Supply Chain Management

G.Sheets
Python
MySQL

Final Project Iron Hack

Data Analyst OCT 2022 Berlin.

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IRON
HACK

Project type:

Database management in Cloud

Data source description

- Purchases in Europe 2020-21.

- More than 70K rows and 30 columns in Excel format - Price,Stock,WH,SKUs,Groups,etc.

- 40 Brands in 38 Suppliers.

Challenges

Data classification, NaN, reductions, codify & descodify data in JSON, connect various tools and stabilize it.

    - Change of one 1 r/c in Spread = Error -

Used tools:

- Python
- MySQL
- Excel and G.Spreadsheets
- Looker

Library

- import numpy
- matplotlib.
- seaborn
- API
- JSON
- gspread

- reportlab
- os InvoiceGenerator
- mysql.conector
- pandas
- BeautifulSoup
- time

What happens in SPM?

<u>**Supply chain management**</u>: **plenty** of **tools**, **outdated data** with low adaptability and highly **time-consuming**.

Still a lot of room for improvement in day-to-day tasks.

- Knowledge workers waste over **40%** of their **time** on **manual** digital administrative **processes**.

- **Data entry** is the most **detested** manual task.

- Over **75% believe** spending time on tasks that **could be automated** is a poor use of their skills.

Goal

Moving to the cloud

➡ **A flexible user friendly tool.**

➡ **Extremely adaptable.**

➡ **Import & Export automatized data from/into Spreadsheets trough powerful Data programs.**

➡ **Goodbye manual tasks.**

➡ **Reduction of back and forth among teams.**
  Procurement - Logistic -WH
  Internal vs Third Parties

➡ **Avoiding human mistakes.**

➡ **Quick invoices in PDF.**

A perfect **balance** between **automatization** and the flexibility of constant **manual** updates.

Who is the target?

● Coordinators and Teamleads

● Office Workers.

Config_SKU	PO-Invoice	Season_Type	EAN	PurchasePrice_bDisc	Brand	Main_Supplier	Commodity_Group_3	Quantity	Sum Price	Total Price	Warehouse	PurchaseDiscountRate
A1	PO-95	All Spring-Summer	2001813394049	47,60 €	Brand 9	Company 27	Ballerinas	1	47,60 €	-	Berlin	13,30%
A2	PO-95	All Spring-Summer	2001314978458	47,60 €	Brand 9	Company 28	Ballerinas	1	47,60 €	-	Berlin	
A565	PO-95	FS21	2001813393851	71,60 €	Brand 9	Company 29	Heeled Sandals	1	71,60 €	-	Berlin	
B234	PO-95	Late Spring & Summer	2001314979875	63,60 €	Brand 9	Company 30	Heeled Sandals	1	63,60 €	-	Berlin	
B12	PO-95	FS21	2001314979462	63,60 €	Brand 9	Company 31	Heeled Sandals	1	63,60 €	294,00 €	Berlin	
Z123	PO-94	All Spring-Summer	2001813394315	63,60 €	Brand 7	Company 32	Ballerinas	1	63,60 €	-	Berlin	
Z124	PO-94	FS21	8435476159976	43,32 €	Brand 7	Company 32	Heeled Sandals	1	43,32 €	-	Berlin	
Z125	PO-94	FS21	8435476156944	41,65 €	Brand 7	Company 32	Heeled Sandals	1	41,65 €	148,57 €	Berlin	
A30	PO-99	Spring Transitional	103214234263	15,60 €	Brand 31	Company 30	House Slippers	1	15,60 €	-	Berlin	
A31	PO-99	Spring	103214234264	15,60 €	Brand 31	Company 30	House Slippers	1	15,60 €	-	Berlin	
A32	PO-99	Spring	103214234265	19,60 €	Brand 31	Company 30	House Slippers	1	19,60 €	-	Berlin	
A33	PO-99	Spring	103214234266	19,60 €	Brand 31	Company 30	House Slippers	1	19,60 €	-	Berlin	
A34	PO-99	Spring Transitional	103214234267	15,60 €	Brand 31	Company 30	House Slippers	1	15,60 €	-	Berlin	
A35	PO-99	Spring Transitional	103214234268	15,60 €	Brand 31	Company 30	House Slippers	1	15,60 €	101,60 €	Berlin	
A34	PO-100	Spring Transitional	103214234267	15,60 €	Brand 31	Company 30	House Slippers	12	187,20 €	187,20 €	Berlin	10,00%
A60	PO-101	Spring Transitional	103214234293	95,60 €	Brand 31	Company 30	Booties	13	1.242,80 €	1.242,80 €	Berlin	
A71	PO-102	Late Spring & Summer	103214234304	39,98 €	Brand 8	Company 8	Heeled Sandals	18	719,64 €	719,64 €	Berlin	11,00%
A68	PO-103	Late Spring & Summer	103214234301	39,98 €	Brand 8	Company 8	Heeled Sandals	13	519,74 €	519,74 €	Berlin	
A64	PO-104	FS21	103214234297	31,65 €	Brand 8	Company 8	Flat Sandals	1	31,65 €	-	Berlin	12,00%
A68	PO-104	Late Spring & Summer	103214234301	39,98 €	Brand 8	Company 8	Heeled Sandals	1	39,98 €	-	Berlin	
A70	PO-104	FS21	103214234303	39,98 €	Brand 8	Company 8	Heeled Sandals	1	39,98 €	111,61 €	Berlin	
A76	PO-105	Spring Transitional	103214234309	96,67 €	Brand 8	Company 8	Boots	8	773,36 €	773,36 €	Berlin	

