# 



## Data Driven Efficiency Improvement Proposal

Project charter

**Table of Contents**

[Data Driven Efficiency Improvement Proposal 0](#_Toc116162672)

[Executive Summary 3](#_Toc116162673)

[Business Strategy 4](#_Toc116162674)

[Potential Initiatives 4](#_Toc116162675)

[Key Entities 4](#_Toc116162676)

[Financial Drivers 5](#_Toc116162677)

[High Priority 5](#_Toc116162678)

[Secondary Use Cases 5](#_Toc116162679)

[Data Evaluation 6](#_Toc116162680)

[Deploying the correct number of self-service & biometric kiosks to airports 6](#_Toc116162681)

[Improve Boarding Pattern to be more efficient 6](#_Toc116162682)

[Buying new fuel-efficient aircraft 6](#_Toc116162683)

[Full Data Value and Feasibility Evaluation Tables 0](#_Toc116162684)

[Increase fuel efficiency of fleet by 2% 0](#_Toc116162685)

[Increase the use of self-service kiosks to decrease the in-person service costs by 10% 0](#_Toc116162686)

[Decrease the number of arrival/departure delay indicators (30+ min) by 10% 2](#_Toc116162687)

[Solution Benefit 0](#_Toc116162688)

[Success Measures 0](#_Toc116162689)

[Tangential benefits 0](#_Toc116162690)

[Return on Investment [optional] 0](#_Toc116162691)

[Project Approach 1](#_Toc116162692)

[Project Roadmap 1](#_Toc116162693)

[Staff and Communications [optional] 1](#_Toc116162694)

[Infrastructure [optional] 1](#_Toc116162695)

[Data 1](#_Toc116162696)

[Appendixes [circumstantial] 3](#_Toc116162697)

[Initial Backlog 3](#_Toc116162698)

[Financial Assessment 3](#_Toc116162699)

[Assumptions and Risks 3](#_Toc116162700)

[Document Version Control [optional] 4](#_Toc116162701)

# 

# Executive Summary

*Provide the brief pitch to those who just want a very high view. Include the 4-6 things you want people to remember.*

With the

* Who are the stakeholders?
* What is the problem or opportunity?
* What is the solution?
* How long will the solution take to develop / what will it cost?
* What is the potential and expected value of the project?
* Provide other key info per the situation.

# 

# Business Strategy

Increase the efficiency of Delta’s utilization of resources.

## Potential Initiatives

1. Increase fuel efficiency of fleet by 2%
2. Increase the use of self-service kiosks to decrease the in person service costs by 10%
3. Decrease the number of arrival/departure delay indicators (30+ min) by 10%

## Key Entities

With the notable exception of customers all of these entities are internal Delta teams. We believe that Delta has a robust data-driven culture and that teams will work together these data-driven projects.

Customers can be our passengers for domestic and international flights, as well as our cargo customers.

* Operations and Analytics Team
* Investor Relations
* Network Planning
* Supply chain management and fleet
* HR innovation and workforce technology
* Customers

# 

# Financial Drivers

We’ve included 11 use cases that we believe will be financial drivers to achieve our *Potential Initiatives*. Our three highest priority use cases are presented first. Eight additional use cases are below and are presented as secondary goals for our teams to investigate once our high priority drivers have been handled.

## High Priority

* Deploying the correct number of self-service & biometric kiosks to airports
  + We prioritized this as a goal for Delta, adding more self-service kiosks will have a high impact on lowering staffing costs, with a very good chance that a predictive algorithm will be able to determine the best airports and the best number of kiosks. If kiosks are correctly deployed, we can begin to serve our ‘Elite’ customers on kiosks, further reducing the need for staffing in departure areas.
* Improve Boarding Pattern to be more efficient
  + Utilizing both front and aft doors for deplaning and enplaning of passengers. Indigo the leading ULCC in India, utilizes this concept by using PBB (Passenger Boarding Bridges) for front and stairs for the aft door. Sometimes in remote stands both doors can be attached to stairs and passengers will be transported through buses from ramp to arrival gates.
* Buying new fuel-efficient aircraft

## Secondary Use Cases

These secondary use cases are presented here to help guide further research, after the high priority use cases have been fully considered. We believe all the presented use cases have merit but the three high priority ones provide the highest value while maintaining a high feasibility score[[1]](#footnote-1).

* Increase maintenance efficiency to ensure planes are fuel efficient
* Tanker in fuel to more expensive centers
* Improve routes to increase fuel efficiency
* Buying new software to improve customer experience
* Increase the number of functions available at the kiosks
* Improve efficiency ground handling operations (baggage, cleaning, refueling)
* Improve in-airport staff training to handle the pre-flight tasks(??)
* Reduce flight delays

## Data Evaluation

We assumed all internal Delta data would be readily available and accessible to the data analysis project teams. We also assumed that our airport partners in conjunction with the Network Planning department at Delta would make data available to us at reasonable prices and without any hassles.

