

Q-STEP Framework for Passenger Satisfaction Challenge

Q & S – Setup Phase

Question framing and notebook structuring to establish clear objectives. Q & S are done in the Jupiter notebook.

T & E – Execution Phase

Step-by-step implementation with systematic evaluation and iteration. T & E is the approach used in coding and debugging in the Jupiter notebook.

P – Communication Phase

Present actionable insights with evidence-backed storytelling. P is mainly about reporting.

Q – Question First → Frame the Question

Frame the analytical question to drive focused investigation → What to do to solve the problem → Notebook Structure

- Define target variable (**Satisfaction**) and success metrics
- Check class balance to understand data distribution

S – Structure the Plan → Plan the Workflow

Design your analytical workflow before diving into code → What to do to solve the problem → Notebook Structure

01	02	03
Data Audit	Cleaning Strategy	Analysis Sequence
Examine rows, columns, data types, and missing values	Impute numeric variables with median, categorical with mode	Univariate → Bivariate → Multivariate → PCA

T – Tackle Step-by-Step → Execute in Small Steps

Execute your structured plan with disciplined iteration → How to execute the structured plan → Approach during implementation

1

Start Simple

Run univariate distributions first, then bivariate analysis against satisfaction

2

Test & Iterate

Implement one step, validate results, then move forward

3

Debug Systematically

When failures occur, ask *why* and fix before proceeding

E – Evaluate the System → See the Whole System

Step back to see patterns across the entire sytem → How to execute the structured plan → Approach during implementation

Multivariate Analysis

Examine interactions and complex patterns beyond simple correlations

- Look for feature interactions
- Identify non-linear relationships

Dimensionality Reduction

Use PCA to simplify correlated features and reveal underlying structure

- Reduce feature complexity
- Distinguish local vs. systemic issues

P – Present the Story → Communicate Insights

Transform analysis into actionable business insights → How to communicate results → Reporting

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Identify Key Drivers

Report the top 2-3 factors that most influence customer satisfaction

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Support with Evidence

Back every claim with plots, statistics, and PCA component analysis

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Explain Business Impact

Translate findings into plain language: what it means and why it matters