Automated part

WH space is automatically updated without the need for follow-ups

Warehouse_Capacity	Units_left
1344,8	240,14

Warehouse	PurchaseDiscountRate	Value_init.Ordered	ValueOrderedaCanc&aClosing	ValueDelivered	ValueOverdelivered	ValueCanceled	ValueOpen	Qty_init.Ordered	QtyOrderedaCanc&aClosing	QtyDelivered	QtyOverdelivered	QtyCanceled	QtyOpen
Berlin	13,30%	716,84 €	716,84 €	716,84 €	0	0	0	13	13	13	0	0	0
Berlin		465,06 €	465,06 €	465,06 €	0	0	0	9	9	9	0	0	0
Berlin		441,13 €	441,13 €	441,13 €	0	0	0	8	8	8	0	0	0
Berlin		165,08 €	165,08 €	165,08 €	0	0	0	4	4	4	0	0	0
Berlin		831,63 €	831,63 €	831,63 €	0	0	0	22	22	22	0	0	0
Berlin	13,30%	453,96 €	453,96 €	0,00 €	0	0	454	11	11	0	0	0	11
Berlin		939,48 €	939,48 €	0,00 €	0	0	939	21	21	0	0	0	21
Berlin		178,95 €	178,95 €	0,00 €	0	0	179	4	4	0	0	0	4

Future manual updates of stock status.

+ | OrderTracker ▾ | Input ▾ | StockOverview ▾ | PO-Invoice ▾ | SKU-List ▾

PO-Invoice
PO-1
PO-2
PO-3
PO-4
PO-5
PO-6
PO-7
PO-8
PO-9
PO-10
PO-11
PO-12
PO-13
PO-14
PO-15
PO-16
PO-17
PO-18
PO-19
PO-20
PO-21
PO-22
PO-23
PO-24
PO-25
PO-26
PO-27
PO-28
PO-29
PO-30
PO-31
PO-32
PO-33
PO-34
PO-35
PO-36
PO-37
PO-38
PO-39
PO-40

