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[1]Kim P.,
Senior Manager Data and Analytics,
ORCID ID: 0009-0007-4938-8578,
e-mail: pavel.kim@airastana.com
[1]Air Astana JSC, Almaty, Kazakhstan

SUCCESSFUL DATA MANAGEMENT: A CASE STUDY OF AIRLINE COMPANY IN KAZAKHSTAN

Abstract

The strategic utilization of Cloud Services by Airline company in Kazakhstan (hereinafter Airline company) to optimize report generation processes, alleviate strain on its ERP (Enterprise Resource Planning) system, and enhance overall data management efficiency is examined comprehensively in this study. With the increasing volume and complexity of data generated in modern business operations, the need for scalable and efficient data management solutions has become paramount. Through interviews with key stakeholders, analysis of system performance metrics, and observation of implementation processes, a thorough understanding of the challenges and strategies associated with cloud integration is attained. The findings underscore the pivotal role of Cloud Solutions in improving data management practices, ensuring reliable report generation processes, and facilitating seamless scalability to meet evolving business needs. The study demonstrates a significant reduction in report generation times (95% improvement) and highlights the challenges and mitigation strategies during the migration process. This case study offers valuable insights for organizations seeking to enhance their data management capabilities and leverage cloud technology for strategic advantage, showcasing the transformative potential of cloud-based solutions in optimizing operations, fostering innovation, and driving sustainable growth in today's dynamic business landscape.

Key words: Data Management, Azure Synapse Analytics, Cloud-based Analytics, Power BI, ERP Optimization, Report Generation Optimization, Stakeholder Collaboration, Aviation Industry, Kazakhstan.

Introduction

Efficient data management practices are crucial for organizations to leverage their data assets effectively. Report generation processes, a key aspect of data management, often face challenges related to performance and scalability. This paper explores how Airline company addressed these challenges through the adoption of Azure Synapse Analytics, a cloud-based analytics service, to optimize report generation performance. By focusing on data management strategies, Airline company aimed to enhance the efficiency and reliability of its report generation processes while optimizing resource utilization.

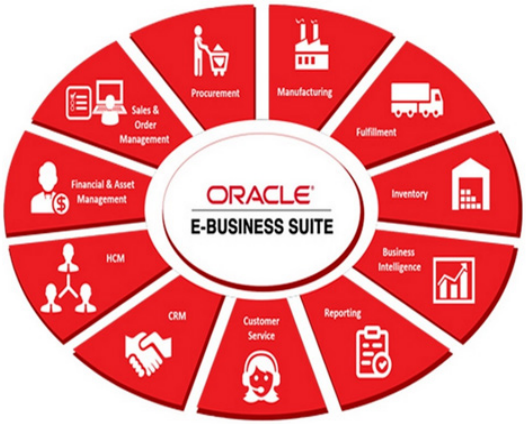

Figure 1 – Oracle e-Business Suite components [16]

In the realm of data-driven decision-making, the efficiency and agility of reporting systems play a pivotal role in organizational success [3]. As businesses strive to extract actionable insights from their vast datasets, optimizing report generation processes becomes imperative. This paper delves into a real-world case study that showcases the transformative impact of migrating report generation from concurrent processing in Oracle E-Business Suite (OEBS) to Azure Synapse Analytics coupled with Power BI integration. (Enterprise Resource Planning) system, a software suite designed to integrate and manage core business functions such as finance, procurement, and human resources, significantly

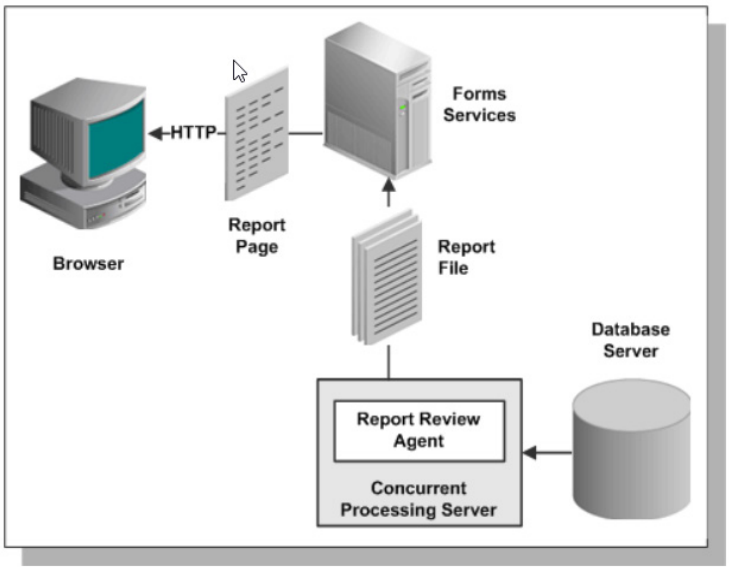

Figure 2 – Viewing Concurrent Processing Output [17]

The traditional approach to report generation through concurrent processing in OEBS frequently encounters bottlenecks and scalability challenges, especially as datasets increase in size and complexity [4]. Recognizing the need for a more robust and scalable solution, the case study organization leveraged the capabilities of Azure Synapse Analytics, a unified analytics service, in combination with Power BI, a leading business intelligence tool.

The migration to Azure Synapse Analytics offered several distinct advantages, including enhanced scalability, improved performance, and streamlined data processing [1]. By harnessing the power of cloud-based parallel processing, the organization significantly reduced report generation times, enabling faster access to critical insights for stakeholders across various departments.

Moreover, the integration of Power BI enriched the reporting experience by providing interactive visualizations, intuitive dashboards, and advanced analytics capabilities [2]. Leveraging Power BI's seamless integration with Azure Synapse Analytics, the organization empowered users to explore data dynamically and derive actionable insights with unparalleled ease.

