AirbusAerothon5.0

IntoTheAir.

Presented On

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AGENDA

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PROBLEM STATEMENT

- Create a data lake with a normalized DB to reduce redundancy.
- Identify the current redundant data.
- Create an automation process for data stamping(approval) the real-time data.
- Create a dashboard for the Users, and Data Officer

PROPOSED SOLUTION

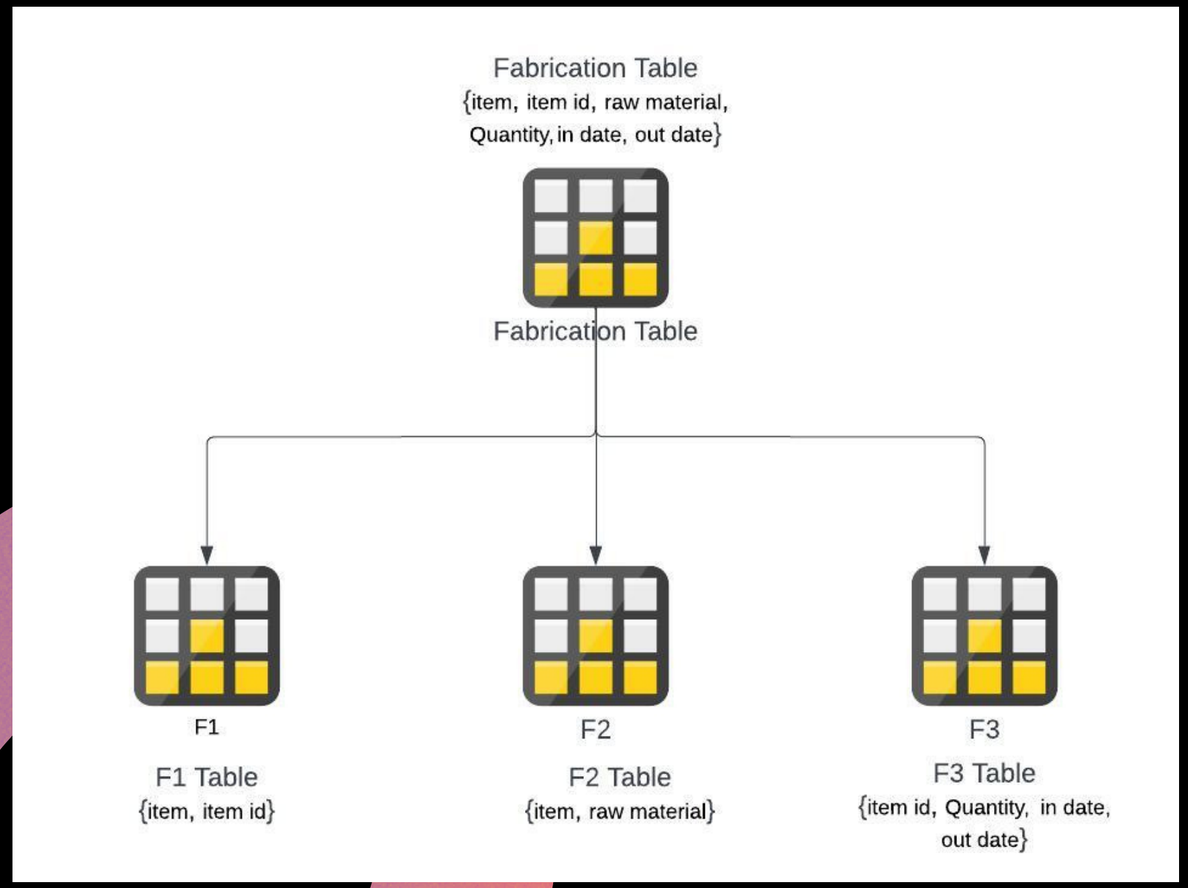
- Create a central data lake to store all data on AWS S3
- Use data profiling techniques to identify redundant data
- Automate data stamping using a workflow
- Workflow approves and timestamps real-time data when a production milestone is reached