PO-Invoice Code

Index

Config_SKU	Season_Type	EAN	PurchasePrice_bDisc	Brand	Main_Supplier	Commodity_Group_3
A69	All Spring-Summer	103214234234	63,6	Brand 31	Company 30	Ballerinas
A2	All Spring-Summer	103214234235	59,6	Brand 31	Company 30	Ballerinas
A3	All Spring-Summer	103214234236	63,6	Brand 31	Company 30	Ballerinas
A4	FS21	103214234237	47,6	Brand 31	Company 30	Ballerinas
A5	FS21	103214234238	43,6	Brand 31	Company 30	Ballerinas
A6	FS21	103214234			Company 30	Flat Sandals
A7	FS21	103214234			Company 30	Flat Sandals
A8	FS21	103214234			Company 30	Flat Sandals
A9	All Spring-Summer	103214234242	47,6	Brand 31	Company 30	Ballerinas
A10	All Spring-Summer	103214234243	47,6	Brand 31	Company 30	Ballerinas
A11	FS21	103214234244	71,6	Brand 31	Company 30	Heeled Sandals
A12	Late Spring & Summer	103214234245	63,6	Brand 31	Company 30	Heeled Sandals
A13	FS21	103214234246	63,6	Brand 31	Company 30	Heeled Sandals
A14	FS21	103214234247	55,6	Brand 31	Company 30	Flat Sandals
A15	Spring Transitional	103214234248	79,6	Brand 31	Company 30	Boots
A16	Spring Transitional	103214234249	79,6	Brand 31	Company 30	Boots
A17	Spring Transitional	103214234250	87,6	Brand 31	Company 30	Boots
A18	Spring Transitional	103214234251	91,6	Brand 31	Company 30	Boots
A19	Spring Transitional	103214234252	91,6	Brand 31	Company 30	Boots
A20	FS21	103214234253	55,6	Brand 31	Company 30	Flat Sandals
A21	Spring Transitional	103214234254	87,6	Brand 31	Company 30	Boots
A22	Spring Transitional	103214234255	75,6	Brand 31	Company 30	Boots
A23	All Spring-Summer	103214234256	59,6	Brand 31	Company 30	Ballerinas
A24	All Spring-Summer	103214234257	59,6	Brand 31	Company 30	Ballerinas
A25	Spring Transitional	103214234258	87,6	Brand 31	Company 30	Boots
A26	Late Spring & Summer	103214234259	59,6	Brand 31	Company 30	Pumps
A27	FS21	103214234260	59,6	Brand 31	Company 30	Pumps
A28	All Spring-Summer	103214234261	91,6	Brand 31	Company 30	Pumps
A29	Spring	103214234262	91,6	Brand 31	Company 30	Pumps
A30	Spring Transitional	103214234263	15,6	Brand 31	Company 30	House Slippers
A31	Spring	103214234264	15,6	Brand 31	Company 30	House Slippers
A32	Spring	103214234265	19,6	Brand 31	Company 30	House Slippers
A33	Spring	103214234266	19,6	Brand 31	Company 30	House Slippers
A34	Spring Transitional	103214234267	15,6	Brand 31	Company 30	House Slippers
A35	Spring Transitional	103214234268	15,6	Brand 31	Company 30	House Slippers
A36	Spring Transitional	103214234269	15,6	Brand 31	Company 30	House Slippers
A37	Spring Transitional	103214234270	19,6	Brand 31	Company 30	House Slippers
A38	Spring Transitional	103214234271	19,6	Brand 31	Company 30	House Slippers
A39	Spring	103214234272	15,6	Brand 31	Company 30	House Slippers
A40	Spring	103214234273	15,6	Brand 31	Company 30	House Slippers

