



MAERSK

SMU DSA x Maersk Case Competition

Team Data? Tada!

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Analysis of the Case

SCQA Framework

Situation

Maersk is an established global leader in logistics & transportation with an extensive network of container shipping, terminal operations and logistics services.

The firm moves 12 million containers every year via multiple transportation channels such as Ocean Transport, Inland Services, Cross Border Rail Transportation, Maersk Air Freight and Less-than-Container Load.

Complication

With a focus on **customer service and quality improvements**, Maersk has a focus point on one of their key business lines – **Maersk Air Freight**, that enables customers to fly goods with them quickly and efficiently across the globe.

Using insights from a **fictional airline dataset**, they aim to carry over insights to improve their air freight cargo business.

Question

- What are the key drivers to **customer satisfaction** and **customer loyalty**?
- How can we draw the **similarities or differences** between airline passengers and air freight cargo customers?
- What are some **creative recommendations** that can enable Maersk to improve its customer service that benchmark that of global leading companies like Tesla, Apple and Amazon?

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The Dataset

Airline Passenger Satisfaction.csv

Consists of 23 labels – 19 numerical and 4 categorical variables

Category	Field Names
Passenger Demographics and Flight Information	Gender, Customer Type, Age, Type of Travel, Flight Distance
Customer Feedback (On a scale of 1 to 5)	Inflight Wi-fi Service, Departure/Arrival time convenient, Ease of Online booking, Gate Location, Food and Drink, Online Boarding, Seat Comfort, Inflight Entertainment, On-board Service, Leg Room Service, Baggage Handling, Check-in Service, In-flight Service, Cleanliness
Others	Departure Delay in Minutes, Arrival Delay in Minutes, Satisfaction, Satisfaction Score

Voice of Customer.csv

- Only feedback of dissatisfied customers (Satisfaction score ≤ 4) are recorded
- Records the customer ID, satisfaction score and reasons for dissatisfaction in their journeys



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Model Analysis for Customer Satisfaction

Methodology

Customer Segmentation

- 1. Reduce Complexity of Dataset
- 2. Improve Market Understanding
- 3. Targeted Resource Allocation & Strategies

High Correlation Filter

- 1. Dimensionality Reduction
- 2. Improve Model Interpretability
- 3. Enhance Model Performance

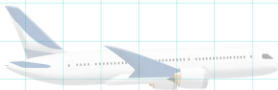
Collinearity Analysis

- 1. Enhance Feature Importance
- 2. Clearer insight into feature impact
- 3. Avoid multicollinearity issues

Features Removed

Collinearity and Correlation Filter set at 0.1

Business Class	Eco Plus Class	Eco Class
Departure/Arrival Delay	Departure/Arrival Delay	Departure/Arrival Delay
Flight Length	Flight Length	Flight Length
Gender	Gender	Type of Travel
Age Group (Senior)	Age Group	Age Group
Gate Location	Gate Location	Gate Location
Departure/Arrival Time Convenient		



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Models Used

- Linear Regression
- Random Forest Regressor
- Gradient Boosting Regressor
- Support Vectors Regressor
- K-Neighbors Regressor
- LightGBM Regressor
- XGBoost Regressor

Evaluation Metrics

- Mean Squared Error
- Root Mean Squared Error
- R-Squared

Top 10 Features in each Class		
Business Class	Eco Plus Class	Eco Class
XGBoost Regressor RMSE: 0.80914 R-Squared: 0.85253	LGBM Regressor RMSE: 0.80914 R-Squared:	XGBoost Regressor RMSE: 0.80914 R-Squared:
Online Boarding	Inflight Service	Inflight Wi-fi Service
Inflight Entertainment	Baggage Handling	Inflight Entertainment
Type of Travel	Inflight Wi-fi Service	Online Boarding
Inflight Wi-fi Service	Check-in Service	Ease of Online Booking
Customer Type	Seat Comfort	Food and Drink
Cleanliness	Departure/Arrival Time Convenient	Departure/Arrival Time Convenient
Check-In Service	On-Board Service	Cleanliness
Leg Room Service	Ease of Online Booking	On-Board Service
Ease of Online Booking	Online Boarding	Inflight Service
On-Board Service	Inflight Entertainment	Seat Comfort

