Digital Business Management

KLM's Digital Travel Agency Implementation

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1. Introduction

1.1. Background Information

The aviation industry is one of the most competitive sectors of the global economy. The airlines must continuously innovate and adapt to new technologies to be ahead in the game. This challenge is especially noticeable in industries with high stakes and rigorous demands, such as aviation. KLM, a leader in the aviation sector, at forefronts of the efforts to not only continuously innovate but also strategically implement solutions within its organizational framework. In Emerging technologies in Digital Business, the innovative solution provided by our group was Digital Travel Agency (Chhatta et al., 2023). It consisted of 3 main changes, Implementation of Social Media Analytics (SMA), Utilization of Digital Voice Assistants (DVA) and Integration of Generative Artificial Intelligence (GAI) within the KLM's booking app (Chhatta et al., 2023). DTA aims at increasing booking volume and the number of excursions through the booking app, in turn increase revenue through different channels keeping the booking price same. The research started in mid of November and ended in third week of December. Implementation of above-mentioned changes require some changes within the organizational structures and cultural dynamics. Therefore, this research aims to investigate into organizational intricacies of KLM and identify opportunities for structural changes that facilitate the seamless integration of Digital Travel Agency (DTA).

1.2. Problem Statement

The role of implementing new innovations is pivotal in airlines industry. KLM encounters significant challenges in restricting its internal environment. The integration of Digital Travel Agency (DTA) into the operations is hindered by barriers within the organization like resistance to change. These barriers extend beyond technological hurdles such as organizational structure, cultural dynamics, and leadership paradigms. A sophisticated strategy that focuses on organizational structure adaptability, the cultural environment that encourages innovation, and leadership that facilitates transformative change is necessary to overcome these challenges.

1.3. Research Objectives

The research does a thorough investigation with primary goal of outlining tactics for KLM to carry out necessary structural and cultural changes within the organization that works as a barrier to implementation of Digital Travel Agency (DTA). The analytical process includes careful examination of current internal business environment. An in-depth investigation of leadership dynamics, culture, and structure. Additionally, a comprehensive assessment of IS landscape is conducted. Developing a strong change management strategy that only fits the implementation of DTA but also sets up a strong change management strategy path for long-term innovation adoption. This exploration discovers elements of organizational structure, culture dynamics, leadership principles, IS\IT portfolio, and a complex web of change management techniques that together pave the way for effective implementation of DTA.

1.4. Research Questions

The aim of the study is to investigate the organizational challenges and opportunities that KLM faces to implement Digital travel Agency (DTA). The changes recommended in DTA were Implementation of Social Media Analytics (SMA), Utilization of Digital Voice Assistants (DVA), Integration of Generative Artificial Intelligence (GAI) (Chhatta et al., 2023). The goal of the study is to determine how KLM can overcome potential obstacles to change posed by its current organizational IS structure, culture, and human resource management. Additionally, the study aims to offer suggestions for structural modifications that help KLM realize its vision and goals while implementing Digital Travel Agency (Chhatta et al., 2023).

The research will address several sub-questions that will help to analyse the current and desired factors. These factors are needed be addressed before implementation of DTA at KLM. It will also provide suggestion based on various frameworks and models. The research will also use secondary data from various sources to support the arguments and recommendations.

Main question: *"How can KLM transform its organizational and IS structure to successfully implement the Digital Travel Agency, enhancing customer experience and bookings by bridging the personalization gap in the booking process?"*

Sub questions:

- Where in the organization does DTA have impact on?
- How does this organization look today?
- How does the organization look like post implementation?
- What changes are needed to implement to make this transition?
- What are the financial consequences when implementing?
- What are the risks when implementing a DTA?

1.5. Research Scope and Structure

This analysis is mainly concerned with the internal changes required at KLM for successful implementation of DTA (Chhatta et al., 2023). Our team kick-starts with research methodology, then analyses of current and desired business environment is done. Then team investigate the current IS/IT environment that deals with IS portfolio, strategy, digital capabilities, and financial benefits of DTA implementation. Later, our team addresses how to manage change resistance within KLM. Our aim is to provide a clear and concise roadmap for KLM Royal Dutch Airlines in success implementation of DTA.

2. Research Methodology

Chapter 2 navigates through the literature to investigate into organizational intricacies of KLM and identify opportunities for structural changes that facilitate the seamless integration of Digital Travel Agency (DTA).

2.1. Background of Literature Study

The literature study is grounded in a comprehensive review of organizational structure and cultural dynamics at KLM. Focusing on strategies for successful integration of Digital Travel Agency (DTA). Current literature emphasizes on gaining insights on organizational structure, cultural dynamics, and leadership paradigms that either facilitate or hinder such integration. The literature study also aims to identify the best practices and challenges in implementing social media analytics (SMA), digital voice assistants (DVA), and generative artificial intelligence (GAI).

2.2. Literature Study

2.2.1. Approach and Search terms

A systematic approach was followed throughout the research, dissecting research questions into different categories based on the respective sub-assignments. From these categories search terms were formulated. This approach addresses all gaps within research question and ensures reliability. The search term can be found in the table below:

Research Question	Keywords and Phrases
Where in the organization does DTA have impact on?	Cameron and Green's classification, KLM's organizational structure, KLM's chain of command, Departments at KLM, Digital innovation impact analysis
How does this organization look today?	KLM's Leadership, Air France KLM Group, KLM's IS portfolio grid, KLM's current digital capabilities.
How does the organization look like post implementation?	The Harrison and Handy Cultural Framework, Competing Values Framework, Organization and cultural value discussed by Hartl and Hess, Five Leadership Qualities framework of Cameron and Green, KLM's Annual Report.
What changes are needed to implement to make this transition?	Force Field Analysis, External and internal stakeholders at KLM, Kotter's change process model
What are the financial consequences when implementing?	Case Study based on DVA/ GAI/ SMA implementation, KLM Financial Report,
What are the risks when implementing a DTA?	Barriers to change at KLM, Risk management in digital implementation at airlines industry

Table 1. Formulation of search terms

2.2.2. Library Databases

High-quality, peer-reviewed articles, especially from high-tier journals with Q1 score journals were used to search targeted databases. Considering the significance of using Q1 articles, here are two databases that were used for selecting and the scope of coverage:

- **ScienceDirect:** It was used as the primary source for this research, ScienceDirect provides access to vast assortment Q1 level articles that are particularly strong in the fields of technology and business. It was chosen because it has a large collection of highly influential publications about corporate strategy and digital innovation.
- **Hogeschool van Amsterdam (HvA) Databases:** provides access to articles and journals that aren't immediately available via Science Direct or any other database. The Hva databases provide a large number of articles covering a variety of topics, such as business, digital innovation, and aviation.

2.2.3. Paper Selection

Initially, a pool of more than 20 scholarly papers was taken into consideration. These were carefully examined considering our study aims, relevance, and quality of insights offered. Following a comprehensive analysis and comparison, 14+ papers per person were ultimately selected for the report. This choice guarantees both a strong basis for the investigation and a wide range of viewpoints and conclusions, enhancing the report's thoroughness and in-depth analysis.

2.2.4. Publication Journals

Journal Names
Computers and Security
Decision Support Systems
European Management Journal
Heliyon
Information and Management
Information Processing and Management
Innovation and Development
International Business Review
International Journal of Accounting Information Systems
International Journal of Hospitality Management
International Journal of Project Management
Journal of Air Transport Management
Journal of Business Research
Journal of Business Venturing
Journal of Innovation and Knowledge
Journal of Management Information Systems
Journal of Open Innovation: Technology, Market, and Complexity
Journal of Purchasing and Supply Management
MIT Sloan Management Review
Organizational Dynamics
Project Leadership and Society
Project Management Journal
Research in Transportation Economics
Research Policy
Safety Science
Sustainability
Technological Forecasting and Social Change
Technology Forecasting and Social Change
Tourism Management

Table 2. Used Journal Names

2.3. Data Collection and Analysis

In order to ensure a direct interaction with relevant, first-hand study findings, primary data were taken from a range of literature sources (Q1 articles). A thorough grasp of the subject was made possible by the compilation of secondary data from a wide range of previously published scholarly works and lecture topics. Our study's credibility was reinforced by a thorough evaluation of its content validity, which ensured that the data was appropriately representing the research variables. Strict adherence to ethical standards was maintained during this process. Furthermore, all textual citations adhere to the 7th Edition APA reference format, guaranteeing academic integrity and accuracy in our reporting and documentation procedures.

2.4. Methodological Choices

In order to comprehend the organizational obstacles at KLM while adopting digital travel agency (DTA), our technique was carefully chosen. Our group concentrated on methods that guaranteed in-depth knowledge, precise data, and moral research procedures, guaranteeing that our research would be thorough and systematic. Our investigation into improving KLM's organizational and IS structure in order to successfully integrate the Digital Travel Agency into the airlines was greatly aided by this methodical selection procedure.

3. Analysis of Current and Desired Internal Business Environment

This chapter covers the analysis of KLM's organizational structure, culture, and leadership. It starts with a detailed study of organizational structure and chain of command, where it describes the organizational structure based on Cameron and Green's classification as a market type of organization. Then categorizes departments at KLM based on the impact of Digital Travel Agency. Further, the evaluation of organizational culture is done using different frameworks. Finally, a thorough analysis of KLM's executive team and advisory board is done to reach a consolidated conclusion of the chapter.

3.1. Assessment of Organization Structure & Chain of command

This paragraph covers the current organizational structure and chain of command at KLM, starting with classifying the organizational structure and chain of command. Then discusses the Impact of both on implementation of DTA. Finally, provides recommendations for structural changes for smooth implementation of DTA.

3.1.1. Classification of Organizational Structure

According to Cameron and Green's classification, KLM should be classified as a market type organization. It focuses on achieving results based on customer needs while being competitive in the market. (Cameron, 2004)

A strong indicator of the above classification is clear vision and strategy of KLM. A culture of innovation and efficiency, evident from KLM's continuous improvement program, which seeks to optimize its operations, reduce costs, and increase efficiency. KLM's new strategy to become a frontrunner in sustainable aviation shows quick adaptation to changing market conditions. Strong focus on performance measurement and accountability. Flexible and Agile network at KLM that adjusted to demand and supply fluctuations caused by the COVID-19 pandemic. There is a clear and transparent governance structure consisting of a Board of Directors, an Executive Committee (Foong et al., 2023), and various specialized committees. Directive and result-driven leadership style is evident at these management levels (Ku, 2022). A decentralized and flexible structure that allows for quick adaptation to changing market conditions. KLM has high customer satisfaction and loyalty, as well as a leading position in the European market.

