Data Warehouse and BI System

MIS 636-A Group 1

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Company Overview

- Global technology company
  - Cognitive Solutions, Global Business Services, Global Financing, Technology & Cloud Services
- 366,000 total employees worldwide
- Total global revenue - 79.14bn (2017)
- Offer many solutions to customers that they must support
  - Cloud Delivery, Software as a Service, Infrastructure as a Service, Platform as a Service
- Need for accurate, timely information to make informed decisions
- Rate of change in technology industry
  - Increasing rate of adoption
- Supporting customers and meeting terms of deals - key

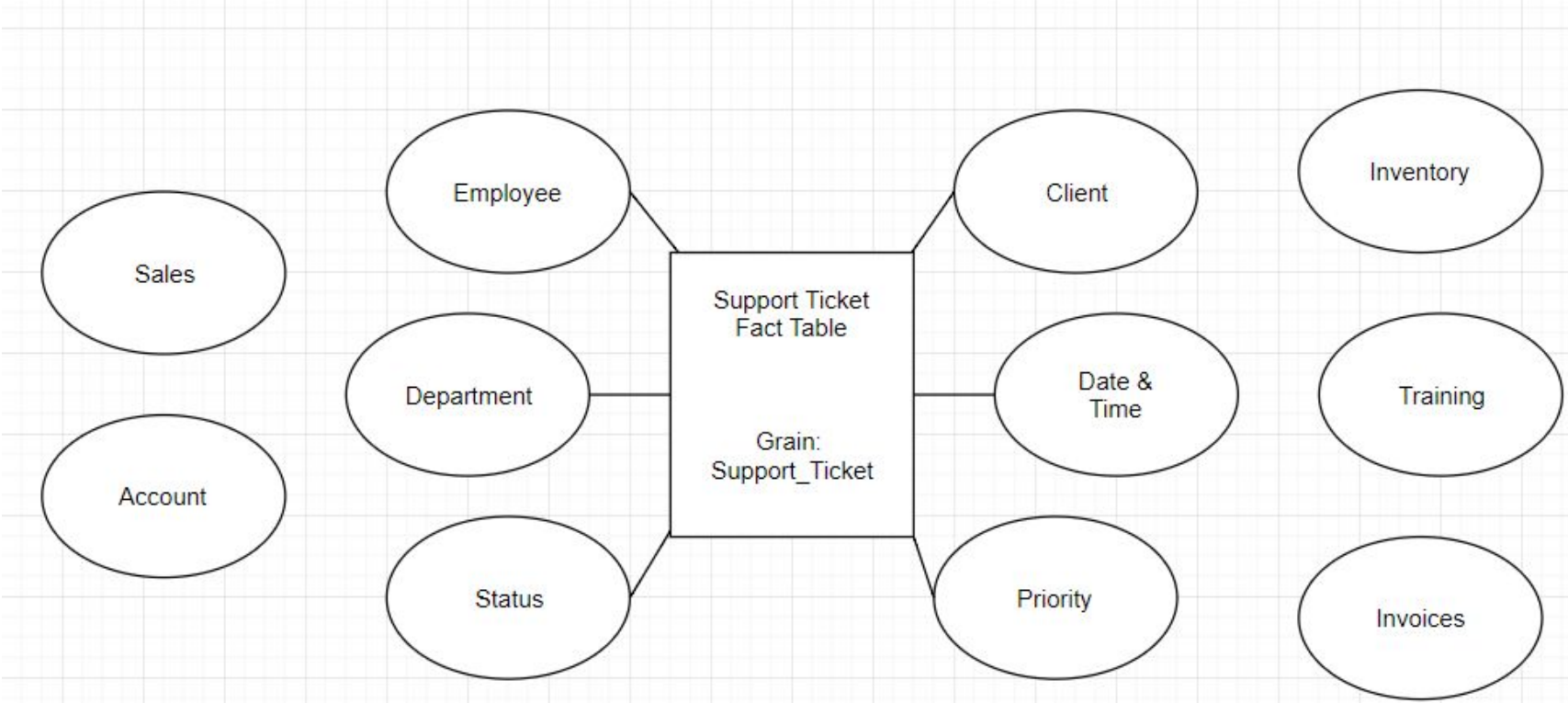
High Level Bus Architecture

Business Process	Date	Client	Service	Employee	Status	Industry
Issue Management	X	X	X	X	X	
Sales Pipeline	X	X	X	X	X	X
SLA Maintenance	X	X	X		X	
Resource Management	X				X	
Service/Client Training		X	X	X		X
Invoicing	X	X	X			

