CYBER SECURITY BREACH

ABOUT THE PROJECT

Data and Security Breaches have become a bigger problem for companies in this digital world. Cyber Security plays an important role in tackling with these problems.

The objective of this project is to create a dashboard which can help in tracking breaches happened in the past and events related to those breaches.

ABOUT THE DATA

The dataset contains various attributes which helps in getting details related to the breaches happened in the past and events related to those breaches. The details about those attributes are :

- Number : Unique Id number for each breach.
- Name of Covered Entity : Name of Company/Organisation which was main target of breach.
- Business Associate Involved : Name of Company/Organisation which was impacted along with the main Company/Organisation.

- Total Individuals : Number of employees working in the Company/Organisation.
- Individuals Affected : Number of employees impacted from the breach.
- Type of Breach : Category of Breach.
- Location of Breach Information : Source Device/Product where breach was detected.
- Breach Start : Date when breach was detected.
- Breach End : Date when issue related to breach was closed. If no date is given then issue is not resolved.
- Branch : Name of branch which was impacted from the breach.
- Department : Name of department which was target of the breach.
- Country Branch : Name of country where Company/Organisation's data was breached.
- Employee(who find out breach) : Cyber Security Employee who detected the breach.
- Employee URL : Profile Picture URL of the employee who detected the breach.
- Estimated Stolen Data(GB) : Amount of data which was compromised in the breach.

EDA AND DATA TRANSFORMATION

The steps involved in EDA and Data Transformation are :

- Checking and Treating Null values : Dataset which will be used for analysis and dashboard creation must be free from null values. In our dataset, there were zero null values and data was ready for analysis.
- Column DataType : In a dataset, each column should have correct datatype, so that analysis can be done in correct way. In our dataset, Breach Start and Breach End columns were changed to Date from text and Estimated Stolen Data(GB) was changed to numeric from text datatype.

- Creating Various Tables for Data Modelling : Data modelling is process of analysing the data objects and their relationship to the other objects. The Data Model's main focus is on what data is needed and how we have to organize data rather than what operations we have to perform. So for data modelling, we have to create various tables (known as Dimension Tables) and then establish there relationship with Main Table (known as Fact Table) to create Star Schema. Tables created are Branches, Departments, Breach Types, Countries, Employees who found the breach.

