PATIENT VISIT DATA ANALYSIS PROJECT

Project Overview:

Analysing Patients Visit Data For A Hospital To Gain Insights And Enhance Decision-Making.

Project Objective:

Generate A Improved Dynamic Dashboard's For Patient Visits To Analyze And Visualize Hospital patient Data.

Project Requirements:

- Problem Statement
- Data Source
- Software's Required

Problem Statements:

1. Evaluate The average Waiting Time Of patient
2. Patient Visit On a Monthly And Year Basis
3. Total Visit By Department Referral
4. Breakdown Patients Visit By age Group
5. Determine The Average Satisfaction by Age-Group And Patient Race
6. Determine The Average Wait Time by Age-Group And Patient Race
7. Patient Visit According To Gender
8. Determine Average Visits Per Month And seasonal Index

Data Source:

Utilizing Patient Data Collected By Hospital Management For Comprehensive Data Analysis.

Data Collection Tool : MS excel

Software's Used:

OS Tool : ChatGPT

BI Tool : Microsoft Power BI

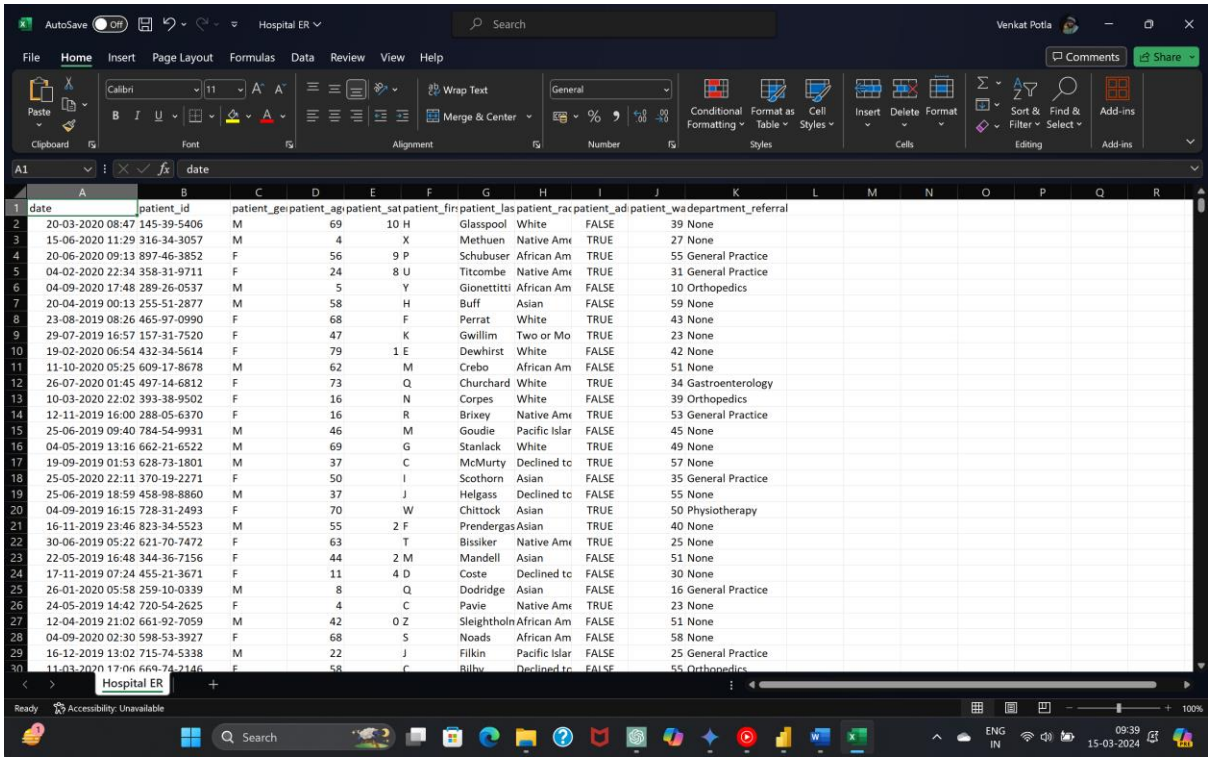
Project Process:

Step By Step Process:

1. Collecting the Data set
2. Importing Data set Into Power Bi
3. Data Transform And Cleaning
4. Data Processing(DAX)
5. Data Visualization
6. Final Dash Board

1.Collecting Data

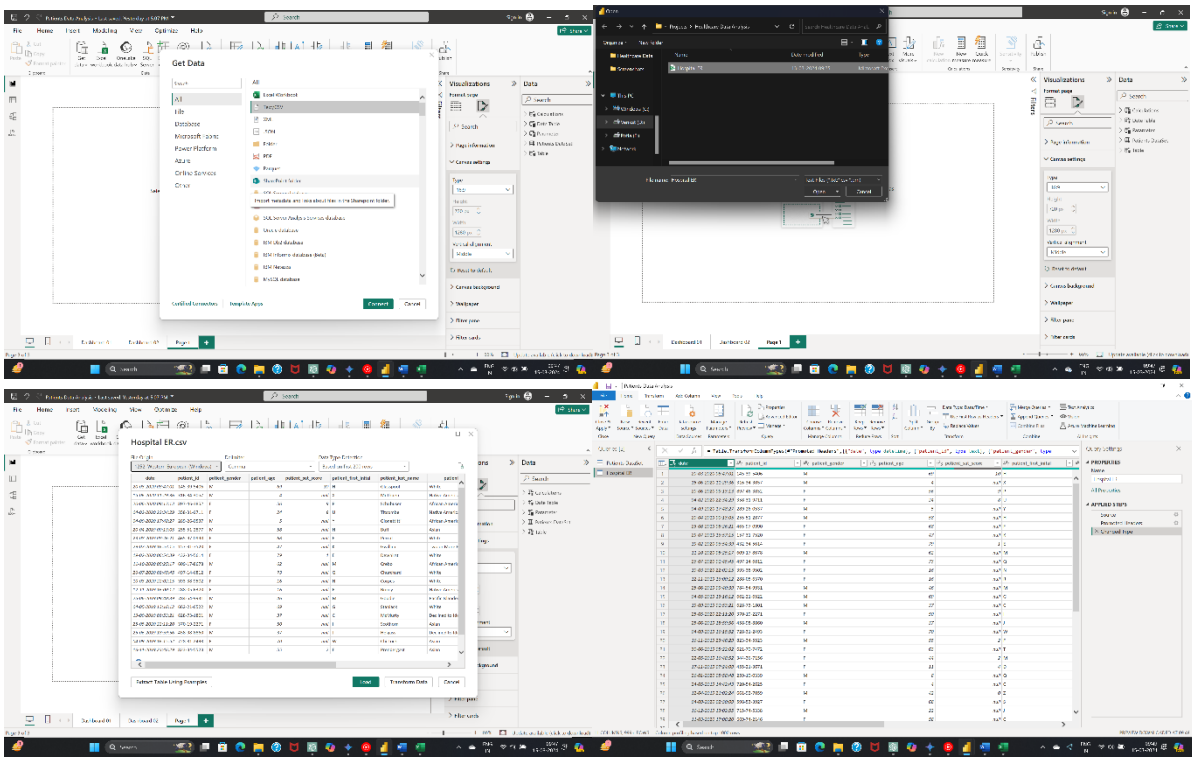
The Data set collected From Hospital Management In The Form Of Excel Sheets.