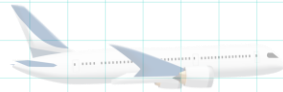
Descending Order of Importance



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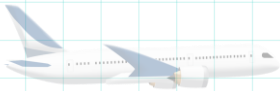
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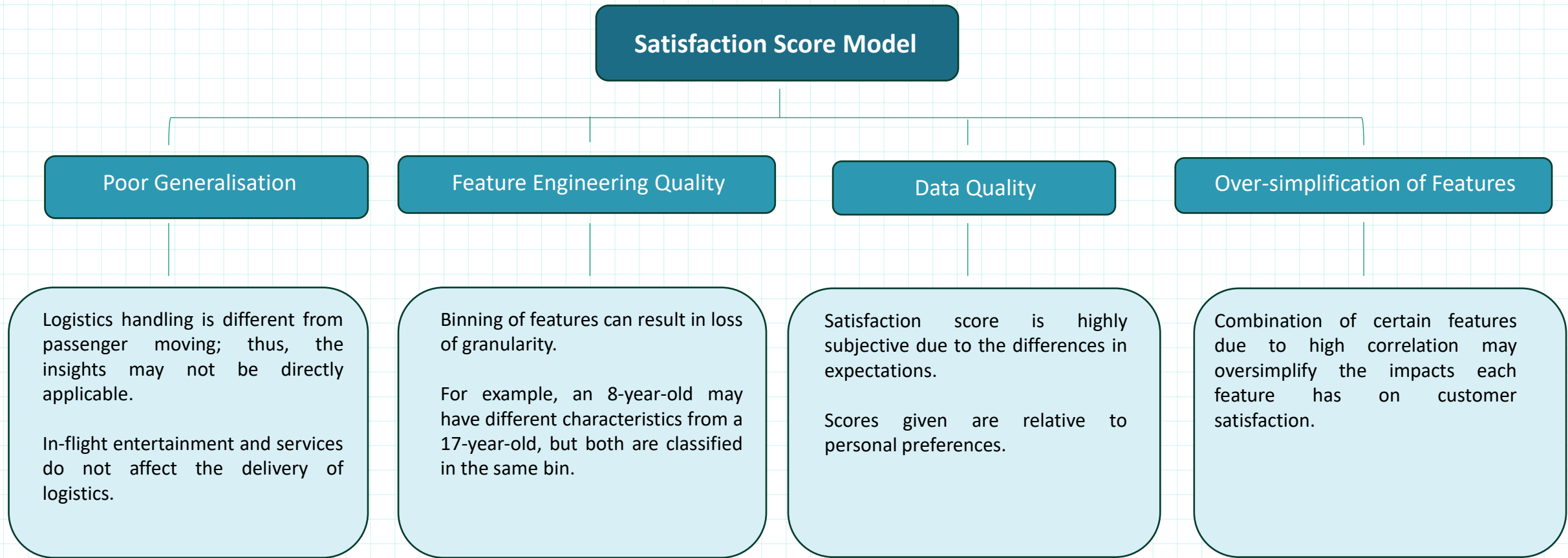


Maersk Business Model



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Limitations of the Model



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Model Analysis for Customer Loyalty

Model Selection

To determine what makes a customer loyal/disloyal, we have set our target variable to “Customer Type” whereby **0 represent disloyal and 1 represent loyal customer**.

1 Logistic Regression

- This model is used for **binary classification** with the intention to determine the probability of the dataset belonging to one of the two classes.
- The model also allow us to **determine coefficients of the dependent variables** and provide **insight into feature importance of important variables**.

2 Random Forest

- This model can capture the **complex relationship** between the features and the target variable through each feature split.
- The terminal nodes generated at each feature selection split have helped to **narrow down the influence of each feature** and deduce on the more important features.

Evaluation Metrics

Classification report	Logistic Regression	Random Forest
Accuracy	0.901	0.987
Precision	0.929	0.981
Recall	0.951	0.949
F1-Score	0.940	0.965

Feature Importance

Logistic Regression	Coefficient	Random Forest	Coefficient
Type of travel_personal	6.164	Type of travel_personal	0.189
Flight length_Long-Haul	4.351	Satisfaction score	0.086
Satisfaction score	3.633	Cleanliness	0.065
Inflight entertainment	2.757	Age group_Young adult	0.065
Online boarding	2.512	Inflight wifi service	0.063



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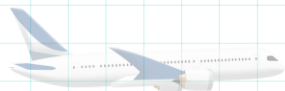
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Limitations of the Model – Loyalty Prediction

Loyalty Prediction

Logistic Regression



1) Linearity Assumption

Customer Loyalty might be influenced by complex and non-linear interactions between some features.



2) Imbalanced Data

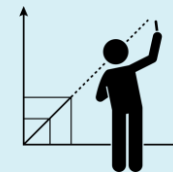
Bias towards majority class, leading to poorer predictions against minority class.

Random Forest



1) Possibility of Overfitting

Overfitting may still occur due to the high number of dependent variables.

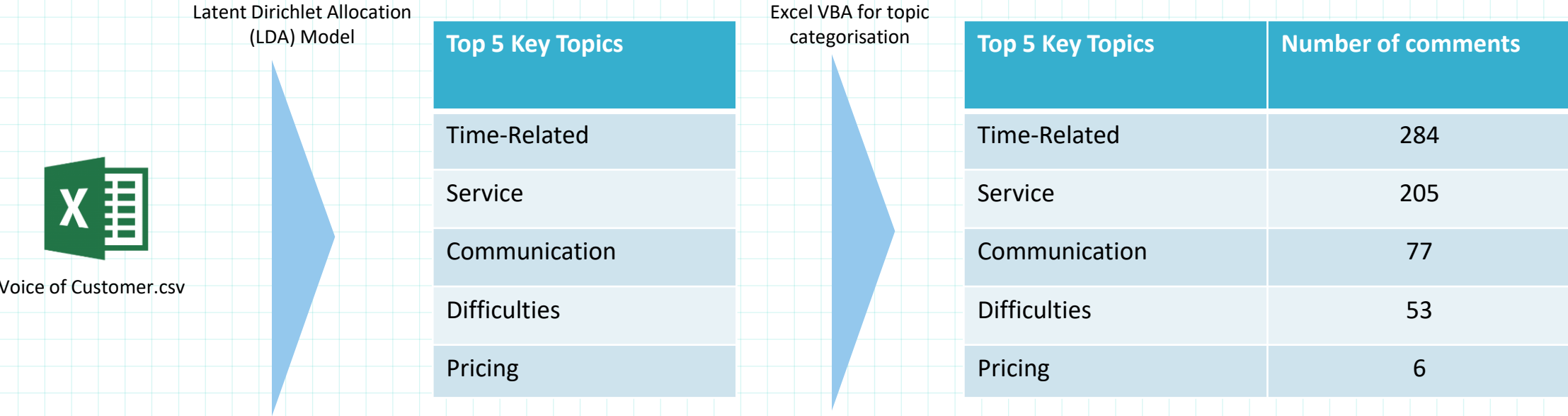


2) Inability to extrapolate

Struggle to predict loyalty for customers with behaviors that significantly differ from those in the training data.