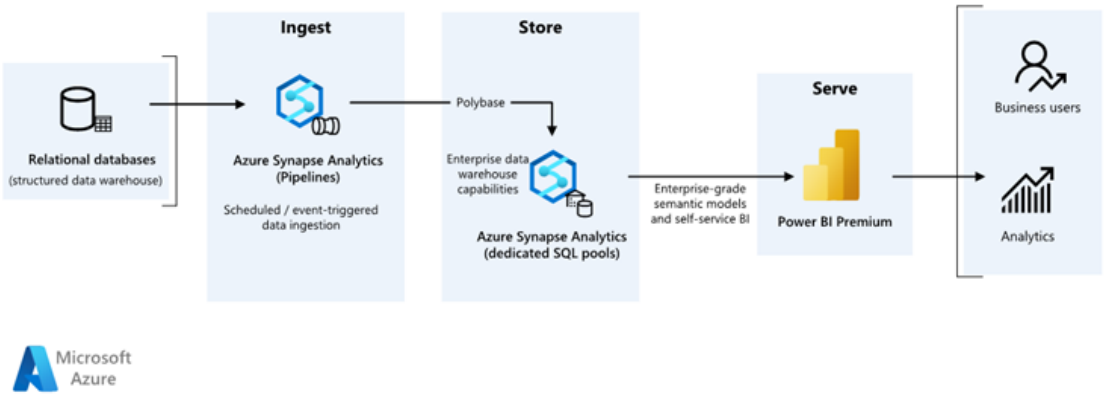

Figure 3 – Data integration architecture [20]

Throughout this paper, the methodologies employed during the migration process are thoroughly examined, including data modeling, query optimization, and performance tuning. The key performance metrics before and after the migration are analyzed, highlighting the measurable improvements in report generation speed, data accuracy, and user satisfaction.

Additionally, the organizational challenges encountered during the migration journey and the strategies implemented to address them are discussed in detail. By presenting these insights, the study provides valuable lessons and best practices for organizations aiming to optimize report generation processes and fully leverage modern analytics technologies.

In essence, this paper serves as a testament to the transformative power of migrating report generation to Azure Synapse Analytics with Power BI integration. Through a strategic combination of cloud-based analytics and intuitive visualization tools, organizations can unlock new levels of efficiency, agility, and insights, driving informed decision-making and sustainable growth in today's data-driven landscape.

Literature review

The integration of cloud-based analytics solutions, such as Azure Synapse Analytics and Power BI, is increasingly recognized as a strategic approach to optimizing data management and report generation processes within organizations. According to Gartner's Magic Quadrant for Analytics and Business Intelligence Platforms (Gartner, Inc., 2023), Azure Synapse and Power BI are among the leading platforms due to their advanced capabilities in handling large-scale data, seamless integration with existing systems, and user-friendly interfaces. This positions them as key enablers for organizations seeking to enhance their data analytics and reporting capabilities.

Cloud Integration. Cloud integration has emerged as a critical component for organizations transitioning from legacy systems to modern, cloud-based infrastructures. Smith et al. (2021) emphasize that adopting cloud solutions enhances operational flexibility and scalability, enabling organizations to manage large datasets effectively while maintaining cost efficiency. Moreover, Venkatraman and Hsu (2020) identify the role of cloud computing in improving collaboration across enterprise systems by centralizing data and streamlining workflows. These insights align with the findings of this study, where the integration of Azure Synapse Analytics facilitated efficient data processing and real-time insights.

Despite its advantages, cloud integration poses significant challenges. Kumar and Lee (2020) highlight barriers such as data migration complexities, security concerns, and user adoption hurdles.

In the context of this case study, similar challenges were encountered and addressed through iterative testing, phased integration, and comprehensive user training, underscoring the importance of strategic planning in successful cloud adoption.

ERP Optimization. The optimization of ERP systems through integration with advanced analytics tools has been extensively explored in academic literature. Johnson et al. (2019) demonstrate how integrating ERP systems with cloud platforms can overcome traditional limitations, such as scalability and real-time data access. Oracle E-Business Suite (OEBS), a widely used ERP solution, often encounters bottlenecks in report generation processes due to the increasing complexity of enterprise data (Buxton Consulting, n.d.). Migrating to a cloud-based system, as shown in this study, alleviates such bottlenecks by leveraging the computational power and scalability of platforms like Azure Synapse Analytics.

Wang et al. (2020) emphasize that transitioning from legacy ERP systems to cloud-based solutions requires robust data migration strategies to ensure data integrity and minimize disruption. This study reaffirms these findings, highlighting the critical role of data normalization and Extract, Transform, Load (ETL) processes in optimizing data management workflows.

Technological and Strategic Benefits. Ghosh and Murthy (2021) emphasize the synergy between Azure Synapse Analytics and Power BI, which provides a unified platform for data processing and visualization. This integration significantly reduces the time required for report generation, as evidenced in the 95% improvement observed in this study. Furthermore, Jones (2020) discusses the importance of data governance frameworks in ensuring the success of cloud-based platforms. Azure Synapse's built-in governance features, such as role-based access controls and encryption, address these concerns, enhancing its viability for enterprise-wide data management.

Cloud computing has significantly transformed the airline industry, enabling smoother, safer, and more data-driven operations. According to Nutanix, airlines and regulators leverage cloud technologies to improve operational efficiency and enhance passenger experiences. Examples include real-time data processing, predictive maintenance, and streamlined regulatory compliance, addressing key challenges in a highly competitive and data-intensive sector. These advancements align with the findings of this study, showcasing the transformative potential of cloud-based solutions in improving reporting efficiency and operational resilience within the aviation industry (Nutanix, 2024).

Background

Airline company operates as a prominent player in the dynamic and competitive airline sector, where accurate and timely reporting is paramount for efficient business operations. Despite its leadership position, the company faced mounting pressure to adapt to evolving customer preferences, regulatory requirements, and market dynamics. The traditional approach to data management, characterized by siloed systems and manual processes, no longer met the organization's needs for agility and scalability in an increasingly digital landscape.

