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# INTEGRATION PLATFORM

## LOW-CODE PLATFORM FOR FAST & HIGH-QUALITY SUPPORT OF INTEGRATION TASKS

## DQ INTEGRATION

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# 1 | KEY INTEGRATION ASPECTS: CHALLENGES AND OPTIMAL APPROACHES

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# INTEGRATION MAKES AN INTEGRAL PART OF ANY IT PROJECT

EFFECTIVE INTEGRATION SIGNIFICANTLY INCREASES OPPORTUNITIES FOR DIGITALIZATION, SINCE THE NEW VALUE CAN BE CREATED ON THE BASIS OF EXISTING SERVICES AND THEIR FUNCTIONS.

UNFORTUNATELY, IMPLEMENTATION OF INTEGRATION SOLUTIONS OFTEN COSTS UNREASONABLY HIGH TO THE PROJECT BUDGET

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# KEY CHALLENGES IN INTEGRATION PROJECTS

### HETEROGENEOUS SYSTEMS

The need to integrate systems provided by different vendors and based on different architectural principles and technologies.

### LACK UNIFIED INTEGRATION STANDARDS

There are no ready-to-use approaches to the integration – each project requires developing its own approach.

### HIGH COST OF INTEGRATION

A large amount of tasks for integration enhancements during the project, weak testing capabilities, lack of monitoring results in the high cost of the development and operation.

### TECHNOLOGICAL RISKS

Proprietary platforms impose strict rules for the choice of technologies and approaches to the implementation of integration solutions, which often happen to be outdated. Many providers of integration platforms have left the market.

### HIGH REQUIREMENTS TO RELIABILITY AND FAULT TOLERANCE

Despite high costs and efforts, integration remains a potential source of failure.

### INFLUENCE OF SPECIFIC FEATURES

Besides the general integration logic, each integration flow has its own specific features, which has a significant impact on the project duration and complexity.

### GUARANTEED RESULTS

If the results of the integration interaction in the integration solution are not verified, this may cause direct losses.

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# DIFFERENT INTEGRATION APPROACHES

## POINT-TO-POINT INTEGRATION

**Creation of direct integration links between each pair of systems.**

- ⊖ Difficulties in understanding and management of the implemented integration. As the number of flows increases, the complexity increases.
- ⊖ High cost of changes – changes in one system may require changes in multiple integrations.
- ⊖ Inevitable duplication of integration functions.
- ⊖ Lack of monitoring tools.

## SMART ESB

**Development of the integration solution using tools of a centralized bus for the data exchange and interactions between systems.**

- ⊖ Complicated configuration and management of the centralized ESB, often using a closed-source proprietary tools.
- ⊖ Dependence on the centralized point of failure.
- ⊖ Limited scalability not capable to support the increasing number of systems and integrations.

## SMART SERVICES AND RELIABLE CHANNELS

- ⊕ Each integrated system uses a separate service with all necessary and sufficient logic for the integration interaction.
- ⊕ Simple solution scalability due to the scalability of each individual adapter.
- ⊕ Simple running and development without regressions of the overall solution.
- ⊕ Unified register of all messages.
- ⊕ Shared reconciliation and monitoring tools.
- ⊕ Simple and reliable message brokers.

**THE ONLY QUESTION IS:** How to effectively and correctly create smart adapters?

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# 2 | THE EFFICIENT SOLUTION: PLATFORM ARCHITECTURE AND FUNCTIONS

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# DESIGNING INTEGRATION FLOWS. KEY STEPS

1. Design of the integration solution
2. Setup of the structure of integration communications
3. **Low-code design** of the mediation and integration logic of adapters (**microservices**) based on the available patterns
4. Design of the business logic for the processing of messages (if required) with the help of BPM processes
5. **Generation of integration microservices** based on the described scheme
6. Building and publication of microservices in the repository
7. Automatic deployment of microservices

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# INTEGRATION PLATFORM ARCHITECTURE

## Designing the Integration Architecture

- Visual Design of the Integration Architecture
- Register of Integrated Systems
- Register of Integration Flows