Model Analysis for Voices of Customer



Limitations

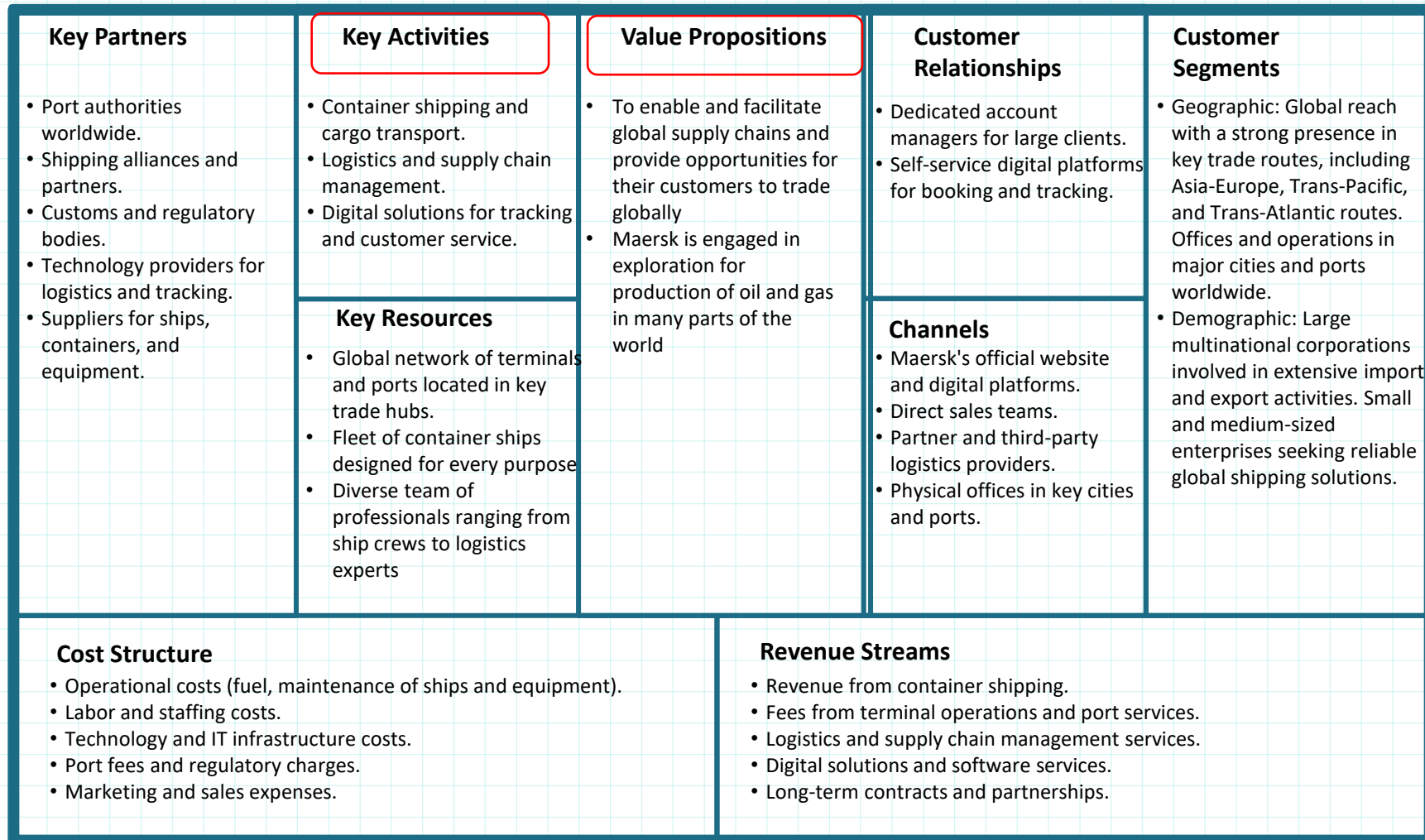
- 1

Sentiment analysis is quite subjective and may not capture the nuances of customer feedback
- 2

Stemming, stop word removal, and other NLP techniques might oversimplify or misinterpret the actual sentiment of the feedback.