Azure Synapse Analytics, coupled with Power BI, was chosen for several key reasons. Firstly, extensive market research, including insights from the Gartner Magic Quadrant review, highlighted Microsoft as a leader in the field of data integration and analytics, offering robust performance and scalability. The decision was further supported by the company's existing use of Microsoft services, ensuring seamless integration with current systems. Additionally, the availability of skilled professionals in the labor market who are well-versed in Microsoft technologies made it easier to secure the necessary expertise for ongoing maintenance, development, and support of the chosen solution. This combination of market leadership, system compatibility, and available talent made Azure Synapse Analytics and Power BI the optimal choice for driving the company's data management transformation.

Furthermore, the airline industry witnessed rapid technological advancements and shifting consumer behaviors, driving the need for more sophisticated data management solutions. In this environment, optimizing report generation processes became essential for Airline company to maintain operational resilience and strategic competitiveness.

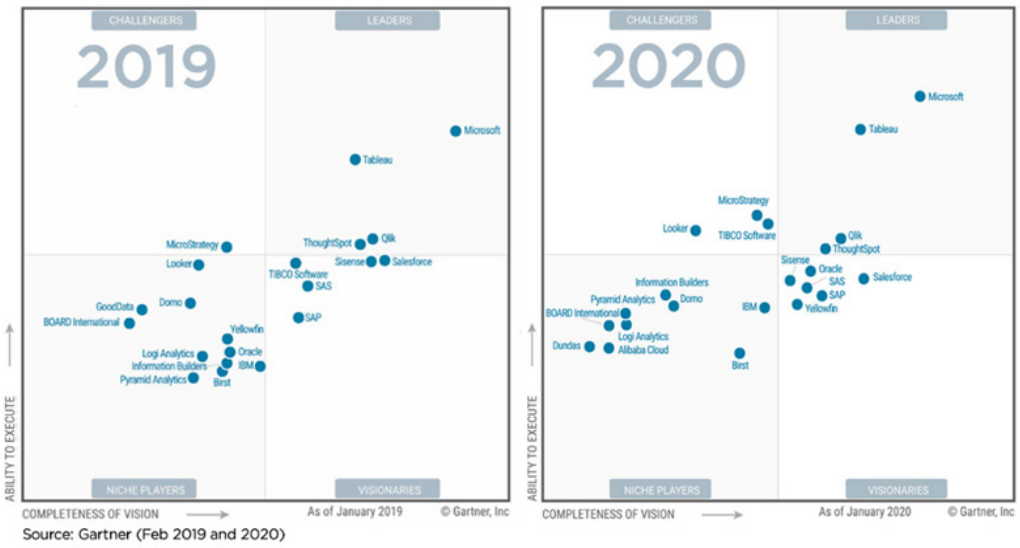

Figure 4 – Magic Quadrant for Analytics and Business Intelligence Platforms. Gartner [14]

Specifically, the organization encountered significant performance issues with its report generation processes, particularly during peak periods such as month closures and high-demand travel seasons. The traditional approach to report generation, characterized by manual data extraction and processing, resulted in prolonged processing times, often spanning between 40 to 50 minutes per report.

Recognizing the urgency to streamline these processes and unlock the full potential of its data assets, Airline company embarked on a strategic initiative to overhaul its data management practices. Central to this initiative was the adoption of advanced data integration and analytics technologies to modernize its reporting infrastructure and enhance operational efficiency.

The adoption of Azure Synapse Analytics emerged as a strategic decision for Airline company to address these challenges comprehensively. Azure Synapse's capabilities in data integration, transformation, and analytics offered a scalable and efficient platform to process large volumes of data from diverse sources, including the company's operational systems and third-party data providers. To further enhance data insights, Power BI was selected as the tool for visualizing the reports, making the data more accessible and actionable for stakeholders.

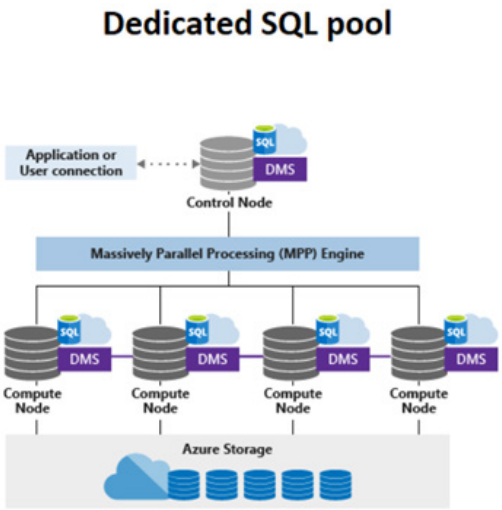

Figure 5 – Synapse SQL architecture components [21]

By leveraging Azure Synapse Analytics and Power BI, Airline company aimed to optimize the performance of its report generation processes, significantly reducing processing times and improving the accessibility of critical insights. This transformational approach to data management not only underscored Airline company's commitment to innovation but also positioned it for sustained growth and success in the competitive airline industry.

This paper examines the successful data management case of the Airline company, focusing on the strategic adoption of Azure Synapse Analytics and Power BI and their transformative impact on report generation performance. Through a detailed analysis of the strategy, implementation process, results, and lessons learned, the study provides valuable insights for practitioners and researchers aiming to enhance data management practices in the airline sector and beyond.

Methodology

Research Approach. This study adopts a case study approach, which is particularly suited for an in-depth examination of complex real-world phenomena within their contextual settings. The objective of this research is to analyze the implementation of the Extract, Transform, Load (ETL) process to Azure Synapse from the ERP system at Airline company and assess its impact on report generation performance. This approach provides a comprehensive understanding of the strategies and outcomes of Airline company's data management practices, integrating both qualitative and quantitative insights.