Strengths	Weaknesses
Clear and consistent vision, B3 strategy, and direction for the company.	Multiple layers of management and bureaucracy that slow down decision-making and execution.
High level of control, coordination, and standardization across the organization.	Low level of alignment, consistency, and quality across the business units.
High level of alignment, consistency, and quality across the functional departments.	Low level of flexibility, agility, and efficiency within the functional departments.
High level of flexibility, agility, and efficiency within the business units.	Low level of integration, leverage, and synergy among the business units.
High level of diversity, expertise, and opportunities within the external network.	Low level of collaboration, coordination, and communication among the external partners and stakeholders.

Table 3. Strengths and Weaknesses of KLM's Current Organizational Structure (KLM Netherlands, 2023)

Opportunities	Threats
Enhance the vision, strategy, and direction for the company by incorporating innovation as a core value and goal.	Lose the vision, strategy, and direction for the company by failing to adapt to the changing market and customer needs and preferences.
Improve the control, coordination, and standardization across the organization by implementing innovation solutions that streamline and automate the processes and systems.	Reduce the control, coordination, and standardization across the organization by introducing innovation solutions that create complexity and inconsistency in the processes and systems.
Increase the alignment, consistency, and quality across the functional departments by implementing innovation solutions that optimize and integrate the resources, capabilities, and best practices.	Decrease the alignment, consistency, and quality across the functional departments by implementing innovation solutions that disrupt and fragment the resources, capabilities, and best practices.
Boost the flexibility, agility, and efficiency within the business units by implementing innovation solutions that customize and differentiate the products, services, and strategies.	Diminish the flexibility, agility, and efficiency within the business units by implementing innovation solutions that standardize and commoditize the products, services, and strategies.
Expand the diversity, expertise, and opportunities within the external network by implementing innovation solutions that create and capture value for the organization and its customers.	Shrink the diversity, expertise, and opportunities within the external network by implementing innovation solutions that destroy and transfer value from the organization and its customers.

Table 4. Opportunities and Threats to KLM based on its Current Organizational Structure (KLM Netherlands, 2023)

3.1.2. Classification of Chain of Command

As part of Air France-KLM (Air France, 2023), a holding company that oversees both airlines and common functions. KLM's CEO reports to the board of directors and the executive committee of Air France-KLM. A management board also supports the above committees. It consists of the CFO, COO, and EVPs of various business units. These business units consist of divisions, departments, and teams, each with their managers and supervisors.

Current Chain of Command

At KLM, the Authority to make decisions and allocate resources lies with the CEO and the managers of different levels. Responsibility is the duty to perform tasks and objectives rests with the employees. Accountability to evaluating the performance and results lies with the managers and executive teams (KLM Netherlands, 2023). Delegation is done by managers and supervisors as they can delegate work to lower-level employees and units based on the principle of empowerment (Van Triest & Williams, 2022).

The employees of KLM and its subdivisions are responsible for carrying out the tasks and objectives assigned by their managers and supervisors. The managers and supervisors are accountable for measuring and evaluating the performance and results of their employees and units. They also have the authority to make decisions and allocate resources within their units. Reports are then sent to higher-level managers and the executive committee (KLM Netherlands, 2023).

3.1.3. Impact of Organizational Structure and Chain of Command

The current organizational structure and chain of command of KLM have both positive and negative impacts on factors affecting digital travel agency (DTA). As shown in figure 1, dividing the departments based on the level of impact is better to categorise the areas that have the higher impact.

High Impact

The departments that are directly involved in customer interaction and service delivery will benefit the most from the recommended changes. They are the social media hub and the e-business department. Social Media Hub is developed in partnership with Tata Consultancy Services (TCS) to leverage AI-enabled functionalities such as chatbots, sentiment analysis, and personalization. It manages KLM's social media presence and customer service across platforms. The implementation of DTA and its generative artificial intelligence (GAI) capabilities, like Chat GPT, would enable to provide more personalised recommendations and offers to the customers (Foong et al., 2023).

The E-Business department manages the digital channels of KLM such as website, mobile app, social media, and chatbots. The utilization of digital voice assistant (DVA) would enhance the accessibility and convenience of the booking systems. As it enables the customers to use voice commands to search, compare, and book flights. The integration of generative artificial intelligence (GAI) would also allow it to offer more tailored suggestions to the customers.

Medium Impact

These are the departments that would benefit from the recommended changes, but not as much as the high-impact ones. They are Digital studio, Operations decision support, and Operations control centre. The Digital studio is responsible for creating and implementing innovative digital solutions such as mobile apps, website, and other digital products for KLM's customers and employees. The implementation of SMA would help it to gather more insights and feedback from customers and employees. GAI and DVA would also provide it with new tools and technologies to create more engaging and interactive digital experiences (Ku, 2022).

The operations control centre department oversees the daily operation of KLM's flights, crew, and ground services. An AI-powered tool called Sentry, developed in partnership with Boston Consulting Group (BCG) is used to optimize complex decisions and reduce delays, cancellations, and missed connections. The implementation of SMA would help in knowing the customer better. The utilization of DVA and GAI would enable it to communicate and collaborate more effectively and efficiently with other departments and stakeholders. The operations decision support department will also be similarly affected by the implementation of DTA as it deals with AI, ML and optimization.

Low Impact

These are the departments that would not benefit much from the recommended changes, as they are not directly related to customer interaction or service delivery. They are Finance, Human Resources, Cargo, Engineering & Maintenance, Strategy & Corporate Development. Strategy & Corporate Development department develops and executes the company's long-term strategy and identifies new business opportunities. Engineering & Maintenance is responsible for the maintenance and technical support of KLM's aircraft and engines. All these departments could use the data and insights from Social Media Analytics (SMA) to understand and respond to customer needs and expectations to cater to the customers.

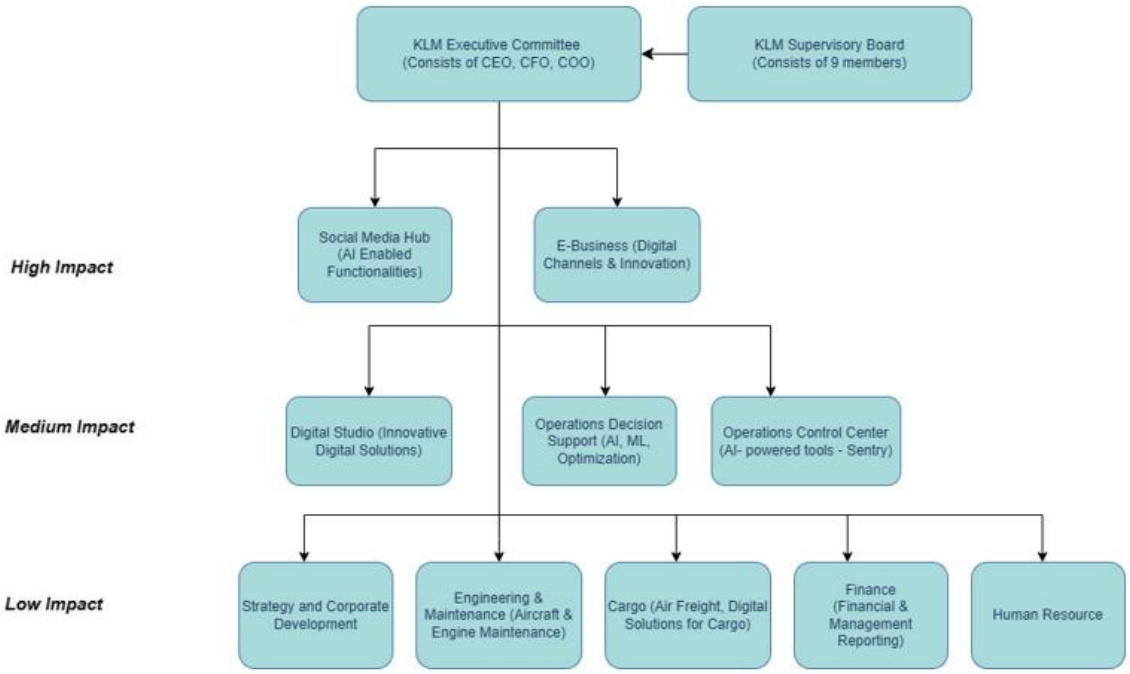

Figure 1. Impact of DTA Implementation on Various Departments at KLM (KLM Netherlands, 2023)

3.1.4. Recommendations for Structural Changes

Possible changes in the elements of KLM's current organizational structure and chain of command, to enable the KLM to use the 3 changes recommended by DTA effectively:

Changing the classification of the organizational structure from market to adhocracy. According to Cameron and Green's classification, a market type of organization is focused on achieving results, meeting customer needs, and being competitive in the market. These types of organizations are usually rigid, bureaucratic, and hierarchical which may hinder innovation (Adiloğlu-Yalçınkaya & Beşler, 2021). It is better to go with an adhocracy type of organizational structure as it is more suitable for dynamic and uncertain environments. An adhocracy type of organizational structure has a fluid and organic structure and a high degree of collaboration and empowerment. There is also a culture of risk-taking and empowerment, a leadership style that is visionary, supportive, and participative.

Change the chain of command from top-down to bottom-up. At KLM, authority, responsibility, accountability, and delegation flow from the CEO and the managers of different levels to the employees and units (Ku, 2022). This approach has some limitations such as being too centralized and controlling. The bottom-up approach is better for KLM as it ensures the flow of authority, responsibility, accountability, and delegation from the employees to the CEO and the managers of different levels. This approach will empower the employees to make decisions and allocate resources within their scope. It is more effective and efficient in executing and delivering the objectives. It is a more proactive and innovative in solving problems and opportunities.

3.2. Evaluation of Organizational Culture for Innovation

In this paragraph, Analysis of the current culture is done based on different cultural frameworks. Based on that impact of current cultural framework is measured. Finally, the recommendations for cultural changes are discussed.

3.2.1. Description of Current Culture

Harrison and Handy framework

KLM is a combination of role and task culture. This means that KLM has both a clear structure and hierarchy as well as a focus on completing specific tasks and projects, such as developing a new strategy, reducing carbon emissions, and improving customer experience.