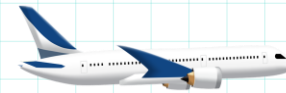
Business Model Canvas of Maersk



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Maersk Business Model



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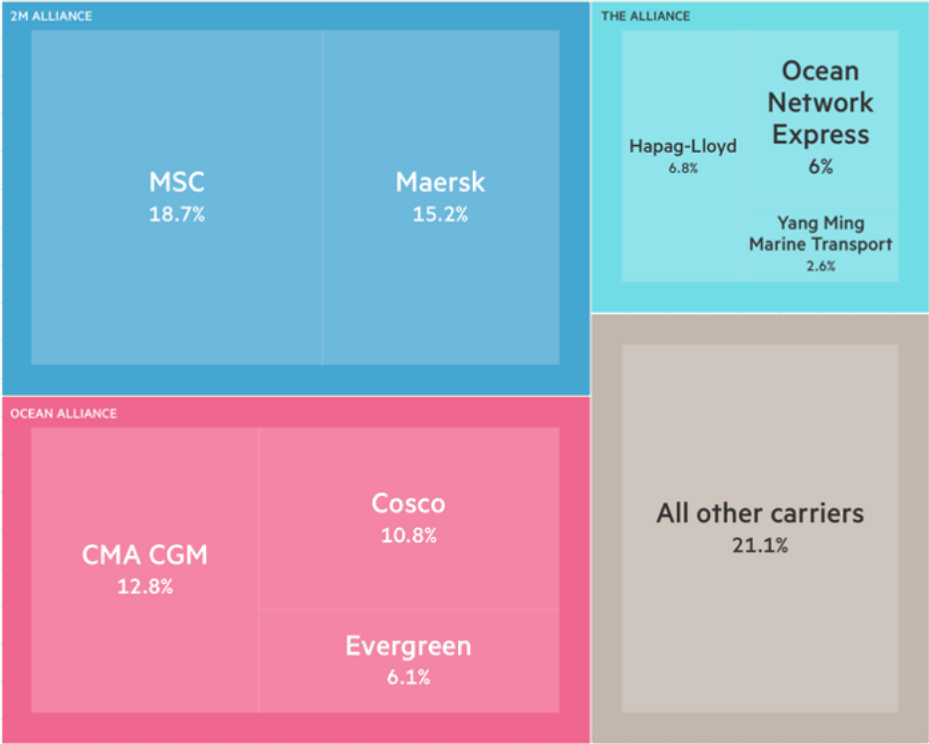
Business Model Canvas of Maersk

Competitor Analysis

Company	Key Products & Services	Innovation & Technology	Customer Base	Key Regions Served
Maersk	Advanced logistics solutions - Global terminal operations	Digital tracking platform "Maersk Flow" - Automated terminals	Multinational corporations - Retailers	Europe - North America - Asia
Mediterranean Shipping Company (MSC)	Integrated logistics - Eco-friendly terminal operations	"MSC e-business platform" for online bookings - Green tech vessels	Import/Export businesses - Manufacturers	Europe - Africa - South America
CMA CGM	Tailored logistics - Special cargo (e.g., refrigerated, oversized)	"CMA CGM+" suite of solutions - LNG powered ships	Agriculture producers - Automotive sector	Europe - Asia - North America
Hapag-Lloyd	Customized logistics solutions - Special cargo handling (e.g., dangerous goods)	"Quick Quotes" instant quotation tool - Eco-efficient fleet	E-commerce businesses - FMCG companies	Europe - Latin America - Asia
COSCO	Comprehensive logistics - Major terminal operations in Asia	Smart port systems - Fleet modernization	Raw material suppliers - Electronics firms	Asia - Europe - Oceania
Evergreen Line	End-to-end logistics - Eco-friendly terminal services	"GreenX" digital platform - Sustainable ship designs	Textile industry - Tech companies	Asia - North America - Europe

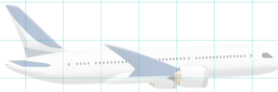
Perceptual Map

Share of global container shipping capacity by company and alliance



Recommended Positioning for Maersk

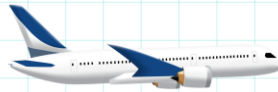
Maersk to maintain its customer base – MNCs in Key regions



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Linking our Findings to Maersk

Insights Summary

Satisfaction Score

There were commonalities found among all classes such as online services & in-flight Wi-Fi, but different customer segments placed importance on different factors.

These insights show **the need for personalization and segregated services.**

Customer Loyalty

Passengers flying for “Personal” reasons often showed higher Customer Loyalty.

We believe that this is because personal travelers tend to have **a choice** in airline while business travelers might instead follow their companies’ choice.

Voices of Customers

A prevalent cause of dissatisfaction came from time-related flight issues.

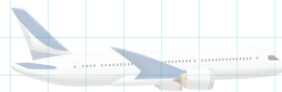
This can cause **time sensitivity issues**, **productivity loss** or **frustration** due to the lack of information.



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Answer

- Our solution must enable safe & ethical **data collection** of customers to **tailor services** to customers on a personal or business level.
- A crucial element that Maersk needs to target is **efficiency and transparency** to the customers in their shipments.
- Recommendations have to be a fresh idea gained from **external industries** (like Tesla, Amazon, and Apple)



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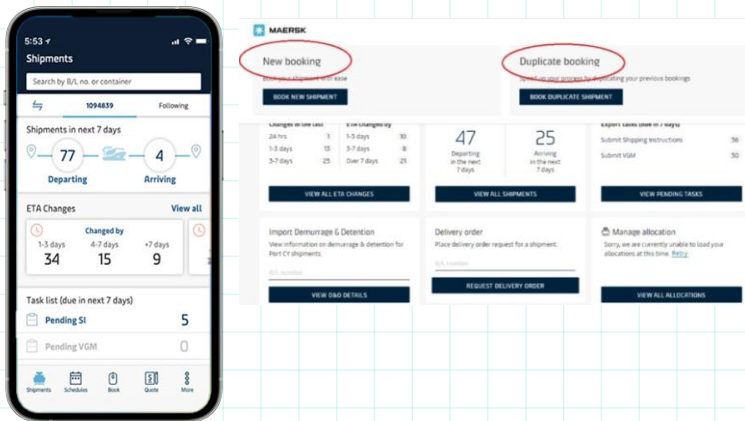
Gamify the Business on Multiple Levels

The Big Picture

Gamification is the implementation of game elements, design principles and mechanics in non-game context to engage & motivate individuals to achieve specific goals & tasks.

