Assignment 3

The fact and dimension tables and were created for 3 domains

a) Industries

b) Road transport

c)Schools

In the real world, dimensions and facts are basic building blocks of data modelling in Data ware housing. These domains were taken from assignment 1 and have been modified slightly according to the requirements of assignment 3

Recap: In the first assignment the data model had domains like industries, schools, tourism, location and road transport. The entity which was connecting all the domains was Location. The domains like industries, location, road transport have been retained for assignment 3

9.

Industries: The entity 'Trade' has been created as a fact table and this table has 3 main attributes. The canadian_industries_id and location _id are the foreign keys in this entity and the attribute 'Value' I describe the quantitative information about the business process (i.e. Trade value)[4].

Road Transport: The entity 'Sales' has been created as a fact table for road transport. This entity describes the sale value of the motor vehicles.Canadian_road_transport_id and location_id are the foreign keys of this table and the attribute 'Value' gives the motor sales[2].

School: The entity 'Area' basically gives the statistical area code for each of the school present in the dimensions table of the domain of the school[3].

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Typically, the fact tables are not functional without the dimension tables. Dimension tables are the descriptive entities that describe the quantitative numbers of the fact tables.

Industries: There are 2 main dimension tables for this domain:

a) Industries: The entity industries describe the nature of the industry and its classification. Its combination with the fact table (Trade entity) describes the trade value of imports and exports[4].

b) Location: The location entity describes the geographical location of the industry. It connects to the fact table -Trade entity to describe the geographical location of the industrial value

Road transport: There are 2 dimensional tables for this domain

Road transport: This domain explains the type of vehicle being used in the form of road transportation. It's a connection with the 'Sales' table gives the sale value of that particular vehicle[2].

Location: This entity describes the geographical location of the vehicles. Its connection with the fact table describes the sale value of the vehicle for that geographical location.

School: It has 2 dimension tables

School: Describes the school name and its location[3].

Location: Location describes the geographical location of the students.

11.

The dimensional attributes are mostly descriptive and describe the numbers displayed on the fact tables

Industries: It has the following 5 attributes:

a) Canadian_industries_id: It forms the primary key of the entity. This attribute is auto incremented for each record.

b) NAICS: It describes the North American industry classification of the industrial system.

c)REF_date: It describes the trade value of the industry for that particular year.

d)Trade: Trade attribute confirms if the good were imported or exported

c)Enterprize_size: It describes whether the industry is small scale, large scale or medium scaled

Road_transport: Road transport entity has the following 3 attributes:

a) Canadian_road_transport_id: This autoincrement value forms the primary key of the entity.

b) Ref_date: It refers to the date on which the vehicle /vehicle type was purchased.

c)Vechicle_type: Vehicle type describes the type of vehicle.

Schools: Canadian_schools have the following 3 Attributes

Canadian_School_id: It gives the id of the school.

School_name: It gives the name of the school.

GEO: Gives the geographical location of the school.

Location: The domains industries and road transport have one common entity i.e. location. It has attributes like location_id and location. This entity describes the geographical locations of the domains

12.

Attribute Hierarchies

Navigational path and attribute hierarchies have been created for the 3 domains:

Industries:

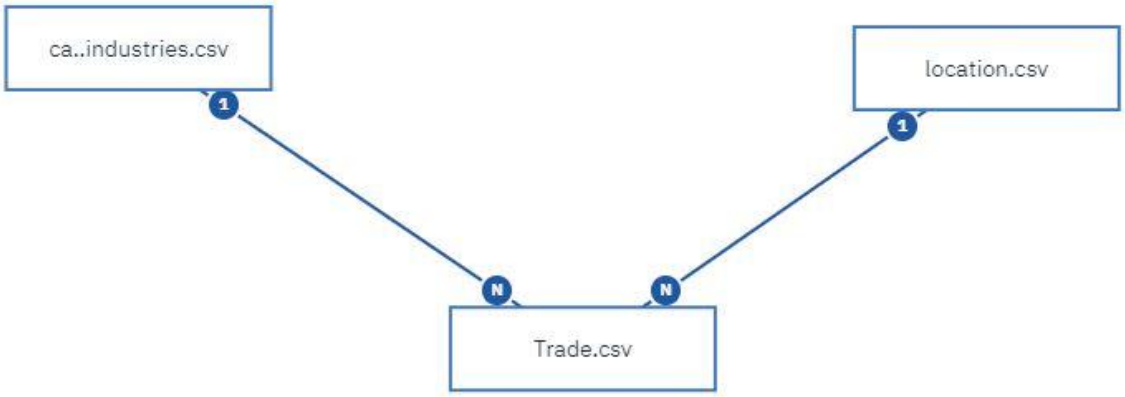


Figure 1: Relationship path for industries [1]

Figure 2: Attribute hierarchy [1]

Figure 3: Relationship path for road transport [1]

Figure 4: Attribute Hierarchy for road transport[1]

Schools

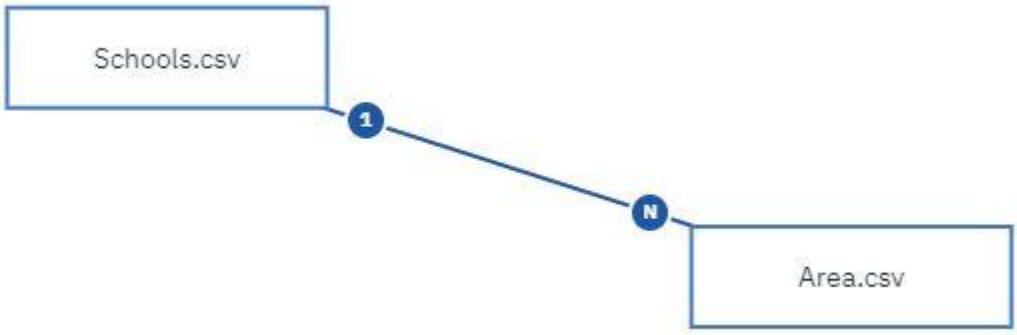
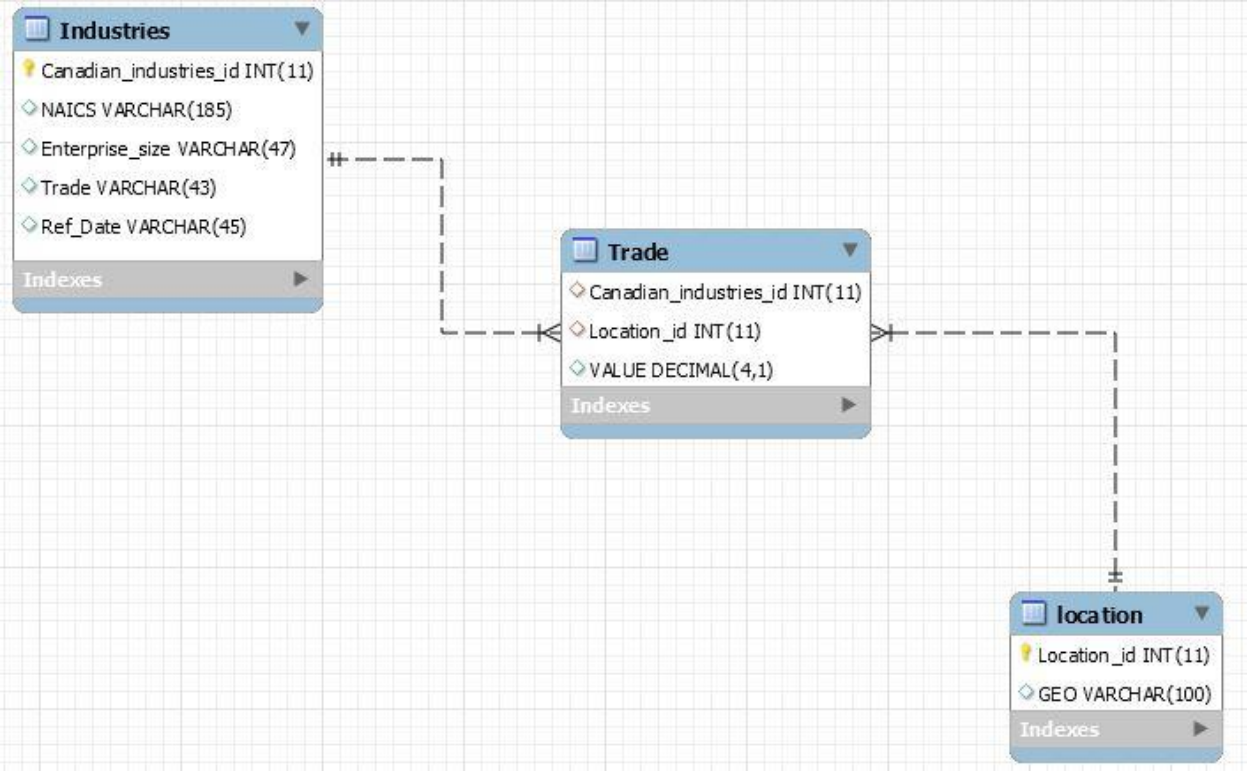