## Designer of Integration Flows

- Register of Ready-to-use Components (Adapters)
- Low-Code Tools for Design of Integration Processes
- Low-Code Designer of Business Logic Processes
- Automatic Generator of Integration PBCs
- Message Settings

## Execution of Integration Flows

- Universal Adapter
- Execution Environment for Integration Adaptors
- Message Register

## Transport Layer (MessageBroker)

- Message Streaming
- MQ Message Broker
- Viewing the Contents of Topics and Queues

## Monitoring and Control

- Data Reconciliation
- Visual Analytical Dashboards for the Analysis of Integration Interactions

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# IMPLEMENTATION OF INTEGRATION FLOWS

## KEY REQUIREMENTS

- Designing integration flows in the visual designer
- Use of integration patters and ready-to-use connectors
- Generation of microservices

## INTEGRATION FRAMEWORK CAMEL

### UNIVERSAL ROUTING LANGULAGE

Camel DSL (Domain Specific Language) presents integration routes as a visual diagram that is easy to understand by users with different training levels

### MULTIPLE TYPES OF COMPONENTS

Support of more than 300 ready-to-use components for easy interaction of almost any systems and technologies (HTTP, JMS, Kafka, SQL, file systems, cloud services, etc.)

### INTEGRATION WITH POPULAR PLATFORMS

Camel easily integrates with Spring, Quarkus, MicroProfile and other popular platforms, which allows using it in the microservice architecture

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# REGISTER OF INTEGRATION FLOWS

- Unification of information on the integrated systems. Specifying interaction methods (flows, protocol, APIs)
- Design of the system interaction diagram. Exchange direction and sequence
- The result: the integration interaction diagram