Maersk offers services to a range of stakeholders– MNCs, SMEs, Start-ups and even on a personal level. To improve customer service, Maersk will have to innovate different strategies, objectives & user journeys for each client segment.

As gamification on a B2B Level and in the Air Freight Industry is scarce, offering various tiers of incentives, goals & achievements for these different levels of businesses & clients can allow Maersk to widely differentiate themselves from competitors.



Segmentation

Multi-National Companies
Amazon, Disney, Microsoft etc.

Small-Medium Enterprises
Start-ups, local Stores etc.

Personal Users
Freelancers, Solo practitioners etc.



Considerations

Might not be receptive towards gamification; rewards/cost savings do not justify the extra time and effort spent.

More cost conscious due to lack of capital as compared to MNCs.

Small scale deliveries, may find it challenging to hit the targets for rewards consistently



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Additional Recommendations to Gamification

Complementary Services

As Maersk specializes mainly in shipping logistics & supplies, other variables or elements that affect a customer experience & service can be acquired with partnerships.

Examples of Services to Partner/Acquire

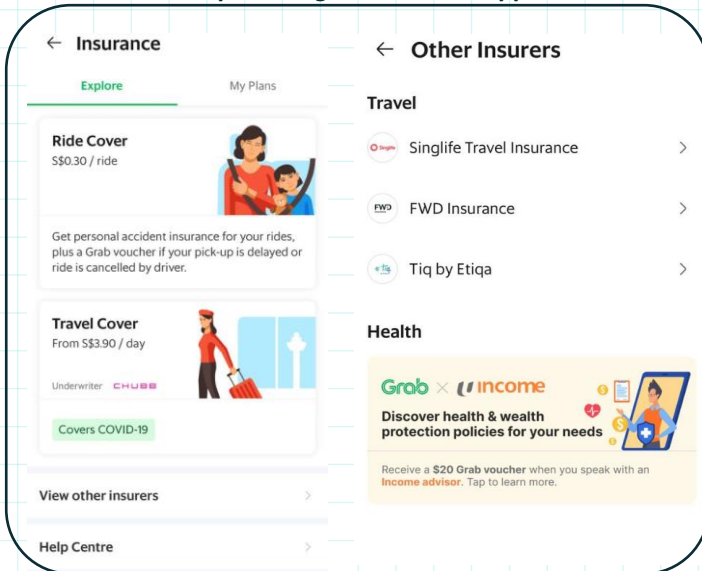
1. Supply Chain Consultation
2. Insurance Providers
3. Customs Brokerage
4. Warehousing & Storage

Customer Journey

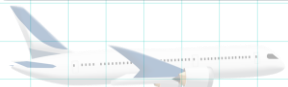
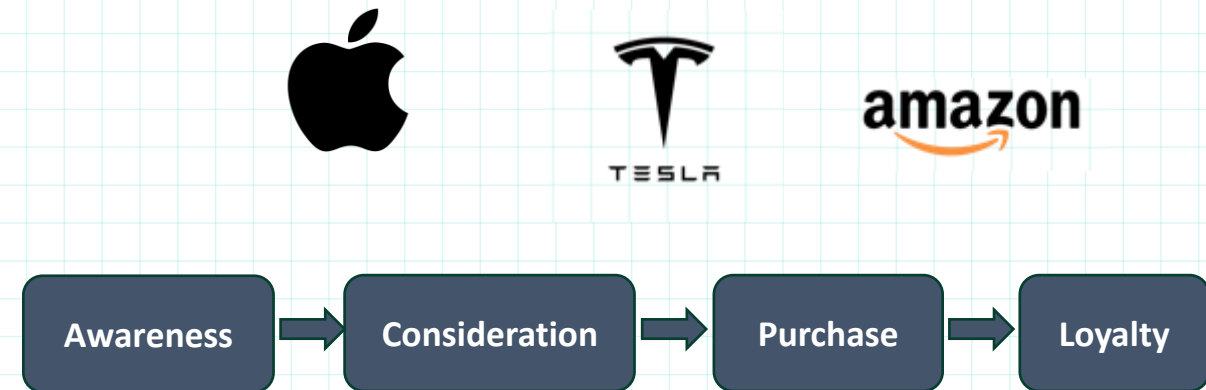
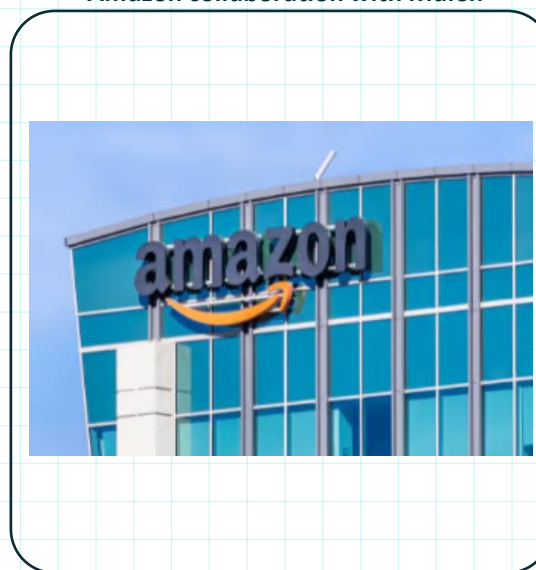
To complement gamification, a cost-effective method is to bring it across to customers as a journey.

