Data Intensive Systems - Miniproject - Part 3

Erik Sidelmann Jensen
ejens11@student.aau.dk

Lasse Vang Gravesen
lgrave11@student.aau.dk

Dennis Jakobsen
djakob11@student.aau.dk

1 DIS Miniproject

1.1 Task E & F

We defined our multidimensional cube using the following xml:

```xml
<?xml version="1.0"?>

<Schema name="FKlubDW">
    <Cube name="Sales">
        <Table name="sales"/>
        <Dimension name="Product" foreignKey="productid">
            <Hierarchy hasAll="true" allMemberName="All Products" primaryKey="productid">
                <Table name="product"/>
                <Level name="Name" column="name" uniqueMembers="false"/>
            </Hierarchy>
    </Dimension>
  <Dimension name="time" type="TimeDimension" foreignKey="timeid">
    <Hierarchy hasAll="true" allMemberName="All Times" primaryKey="timeid">
      <Table name="time"/>
      <Level name="hour" column="hour" uniqueMembers="true" levelType="TimeHours" type="
          Numeric"/>
      <Level name="minute" column="minute" uniqueMembers="false" levelType="TimeMinutes" type
          ="Numeric"/>
    </Hierarchy>
  </Dimension>
  <Dimension name="hour" type="TimeDimension" foreignKey="timeid">
    <Hierarchy hasAll="true" allMemberName="All Hours" primaryKey="timeid">
      <Table name="time"/>
      <Level name="hour" column="hour" uniqueMembers="true" levelType="TimeHours" type="
          Numeric"/>
    </Hierarchy>
  </Dimension>
   <Dimension name="date" type="TimeDimension" foreignKey="dateid">
    <Hierarchy hasAll="true" allMemberName="All Dates" primaryKey="dateid">
      <Table name="date"/>
      <Level name="Year" column="year" uniqueMembers="true" levelType="TimeYears" type="
          Numeric"/>
      <Level name="Month" column="month" uniqueMembers="false" levelType="TimeMonths" type="
          Numeric"/>
      <Level name="Day" column="day" uniqueMembers="false" levelType="TimeDays" type="Numeric
          "/>
    </Hierarchy>
  </Dimension>
        <Dimension name="Member" foreignKey="memberid">
            <Hierarchy hasAll="true" allMemberName="All Members" primaryKey="memberid">
                <Table name="member"/>
    <Level name="memberid" column="memberid" uniqueMembers="true" type="Numeric" />
                <Level name="Balance" column="balance" uniqueMembers="false" type="Numeric" /
                    >
                <Level name="Year" column="year" uniqueMembers="false" type="Numeric" />
            </Hierarchy>
    </Dimension>
        <Measure name="Sale Amount" column="sale" aggregator="sum" formatString="#,###"/>
    </Cube>
</Schema>
```

We then could answer the following questions:

How much is bought at some point during some day?

We can answer this by looking at summarized hours, we look at the hours with the most spent.

28,618,675 Ører has been spent at the 12th hour and 20,400,875 Ører has been spent at the 13th hour.

How does the amount sold change over time? We can answer this by looking at individual years and how much is total spent on each of the years.

Year	Sale Amount
1996	187,650
1997	2,359,375
1998	13,696,025
1999	15,180,275
2000	15,763,800
2001	16,402,075
2002	19,679,050
2003	18,017,550
2004	19,876,325
2005	17,882,675
2006	20,225,450
2007	19,932,050
2008	61,650

As it can be seen the first years had little sales compared to the later years such as 2002 through 2007. The last year presented 2008 may be an invalid year since the total sales may be misleading if sales for a whole year is not considered.

When is it best to restock, given low activity?

We can answer this by looking at which hours have the least activity during 8-16.

Those hours are 8 with 9,632,450 and 16 with 9,981,050.

A better way of answering this would be to look at the weekdays too, but we do not have that field.

Which product gives the most revenue?

Name	Sale Amount
$\frac{1}{2}$L Vand excl. pant	66,970,550
Øl	20,272,250
$\frac{1}{2}$L Matilde cacao	19,476,750
Kaffe/Choko(1 kop)	11,578,400
Juice	8,738,675

What does the increase in sale for specific products look like over time? See Figure 1.1 for a graphical overview of how the sales for soda without deposit(pant), Matilde kakao, juice, and beer changes over each year. For example it can be seen that beer was a popular drink in 2002. The figure is split in a non-drilled version in Figure 1.1a and a drilled in Figure 1.1b

Is it worth it to sell soda without deposit(pant) See Figure 1.2 for an illustration of how the sales are of soda with and without deposit(pant). It can for example be seen that the sale for soda with deposit(pant) is only a fraction of the sales of soda without. The figure is split in a non-sliced and sliced version in Figure 1.2a and Figure 1.2b

Which member have spent the most? The member that has spent the most is '1704' having spent 1,439,650 ører, see Figure 1.3.

Year	½L Vand excl. pant	½L Matilde cacao	Juice	Øl
1996	66,500	17,400		19,000
1997	1,349,600	150,175		234,500
1998	7,860,000	1,376,700		1,627,400
1999	8,975,200	1,305,000		1,653,600
2000	8,072,000	1,743,000		1,346,400
2001	8,348,300	1,240,350	608,025	2,826,050
2002	7,426,500	2,542,575	1,681,650	3,198,700
2003	5,947,200	2,552,425	1,354,500	1,998,000
2004	4,975,950	2,028,600	1,000,300	2,191,200
2005	4,737,600	1,815,275	1,036,000	1,671,600
2006	4,371,200	2,296,850	1,194,200	1,616,400

(a) Normal version

Year	Month	½L Vand excl. pant	½L Matilde cacao	Juice	Øl
1996	11	9,800	1,200		5,000
	12	56,700	16,200		14,000
1997	1	29,400	600		8,000
	2	34,300	8,200		9,000
	3	59,500	4,375		6,500
	4	64,400	12,000		21,000
	5	142,100	19,000		13,000
	6	168,700			20,000
	7	59,500			1,000
	8	71,400			8,000
	9	121,800	10,500		24,500

(b) Drilled down version

Figure 1.1: Different product sales over time.

Name	hour	Sale Amount
½L Vand excl. pant	10	6,725,550
	11	8,599,100
	12	12,855,550
	13	8,299,650
	14	6,992,900
½L Vand incl. pant	10	267,200
	11	300,500
	12	450,900
	13	314,800
	14	243,700

(a) Normal version

Name	hour	Sale Amount
½L Vand excl. pant	12	12,855,550
½L Vand incl. pant	12	450,900

(b) Slice and diced

Figure 1.2: Sales of soda with and without deposit(pant)

memberid	Sale Amount
1704	1,439,650
991	1,400,600
1	1,348,050
2124	1,115,825
138	1,097,800
553	1,088,350
1542	985,475
1401	886,425
1994	861,900
1703	838,050

Figure 1.3: Member ids and sales