ADVANTAGES

- Easy To Access
- Improved data quality
- Improved consistency
- Increased data security
- Improved data analysis capabilities
- Improved decision-making capabilities

METHODOLOGY

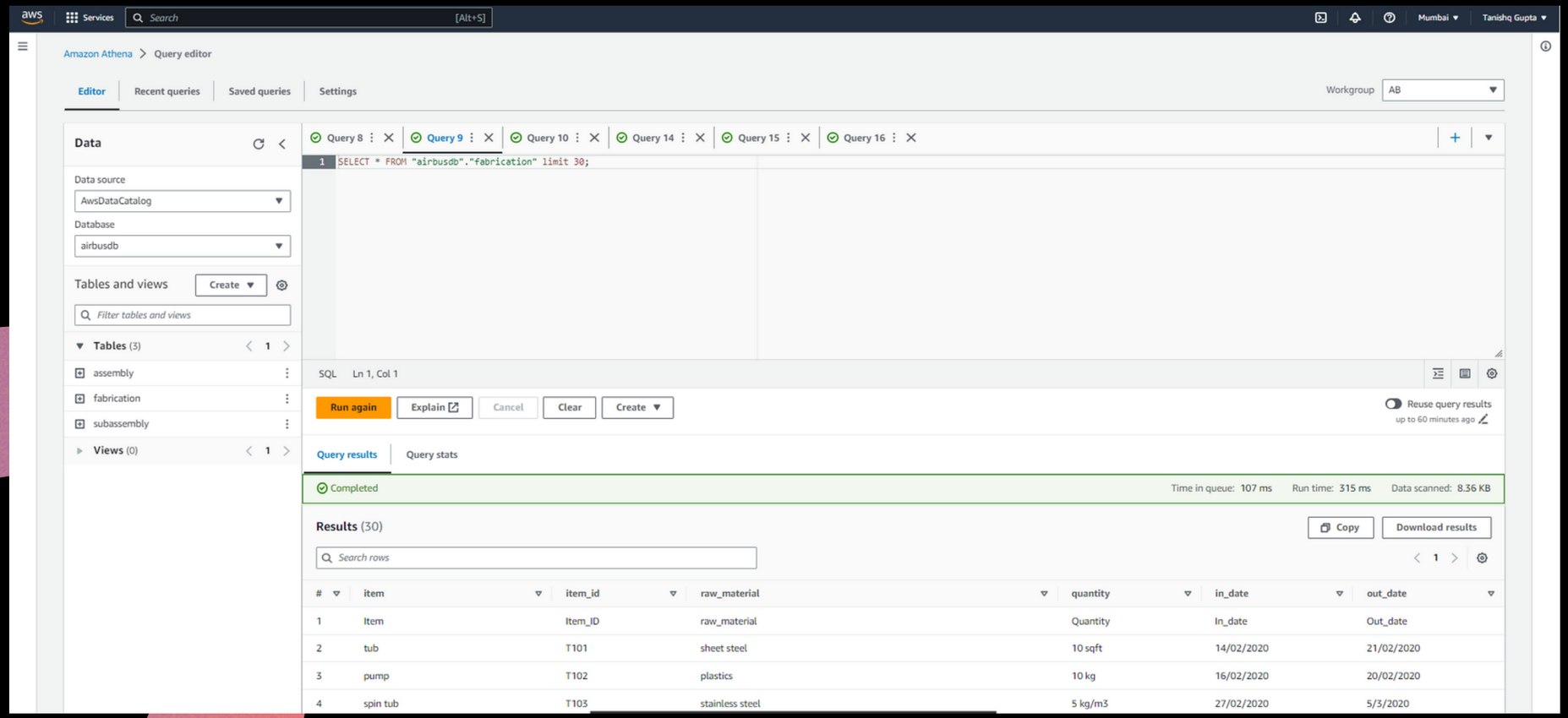
Normalize the table



- Find the redundancy in the dataset
- Normalize the table by dividing it into smaller Table
- Creating SQL Queries
- Uploading the Original Dataset into AWS S3
- Running the created queries on AWS Athena to generate a non-redundant dataset on AWS
- Create a User Interface
- Connecting the AWS S3 API with the FrontEnd