Figure 5:Relationship path for schools [1]

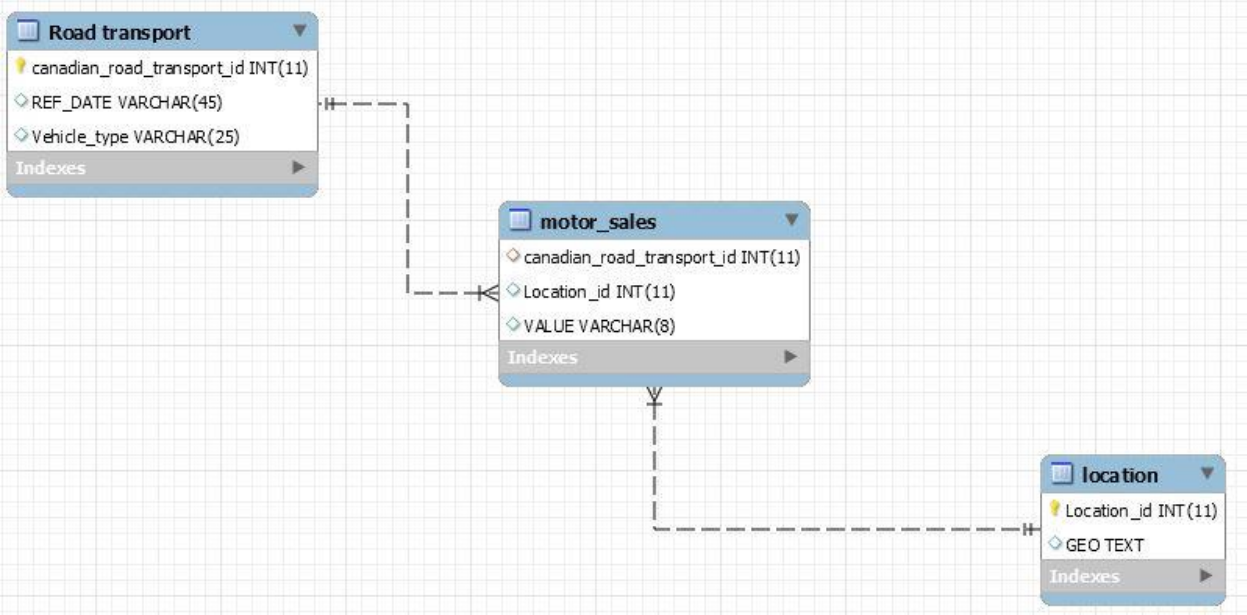
Figure 6: Attribute hierarchy of schools [1]

