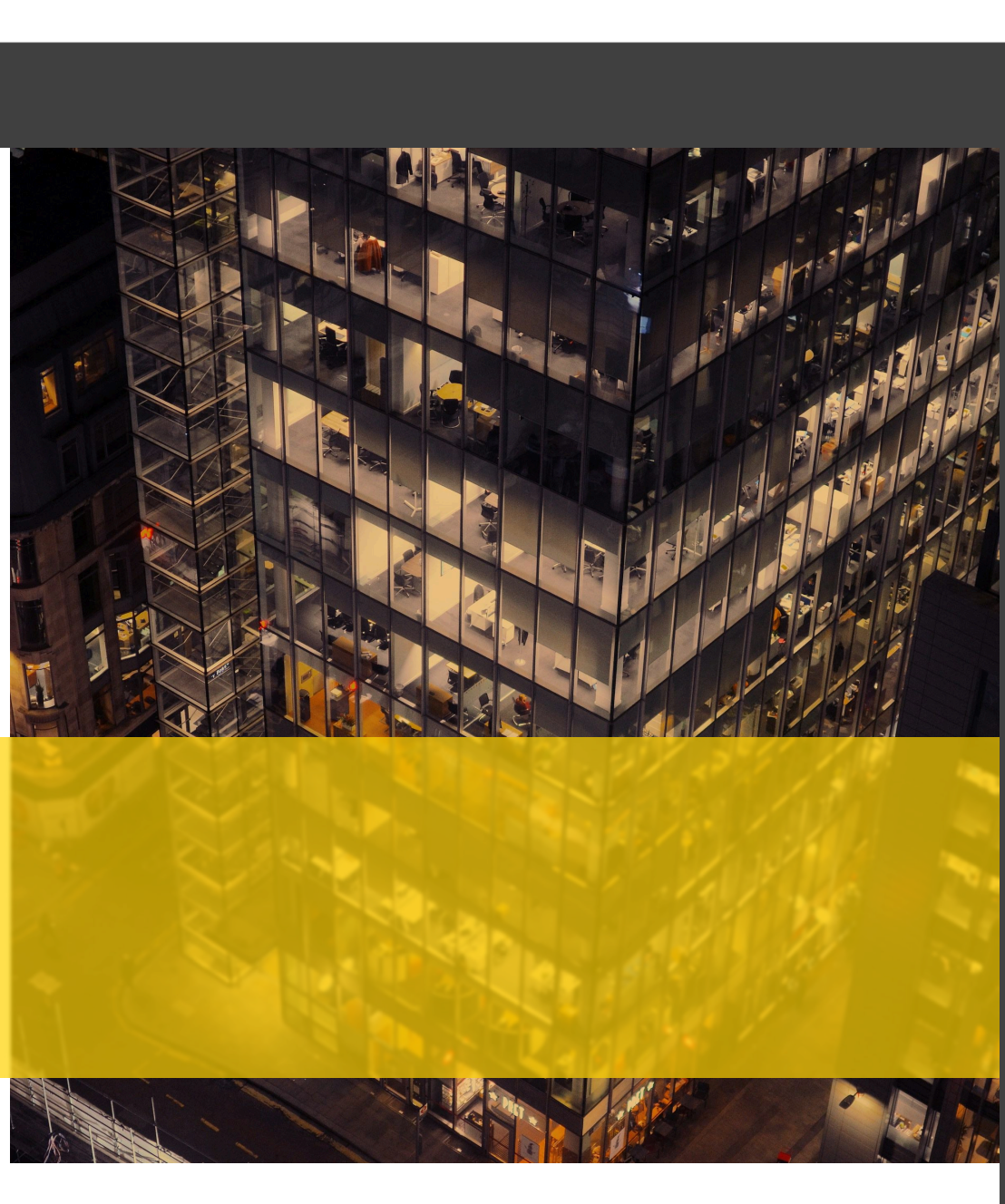
ANDERSEN

Smart Data Transformation Solution for Fintech

White Paper



Business Challenge

Rapid digitalization and a growing network of partners, payment and fintech service providers face the pressing need to scale integrations swiftly without compromising quality or operational stability.

Modern platforms operate under high integration loads, facilitating secure and stable data exchange with dozens and often hundreds of financial institutions daily. The lack of standardized formats, business rules, and architectural approaches turns every connection into a unique, resource-intensive project, requiring manual setup and custom transformations.

As a result, organizations face several critical challenges:

- **High maintenance costs:** Considerable effort is required to support unique integrations with each institution;
- **Operational vulnerabilities:** Data transfer errors especially in AML, KYC, and settlement processes can result in sanctions, financial loss, and damaged trust;
- **Limited scalability:** The complexity of onboarding new partners slows down business growth;
- **Lack of centralized control:** Businesses lack end-to-end visibility into integration processes and deviation diagnostics;
- **Regulatory and reputational risks:** Data transfer errors can lead to compliance violations and reputational damage.

Executive Overview

The proposed solution — a smart Data Transformation Layer (DTL) — addresses the architectural and operational limitations of traditional integration approaches. DTL is a unified ETL platform that sits between internal systems and external data sources, automating the extraction, transformation, and delivery of data in the required format and logic, without the need for custom mappings for each integration.

DTL enables organizations to move from fragmented, ad hoc integrations to a managed, scalable, and transparent data ecosystem.

The solution focuses on eliminating the need for custom integrations by providing:

- Support for any input/output formats without requiring changes to partner architecture;
- Automated mapping to the internal canonical model (automapping);
- Full operational control and auditability;
- Lower operational risk and enhanced compliance resilience.

Solution Overview

Business Modules:

1 Configuration & Set Up

Allows connecting external systems using a library of prebuilt integration adapters **(e.g., T24, Base24)** with predefined mappings.

If the required adapter is missing, the user uploads data structure descriptions **(JSON, XML, or templates)** and configures mappings manually or using AI assisted methods like NLP, which suggests probable matches.

All mappings are visualized and can be adjusted.

2 Execution Control

Ensures stability and correctness of data transfer. The system tracks acknowledgment of data receipt.

In case of failure, diagnostics are performed: security, availability, configuration checks, etc.

Rejected files from the client highlight unprocessed transactions for which root cause analysis is launched — either manually or with automation.

Corrections **can be manual or AI-assisted.**

3 Monitoring & Reporting

Enables performance monitoring via KPI dashboards: transaction volume, exceptions, SLA compliance.

The system detects anomalies, such as sharp drops in activity.