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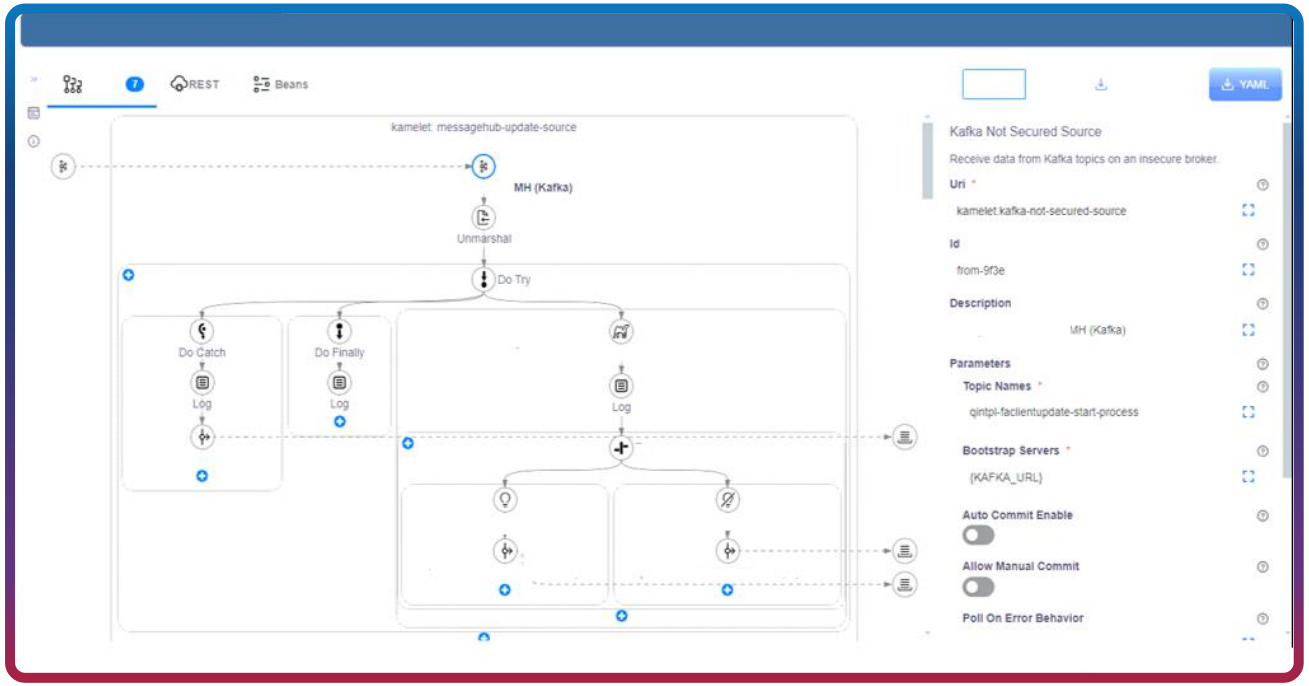
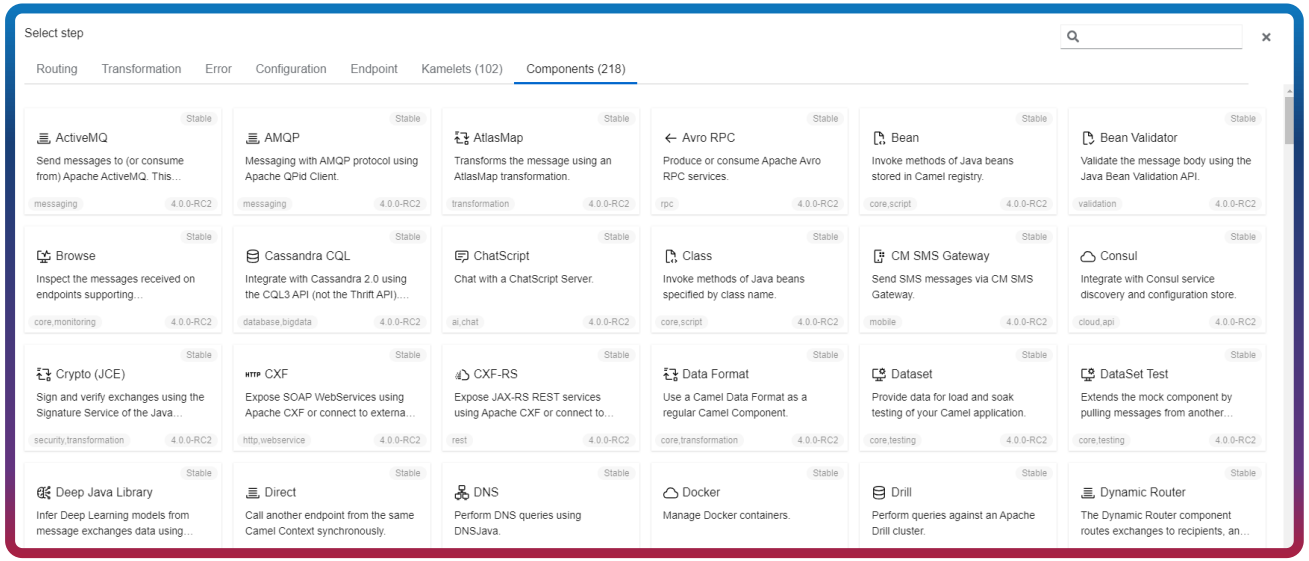
# DESIGNER OF INTEGRATION FLOWS

- **Visual design of integration processes**
- **300+ ready-to-use components for interaction with external systems**
- **Support of popular message delivery protocols and channels**



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# EXECUTION OF INTEGRATION FLOWS

1. **Component-Based Architecture**
   Integration adapters represent separate microservices.
2. **Compact Design**
   Each service contains only necessary but sufficient tools for the execution of the integration logic. Nothing extra.
3. **Distribution of Responsibility**
   Clear separation of the integration logic from the business logic in message processing.
4. **Scalability**
   Unrestricted scalability of separate PBC services based on the workload requirements.
5. **Accuracy**
   Registration of all integration exchange messages, with clear indication of their statuses and processing protocols.

