UK Train Rides

Team Members

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Project Overview

This project analyses mock UK National Rail ticketing data from January to April 2024. The aim is to explore:

- Popular travel routes

- Peak travel times

- Revenue performance

- On-time and operational performance

- Factors contributing to delays and cancellations

The dataset includes journey times, ticket types, payment methods, prices, delays, cancellations, refund requests, and more.

Data Preparation

1. Data Download
 Dataset was provided in CSV format.

Dataset Link: https://www.kaggle.com/datasets/motsimaslam/national-rail-uk-train-ticket-data

2. Loading into Power BI
 Imported using *Get Data → CSV*.

3. Data Cleaning

- Corrected data types (dates, times, numbers).

- Removed or treated outliers in prices and journey times.

- Ensured consistency in categorical fields (ticket type, payment method, status).

Dashboard Overview

The dashboard contains four main analytical sections:

- UK Train Overview

- Revenue Analysis

- Refund Analysis

- Routes & Stations Analysis

Interactive navigation buttons allow exploring each category easily.
The dashboard helps stakeholders understand traveller behavior, operational issues, and financial trends.

DAX Measures (Organized Version)

Performance Measures (Delay / On-Time / Cancellation)

Delayed Journeys Count
```
Delayed = CALCULATE(COUNTROWS(railway), railway[Journey Status] = "Delayed")
```

Average Delay (Minutes)
```
AVG Delay (Minutes) = CALCULATE(AVERAGE(railway[Delay (Minutes)]), railway[Journey Status] = "Delayed")
```

On-Time Journeys Count
```
On Time = CALCULATE(COUNTROWS(railway), railway[Journey Status] = "On Time")
```

Not Cancelled
```
Not Cancelled = CALCULATE(COUNTROWS(railway), railway[Journey Status] <> "Cancelled")
```

Cancelled Journeys
```
Cancelled = COUNTROWS(railway) - [Not Cancelled]
```

On-Time Percentage
```
On-Time % = DIVIDE([On Time], [Not Cancelled])
```

DAX Measures (Organized Version)

Revenue & Ticket Sales Measures

Total Revenue
```
Total Revenue = SUM(railway[Price])
```

Average Ticket Price
```
AvgPrice = AVERAGE(railway[Price])
```

Number of Tickets Sold
```
No of Tickets = COUNT(railway[Transaction ID])
```

Number of Routes
```
Number of Routes = DISTINCTCOUNT(railway[Route])
```

Number of Stations
```
No of stations = DISTINCTCOUNT(railway[Arrival Destination])
```

DAX Measures (Organized Version)

Refund Measures

Refund Requests Count
```
Refund Request = CALCULATE(COUNT(railway[Refund Request]), railway[Refund Request] =
"Yes")
```

Refund Percentage
```
Refund% = DIVIDE([Refund Request], [No of Tickets])
```

Total Refund Amount
```
Refund Amount = CALCULATE(SUM(railway[Price]), railway[Refund Request] = "Yes")
```

Average Refund Amount
```
Avg refund = CALCULATE(AVERAGE(railway[Price]), railway[Refund Request] = "Yes")
```

Revenue Analysis (Summary)

- Total Revenue: **£741,921**

- Number of Tickets: **31,653**

- Average Ticket Price: **£23.44**

- Total Stations Covered: **32**

Monthly Revenue:

- Highest: **January (£170k)**

- Lowest: **February (£126k)**

Ticket Class:

- Standard Class generated more revenue than First Class.

Payment Methods:

- Most used: Credit Card, followed by Contactless and Debit Card.

Revenue Insights

- High-revenue routes/stations should receive investment and improved service quality.

- Low-revenue stations may need marketing, better connectivity, or optimized schedules.

- Standard Class demand indicates price sensitivity among passengers.

- Monthly variations suggest opportunities for targeted seasonal promotions.

Revenue Recommendations

- Increase train frequency on high-demand routes.

- Improve customer experience at busy stations.

- Reevaluate First Class pricing to boost interest.

- Tailor marketing campaigns based on monthly demand trends.

Refund Analysis (Summary)

- Total Refund Requests: **1,118**
- Refund Rate: **3.53% of total tickets**
- Total Refund Amount: **£38,702**
- Average Refund: **£34.62**

Refund Reasons:

- Cancellations: **51.16%**
- Delays: **48.84%**

Refund by Ticket Type:

- **Highest: Advance**
- **Medium: Off-Peak**
- **Lowest: Anytime**

Refund Channels:

- At stations: **709**
- Online: **409**

Refund Recommendations

- Refund % is low overall → indicates generally good service levels.

- High refunds for Advance tickets suggest disruptions or last-minute travel changes.

- Majority of refunds happening in stations → passengers still prefer face-to-face problem solving.

Routes Analysis (Summary)

- High number of delays + **1,880 cancellations** observed.

- Top Departure Stations:
  Manchester Piccadilly, London Euston, Liverpool Lime Street, London Paddington, London Kings Cross.

- Top Arrival Stations:
  Birmingham New Street, Liverpool Lime Street, York, Manchester Piccadilly, Reading.

- Key Delay Reasons:
  Weather → Technical Issues → Signal Failure

- Key Cancellation Reason:
  Signal Failure (most dominant)

Routes Insights

- Certain routes require operational improvement due to frequent delays/cancellations.

- Popular stations represent huge revenue potential and need better infrastructure.

- Weather-related delays show need for more resilient systems.

- Signal failures indicate weak rail signaling infrastructure.

Routes Recommendations

- Upgrade signaling systems to minimize cancellations.

- Improve infrastructure to handle weather disruptions.

- Ensure adequate staffing to avoid service interruptions.

- Promote popular routes and improve underperforming ones via targeted campaigns.

Conclusion

The analysis provides a comprehensive view of UK rail performance from Jan–Apr 2024.
Key findings:

- Seasonal fluctuations in revenue.

- High dependence on Standard Class and digital payments.

- Delays and cancellations remain the largest operational issues affecting refunds.

- Improving reliability, communication, and customer experience will drive long-term growth.

By implementing these recommendations, the railway network can enhance service quality, increase passenger satisfaction, and optimize revenue performance.