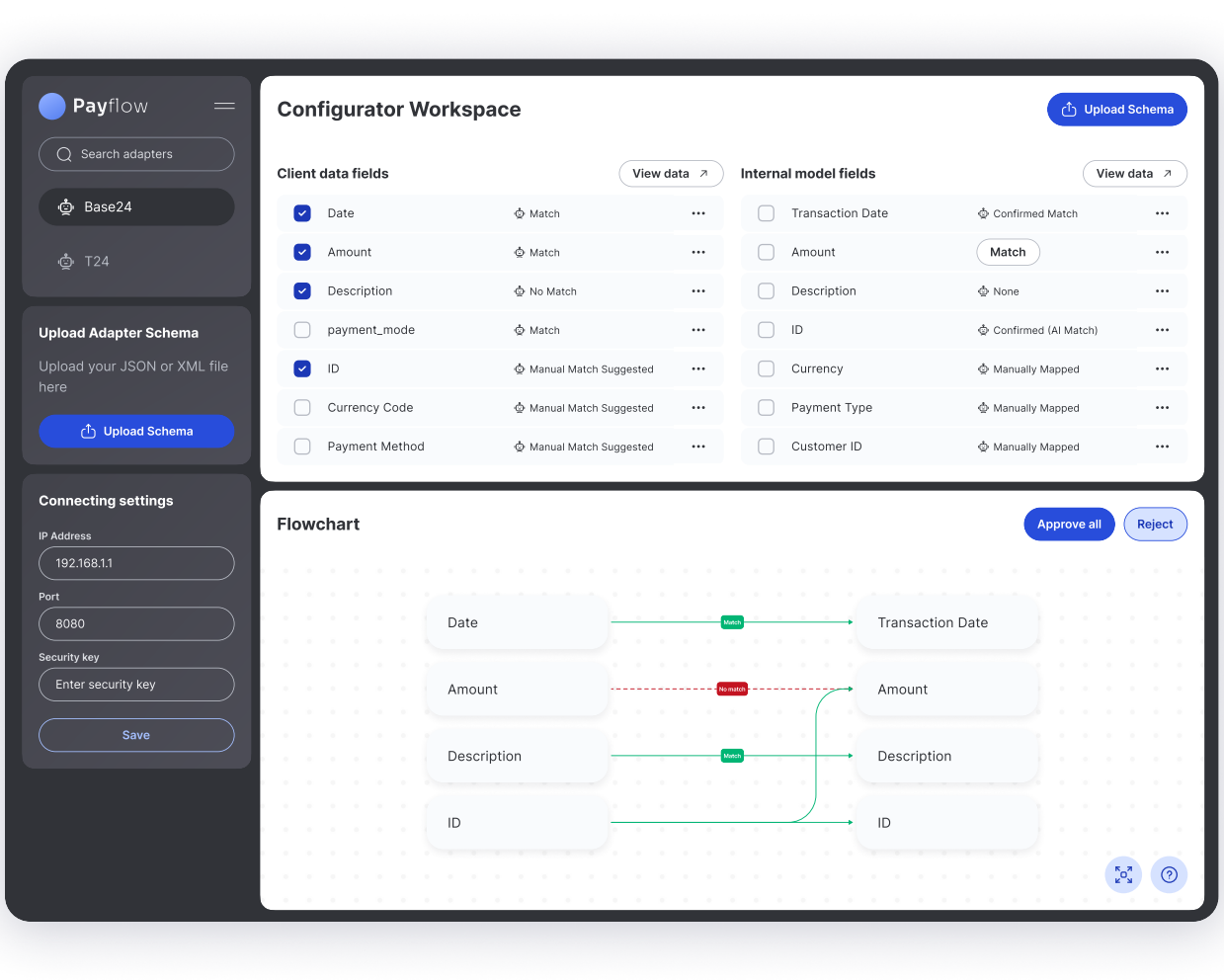
Reports can be exported to **Power BI and other BI systems.**

Configurator

Control Configurator Workspace is designed for setting up new integrations and adapting the platform to specific clients. Configurator roles can perform the following actions:

- **Integration Adapter selection from the library:** The user selects a ready-made adapter for known systems (e.g., T24, Base24) containing predefined mappings and connection parameters.
- **Loading client data schemas:** If no adapter is available, the configurator uploads data descriptions from the client (e.g., XML schema, JSON structure, or file template). The platform automatically builds an object model.
- **Manual or semi-automatic mapping setup:** The system performs initial matching using NLP algorithms, offering probabilistic matches based on structure and naming analysis. The user can: - Confirm suggested matches;
  - Manually match fields if automatic results are weak;
  - Add transformation rules for value conversions (e.g., date or currency formats).
- **Mapping visualization:** All field matches are visually displayed. The configurator approves or rejects each match. Once confirmed, results are saved to the mapping library.
- **Saving configuration and adapter generation:** Upon completion, the system generates a configuration. If an adapter is missing, the user inputs connection parameters (IP, port, security) and adds the adapter manually.

Configurator


Payflow
Search adapters
Base24
T24
Upload Adapter Schema
Upload your JSON or XML file here
Upload Schema
Connecting settings
Save
Configurator Workspace
Upload Schema
View data
View data
Flowchart
Approve all
Reject
Match
No match
Match

IP Address: 192.168.1.1
Port: 8080
Security key: Enter security key

Client data fields	
☑ Date	Match
☑ Amount	Match
☑ Description	No Match
☐ payment_mode	Match
☑ ID	Manual Match Suggested
☐ Currency Code	Manual Match Suggested
☐ Payment Method	Manual Match Suggested

Internal model fields	
☐ Transaction Date	Confirmed Match
☐ Amount	Match
☐ Description	None
☐ ID	Confirmed (AI Match)
☐ Currency	Manually Mapped
☐ Payment Type	Manually Mapped
☐ Customer ID	Manually Mapped