This will create a dynamic shipping journey for clients of Maersk, whilst marketing the gamification initiative to the general public.

Grab providing Insurance in-app



Amazon collaboration with Marsh



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Examples of Gamification in Maersk

Multi-National Corporations

Objective	How
Foster Efficient Communication	Implement gamified communication platform that rewards MNCs for timely responses, providing necessary documentation and proactive collaboration with Maersk's Team.
Promote Various Ways of Logistical Transport.	Offer experience and points when clients' logistical supplies include a certain mode of transport.
Promote Sustainability Choices	Award extra points for choosing eco-friendly shipping options , providing information on carbon emission offset.



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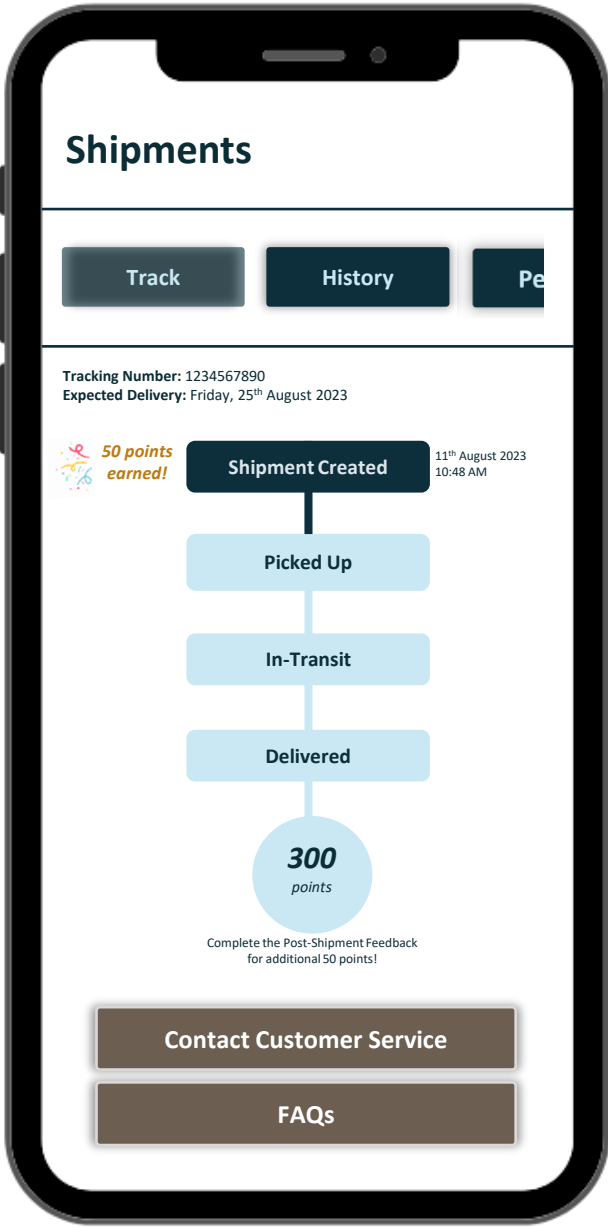
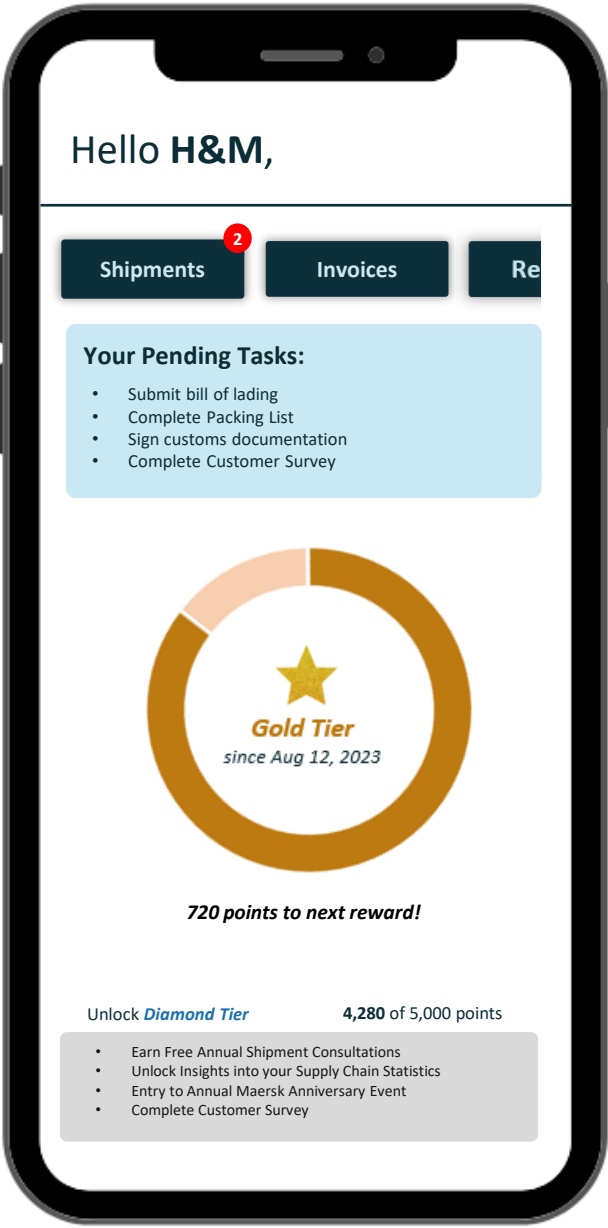
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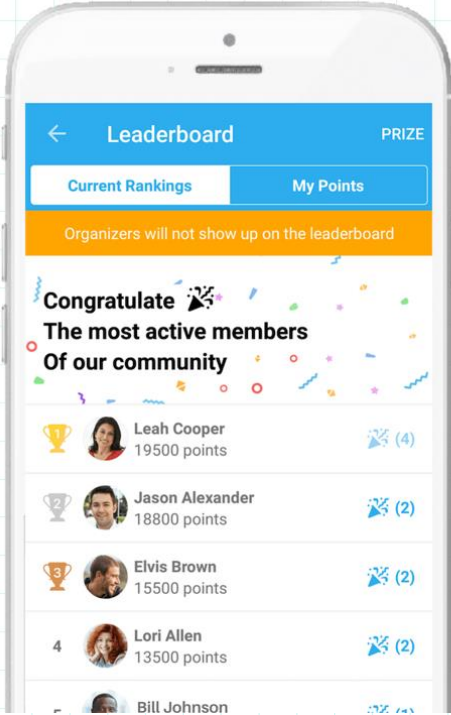
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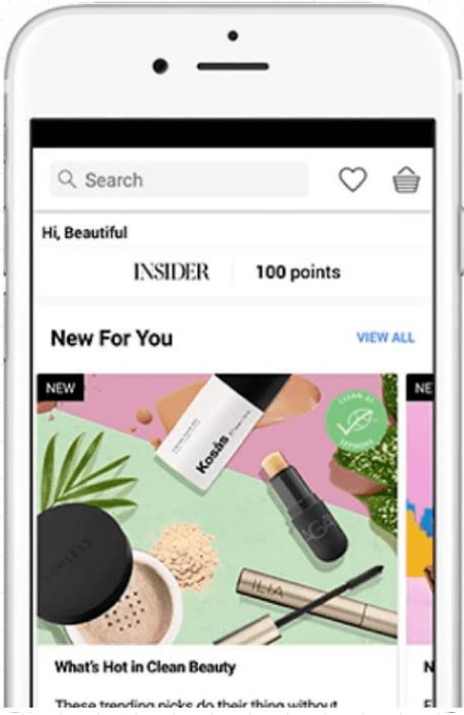
Examples of Gamification in Maersk