The formal rules and regulations, standard procedures, and policies are strong evidence of the role culture aspect of KLM. As part of the Air France-KLM Group, KLM follows the group's principles, values, and policies. These policies ensure consistency, quality, and safety across the group's operations (Leal-Rodríguez et al., 2023). KLM also has a clear organizational structure, with well-defined roles and responsibilities for each function.

The project-based work, teamwork, and collaboration are some evidence of the task culture aspect at KLM. There are cross-functional teams to work on specific innovation initiatives such as developing new products, services, or business models. Enabling it to leverage the skills, knowledge, and creativity of its employees. It also enables to collaboration with external partners such as customers, suppliers, universities such as HvA, and startups.

The advantages of having a combination of role and task culture are that KLM can achieve both stability and innovation, professionalism, and creativity (Schulman, 2020). The disadvantage of having a combination is it can be challenging to balance the different needs and expectations of role and task culture like authority and autonomy, control and freedom, order, and change.

Cameron and Quinn framework

A combination of market and adhocracy culture of innovation is evident in KLM. The organization focuses on achieving results and being competitive in external environments, as well as fostering creativity and innovation internally (Gong et al., 2022).

KLM's emphasis on customer satisfaction, profitability, and market share is strong evidence of market culture. Being a frontrunner in sustainable aviation, its emphasis on customer satisfaction, profitability, and market share also shows this. KLM's leaders set high standards and expectations for their employees and reward them for their performance.

The pursuit of creativity and innovation and KLM's responsiveness to the changing environment and customers' needs show some elements of adhocracy culture (Otike et al., 2022). There are also some elements of clan culture within the organization. The internal environment focuses on things like employee development during the two-week break given in the year, and emphasis on mentoring.

The advantages of having a combination of market with some elements of adhocracy cultures are that KLM can achieve both competitiveness and differentiation, efficiency, and flexibility. The disadvantages of having a combination of market and adhocracy cultures are that KLM may face challenges in balancing the different needs and expectations of the market and adhocracy cultures, such as stability and change, control and freedom, and order and diversity (Osei et al., 2023).

Hartl and Hess's organizational and cultural values

The strongest cultural values as described by Hartl and Hess at KLM are Customer orientation, Innovation orientation, and Agility. There is a strong focus on Customer Experience and Innovation at

KLM. KLM pursues creativity and innovation in its products, services, and processes. KLM also encourages and supports experimentation and risk-taking among its employees and partners.

3.2.2. Impact on Current Culture

The elements of KLM's current culture that are stimulating factors that impact the potential contribution of Digital Travel Agency are Customer orientation, Innovation orientation, Collaboration orientation, and Agility (Anglani et al., 2023). Customer orientation is a stimulating factor as it aligns with KLM's goal of enhancing customer satisfaction and loyalty. Innovation orientation is also a driving factor as it aligns with the goal of being a frontrunner in sustainable aviation and leveraging digital technologies to enhance its competitive advantage. Collaborative orientation is also in alignment with the goal of promoting teamwork, communication, and cooperation across different functions and levels (Zoppelletto & Orlandi, 2022). The goal of adapting quickly and effectively to the changing environments and customer needs shows KLM's Agility.

3.2.3. Recommendations for Cultural Changes

Role culture should be changed to allow more innovation, creativity, and flexibility in the organization. The role culture of KLM may limit the implementation and adoption of new technologies, such as SMA, DVA, and GAI. These changes will challenge the formal rules and regulations that KLM relies on.

Market culture should be changed to allow more collaboration, diversity, and empowerment in the organization. It may create a high-pressure and stressful work environment for the employees and partners who are involved in the deployment of the new technologies (Anglani et al., 2023). The implementation of SMA, DVA, and GAI is one such case where employees may face high expectations from leaders. KLM should foster a more supportive and inclusive culture that promotes teamwork, communication, and cooperation across different functions and levels.

3.3. Assessment of Organizational Leadership for innovation

In this paragraph, initially current leadership is categorized based on five leadership qualities framework of Cameron and Green's classification. Then impact of current leadership is discussed on implementation of DTA. Finally, recommendations for change in leadership style is discussed.

3.3.1. Description of Current Leadership

Cameron and Green's Five Leadership Qualities

The Five Leadership Qualities framework of Cameron and Green identifies five types of leaders: Tenacious Implementer, Measured Connector, Visionary Motivator, Thoughtful Architect, and Edgy Catalyser (Lee et al., 2023).

Name	Position	Leadership Quality	Summary
Marjan Rintel	President and CEO of KLM	Visionary Motivator	Inspires others with their vision and mission and invests in the development and empowerment of their people.
Erik Swelheim	Managing Director and CFO of KLM	Tenacious Implementer	Committed to achieving results and executes their plans and projects with discipline, rigor, and resilience.

Maarten Stienen	Chief Operations Officer of KLM	Thoughtful Architect	Designs systems, structures, and processes that enable effective performance of KLM's operations.
Wiebe Draijer	Chair of the supervisory board	Visionary Motivator	Inspires others with vision and mission and invests in development and empowerment of his people.
François Enaud	Member of the supervisory board	Edgy Catalyser	Drives innovation, challenge, and change, and encourages creativity and risk-taking.
Jan-Kees de Jager	Member of the supervisory board	Tenacious Implementer	Delivers results, follows plans, and overcomes obstacles.
Christian Nibourel	Member of the supervisory board	Measured Connector	Builds relationships, facilitates communication, and creates trust among the board members and the executive team.
Marjan Oudeman	Member of the supervisory board	Edgy Catalyser	Drives innovation, challenge, and change, and encourages creativity and risk-taking.
Fleur Pellerin	Member of the supervisory board	Tenacious Implementer	Delivers results, follows plans, and overcomes obstacles.
Pierre-François Riolacci	Member of the supervisory board	Measured Connector	Builds relationships, facilitates communication, and creates trust among the board members and the executive team.
Benjamin Smith	Member of the supervisory board	Edgy Catalyser	Drives innovation, challenge, and change, and encourages creativity and risk-taking.
Janine Vos	Member of the supervisory board	Measured Connector	Builds relationships, facilitates communication, and creates trust among the board members and the executive team.

Table 5: Leadership Quality Analysis of Current Leaders at KLM (KLM Netherlands, 2023)

As seen from Table 5, the executive team is a mix of Visionary Motivators, Tenacious implementers, and Thoughtful Architects. This means that they are passionate about inspiring others and committed

to achieving results. They are well-suited for leading KLM's strategy, operations, and innovation in a competitive and dynamic industry.

The supervisory board is a mix of Measured Connector, Edgy Catalyser, and Tenacious Implementer with one Visionary Motivator (Abbas & Raza, 2023). They are skilled at building relationships, driven by innovation and challenge. They are well-suited for supervising the management and performance of KLM, as well as providing guidance and support to the executive team. The details for all the members of the leadership boards are mentioned in the table below.

The combination of these two groups creates a balanced and complementary leadership culture at KLM. Vision, execution, and innovation are valued and encouraged in both groups. The executive and supervisory board work together to ensure that KLM achieves its goals and objectives, while also staying true to the values and mission of the organization.

3.3.2. Impact of Current Leadership

KLM's current leadership is mostly stimulating factors that impact the 3 main recommendations in Digital Travel Agency for KLM's mobile application.

Implementation of Social Media Analytics (SMA) to do sentiment analysis: KLM's vision of being customer-centric and creating memorable experiences is aligned with this change. It is also supported by the Visionary Motivator and the Tenacious Implementer in the executive team and supervisory board. They are passionate about inspiring others and delivering results. The Measured Connector and the Edgy Catalyser in the supervisory board can also foster the creativity and communication needed for this change.

Utilization of Digital Voice Assistants (DVA) to enhance the accessibility of the booking system: KLM's value of innovation and sustainability is aligned with this change. It is also supported by the Thoughtful Architect and Edgy Catalyser in the executive team and supervisory board. The Measured Connector and the Tenacious Implementer in the supervisory board can also build relationships and deliver the results needed for this change.

Integration of Generative Artificial Intelligence (GAI) like Chat GPT to provide personalized recommendations: KLM's value of customer focus and innovation is aligned with this change. It is also supported by the Visionary Motivator and the Edgy Catalyser in the executive team as they are passionate about inspiring others and driving innovation and change. The Measured Connector and the Tenacious Implementer in the supervisory board can also facilitate the communication and execution needed for this change.

The only possible inhibiting factor that could impact the 3 changes is the high-pressure and stressful work environment that a market culture can create (Simkhada & Bhattarai, 2023). Collaboration, innovation, and employee engagement can improve the environment, which is essential for implementing the changes. However, this factor can be mitigated by the Measured Connector and the Visionary Motivator in both the executive and supervisory board by creating trust, feedback, and empowerment among the employees.

3.3.3. Recommendations for Current Leadership

KLM's current leadership that should be changed, to enable the organization to implement the 3 changes effectively, are as follows:

The Tenacious Implementers in the executive team and the supervisory board should be more open to experimentation and learning from failures, rather than sticking to rigid plans and targets. Embracing uncertainty and complexity that comes with 3 changes.

The Thoughtful Architect in the executive team should be more collaborative and inclusive, rather than designing systems and processes in isolation. Involving users and stakeholders of the mobile application in the design and implementation of the 3 changes to ensure that their needs and preferences are met.

The Measured Connector in the executive team and the supervisory board should be more proactive and assertive, rather than reactive and passive. Allowing them to initiate communication and coordination for 3 changes. Influencing and persuading others to support and adopt changes related to DTA.

3.4. Conclusion

In Conclusion, KLM can be classified as a market type of organization. It should be changed to adhocracy type to add more fluidity and flexibility to the rigid structure. The top-down chain of command should be changed to bottom-up as it would empower the employees. The implementation of DTA has a high impact on the social media hub and e-business department and, a medium impact on the digital studio, operations decision support, and operations control centre at KLM. The role culture may limit the implementation and adoption of DTA. It should be changed to allow more innovation and creativity. KLM's current leadership should also change, tenacious implementers should be more open to experimentation. Thoughtful architects in the executive team should be more collaborative as well as inclusive. The measured connectors in the supervisory board should be more proactive and assertive. The recent change of measured connectors to that of visionary motivator in the supervisory board is a favourable step towards the implementation of DTA.