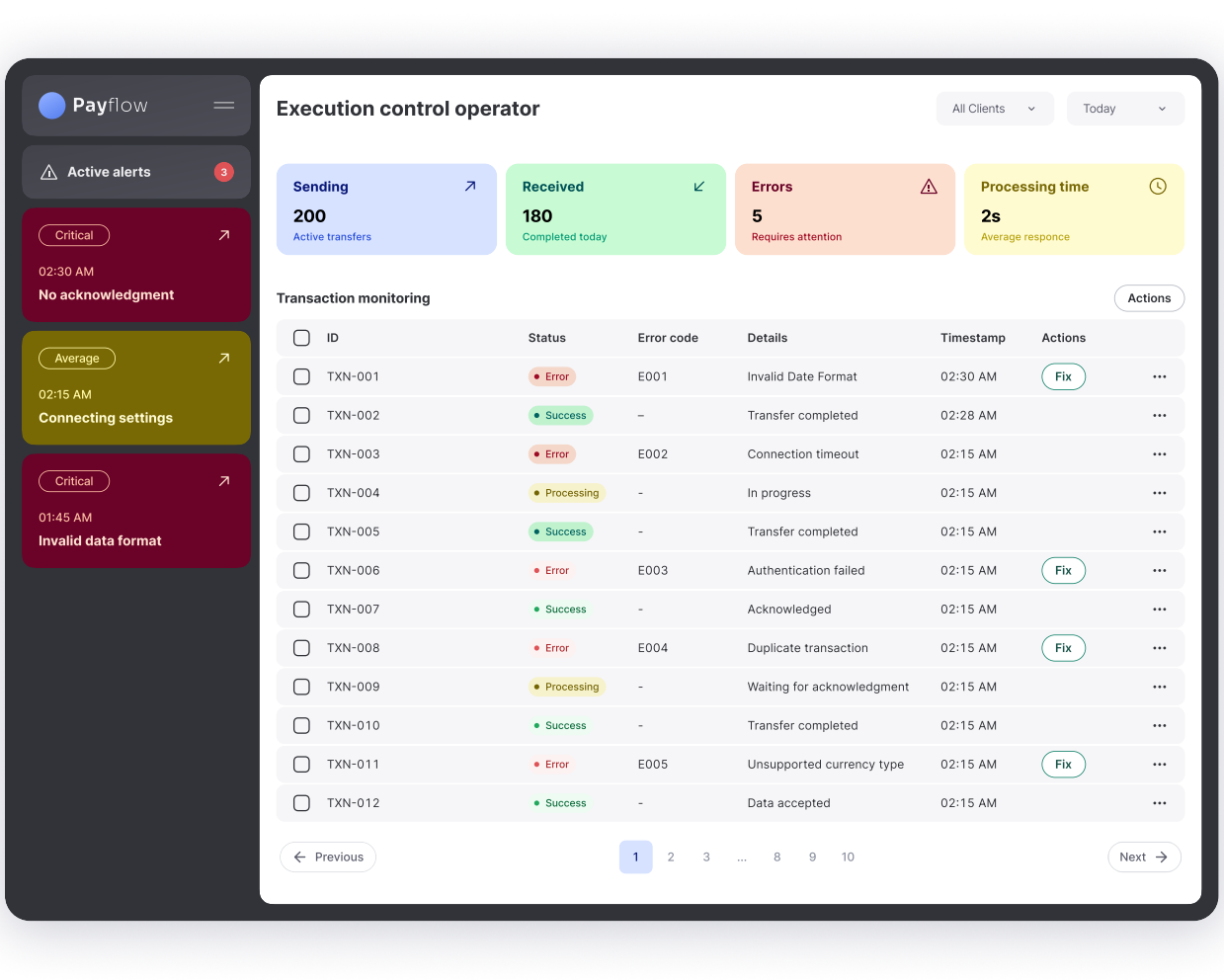
Flowchart: Date → Transaction Date; Amount → Amount; Description → Description; ID → ID

Execution Control Operator

The Control Operator interface is designed for managing integration execution, diagnosing failures, and resolving them promptly. Functions include:

- **Monitoring flow execution:** Real-time tracking of integration statuses: sending, receiving, acknowledgment, volume, and processing time.
- **Exception and failure handling:** On errors (e.g., no acknowledgment or security issues), the system logs events and alerts the operator. Diagnostics checks channel configuration, data format, and source/target availability.
- **Fallout management and root cause analysis:** If the consumer returns a file with unprocessed transactions (fallout), the operator investigates:
  - Error code viewing;
  - Structural issue analysis;
  - Problem documentation and description.
- **Correction and resending.** The operator can:
  - Manually adjust source data;
  - Resend corrected packages;
  - Mark the issue as resolved once addressed.

Execution Control Operator


Payflow
Active alerts
3
Critical
02:30 AM
No acknowledgment
Average
02:15 AM
Connecting settings
Critical
01:45 AM
Invalid data format
Execution control operator
All Clients
Today
Sending
200
Active transfers
Received
180
Completed today
Errors
5
Requires attention
Processing time
2s
Average responce
Transaction monitoring
Actions
Previous
1 2 3 ... 8 9 10
Next