date	patient_id	patient_ge	patient_ag	patient_sat	patient_fir	patient_las	patient_rac	patient_ad	patient_wa	department_referral
20-03-2020 08:47	145-39-5406	M	69	10	H	Glasspool	White	FALSE	39	None
15-06-2020 11:29	316-34-3057	M	4		X	Methuen	Native Ame	TRUE	27	None
20-06-2020 09:13	897-46-3852	F	56	9	P	Schubuser	African Am	TRUE	55	General Practice
04-02-2020 22:34	358-31-9711	F	24	8	U	Titcombe	Native Ame	TRUE	31	General Practice
04-09-2020 17:48	289-26-0537	M	5		Y	Gionettitti	African Am	FALSE	10	Orthopedics
20-04-2019 00:13	255-51-2877	M	58		H	Buff	Asian	FALSE	59	None
23-08-2019 08:26	465-97-0990	F	68		F	Perrat	White	TRUE	43	None
29-07-2019 16:57	157-31-7520	F	47		K	Gwillim	Two or Mo	TRUE	23	None
19-02-2020 06:54	432-34-5614	F	79	1	E	Dewhirst	White	FALSE	42	None
11-10-2020 05:25	609-17-8678	M	62		M	Crebo	African Am	FALSE	51	None
26-07-2020 01:45	497-14-6812	F	73		Q	Churchard	White	TRUE	34	Gastroenterology
10-03-2020 22:02	393-38-9502	F	16		N	Corpes	White	FALSE	39	Orthopedics
12-11-2019 16:00	288-05-6370	F	16		R	Brixey	Native Ame	TRUE	53	General Practice
25-06-2019 09:40	784-54-9931	M	46		M	Goudie	Pacific Islar	FALSE	45	None
04-05-2019 13:16	662-21-6522	M	69		G	Stanlack	White	TRUE	49	None
19-09-2019 01:53	628-73-1801	M	37		C	McMurty	Declined to	TRUE	57	None
25-05-2020 22:11	370-19-2271	F	50		I	Scothorn	Asian	FALSE	35	General Practice
25-06-2019 18:59	458-98-8860	M	37		J	Helgass	Declined to	FALSE	55	None
04-09-2019 16:15	728-31-2493	F	70		W	Chittock	Asian	TRUE	50	Physiotherapy
16-11-2019 23:46	823-34-5523	M	55	2	F	Prendergas	Asian	TRUE	40	None
30-06-2019 05:22	621-70-7472	F	63		T	Bissiker	Native Ame	TRUE	25	None
22-05-2019 16:48	344-36-7156	F	44	2	M	Mandell	Asian	FALSE	51	None
17-11-2019 07:24	455-21-3671	F	11	4	D	Coste	Declined to	FALSE	30	None
26-01-2020 05:58	259-10-0339	M	8		Q	Dodridge	Asian	FALSE	16	General Practice
24-05-2019 14:42	720-54-2625	F	4		C	Pavie	Native Ame	TRUE	23	None
12-04-2019 21:02	661-92-7059	M	42	0	Z	Sleightholn	African Am	FALSE	51	None
04-09-2020 02:30	598-53-3927	F	68		S	Noads	African Am	FALSE	58	None
16-12-2019 13:02	715-74-5338	M	22		J	Filkin	Pacific Islar	FALSE	25	General Practice
11-03-2020 17:06	669-74-2146	F	58		C	Bilby	Declined to	FALSE	55	Orthopedics

2.Importing Data set Into Microsoft Power BI

- For That, Open Power BI, Go to Get Data and Select Text/CSV Then, Make a Connection With CSV File



- After Completion of Connection we can Load Or Transform Data Based On Requirement

6.Data Cleaning &Processing

- After Loading Data Into PowerBI By Using The Power Query Editor, We Perform DAX(Data Analysis Express) For Data cleaning and Processing
- These Are Some Of DAX Formulas written for Data Visualization

DAX Formula's:

1.Date Table

```
Date Table = ADDCOLUMNS(CALENDAR(MIN('Patients DataSet'[Date]),MAX('Patients DataSet'[Date])),"Year",YEAR([Date]),"Month",FORMAT([Date],"mmm"),"WeekNumber",WEEKDAY([Date]),"weekType",
IF(WEEKDAY([Date])=1,"Weekend",IF(WEEKDAY([Date])=7,"Weekend","Weekday")),"Weekday",FORMAT([Date],"ddd"),"Month Number",MONTH([Date]))
```

