ADMT 2018 - Project report

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1 Introduction

The domain of our fictional company is the one of furniture production and retail. The company is located in the province of Bolzano and has several showrooms in the area and one production center.

1.1 Business processes

1.1.1 CRM - Showroom visit

One CRM process is the collection of data about visitors at the different showrooms. A visitor can either be one who is just looking around without intention of buying anything (Seeleute), a future potential customer or an already existing customer. A visit can lead to an order.

Business questions:

- Which is the best running showroom (most visitors, most orders, etc.)
- Where are the customers from (with different granularity)
- Which department are the customers the most interested in
- Compare the number of visitors to the number of customers for a time period and/or showroom

1.1.2 Production

The company logs every step in the production process, especially duration, defects and machine failures.

Business questions:

- What is the average time to produce a particular product
- Which is the product with the highest/lowest quality
- How much effort/time is spent per production stage, product category
- What is the production cost of a product

2 Conceptual Design

Table 1: Fact table

Fact	Dimensions	Measures
Showroom visit	Date, Showroom, Visitor, Order, Detail, Department, Sales representative	Duration (AVG), Amount of people (SUM, AVG)
Production	Start Date, End date, Product, Production Stage, Machine, Quality control, Operator	Duration (AVG), Raw material cost (AVG)

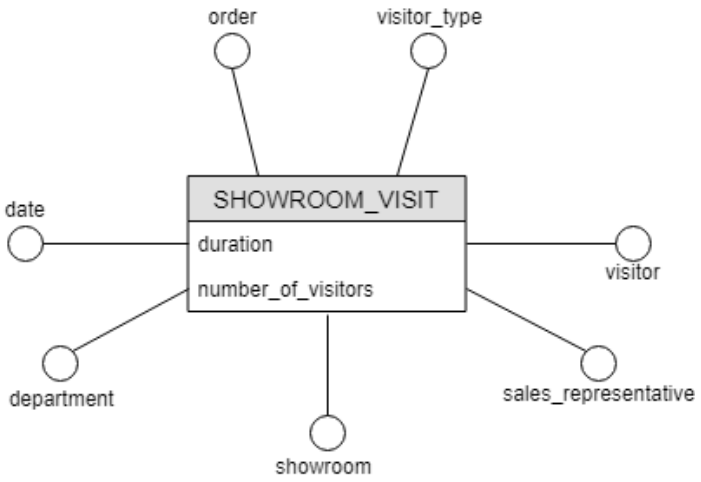

Figure 1: DFM of the showroom visit

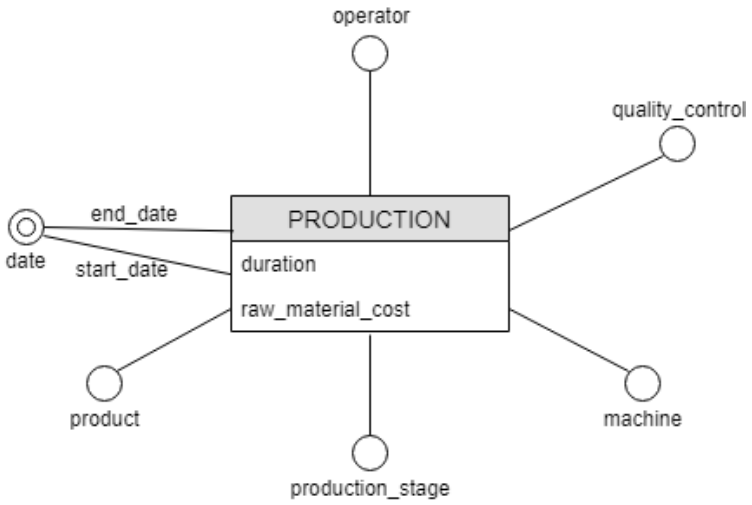

Figure 2: DFM of the production

2.1 Showroom visit

Table 2: Fact table

Dimension	Attributes
Date	Day, Month, Year, Quartal, Week, Day of Week, Season, Holiday
Showroom	Name, City, District, Province, Region, Country, Manager, Address, Telephone, Size
Visitor	Name, City, District, Province, Region, Country, Language, Telephone, E-Mail, Type, Sector, Gender, Customer number
Order	Order Number, Total Price, Discount
Order Detail	Quantity, Quantity Type, Product, Unit price, Total price
Department	Name
Sales representative	Name, City, District, Province, Region, Country, Language, Telephone, E-Mail, Gender