4. Analysis of Current and Desires Internal IS Environment

In this chapter, a thorough analysis is conducted to identify the necessary changes for the realization of a Digital Travel Agency. This involves examining the adjustments required in KLM's current Information System (IS) portfolio, management structure, strategic objectives, financial considerations, and digital capabilities. The current landscape will be delineated, the post-implementation scenario envisioned, and the specific transformations needed to achieve this digital transition will be articulated. This analysis aims to provide a clear roadmap for KLM in its journey towards becoming a fully integrated Digital Travel Agency.

4.1. Assessment of Information Systems Portfolio

The first paragraph identifies and maps KLM's current IS portfolio using a portfolio grid, serving as the foundation for assessing business value and costs, which is discussed further in Chapter 4.8 with a focus on financial considerations.

IS portfolio management is crucial for big companies. It involves systematic and structured decision-making processes for evaluating (new) applications across different dimensions, ensuring optimization, and addressing issues to meet enterprise objectives effectively (Simon et al., 2010, p 38). Consequently, implementing a portfolio grid is an essential strategy for managing these systems effectively in the long term (Peppard and Ward, 2016, p. 280)

In the context of IS, a portfolio grid, is a strategic management tool used to analyze and categorize the various information systems within an organization based on certain criteria.(McFarlan, 1981) It is often used to help decision-makers understand the current composition of their IS investments and to plan future investments more effectively. To analyze this, the following grid composition is used:

- **Business Value:** This axis assesses how much value each IS application brings to the organization. It considers factors like whether the application provides a competitive advantage, enhances productivity, or is critical to the company's operations.
- **Investment/Cost:** This axis measures how much investment (financial, time, resources) is required to maintain and develop each IS application. It considers factors like initial development costs, ongoing operational costs, and costs associated with upgrades or expansions.

Although specific details about KLM's Information Systems are proprietary and not publicly disclosed, the following is an estimation of general Information Systems commonly utilized in the airline industry which is based on (Buhalis, D. 2004) ICT- empowered functions table. The following table provides an overview of the key IS deployed by airlines, like KLM, detailing their specific functions and needs based on:

Information System	Objective
1. Reservation and Booking Systems	Manage flight bookings, ticketing, and customer information, handling interactions from booking to boarding.
2. Flight Operations Systems	Include flight planning, crew management, and fleet management, crucial for daily flight operations.
3. Customer Relationship Management (CRM) Systems	Manage customer data, interactions, and personalized marketing, vital for customer service and loyalty programs.
4. Cargo Management Systems	Handle air cargo logistics, tracking, and scheduling, ensuring efficient cargo handling and transportation.

5. Maintenance, Repair, and Overhaul (MRO) Systems	Track and manage aircraft maintenance schedules, inventory, and compliance with safety regulations.
6. Human Resources Management Systems (HRMS)	Manage employee data, payroll, training, and recruitment processes.
7. Financial and Accounting Systems	Used for budgeting, financial reporting, and transaction management.
8. Enterprise Resource Planning (ERP) Systems	Integrate various business processes and data into a unified system to streamline operations and improve efficiency.
9. Communication and Collaboration Tools	Include internal communication platforms, document management systems, and collaboration tools.
10. Data Analytics and Business Intelligence Systems	Analyze large volumes of data to inform strategic decisions and improve operational efficiency.
11. Safety and Compliance Systems	Ensure adherence to aviation regulations, safety standards, and manage risk.

Table 6. List of IS Utilized By KLM

Based on the above stated identification of the IS systems utilized by KLM, the Portfolio grid is assessed based on the bullet points 1 and 2. Table 7 shows the IS portfolio grid of KLM:

High Business Value, High Investment/Cost	High Business Value, Low Investment/Cost	Low Business Value, High Investment/Cost	Low Business Value, Low Investment/Cost
Reservation and Booking Systems	Customer Relationship Management (CRM) Systems	Human Resources Management Systems (HRMS)	Communication and Collaboration Tools
Flight Operations Systems	Data Analytics and Business Intelligence Systems		
Cargo Management Systems	Financial and Accounting Systems		
Maintenance, Repair, and Overhaul (MRO) Systems			
Enterprise Resource Planning (ERP) Systems			
Safety and Compliance Systems			

Table 7: IS Portofolio Grid

4.2. Assessment of KLM's IS Performance

In this paragraph, an evaluation of the performance of KLM's Information Systems (IS) is given against their original objectives, as outlined in Table 7. Given the classified nature of specific details about KLM's IS, due to security and strategic concerns, this assessment utilizes the Q3 2023 annual report figures as a benchmark for success. This approach helps in determining the extent to which these systems align with and support KLM's strategic goals, despite the limited availability of direct system-specific information. The comparison between the current roles and achievements of the IS and their initial intended purposes offers a clear view of their effectiveness in the broader context of the airline's operations and objectives.

IS assessment: reservation and booking & Flight operation systems

In assessing the effectiveness of KLM's Information Systems (IS) as per their latest annual report, there is a strong alignment with their operational success. The Reservation and Booking Systems have shown efficiency, mirrored in the 7.6% passenger increase (Air France-KLM, 2023), indicating adept handling of higher booking volumes. Flight Operation Systems have been integral to the 6% capacity increase and 7.6% traffic growth (Air France-KLM, 2023), underscoring their role in efficient operational management.

IS assessment: CRM, CMS & MRO

The Customer Relationship Management (CRM) Systems align with the record operating profit, suggesting effective customer engagement strategies (Air France-KLM, 2023). Although Cargo Management Systems faced a revenue dip (Air France-KLM,2023), they likely managed cargo operations well, with external factors affecting outcomes. Maintenance, Repair, and Overhaul (MRO) Systems, crucial in fleet maintenance, have indirectly contributed to operational expansion (Air France-KLM, 2023).

IS assessment: HRMS, Financial and Accounting & ERP

Human Resources Management Systems (HRMS) have played a strategic role, especially in implementing the "Partners for the Future" plan, focusing on employee engagement (Air France-KLM,2023). Financially, the Financial and Accounting Systems have been pivotal in achieving a significant profit and revenue increase (Air France-KLM,2023), demonstrating strong financial management. Enterprise Resource Planning (ERP) Systems have enhanced operational efficiency and process integration (Air France-KLM,(2023).

IS assessment: Communication and Collaboration & Analytics and Business Intelligence

The successful handling of increased operations and employee initiatives implies effective use of Communication and Collaboration Tools for internal coordination (Air France-KLM, 2023). Finally, strategic decisions like capacity expansion point to the significant role of Data Analytics and Business Intelligence Systems in providing insights for informed decision-making, aligning with KLM's strategic goals (Air France-KLM,2023).

4.3. Identification of Depended IS on Emerging Technologies

In the focal report, an analysis has been performed on each of the touchpoints in KLM's booking process, where a lack of personalization was noticed, based on selected criteria. To address this gap, the emerging technology of a digital travel agency is introduced, leveraging the gaps in personalization with Social Media Analytics (SMA), Digital Voice Assistants (DVA), and Generative Artificial Intelligence (GAI).

This emerging technology primarily depends on the Reservation and Booking System and CRM for direct integration. The Reservation and Booking Systems are pivotal for the seamless integration of these technologies, given their role as the primary customer interface during booking. They provide critical data for SMA and GAI to personalize customer experiences, encompassing customer preferences and booking history (Cristina Ledro,.2023). Ensuring real-time information availability is also crucial for these systems to offer accurate, personalized options (Luo et al., 2023).

Equally crucial is the CRM system, which manages comprehensive customer data, forming the basis for enhanced customer engagement and personalized marketing. Integrating SMA, DVA, and GAI with CRM will enable more tailored customer interactions, leveraging the CRM's analytics for effective personalized recommendations(Luo et al., 2023).

Furthermore, the integration will involve Data Analytics and Business Intelligence Systems for processing, and retrieving large volumes of data, providing insights for SMA and GAI (Aldwairi et al., 2023). Communication and Collaboration Tools will facilitate coordination across departments, ensuring smooth technology integration.

Enterprise Resource Planning (ERP) Systems will also play a significant role in this integration, maintaining the continuity of business processes (Emanuel Martins., 2022). Human Resources Management Systems (HRMS) may need to manage new roles or skill requirements emerging from this technological advancement(Menzies et al. 2023).

Additionally, Safety and Compliance Systems become crucial, especially for data privacy and cybersecurity in handling customer data(Li et al. 2023).

Indirect impacts may also be felt in operationally focused systems such as Flight Operations, Cargo Management, Maintenance & Repair, and Overhaul (MRO) Systems due to shifts in customer preferences influenced by these new technologies.

In essence, the implementation of SMA, DVA, and GAI in KLM's digital travel agency necessitates a comprehensive and coordinated effort across various information systems. This includes not only enhancing customer experiences through the Reservation and Booking and CRM systems but also ensuring alignment with operational, administrative, and compliance frameworks.

4.4. Appropriate Management of the IS within Digital Travel Agency

In this subchapter, an evaluation is performed on how KLM's management of the identified IS effectively supports and influences the integration and potential of innovative technologies within the Digital Travel Agency. With the integration of a Digital Travel Agency with technologies like SMA, DVA, and GAI, the role of IS management is of great importance.

Management alignment: Reservation and booking systems

The management of Reservation and Booking systems shows good adaptability in handling increased booking volumes. With this annual passenger increase, there is still a need for greater focus on the enhancement of managing real-time data availability and handling customer preferences data which can be translated to the CRM and Data Intelligence Systems, this is a crucial step for the integration of

SMA and GAI (Ku. 2022). Since the implementation of the DTA requires a lot of new customer data to be handled, a way to keep up with the availability and processing of data is by implementing fixed timeslots. This allows algorithms to make anticipation based on historical patterns, like heightened booking periods to keep up with the server availability and processing of data (Varone, Heilmann, Porruvecchio, and Romanino 2024).

Management alignment: CRM systems

Also, the CRM systems, while efficiently managing customer data, require a strategic management shift to fully exploit their personalization potential. This involves integrating SMA, DVA, and GAI to enhance customer engagement, which is vital for the success of the digital travel agency. To manage this, KLM must create a comprehensive framework to adjust and revise their DTA tactics in line with intended outcomes (Shawky et al. 2020).

Management alignment: Business Intelligence Systems

Business Intelligence Systems are critical in providing insights for SMA and GAI, necessitating strategic decision-making and operational efficiency through the analysis of large data volumes, the Data Analytics and Business Intelligence teams must be fully informed about the new integrations brought by DTA.