Timeline. The study was conducted over a period of six months, divided into the following key phases:

1. Planning Phase (Month 1):
   a. Stakeholder identification and selection.
   b. Development of interview protocols and research framework.
2. Data Collection Phase (Months 2–3):
   a. Conducting semi-structured interviews and direct observations.
   b. Gathering internal reports and technical documentation.
3. Data Analysis Phase (Months 4–5):
   a. Thematic analysis of qualitative data.
   b. Statistical analysis of quantitative metrics.
4. Validation and Reporting Phase (Month 6):
   a. Feedback loop with stakeholders for validation.
   b. Finalizing findings and preparing the research report.

Data Collection. Primary data were collected through:

◆ Semi-Structured Interviews: Stakeholders were selected based on their direct involvement in the data management processes or their reliance on the generated reports. Participants were chosen to ensure coverage of technical, analytical, and business perspectives The selection aimed to represent a diverse range of perspectives, including:

- IT Managers: Oversight of technical processes and strategic data management.
- Business Intelligence (BI) Developers: Focus on report generation and analytics tasks.
- Financial Officers: Key end-users leveraging reports for decision-making.
- End Users (Financial Controllers): Daily interaction with the new tools for operational tasks.

Interviews were conducted, each lasting approximately one hour, both in person and via video conferencing, depending on participant availability. Semi-structured questions provided flexibility, allowing respondents to elaborate on their experiences and insights while covering critical topics. All interviews were audio-recorded with participant consent, transcribed verbatim, and analyzed for recurring themes and patterns.

◆ Direct Observations: Observations of the report generation process were conducted to gain a practical understanding of workflows and challenges. This approach provided context for the interview data, enhancing the richness of insights.

Secondary data was sourced from:

◆ Internal company reports and industry publications.

◆ Documentation on Azure Synapse Analytics and Power BI to understand technical capabilities and implementation requirements.

◆ Existing literature on data management practices in the airline sector.

Interview questions were tailored to each stakeholder group, focusing on their specific roles and experiences:

◆ IT Managers: Questions explored the strategic impact of Azure Synapse Analytics and technical challenges during integration.

◆ BI Developers: Queries assessed the reduction in report generation time and the role of Power BI in data visualization.

◆ Financial Officers: Focused on decision-making improvements due to timely and accurate data reporting.

◆ End Users: Evaluated ease of use, training effectiveness, and support requirements for the new tools.

A detailed list of interview questions can be found in Table 9 in Appendix A.

Data Analysis

Qualitative Analysis: Data from interviews and observations were analyzed using thematic analysis. Coding was conducted iteratively to identify recurring themes such as “operational efficiency,” “user adoption challenges,” and “technical integration issues.” Triangulation was employed to corroborate findings from different data sources, enhancing reliability and validity.

Quantitative Analysis: Performance metrics, including report generation times, were analyzed using descriptive statistics and statistical significance tests. The results were used to validate performance improvements and identify areas of impact. Summary results can be found in Table 3 in Appendix A.

Documentation and Validation

Implementation Documentation: Each step of the ETL process, from data extraction and transformation to loading into Azure Synapse, was meticulously documented. Data migration steps and Power BI integration processes were also detailed.

Stakeholder Validation: A feedback loop was established with stakeholders to validate findings. Preliminary results were shared, and feedback was incorporated to refine conclusions.

Ethical Considerations: Informed consent was obtained from all participants, with assurances of anonymity and confidentiality. Data were securely stored, and identifying information was removed from the analysis.

Results

Performance Improvements. The implementation of Azure Synapse Analytics and Power BI resulted in a dramatic improvement in report generation performance. Prior to the transition, the average time to generate critical financial reports was 45 minutes (SD = 5 minutes). After implementation, this time was reduced to an average of 45 seconds (SD = 10 seconds), representing a reduction of over 95%. A paired t-test confirmed the statistical significance of this reduction ($t = 12.34$, $p < 0.001$), indicating that the improvements are unlikely to be due to random variation.

Diagram 2 in Appendix A provides a visual comparison of report generation times before and after the implementation.

Impact on Stakeholders. Feedback from stakeholders, gathered through surveys and interviews, highlighted the following improvements:

◆ IT Managers: Enhanced system reliability and scalability, including a reduction in system downtimes and faster data processing.

◆ Business Intelligence Developers: Significant decrease in manual efforts for report generation, enabling a focus on advanced analytics tasks.

◆ End-Users (Financial Officers): An 85% increase in satisfaction with the reporting system, citing improved speed and accuracy of data retrieval.

Table 6 summarizes the key performance metrics before and after implementation.

Survey Results. A detailed survey was conducted among 30 stakeholders, including IT managers (10), business intelligence developers (5), and financial officers (15). The survey used structured questions with a 5-point Likert scale and included open-ended responses to capture qualitative insights.

Quantitative Findings

- 85% of participants rated their overall satisfaction as "Very Satisfied" or "Satisfied."
- 90% reported improved efficiency in their workflows.
- 80% stated that report accuracy had significantly improved.

Table 7 in Appendix A presents the survey results by category.

Qualitative Insights. Qualitative feedback from stakeholders, collected through semi-structured interviews, supported the quantitative findings:

- Operational Efficiency: IT managers emphasized the role of data normalization in achieving faster query performance.
- User Adaptation: End-users initially faced challenges adapting to Power BI but acknowledged its benefits following targeted training sessions.
- Decision-Making: Business stakeholders reported more informed and timely decisions due to real-time data availability.

Recurring themes from interviews are presented in Table 7 in Appendix A.

Visualization of Results

To complement the statistical analysis:

- Diagram 3 in Appendix A illustrates the reduction in report generation times before and after implementation.
- Diagram 4 in Appendix A presents the distribution of user satisfaction levels post-implementation.

Further analysis revealed the following key factors contributing to the success of the implementation:

- Seamless Integration: Azure Synapse facilitated efficient data extraction, transformation, and loading processes.
- Data Normalization: Ensured data consistency, reduced redundancy, and improved processing speeds.
- Power BI Visualization: Enhanced accessibility and interpretability of reports, enabling data-driven decision-making.