Detailed Bus Matrix

Business Process	Fact Table	Granularity	Date	Client	Service	Employee	Status	Industry
Issue Management	Support_Tickets	Ticket	X	X	X	X	X	
	Tech_Requests	Case	X		X	X	X	
Sales Pipeline	Client_Accounts	Account	X	X	X	X	X	X
	Marketing_Ops	Campaign	X		X			X
SLA Maintenance	Service_Process	Term	X	X	X		X	
Resource Management	Hardware_Status	Item	X				X	
	System_Upkeep	Action	X			X	X	
Service/Client Training	Training	Training		X	X	X		X
Invoicing	Client_Invoices	Invoice	X	X	X			

Logical Fact Table Diagram



Detailed Fact Table

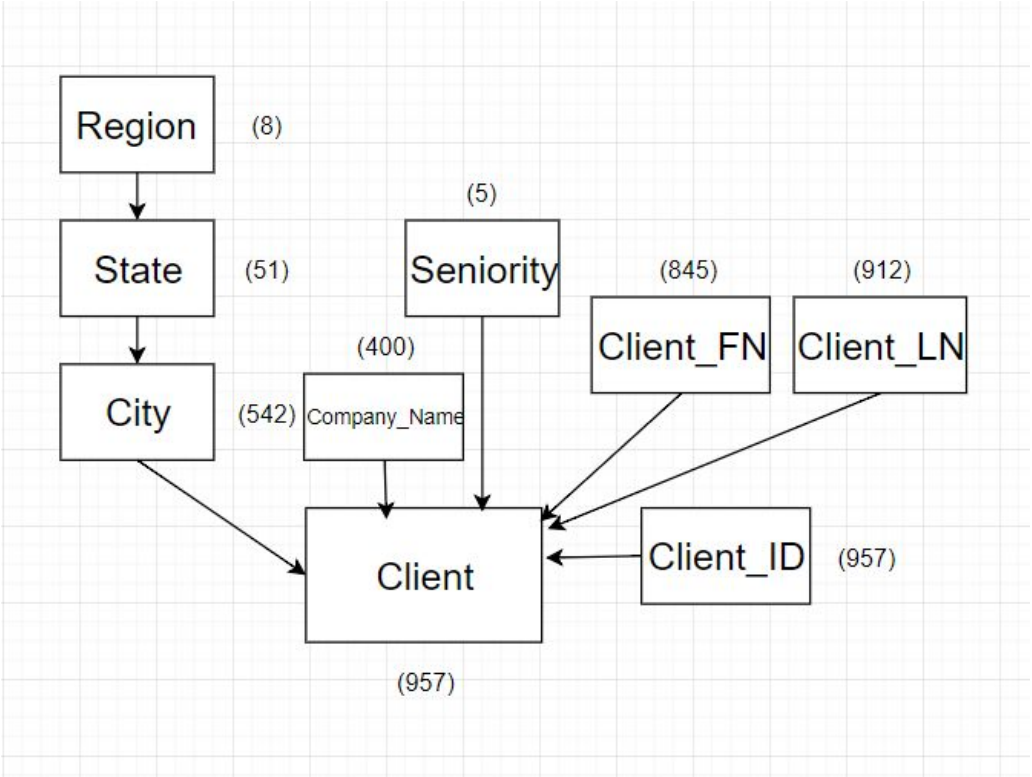
Support_Ticket Line Item Fact Table:

Employee_key
Department_key
Client_key
Status_key
Date_key
Priority_key

Fact:
Ticket_number

- Support_Ticket Fact Table with Foreign Keys and Facts

Dimension Table Detail Diagram



Detail diagram for “Client” dimension

Slowly changing dimensions:

1. Company_Name
2. Seniority

Dimension Attribute Detail Diagram

Attribute Name	Attribute Description	Cardinality	Slowly Changing Dim Policy	Sample Values
City	The city where the client is located	542	Overwritten	Newark
State	The state where the client is located	51	Overwritten	NJ
Region	The region where the client is located	8	Overwritten	Northeast
Company_Name	The name of the company	400	Overwritten	Prudential
Seniority	The level of the client's position within the company	5	Overwritten	2
Client_FN	The first name of the client	845	Overwritten	Mike
Client_LN	The last name of the client	912	Overwritten	Hill
Client_ID	The client's individually assigned ID number	957	Not Updated	15478

Transformation rules for retail sales

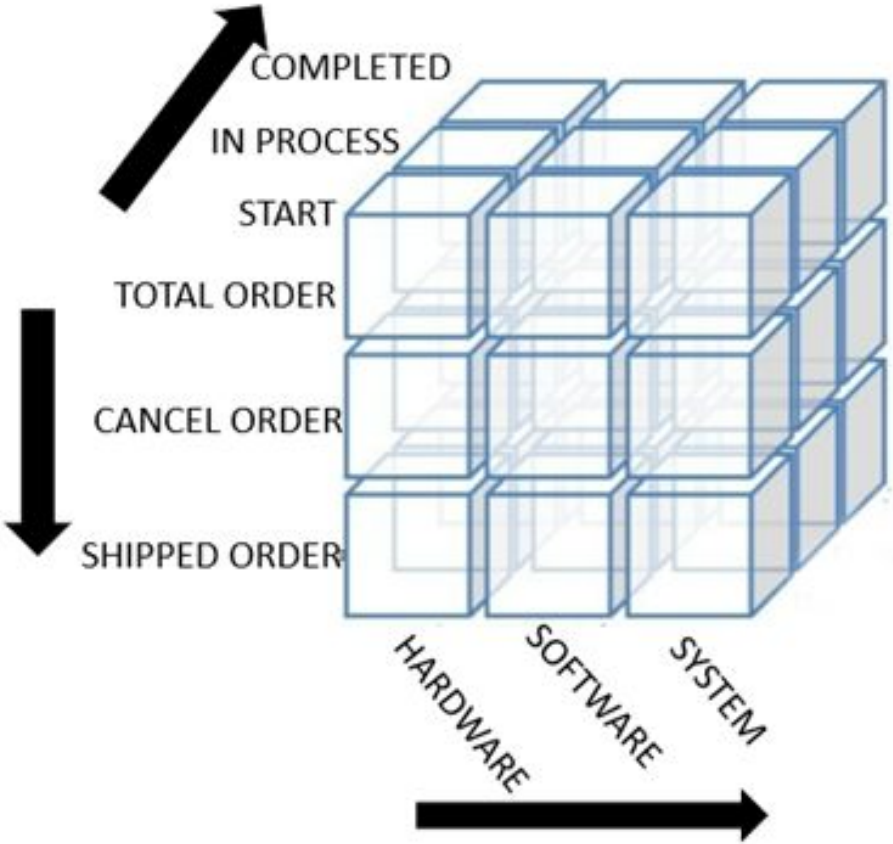
- Delete rows when most of the columns have null values or empty. For example, there might be parameters with no data in columns.
- Avoid duplicates. For example some parameters have similar data in many rows.
- To summarize all the values, group by selecting certain combination of parameters.
- New data is generated from summarized data. For example, sales compared to previous year.
- Success of one parameter is attributed to another parameter. For example, some parameters have dependencies.
- Apply analytics easily by Combining multiple similar files. For example, two files having similar parameters or columns.