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# TRANSPORT LAYER

## CONTINUITY

The information flow is received and transmitted in the real time, without delays or breaks

## MESSAGE DISTRIBUTION

The message broker distributes messages between recipients

## GUARANTEED DELIVERY

Messages will be delivered even in case of system failures or network issues

## MANAGEMENT OF THE MESSAGE STREAM

Control of the delivery speed and message priorities; filtering; handling errors

## SYNCHRONOUS AND ASYNCHRONOUS MODES

## CONTROL

Viewing the contents of topics and queues; centralized logging of incoming and outgoing parameters; health monitoring

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# GUARANTEED DELIVERY

Due to the built-in tools and features of the broker:

## LONG-TERM STORAGE

Supports persistent storage of messages, ensuring that messages are not lost even if the system fails.

## TRANSACTIONAL SYSTEM

Support of JMS transactions allows grouping several message sends or receives as one atomic operation.

## ACKNOWLEDGEMENTS

Consumers can send acknowledgements on the receipt of messages, which ensures that the broker knows about the successful delivery. If the broker does not receive a confirmation, it can try to resend the message.

## MESSAGE REDISPATCH POLICIES

For the messages that cannot be delivered or processed, the solution allows setting up a retry policy, which includes setup of the delay time between attempts and the maximum number of attempts.

## DEAD LETTER QUEUES (DLQ)

If a message cannot be delivered after a certain number of attempts, it may be redirected to the special queue called the Dead Letter Queue.

## CLUSTERING AND REPLICATIONS

These features can be set up in the cluster mode to ensure high availability and fault-tolerance.

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# MESSAGE BROKER FOR MICROSERVICE PRODUCTS

Artemis Message Broker

for the secure and reliable data exchange between applications

- Support of popular message exchange protocols (AMQP, OpenWire, MQTT, STOMP, HornetQ)
- Support of the Java Message Service (JMS) standard
- Support of the Point-to-Point and Publish-Subscribe message exchange patterns
- Support of transactions during sending of messages
- Ability to set up message filtering and routing

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# PERFORMANCE

## THE PERFORMANCE OF THE PLATFORM DEPENDS ON MANY FACTORS

- Message storage settings
- Logging
- Hardware
- Network topology
- Transport protocol
- and many other factors

The performance in the most basic configuration (broker, single flow from the sender, single flow from the receiver, Intel Celeron CPU 2.40GHz, one node, one queue):

**2 000** messages per second

In other configurations, the performance can reach:

**20 000** messages per second

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# UNIQUE ADVANTAGES

## EASY DEVELOPMENT WITH THE USE OF LOW-CODE TOOLS

Design of integration flows in a visual designer. Use of integration patterns and ready-to-use connectors. Generation of microservices.

## READY-TO-USE INTEGRATION COMPONENTS

The platform contains all required integration components. The list of integration components can be expanded by both the vendor and the customer.

## EFFECTIVE SCALABLE INTEGRATION

Integration adapters are designed as microservices with necessary functions, scalability and distribution of the logic. All messages are registered with their statuses and processing protocols.

## RELIABLE TRANSPORT LAYER

The information is transmitted in real time, with a guaranteed delivery and distribution of messages through a broker, taking into account priorities and filtering. The system supports both the synchronous and asynchronous modes and provides control and monitoring tools.

## EXPERTISE

More than 20 years of experience in system integration. Our deep expertise allows us to solve complex tasks and quickly connect external systems.

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# 3 | SUCCESS STORIES 2024

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# SUCCESS STORIES

## PROJECT

Integration of the remote banking system with the core banking system

## PROJECT GOAL

Ensure execution of end-to-end business processes for payments, money transfers, free-format documents, currency control forms

## PROJECT RESULT

- Implementation of DQ Solutions' Integration platform to support the integration interactions helped to significantly reduce the time for development of integrations and ensure the continuity of business processes
- Support of the further inhouse development of the system by the customer