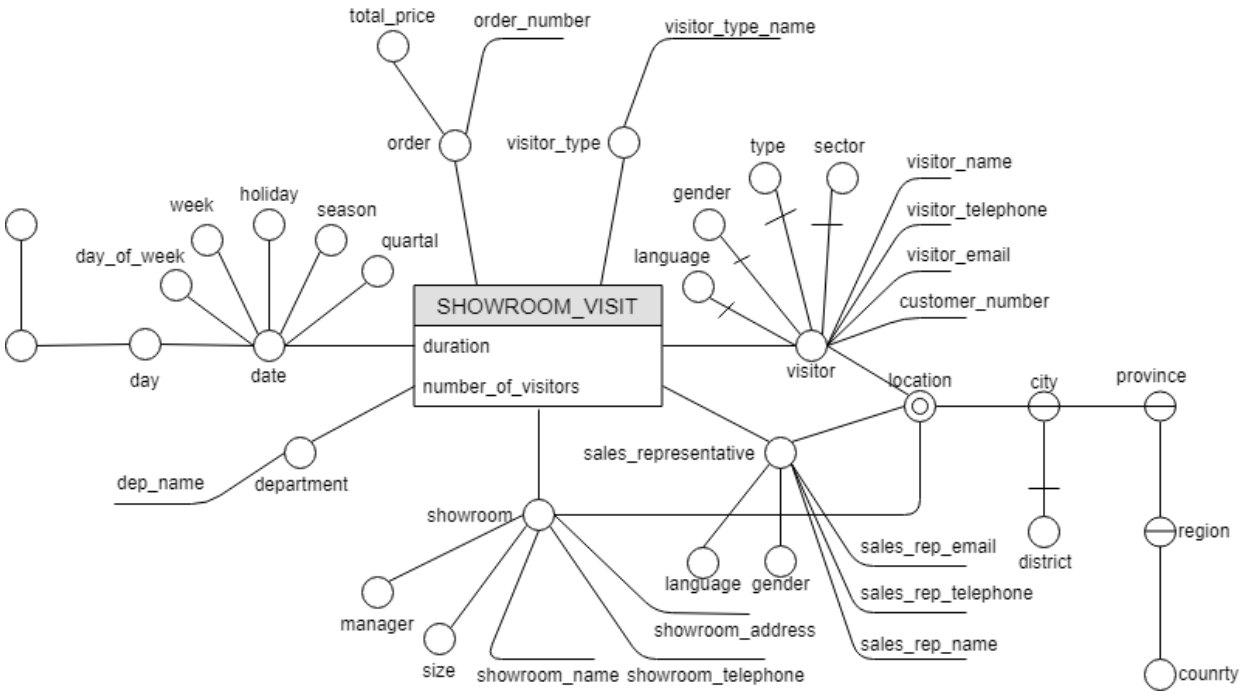

Figure 3: Dimension fact model (DFM) of the showroom visit with attributes

2.2 Production

Table 3: Fact table

Dimension	Attributes
Start date	Day, Month, Year, Week
End date	Day, Month, Year, Week
Product	Product number, Name, Department, Category
Production stage	Name
Machine	Name, Purchasing year, Vendor
Quality control	Grade
Operator	Name