Management alignment: Communication and Collaboration Tools & ERP

Furthermore, the effective management of Communication and Collaboration Tools is essential for the coordination of new technologies across departments, facilitating smoother integration and operational synergy (Nguyen et al. 2023). The adaptability of ERP systems is crucial for seamlessly integrating new technological innovations while maintaining operational efficiency within the digitized management strategies of KLM's Digital Travel Agency (Perera et al. 2023).

Management alignment: HRMS & Safety and Compliance systems

The management of HRMS is also significant, focusing on developing new competencies and roles emerging from this digital transformation. This aligns HR strategies with technological advancements to support the Digital Travel Agency. To manage this transaction, a comprehensive adoption process or framework should be implemented to adapt to new competencies and roles (Prikshat et al. 2023). Additionally, with the introduction of new technologies that handle sensitive data, the management of Safety and Compliance Systems becomes vital for risk mitigation.

Management alignment: Flight ops, CMS, & MRO

Operational Systems such as Flight Operations, Cargo Management, and MRO may not be directly involved, but their management should be responsive to the changing customer preferences influenced by the Digital Travel Agency, supporting the innovation's success indirectly.

4.5. Recommendations for Portfolio Changes

In this paragraph, recommendations are given based on section 4.1 – 4.4. The focus of these recommendations enables to identification of gaps and opportunities to enable a smooth management shift with the realization of the Digital Travel Agency.

To effectively utilize the innovation solutions at KLM, a strategic realignment of their Information System (IS) portfolio is essential. It is to be noted that the current IS portfolio grid will be further utilized for any potential investment solutions in Chapter 4.8. Despite KLM's current IS portfolio showing competence, as evidenced by indicators in the Air France-KLM Q3 annual report, there is room for improvement, particularly in integrating Digital Travel Agency (DTA) functionalities more effectively. This requires a management shift in several key areas:

Reservation and Booking Systems: Implementing algorithms for anticipating fixed time slots will enhance server availability and efficient handling of customer preference data. Potentially, additional hardware upgrades need to be made to efficiently process the huge amount of new data.

CRM Systems: Management shift towards maximizing the potential of personalization features. This involves integrating Social Media Analytics (SMA), Data Voice Assistant (DVA), and General Analytics Integration (GAI). To manage this KLM must create a comprehensive framework to adjust and revise their DTA tactics in line with intended outcomes.

Data Analytics and Business Intelligence Systems: Critical for providing insights into SMA and GAI, these systems require strategic decision-making to analyse large data volumes effectively. It's essential that the teams utilizing this IS, are fully informed by the new integration of the DTA, this way it's easier to manage the huge amounts of data coming through.

Communication and Collaboration Tools: Essential for coordinating new technologies across departments, these tools ensure smoother integration and operational synergy.

Enterprise Resource Planning (ERP) Systems: Integral for integrating new technological innovations while maintaining operational efficiency within KLM's digitized management strategies.

Human Resource Management Systems (HRMS): These systems should focus on developing new competencies and roles emerging from digital transformation. To manage this transaction, a comprehensive adoption process or framework should be implemented to adapt to new competencies and roles

Safety and Compliance Systems: With the introduction of technologies handling sensitive data, these systems become crucial for risk mitigation.

Operational Systems (Flight Operations, Cargo Management, MRO): Though not directly involved, these systems should be responsive to changing customer preferences influenced by the DTA.

4.6. Assessment of Information Systems Strategic Alignments

In this paragraph, the strategic objectives KLM has to establish are discussed in order to achieve the optimum level of IS performance. Furthermore, two strategies are proposed which can help KLM to achieve this IS performance. Lastly, the alignment of these objectives with our DTA is discussed.

4.6.1. Strategic Objectives

Since there is no information available about specific strategic objectives concerning the IS/IT of KLM, a general approach to strategic objectives concerning IS/IT is given in the trend of a big corporate airline like KLM. In the current world of Digital Transformation implementations, KLM's focus lies on achieving a series of objective goals to ensure high-quality, adaptive performance of IS.

Technology and Data Management

Firstly, KLM invests in and maintains cutting-edge technology infrastructure that supports various IS applications. It's vital to keep up with new technologies and advances that are rapidly adopted in the aviation industry. Also, an important objective is Data Management and Analytics proficiency. KLM develops robust capabilities in data management and analytics to harness the full potential of the IS, often developing these capabilities internally (Gerritsen, R. 2023).

Customer Focus and Adaptability

Secondly, another vital objective to achieve the desired outcomes of each IS is a customer-centric approach. The performance of each IS should emphasize customer needs, as this is the main income source for KLM (Air France-, 2023). Also, agile and adaptive frameworks are important objectives to

implement flexible frameworks for quick adaptations to trends, customer feedback, and technological innovations.

Collaboration and Organizational Culture

Another important objective is cross-functional collaboration and communication across departments to integrate new technologies. Smooth integration of emerging technologies across different departments is essential to mitigate the risk of integration delay and thus additional costs. Also, driving an innovation culture that supports the experimentation of digital emerging trends is vital, as innovative technologies drive company revenues to new extents (Cozzens et al., 2010; Slack et al., 2016; Tidd and Bessant, 2018).

Employee Development and Engagement

Another important objective is the continuous investment in employee development and engagement. This is important for quickly adopting emerging trends and technologies. Along with this, continuously developing strategies to help staff adapt to new systems and roles created in the process of new technology innovations is crucial.

Compliance and Feedback Integration

Lastly, a very important objective is to maintain vigilant compliance and Risk Management when innovating with new technologies. Good risk management is vital to estimate different outcomes of scenarios to be prepared for every scenario. When implementing new technologies, new or adjusted integrated systems must be compliant and highly secured to handle sensitive data.

4.6.2. Strategy for Achieving Objectives

A refined strategy for achieving the objectives outlined in the previous chapter involves innovating Information Systems (IS) Portfolio Management at KLM. This approach advances beyond current methodologies by utilizing simulated scenarios. Such simulations effectively counter the challenge of limited real-world organizational IS portfolio data. This is particularly beneficial for KLM, as innovation in new technologies often introduces a substantial amount of unknown data. This proposed method proactively manages this uncertainty by generating weight scores. These scores aid in forming a rational basis for enhancing IS investments. They also help in prioritizing IS projects in alignment with KLM's strategic enterprise goals, thus facilitating more efficient and targeted technological advancements within the company's IS framework (Huang et al. 2021).

Another refined strategy for achieving the objectives outlined in the previous chapter involves the implementation of an open API-driven platform. Application Programming Interfaces (APIs) are sets of rules and protocols used for building and interacting with software applications (Pujadas, R. 2024). APIs act as an intermediary, allowing different software applications to communicate with each other. They enable the integration of new features and services, allowing data to be easily shared and processed across different systems. An open API platform can drive innovation and success in information systems by offering a flexible and scalable way to integrate and leverage various services and data sources (Heshmatisafa and Seppänen, 2023).

4.6.3. Alignment and Impact on Innovation Solutions

The objectives given in Chapter 4.6.1 closely align with the objectives required to initiate the DTA. The objectives closely align with the trend of innovation, ensuring a quick and transparent way when implementing new emerging technologies like a DTA. Furthermore, the first discussed strategy offers a good way to achieve the strategic objectives by facilitating efficient and targeted technological advancements in KLM's IS, by utilizing a weighted score, this sufficiently handles the substantial amount of new data when implementing the DTA. This is vital to adapt to, as the realization of a DTA requires a

shift in the IS portfolio management as already discussed in 4.5. The second strategy emphasizes further utilizing an open API-platform to achieve the strategic objectives to ensure the best IS performance when innovating. An open API platform drives innovation and success in IS by offering a flexible and scalable way to integrate and leverage various services and data sources. The following value-creation mechanisms showcase the impact of public APIs on the business values aligned with the realization of a DTA.

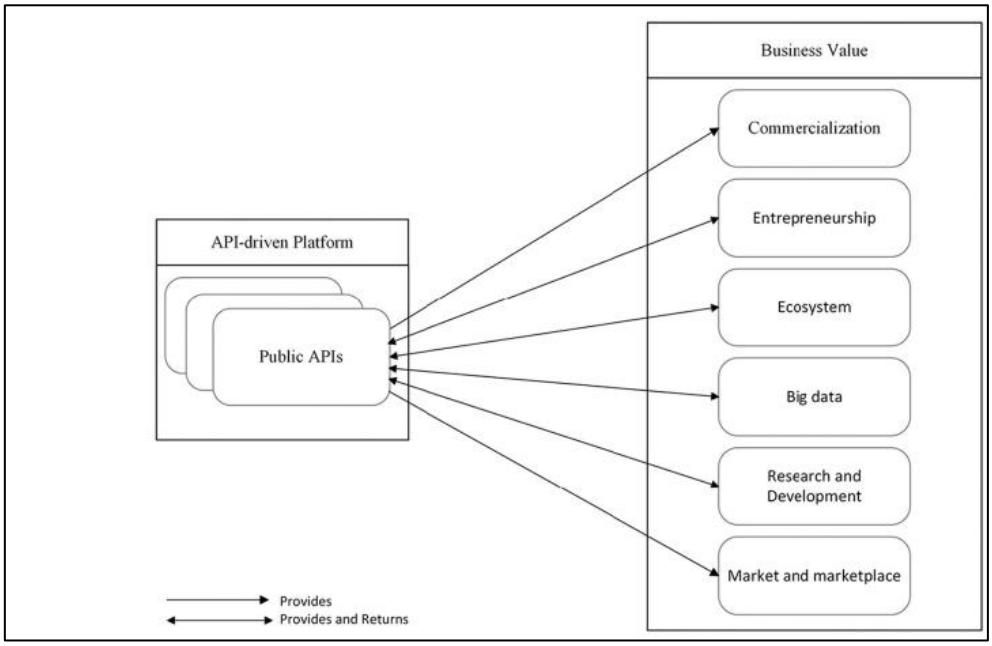

Figure 2. Optimizing IS Performance utilizing APIs

Although the strategies seem to offer strong potential for advancing KLM's strategic objectives, the implementation of a DTA could require significant organizational change and substantial resource allocation. Therefore, it's vital to implement the right adoption strategies and risk management to optimize this transition.