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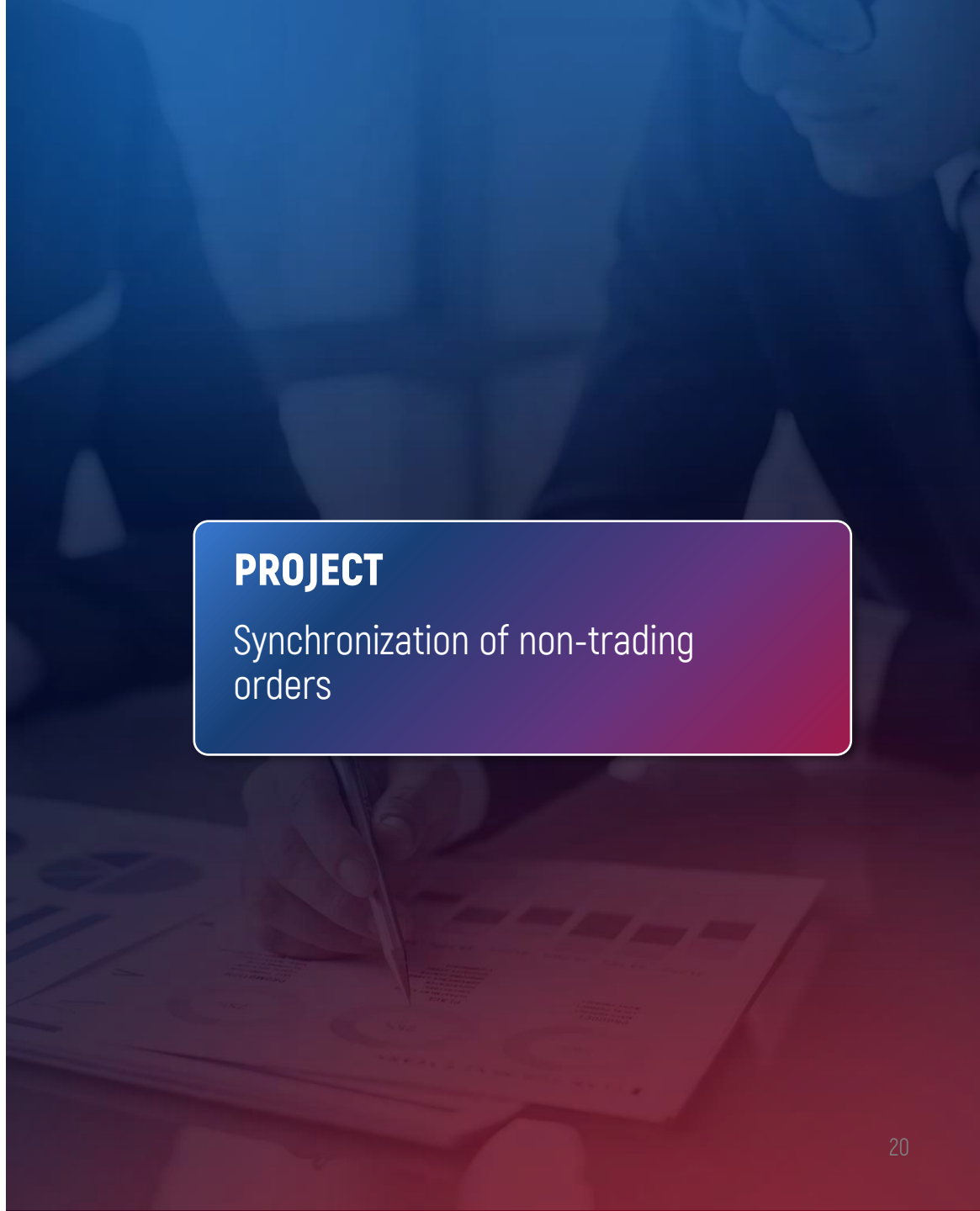
# SUCCESS STORIES

## PROJECT GOAL

Support the entry of deposits and withdrawals from customer brokerage accounts in the back-office system for the management of non-trading orders received from the QUIK trading system

## PROJECT RESULT

- Support of online synchronization of non-trading orders from the back-office system to the QUIK trading system
- Generation and viewing of integration message processing reports



