

# ALTAIR® MONARCH® - ENTERPRISE-CLASS DATA TRANSFORMATION

Altair® Monarch® is a comprehensive, self-service data transformation and process automation solution. It connects directly to a wide range of structured and semi-structured data sources, including PDFs, text, complex spreadsheets, JSON, XML, big data sources, relational databases, and many others. Business users and analysts can extract, cleanse, and transform data into consistent, governed, and secure rows and columns without specialized knowledge or training, and without writing any code. The platform includes more than 80 pre-built data preparation functions which makes it easy to build new error-free workflows in minutes.

Monarch incorporates patented report trapping technology and is built on more than 30 years of experience. No matter the source or format, business users can extract data in seconds into rows and columns for analysis.

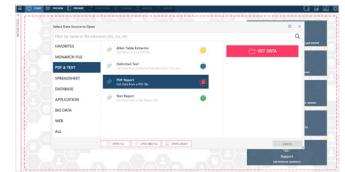
## Data Preparation: The First Step in Any Analytics Project

Analytics projects begin with data preparation. They often use data from many sources to solve complex problems. Raw data usually contains errors and inconsistencies. In order to produce accurate reports and/or reliable artificial intelligence (AI) and machine learning models, it is critical to start with clean, consistent information.

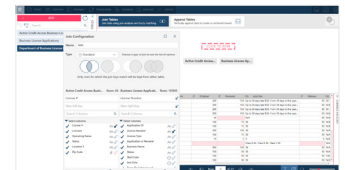
Data preparation is the iterative, agile process of exploring, collecting, and manipulating data into a form suitable for analysis (reporting or processing) by cleaning and often combining or consolidating data into one file or data table. Data preparation includes transforming raw data into curated (and ideally secure) datasets for operational processes, AI and machine learning, data visualization, and business intelligence applications.

Typical challenges to efficient data preparation workflows include:

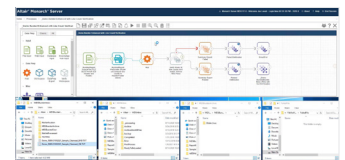
- Limited access to data sources and dependency on IT for access to datasets
- Difficulty combining data from multiple sources with data stored in different formats and organized according to different paradigms
- Data originating from manual data entry processes which may contain inconsistent errors
- Semi-structured sources like PDF documents, web pages, and reports from enterprise and cloud-based applications



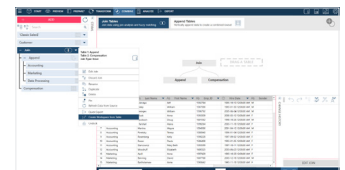
Extract data directly from PDFs, spreadsheets, and text files as well as SQL databases and Big Data repositories.



Join and cleanse data from disparate sources. Redact fields and rows, generate calculated fields, and apply filters.



Burster node unbundles files, detects errors, and distributes results.



Centralized data management and automated workflows streamline bulk data processing and report distribution.



### Data Quality is Critical

In data analytics, everything boils down to the quality of the data. Low quality data leads to poor decisions unsupported by the facts, inaccurate AI-generated predictions, missed opportunities, and the sudden emergence of unexpected threats. Data quality issues can also impact the organization's ability to meet key objectives, which in turn reduce profitability and growth. For example:

- Manufacturing plans may go awry due to inaccurate logistical and inventory information.
- Marketing may annoy customers by repeatedly sending the same messages to the same people because their contacts details were stored a bit differently in separate records. Such errors also run the risks of violating privacy and contact clauses in client contracts or sending conflicting marketing messages.
- The organization may incur fines or other costs related to its inability to comply with privacy regulations like GDPR.
- Accounting reports may present conflicting results.
- Sales projections generated by machine learning models may indicate the wisdom of increased advertising, but faulty data will make the predictions unreliable.
- Buyers can rely on models predicting the future price of raw materials only if they can be sure the data feeding the model is valid.
- With poor quality data inputs, AI and machine learning algorithms and automated workflows can be worse than useless; they can often “speed up the mess.” Such tools can add value only when they are fed complete, consistent, and error-free data.

### Create Audited Data Transformation Workflows

Monarch's tools support clear audit trails that make it difficult or impossible to “game the system.” Monarch's audit trail records a timestamp for each change to objects, including the author, editing and deletion of templates, fields, filters, sorts, summaries, and more. This transparency is vital to ensuring that the ongoing quality of the data preparation process. If errors do show up, Monarch's traceability makes it simple to figure out what happened and what, if any, downstream processes might have been affected.

This traceability makes a workflow more robust and sustainable over time, even after the people who developed it are no longer available, and easier to explain to auditors, regulators, and executives.

By design, Monarch's auditing functions **cannot** be disabled.



San Bernardino County's school system use Monarch to handle self-service data preparation tasks, including those related to payroll, healthcare, HR, and Freedom of Information Act requests. In some instances, they estimate they save the equivalent of four days of employee time every month for the payroll applications alone.



