, Snowflake Schema, Waroenk kids collage

## 1. Introduction

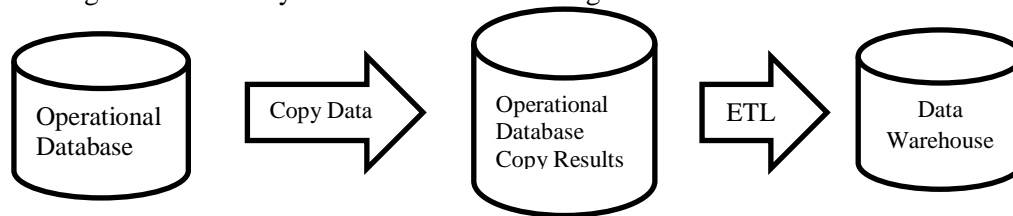
Data warehouse is a system that can combine data from various sources into a single data repository, implement and consistently support business analysis [1] From that explanation, several journal references were found, such as, [2] Design and Implementation of sales data warehouse (Case Study : Northwind Sample Database) By M. Firdaus Zulkarnain, Ni Putu Novia Ardiyanti, I Wayan Wijaya K Sandi, I Dewa Ngurah T Hendrawan, Ida Bagus M Mahendra in 2021 resulted in the data warehouse integration process using the ETL concept with the help of Pentaho Data Integration. [3] Implementation of Data Warehouse and Sales Data to Determine Strategic Plan for Batik Sales (Case Study of Batik Mahkota Laweyan) by Fatah Yasin Al Irsyadi in 2014 resulted that all monitoring of data on Batik Mahkota Laweyan products was carried out using a cube browser. [4] The design of a data warehouse to support executive information systems at the Ummu'L Quro foundation in Depok by Syamsul Bakhri1, Yamin Nuryamin in 2018 the results have that a database and its applications can be carried out to analyze transactional information that occurs in the education unit at the Ummu'l Quro Foundation, Depok, which is used to support the decision-making process by the leadership. From some of the references above, a data warehouse is designed that can be used as a good source of information for waroenk owners for college students related to sales strategies for the future with price, taste quality, customer discounts.

## 2. Research Methodology

Research methodology is a scientific process or method to obtain data that will be used for research purposes[5].

### 2.1. Data Collection Method

Data collection in this study used a literature study from several comparison journals, and by searching for data directly from waroenk kids college.



**Figure 1.** Data warehouse architecture for marketing strategy

In Figure 1 above is the data architecture for marketing strategies for college students where the initial process is to get an operational database, copy the data, how are the results from the data copy, do the ETL process, then the results are finally obtained.

### 2.2. Transaction Data

The data needed to build a marketing data warehouse is from data sources from restaurants. Based on the results of data collection at Waroenk kids collage, the data obtained is derived from daily, weekly, monthly sales transaction records stored in Microsoft Excel.