+ ≡ OrderTracker ▾   Input ▾   StockOverview ▾   PO- ▾

+ ≡ OrderTracker ▾   Input ▾   StockOverview ▾   PO-Invoice ▾   SKU-List ▾

Brand	%cancel	%open_value	%canceled_waiting_VS_initial_order
Brand 1	38,21	37,81	76,02
Brand 10	4,75	10,56	15,31
Brand 11	29,72	37,12	66,83
Brand 12	1,87	44,79	46,66
Brand 14	4,33	93,46	97,78
Brand 15	1,86	85,8	87,66
Brand 16	8,76	33,75	42,51
Brand 17	5,19	56,73	61,91
Brand 18	54,36	7,49	61,85
Brand 19	34,47	37,61	72,08
Brand 2	8,03	27,89	35,92
Brand 20	14,46	53,69	68,14
Brand 21	4,6	16,55	21,16
Brand 22	5,89	0,35	6,24
Brand 23	48,77	8,11	56,87
Brand 24	2,8	59,72	62,52
Brand 25	0,12	13,64	13,76
Brand 26	0,12	9,29	9,41
Brand 27	35,38	3,68	39,06
Brand 28	9,91	20,17	30,08
Brand 29	7,11	28,66	35,77
Brand 3	9,02	15,46	24,48
Brand 30	7,59	38,02	45,61
Brand 31	0,06	10,57	10,63
Brand 32	7,76	80,79	88,55
Brand 33	1,68	75,55	77,23
Brand 34	0,57	55,7	56,26
Brand 35	1,15	69,37	70,52
Brand 36	0	32,19	32,19
Brand 37	22,11	31,78	53,89
Brand 38	0	40,14	40,14
Brand 39	0	100	100
Brand 4	11,84	18,14	29,98
Brand 40	1,42	56,19	57,61
Brand 5	7,13	88,96	96,09
Brand 6	7,92	55,38	63,31
Brand 7	5,35	27,99	33,34
Brand 8	4	69,65	73,65
Brand 9	3,26	90,67	93,92

Total cancelled value over initial Order	Total open stock value vs Original Order (cancellations included)	Open stock value after removing cancelations vs Original Order
20,28	34,21	42,91
	Source Stock before being 'cleaned'	

AVG -Column D	Sum - Column D	Count - Column D
52,69	2054,94	39

*Companies (left) with clarification
Left table: stock not canceled by User Company or Supplier Company before delivery.

All data from the OrderTracker sheet will be auto-analyzed and exported to this sheet for the whole team. Goodbye Pivot tables!

+ ☰ OrderTracker ▾ Input ▾ StockOverview ▾ PO-Invoice ▾ SKU-List ▾

Invoices

Invoice num.: PO-105

Provider	
Company 8	Customer
	Brand 8
Payment information	
Account n.:	

List of items

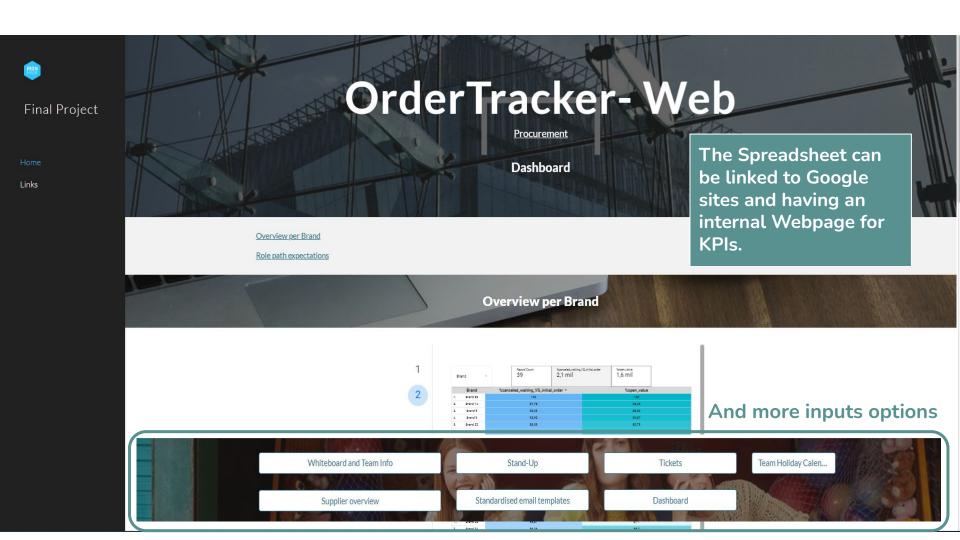| Description	Units	Price per one	Total price
SKU: A76, EAN: 103214234309	8	96,67 Euros	773,36 Euros