Small-Medium Enterprises		Personal Users	
Objective	How	Objective	How
Enhance Cost Efficiency	Offer rewards for cost-effective routes, consolidating shipments and minimizing delays.	Encourage Friendly Competition	Implement a Leaderboard System with careful data-sharing and collection, to publicly rank users based on points earned.
Reward Loyal Partners	Create a loyalty program that rewards SMEs for consistent use of Maersk's services.	Promote Community Involvement	Introduce a sense of community between users for participating in forums, providing tips, sharing experiences.
Feedback Generation	SMEs can earn points for sharing constructive, actionable feedback, participating in surveys or giving suggestions.	Service Utilization and Engagement	Encourage users to explore & utilize services like insurance providers and shipping cost calculators to earn badges.

Example of Leaderboards in Apps



Example of Forums & Blogs in Apps



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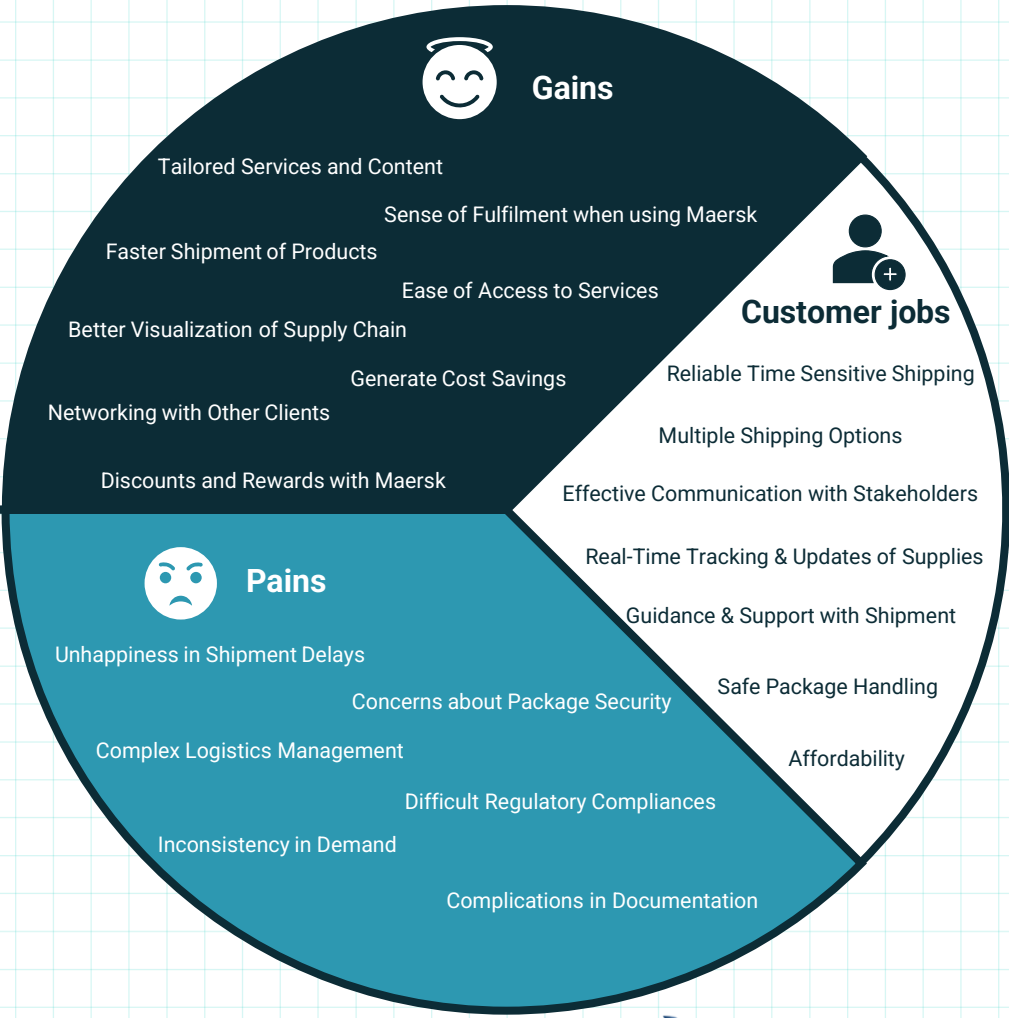
Recommendations