ARCHITECTURE DESCRIPTION

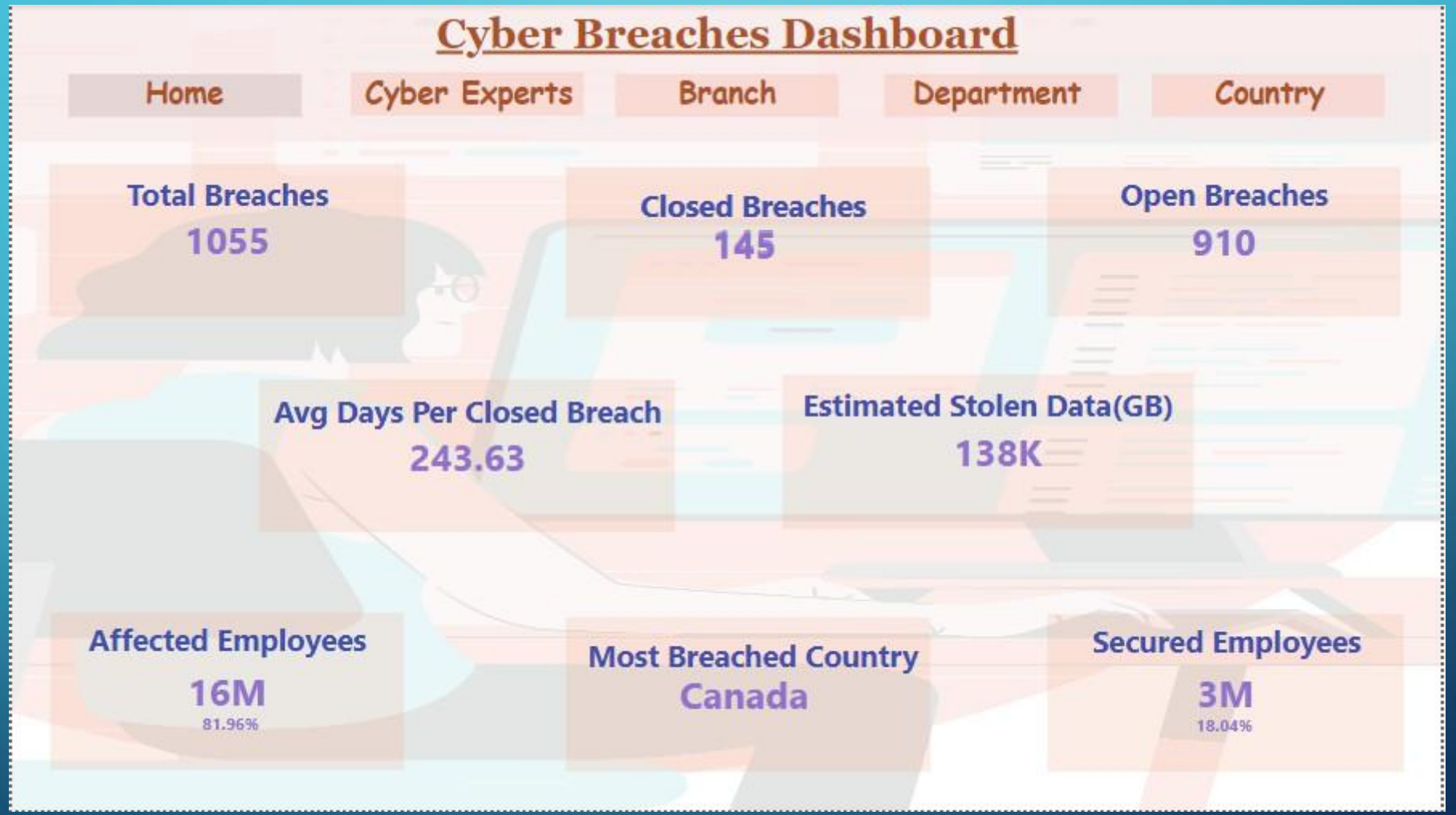
- Raw data collection : Data is a open source file and collected form Kaggle website.
- Data Pre-processing and Transformation : Before building any model, it is important to perform data processing and transformation to make data suitable for data analysis and visualization. The processes followed in this project are :
  - Checking null values : Dataset was checked for null values and data was free from null values.

- Checking and Correcting datatype of columns : The datatype of each column should be according to the values inside it for better analysis and visualization. The datatype of Columns Breach Start and Breach End was changed from Text to Date and Estimated Stolen Data(GB) from Text to Numeric datatype.