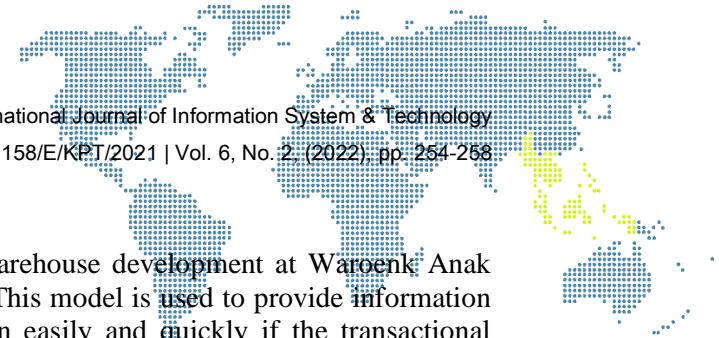
**Table 1.** Transaction Data

	PRODUK	HARGA	PELAYANAN	PELANGGAN
1	Nasi Goreng Seafood	18000	Baik	Sari
2	Chicken Steak Mushroom	25000	Sangat Baik	Fahmi
3	Chicken Steak Mozzarella	25000	Baik	Arum
4	Nasi Goreng Seafood	18000	Baik	Leony Ratih
5	Nasi Goreng Ayam	15000	Cukup	Yantri Sukanti
6	Chicken Mushroom	25000	Baik	Wiske Ratna
7	Nasi Goreng Original	12000	Baik	Peggy Rosana
8	Chicken Steak Single	17000	Baik	Rama
9	Nasi Goreng Ayam	15000	Sangat Baik	Yasna Alfath
10	Nasi Goreng Ayam	15000	Sangat Baik	Dicky Saptoaji
11	Chicken Mozzarella	25000	Baik	Slamet Subandi Purnungkas
12	Nasi Goreng Ayam	15000	Cukup	Aryo Setvo whono
13	Nasi Goreng Mushroom	17000	Baik	Hendra G
14	Nasi Goreng Original	12000	Sangat Baik	Abdullah Achmad
15	Sirloin Mozzarella	35000	Baik	Sylviana
16	Nasi Goreng Seafood	18000	Sangat Baik	Resty
17	Nasi Goreng Ayam	15000	Sangat Baik	Rosafery
18	Chicken Mozzarella	25000	Baik	Sarah Nabila
19	Nasi Capcay Seafood	20000	Kurang Baik	Haris
20	Nasi Goreng Mushroom	17000	Baik	Joko
21	Nasi Goreng Ayam	15000	Sangat Baik	Rangga
22	Nasi Ayam Bakar	20000	Sangat Baik	Ibu Ida
23	Nasi Goreng Seafood	18000	Sangat Baik	Resty
24	Nasi Goreng Seafood	18000	Sangat Baik	Rusky Fahmansyah
25	Chicken Mozzarella	25000	Baik	Ipani
26	Nasi Goreng Original	12000	Sangat Baik	Muhammad Iqbal
27	Sirloin Mozzarella	35000	Baik	Hanum Alharum
28	Nasi Goreng Seafood	18000	Kurang Baik	Ibu Iri
29	Nasi Ayam Bakar + Ati Ayam Bakar	40000	Sangat Baik	Siti Syaputra
30	Nasi Capcay Seafood	20000	Baik	Taufik Soemantri
31	Nasi Capcay Seafood	20000	Baik	Farhan Syahdan
32	Nasi Goreng Mushroom	17000	Baik	Pak Andi
33	Nasi Goreng Ayam	15000	Sangat Baik	Achmad

Table 1 is sales transaction data made in Ms Excel carried out by Waroenk kids collage for 1 year starting in early 2020 until the end of 2021

### 2.3. Understanding the Snowflake Schema

Snowflake schema is a multidimensional database in a data warehouse, this schema is composed of a fact table or fact table in the middle. This table is related to various dimensions which are also grouped in the table [6].