2.Patient Visit Data table

```
1. Total Patients = COUNT('Patients DataSet'[patient_id])
2. Average Wait Time = AVERAGE('Patients DataSet'[patient_waittime])
3. Avg Satisfaction Rate = CALCULATE(AVERAGE('Patients
   DataSet'[patient_sat_score]),'Patients
   DataSet'[patient_sat_score]<>BLANK())
4. % No Rating = VAR _NoRatings=CALCULATE([Total Patients],'Patients
   DataSet'[patient_sat_score]=BLANK()) RETURN
   DIVIDE(_NoRatings,[Total Patients])

5. % Administrative =
   DIVIDE(COUNTROWS(FILTER('PatientsDataSet','Patients
   DataSet'[patient_admin_flag]=TRUE())),[Total Patients])
6. % NON Administrative = DIVIDE(COUNTROWS(FILTER('Patients
   DataSet','Patients DataSet'[patient_admin_flag]=FALSE())),[Total
   Patients])

7. % Female Visit = DIVIDE(CALCULATE([Total Patients],'Patients
   DataSet'[patient_gender]="F"),[Total Patients])
8. % Male Visit = DIVIDE(CALCULATE([Total Patients],'Patients
   DataSet'[patient_gender]="M"),[Total Patients])
9. % Unknown = DIVIDE(CALCULATE([Total
   Patients],'PatientsDataSet'[patient_gender]="NC"),[Total Patients])

10.      % Referred Patient = VAR _FilterPatients= CALCULATE([Total
   Patients],'Patients DataSet'[department_referral]<> "none") RETURN
   DIVIDE(_FilterPatients,[Total Patients])
11.      % Un Referred Patient = VAR _FilterPatients= CALCULATE([Total
   Patients],'Patients DataSet'[department_referral]="none") RETURN
   DIVIDE(_FilterPatients,[Total Patients])
12.      Age Buckets = SWITCH(TRUE(),'Patients
   DataSet'[patient_age]<=10, "0-10",'Patients
   DataSet'[patient_age]<=20, "11-20",'Patients
   DataSet'[patient_age]<=30, "21-30",'Patients
   DataSet'[patient_age]<=40, "31-40",'Patients
   DataSet'[patient_age]<=50, "41-50",'Patients
   DataSet'[patient_age]<=60, "51-60",'Patients
   DataSet'[patient_age]<=70, "61-70","70+")
13.      Age Group = VAR _patientAge = 'Patients DataSet'[patient_age]
   RETURN IF(_patientAge<2,"infancy",IF(_patientAge<6,"Early
   Childhood",IF(_patientAge<12,"Middle
   Childhood",IF(_patientAge<18,"Teenager","Adult"))))
14.      CF Marks Point(month) = VAR _Patient_table= CALCULATETABLE(
   ADDCOLUMNS(SUMMARIZE('Date Table','Date
   Table'[Month]),"@TotalPatients",[Total Patients] ),ALLSELECTED())
   VAR _Minvalu =MINX(_Patient_table,[@TotalPatients]) VAR _Maxvalu
   =MAXX(_Patient_table,[@TotalPatients])
   VAR _Totalpatients =[Total Patients] RETURN SWITCH(TRUE(),
   _Totalpatients=_Minvalu,0,_Totalpatients=_Maxvalu,1)
```