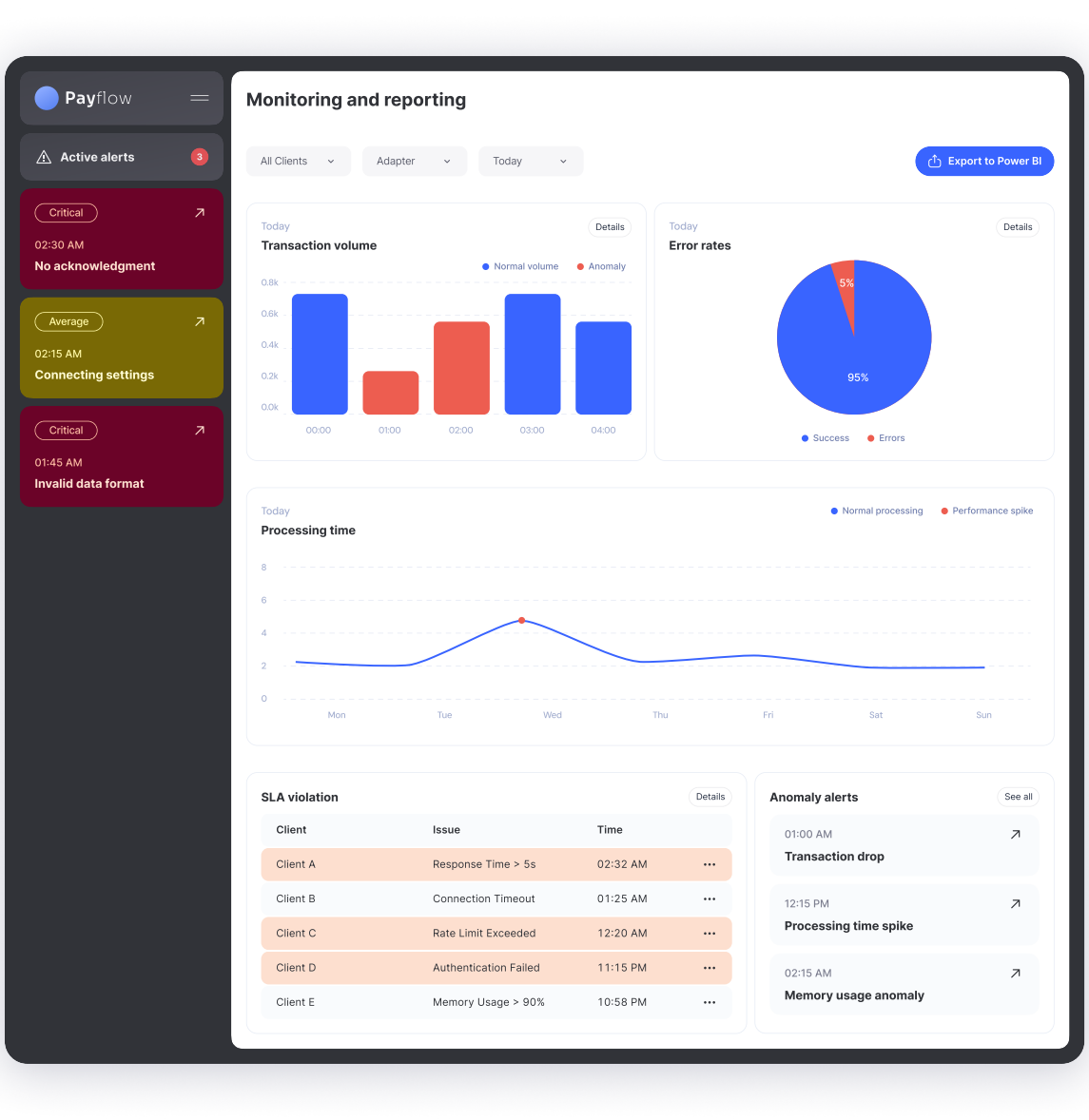
ID	Status	Error code	Details	Timestamp	Actions
TXN-001	Error	E001	Invalid Date Format	02:30 AM	Fix
TXN-002	Success	–	Transfer completed	02:28 AM	
TXN-003	Error	E002	Connection timeout	02:15 AM	
TXN-004	Processing	-	In progress	02:15 AM	
TXN-005	Success	-	Transfer completed	02:15 AM	
TXN-006	Error	E003	Authentication failed	02:15 AM	Fix
TXN-007	Success	-	Acknowledged	02:15 AM	
TXN-008	Error	E004	Duplicate transaction	02:15 AM	Fix
TXN-009	Processing	-	Waiting for acknowledgment	02:15 AM	
TXN-010	Success	-	Transfer completed	02:15 AM	
TXN-011	Error	E005	Unsupported currency type	02:15 AM	Fix
TXN-012	Success	-	Data accepted	02:15 AM	

Monitoring & Reporting

Interface for business users and operators monitoring overall platform efficiency:

- **Viewing key metrics (KPI):** Displays transaction volume, error rates, average processing time, integration statuses, and SLA violations.
- **Anomaly detection:** The system identifies anomalies (e.g., sharp transaction drops or failure spikes) and visualizes them on dashboards.
- **Report generation:** Aggregated reports across integrations and detailed views per client, adapter, or period are available. Users can filter, sort, and export data.
- **BI tool integration:** All data can be exported to external BI platforms (e.g., Power BI) for further analysis or presentations.