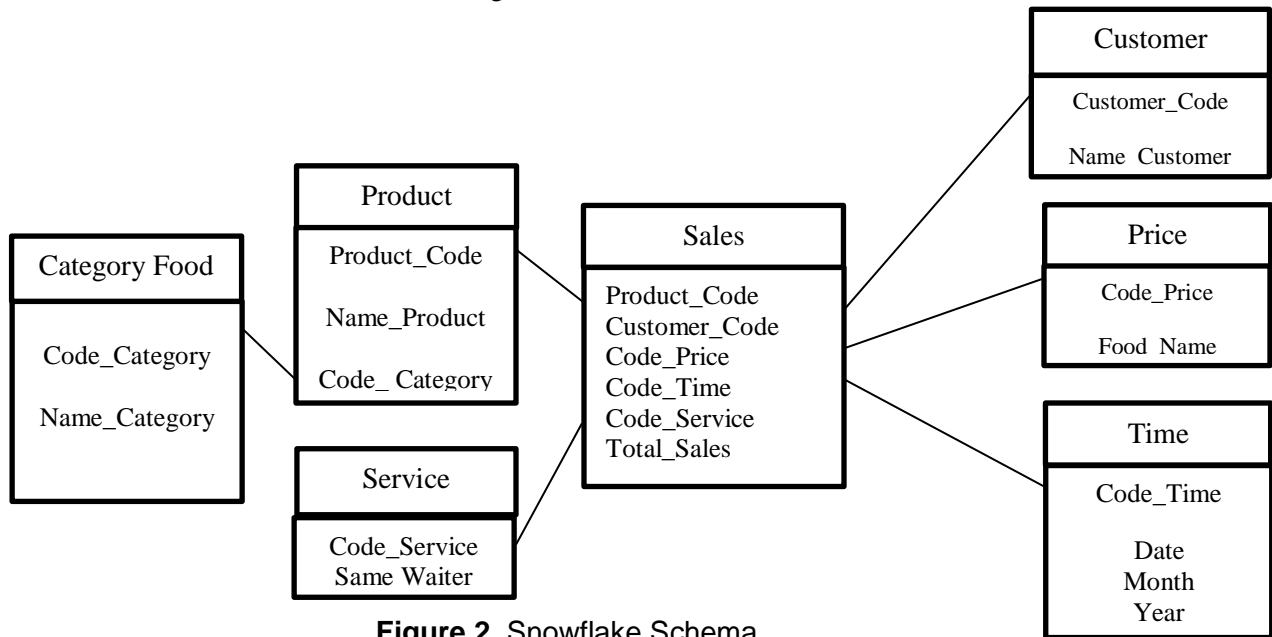


### 3. Results And Discussion

The scheme that has been designed for data warehouse development at Waroenk Anak Kampusan is using the Snowflake Schema model. This model is used to provide information that the restaurant owner wants to find and obtain easily and quickly if the transactional database is difficult to obtain.

#### 3.1 Snowflake Schema Design Results

Based on the results of the determination of the transactional table, it is in the form of the Snowflake Schema which is shown in Figure 2 below:



**Figure 2.** Snowflake Schema

In the picture above, the sales table has product code, customer code, price code, time code and total sales, in each sub category there is time, price, customer, product and type category.

#### 3.2. ETL (Extract, Transform and Load)

Extract Transform Load is a data integration process that combines data from various sources into one consistent storage and is loaded in a data warehouse [7].

#### 3.3. How Works Extract Transform Load

- Data Extraction : Data must be extracted from the source before being moved to another place [7].
- Transformation : The ETL transformation is cleaning and preparing the aggregation for analysis [7].
- Load : ETL loading, transformation into a new record in the data warehouse. Full load is useful for generating exponentially growing and difficult to manage data sets [7].

#### 3.4. Process Extract Transform Load

The ETL process is used to move transactional data from the data source table to the data warehouse [3]. Then the ETL process is needed so that the data entered in the data warehouse is in accordance with the snowflake schema that was designed at the beginning.



**Figure 3.** ETL process in products

In Figure 3 above is the ETL process where the results of the ETL process are in the form of a product table

**Table 2.** Slice of Product Table

Code Product	Name Product
NG_001	Fried rice
ST_001	Steak
RB_001	Toast
ID_001	Indomie

From Table 2 above, you can see a snippet of the contents of the product table

**Table 3.** Category Table Cuts

Code Product	Name Product
NG_002	Fried Rice
NG_003	Chicken Fried Rice
NG_004	Beef Fried Rice
ST_001	Steak
ST_002	Chicken Steak
ST_003	Sirloin Steak
RB_001	Toast
RB_002	Cheese toast
RB_003	Chocolate toast
RB_004	Peanut toast
MG_001	Noodle
MG_002	Chicken Noodle Ayam
MG_003	Beef Noodle

From Table 3 above, it can be seen a snippet of the contents of the category table