Aggregation table

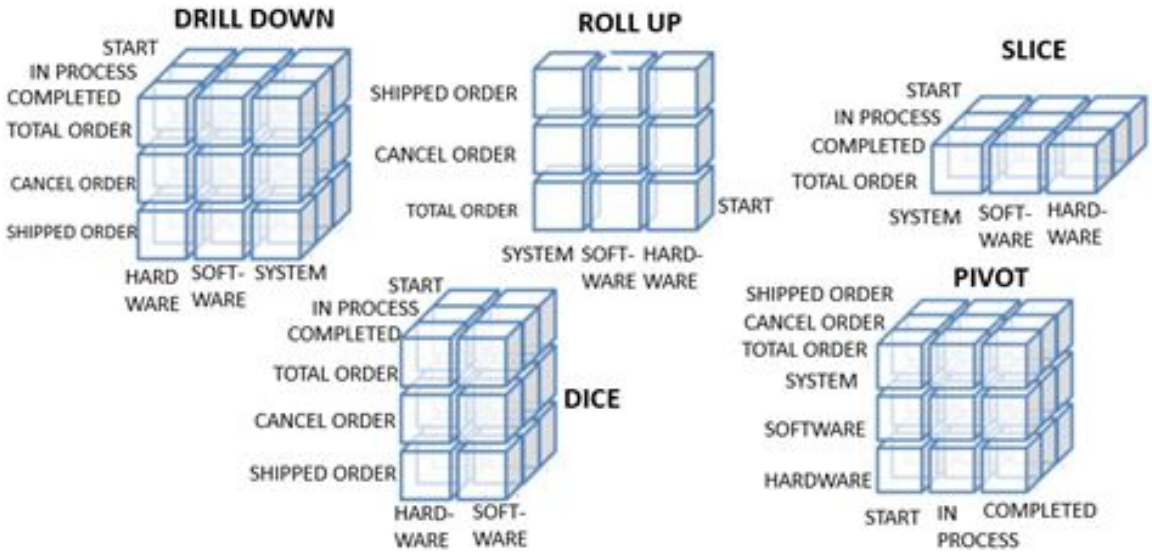
ID	Department	rating	year

Employee ID	Customer services	Marketing	OP	FIN	HR		Q1	Q2	Q3	Q4
BU7978		X				3		600		
QZ4435	X		X			2			850	
CF8506						3	950			
VQ6519				X		5				780

IBM CUBE


COMPLETED
IN PROCESS
START
TOTAL ORDER
CANCEL ORDER
SHIPPED ORDER
HARDWARE
SOFTWARE
SYSTEM

IBM CUBE


DRILL DOWN
START
IN PROCESS
COMPLETED
TOTAL ORDER
CANCEL ORDER
SHIPPED ORDER
HARD WARE
SOFT- WARE
SYSTEM
ROLL UP
SHIPPED ORDER
CANCEL ORDER
TOTAL ORDER
START
SYSTEM
SOFT- WARE
HARD- WARE
SLICE
START
IN PROCESS
COMPLETED
TOTAL ORDER
SYSTEM
SOFT- WARE
HARD- WARE
DICE
START
IN PROCESS
COMPLETED
TOTAL ORDER
CANCEL ORDER
SHIPPED ORDER
HARD- WARE
SOFT- WARE
PIVOT
SHIPPED ORDER
CANCEL ORDER
TOTAL ORDER
SYSTEM
SOFTWARE
HARDWARE
START
IN PROCESS
COMPLETED

IBM USER AND TASK ANALYSIS

Operational

- Lowest level entry point with limited data on a specific business process
- Informative explanatory visualization

Customer

- Lower level entry point with both summary and drill down capability
- Hybrid persuasive exploratory– informative explanatory visualization

IBM USER AND TASK ANALYSIS

Manager

- High level entry point with summary data, drill down and drill across capabilities
- Hybrid exploratory– informative explanatory visualization

Executive/Management

- High level entry point with summary data and drill down capability
- Primarily informative explanatory visualization

Visualizations and B.I. Landscape

The following visualization correspond to the three types of users that we are designing for; the **IT Owners**(Technicians), **Analysts**, and **Managers**.

IT Owner

These dashboards give an insight into the employees tickets that are assigned to them. They are given an optional set of filters to customize their view to their preference.

Analyst

The analyst dashboards are created and used to identify any anomalies that are gathered from the entire population. These dashboards gather historical data and use it to make predictions for trends into the future. These dashboards are combinations of OLAP queries to help with planning, hiring, and preparation.

Manager

The manager requires a high level look at the entire department. Their dashboard is similar to that of the tech's individual dashboard. They recieve an aggregate of tickets as well as the filters to allow them to customize the look and feel. Aside from just historical data, their dashboard also contains forecasts for the ticketing database that will help with planning, hiring etc.