4.7. KLM Digitals Capabilities

This section delves into KLM's current digital strengths and its strategic vision for digital integration and innovation. In 4.7.1, it examines KLM's existing digital capabilities across various Information Systems, offering a comprehensive view of its digital landscape. In 4.7.2, the section underscores the urgency of digital transformation in response to the evolving digital environment, emphasizing the role of KLM's digital infrastructure in enhancing customer experiences and operational efficiency. It also outlines KLM's strategies to overcome integration challenges, maintain data privacy, and stay competitive through technological advancements while fostering an innovative culture.

4.7.1. Current Digital Capabilities

Creating or evaluating digital innovation strategies is crucial for the strategic integration and innovation of digital capabilities within an organization (Busulwa et al., 2022). Tables 8 and 9 therefore cross-reference KLM's current Information Systems based on the portfolio grid from paragraph 4.1. with both first-order and second-order digital capabilities, based on the Annarelli et al. (2021) framework which can be found in Appendix I, providing a holistic view of the organization's digital landscape as it relates to its operations and strategic IT initiatives.

First-Order Capabilities	Information System	Related Digital Capabilities
Reconfiguring digital resources	Reservation and Booking Systems	Continuously updating and integrating new features to improve user experience
	Flight Operations Systems	Implementing advanced planning algorithms and real-time adjustments to flight schedules
	MRO Systems	Leveraging IoT for predictive maintenance to reconfigure resources more efficiently
Seizing digital capabilities	CRM Systems	Utilizing data analytics to capture customer insights and seize market opportunities
	Cargo Management Systems	Digital tools for real-time tracking and optimizing cargo loads
	Data Analytics and Business Intelligence Systems	Leveraging insights to seize operational efficiencies and market opportunities
Sensing opportunities and threats	Safety and Compliance Systems	Advanced monitoring systems to sense and mitigate risks
	Communication and Collaboration Tools	Platforms to sense employee sentiments and foster innovation

Table 8. First-order Digital Capabilities

Second-Order Capabilities	Information System	Related Digital Capabilities
Improvisational capabilities	Reservation and Booking Systems	The ability to quickly adapt IT functionalities in response to disruptions
Scanning digital environment	Flight Operations Systems	Keeping track of the latest IT developments to upgrade systems
	MRO Systems	Timely reconfiguration of resources
Employing heterogeneous resources	HRMS and Financial Systems	Integrating diverse technologies across different systems
Deploying IT for digital competitiveness	CRM Systems and Cargo Management Systems	Utilizing IT advancements to maintain a competitive edge
Role of managerial cognition	HRMS and Financial Systems	Leadership's understanding of digital trends to guide digital transformation
Organizing IT capabilities	ERP Systems and Data Analytics Systems	Structuring IT services and infrastructure to support systems
Ecosystem capabilities	Safety and Compliance Systems	Creating a network of digital solutions that integrate with Flight Operations Systems
Supply chain integration capability	Cargo Management Systems	Ensuring seamless integration of supply chain processes

Table 9. Second-order Digital Capabilities

4.7.2. Strategic Integration and Innovation for KLM's Digital Capabilities

Traditional business models cannot answer the challenges of the new digital environment. To meet the challenges of the new digital environment, companies must therefore foster digital transformation including a reinvention of operating models, skills, and organizational structures (Hadjielias et al., 2022). The change process requires structural, cultural, capability, competency, and infrastructure changes aimed at delivering the necessary digitalized business models, business processes, and products/services to maximize competitive advantage and business longevity benefits on offer (Marx et al., 2022).

KLM's current digital infrastructure and capabilities are important in enhancing the potential contributions of the Digital Travel Agency, aligning with digital trends to meet customer expectations effectively. The continuous evolution and integration of their reservation and booking systems are

central to this, offering a seamless connection that could significantly improve the booking processes and customer service. Advanced data analytics and the strategic adoption of AI technologies promise to personalize travel experiences and boost operational efficiency within the Digital Travel Agency.

However, KLM faces challenges such as the complexity of integrating advanced systems like AI and SMA, which may present compatibility issues with the DTA platform. Balancing the effective use of data analytics with privacy regulations is also critical to avoid limiting personalization. Moreover, keeping pace with rapid technological changes is essential to maintain competitiveness.

To address these issues and enhance its digital capabilities, KLM must streamline the integration of AI and SMA into its systems with modular designs and standardized protocols for easy collaboration with the DTA. Reinforcing APIs and middleware to support robust connections with external platforms is also necessary. A focus on data management and privacy is essential to ensure the secure handling of user data in compliance with regulations.

Embracing technological changes through continuous learning for its workforce will foster an adaptive culture. Reassessing and potentially reengineering organizational processes, particularly within ERP and analytics systems, will add agility and flexibility, possibly through agile methodologies and new digital tools to quicken collaboration and decision-making.

By merging these strategic initiatives, KLM aims to not only refine its digital infrastructure but also to foster a culture receptive to innovation. This holistic approach is essential for KLM to preserve its market leadership and continue providing personalized, efficient travel experiences.

4.8. Financial Assessment

In section 4.8, the focus is on the financial aspects of KLM's adoption of the Digital Travel Agency (DTA) system. 4.8.1. presents an overview of the projected costs associated with the DTA implementation, including one-time expenses and ongoing operational costs. In 4.8.2, the discussion shifts to the benefits of the DTA, such as increased efficiency, cost savings, and potential revenue growth. The adoption of AI within the DTA is seen as a means to gain a competitive edge and secure long-term market share growth, highlighting the strategic significance of this technological advancement.

4.8.1. Costs

Digitalization has been confirmed to help airlines reduce costs and improve profitability, supporting the development of sustainable business strategies (Ordieres-Meré et al., 2020). The adoption of the Digital Travel Agency (DTA) system represents a considerable investment by KLM. The projected costs, as detailed in the Implementation Costs Table (Table 11), include one-time expenses for software licensing, system development, ERP upgrades, and essential training for HRMS, among others. Operational costs, laid out annually, encompass system maintenance, licenses, and additional IT support. Additional costs account for risk mitigation and any potential downtime during the implementation phase.

Cost Category	Details
Implementation Costs	• Software licenses for CRM and Data Analytics systems. • Development and integration of algorithms for reservation and booking systems. • ERP system upgrades or replacement. • Training and development of personnel for HRMS. • Security and compliance system updates. • Adjustments to operational systems.
Operational Costs	• Maintenance and updates of new systems. • Ongoing license costs. • Additional IT support and staff.
Additional Costs	• Risk mitigation and unforeseen costs. • Potential downtime during implementation.

Table 10. Cost Categorization Table

Cost Category	Cost (Low Estimate)	Cost (High Estimate)
CRM Implementation Costs	$100,000	$500,000
Custom Software Development Costs	$250,000	$1,000,000
ERP System Upgrades	$500,000	$2,000,000
Training Costs	$2,000,000	$5,000,000
Security and Compliance Updates	$100,000	$500,000
Adjustments to Operational Systems	$250,000	$1,000,000
Annual Operational Costs	$45,000 (annually)	$60,000 (annually)
Annual Additional IT Support and Staff	$1,000,000 (annually)	$1,000,000 (annually)
Annual Risk Mitigation and Downtime Costs	$140,000 (annually)	$200,000 (annually)

Table 11. Implementation Cost Table (Sheykin (2023), Sameer, (2023), Smith (2023), Ryzhkov (2023), WowLabz et al. (2023))

4.8.2. Benefits

Balanced against these expenses are the anticipated benefits, which are substantial. Airlines are turning to digital avenues to improve risk tolerance and profitability. Operational efficiency and cost reduction are key benefits achieved through digital transformation (Heiets et al., 2022). Similarly, the airline industry increasingly expands online ticket sales, reducing operating costs and enhancing revenue (Yoon & Yang, 2006)

As highlighted in the Benefits Category Table (Table 12), the DTA system is expected to significantly increase efficiency through faster data processing and analysis, thus improving both customer service and personalized experiences. This increase in efficiency is forecasted to lead to cost savings, notably from automation and more effective system integration, which are predicted to reduce operational costs by a notable margin over three years.

Benefit Category	Details
Increased Efficiency	• Faster data processing and analysis. • Improved customer service and personalized experiences. • More efficient operations through integrated systems.
Increased Revenue	• Higher customer satisfaction and retention.
Cost Savings	• Reduction in operational costs through automation. • Lower long-term costs due to more efficient systems.
Competitive Advantage	• Maintaining market position through technological advancement. • Flexibility and adaptability in a rapidly changing market.

Table 12. Benefit Category Table

The McKinsey report on the state of AI in 2022 (McKinsey & Company, 2022) reveals that organizations that have adopted AI see substantial bottom-line impacts, with leaders in AI adoption outpacing their competitors. AI leaders are likely to see increased revenue rather than cost reductions, with significant investments in AI correlating with higher financial returns. But Tapscott & Tapscott (2017) have observed that the airline industry, known for its high fixed costs and considerable search expenses, considers even minor cost reductions resulting from digital transformation to be essential in enhancing profit margins.

Moreover, these leaders are often engaging in advanced practices for scaling AI and mitigating associated risks. This suggests that KLM's investment in the Digital Travel Agency could lead to significant competitive advantages and improved financial performance, provided they align with best practices for AI adoption and risk management outlined by AI high performers.

The adoption of the DTA at KLM is projected to significantly influence passenger numbers, building on the 25.8 million passengers reported (KLM Royal Dutch Airlines, 2023). Lee et al. (2022) state that firms that implement AI technologies see a considerable increase in revenue growth, with AI adopters experiencing about a 30 percent increase on average. This revenue growth, when related to airlines, can be attributed to several factors that also affect passenger numbers: enhanced customer service through personalized interactions, optimized booking and operational efficiency, and improved targeting in marketing efforts.

However, it's crucial to note that the growth in passenger numbers will also depend on KLM's ability to scale its AI adoption effectively and integrate new technologies into its existing systems without disrupting service. Given the complexity of AI integration mentioned by Lee et al. (2022), there may be a period of adjustment before the full benefits are realized. Nevertheless, once the initial stages are surpassed and AI is more fully integrated—assuming KLM follows the trend of a 30 percent growth in revenue in three years—it's reasonable to anticipate a corresponding positive impact on passenger numbers

Moreover, the projected increase in AI's impact on profit (figure 3) aligns with the anticipated benefits of implementing KLM's Digital Travel Agency (DTA). With AI expected to significantly boost profits in the coming years, KLM's revenue growth could be substantially enhanced by leveraging AI within the DTA.