Total: 773,36 Euros

Creator: 2022-12-14

PO-Invoice: 'PO-106'

Season_Type	EAN	PurchasePrice_bDisc	Brand	Main_Supplier	Commodity_Group_3	Quantity	Sum Price	Total Price
FS21	103214234237	47.6	Brand 31	Company 30	Ballerinas	1	47.6	-
FS21	103214234244	71.6	Brand 31	Company 30	Heeled Sandals	1	71.6	-
FS21	103214234253	55.6	Brand 31	Company 30	Flat Sandals	1	55.6	-
Spring Transitional	103214234258	87.6	Brand 31	Company 30	Boots	1	87.6	-
Late Spring & Summer	103214234259	59.6	Brand 31	Company 30	Pumps	1	59.6	322.0

Payment information	Account number
Visa 123456	123456
Mastercard 456789	456789
Discover 901234	901234

OrderTracker- Web

Procurement

Dashboard

The Spreadsheet can be linked to Google sites and having an internal Webpage for KPIs.

Overview per Brand

Role path expectations

Overview per Brand

Final Project

Home

Links

1

2

And more inputs options

| Whiteboard and Team Info | Stand-Up | Tickets | Team Holiday Calen... |
| Supplier overview | Standardised email templates | Dashboard |

N° items, SKU and WH

```
Please, enter the total number of items in the order, in order to check the WH space: 
Space available in WH: 97.92% by 235 units left.
Space left: 1316.8 Sqm left
Enter SKU: A4
Enter a number: 1
```

```
C:\Users\Stephan\AppData\Local\Temp\ipykernel_6168\652438876.py:110: FutureWarning: The frame.append method is deprecated and w
ill be removed from pandas in a future version. Use pandas.concat instead.
  df = df.append({'Config_SKU': x, "Quantity":n_sku}, ignore_index=True)
```

```
Do you want to add another SKU? yes/no y
Enter SKU: A11
Enter a number: 1
```

```
C:\Users\Stephan\AppData\Local\Temp\ipykernel_6168\652438876.py:110: FutureWarning: The frame.append method is deprecated and w
ill be removed from pandas in a future version. Use pandas.concat instead.
  df = df.append({'Config_SKU': x, "Quantity":n_sku}, ignore_index=True)
```

```
Do you want to add another SKU? yes/no y
Enter SKU: A20
Enter a number: 1
```

```
C:\Users\Stephan\AppData\Local\Temp\ipykernel_6168\652438876.py:110: FutureWarning: The frame.append method is deprecated and w
ill be removed from pandas in a future version. Use pandas.concat instead.
  df = df.append({'Config_SKU': x, "Quantity":n_sku}, ignore_index=True)
```

```
Do you want to add another SKU? yes/no y
Enter SKU: A25
Enter a number: 1
```

```
C:\Users\Stephan\AppData\Local\Temp\ipykernel_6168\652438876.py:110: FutureWarning: The frame.append method is deprecated and w
ill be removed from pandas in a future version. Use pandas.concat instead.
  df = df.append({'Config_SKU': x, "Quantity":n_sku}, ignore_index=True)
```

```
Do you want to add another SKU? yes/no y
Enter SKU: A26
Enter a number: 1
```

```
C:\Users\Stephan\AppData\Local\Temp\ipykernel_6168\652438876.py:110: FutureWarning: The frame.append method is deprecated and w
ill be removed from pandas in a future version. Use pandas.concat instead.
  df = df.append({'Config_SKU': x, "Quantity":n_sku}, ignore_index=True)
```

```
Do you want to add another SKU? yes/no no
```

```
C:\Users\Stephan\AppData\Local\Temp\ipykernel_6168\652438876.py:203: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-ve
rsus-a-copy
  df_merged['Total Price'].iloc[:-1] = '-'
```