13. Star schema Model



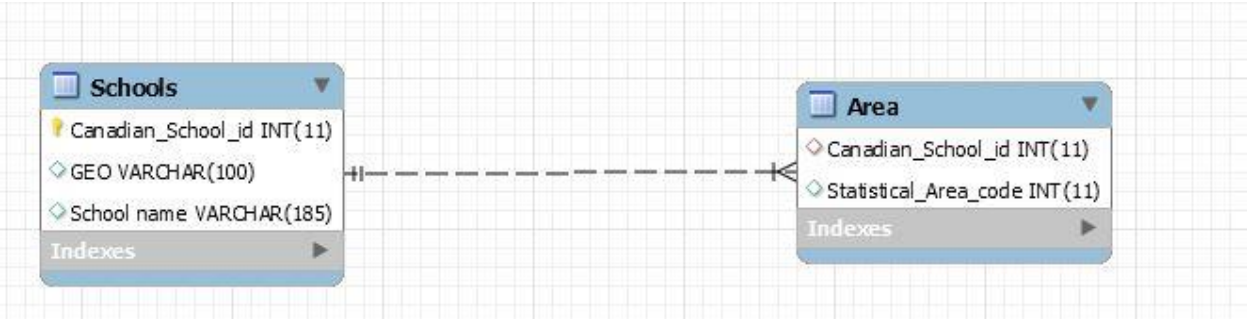
Trade is the fact table. Other 2 are dimension

Figure 7: Industries



Motor sales is the fact table. other 2 are dimension tables

Figure 8: Road transport



Area is the fact table and school are the dimension table

Figure 9: Schools

14.

Data modules have been created in Cognos and reports have been generated

The sample report has been generated using Cognos and comes under the category of a list report. It concentrates on location, size of the enterprise and type of the trade

REF_DATE	GEO	Enterprise size	Trade
2017	Canada	Total, all enterprise sizes	Direct, indirect and intermediary exporters
2017	Canada	Total, all enterprise sizes	Indirect exporters only
2017	Canada	Total, all enterprise sizes	Intermediary exporters only
2017	Canada	Small enterprises (20 to 99 employees)	Importers and direct exporters
2017	Canada	Small enterprises (20 to 99 employees)	Direct, indirect and intermediary exporters
2017	Canada	Small enterprises (20 to 99 employees)	Intermediary exporters only
2017	Canada	Medium-sized enterprises (100 to 249 employees)	Direct and intermediary exporters
2017	Canada	Large enterprises (250 and more employees)	Direct and indirect exporters
2017	Canada	Large enterprises (250 and more employees)	Direct, indirect and intermediary exporters
2017	Quebec	Total, all enterprise sizes	Direct, indirect and intermediary exporters

Figure 10: Report generated for the industries[1]

15 .

OLAP operations are usually used in BI technologies in making efficient decisions and to analyze the data across different dimensions and it is often convenient for the clients to make faster business decisions in the dynamic world.