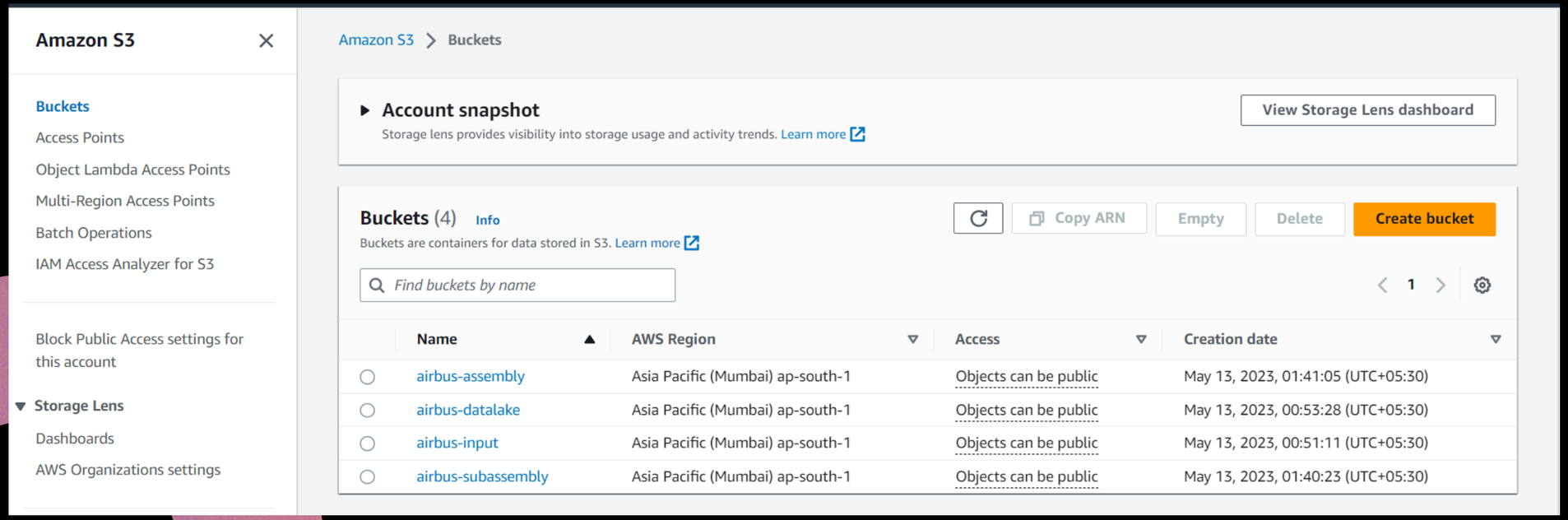
FUNCTIONAL PROTOTYPE

2.1 Running the Query on provided Dataset in AWS Athena



FUNCTIONAL PROTOTYPE

2.2 Creating a Normalized Database in AWS S3



FUNCTIONAL PROTOTYPE

2.3 Non Redundant Dataset in Bucket [airbus-datalake] created in AWS S3

○	airbus-datalake	Asia Pacific (Mumbai) ap-south-1	Objects can be public	May 13,

Objects (6)

Objects are the fundamental entities stored in Amazon S3. You can use Amazon S3 inventory to get a list of all objects in your bucket. For others to access your objects, you'll need to explicitly grant them permissions. Learn more

Copy S3 URI | Copy URL | Download | Open | Delete | Actions | Create folder | Upload