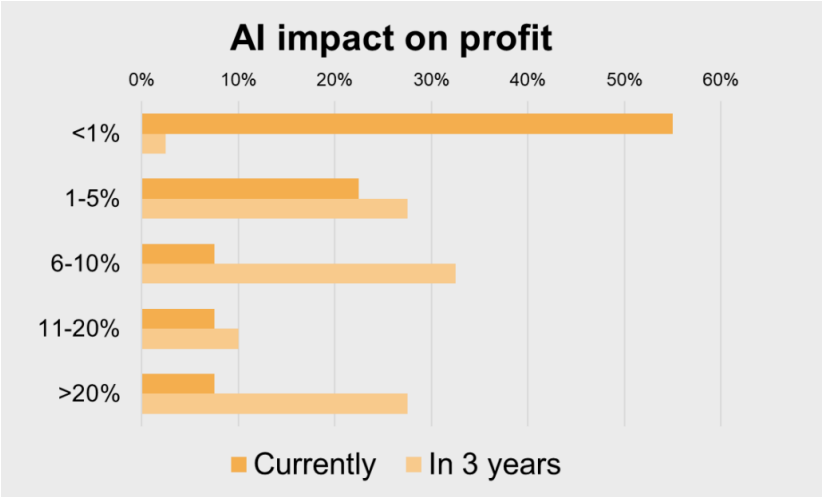

Figure 3. AI Impact on profit (Crainic, 2021)

A key strategic benefit, though less quantifiable, is the competitive advantage that comes with the technological leap. By staying ahead in technology adoption, KLM is not only solidifying its market position but is also ensuring its adaptability in a dynamic industry. The recent adoption of digital technologies has led to several waves of transformation in the travel industry, making digitalization strategically important for companies to avoid falling behind and maintain competitiveness (Perelygina et al., 2022). Companies where digital technologies and tactics are implemented to improve operational efficiency, customer engagement, and overall competitiveness, can help firms stand out and gain market share (Abbas et al., 2024). This strategic foresight is expected to translate into an increased market share, thereby providing invaluable long-term benefits that extend beyond the figures.

Considering the outlined costs against the potential for enhanced revenue and efficiency gains, the three-year financial outlook suggests a promising return on investment (ROI). The strategic advantage afforded by the DTA system implementation is poised to deliver substantial rewards, reinforcing KLM's leadership in the aviation sector.

4.9. Investment Analysis (Three Scenarios)

In this section, an investment analysis featuring three distinct scenarios that explore the potential outcomes of KLM's adoption of the Digital Travel Agency (DTA) system is discussed. These scenarios provide valuable insights into the financial implications and passenger growth expectations associated with AI integration in the aviation industry. From the worst-case scenario with minimal AI impact to the best-case scenario with substantial profitability gains and passenger growth, this analysis offers an overview of the potential outcomes and associated risks and rewards of KLM's strategic investment in digital transformation.

4.9.1. Worst-Case Scenario

The DTA's impact on profits is minimal, accounting for less than 1% of overall profitability. This limited impact may be attributed to suboptimal integration or unfavourable market conditions.

In terms of passenger growth, the outlook is relatively modest. There is a possibility that passenger numbers could remain stagnant or experience only marginal growth. This is due to the challenge of significantly enhancing the customer experience or achieving substantial operational efficiencies, resulting in a potential increase of less than 1%.

However, the financial outlook is less optimistic. The actual costs incurred may exceed the higher end of projected estimates. Anticipated benefits, such as improved efficiency and cost savings, may not materialize as expected. Consequently, the return on investment (ROI) falls below initial expectations. Furthermore, the organization's market share remains largely unchanged or may even experience a slight decrease.

4.9.2. Medium-Case Scenario

The DTA's impact on profits is noteworthy, contributing to an average profit increase ranging from 6% to 10%. This aligns well with industry standards, indicating a positive financial outcome.

In terms of passenger growth, there are moderate improvements in both customer service and operational efficiency. These improvements correspond to a moderate increase in passenger numbers. Assuming a direct correlation, this could result in a passenger growth rate ranging from 6% to 10%, building upon the baseline of 25.8 million passengers.

From a financial perspective, costs are effectively managed within the estimated range. KLM experiences a balanced increase in efficiency and revenue streams. The return on investment (ROI) is favorable, reflecting the successful implementation of AI initiatives. KLM also maintains its market position and has the potential for slight growth in the market.

4.9.3. Best-Case Scenario

The DTA's impact on profits is substantial, leading to a significant boost in profits that exceeds 20%. This remarkable increase is attributed to the successful implementation of the DTA, which enhances the customer journey and their satisfaction.

In terms of passenger growth, the improvements in service and efficiency are substantial and lead to significant passenger growth. Considering the 30% average increase in revenue growth mentioned in Lee et al. (2022), it can be indicative of a similar surge in passenger numbers. This surge could potentially translate to an increase of more than 7.7 million additional passengers (As the specific number/percentage of bookings made through the KLM app is not available, it is not possible to estimate any potential increase in passengers booking via the app. Consequently, this report only presents the overall projected increase in total passenger numbers.)

From a financial perspective, costs are efficiently managed and are either at or below the low-end estimates. The DTA system generates substantial cost savings and opens up new revenue streams, greatly enhancing the return on investment (ROI). Not only does KLM solidify its market position, but it also captures a larger market share, securing long-term benefits for the organization.

4.9.4. Scenario Evaluation

In all scenarios, KLM's digital capabilities, especially in resource reconfiguration, opportunity seizing, and threat sensing, play a crucial role in the DTA system's potential to improve operational efficiency and customer satisfaction. Strategic management of AI implementation costs, regular performance assessments, and adaptability to market and technological changes will be key to realizing the benefits of the DTA system. The strategic foresight in adopting the DTA will offer KLM a competitive edge and increased adaptability in the evolving aviation industry.

5. Change Management and Organizational Implementation

Chapter 5, explores how KLM is navigating the implementation of its Digital Travel Agency (DTA) with a focus on effective change management and organizational integration. Section 5.1, internal and external stakeholders involved in the DTA project are identified, outlining their interests and organizational roles. Also, the potential resistance from key internal stakeholders is discussed. Section 5.2 outlines the Change Strategy and Action Plan. A Force Field Analysis and Kotter's 8-Step Change Process Model to guide the DTA integration is used. The plan addresses key dimensions of success, such as system quality, information quality, service quality, use, user satisfaction, and net benefits

5.1. Stakeholder Analysis and Resistance Assessment

In this paragraph, the current internal and external stakeholders are identified, and each of them is described with their interest in DTA, furthermore the organizational level is proposed for each of these internal stakeholders on which level they operate. Furthermore the resistance of the internal stakeholders is assessed based on the key internal stakeholders who are at the forefront when implementing a DTA.

5.1.1. Identification of Stakeholders

Within this chapter a stakeholder analysis is conducted, a stakeholder is anyone who can influence or is influenced as an organization seeks to achieve its objectives, or without whose support an organization would cease to exist (Mitchell et al. 2021). Both internal and external stakeholders are identified who would use, be influenced by, or benefit from the Digital Travel Agency. Furthermore, the interests of these stakeholders in the DTA are explained in a couple of key-words, also the organizational level is proposed at which the internal stakeholders operate. This table can be found in Table 13 which has been established according to Aaltonen, (2011).

Stakeholder Type	Stakeholder	Interest in the DTA	Organizational Level
Internal	IT Department	Implement & maintain DTA	Operational/Technical
Internal	Executive Team	Strategic direction & Return Of investment (ROI)	Executive/Strategic
Internal	R&D Team	DTA development	Operational/Technical
Internal	Directors	Governance & Oversight	Executive/Strategic
Internal	HRMS Department	Workforce Management & Training	Operational/Strategic
Internal	Marketing and Sales	Market Growth & Customer Outreach	Operational/Strategic
Internal	Legal Department	Regulatory Compliance	Operational/Strategic
Internal	Customer Service Team	Enhancing Customer Support, feedback mechanism for DTA.	Operational
External	Customers	Improved service quality, increased revenue	N/A
External	Suppliers	Business opportunities, data providing of SMA, GMA.	N/A
External	Regulatory Bodies	Compliance with laws	N/A
External	Investors	ROI, data sharing	N/A
External	Competitors	Market Position & Strategy	N/A
External	Media and Public Relations	Reputation & Brand Management	N/A

Table 13. Stakeholder Identification Table

5.1.2. Assessment of Resistance

Within this chapter an assessment is done to which extent the focal organization would face resistance to change when implementing the DTA. Within the assessment, the focus has been narrowed down to the key stakeholders which are at the forefront when new systems are implemented.

Implementing a Digital Travel Agency (DTA) may encounter resistance within the focal organization. The IT Department could be wary of the demands of integrating new systems since the implementation of DTA adoption can lead to great technical issues. The Executive Team might be skeptical about the DTA's return on investment because digital innovation on this level is still relatively new. The R&D Team could resist if the DTA diverges from existing development paths which is complicated to successfully align with each other. HRMS might face difficulties in training staff for the DTA, as, new roles and competencies are constructed from the realization of the DTA. Customer Service may be hesitant to adapt to new protocols as there is a whole new level of customer engagement, and the Legal Department could have concerns about compliance and data security of the huge amount of data being translated between systems. Customers might be reluctant to accept changes to the services they're used to, and investors could be cautious about the investment's transparency and cost. Each concern represents a potential resistance that the organization will need to manage through strategic change management practices (Naveed et al. 2022).

5.2. Change Strategy and Action Plan

In Section 5.2, an action plan for KLM's Digital Travel Agency (DTA) implementation, informed by a Force Field Analysis and Kotter's 8-Step Change Process Model is discussed. The Force Field Analysis visually identifies driving and restraining forces, and the action plan outlines concrete steps aligned with each stage of Kotter's model. This strategic approach aims to ensure a successful DTA integration while emphasizing the importance of urgency and effective communication throughout the change process

5.2.1. Force Field Analysis

Figure 4 and Table 14 represents an overview of a Force Field Analysis for KLM's DTA implementation, which uncovers the driving and restraining forces for the desired change related to the project (Yang et al., 2021). The figure illustrates the driving forces in green, which are factors that can facilitate the implementation, and the restraining forces in red, which are potential obstacles or challenges. The length of the bars represents the relative strength of each force, indicating how significantly they might impact the DTA implementation.