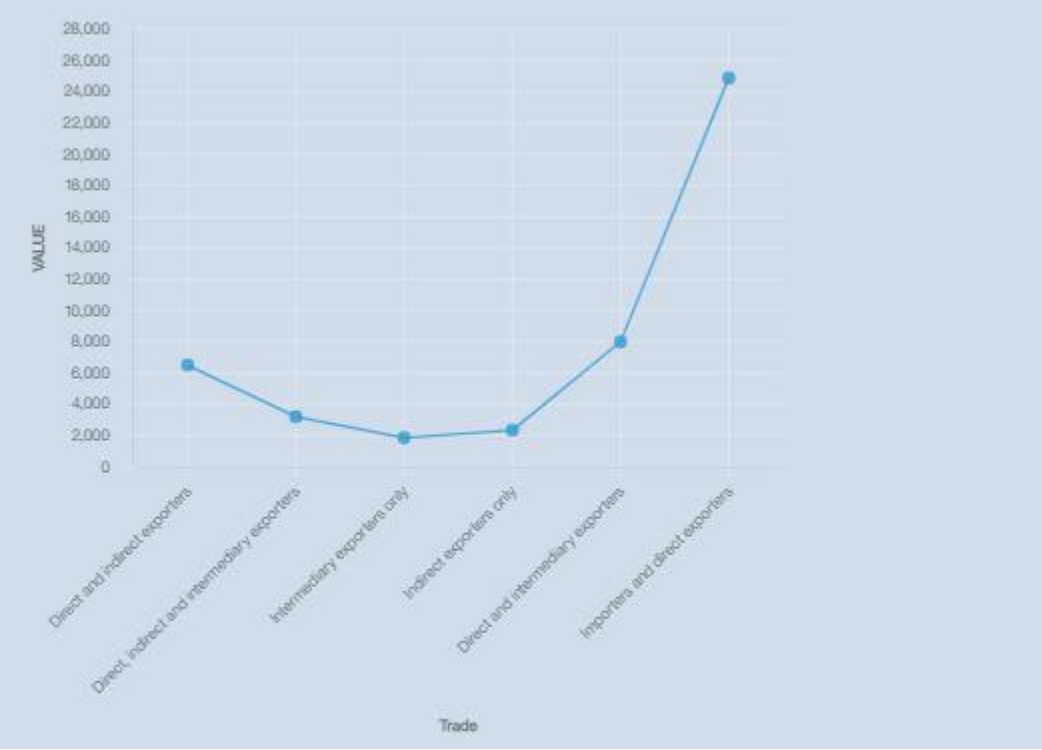
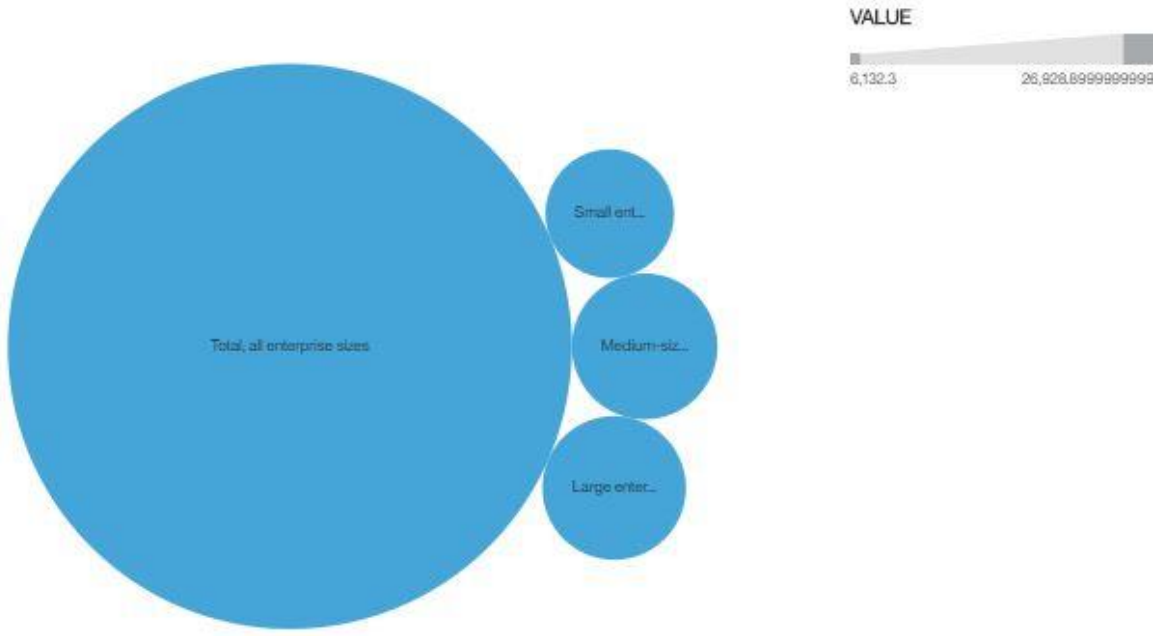


