

# Case Study

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Integration of crucial data hubs for one of the leaders in holiday tourism



# The Client

Our client is a regional hospitality powerhouse, an internationally renowned group of hotels and resorts, one of the biggest of its kind in Croatia as they manage great deal of all categorized accommodation in the country. As the hospitality and tourism industry was especially struck-up after the pandemic, the champions in the sector dived into the complex process of digitalization paths, which meant the implementation of innovative approaches and better integration of various enterprise systems departments.

To streamline operations, enhance customer experiences, and enable data-driven decision-making, our client embarked on developing an integrated data system. This system leverages Kafka Connect, Kafka topics, migrator microservices and source/sink connectors to handle data from various sources such as reservation systems, customer feedback platforms, web interfaces and loyalty programs.



# Requirements

Our client wanted to avoid and/or eradicate some of the industry-unwanted occurrences such as:

- Complex or non-digitized guest journey
- Inability to deliver guest value promptly
- Employees with limited guest knowledge or call-center agents unable to provide proper information
- Lower direct sales
- Soiled platforms and data
- High integration and maintenance cost

As a regional market leader, they wanted to consult a company with proven industry expertise, and that is the reason why you are reading this.



# Requirements

After completing the first joint project with Serengeti, our client's dedicated in-house digitalization team decided that we should deepen our cooperation. So, we stepped into a new project focused on the integration of all systems within the company. At the beginning, four Serengeti developers (two leads & two juniors) were onboarded and accustomed to a new set of daily procedures. Maintenance, improvement, and implementation of new functionalities are the daily tasks they work on. Kafka's cross-service integration is one of the components used in a client's central data warehouse.

Some of the biggest challenges our client faced were related to:

**Data Silos:** Our client faced the challenge of fragmented data storage and management of data across various systems and applications within their organization, as their data was scattered across different systems. This hindered their ability to gain a comprehensive view of their operations and customer interactions.

**Real-time Data Processing:** Real-time data processing was crucial for our client to gain insights into customer preferences, identify trends and provide personalized experiences.

**Data Integration:** Integrating data from diverse sources such as reservation systems, web interfaces, customer feedback platforms and loyalty programs required a scalable and reliable solution.

**Data Migration:** Migrating data from legacy systems to a unified data platform while ensuring data consistency and integrity was a critical aspect of the project's success.

**Scalability and Performance:** Our client anticipated the solution's need to handle a large volume of data efficiently and scale seamlessly as their business expanded.



# Solution

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Our team, guided by the client's digitalization team, work on a core infrastructure platform that:

- Integrates and correlates Guest and Business data
- Collects real-time events, interactions, and data
- Provides real-time streaming data to any consumer

The supported formats of the aforementioned data are Kafka Topic, Rest/JSON, NoSQL, and the data can be delivered at the required time: real-time, scheduled time, or on demand API.

Our team is working on implementation and optimization of .NET producers and consumers, APIs, Selenium and B2C projects to help our client to upgrade their legacy applications for better overall performance and user experience, being one of the most important things in the industry that relies greatly on the quality of customer feedback.

Some of the other sub-projects we worked on were:

- Security fixes in .NET project, Azure Infrastructure and MongoDB Atlas
- Selenium solutions to automate business use cases
- Project build Azure AD B2C user flows for web and mobile applications

Smoother interconnection and real-time communication between various systems (PMS, CRM, call center, booking aggregators, HR, etc.) are making bits of daily procedures easier for each party in the whole system, especially if you have vital intelligence regarding the operational side of the business in data warehouse designed for that purpose. This way, you operate directly and implement improvements based on inputs your collected data suggests.



# Technologies

In accordance with our client's challenges, the following solutions were adopted, leveraging Azure services and .NET Core:

**Azure Event Grid with Kafka Topic Integration:**

Azure Event Grid, a fully managed event routing service, integrated with Kafka topic events was utilized for this purpose. This integration allowed us to capture and process events from various sources, including reservation systems, web interfaces, customer feedback platforms and loyalty programs, in real time.