Dataset

- Our database contains 100,000 records. Every record contains a unique Ticket number.

- Each record contains a ticket number along with the many attributes for each ticket, including priority, severity, days open, and satisfaction.

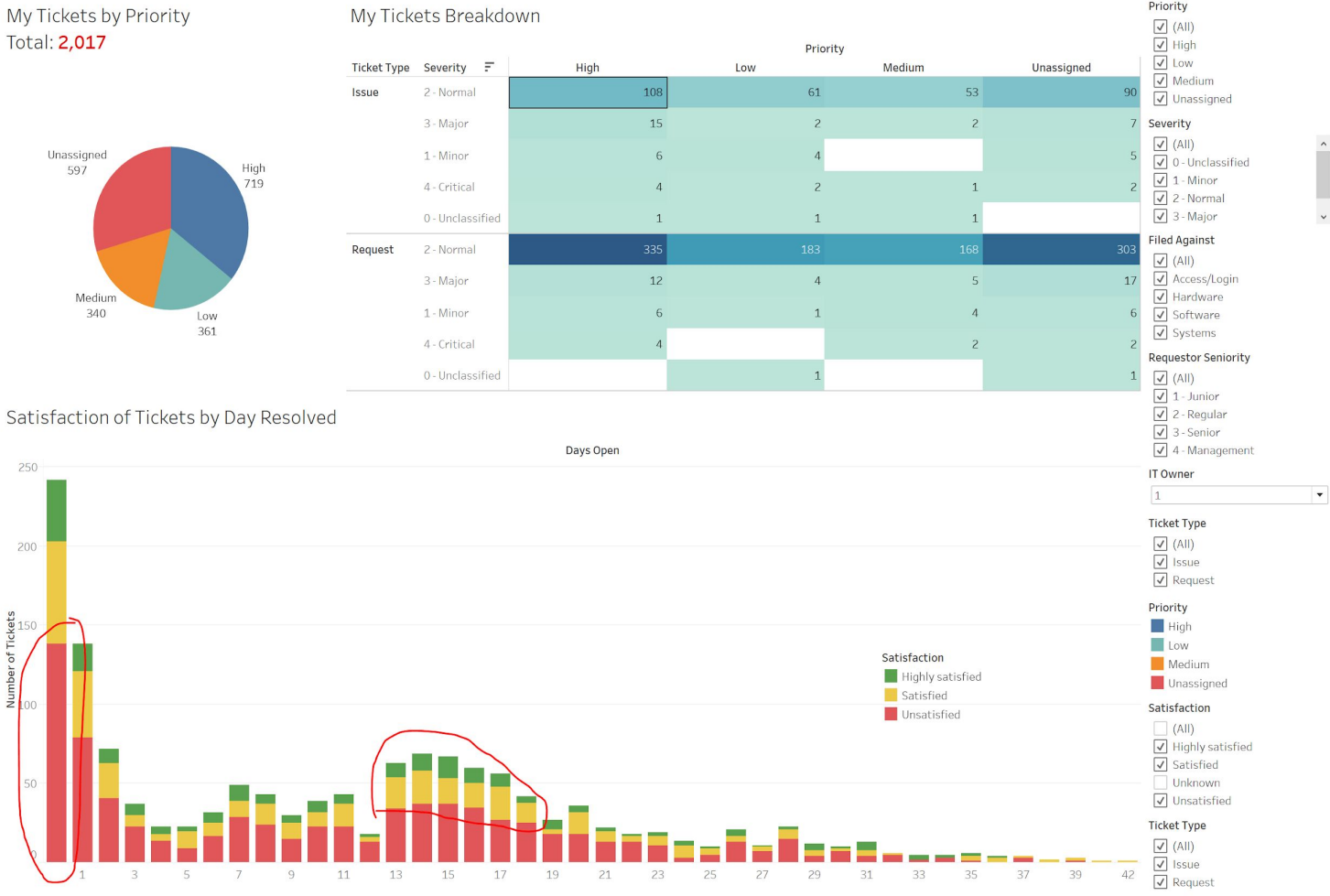
- A ticket is opened when an issue or request is initiated by the IT department. Every ticket has an owner assigned to it, out of a total of 50 employees.