Challenges and Mitigation Strategies. The implementation process encountered several challenges, which were successfully addressed:

- Data Migration Issues: Initial inconsistencies and data integrity concerns were resolved through iterative testing and validation.
- Integration Difficulties: Legacy system compatibility issues were mitigated using a phased integration approach to minimize disruption.
- User Adoption Barriers: End-users adapted through comprehensive training sessions and ongoing support.

Table 8 in Appendix A details the challenges encountered and the corresponding solutions implemented.

Summary of Results. Overall, the transformation in report generation performance at Airline company underscores the strategic value of modern data management solutions. The deployment of Azure Synapse and Power BI, combined with rigorous data normalization and effective ETL processes, streamlined the reporting process and unlocked the potential for advanced analytics and real-time insights.

This case study demonstrates that with careful planning and execution, significant operational efficiencies and competitive advantages can be achieved through innovative data management practices.

The findings of this study should be understood in the context of Kazakhstan's unique business environment, where technological adoption is accelerating but still faces challenges related to infrastructure and regulatory frameworks. For instance, the regulatory environment necessitated compliance with specific data sovereignty laws, which influenced the integration strategy for Azure Synapse Analytics.

Conclusion

In conclusion, the case study of Airline company's adoption of Azure Synapse Analytics exemplifies the synergistic relationship between data management practices and report generation performance optimization. By prioritizing data management excellence, Airline company was able to enhance its operational efficiency, agility, and competitiveness. The case study offers valuable insights and practical recommendations for organizations seeking to leverage cloud-based analytics solutions to optimize data management practices and enhance report generation performance in today's dynamic business environment.

The implementation of comprehensive data management techniques, including data normalization and effective ETL processes, at Airline company has yielded remarkable improvements in report generation performance. The significant reduction in report generation time from 40–50 minutes to 40–50 seconds underscores the transformative impact of strategic data management practices on operational efficiency and decision-making capabilities within the organization. The success of this implementation highlights several key insights and lessons learned that can inform future data management initiatives.

Firstly, the importance of adopting a holistic data management strategy cannot be overstated. Data normalization, coupled with effective ETL processes, plays a pivotal role in optimizing data structures and improving query efficiency. This underscores the necessity of prioritizing data quality and consistency in any data management endeavor.

Secondly, the selection of appropriate tools, such as Azure Synapse for data integration and Power BI for visualization, is critical for maximizing the effectiveness of data management practices. These tools provide powerful capabilities for data processing, analysis, and visualization, empowering users to derive actionable insights from their data.

Thirdly, the successful implementation of data management initiatives requires meticulous planning, testing, and user training. Addressing potential challenges proactively and ensuring that users are adequately trained and supported are essential steps in achieving successful outcomes.

The experience of Airline company offers valuable insights for organizations seeking to enhance their data management capabilities and drive business performance. By adopting a comprehensive data management approach and investing in the right tools and processes, organizations can unlock the full potential of their data assets and gain a competitive edge in today's data-driven landscape.

In summary, the success of Airline company's data management initiative demonstrates the transformative power of strategic data management practices in driving operational efficiency, improving decision-making capabilities, and ultimately, achieving business success

Research Challenges and Potential for Future Research

Throughout the research process, several challenges were encountered that shaped the scope and depth of the study. One of the primary difficulties was gathering comprehensive, reliable data from stakeholders within the Airline company. Due to the sensitive nature of data management practices and the involvement of various departments, obtaining access to relevant information and arranging interviews with key personnel required extensive coordination. Additionally, stakeholders were sometimes hesitant to share detailed insights, citing concerns over confidentiality and competitive advantage. To overcome this, a clear framework for confidentiality and data protection was established, which helped facilitate more open discussions.

Another significant challenge was the technical complexity of analyzing the performance metrics of Azure Synapse Analytics and Power BI. Evaluating the effectiveness of cloud-based

solutions in improving report generation required deep technical knowledge, as well as access to system performance data, which was not always readily available. The reliance on internal IT teams for this data sometimes caused delays, as their priorities were aligned with operational tasks rather than research efforts.

Furthermore, the integration of findings from academic literature, market research (including Gartner's Magic Quadrant), and practical insights from the Airline company required a balanced approach. Ensuring that the study remained both grounded in academic rigor while addressing practical business applications was a constant balancing act. This challenge highlighted the need for more readily accessible case studies and empirical research on cloud-based analytics implementations in the aviation industry.

While this study offers valuable insights into the effectiveness of Azure Synapse Analytics and Power BI in enhancing data management and report generation, it also opens up several avenues for future research. First, a more longitudinal study could be conducted to explore the long-term impacts of these cloud-based solutions on organizational performance and competitive advantage. This would provide a deeper understanding of how these technologies contribute to sustained business success.

Additionally, future research could focus on comparative studies across different industries, examining how organizations in sectors other than aviation implement and benefit from similar data management solutions. This would allow for a broader generalization of the findings and help identify industry-specific challenges and opportunities.

There is also potential for investigating the role of organizational culture and change management in the successful adoption of cloud-based data analytics solutions. Understanding the human factors—such as resistance to change, user adoption rates, and the effectiveness of training programs—could provide further insights into how companies can better manage the transition to advanced data management practices.

Finally, research into the evolving capabilities of platforms like Azure Synapse Analytics, particularly in terms of AI and machine learning integrations, could offer valuable perspectives on the future of data management. As these technologies continue to evolve, their potential for driving innovation and transformation within organizations will be a critical area of study.

While the results of this study demonstrate the transformative potential of modern data management solutions, they are shaped by the specific context of Kazakhstan's business environment and the operational requirements of the airline industry. These findings may not be directly transferable to other regions or industries without considering local regulatory, infrastructural, and operational factors. Future research could explore how similar implementations perform in other industries or emerging markets to identify broader trends and insights.

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APPENDIX A

Glossary of Terms

1. ERP (Enterprise Resource Planning): A software suite that integrates and manages an organization's core business processes, including finance, supply chain, and human resources, within a unified system.