We’ll first evaluate the high priority use cases individually and talk about the data’s value and feasibility. Below that we will present a complete value and feasibility table for each of the potential initiatives.

### Deploying the correct number of self-service & biometric kiosks to airports

We’ve identified eight “best” value data sources for this use case, six of these sources are internal to Delta and can sourced from our data lake, or from the human resources database. The two external data sources are available from our airport partners and from census data. The data sources, value score and feasibility score are below:

Table

|  |  |  |
| --- | --- | --- |
| Data Source | Value (out of 4) | Feasibility (out of 20)[[2]](#footnote-2) |
| revenue production per kiosk (internal) | 4 | 20 |
| What proportion of people use self-service vs personal service(internal) | 4 | 19 |
| Airport departure numbers (internal) | 4 | 18 |
| customers per hour for self-service (internal) | 4 | 17 |
| customers per hour for personal service (internal) | 4 | 17 |
| staff scheduling (internal) | 4 | 17 |
| layout of departure area (external) | 4 | 15 |
| Departure city demographics (external) | 4 | 14 |

With the high feasibility and high value data for this use case we think that data analysis of this use case will provide excellent prescriptive results that will allow Delta to manage staff and kiosk costs in our departure cities.

### Improve Boarding Pattern to be more efficient

### Buying new fuel-efficient aircraft

### Full Data Value and Feasibility Evaluation Tables

#### Increase fuel efficiency of fleet by 2%

#### Increase the use of self-service kiosks to decrease the in-person service costs by 10%

Table - Value

|  |  |  |  |
| --- | --- | --- | --- |
| **Data source** | **Buying new software to improve customer experience** | **increasing the number of kiosks for busy airports** | **increase the number of functions available at the kiosks** |
| Airport departure numbers (internal) | 3 | 4 | 4 |
| revenue production per kiosk (internal) | 4 | 4 | 3 |
| customers per hour for self-service (internal) | 2 | 4 | 3 |
| customers per hour for personal service (internal) | 2 | 4 | 3 |
| staff scheduling (internal) | 2 | 4 | 3 |
| What proportion of people use self-service vs personal service(internal) | 2 | 4 | 2 |
| Departure city demographics (external) | 1 | 4 | 3 |
| layout of departure area (external) | 1 | 4 | 1 |
| TSA delays (external) | 1 | 3 | 4 |
| Maintenance reports (internal) | 3 | 3 | 2 |
| Competion kiosk usage (external) | 2 | 3 | 3 |
| Parking lot usage (external) | 1 | 3 | 3 |
| Airport surveillance (external) | 1 | 3 | 1 |
| Mobile app (internal) | 3 | 2 | 2 |
| delay frequency (internal) | 1 | 2 | 2 |
| cancellation frequency (internal) | 1 | 2 | 2 |
| Crm notes (internal) | 1 | 2 | 2 |
| customer satisfaction surveys (internal) | 4 | 1 | 3 |
| Application logs (internal) | 4 | 1 | 3 |
| Development turn-around time (internal) | 4 | 1 | 1 |
| proportion of business/first class class passengers who use self-service (internal) | 3 | 1 | 1 |
|  | **46** | **59** | **51** |

Table - Feasibility

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Data Source** | **Ease of acquiring** | **Cleanliness** | **Accuracy** | **Granularity** | **Cost** | **total feasibility** |
| revenue production per kiosk | 4 | 4 | 4 | 4 | 4 | 20 |
| What proportion of people use self-service vs personal service | 4 | 4 | 4 | 3 | 4 | 19 |
| proportion of business/first class class passengers who use self-service | 4 | 4 | 4 | 3 | 4 | 19 |
| Airport departure numbers | 4 | 4 | 4 | 2 | 4 | 18 |
| delay frequency | 4 | 4 | 4 | 3 | 3 | 18 |
| cancellation frequency | 4 | 4 | 4 | 3 | 3 | 18 |
| customers per hour for self-service | 3 | 4 | 4 | 2 | 4 | 17 |
| customers per hour for personal service | 3 | 4 | 4 | 2 | 4 | 17 |
| staff scheduling | 4 | 3 | 3 | 3 | 4 | 17 |
| Maintenance reports | 4 | 3 | 3 | 3 | 4 | 17 |
| Application logs | 3 | 3 | 2 | 4 | 3 | 15 |
| layout of departure area | 3 | 2 | 4 | 3 | 3 | 15 |
| TSA delays | 3 | 4 | 3 | 1 | 3 | 14 |
| Mobile app | 4 | 2 | 3 | 2 | 3 | 14 |
| departure city demographics | 4 | 3 | 3 | 1 | 3 | 14 |
| Crm notes | 4 | 1 | 2 | 3 | 3 | 13 |
| customer satisfaction surveys | 4 | 2 | 1 | 2 | 3 | 12 |
| Development turn-around time | 2 | 4 | 1 | 1 | 4 | 12 |
| Competion kiosk usage | 1 | 3 | 3 | 3 | 1 | 11 |
| Parking lot usage | 2 | 2 | 1 | 1 | 2 | 8 |
| technological prowess of customers | 1 | 1 | 2 | 3 | 1 | 8 |
| Airport surveillance | 1 | 1 | 2 | 2 | 1 | 7 |

