EcOS
(Economic Outlook Suite)
The International Monetary Fund (IMF) is an international organization working to promote international monetary cooperation and exchange stability; to foster economic growth and high levels of employment; to provide temporary financial assistance to countries for easing balance of payments adjustment; and to formulate and promulgate international standards, guidelines, and best practices related to financial statistics.

Description

As the flagship publication of the IMF, the World Economic Outlook or WEO presents analysis and projections of economic development and the impact of economic policy issues at the global level, in major country groups, and in many individual countries.

The content of the WEO relies upon complex algorithms refined over time and substantial amounts of global economic data. To meet the increasing demands of the models and to streamline data-collection procedures, the IMF turned to Prognoz for assistance. The result was EcOS, the Economic Outlook Suite: a customized application for collecting, processing, and modeling global economic statistics.

Today, all five of the IMF’s regional area departments, comprising over 700 users, are leveraging the power of Prognoz software to collect and process data.
ADVANCED TECHNOLOGY

EcOS benefits from the advanced technological capabilities of the Prognoz Platform:

- EcOS comes with a built-in IDE, providing all necessary tools for data collection, processing, and analysis.

POWERSFUL CAPABILITIES

EcOS offers an extensive feature set to provide benefits such as the following:

- With the Prognoz Platform’s built-in transformation and modeling tools, IMF users can transform and calculate various ratios much more easily and generate reports for display in print.

IN-DEPTH VIEW

Built on top of the Prognoz Platform, EcOS offers a set of tools for streamlining the preparation of data and metadata. EcOS users can work together to collect, process, validate, transform, review, and revise their data—all within the solution.

DATABASE DESIGNER

EcOS provides a common toolset and interface to support diverse data, metadata, and reference repository needs. This data management component includes tools for data collection, data analysis, data transformation, data validation, and data dissemination (to both internal and external users).

Metadata support is a built-in feature of the data management software. For any given data item, data series, or database within EcOS, all relevant statistical metadata—including definition, original source, data quality, methodology, and reference data for comparison or context, among other types—is accessible by any authorized login.

In particular, EcOS can:

- IMF analysts can work with data and metadata simultaneously using efficient visualization tools and change data values in real time.
- The Process and Collaboration Engine enables IMF analysts to share system objects, including validations, transformations, and so on, which facilitates connected processes and helps to eliminate production bottlenecks.
- EcOS leverages to the maximum extent possible the collective intelligence of the IMF’s economists, departments, and Executive Board in the preparation of tables, graphs, and charts. All tables based on predefined templates are available both in Word and Excel format via the internal Web site of the IMF’s Research Department.
- Metadata support is a built-in feature of the data management software. For any given data item, data series, or database
Description

- Provide the capacity to store and report on country data that is captured at the sub-national level
- Allow storage and representation of missing values as non-numerical NULLs
- Support the specification of custom metadata attributes
- Log and monitor data and metadata transformation history
- Support metadata hierarchies
- Allow for the specification and distinction of raw and derived series
- Enable users to edit, save, duplicate, and share metadata
- Enable administrators to set and modify user permissions relating to the use and access of data and metadata

TIME SERIES DATABASES AND METADATA TOOLS

Time series databases, metadata dictionaries, and attributes are core concepts of data management within Prognoz. The Prognoz Platform provides built-in support for time series databases and various metadata types such as structural, referential, time series, and observation-level metadata.

The Metadata Definition Tool of EcOS allows for the centralized management of structural metadata and metadata dictionaries in a single convenient user interface:

- Create arbitrary metadata dictionaries with integer, decimal, and text fields
- Establish links between metadata dictionaries
- Organize metadata items into groups and hierarchies
- Define metadata constraints such as unique and required fields
- Trace dependencies between metadata elements

DATA COLLECTION

EcOS offers a flexible, efficient, and reliable data collection toolkit to accommodate different formats from various sources. IMF analysts can collect multiple sets of data for the same indicators from different data sources and subsequently combine the most plausible data to create a set of consolidated, logical, and complete datasets. If needed, analysts may also collect metadata from external official sources and import them into EcOS. Data import and export wizards and Excel add-ins are readily available within the solution for an easy data-in and data-out process.