2. Scalability: The capability of a system or network to efficiently handle increasing workloads or to expand in size and complexity without losing performance.

3. ETL (Extract, Transform, Load): A data integration process that involves extracting data from various sources, transforming it into a structured format, and loading it into a target database or system for analysis.

4. Cloud-Based Analytics: The practice of using cloud computing infrastructure to perform data analysis, offering benefits such as remote accessibility, scalability, and cost efficiency.

5. Power BI: A business analytics tool by Microsoft that provides interactive visualizations and business intelligence capabilities with a user-friendly interface for creating reports and dashboards.

6. Oracle E-Business Suite (OEBS): An integrated suite of business applications developed by Oracle Corporation that provides comprehensive tools for managing enterprise-wide operations, including finance, procurement, project management, and human resources.

7. Azure Synapse Analytics: A cloud-based analytics service by Microsoft that combines big data and data warehousing capabilities, enabling organizations to integrate, analyze, and visualize large volumes of data efficiently.

Table 1 – Summary of Interview Questions and Responses

Stakeholder Group	Interview Question	Key Responses/Themes
IT Managers	How has the adoption of Azure Synapse Analytics influenced overall data management strategies?	Improved data integration, enhanced scalability, better performance.
BI Developers	How has the reduction in report generation time impacted your work?	Increased efficiency, reduced manual effort, improved report accuracy.
Business Stakeholders	How has the new data management system impacted decision-making processes?	Faster access to insights, more informed decisions, improved strategic planning.
End Users	How easy is it to use the new tools for your daily tasks?	User-friendly interface, some initial adaptation challenges, need for additional training.

Table 2 – Challenges and Solutions

Challenge	Stakeholder Group	Description	Solution Implemented
Data Migration Issues	IT Managers	Data inconsistencies and integrity concerns.	Iterative testing and validation procedures.
Integration Difficulties	IT Managers	Compatibility issues with legacy systems.	Phased integration approach.
User Adoption Barriers	End Users	Difficulty adapting to new tools.	Comprehensive training and support.
Visualization Tool Challenges	BI Developers	Issues with adapting to Power BI.	Training sessions and ongoing support.

Table 3 – Results of new approach implementation

Metric	Before Implementation	After Implementation	Percentage Improvement
Average Report Generation Time	40-50 minutes	40-50 seconds	Over 95% reduction
Data Accuracy	Moderate	High	Significant improvement
User Satisfaction	Mixed	High	Improved
Decision-Making Speed	Slow	Fast	Significant improvement

Table 4 – Thematic Analysis of Interview Responses

Theme	Description	Stakeholder Group(s)	Example Responses
Improved Efficiency	Enhanced performance and reduced processing time.	IT Managers, BI Developers	“The new system has significantly reduced report generation time.”
Better Decision-Making	Faster and more accurate data-driven decisions.	Business Stakeholders	“Access to timely insights has improved our strategic planning.”
User Experience	Ease of use and adaptation challenges.	End Users, BI Developers	“Power BI’s interface is intuitive but required some initial training.”
Technical Challenges	Issues related to data integration and migration.	IT Managers	“We faced initial data migration issues but resolved them through rigorous testing.”

Table 5 – Effectiveness of training and support provided to users

Aspect	Description	Stakeholder Group	Feedback Summary
Training Sessions	Quality and coverage of training provided.	End Users	“Training was comprehensive but needed more hands-on practice.”
Ongoing Support	Availability and effectiveness of ongoing support.	End Users	“Ongoing support has been helpful in addressing issues quickly.”
Adoption Challenges	Difficulty faced by users in adapting to new tools.	End Users	“Some initial difficulties, but support helped overcome them.”

Table 6 – Key performance metrics before and after implementation

Metric	Before Implementation	After Implementation	Percentage Improvement
Average Report Generation Time (min)	45	0.75	98.3%
Standard Deviation of Time (min)	5	0.17	96.6%
User Satisfaction (%)	60	90	50%

Table 7 – Thematic Analysis of Stakeholder Feedback

Theme	Description	Stakeholder Group(s)
Operational Efficiency	IT managers emphasized the role of data normalization in achieving faster query performance.	IT Managers
User Adaptation	End-users initially faced challenges adapting to Power BI but acknowledged its benefits following targeted training sessions.	End-Users
Decision-Making	Business stakeholders reported more informed and timely decisions due to real-time data availability.	Business Stakeholders

Table 8 – The survey results by category

Aspect	Percentage of Positive Responses
Overall Satisfaction	85%
Workflow Efficiency	90%
Report Accuracy	80%

Table 9 – Interview Questions with Stakeholders

◆ IT Managers:

¤ Strategic Impact (to explore how the strategic use of Azure Synapse Analytics influenced overall data management strategies at the Airline company, the following questions were posed):

- How has the adoption of Azure Synapse Analytics influenced overall data management strategies at the Airline company?
- What specific improvements in operational efficiency have you observed since implementing the new data management tools?

¤ Technical Challenges (to understand the technical challenges faced during the integration process, IT managers were asked):

- What were the primary technical challenges faced during the integration of Azure Synapse with existing legacy systems?
- How did you address issues related to data migration, such as inconsistencies and data integrity?

◆ Business Intelligence (BI) Developers:

¤ Report Generation (considering the significant reduction in report generation time, questions were directed at BI developers to uncover their experiences):

- How has the reduction in report generation time from 40-50 minutes to 40-50 seconds impacted your work?
- What role did data normalization play in optimizing report generation processes?

¤ Visualization Tools:

- To assess the impact of Power BI on data visualization and user experience, the following inquiries were made:
- How has the integration of Power BI enhanced data visualization and accessibility?
- What challenges did you encounter while adapting to Power BI, and how were they resolved?

◆ Finance Managers:

¤ Decision-Making (given the improvements in report accuracy and timeliness, business stakeholders were questioned about their decision-making processes):

- How has the new data management system impacted decision-making processes within your department?