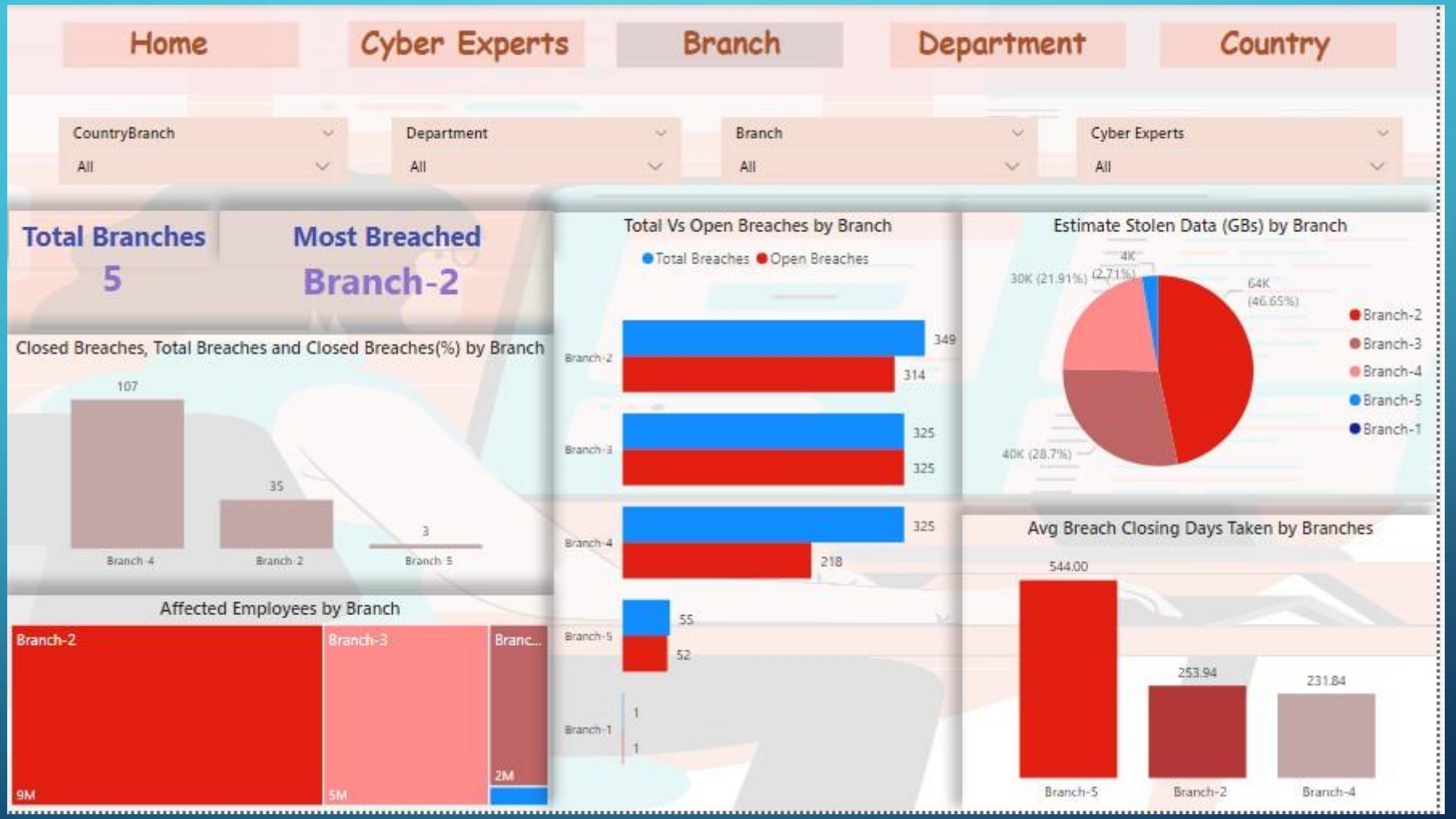
- Data Modelling : Data modelling is process of analysing the data objects and their relationship to the other objects. The Data Model's main focus is on what data is needed and how we have to organize data rather than what operations we have to perform. So for data modelling, we have to create various tables (known as Dimension Tables) and then establish there relationship with Main Table (known as Fact Table) to create Star Schema. Tables created are Branches, Departments, Breach Types, Countries, Employees who found the breach.

- Deployment : Dashboards are created using Power BI Desktop and then deployed in workspace at Power BI Web. From Power BI web client can access using their relevant account.

Dashboards


Cyber Breaches Dashboard
Home
Cyber Experts
Branch
Department
Country
Total Breaches
1055
Closed Breaches
145
Open Breaches
910
Avg Days Per Closed Breach
243.63
Estimated Stolen Data(GB)
138K
Affected Employees
16M
81.96%
Most Breached Country
Canada
Secured Employees
3M
18.04%


Home
Cyber Experts
Branch
Department
Country
CountryBranch
All
Department
All
Branch
All
Cyber Experts
All
Total Cyber Security Experts
11
3rd
Carlos Sultan
134
12.70%
1st
Kareena Rathore
147
13.93%
2nd
Rajesh Rana
136
12.89%
Cyber Experts Performance Card
Rank Employee Breaches Detected Open Breaches Closed Breaches % of Breaches Found
4 Choby Khanna 123 111 12 11.66%
5 Diljit Rana 99 85 14 9.38%
6 David Carlos 97 88 9 9.19%
7 Khalida Kapoor 86 70 16 8.15%
8 Ali Khan 74 60 14 7.01%
9 Umair Awan 61 53 8 5.78%
10 Isma Zafar 50 44 6 4.74%
11 Ahmad Butt 48 42 6 4.55%