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## Data Transformation with Zero Coding

Monarch's code-free approach to data preparation means people with many different skill sets can connect to many different data sources, and quickly cleanse, blend, and transform those sources into trusted and accurate data. Allowing more people to work with the organization's data enables them to discover new insights and solve more complex problems in less time.

People who understand that business and the contexts in which the data will be used are best positioned to prepare the data. Altair's self-service approach to data prep supports the production of better-quality outputs and increased productivity. Businesspeople can start using Monarch in a few minutes without knowing anything about Python, R, or other programming tools. They can develop fully customized workflows that are easy for anyone on the team to maintain or adapt to support the requirements of new data prep projects. They can also build larger data pipelines quickly rather than wasting time processing lots of sample datasets to debug a custom program.

- Create complex joins through a menu-driven user interface with no coding
  - Inner
  - Outer
  - Right
  - Left
  - Lookup
  - Negative
- Redact fields and rows as needed
- Generate calculated fields
- Build and apply filters on demand
- Generate summaries
- Pivot and unpivot datasets
- De-duplicate records across multiple datasets

## WHERE MONARCH HELPS

### Reconciliation

Leverage automated workflows that minimize human interaction across the enterprise and automates reconciliation tasks. Consolidate thousands of reports and spreadsheets, standardize reporting formats, and improve forecasting. Seamless integration with robotic processing automation (RPA) helps financial services drive out inefficiencies from back-office operations and reduces costs.

### Fraud Detection

Raw data arriving in PDF or text-based reports from clients and external systems can create confusion due to double-payments, cash or billing schemes, or other types of corporate fraud. Altair data preparation solutions can automate the extraction and transformation of data from these data formats and apply advanced fraud detection techniques such as Benford's Law or the relative size factor (RSF) tests.

### Automated Regulatory Reporting

Agencies such as the Consumer Financial Protection Bureau, the Department of Health & Human Services, the Federal Reserve, and the National Credit Union Administration require firms to provide detailed reporting elements that include current and past data points. It is common for report outputs from legacy systems to be generated as PDF files. Monarch automates the extraction of required information, allowing organizations to access and clean information previously locked in PDF files, and combine it with other sources of data such as XML, HTML, text, spool, and ASCII files containing invoices, sales reports, balance sheets, and more.



Icicle Seafoods, one of the largest and most diversified seafood companies in North America, uses Monarch to access data stored in PDFs and other inaccessible file types. This enables them to automate the extraction and preparation of data, and then generate daily, weekly, and ad hoc accounting reports that had previously required excessive amounts of time-consuming manual work.

## Robotic Process Automation (RPA)

Using RPA to handle rules-based processes gives business users the ability to spend more time with customers or handle other high value work. Implementing RPA, however, requires solid process design, governance, and, above all, trusted data inputs. Without good data to feed an RPA workflow, the costs of catching and mitigating repeated errors can grow exponentially. Monarch helps eliminate the need to re-key data and human error in accessing, blending, and cleaning data, making it a perfect fit for RPA.

Monarch's no-code data preparation capabilities enable people with any level of skill and training to access and transform data for better decision making.

- Extract data from Microsoft® Excel® workbooks containing multiple worksheets, merged cells, specialized casing, conditional formatting, and other complex structures into clean rows and columns.
- Use Monarch's patented PDF extraction engine to convert even the most complicated PDFs into clean structured data files.
- Cleanse and transform data using a library of pre-built functions — no coding required
- Join datasets to enrich analytics.
- Build trust in analytics source data with auditable change histories and clear data lineage tracking.
- Export data to reporting, analytics, or visualization tools.
- Automate repeatable data extraction and transformation processes.
- Automate feeds to Oracle, SQL Server, DB2, and most other data integration tools.

## Data Transformation for the Enterprise

- No-code, pattern-driven data capture of reports and text files is stored in virtually any format, from spreadsheets to PDFs to ODBC-compliant databases.
- Save transformation models, filters, joins, sorts, external lookups, and exports into reusable automated workflows.
- Build complex joins quickly through a menu-driven interface and eliminate the need to create code-intensive SQL joins.
- Handle any type of text encoding, including EBCDIC.
- Connect to remote or local data sources.
- Work with multiple models in the same workspace to build robust workflows
- Use Monarch's Rest API to enable external systems to kick off and control automated workflows.
- Summary tables provide multiple views of to foster better understanding of how the system is transforming raw semi-structured data into analytics-ready clean, structured records.



The US Naval Academy uses Monarch to improve the accuracy and fidelity of accounting data and automate complex, high-risk manual business processes. Monarch's ability to acquire, join, associate, cleanse and combine information from separate data sources, including live databases, enables training coordinators and financial managers to focus more higher value tasks while ensuring efficient operations and reporting.

Major financial services, manufacturing, government, education, and retail organizations use Monarch to extract data locked in mainframe reports and other difficult-to-access sources for efficient analysis of accounting, customer service, production, and warranty data.