- Can you provide examples of decisions that were influenced by faster and more accurate data reporting?

◆ End Users (Financial Controllers):

¤ Ease of Use (to evaluate the user experience with the new tools, end users were asked):

- How easy is it to use the new tools for your daily tasks?
- Have you experienced any challenges in adapting to the new data management practices?

¤ Training and Support (understanding the importance of training, the following questions were posed):

- How effective was the training provided for the new tools?
- What kind of ongoing support do you require to use the tools efficiently?

Diagram 1 – Distribution of Stakeholder Feedback on the new approach implementation

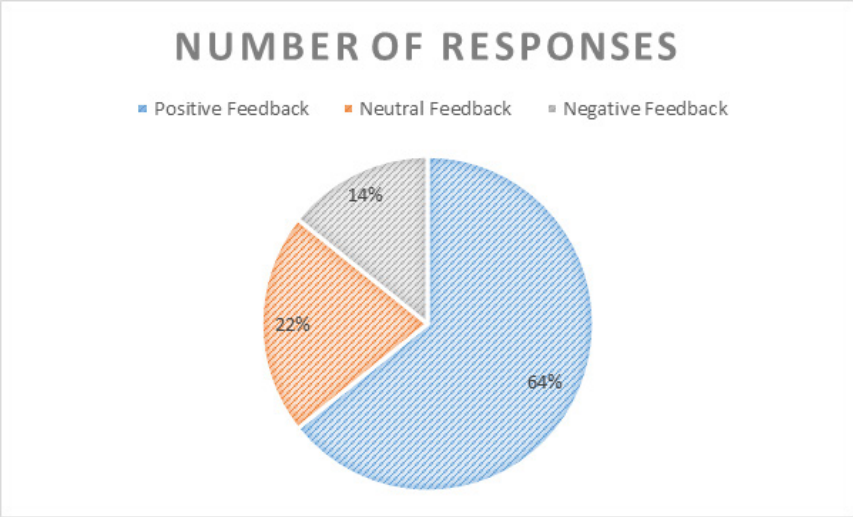


Diagram 2 – Comparison of Report Generation Time Before and After Implementation

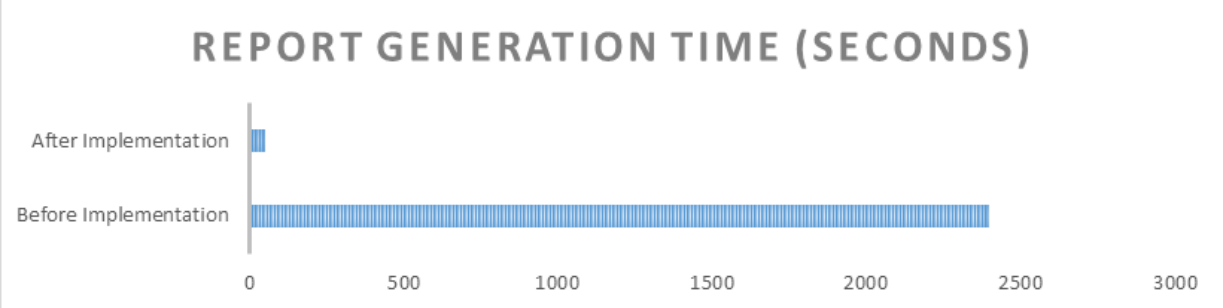


Diagram 3 – Comparison of Pre- and Post-Implementation Report Generation Times

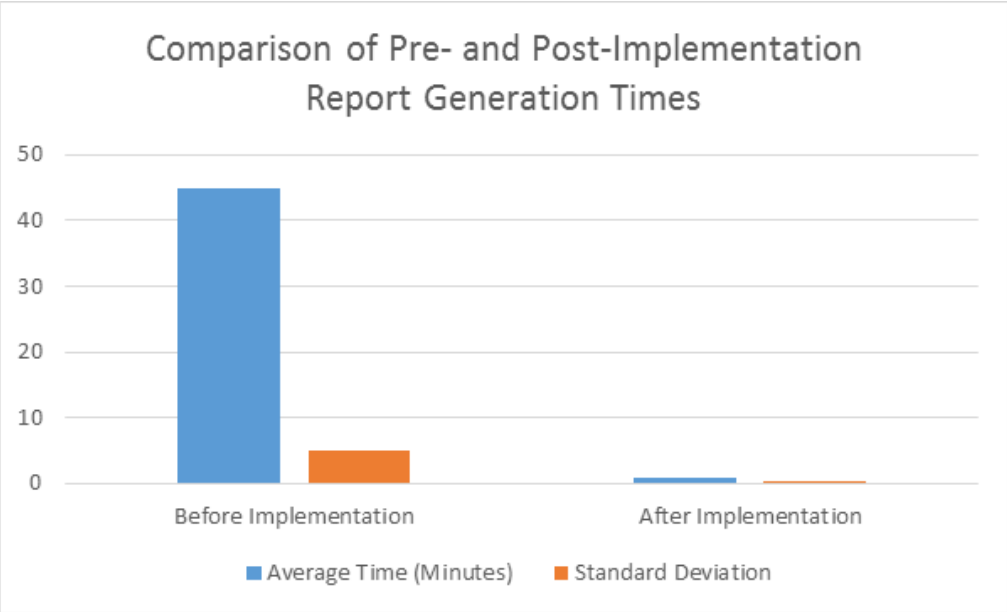
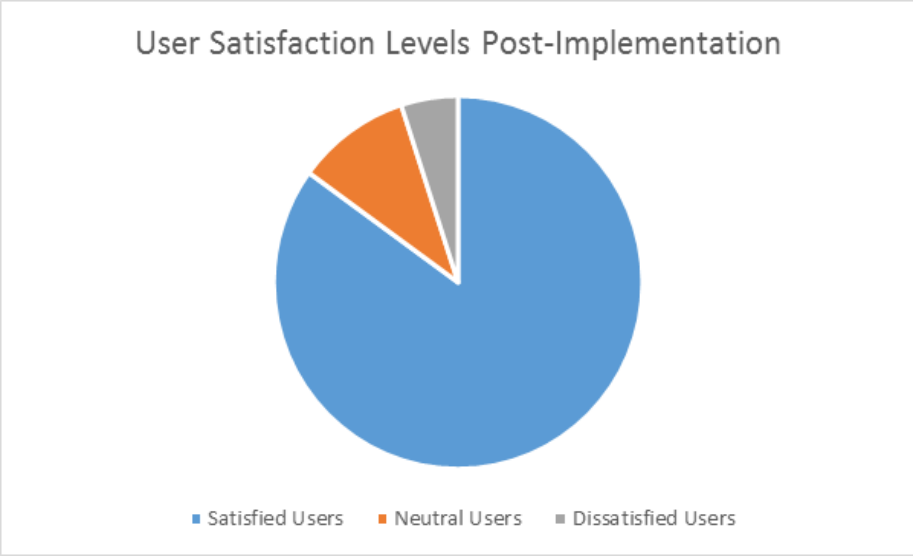