Figure 11: Roll up operations for trade value vs trade type for industries [1]



I Figure 12: Helps user analysis the trade value by enterprise size[1]

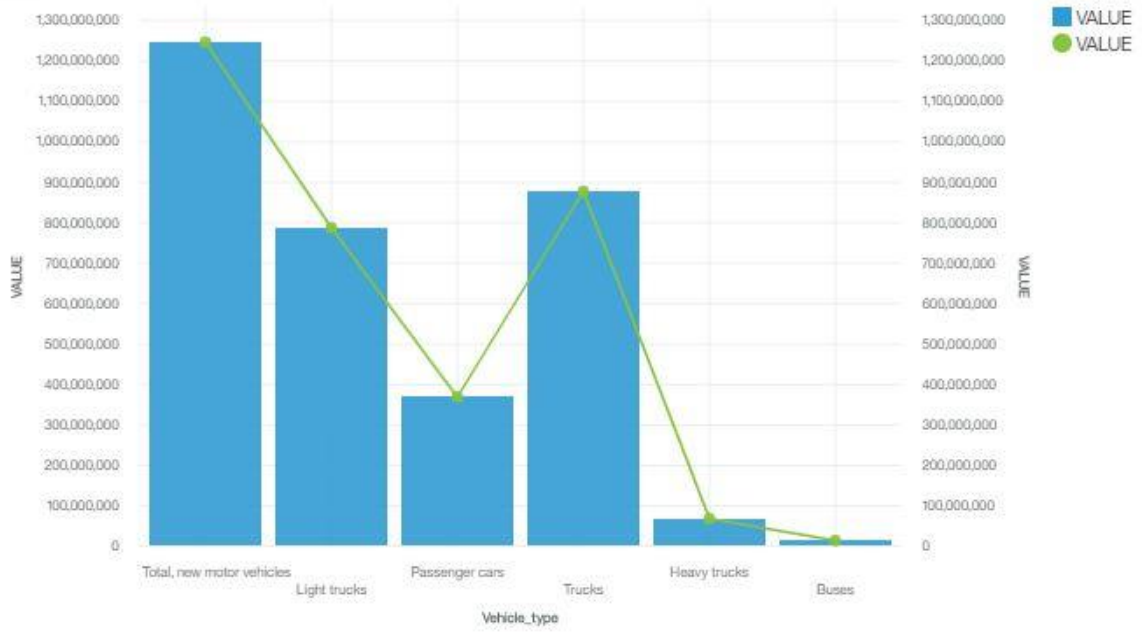


Figure 13: Helps user analyses the vehicle sales by vehicle type[1]

