

An Epicor® White Paper

Epicor ERP 10— Reaching Out: Connected ERP



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Introduction

For businesses whose operations increasingly span the globe, connectivity is not an option but a strategic imperative. One of the reasons for this is the accelerating pace of change and innovation driving market demand. Markets are inherently dynamic, often volatile, and supply networks that are widely dispersed and highly nuanced need to access information as it emerges, when it emerges, accurately, anywhere. This is necessary for operational efficiency, but also for effective collaboration, meaningful analysis, and supported decision-making.

In this fluid environment, companies are also changing more rapidly—growing organically, acquiring new products and services, and taking on new partners (and dispensing others) to increase the power and value of their supply chains.

What does this mean for ERP? First, it must be easily integrated with services from any source and data in any format. It must not only support the elimination of siloed information that has been the bane of many an organization, but also go beyond its transactional roots to empower and connect “information workers” wherever they exist in an organization, either formally or informally. For ERP, this means flexible integration: a move beyond permanent, formal EDI connections to the further ability of seamless connectivity at the business level on an ad hoc basis as well as through standardized methods.

For Epicor ERP 10, connections to other systems and data take many forms. For example, ERP 10 has nearly 1,400 services that interact with callers through over 20,000 operations. Operations are the primary way ERP 10 conducts business, usually by conversing with the ERP 10 Client Application, mobile devices, or browser forms. However, there are other ways to engage Epicor ERP 10, including interfaces designed for bulk data import/export through flat structures or EDI formats. ERP 10 also allows users to define ad hoc data views, which are convenient slices of information that can be visualized and updated in dashboards or used as easily invoked APIs.

Many ERP customers have multiple establishments (i.e., offices, plants, warehouses) and sometimes multiple ERP instances (Peer ERP). Epicor ERP 10 can federate these instances together to form a single-enterprise ERP system. Federated ERP is loosely coupled, which means resource data such as customer and part records do not require complete synchronization.

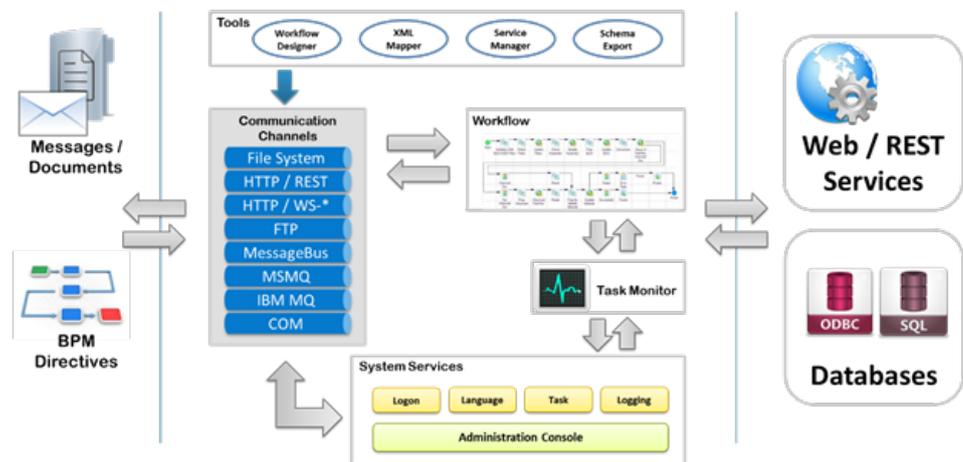
All these approaches to reaching out to other systems and data are available through Epicor ERP 10. It has the capability to manage high throughput shipping transactions for distributors, business workflows that automate complex interactions with partners, or even a simple data entry form from any device. ERP 10 is designed to provide the right tool for the right task, anywhere in an organization’s value network.

Services Orchestration

Orchestration—a term first coined by systems integrators—means enlisting and managing multiple systems involved in a complex business process. Most integrations can't be accomplished simply by "having system X call on system Y," especially if these systems are from different vendors or on different platforms. Usually, the data format expected by one system is not the same format as the data emitted by the other. In many cases, the processing required depends on the contents of the data being passed. It is also likely that completing a business operation can require multiple round trips between systems.