Diagram 4 – User Satisfaction Levels Post-Implementation



[1]Ким П.,
деректерді басқару және аналитика бойынша аға менеджер,
ORCID ID: 0009-0007-4938-8578
e-mail: pavel.kim@airastana.com

[1]«Эйр Астана» АҚ, Алматы қ., Қазақстан

ДЕРЕКТЕРДІ ТАБЫСТЫ БАСҚАРУ: ҚАЗАҚСТАНДАҒЫ ӘУЕ КОМПАНИЯСЫНЫҢ КЕЙСІ

Аңдатпа

Бұл зерттеуде Қазақстандағы әуе компаниясының (әрі қарай – Әуе компаниясы) есептерді генерациялау процестерін оңтайландыру, ERP (кәсіпорынды басқару жүйесі) жүктемесін жеңілдету және деректерді басқарудың жалпы тиімділігін арттыру үшін бұлтты қызметтерді стратегиялық пайдалану жан-жақты қарастырылған. Заманауи бизнес-операциялар аясында өндірілетін деректердің көлемі мен күрделілігінің артуымен, масштабталатын және тиімді деректерді басқару шешімдеріне қажеттілік айрықша маңызды болып отыр. Негізгі мүдделі тараптармен сұхбат, жүйе өнімділігінің көрсеткіштерін талдау және енгізу процестерін бақылау арқылы, бұлтты шешімдерді интеграциялаумен байланысты қиындықтар мен стратегияларды терең түсіну жетістікке жетті. Нәтижелер деректерді басқару тәжірибелерін жақсартуда, есептерді генерациялау процесінің сенімділігін қамтамасыз етуде және дамып келе жатқан бизнес қажеттіліктерін қанағаттандыру үшін тегіс масштабталуды жеңілдетуде бұлтты технологиялардың маңызды рөлін көрсетеді. Зерттеу есеп беру уақытының айтарлықтай қысқарғанын (95% жақсарту) және көшу процесі барысында туындаған қиындықтар мен оларды еңсеру стратегияларын ұсынады. Бұл кейс деректерді басқару мүмкіндіктерін жетілдіріп, стратегиялық артықшылықтар алу үшін бұлтты технологияларды пайдалануға талпынған ұйымдар үшін құнды ақпарат ұсынады, бұлтты шешімдердің операцияларды оңтайландыруда, инновацияларды ынталандыруда және қазіргі динамикалық бизнес жағдайында тұрақты өсуді қамтамасыз етудегі түрлендіргіш әлеуетін көрсетеді.

Тірек сөздер: деректерді басқару, Azure Synapse Analytics, бұлттық аналитика, Power BI, ERP-ті оңтайландыру, есеп беру процесін оңтайландыру, мүдделі тараптармен ынтымақтастық, авиация саласы, Қазақстан.

[1]Ким П.,
старший менеджер по управлению данными и аналитикой,
ORCID ID: 0009-0007-4938-8578,
e-mail: pavel.kim@airastana.com

[1]АО «Эйр Астана», г. Алматы, Казахстан

УСПЕШНОЕ УПРАВЛЕНИЕ ДАННЫМИ: КЕЙС АВИАКОМПАНИИ В КАЗАХСТАНЕ

Аннотация

В данном исследовании всесторонне рассматривается стратегическое использование облачных сервисов авиакомпанией в Казахстане (далее – Авиакомпания) для оптимизации процессов генерации отчетов, снятия нагрузки с ее ERP (системы управления предприятием) и повышения общей эффективности управления данными. С ростом объемов и сложности данных, генерируемых в рамках современных бизнес-операций, необходимость в масштабируемых и эффективных решениях для управления данными стала особенно актуальной. Через интервью с ключевыми заинтересованными сторонами, анализ показателей производительности системы и наблюдение за процессами внедрения было достигнуто глубокое понимание сложностей и стратегий, связанных с интеграцией облачных решений. Результаты подчеркивают ключевую

роль облачных технологий в улучшении практик управления данными, обеспечении надежных процессов генерации отчетов и облегчении плавного масштабирования для удовлетворения развивающихся бизнес-потребностей. Исследование демонстрирует значительное сокращение времени на создание отчетов (улучшение на 95%) и подчеркивает вызовы и стратегии их преодоления в ходе процесса миграции. Этот кейс предлагает ценную информацию для организаций, стремящихся улучшить свои возможности управления данными и использовать облачные технологии для получения стратегических преимуществ, демонстрируя преобразующий потенциал облачных решений в оптимизации операций, стимулировании инноваций и содействии устойчивому росту в современных динамичных бизнес-условиях.

Ключевые слова: управление данными, Azure Synapse Analytics, облачная аналитика, Power BI, оптимизация ERP, оптимизация генерации отчетов, сотрудничество с заинтересованными сторонами, авиационная индустрия, Казахстан.

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