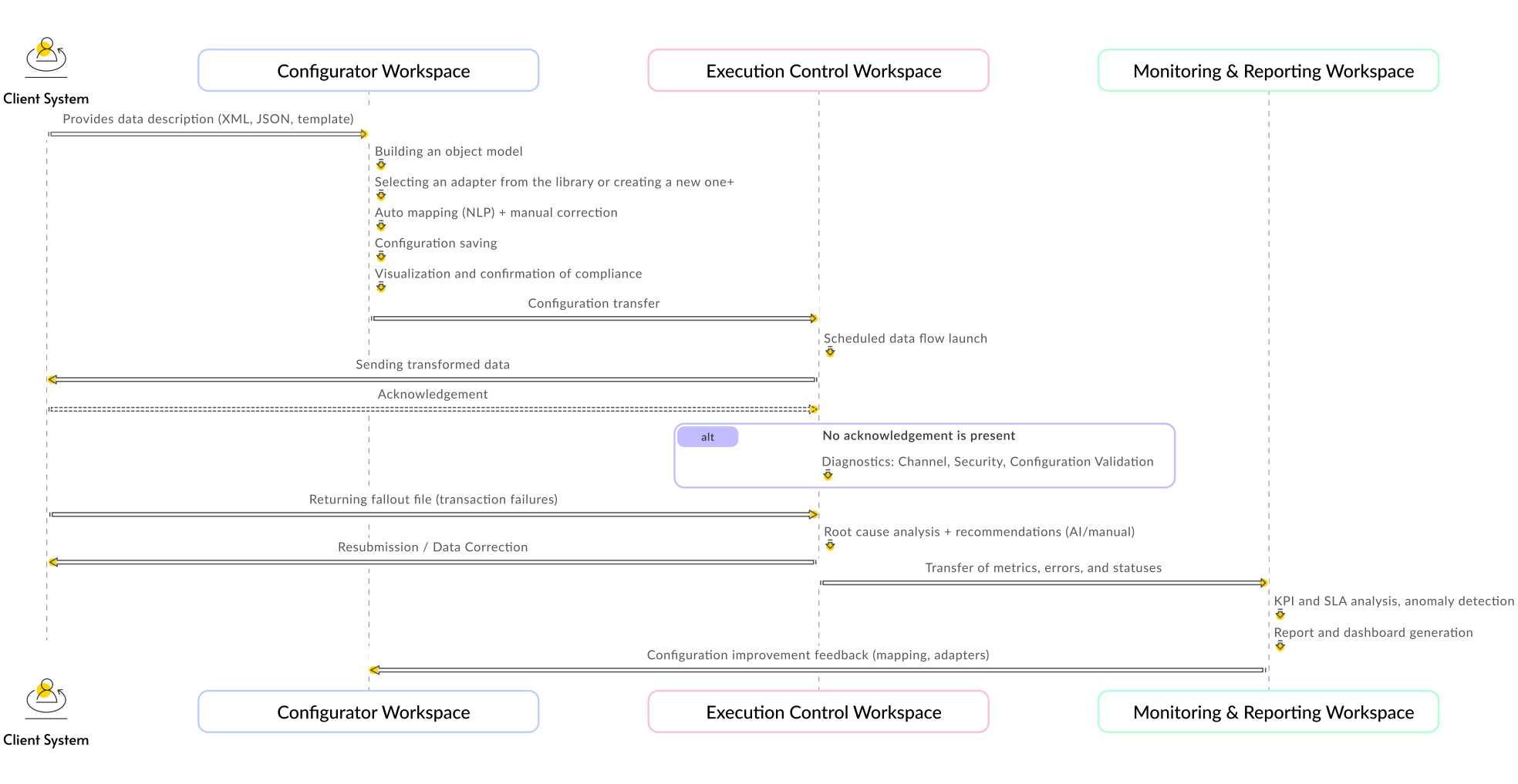
Monitoring & Reporting


Payflow
Active alerts
3
Critical
02:30 AM
No acknowledgment
Average
02:15 AM
Connecting settings
Critical
01:45 AM
Invalid data format
Monitoring and reporting
All Clients
Adapter
Today
Export to Power BI
Today
Transaction volume
Details
Normal volume
Anomaly
0.8k
0.6k
0.4k
0.2k
0.0k
00:00
01:00
02:00
03:00
04:00
Today
Error rates
Details
5%
95%
Success
Errors
Today
Processing time
Normal processing
Performance spike
8
6
4
2
0
Mon
Tue
Wed
Thu
Fri
Sat
Sun
SLA violation
Details
Anomaly alerts
See all

Client	Issue	Time
Client A	Response Time > 5s	02:32 AM
Client B	Connection Timeout	01:25 AM
Client C	Rate Limit Exceeded	12:20 AM
Client D	Authentication Failed	11:15 PM
Client E	Memory Usage > 90%	10:58 PM

Anomaly alerts:
- 01:00 AM Transaction drop
- 12:15 PM Processing time spike
- 02:15 AM Memory usage anomaly

Sequence Diagram


Client System
Configurator Workspace
Execution Control Workspace
Monitoring & Reporting Workspace
Provides data description (XML, JSON, template)
Building an object model
Selecting an adapter from the library or creating a new one+
Auto mapping (NLP) + manual correction
Configuration saving
Visualization and confirmation of compliance
Configuration transfer
Scheduled data flow launch
Sending transformed data
Acknowledgement
alt
No acknowledgement is present
Diagnostics: Channel, Security, Configuration Validation
Returning fallout file (transaction failures)
Root cause analysis + recommendations (AI/manual)
Resubmission / Data Correction
Transfer of metrics, errors, and statuses
KPI and SLA analysis, anomaly detection
Report and dashboard generation
Configuration improvement feedback (mapping, adapters)
Client System
Configurator Workspace
Execution Control Workspace
Monitoring & Reporting Workspace

Solution Architecture

The solution is based on a modular architecture covering the full data processing lifecycle — from initial configuration to the delivery of cleansed and transformed data to the target system.

Configuration Module

Allows rapid setup of mappings between external source structures and the internal data model:

1. Support for standard and custom templates
2. Automatic detection and mapping of file structures and fields for unknown sources
3. Manual editing and versioning of mapping configurations
4. Support for various connection types: FTP, S3, SOAP, REST, etc.

Ingestion Module

Executes transformations on actual data:

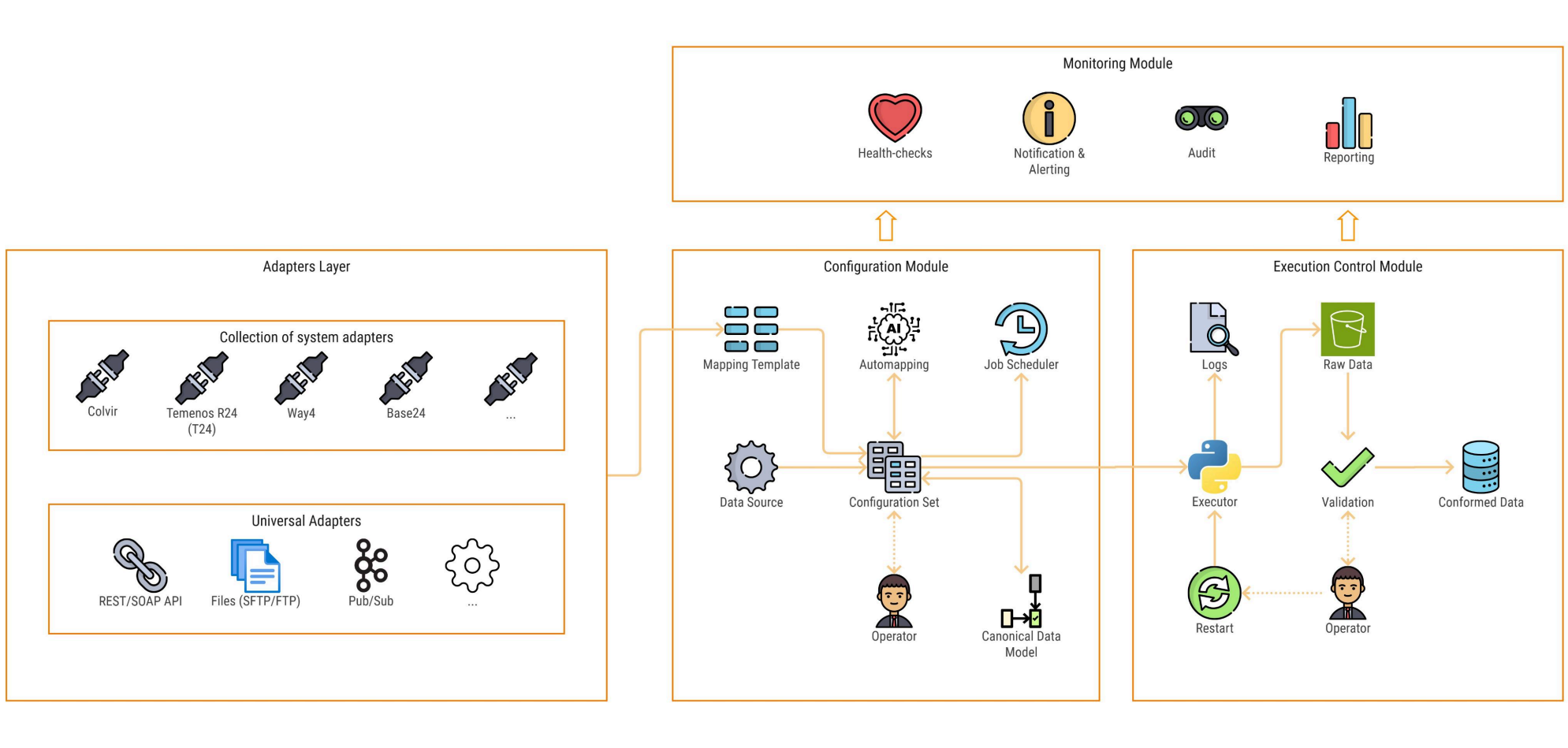
1. Activation of configurations and loading of data packages or files
2. Validation of incoming data structure
3. Conversion to the canonical model
4. Logging of each operation to track errors
5. Storage of both raw and transformed data for audit purposes