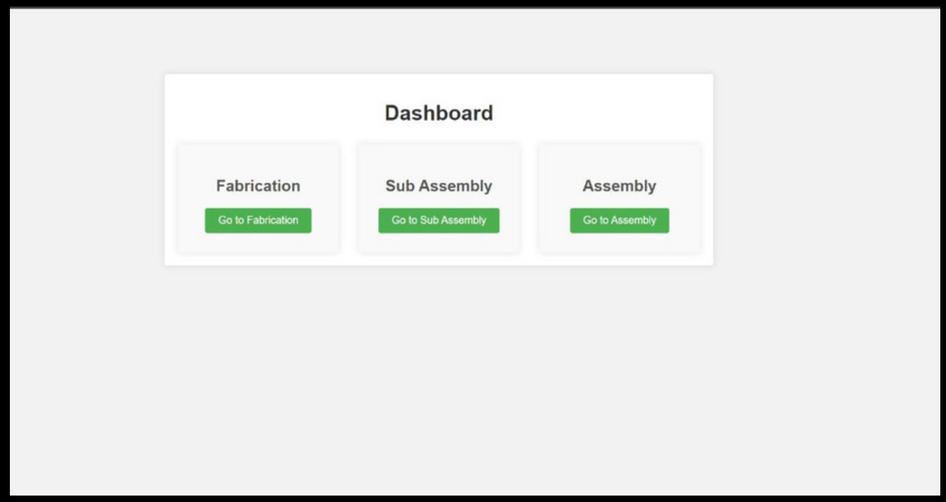
Find objects by prefix

1

Name	Type	Last modified	Size	Storage class
F1.csv	csv	May 13, 2023, 02:21:41 (UTC+05:30)	7.2 KB	Standard
F2.csv	csv	May 13, 2023, 02:21:42 (UTC+05:30)	13.5 KB	Standard
F3.csv	csv	May 13, 2023, 02:21:42 (UTC+05:30)	13.5 KB	Standard
assembly.csv	csv	May 13, 2023, 02:21:41 (UTC+05:30)	2.9 KB	Standard
fabrication_new.csv	csv	May 13, 2023, 02:21:42 (UTC+05:30)	2.2 KB	Standard
newsubassembly.csv	csv	May 13, 2023, 02:21:41 (UTC+05:30)	4.0 KB	Standard