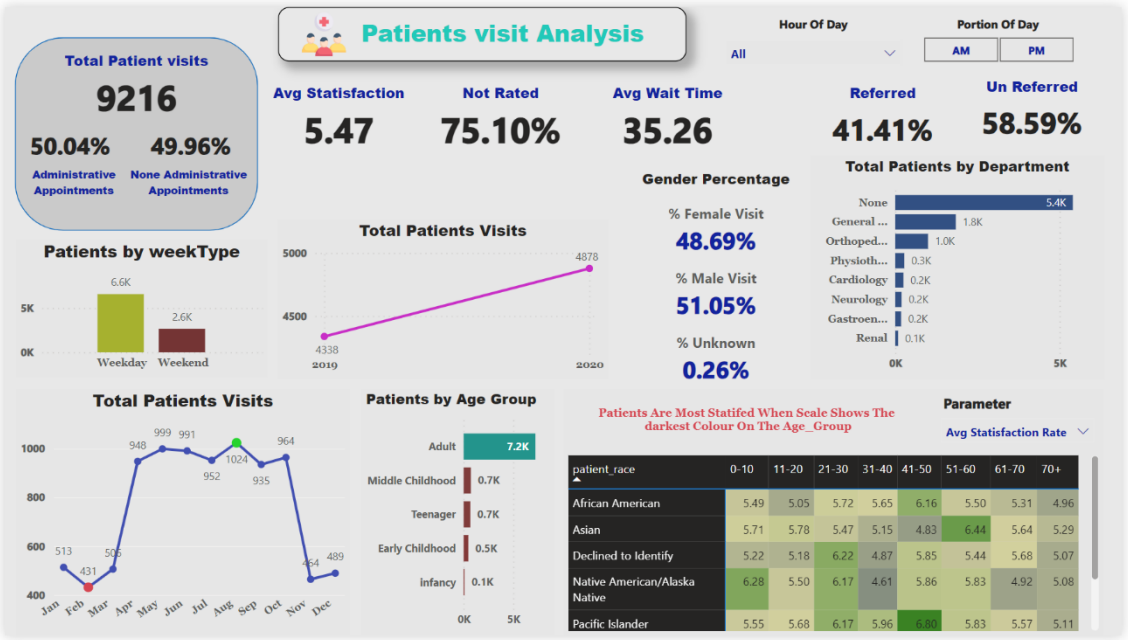
```
15.      CF Marks Point(Year) = VAR
_Patient_table=CALCULATETABLE(ADDCOLUMNS(SUMMARIZE('Date
Table','Date Table'[Year]), "@TotalPatients",[Total Patients]
),ALLSELECTED())
VAR _Minvalu =MINX(_Patient_table,[@TotalPatients])
VAR _Maxvalu =MAXX(_Patient_table,[@TotalPatients])
VAR _Totalpatients =[Total Patients]
RETURN
SWITCH(TRUE(), _Totalpatients=_Minvalu,0, _Totalpatients=_Maxvalu,1)
16.      Hitmap Caption = VAR _selectMeasure =
SELECTEDVALUE(Parameter[Parameter Order])
RETURN IF(_selectMeasure =1,
"The Darkest Colour On Scale Denotes High Wait Time On
Age_group","Patients Are Most Statifed When Scale Shows The darkest
Colour On The Age_Group")

17.      Hour = HOUR('Patients DataSet'[Time])
18.      AvgVisitsPerMonth = DIVIDE([Total Patients],
COUNTROWS(DATESYTD('Patients DataSet'[Date])))

19.      SeasonalIndex = [Total Patients] / [AvgVisitsPerMonth]

20.      Parameter = { ("Avg Wait Time", NAMEOF('Patients
DataSet'[Avearge Wait Time]), 1),
("Avg Statisfaction Rate", NAMEOF('Patients DataSet'[Avg
Statisfaction Rate]), 0)}
21.      Value Marks Point(month) = VAR _Patient_table=
CALCULATETABLE(ADDCOLUMNS(SUMMARIZE('Date Table','Date
Table'[Month]),"@TotalPatients",[Total Patients]),
ALLSELECTED())
VAR _Minvalu =MINX(_Patient_table,[@TotalPatients])
VAR _Maxvalu =MAXX(_Patient_table,[@TotalPatients])
VAR _Totalpatients =[Total Patients]
RETURN
SWITCH(
TRUE(),_Totalpatients=_Minvalu,[Total Patients],
_Totalpatients=_Maxvalu,[Total Patients])
```