**Table 4.** Discounted Price Table

Code Product	Price
NG_002	Rp. 23000
NG_003	Rp. 30000
NG_004	Rp. 25000
ST_001	Rp. 25000
ST_002	Rp. 25000
ST_003	Rp. 30000
RB_001	Rp. 18000
RB_002	Rp. 20000
RB_003	Rp. 21000
RB_004	Rp. 18000
MG_001	Rp. 18000
MG_002	Rp. 20000
MG_003	Rp. 25000

From Table 4 above, you can see a cut from the contents of the price table

**Table 5.** All pieces of data from the sales transaction

Fact Code	Time Code	Kode Product Category	Code Customer	Price	Amount	Total Sales
1	10100	NG_002	P_001	23000	10	230.000
2	10101	NG_003	P_002	23000	10	230.000
3	10102	NG_004	P_003	25000	9	225.000
4	10103	ST_001	P_004	25000	7	175.000
5	10104	ST_002	P_005	25000	10	230.000
6	10105	ST_003	P_006	30000	5	150.000
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200	11000	MG_001	P_200	18000	12	216.000
201	11001	MG_002	P_201	20000	8	160.000
202	11002	MG_003	P_202	25000	5	125.000

From Table 5, we get entire data snippet from the sales transaction table after converted into a Sales Facts table.

#### 4. Conclusion

The data warehouse for Waroenk kids collage has a product table, a price table, a time table, a service table, and a customer table. It has subtables, namely food categories and one fact table, namely sales facts. All monitoring of data in the sale of food products at Waroenk kids collage has been integrated and has been well systemized so that data is not lost.

#### References

- [1] Maria, T. H, 2021, Memahami data warehouse dan manfaatnya, <https://www.ekrut.com/media/data-warehouse-adalah>
- [2] Ni Putu N. Ardiyanti, M, F. Zulkarnain, I, W, Wijaya Kusuma S, I Dewa Ngurah Thendrawan, Ida Bagus Made Mahendra, 2021, Perancangan dan Implementasi Data Warehouse Penjualan (Studi Kasus: Northwind Sample Database) <https://ojs.unud.ac.id/index.php/JLK/article/view/73476>
- [3] Fatah Yasin Al Irsyadi, 2014, Implementasi Data Warehouse dan Data Mining untuk Penentuan rencana strategis Penjualan Batik (Studi Kasus Batk Mahkota Laweyan) <https://journals.ums.ac.id/index.php/komuniti/article/view/2938>
- [4] Syamsul Bakhri, Yamin Nur Yamin , 2018, Rancangan Data Warehouse Untuk Penunjang Sistem Informasi Eksekutif pada Yayasan Ummul Quro di Depok <https://ejournal.bsi.ac.id/ejurnal/index.php/jtk/article/view/2498>
- [5] Admin, 2020, Pentingnya Mengetahui Tujuan Metodologi Penelitian, <https://www.pilarteknotama.co.id/pentingnya-mengetahui-tujuan-metodologi-penelitian/>
- [6] Nadiyah Rahmalia, 2020, Kenalan dengan Snowflake Schema, Struktur Database yang Menyerupai Kepingan Salju, <https://glints.com/id/lowongan/snowflake-schema-adalah/#.YrQfy51BzIU>
- [7] Nur Rosita Dew, 2021, ETL (Extract Transform Load): pengertian dan cara kerjanya, <https://www.ekrut.com/media/etl-adalah>
- [8] Rima, T. A., 2021. Penerapan Metode RAD (Rapid Application Development) Pada Sistem Informasi Promosi dan Pemesanan Makanan Berbasis Website Studi Kasus Restoran Waroenk Anak Kuliah. Building of Informatics, Technology and Science (BITS), 3(3), 446–452. <https://doi.org/10.47065/bits.v3i3.1137> <http://ejurnal.seminar-id.com/index.php/bits/article/view/1137>.