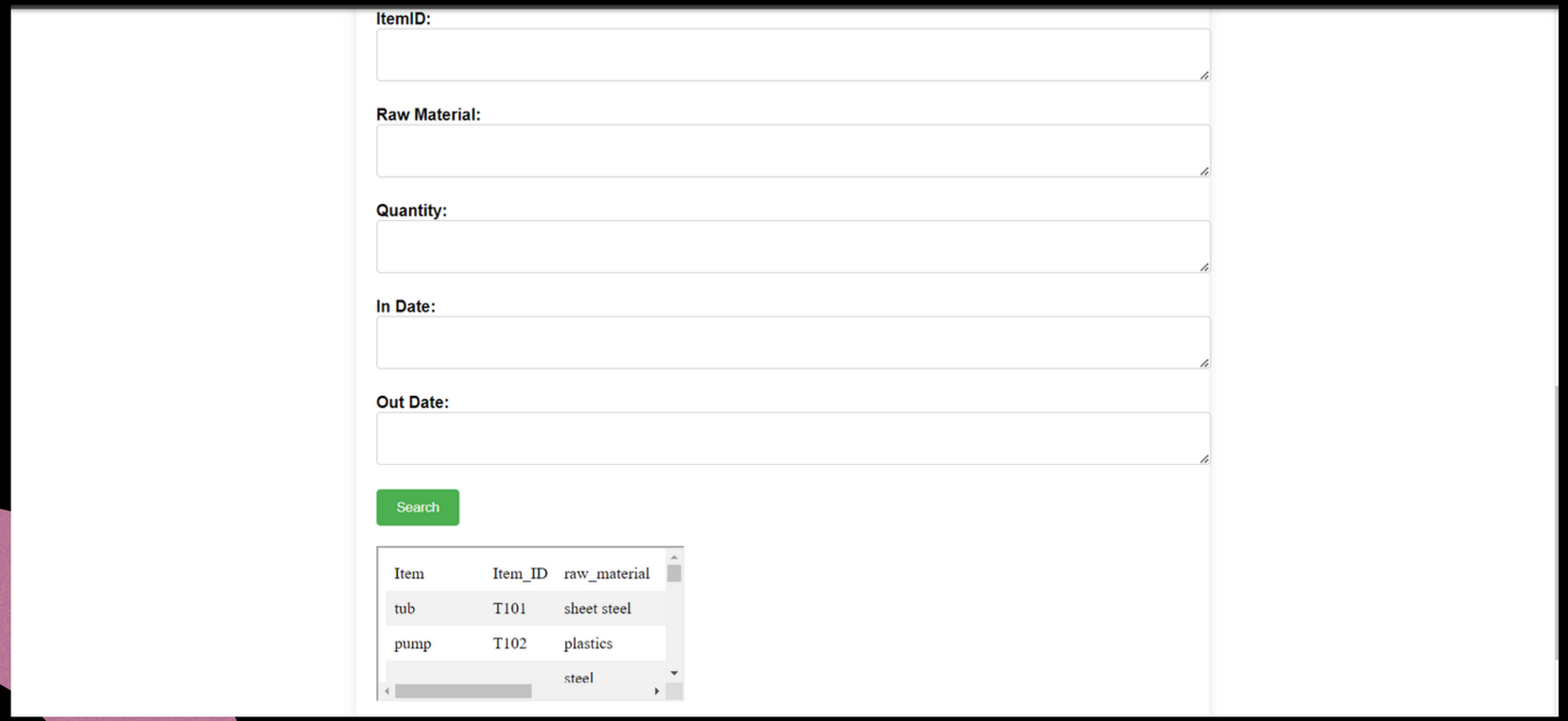
FUNCTIONAL PROTOTYPE

3. Designing the User Interface [Authentication & Authorisation Included]



FUNCTIONAL PROTOTYPE

3.1 Fetched Data on the Dashboard & Option to add Real-Time Data



DATA ANALYSIS

4. Analysis of the Provied Dataset using Python in Jupyter Notebook

jupyter IntoTheAir Last Checkpoint: 20 minutes ago (autosaved) Logout

File Edit View Insert Cell Kernel Widgets Help Not Trusted Python 3 (ipykernel)

Run Code

In [8]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
from collections import Counter
```

In [91]:
```
exf=pd.ExcelFile("data.xlsx")
df1=exf.parse("fabrication")
df1.describe()
```

Out[91]:

	item	item id	raw material	Quantity	in date	out date
count	28	28	28	28	28	28
unique	7	27	8	11	6	8
top	tub	T124	plastics	10 sqft	27/02/2020	2020-05-03 00:00:00
freq	5	2	7	5	8	4

In [26]:
```
df.head()
```

Out[26]:

	item	item id	raw material	Quantity	in date	out date
0	tub	T101	sheet steel	10 sqft	14/02/2020	21/02/2020
1	pump	T102	plastics	10 kg	16/02/2020	20/02/2020
2	spin tub	T103	stainless steel	5 kg/m3	27/02/2020	2020-05-03 00:00:00
3	wash tub	T104	(enameling iron) Porcelain coating	24 gauge	27/02/2020	2020-03-02 00:00:00
4	balance ring	T105	plastics	3 kg	16/03/2020	21/03/2020

In [36]:
```
df2=exf.parse("assembly")
df2.describe()
df2.head()
```

Out[36]:

	process	Process ID	Machine ID	2020-09-03 00:00:00	2020-11-30 00:00:00	Start Date	END DATE	2020-12-02 00:00:00	2021-02-02 00:00:00
0	Component Integration	SAWM3036_FA_WM128	MAII1017ECME3020079	NaN	NaN	2020-10-19	2020-12-11	NaN	NaN

DATA ANALYSIS

4.1 DATA CLEANING

0	Component Integration	SAWM3036_FA_WM128	MAII1017ECME3020079	NaN	NaN	2020-10-19	2020-12-11	NaN	NaN
1	Electrical Testing	SAWM3042_FA_WM134	MAII1017ECME3020080	NaN	NaN	2020-11-26	2020-12-05	NaN	NaN
2	Complaince	SAWM3042_FA_WM135	MAII1017ECME3020081	NaN	NaN	2020-09-10	2021-02-02	NaN	NaN
3	Certification Standards	SAWM3042_FA_WM136	MAII1017ECME3020082	NaN	NaN	2020-08-03	2021-01-06	NaN	NaN
4	pivot dome	SAWM3042_FA_WM137	MAII1017ECME3020083	NaN	NaN	2020-10-18	2021-01-05	NaN	NaN

In [37]:
```
print(df2.isnull().sum())
```