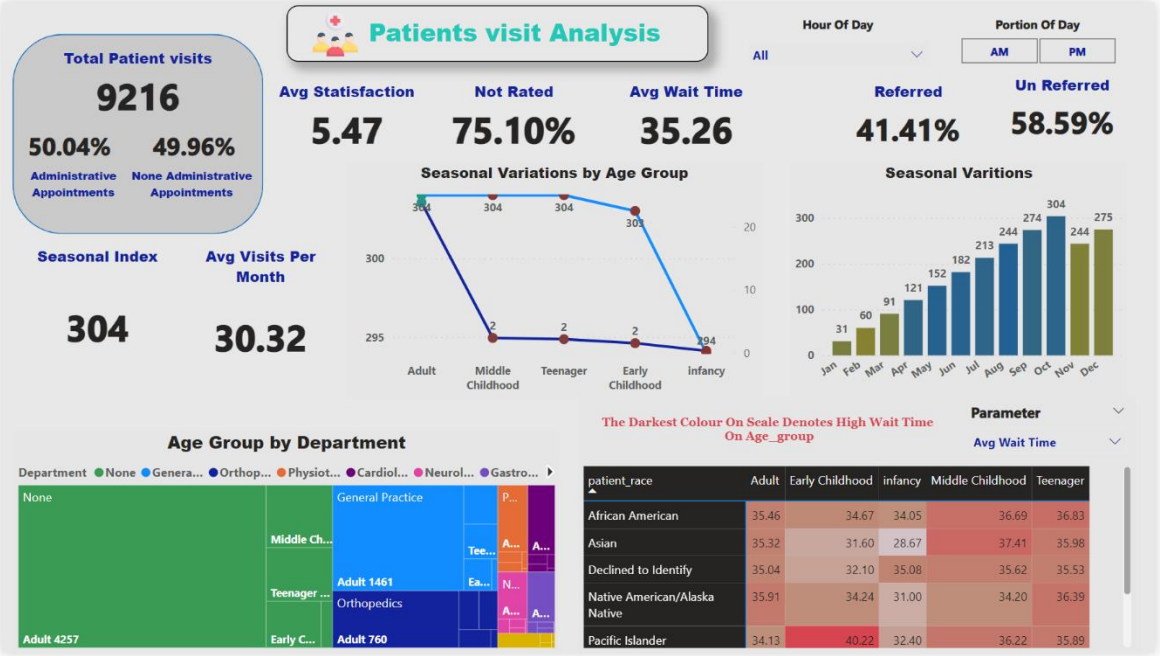
3.Table

```
1. Table = VAR _Patient_table= CALCULATETABLE( ADDCOLUMNS(
SUMMARIZE('Date Table','Date Table'[Month]),
"@TotalPatients",[Total Patients]),
ALLSELECTED()) RETURN _Patient_table
```

8.Data Visualization

- After Cleaning And Processing The Data According To The Requirements of Hospital Management, Prepare Dashboards' For A Hospital Management To Get Insights And Improve Decision-Making





Conclusion:

Total Patient Visits:

- **Total of 9216 patient visits**. This figure likely encompasses both administrative and non-administrative appointments.

Satisfaction Rates:

- The **average satisfaction rate** across all visits is **5.47**.
- Interestingly, a significant portion of patients (approximately **75.10%**) have not been rated for satisfaction.

Wait Times:

- The **average wait time** for patients is **35.26 minutes**.
- This metric provides valuable insights into operational efficiency and patient experience.

Referral Rates:

- **41.41%** of patients have been referred By Specific Department.
- Understanding referral patterns can aid in optimizing healthcare services.

Gender Distribution:

- The dashboard shows an **almost equal distribution** between male and female patients.
- Gender demographics play a crucial role in tailoring healthcare services.

Age Groups:

- **Adults** constitute the majority of visitors.
- Seasonal variations in visits by age group are evident

Weekday Trends:

- Most visits occur during the **weekdays**.
- Analysing daily patterns helps allocate resources effectively.

Seasonal Variation's:

- There are more visits by younger age groups (Early Childhood, Infancy, Childhood) in the summer months (Jun, Jul, Aug)
- More visits by older age groups (Adult, Middle) in the winter months (Oct, Nov, Dec).