**Kafka Connect:** Kafka Connect was employed to build connectors that interfaced with different source systems, capturing the relevant data. Source connectors were developed to ingest data from various databases, events, and other data sources into Kafka topics.

**Data Transformation and Enrichment:** Migrator microservices were developed using .NET Core to handle data transformation, enrichment and aggregation tasks. These microservices processed the data to and from Kafka topics, applied necessary transformations, and loaded it into the target systems.

**Azure PaaS MongoDB:** Instead of Azure Cosmos DB, client utilized Azure's Platform-as-a-Service offering for MongoDB. This fully managed service provided scalability, high availability and automatic backups, alleviating the operational burden for our client.

**MS SQL Database:** Client also leveraged MS SQL Database to store transactional and relational data, including customer profiles, reservation details and financial information.

**Azure Security Features:** Azure security features such as private links and key vaults are implemented to ensure data security and compliance.



# Top Benefits For The Client

Integration through Apache Kafka not only connected various systems but also added value to the existing data. It made the hotel technology more efficient, resilient and productive with the addition of new capabilities. With the faster influx of actionable data, the client could recognize and respond to the needs of their customers and deliver real value in no time.

Some of the emerging trends relate to enriching the hospitality vendors with different offerings, experiential vacations and, above all, high-level personalization. Guests nowadays want tailor-made options regarding many aspects of their stay, and hotels, restaurants and resorts are doing their best to improve the overall customer satisfaction and experience.

Some of the other benefits worth mentioning:

- Real-time Insights
- Streamlined Operations
- Data-driven Decision Making
- Scalability and Performance
- Enhanced Data Security
- Simplified Management and Maintenance
- Integration with .NET Core
- Efficient CI/CD with Azure DevOps
- Secure Identity and Access Management

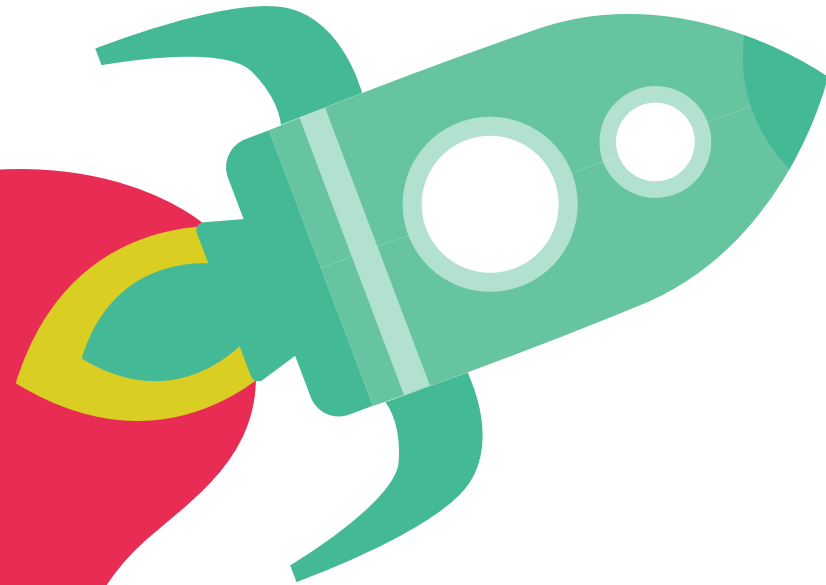


# Result

Overall, the proposed architecture empowers our client to break down data silos and create a unified data ecosystem.

By seamlessly integrating data from diverse sources, such as reservation systems, customer feedback platforms and loyalty programs, they gain a comprehensive view of their operations and customer interactions.

With real-time data processing and event-driven architecture enabled by Kafka Connect and Azure Event Grid, our client can capture and process data as it happens, unlocking valuable insights into customer preferences, operational performance, and revenue generation.





# Accelerating business transformation through innovative technology

Serengeti d.o.o. is a software development near-shoring and consulting company. For the past 15 years, we have been partnering with our clients to reinvent their business models using innovative information technology. We work according to the principles of DevOps, implementing disruptive trends in our specializations. Our experience and business acumen comes from successfully working on over 300 projects.

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