Home
Cyber Experts
Branch
Department
Country
CountryBranch
All
Department
All
Branch
All
Cyber Experts
All
Total Branches
5
Most Breached
Branch-2
Closed Breaches, Total Breaches and Closed Breaches(%) by Branch
107
35
3
Branch 4
Branch 2
Branch 5
Affected Employees by Branch
Branch-2
9M
Branch-3
5M
Branc...
2M
Total Vs Open Breaches by Branch
Total Breaches
Open Breaches
Branch-2
349
314
Branch-3
325
325
Branch-4
325
218
Branch-5
55
52
Branch-1
1
1
Estimate Stolen Data (GBs) by Branch
4K
(2.71%)
30K (21.91%)
64K
(46.65%)
40K (28.7%)
Branch-2
Branch-3
Branch-4
Branch-5
Branch-1
Avg Breach Closing Days Taken by Branches
544.00
253.94
231.84
Branch-5
Branch-2
Branch-4


Home
Cyber Experts
Branch
Department
Country
CountryBranch
All
Department
All
Branch
All
Cyber Experts
All
Total Department
15
Most Breached
Department-15
Closed Breaches by Department
48
16
13
10
10
8
8
8
7
6
4
4
2
1
Department
Department-12
Department-6
Department-1
Department-3
Department-13
Department-14
Department-4
Department-9
Department-5
Department-11
Department-8
Department-10
Department-7
Affected Employees by Department
Department-12
6M
Department-1
3M
Departme...
1M
Departm...
1M
Department-15
2M
Depart...
Depa...
Depa...
Depart...
Estimate Stole Data (GBs) Of Top 3 Department
12K (18.1%)
14K (21.2%)
40K (60.7%)
Department-15
Department-12
Department-1
Avg Breach Closing Days Taken by Top 5 Dept
902.75
438.17
292.46
279.50
268.00
Department-13
Department-5
Department-6
Department-10
Department-7
Open Breaches by Department
Department-15
312
Department-12
110
Department-1
107
Department-4
77
Department-13
67
Department-3
65
Department-9
57
Department-6
54
Department-14
42
Department-8
42
Department-7
35
Department-5
31
Department-11
28
Department-10
22
Department-2
6


Home
Cyber Experts
Branch
Department
Country
CountryBranch
All
Department
All
Branch
All
Cyber Experts
All
Total Country
25
Most Breached
Canada
Countries by Most Closed Breaches
10
8
7
6
6
4
4
Japan
Germany
Australia
Canada
United States
France
India
Affected Employees by Countries
United States
5M
Japan
3M
United Kingdom
1M
New Zeal...
1M
Qatar
Italy
India
Ne...
0M
0M
0M
Fr...
Estimate Stolen Data (GBs) Of Top 5 Countries
France
Canada
Japan
India
Germany
United States
Australia
Canada
India
United States
Australia
Germany
Japan
France
Avg Breach Closing Days Taken by Top 5 Countries
665.3
664.9
441.2
412.0
396.7
Sweden
Norway
Russia
Greece
United States
Open Breaches by Countries
Canada 49
India 49
United States 49
France 48
Australia 45
Germany 44
Japan 42
South Korea 40
China 39
United Kingdom 39
New Zealand 38
Netherland 36
Sweden 36
Austria 35
Belgium 35
Denmark 35
Norway 35

VISUAL ANALYTICS AND INSIGHTS

- ✔ There are total 1055 breaches detected from which 145 are closed and 910 breaches are still open which is 86% of total breaches.
- ✔ Average Time taken to Close a Breach is 243 days because of which 138K GBs of data was stolen.
- ✔ Out of 19M employees, 16M employees are victim of breaches which is 84% of total employees.

- ✔ From all 11 cyber experts, top 4 experts have detected 51% of total breaches.
- ✔ From all 5 branches, Branch-2 is most impacted branch with 349 total breaches out of which 314 breaches are open, 64K GBs of Stolen Data and 9M affected employees.
- ✔ From 15 departments, Department-15 is most breached department with 312 breaches out of which 264 breaches are open and 40K GBs of stolen data. Also, Department-15 has closed 48 breaches which highest among all departments.

- ✔ From 25 Countries, Canada is most breached country with 55 breaches and 7.4K GBs of Stolen data.
- ✔ Canada, India and United States have most open breaches, each have 49 open breaches.
- ✔ Sweden and Norway has highest Average Time taken to Close Breach of 665 Days.
- ✔ United States has highest number of employees(5M) which are affected from various types of breaches.

THANK YOU