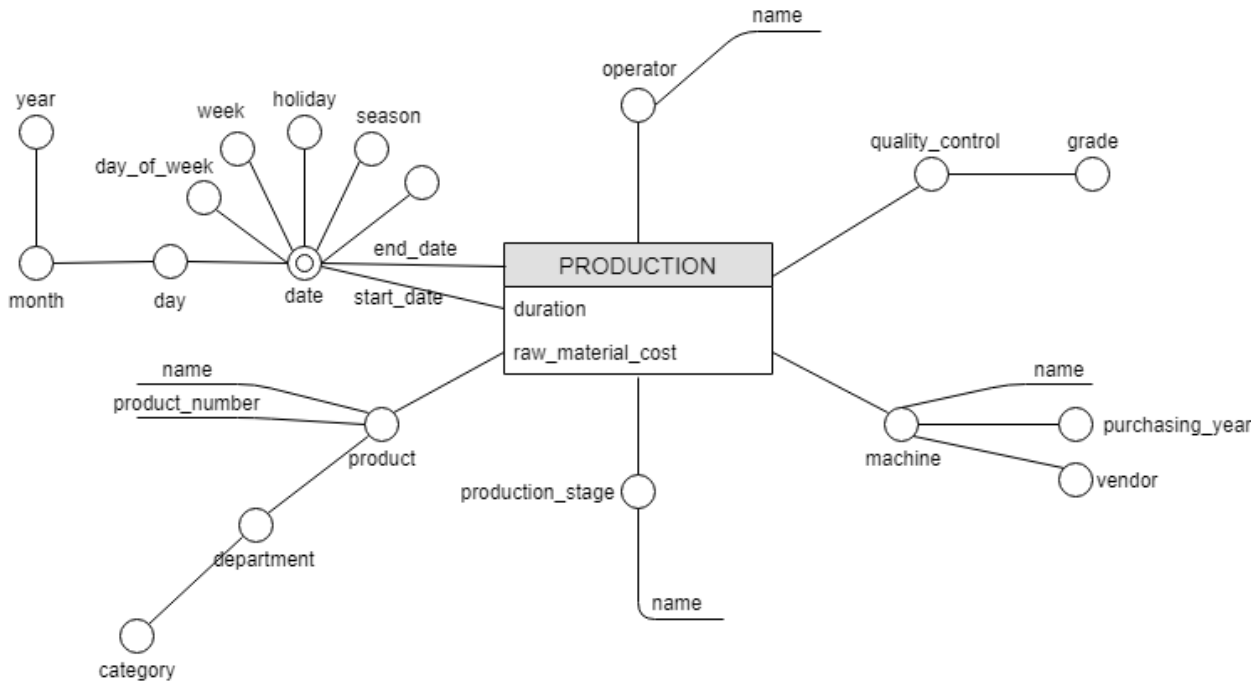

Figure 4: Dimension fact model (DFM) of the production with attributes

3 Logical Design

3.1 Star schemas

3.2 Two business questions

3.2.1 Fact: Showroom visit

In order to be able to make the right marketing decisions, it is very important for the management to know from which sector the various customers or interested parties of a particular showroom come from. So, for example the management wants to know, from which sectors the various customers of showroom "Showroom-Bozen" were coming in the last year.

SQL query:

```
1         SELECT v.visitor_sector, count(*)
2         FROM warehouse.visitor v
3         INNER JOIN warehouse.showroom_visit sv on v.visitor_id = sv.visit
4         INNER JOIN warehouse.showroom s on sv.showroom_id = s.showroom_id
5         INNER JOIN warehouse.date d on sv.date_id = d.date_id
6         WHERE s.showroom_name = 'Showroom-BOZEN'
7         AND d.date_actual >= '2018-01-01' AND d.date_actual <= '2018-12-3
8         GROUP by v.visitor_sector
```