- With the size of our dataset we are able to represent the data in various perspectives, and gain some insight into the performance of our team using Tableau.

User's Dashboard

The user's dashboard is populated with an high level overview of their total tickets.

This dashboard also contains the appropriate filters for the user to get a better look on the tickets they want to review.



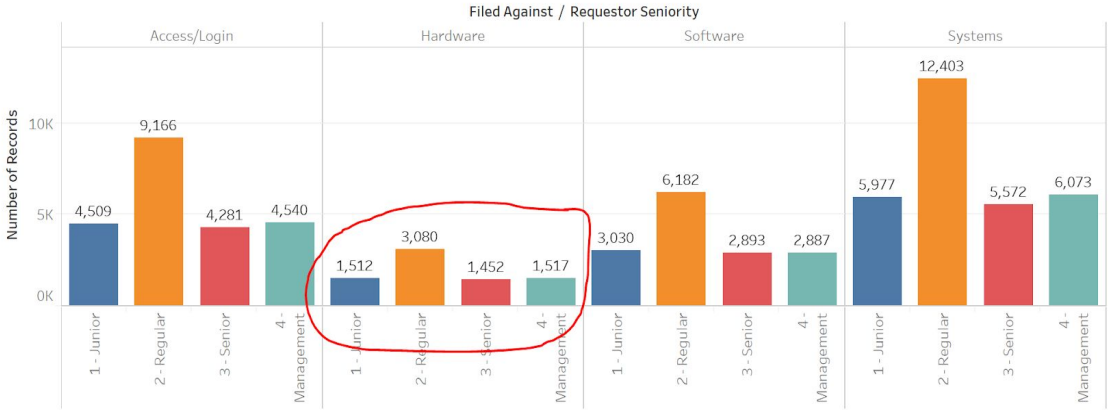
Analyst Dashboard

Hardware is among the least requested tickets.

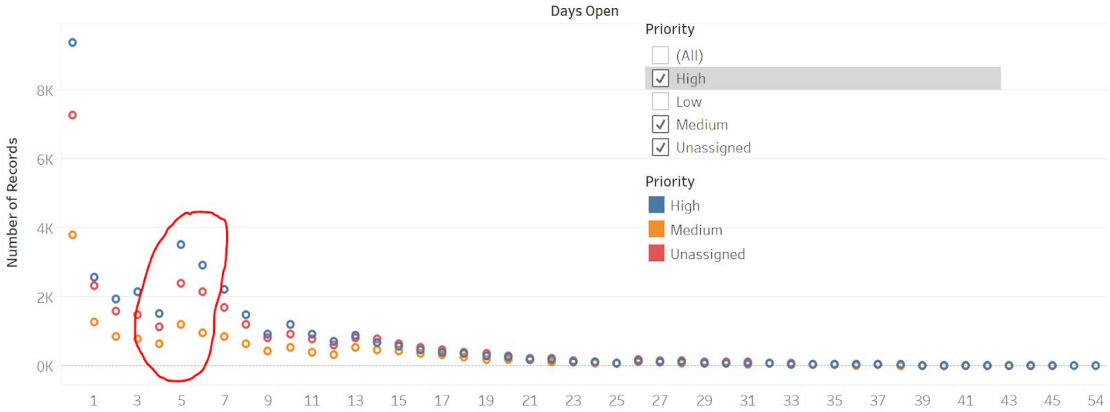
A large portion of tickets deal with access/login issues.

There is also a positive reception of customers who rate the satisfaction of their tickets at the 5 day mark, however, the decline begins here.