#### Decrease the number of arrival/departure delay indicators (30+ min) by 10%

# Solution Benefit

## Success Measures

*How will success be measured? Specific metrics are listed in* [*this post*](https://www.datascience-pm.com/9-ways-to-measure-data-science-project-performance/) *but broadly there are business, model, and system metrics.*

* Business impact metrics – Typically these are already existing metrics like financial metrics, subscriber churn, or mean-time-to-failure. Include goals if possible.
* Data science metrics – May or may not need to be defined upfront but think of your typical model performance metrics such as specificity, sensitivity, or lift.
* System metrics – Might be covered in the SLA section above.

## Tangential benefits

*Not every benefit can be measured. Include some indirect benefits*

* Organizational knowledge gained
* Team skillsets gained
* Reusable artifacts created (e.g. new data sets engineered can also be used for different use cases)

## Return on Investment [optional]

*Might need to be extensive with details in the appendix if seeking funding from an approval committee. Or could be skipped for smaller Proof of Concept or research projects*

* ROI analysis
* Cost-benefit analysis
* Break-even analysis
* CapEx vs OpEx assessment (key for some organizations)

# 

# Project Approach

## Project Roadmap

*Avoid Gantt charts. But do provide enough clarification on how the project could progress. A* [*project roadmap*](https://www.datascience-pm.com/example-roadmap/) *is recommended.*

* What is the sequence of possible deliverables?
* What are the go/no-go decisions to continue the project?
* What are the external influencers on the timelines? (e.g. an app launch date or a marketing campaign)

## Staff and Communications [optional]

*If already part of a product team that doesn’t shift with each project, then most of this can be skipped.*

* Staffing - Existing internal, Contractors, Partners, New hires?
* What are the anticipated hours or length of effort needed?
* Broader team members such as Security or Networking or Legal
* Communication – points of contact, setting up shared drives, chat groups, meetings cadences, etc
* Do project team members or stakeholders need training?

## Infrastructure [optional]

*Some teams might already admin privileges over their own servers or cloud environments. If so, this section could be skipped. Otherwise, ignoring this section could lead to significant blockers later in the project.*

* Licenses vs open-source
* Cloud vs on-prem services needed
* Requests needed such as new accounts or environments

## Data

*This is often the most unique aspect of data science vs. other project types.*

* What data do you need?
  + Do you already have the data?
  + Can you start collecting the data?
  + Can you purchase the data?
  + What metadata do you need (e.g. does the data need to be labeled?)
* Data privacy and environment
  + Classification: PII, CPNI, HIPAA, etc
  + Legal/ethical use: Can you legally or ethically use the intended data? What data can you *not* use
* How clean is this data?
  + Unless your team has already used the intended data source, exploratory data analysis is needed before understanding the data cleanliness.
* Big data considerations
  + What is data Volume (size)?
  + What is the data Variety (formats?)
  + What is the data Velocity (rate of influx?)
  + How can we process and store this data?

# 

# Appendixes [circumstantial]

*The appendices needed are highly circumstantial. Generally, every appendix used should support the statements in the body of the document.*

## Initial Backlog

* Stack rank the most promising deliverables. Often focus on the most valuable deliverables relative to their effort.
* Avoid dependencies among deliverables. But if unavoidable, note these dependencies.

## Financial Assessment

* Break-even analysis calculations
* Cash flow analysis chart
* ROI analysis calculations

## Assumptions and Risks

* What key assumptions have you made in this document?
  + What is taken as a given and beyond the project’s ability to influence?
  + What are variables that you will test as part of the project (i.e. testable hypotheses)?
* What are key dependencies?
* What are key risks? [risk assessment matrix recommended]
  + Security (e.g. how do I ensure the data or model are not compromised?)
  + Legal (e.g. will data privacy law changes impact our ability to use the intended data?)
  + Ethics (see the [Data Science Ethics](https://www.datascience-pm.com/10-data-science-ethics-questions/) post)
  + Business (e.g. market changes, stakeholder turn-over)
  + Resources (e.g. team member turn-over, shifts in funding allocation)
  + Technical (e.g. data, modeling, computing availability)

# 

# Document Version Control [optional]

|  |  |  |
| --- | --- | --- |
| Date / Version | Edited By | Changes |
|  |  |  |
|  |  |  |

1. See Data Evaluation section on pg. 5 [↑](#footnote-ref-1)
2. The breakdown of the feasibility score is available in table 3 [↑](#footnote-ref-2)