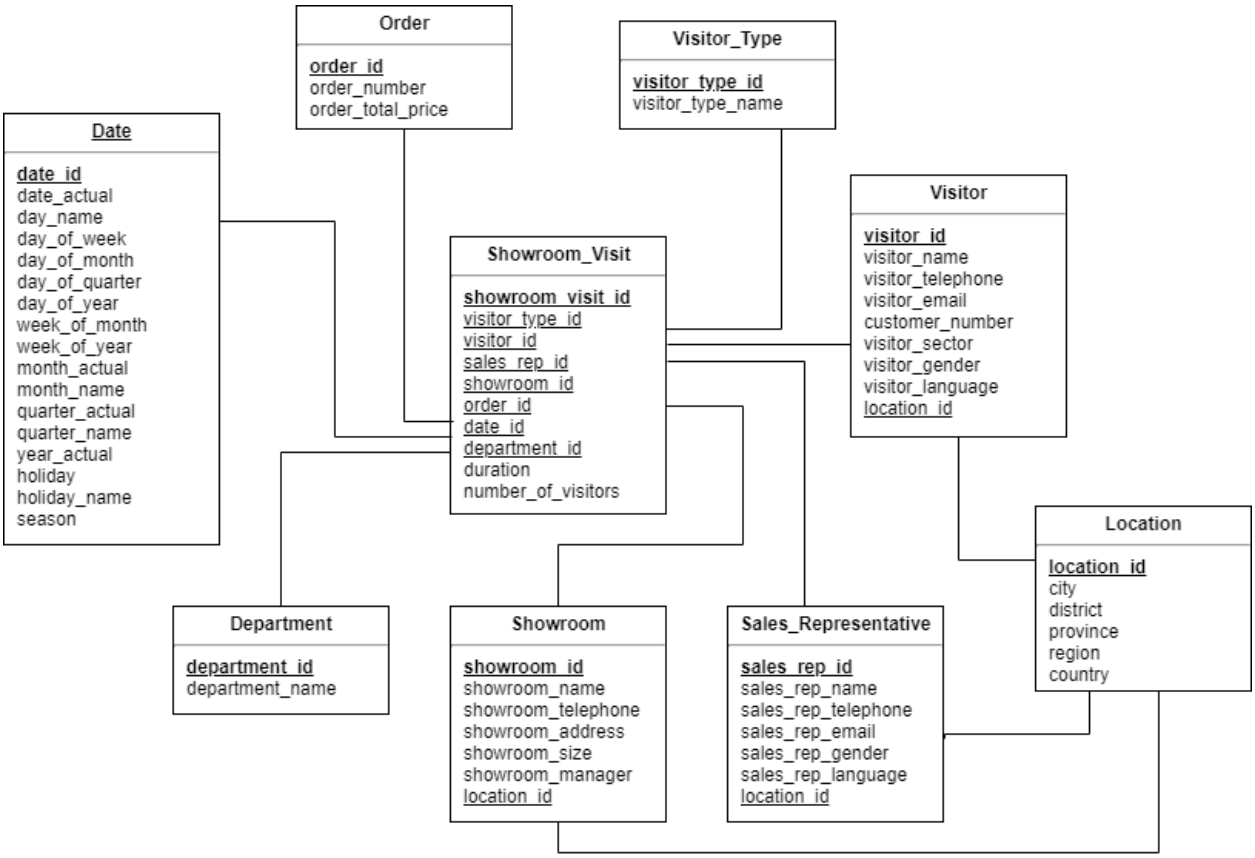

Figure 5: Star schema of the showroom visit

Table 4: Showroom visit

ID	Visitor_id	Sales_rep_id	Showr._id	Depart._id	Date_id	Type_id	Duration	Nr._of_visit.
1282369	570822	6	5	4	20180323	2	90	2
1282370	570823	5	5	2	20160107	4	167	4
1282371	570823	7	5	1	20130526	3	173	6
1282372	570823	11	5	6	20150806	3	100	10
1282373	570823	7	5	1	20121116	4	169	5
1282374	570824	7	5	1	20171210	3	57	3
1282375	570824	18	5	2	20110212	3	166	7

ID	Visitor_id	Sales_rep_id	Showr._id	Depart._id	Date_id	Type_id	Duration	Nr._of_visit.
1282376	570824	9	5	4	20130811	3	84	5
1282377	570825	11	5	6	20170507	3	184	10
1282378	570825	12	5	2	20111127	2	26	2
1282379	570825	7	5	1	20150425	3	141	10
1282380	570826	11	5	6	20130208	2	8	2
1282381	570826	12	5	1	20111214	3	61	8
1282382	570827	12	5	1	20170202	3	139	9
1282383	570827	12	5	2	20121012	3	71	7

Table 5: Visitor

ID	Name	Telephone	E-Mail	Sector	Sex	Lang.	Loc._id
570822	Melanie Eder			Gastronomy	F	german	9
570823	Julian Schmidt		j.schmidt@email.com	Private	M	german	9
570824	Marcel Schwarz	306 9579783	m.schwarz@email.com	Hotel	M	german	9
570825	Denise Fuchs	396 5305260	d.fuchs@email.com	Public	F	german	9
570826	Sophie Wimmer	322 7641804	s.wimmer@email.com	Private	F	german	9