EcOS users can:

- Work with multiple input and output formats, including Excel (XLS, XLSX), Access (MDB), XML, CSV, EViews, and FAME
- Exchange data with other data providers and government agencies via SDMX (Statistical Data and Metadata Exchange)
- Request data and metadata from multiple data sources to populate one or several destination databases with complete metadata mapping control
- Edit, save, duplicate, and share source specifications and collection template specifications
- Collect data using previously saved data collection templates
DATA ACCESS, ANALYSIS, AND VISUALIZATION

Designed to provide superior means for interacting with data and metadata and improving the assessment of data quality, EcOS allows for easy data access and visualization:

- **Easy facet navigation through datasets and time series with data filtering and sorting options**
- **Excel-like interface for viewing data and working with time series and cross-sectional data**
- **Coordinated table and chart data visualization**
- **Ability to view data from multiple datasets on the same table and chart**

EcOS is also equipped with a rich set of out-of-the-box data analysis tools for advanced data exploration and analysis purposes:

- **Perform cross-dataset, cross-frequency, and cross-version analysis**
- **Conduct ad-hoc calculations, data transformations, and statistical analysis in real time, so that specified calculations and transformation functions automatically execute when any element of the dependent data is updated by the user or by the system itself**
- **Analyze the components of any built-in function or formula to identify anomalies or large revisions in the component data**
- **Work with the coordinated metadata and data display in table and chart form**
- **Make use of workbooks for convenient data viewing and sharing purposes**
- **Print and export tables and charts to external formats**
DATA VALIDATION

EcOS supports data quality assessment and monitoring processes by providing a set of robust tools for validating and analysing large volumes of historical, current, and forecast data at various levels. Built-in data validation tools enable users to identify inconsistencies and discrepancies in the data:

- Specify and apply validation filters to identify missing data, data discrepancies, statistical outliers, and inconsistencies in cross-frequency, cross-country, or cross-version data
- Specify and apply custom validation filters that make use of logical and comparison operators
- Associate a severity level to each validation filter
- Run validation checks and view results in the form of diagnostic reports that include summary information for easy analysis
- Overlay results of one or multiple validation filters on top of a visual display of data
- Navigate through the identified exceptions and view any documented explanations for them
- Document valid exceptions by providing additional explanatory metadata
- Edit, save, duplicate, and share validation filters and diagnostic reports
- Specify multiple groups of validation rules to run on different datasets
- Invoke data validation tests on demand, on schedule, or according to a specific event in the workflow process
- Easily access and review previous validation test results which are automatically stored for user’s convenience

DATA TRANSFORMATION

In addition to providing exploratory data analysis, EcOS supports the statistical and analytical editing and transformation of the data. A built-in data transformation engine and a library of statistical functions enable IMF analysts to process and transform data into high-quality derived data products:

- Effortlessly edit data and metadata manually
- Access a set of built-in arithmetic, time series, and analytical functions supporting standard statistics, correlation, normalization, splicing, weighting, aggregation, regression, interpolation, and extrapolation of the data
- Derive time series through transformation of component time series (with derived data and metadata support)
- View ad-hoc transformation results as well as the input components in table and chart form
- Construct parameterized transformation routines with identities and aggregation methods for execution on demand, on schedule, or according to an event in the workflow process
- Make use of branching conditions, repetition conditions, and nested functions to construct complex transformation routines
- Automatically document all data and metadata transformations with system feedback and alerts during the transformation process
- Trace transformation history of any data element
- Step through and perform incremental execution of transformation routines
- Perform debugging by suspending the execution of a transformation routine at user-defined breakpoints and, if necessary, make manual edits to the data or metadata before resuming or aborting the execution
- Edit, save, duplicate, and share transformation routines
- Apply version control over transformation routines

Description
MODERN TOOLS

The Prognoz Platform incorporates a huge library of mathematical and statistical functions, including:

- Basic mathematical operations
- Time series calculations, such as percent change (period-over-period, year-over-year, annualized), logarithmic difference, lead and lag, moving averages and sums, truncation, extrapolation, and splicing
- Cross-frequency operations, including collapse and interpolation
- Smoothing and seasonal adjustment, including X12, TRAMO/SEATS, exponential smoothing, and band-pass filter
- Linear and non-linear regression analysis
- Aggregation, for aggregate data across regions, industries, sectors, and so on

DATA VISUALIZATION AND DISSEMINATION

EcOS comes with a report designer:

- Create pixel-perfect reports containing data tables, charts, and maps in an Excel-like interface with formula support
- Make use of parameterized reporting capabilities to design one report template for multiple purposes
- Export to commonly used dissemination formats, including Excel, PDF, Word, HTML, and PPT
- Batch-generate and print multiple reports on demand, on schedule, or according to an event in the workflow process

Results of the implementation of the system

EcOS also provides enhanced data dissemination mechanisms for the automatic generation of high-quality system outputs using various methods of data and metadata visualization. Tables, graphs, and maps highlight trends, anomalies, and areas of concern. Key country indicators in the form of precompiled reports provide a useful vehicle to assess a situation at a glance and serve as a forum for formal production reviews.