**PROJECT**

Synchronization of non-trading orders

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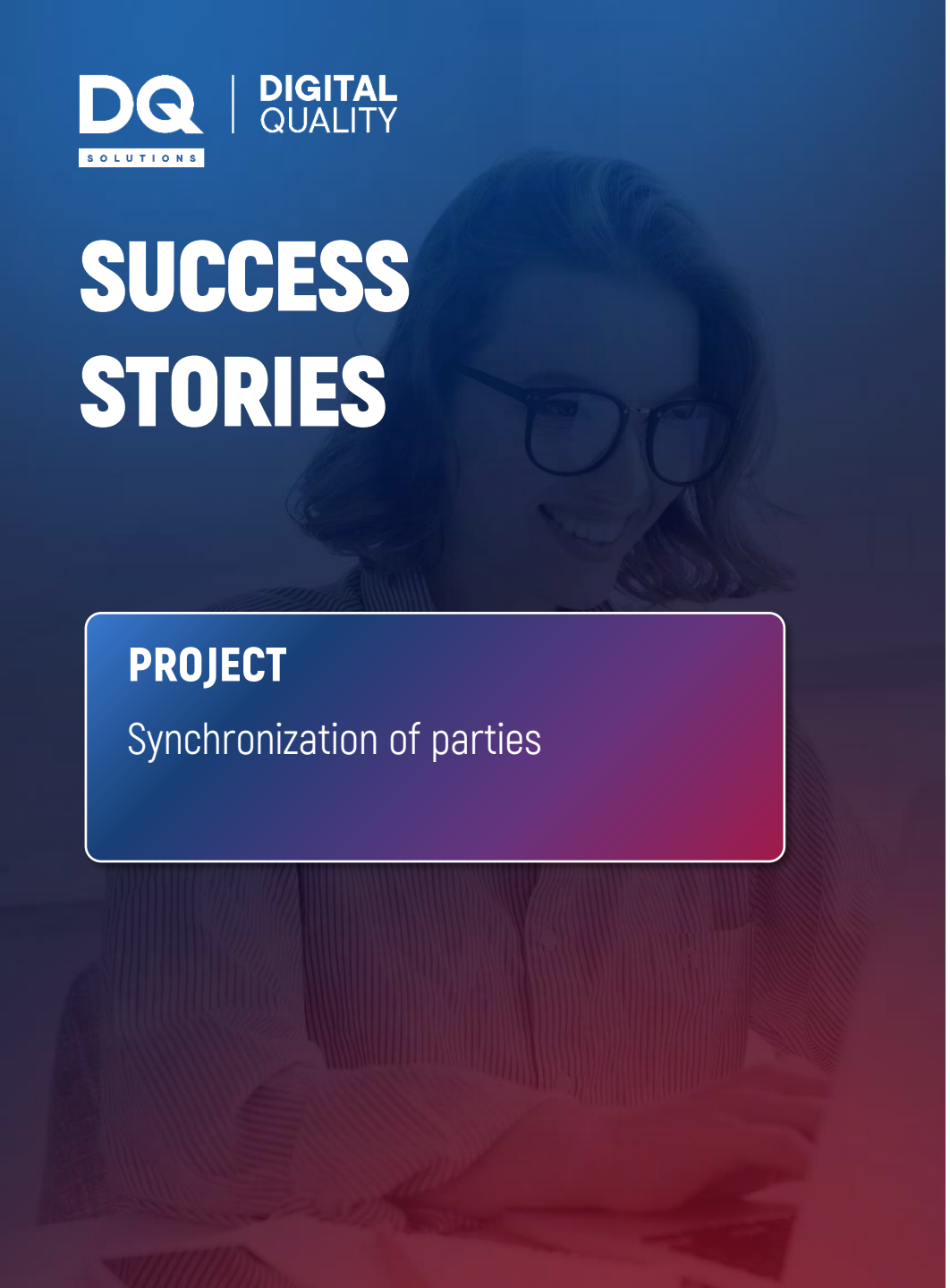
# SUCCESS STORIES



**PROJECT**

Synchronization of parties

## PROJECT GOAL

Support synchronization of parties in all IT systems

## PROJECT RESULT

- Support of the online synchronization of parties between the Party Register and other customer information storage and management systems
- Generation and viewing of integration message processing reports

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# THANK YOU

digital@dq-solutions.com
www.dq-solutions.com