Formatting Module

Ensures data quality control, error diagnostics, and user guidance before loading into the canonical model:

1. **Result Visualization:** Users see the configuration status — successful or with errors — and can view detailed diagnostics.
2. **Error Detection and Warnings:** The system performs automated analysis to flag technical issues (e.g., source inaccessibility), structural mismatches, and data type or format inconsistencies. Non-critical issues generate warnings without interrupting the process.
3. **Recommendations:** For structural issues, the system suggests automated or semi-automated fixes — e.g., mapping schema adjustment to match actual data. The user can approve changes, prompting the system to create a new version of the configuration. Critical issues are accompanied by step-by-step guidance for manual resolution.

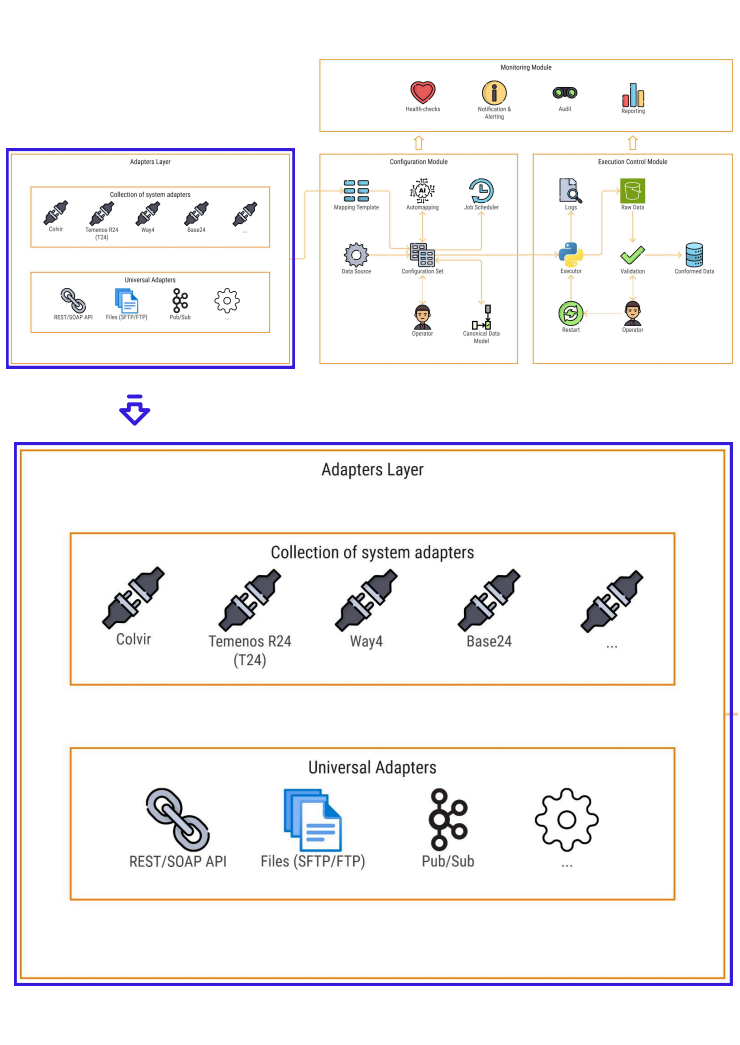
High Level Solution Architecture


Monitoring Module
Health-checks
Notification & Alerting
Audit
Reporting
Adapters Layer
Collection of system adapters
Colvir
Temenos R24 (T24)
Way4
Base24
...
Universal Adapters
REST/SOAP API
Files (SFTP/FTP)
Pub/Sub
...
Configuration Module
Mapping Template
Automapping
Job Scheduler
Data Source
Configuration Set
Operator
Canonical Data Model
Execution Control Module
Logs
Raw Data
Executor
Validation
Conformed Data
Restart
Operator

Adapters Layer

This layer serves as the entry point for all incoming and outgoing data, abstracting the technical complexities of connecting to diverse external systems. It is comprised of two distinct types of adapters:

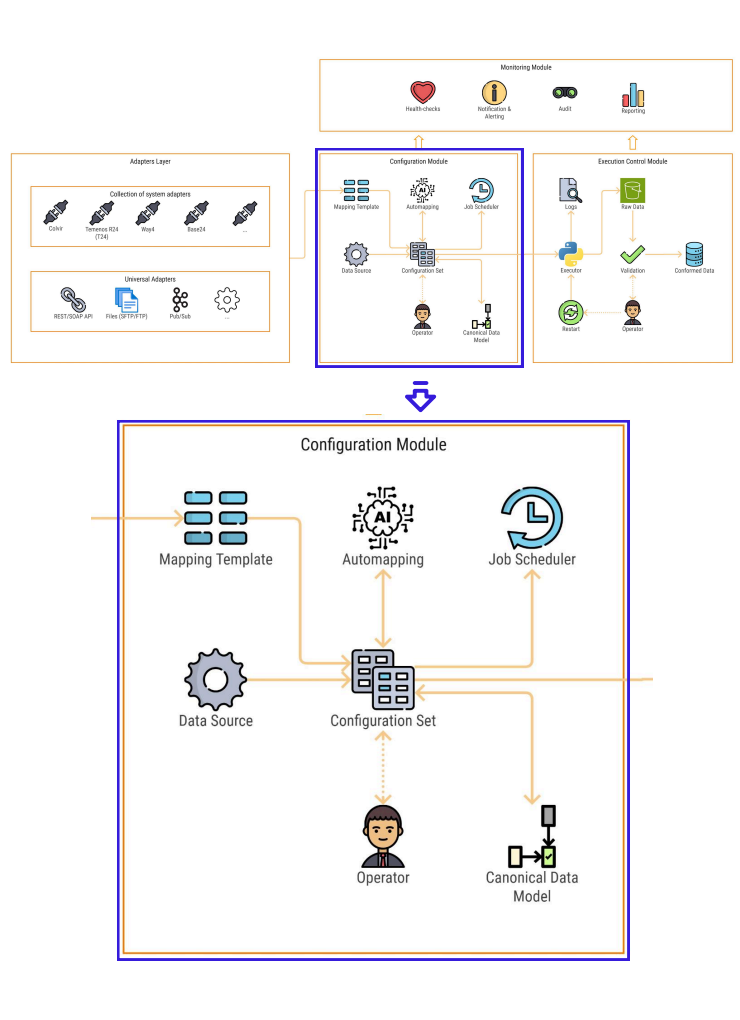
- **Collection of System-Specific Adapters:** This is a library of pre-built, out-of-the-box connectors for well-known financial and payment processing systems like **Calvir, Temenos R24 (T24), Way4, and Base24**. These adapters contain pre-configured mappings and logic for handling the specific protocols and data formats of these systems, enabling rapid, plug-and-play onboarding for partners who use them.
- **Universal Adapters:** This is a set of protocol-based connectors for standardized integration methods. It includes adapters for **REST/SOAP APIs, File-based exchange (SFTP/FTP), and Publish-Subscribe messaging queues (e.g., Kafka, RabbitMQ).** These are used when a specific system adapter is not available, allowing for flexible integration with any partner capable of communicating via standard protocols.