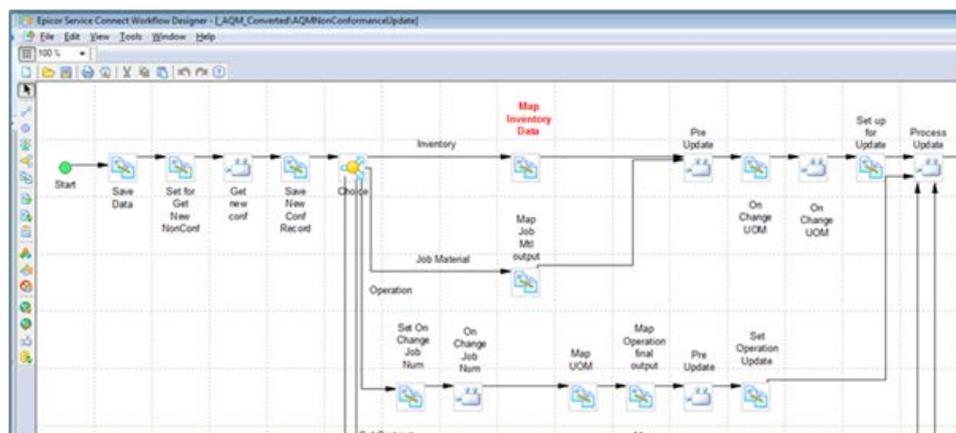
Epicor Service Connect

Epicor Service Connect (ESC) is a services orchestration toolkit designed and optimized for handling complex interactions between Epicor ERP 10 and other systems. ESC is architected around the notion of channels that accept and emit data using various means (e.g., email, message queues, file drop locations, or Web services). When a channel receives a message, Epicor Service Connect invokes a workflow designed by an administrator that can transform the data, call ERP 10 service operations, and optionally return data via another channel. Epicor Business Process Management (BPM) directives can also invoke ESC workflows.



ESC Architecture

ESC workflows are created using the Workflow Designer Tool, where users can drag activity tiles onto the design surface. Workflow activities execute common tasks such as evaluating data and making decisions, transforming data from one format to another, mapping data to ERP 10 service operations, and accessing data from a variety of sources.



ESC Workflow

Each arriving message kicks off an instance of the workflow bound to the message's type and the channel where it is received. The Service Connect Administration Console is used to track and manage workflows, view the workflow history, and sometimes resolve problems. Workflows and activities can also be set to execute at specific times or recurring intervals for situations that require polling external systems for relevant changes.

Master Data Management

Managing operations for multiple companies and continuously sharing data across companies is very challenging, especially when each company uses different item codes or customer numbers. This is especially common for manufacturers who have acquired production sites, but have not fully integrated their resource data.

Epicor ERP 10 Master Data Management (MDM) is a comprehensive data sharing system specifically designed for complex data synchronization scenarios. ERP 10 supports company partitions within each instance. External companies can also be defined, which enables the Master Data Management capabilities to keep information between local company databases and external companies being coordinated. MDM communicates between local and external companies either directly at the database connection level or through Microsoft ServiceBus, which is recommended for widely distributed ERP instances.



Epicor ERP Master Data Management Components

Shared tables define which database tables are to be synchronized between systems. Tables can be partially shared, meaning that some table values can be locked down while other values can be independently owned or managed within each company. For example, a customer billing address and payment terms can be read-only for subscribing companies, but other values such as shipping preferences can be edited.

Records also pass through a data cleansing/translation process that allows identifiers and values to be modified to match local requirements. This feature is used to translate attributes such as terms and commodity codes within order and part records to match the subscribing data.

Epicor MDM also features a conflict resolution system. Records that cannot be synchronized are held in suspension until they are reviewed. ERP 10 shows disputed records in the appropriate form to allow users to fix values or otherwise disposition the conflict. Once the record is saved and re-processed, the conflict is resolved. Epicor ERP 10 multi-company and MDM features work together to make inter-company transactions easier to complete. For example, material transfers between warehouses belonging to different companies can automatically generate “arms-length” sales/purchasing transactions to ensure that revenue, tax, and other governance is correctly followed.

Business Activity Queries

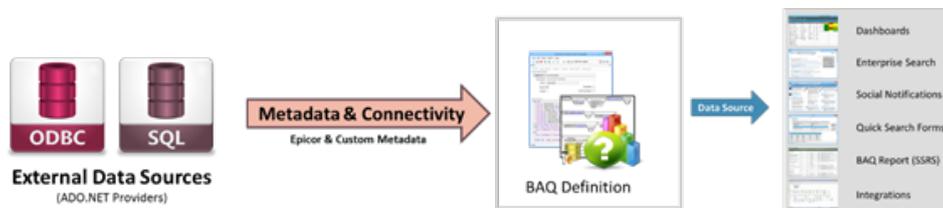
Business Activity Queries (BAQ) are a foundational feature of Epicor ERP 10 that provides data-driven integration capabilities. A BAQ is a data view definition that can be defined once and then run safely by users and integrators. BAQs bridge between data and process security aspects automatically. When executed, they only expose data the current user is allowed to see. ERP 10 secures all tables and columns by assigning access rights to users and groups. Further, ERP 10 has a number of other global security partitions that are enforced by the BAQ system (e.g., company, plant, department, and territories).