Type of Ticket - Request

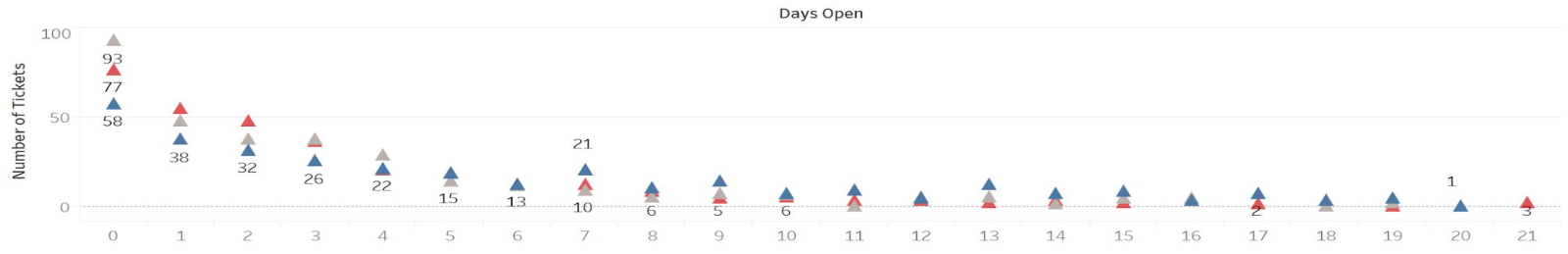


Priority Days Open



Analyst Dashboard 2

Tickets Open by Employee

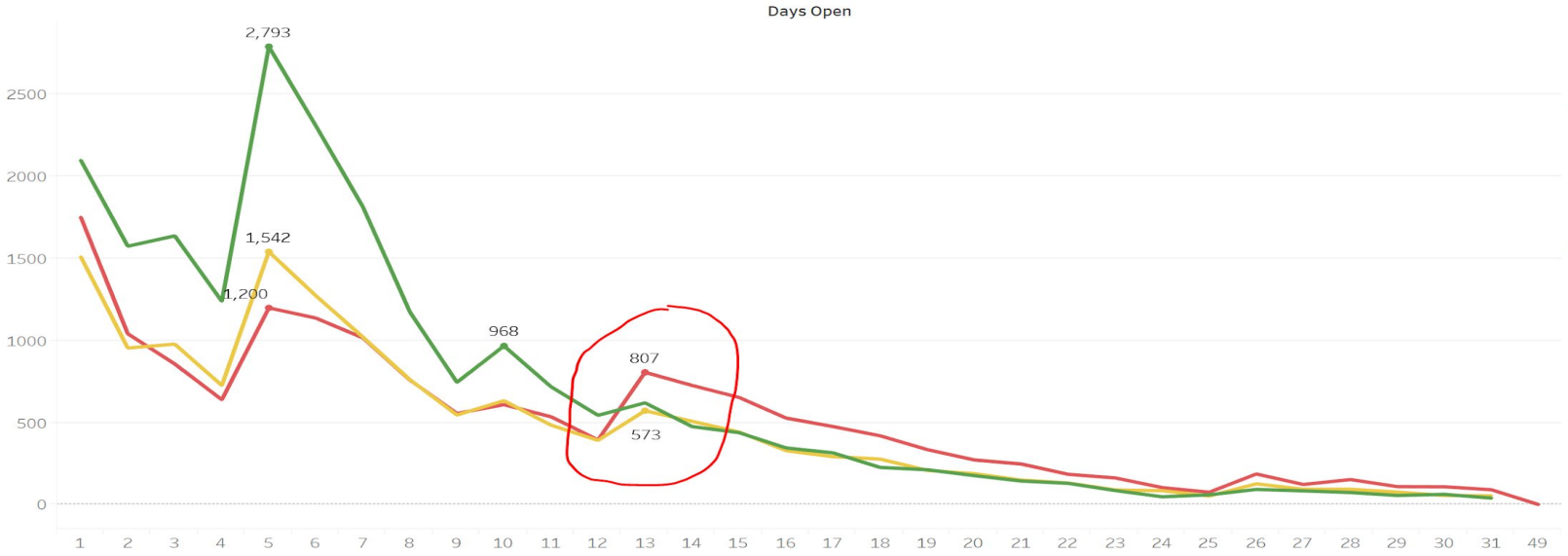


Priority
- (All)
- [x] High
- [x] Low
- [x] Medium
- Unassigned

Ticket Type
- (All)
- [x] Issue
- Request

IT Owner
- 3
- 9
- 37

Ticket Type Satisfactions



Ticket Type
- [x] (All)
- [x] Issue
- [x] Request

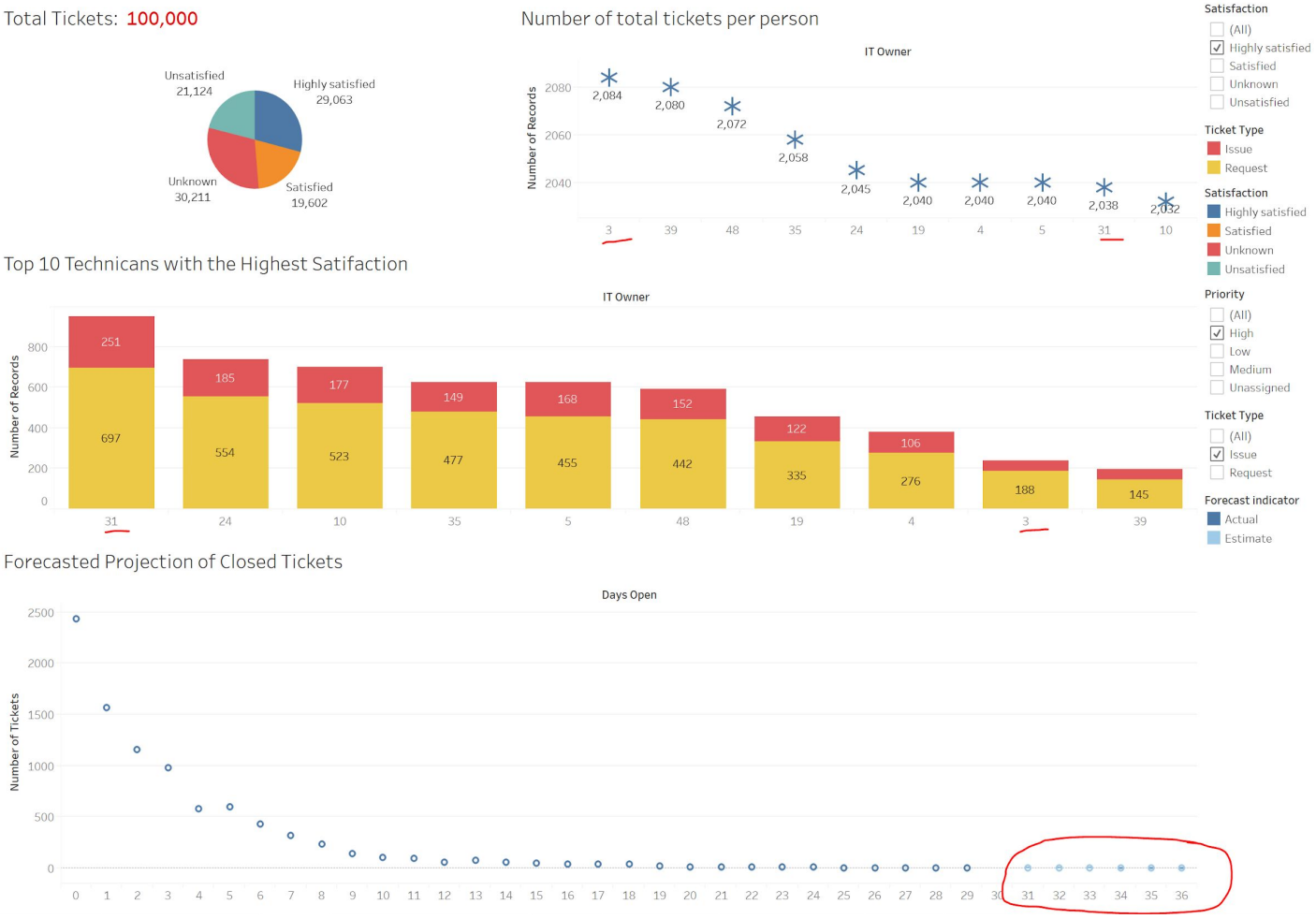
Satisfaction
- (All)
- [x] Highly satisfied
- [x] Satisfied
- Unknown
- [x] Unsatisfied

Satisfaction
- Highly satisfied
- Satisfied
- Unsatisfied

Manager Dashboard

This dashboard gives an overview and forecast on the total number of tickets per member on the team.

The manager gets a review of the top 10 employees as well as their levels of satisfaction on issues and requests.



Thank you