Adapters Layer
Collection of system adapters
Colvir
Temenos R24 (T24)
Way4
Base24
...
Universal Adapters
REST/SOAP API
Files (SFTP/FTP)
Pub/Sub
...

Configuration Module

This is the heart of the solution's intelligence, where integration logic is defined, customized, and stored. It empowers users to configure data flows without writing any code.

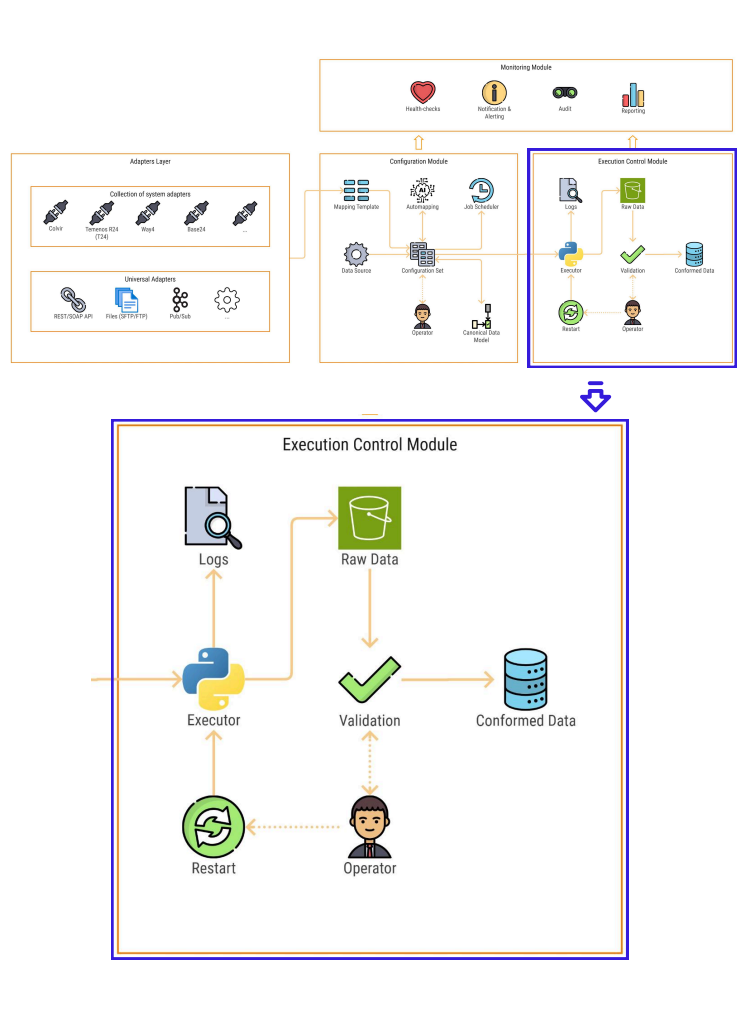
- **Data Source:** The starting point, where a user defines the source of data after selecting an adapter from the Adapters Layer.
- **Mapping Template & Automapping:** A visual interface for defining the transformation rules between the source data schema and the internal Canonical Data Model. To accelerate this process, an Automapping feature, powered by NLP algorithms, analyzes the source data structure and suggests probable field mappings. The operator can then confirm or manually adjust these mappings.
- **Configuration Set:** The final, version-controlled artifact that contains all the information for a specific integration: the chosen adapter, the data mapping rules, transformation logic, and scheduling parameters.
- **Job Scheduler:** A component for configuring the execution schedule for batch-based integrations (e.g., run daily at midnight).
- **Canonical Data Model:** A standardized, internal data model that represents business objects (e.g., transactions, customers) in a unified format. All incoming data is transformed into this model, and all outgoing data is generated from it, ensuring consistency for internal systems.
- **Operator (Configurator Role):** A user responsible for using this module to set up and maintain integrations.


Configuration Module
Mapping Template
Automapping
Job Scheduler
Data Source
Configuration Set
Operator
Canonical Data Model

Execution Control Module

This is the runtime engine of the platform, responsible for executing the integration jobs defined in the Configuration Module.