Value Proposition of Integrating Gamification

VALUE PROPOSITION



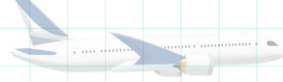
CUSTOMER SEGMENT



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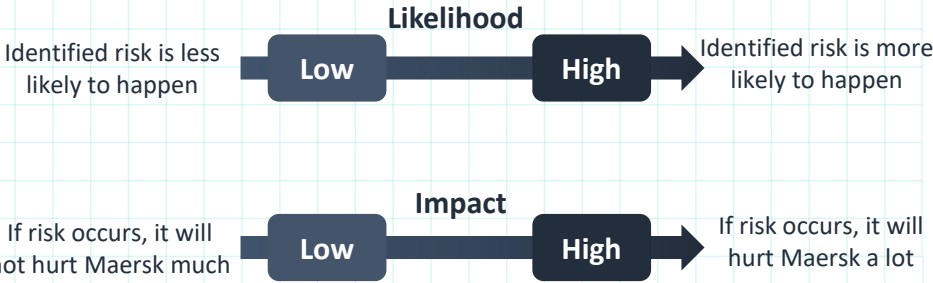
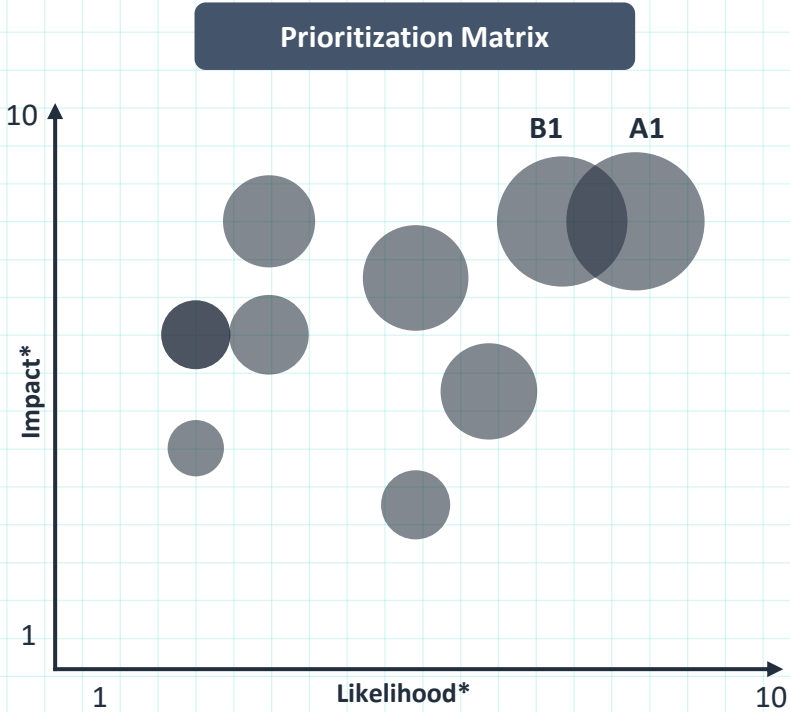
Maersk Business Model



Recommendations

Risk Mitigation

Solutions	Risk	Mitigation Plan	Code	L	I
Gamification in App and Web interface	Data Privacy & Security Concerns	Clearly communicate how user data will be used, obtained and adheres regulations	A1	9	8
	Low Onboarding Rates	Use data collected for specific customer segments to tailor the experience & rewards	A2	4	6
	Dependency on Rewards	Balance rewards and achievements with other intrinsic motivation factors	A3	7	5
	Misaligned Cultural Fit with Maersk	Simplify the gamification of the business, like Starbuck's Loyalty Program	A4	3	6
Integrating Complementary Services	Operational Complexity	Only incorporate services that Maersk's company infrastructure can handle	B1	8	8
	Regulatory & Compliance Issues	Research & understand regulatory landscape	B2	4	8
	Competitive Dynamics	Clearly demarcate the separation & independence of businesses	B3	3	4
Building Customer Journey	Running out of Ideas	Look for references and benchmarking from competitors' social media accounts	C1	6	3
	Inaccurate Assumptions	Base customer journey on solid research and data-driven insights	C2	6	7
	Overcomplication of Journey	Keep the journey simple, intuitive, and aligned with customers' natural flow and preferences	C3	3	6



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