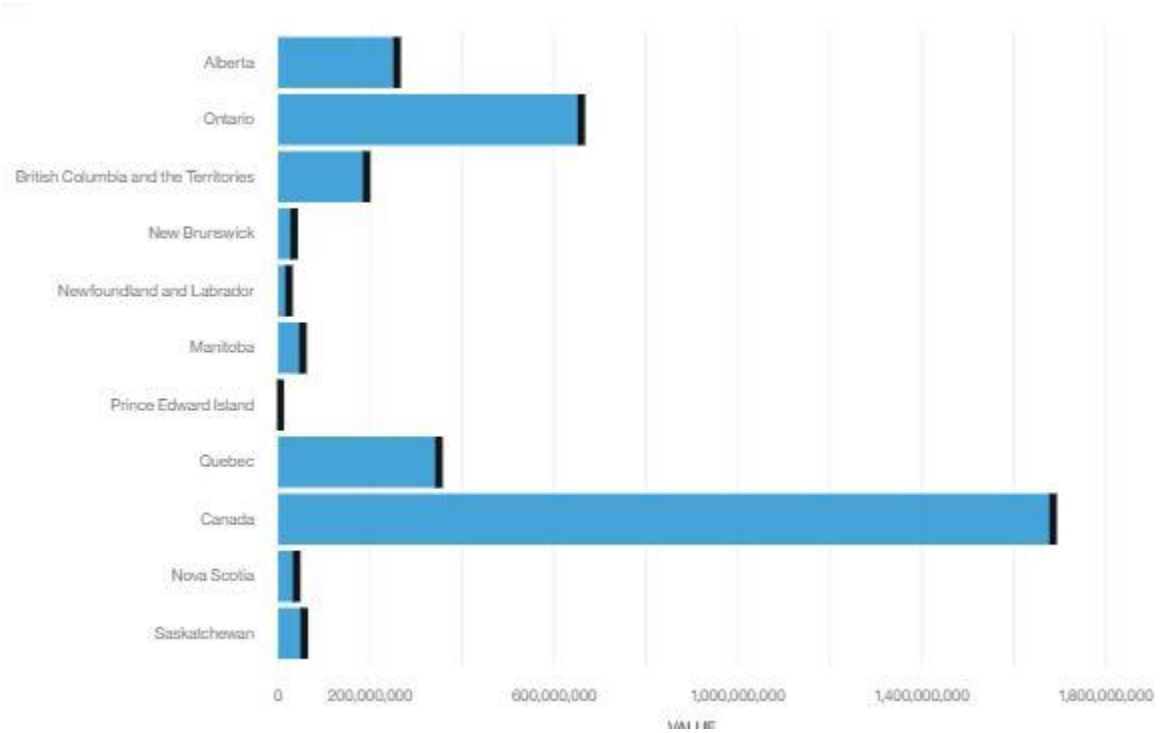


Figure 14: Helps user analyze the vehicle sale by region [1]

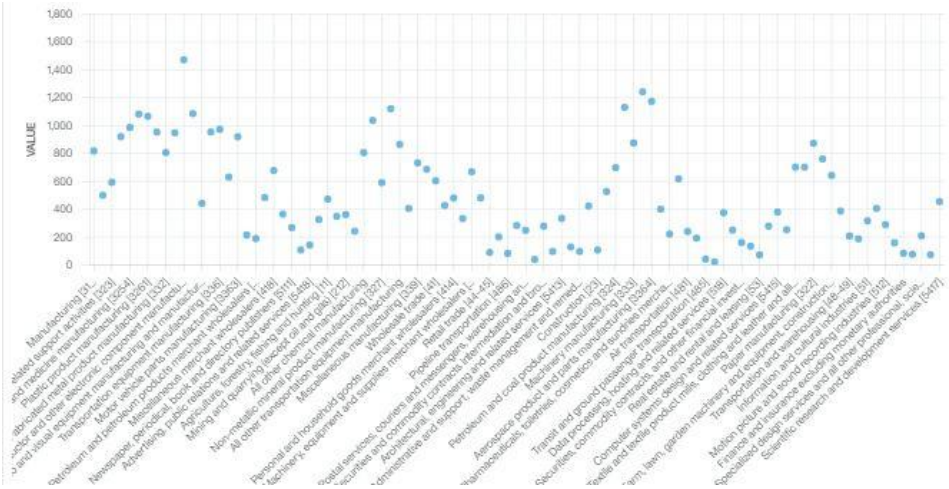


Figure 14 a: Helps user analyze the industry trade by NAICS[1]

16.

a) The visualized graph seems to be representing data from 2010 to 2018.There seems to be a steady growth in the sales of the motor vehicles starting from 2010 to 2018.This is an indirect means of evaluating the Canadian economy. The Ref date in the graph represents year and the value represents motor sales value.