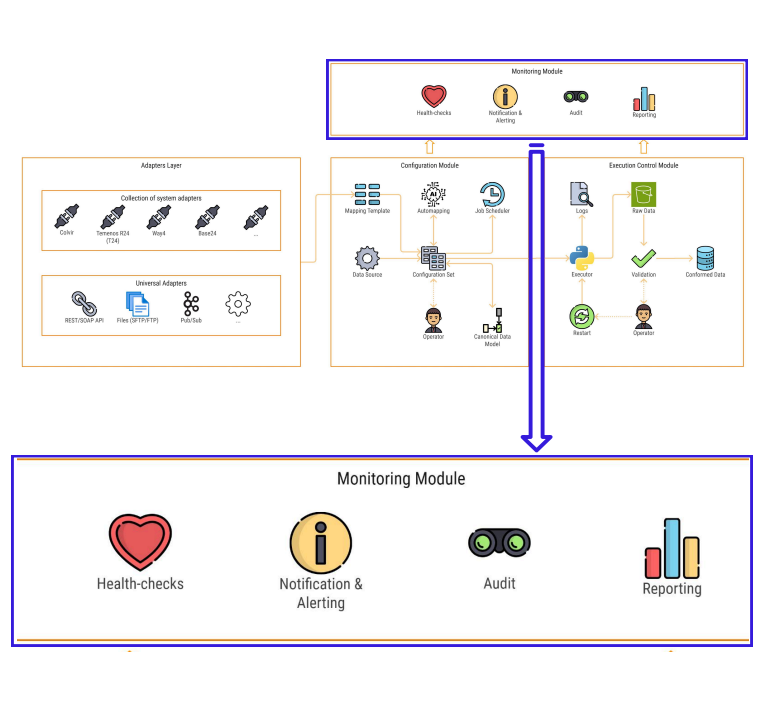
- **Executor:** The core processing engine (e.g., a Python-based service) that retrieves a Configuration Set and orchestrates the data flow
- **Process Flow:** The Executor processes Raw Data from the source, applies the defined transformations, and runs it through a Validation engine to check for correctness and integrity.
- **Conformed Data:** Successfully validated and transformed data that adheres to the Canonical Data Model. This clean data is then delivered to the appropriate internal systems.
- **Logs:** The module generates detailed logs for every step of the execution, providing full traceability for debugging and auditing purposes.
- **Operator (Execution Control Role):** In case of failures (fallouts), an Operator is notified. They can use this module to analyze logs, diagnose the root cause of the failure, and trigger a Restart of the process once the issue is resolved.


Execution Control Module
Logs
Raw Data
Executor
Validation
Conformed Data
Restart
Operator

Monitoring Module

This module provides comprehensive, platform-wide oversight to ensure operational stability, compliance, and business performance. It aggregates data from all other modules.

- **Health-checks:** Proactively monitors the status and availability of all platform components and connections.
- **Notification & Alerting:** Automatically sends alerts to operators in case of execution failures, performance degradation, or security anomalies.
- **Audit:** Provides an immutable audit trail of all actions performed on the platform, including configuration changes and data processing events, to ensure compliance.
- **Reporting:** Offers dashboards with key performance indicators (KPIs) such as transaction volume, error rates, and SLA compliance. It allows for the generation of detailed reports and can export data to external BI tools like Power BI for further analysis.


Monitoring Module
Health-checks
Notification & Alerting
Audit
Reporting

Key Outcomes & Results

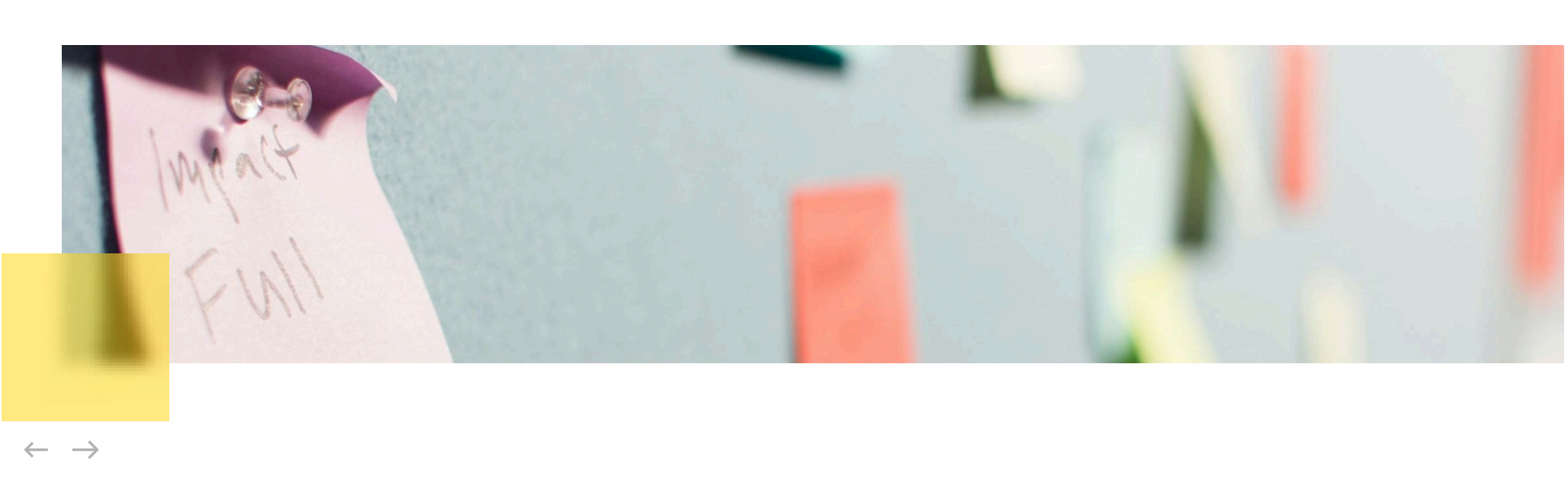
Implementing the Data Transformation Layer delivers strategic advantages:

- Up to 70% reduction in integration development efforts;
- 3–5x faster partner onboarding;
- A unified processing standard for all data types and sources;
- Improved resilience and data processing accuracy;
- End-to-end quality control from source to output;
- Audit readiness and compliance with regulations (KYC, AML, etc.);
- High scalability: new providers can be connected or rules adjusted without code changes.

Recommendations

To maximize impact and ensure successful adoption:

- Prioritize integration segments with high data variability (e.g., banking systems, ERPs, API-based partners);
- Implement version control for mappings and a centralized template repository;
- Provide operational teams with low-code configuration training;
- Enable anomaly detection and automated alerting;
- Treat the template repository as a strategic asset.



Summary

In today's landscape of high-frequency and high-sensitivity data exchange, traditional integration models are no longer sustainable. The Data Transformation Layer emerges as a mission-critical component of modern digital infrastructure—enhancing adaptability, enabling rapid scale, and reinforcing operational stability.

Shifting from fragmented integrations to standardized, governed data transformations is not merely a technical upgrade—it is a foundational step toward a mature and agile digital operating model. DTL becomes an integral part of the company's digital core, enabling transformation across value chains, strengthening customer trust, and accelerating responsiveness to evolving market demands.

An additional advantage is the solution's readiness for AI integration: tasks such as anomaly detection, recommendation generation, and auto-formatting can be delegated to intelligent agents. This opens opportunities for configuration automation and adaptive processing scenarios, including personalized recommendations and self-learning data transformation models.

Thank you and...

Let's build seamless solutions together!