```
process                0
Process ID             0
Machine ID             0
2020-09-03 00:00:00    36
2020-11-30 00:00:00    36
Start Date             0
END DATE               0
2020-12-02 00:00:00    36
2021-02-02 00:00:00    36
dtype: int64
```

In [38]:
```
df2 = df2.dropna(axis=1)
df2.head()
```

Out[38]:

	process	Process ID	Machine ID	Start Date	END DATE
0	Component Integration	SAWM3036_FA_WM128	MAII1017ECME3020079	2020-10-19	2020-12-11
1	Electrical Testing	SAWM3042_FA_WM134	MAII1017ECME3020080	2020-11-26	2020-12-05
2	Complaince	SAWM3042_FA_WM135	MAII1017ECME3020081	2020-09-10	2021-02-02
3	Certification Standards	SAWM3042_FA_WM136	MAII1017ECME3020082	2020-08-03	2021-01-06
4	pivot dome	SAWM3042_FA_WM137	MAII1017ECME3020083	2020-10-18	2021-01-05

In [71]:
```
# Check for duplicate rows
duplicate_rows = df2.duplicated()
if duplicate_rows.any():
    print("There are duplicate rows in the dataframe")
else:
    print("There are no duplicate rows in the dataframe")
```

```
There are no duplicate rows in the dataframe
```

In [72]:
```
# Check for duplicate rows
duplicate_rows = df2.duplicated()
if duplicate_rows.any():
    print("There are duplicate rows in the dataframe")
else:
    print("There are no duplicate rows in the dataframe")
```

```
There are no duplicate rows in the dataframe
```

In [92]:
```
new_row = {'item': 'tub',
           'item id': 'T101',
           'raw material': 'sheet steel',
           'Quantity': '10 sqft',
           'in date': '14/02/2020',
           'out date':'21/02/2020'}
new_row
```

Out[92]:
```
{'item': 'tub',
 'item id': 'T101',
 'raw material': 'sheet steel',
 'Quantity': '10 sqft',
 'in date': '14/02/2020',
 'out date': '21/02/2020'}
```

DATA ANALYSIS

4.2 CLEANED DATA

In [94]:
```
if is_duplicate.any():
    print("New row is a duplicate row")
else:
    print("New row is not a duplicate row")
```