	Config_SKU	PO-Invoice	Season_Type	EAN	PurchasePrice_bDisc	Brand	Main_Supplier	Commodity_Group_3	Quantity	Sum Price	Total Price
0	A4	PO-106	FS21	103214234237	47.6	Brand 31	Company 30	Ballerinas	1	47.6	-
1	A11	PO-106	FS21	103214234244	71.6	Brand 31	Company 30	Heeled Sandals	1	71.6	-
2	A20	PO-106	FS21	103214234253	55.6	Brand 31	Company 30	Flat Sandals	1	55.6	-
3	A25	PO-106	Spring Transitional	103214234258	87.6	Brand 31	Company 30	Boots	1	87.6	-
4	A26	PO-106	Late Spring & Summer	103214234259	59.6	Brand 31	Company 30	Pumps	1	59.6	322.0

Output

```
storage()
```

```
12
Space available in WH: 96.64% by 345 units left.
Space left: 1932.8 Sqm left
```

```python
def WH_capacity (wh_total):

    import gspread #getting access
    gc= gspread.service_account(filename = "mythic-delight-370211-09579ff6aae2.json")
    sh= gc.open("Final Project").worksheet("OrderTracker")
    sh.update("AG2",wh_total) #updating cell with updated space left
    wh_total=wh_total
```

```
WH_capacity(2000) # add into Sheet WH space
```

Updating WH space

python™

BI Overview in StockOverview (Final Project)

introudce file name and process everything

Automated Ordertracker data processing and export of summaries.

```python
def Stock_file_Spread(): # SQL_Purchase_Order_Report.xlsx   # New_Purchase_Order_Report.xlsx.xlsx
    import pandas as pd
    x=input()
    Excel_file = pd.read_excel(x)
    Copy_1= Excel_file
    Sorted_copy= Copy_1[["Brand","Supplier Supplier Name","Cancellation Reason (PO Position Number)","Value_init_Order

    New_sorted = Sorted_copy[Sorted_copy["Cancellation Reason (PO Position Number)"] != "INTERNAL_MISTAKE"]
    New_sorted =Sorted_copy[Sorted_copy["Cancellation Reason (PO Position Number)"] != "CANCELED_BY_ZALANDO"]
    New_sorted =Sorted_copy[Sorted_copy["Cancellation Reason (PO Position Number)"] != "OTHER"]
    New_sorted_brand =New_sorted.groupby(['Brand']).sum().reset_index()


    Sorted_nan=New_sorted_brand.dropna()


    ### cancelations per brand

    Sorted_nan_cancellations= pd.DataFrame(((Sorted_nan["Value_Canceled"])/Sor
    Sorted_nan_cancellations = round(Sorted_nan_cancellations,2)
    Sorted_nan_cancellations.index = New_sorted_brand.Brand
    Sorted_nan_cancellations.columns = ["%cancel"]

    Sorted_nan_cancellations = Sorted_nan_cancellations.reset_index() #reset the index again, brand are settled as index, and nov
    Sorted_nan_cancellations=pd.DataFrame(Sorted_nan_cancellations)
    #Sorted_nan_cancellations

    #OPEN VALUE per brand
    Sorted_nan_open=pd.DataFrame(Sorted_nan["Value_Open"]/Sorted_nan["Value_init_Ordered"]*100)
    Sorted_nan_open= round(Sorted_nan_open,2)
    Sorted_nan_open.index = New_sorted_brand.Brand
    Sorted_nan_open.columns = ["%open_value"]

    Sorted_nan_open = Sorted_nan_open.reset_index() #reset the index again, brand are settled as index, and not show in G.Spread,
    Sorted_nan_open=pd.DataFrame(Sorted_nan_open)
    #Sorted_nan_open

    #inicial cancel and open üper brand
    InicialVSperbrand= ((Sorted_nan["Value_Canceled"]+Sorted_nan["Value_Open"])/Sorted_nan["Value_init_Ordered"])*100
    InicialVSperbrand.index = New_sorted_brand.Brand

    InicialVSperbrand=pd.DataFrame(InicialVSperbrand)
```

In [42]: Stock_file_Spread()   # New_Purchase_Order_Report.xlsx.xlsx   #Sorted_copy_2_Open

New_Purchase_Order_Report.xlsx.xlsx
It ran well