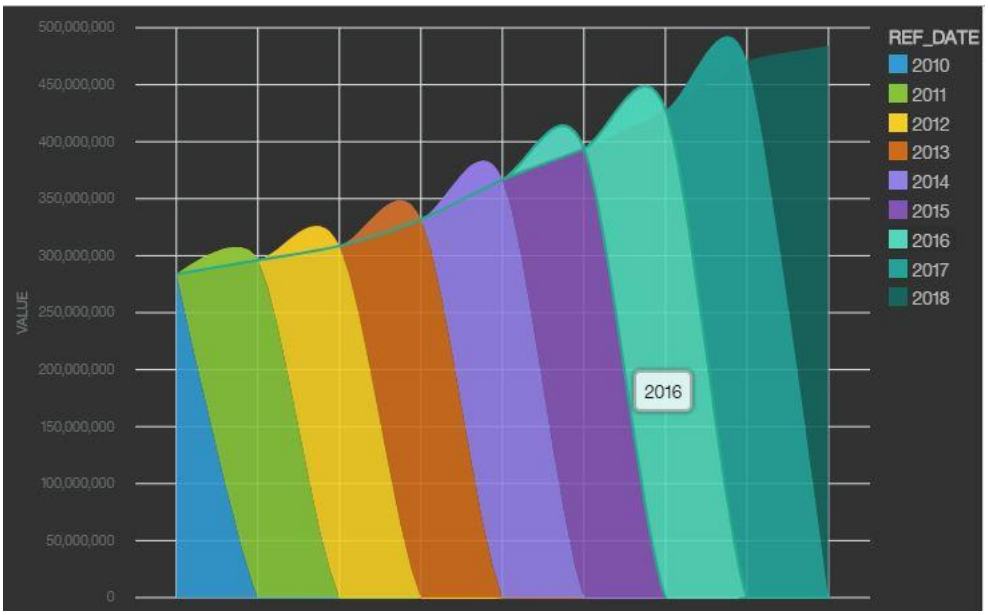


Figure 11: Represents the motor sale value from year 2010-2018[1]

16

b) The dataset used does not have all the schools and has been extracted only for the schools which have been teaching both English and French language. It gives the list of the second language immersion schools in Canada. A list report has been generated to know the school names of all provinces

Loctation	Statistical Area Classification (SAC) code	school_name
British Columbia	932	Centennial Park Elementary
Ontario	590	Rosedale Public School
New Brunswick	305	Bernice MacNaughton High School
New Brunswick	305	Edith Cavell School
New Brunswick	997	Petitcodiac Regional School
New Brunswick	305	Salisbury Elementary School
New Brunswick	997	Tantramar Regional High School
New Brunswick	328	Bathurst High School
New Brunswick	998	Eleanor W. Graham Middle School
New Brunswick	329	Gretna Green Elementary School
New Brunswick	997	L.E. Reinsborough School
New Brunswick	329	St. Andrews Elementary School
New Brunswick	328	Terry Fox Elementary School
New Brunswick	310	Bayside Middle School
New Brunswick	310	Fairvale Elementary School
New Brunswick	998	Fundy High School
New Brunswick	310	Harry Miller Middle School
New Brunswick	310	Kennebecasis Valley High School
New Brunswick	310	Millidgeville North School
New Brunswick	310	Quispamsis Elementary School

Figure 12: Second immersion school name of the provinces

References:

[1] Ibm.com. (2019). *IBM Cognos Analytics on Cloud - Overview - Canada*. [online] Available at: https://www.ibm.com/ca-en/marketplace/business-intelligence [Accessed 22 Jul. 2019].

[2] "Open Data", open.canada.ca, 2010. [Online]. Available: https://open.canada.ca/data/en/dataset/f6e7e871-79b7-49e1-90a2-e3c913f1951d. [Accessed: 30- May- 2019]

[3] "Open Data", open.canada.ca, 2010. [Online]. Available: https://open.canada.ca/data/en/dataset/2bfebd29-1a98-4c57-9134-93f1b18190ea. [Accessed: 30- May- 2019]

4]"Open Data", open.canada.ca, 2010. [Online]. Available: https://open.canada.ca/data/en/dataset/1433feac-853a-4efa-9c05-2133b93af638. [Accessed: 30- May- 2019].