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## Data Driven Efficiency Improvement Proposal

Project charter

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# 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.

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# 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

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

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# 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

1. Increasing the number of kiosks for busy 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.

## Deployment

*Consumption focuses on the fuller value stream from the overall system or the user’s perspective. Value stream mapping and use case diagrams can help. Deployment is from the internal product’s perspective of how it will be delivered.*

* How will the output be consumed?
  + Human consumption vs into another system
  + If for human consumption, how will the user interact with the model output?
* How will the deliverable be deployed?
  + Real-time vs batch vs ad hoc?
  + API needed?
  + File delivery into a target location?
  + Into a viz such as Tableau?

## Supporting Systems

*What are the supporting machine learning operational systems?*

* Data monitoring system
* Model monitoring system
* IT monitoring systems
* Maintenance plans

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# 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)

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# 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?

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# 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)

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# Document Version Control [optional]

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