BAQ Anatomy

Business Activity Queries can also be used to enable complex integrations. BAQ definitions can be marked as updatable (i.e., a “UBAQ”), which means that not only will the BAQ return queried data, but the BAQ service will accept changes to that data. Data sent to the server via an updatable BAQ is automatically analyzed and then routed to the appropriate ERP 10 application service or sequence of services to ensure all required validations, security, and business logic are correctly applied. These features allow BAQs to form new data-driven APIs that can be much easier to use than directly programming calls to ERP 10 services.

Updatable BAQs can be easily bound to dashboards to create powerful data entry forms. External Business Activity Queries (EBAQ) can be defined for data sources beyond Epicor ERP 10. EBAQs can be connected to any SQL Server or ODBC data source. The BAQ query designer will use inherent metadata from the data source to help administrators create complex queries. ERP 10 allows administrators to create local metadata to document available tables and fields or link related tables automatically. Just like a native BAQ, external BAQs can drive dashboards or be executed as part of a BPM or Service Connect workflow.



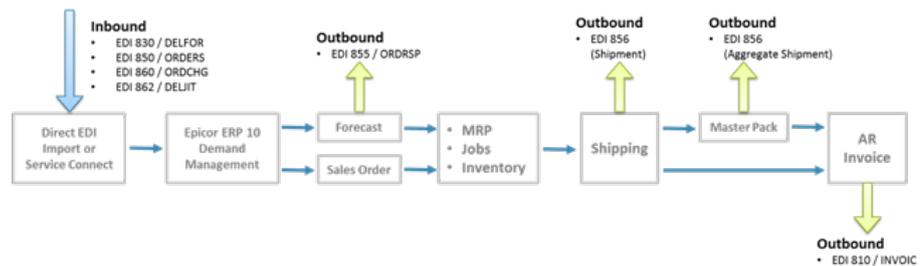
External BAQ

Electronic Data Interchange

Electronic Data Interchange (EDI) is a mature and standardized system for messaging between trading partners. ERP systems generally need to support inbound and outbound EDI messaging as a part of demand management, planning, and order expediting processes. As ERP systems become more automated and less dependent on data entry, EDI has become a first-class means for ensuring that commerce management decisions that affect trading partners are communicated in near real time.

Epicor ERP 10 includes a fully featured platform for mapping key capabilities to inbound and outbound integration via EDI. ERP 10 provides direct support for planning schedules, purchase orders, shipping schedules, and related change order transactions. For outbound EDI, ERP 10 can emit invoices, PO acknowledgements, and advanced shipping notices as well as manifest messages directly from the appropriate ERP process.

Epicor ERP 10 includes a complete, bidirectional Demand Management system that allows manually or generated transactions to pass between ERP systems and trading partners. Demand Management handles creation, analysis, editing, and reconciliation of cumulative totals for releases from trading partners. This system provides an efficient process to manage demand contracts, lead-time adjustments, delivery day, and customer periodicity requirements that drive ship-by or need-by dates.



EDI support in Epicor ERP 10

Financial Transaction Bulk Import

Bulk processing of financial transactions is an important capability of any ERP system. The Epicor ERP 10 Generic Integration Server (GIS) is a low-level interface specifically designed for bulk processing of financial transactions from external sources.

GIS is an application programming interface (API) tied to the Epicor ERP 10 task scheduler. The GIS API is a pipeline that carries imported data through the global table translation process, where attribute types such as commercial terms, customer types, and so forth are changed as needed to match ERP resource data, then moved into suspension tables. Next, records are validated and ultimately copied to ERP 10 data tables. GIS calls user-defined code routines as needed along the way; this means import processing can be extremely fast because all steps are optimized to best match the data.



Conclusion

In today's rapidly changing and increasingly networked commercial environment, easy integration to other systems is as important to modern ERP systems as the business capabilities they support. Every business has a unique set of systems and business process requirements; organizations that participate as part of extended supply and value networks must be able to communicate them. Epicor ERP 10 features extensibility and integration capabilities to suit virtually any programming model or approach to reaching out to other systems:

- ▶ ERP application services are the backbone for programmatically linking Epicor ERP 10 with any calling system or even user-created client applications. Surrounded by supporting technologies that enhance the ability to connect systems, ERP application services, including Epicor Service Connect, orchestrate complex workflows and long-running conversations between multiple and disparate systems.
- ▶ Master Data Management links Epicor ERP systems to each other as well as to external systems via data synchronization.
- ▶ Business Activity Queries—the backbone technology for accessing ERP data—can be used to update the system or connect to external data sources and legacy data.
- ▶ Finally, bulk data processors for handling financial transactions by EDI and Generic Integration Server complete the services necessary for effective integration.

Einstein once wryly noted, “We cannot solve our problems with the same thinking we used when we created them.” We might paraphrase this: ERP cannot solve the problems it faces today with the same thinking used when it was first devised. That's why Epicor ERP 10 has been built on new thinking: to continue providing the transactional framework ERP was designed for, but also to go further and ensure the connectivity and analytical support today's global businesses need to grow and prosper.

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