Figure 4. Force Field Analysis

Force	Strength	Explanation
Advanced Digital Capabilities	8	KLM's current strong digital capabilities are a significant positive influence, facilitating the integration of the DTA system.
Continuous System Updates	7	KLM's commitment to continuously updating systems shows a considerable force towards maintaining modernity and relevance, which supports DTA implementation.
Deployment of AI and SMA Technologies	9	The implementation of advanced technologies like AI is expected to have a major impact on enhancing the DTA system, marked as one of the strongest driving forces.
Leadership Guidance in Digital Trends	6	While important, leadership's role in guiding digital transformation is less forceful compared to the direct impact of technological capabilities.
Robust IT Infrastructure	8	A solid IT infrastructure is crucial for DTA implementation and is seen as a strong driving force, enabling the support of new systems and technologies.
Complex System Integration	5	The complexity of integrating new systems presents a moderate challenge, indicating some resistance but not insurmountable with proper management.
Data Privacy Regulations	7	Data privacy is a significant concern and a restraining force that could impede the implementation process if not addressed adequately.
Rapid Technological Changes	6	Keeping up with fast-paced technological advancements is a challenge, but KLM's existing digital capabilities suggest this can be managed.
Organizational Culture Resistance	5	Potential resistance to change within the company culture is a moderate force against the DTA's implementation, emphasizing the need for cultural transformation initiatives.
Staff Training for New Competencies	7	The need for training staff to handle new systems and technologies is a notable restraining force, suggesting significant effort will be needed in this area.

Table 14. Forces Explanation Table

5.2.2. Action Plan

Based on the outcomes of the Force Field Analysis, along with the identified necessary changes and expected resistance, this paragraph is a proposed set of concrete measures and actions. These are aligned with each stage of Kotter's 8-Step Change Process Model, as explained in Toor et al. (2022), related to the antecedents and dimensions of IS success from Petter et al. (2013), and address the management of the sense of urgency and effective change communication.

In Kotter's 8-step model for change, creating a sense of urgency is the first step. According to Kotter, this should be done by drawing organization-wide attention to outside threats and matters of pressing importance (Rousseau & Have, 2020). To managing the sense of urgency, KLM needs to communicate the potential for enhanced revenue and competitive advantage as key drivers for urgent action, using the data from the financial assessment to stress the ROI and long-term benefits of the DTA.

For effective Change Management Communication, the most suitable approach would be a mix of formal and informal communication strategies, ensuring clarity and transparency. This should include regular updates, Q&A sessions, and an open-door policy for feedback. The communication should be two-way, allowing for dialogue and discussion, ensuring that all levels of the organization are informed and engaged

Stage	Measure/Action	IS Success Relation
Stage 1: Establish a Sense of Urgency	Highlight competitive pressures and market opportunities through an all-hands meeting, presenting the Force Field Analysis to demonstrate the need for change.	Ensures service quality by addressing the market's need for advanced digital capabilities.
Stage 2: Create the Guiding Coalition	Form a change coalition of leaders from IT, HR, Legal, and other departments critical to the DTA.	Leadership's alignment ensures system quality and service quality.
Stage 3: Develop a Vision and Strategy	Craft a vision statement that connects the DTA's capabilities with KLM's strategic objectives.	Ties the vision to user satisfaction and information quality, outlining the DTA's role in improving customer service
Stage 4: Communicate the Change Vision	Utilize multiple communication channels, including digital platforms and face-to-face meetings, to share the vision and strategy.	Regular, transparent communication about the change vision ensures that the information quality is maintained across all levels.
Stage 5: Empower Broad-Based Action	Identify and remove barriers to change, such as outdated processes or technologies that hinder the DTA's integration.	Empowering employees at all levels ensures the system's use quality and facilitates service quality through better tool adoption.

Stage 6: Generate Short-Term Wins	Recognize and celebrate early adopters and success stories within the DTA's pilot phase.	Short-term wins provide evidence of the system's net benefits, encouraging broader stakeholder buy-in.
Stage 7: Consolidate Gains and Produce More Change	Leverage the momentum from short-term wins to drive further changes in systems and processes.	Ongoing improvements to the system quality and information quality sustain the IS's success.
Stage 8: Anchor New Approaches in the Culture	Institutionalize the new approaches through policy changes, training programs, and succession planning.	Ensures sustained use quality by making the DTA an integral part of KLM's operational culture.

Table 15. Action Plan Overview

This plan strategically addresses the dimensions of IS success—system quality, information quality, service quality, use, user satisfaction, and net benefits—while steering the organization through a successful change journey. It is imperative that KLM's management maintains flexibility and responsiveness to both internal and external feedback throughout the change process to ensure alignment with the strategic goals and successful DTA implementation

6. Conclusion

The objective of this project was to develop strategies for KLM to enact essential organizational and cultural changes, overcoming barriers to the implementation of the Digital Travel Agency (DTA). An in-depth analysis of KLM's internal business environment, leadership dynamics, cultural influences, and structural elements, along with a thorough evaluation of the Information Systems (IS) landscape, has identified key factors that will enable successful DTA implementation. This process highlighted the need for a robust change management strategy, tailored not only for DTA implementation but also to set a foundation for long-term innovation. Addressing the main question, "How can KLM transform its organizational and IS structure to successfully implement the Digital Travel Agency, enhancing customer experience and bookings by bridging the personalization gap in the booking process?" The following discovered areas are in need of improvements.

Organizational Impact and Transition

The DTA will significantly affect various departments, particularly the Social Media Hub and E-Business departments. Transitioning to an adhocracy model from a market-oriented structure and shifting from a top-down to a bottom-up chain of command is essential for empowering employees and fostering a culture of innovation and responsiveness.

Cultural and Leadership Adaptation

For successful digital transformation, KLM must transition from a role and market culture to one that encourages innovation, collaboration, and agility. Leadership styles need to evolve to support experimentation, inclusiveness, and proactive communication.

Strategic Alignment of Information Systems

Effective management and alignment of Information Systems are crucial. Enhancements in reservation and booking systems, CRM, Data Analytics, Business Intelligence Systems, Communication and Collaboration tools, ERP systems, HRMS, Safety and Compliance systems, and other operational systems are necessary. A focus on cutting-edge technology, data management, customer-centric adaptability, cross-functional collaboration, and compliance, along with employee development and engagement, is vital for realizing a successful DTA.

Change Management

The comprehensive approach to change management and organizational implementation for the Digital Travel Agency (DTA) exemplifies a strong commitment to achieving a successful integration. By addressing stakeholder interests, proactively managing resistance, and emphasizing the alignment of technology, people, and processes, KLM has laid a solid foundation for navigating the complexities of DTA implementation effectively.

This holistic strategy not only aligns with KLM's strategic goals but also underscores the significance of clear communication and adaptability in ensuring the DTA's seamless integration and long-term success within the organization. Moreover, it highlights the importance of developing competencies and roles that align with digital transformation objectives, ensuring compliance with regulatory requirements, and implementing robust data security measures.

Financial and Risk Considerations

KLM's adoption of the Digital Travel Agency (DTA) system involves a significant investment, with thorough financial assessments and analyses covering various cost scenarios. These projected costs, including implementation, operational, and additional expenses, may be substantial, but they prove justifiable when weighed against the substantial anticipated benefits.

The financial assessment of KLM's DTA adoption underscores the potential benefits outweighing the initial costs. The worst-case scenario, emphasizes the importance of effective AI integration, while the medium-case scenario indicates solid financial outcomes and moderate passenger growth. The best-case scenario highlights the potential and the strategic advantage gained through technological advancement.

Throughout these scenarios, KLM's digital capabilities and cost management remain pivotal. The airline's commitment to technology positions it for success in an ever-evolving industry, bolstering its leadership and adaptability. Overall, the DTA system investment appears promising, promising substantial rewards and enhancing KLM's position in the aviation sector.

7. Recommendations

In formulating a recommendation for KLM to implement the Digital Travel Agency (DTA) across different time scenarios, it's crucial to consider a phased approach that addresses both immediate and long-term needs. By adopting this phased and comprehensive approach, KLM can effectively manage the implementation of the DTA, setting the stage for long-term success and innovation in the digital travel industry.

Short-Term Implementation Phase (0-6 months)

KLM should focus on laying the groundwork for change. This includes conducting a comprehensive assessment of the current organizational structure, culture, and processes, along with preparing a detailed plan for the transition to an adhocracy model and a bottom-up chain of command. Leadership and cultural readiness are also of great importance during this phase, necessitating the initiation of workshops and training programs aimed at equipping leaders for the impending changes. Additionally, engaging key stakeholders early on to gauge potential resistance and expectations will be critical, as will conducting an audit of the current Information Systems (IS) to identify areas requiring enhancement or realignment with the DTA's objectives.

Medium-Term Implementation Phase (6-12 months)

KLM should start actualizing the structural and cultural changes. This phase is characterized by the implementation of the new organizational structure, particularly in departments that are most affected by the DTA, like the Social Media Hub and E-Business departments. Company-wide cultural transformation initiatives should be rolled out during this time, emphasizing the importance of innovation and adaptability. Leadership development should continue, with a focus on fostering inclusive and proactive communication styles. Parallel to these, the upgrading of IS, including the reservation and booking systems, CRM, and analytics tools, should begin.

Long-Term Implementation Phase (1-3 years)

KLM should focus shifts on consolidating and expanding the transformation efforts. This period will see the full implementation and operationalization of the new adhocracy model across all departments. The integration of the new cultural values into KLM’s everyday business practices is a priority, ensuring that these values are thoroughly embedded within the company. Advanced leadership training programs, focusing on sustaining the cultural and organizational changes, should be implemented. The enhancement and integration of IS capabilities should continue, ensuring alignment with the DTA and the ability to adapt to future technological advancements. Regular reviews of the impact of these changes will be crucial, with adjustments made to the change management strategies as necessary.

Continuous Monitoring

Throughout all these phases, KLM must maintain a focus on continuous monitoring and adjustment. Establishing a robust feedback mechanism from employees, customers, and stakeholders will inform continuous improvement while staying adaptive to industry trends and technological advancements will ensure KLM remains at the forefront of digital travel solutions. Financial planning and risk management are integral throughout this entire process, ensuring sustainable investment in the DTA and effective navigation of potential risks in technology integration and compliance.

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Appendices

Appendix I – Framework: Digitalization capabilities and dimensions based on second-order capabilities