```
New row is a duplicate row
```

In [96]:
```
df1.drop_duplicates(inplace=True)
```

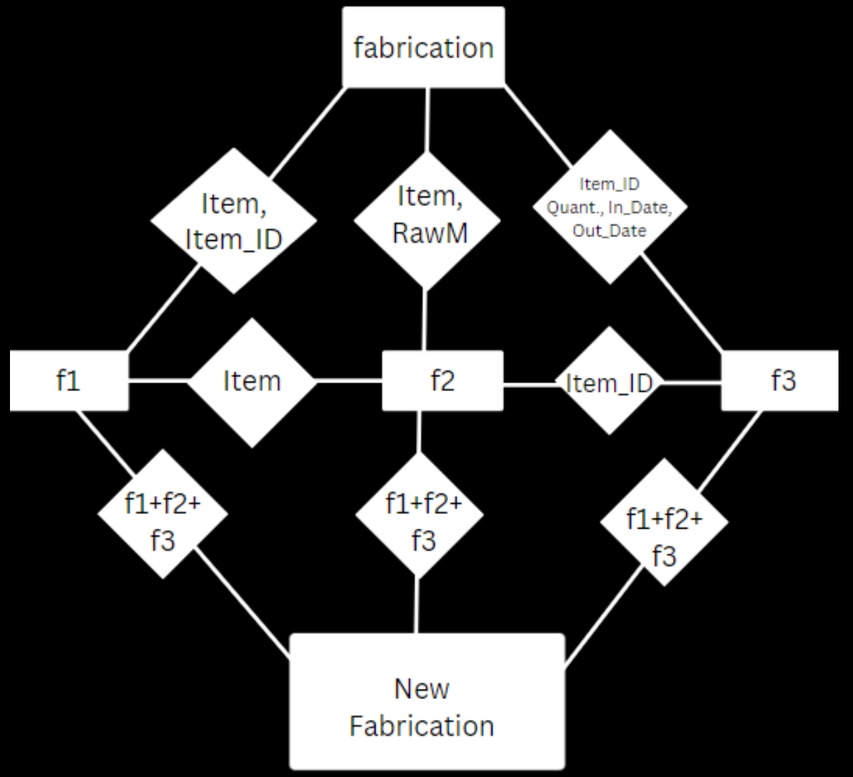
In [97]:
```
df1
```

Out[97]:

	item	item id	raw material	Quantity	in date	out date
0	tub	T101	sheet steel	10 sqft	14/02/2020	21/02/2020
1	pump	T102	plastics	10 kg	16/02/2020	20/02/2020
2	spin tub	T103	stainless steel	5 kg/m3	27/02/2020	2020-05-03 00:00:00
3	wash tub	T104	(enameling iron) Porcelain coating	24 gauge	27/02/2020	2020-03-02 00:00:00
4	balance ring	T105	plastics	3 kg	16/03/2020	21/03/2020
5	transmission gears	T107	cast aluminum	ingots—20	26/03/2020	2020-09-04 00:00:00
6	plastic brackets	T108	plastics	2 kg	2020-08-04 00:00:00	2020-12-04 00:00:00
7	tub	T109	sheet steel	10 sqft	14/02/2020	21/02/2020
8	pump	T110	plastics	10 kg	16/02/2020	20/02/2020
9	spin tub	T111	steel (enameling iron) Porcelain coating	5 kg/m3	27/02/2020	2020-05-03 00:00:00
10	wash tub	T112	(enameling iron) Porcelain coating	24 gauge	27/02/2020	2020-03-02 00:00:00
11	balance ring	T113	stainless steel	2 kg/m3	16/03/2020	21/03/2020
12	transmission gears	T115	cast aluminum	ingots—20	26/03/2020	2020-09-04 00:00:00
13	plastic brackets	T116	plastic	2 kg	2020-08-04 00:00:00	2020-12-04 00:00:00
14	tub	T124	sheet steel	10 sqft	14/02/2020	21/02/2020
15	pump	T117	plastics	10 kg	16/02/2020	20/02/2020
16	spin tub	T118	stainless steel	5 kg/m3	27/02/2020	2020-05-03 00:00:00
17	wash tub	T119	(enameling iron) Porcelain coating	24 gauge	27/02/2020	2020-03-02 00:00:00

ER-DIAGRAM

ER-DIAGRAM



*DataSource: Fabrication.csv

*DataLake:f1,f2,f3,New_Fabrication,Subassembly,Assembly

*NormalizedDB: New_Fabrication, Subassembly, Assembly

Thank you