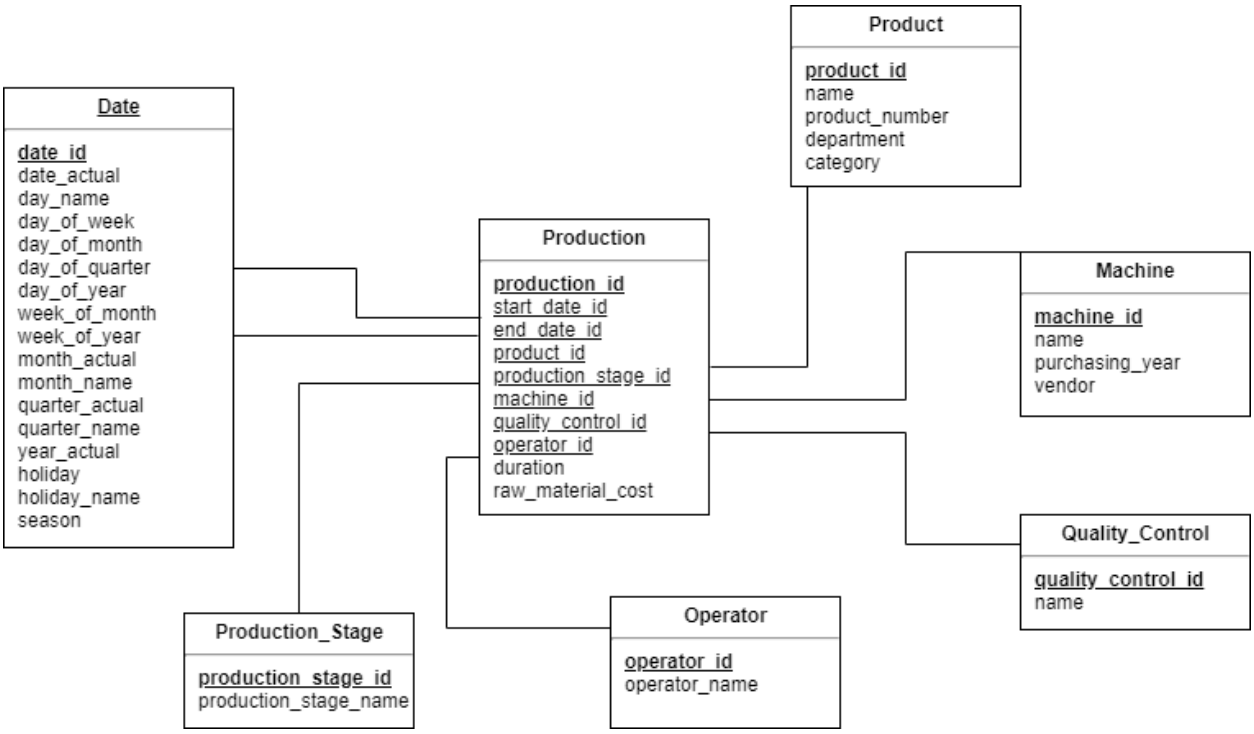

Figure 6: Star schema of the production

Table 6: Showroom

ID	Name	Telephone	Address	Size	Manager	Loc._id
1	Showroom-LATSCH	0477 069655	Herrengasse 8	581	Paul Wolf	42
2	Showroom-MÜHLBACH	0474 039227	Platzerstr. 58	349	Christoph Steiner	54
3	Showroom-MÖLTEN	0470 429676	Vernag 97	857	Christoph Steiner	51
4	Showroom-SALURN	0475 248487	Gewerbezone 44	198	Johannes Egger	77
5	Showroom-BOZEN	0473 723301	St. Urban 73	447	Sabine Schneider	9

Table 7: Date

ID	Date	Day_week	Day	Month	Quartal	Year	Holiday	Season
20160102	2010-01-02	6	Saturday	January	First	2016	false	Winter
20170103	2010-01-03	7	Sunday	January	First	2017	false	Winter

Sector	Number of visitors
Public	1371

3.2.2 Fact: Production

The company's quality control is always interested in optimizing processes. It is therefore interesting for employees to know whether a machine has significant time differences in production in relation to a particular product in comparison to the other machines.

SQL query:

```
SELECT m.machine_name, avg(p.duration) AS avg_production_duration
FROM warehouse.machine m
INNER JOIN warehouse.production p ON m.machine_id = p.machine_id
INNER JOIN warehouse.product o ON p.product_id = o.product_id
WHERE o.product_number = 'Warteraum-Couch␣-␣10'
GROUP BY m.machine_id
ORDER BY avg_production_duration DESC LIMIT 10
```

Table 9: Production

ID	Operator*	Machine*	Stage*	Product*	Start_date*	End_date*	Duration	Raw_mat._cost
591814	779	1144	1	361016	20101105	20101202	152	76
591815	780	1174	2	361016	20101202	20101203	1	395
591816	775	1213	3	361016	20101203	20101207	2	277
591817	770	1055	1	361016	20101122	20101214	30	66
591818	722	1176	2	361016	20101214	20110111	133	391
591819	755	1079	3	361016	20110111	20110204	36	275
591820	740	1069	1	361016	20150511	20150520	49	73
591821	756	1025	2	361016	20150520	20150603	54	398
591822	758	1130	3	361016	20150603	20150625	96	278
27064	754	1164	1	361016	20101022	20101026	8	66

ID	Operator*	Machine*	Stage*	Product*	Start_date*	End_date*	Duration	Raw_mat._cost
27065	739	1028	2	361016	20101026	20101104	6	407
27066	798	1098	3	361016	20101104	20101105	6	280
27067	780	1013	1	361016	20130327	20130411	70	74
27068	737	1145	2	361016	20130411	20130509	18	404
27069	772	1032	3	361016	20130509	20130520	14	281

Note: all columns with the * are foreign key columns and are carrying only the id

Table 10: Machine

ID	Machine_name	Machine_vendor	Purchasing_year
1172	Melichr	Durn	1998
1173	Horn		2009
1174	Chihaia	Murtazaev	2002
1175	Kork	Durn	2006
1176	Ramna	Barbora	1996

4 Conclusions

5 References