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An Epicor White Paper



Epicor ERP 10

Adaptive ERP

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Introduction

From their inception, Enterprise Resource Planning (ERP) systems have been deployed with an overarching purpose: reduce costs by managing processes and materials. Until the middle 1980s, enterprise systems were built for narrowly defined business needs such as order management, account payables, and inventory control. The first real ERP systems integrated the data and processes once handled by individual programs into a single system capable of managing almost every aspect of running a sizable business. They transformed how modern businesses work.

The principal benefit of a consolidated ERP strategy was ensuring that data wasn't duplicated across departments, eliminating "islands of information." Processes once separated could now be linked, enabling enterprise-wide planning and optimization. For years, the focus of ERP was top-down implementation of this strategy: the imposition of processes and measurements from an executive perspective. As the marketplace has evolved into a global competition, where facilities, suppliers, and partners are dispersed geographically and supply and demand signals occur over increasingly complex and nuanced value networks, the top-down orientation of traditional ERP is proving to be less than adequate on its own. In this new business environment, change and innovation are accelerating; risk and opportunity are dynamic elements across networks, and business practices and processes are evolving at a pace heretofore unimagined. Response to this changed competitive landscape demands that ERP not only support the executive agenda but also the needs of individuals, regardless of where they are in an organization's value network. Only then can companies mobilize quickly and respond effectively to events as they occur at breakneck speed, whether in Singapore or Stuttgart or the Silicon Valley. So ERP has had to evolve into adaptive ERP.

Why Adaptive ERP Is Important

In a global marketplace where speed, change, and the demand for innovation are accelerating challenges, the expectations of ERP have changed. ERP is no longer simply about cutting costs, but rather about enabling businesses to grow and take advantage of new opportunities (and avoid unexpected risks) as they emerge. Competition may come from anywhere, often from unfamiliar players; disruptive technologies (e.g., additive manufacturing, social networks) may also change the game radically in a short time. Companies now need ERP systems that can adapt to unique and dynamic business environments and that can drive growth as well as control costs.

A large part of business innovation involves trying new things with less risk, modeling ideas and outcomes, or simply changing how people work with information. Today, ERP systems have to be approachable by all employees, changeable to waste less time, and readily integrated with other systems. Consequently, ERP needs to adapt at the same speed as business—or get out of the way.

As discussed, enterprises today have to deal with complexity and levels of competition unimaginable a few years ago. New product introduction cycles have shortened dramatically as customer demands for innovation reach unprecedented heights. (For example, go into your cell phone store today. Go back in six weeks. Note the difference in products on display.) Even small and mid-sized companies face multi-national concerns; as such, they must be capable of managing volatile economic situations and new compliance regimes. Increasingly, companies are moving to achieve necessary velocity by collapsing processes and partnering to expand ecosystems.

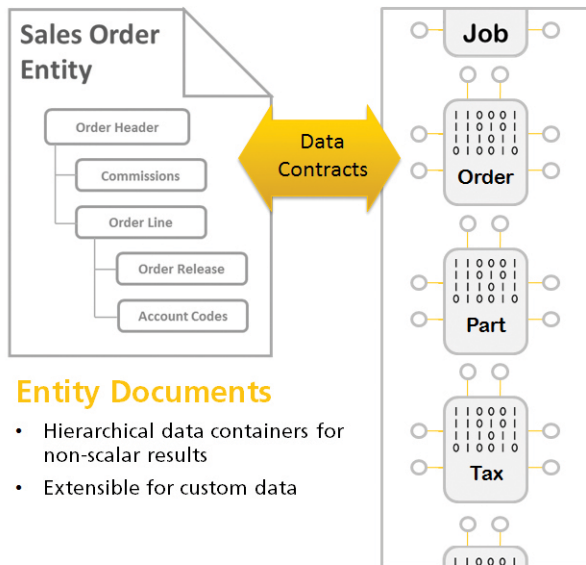
How Epicor ERP 10 Supports Adaptive ERP

One way Epicor ERP 10 helps meet these challenges is through flexibility. Processes can be defined and changed easily, and the system can be deployed as a single instance or in loosely coupled peer instances, on-premise or in the cloud. Epicor ERP 10 has been designed with the knowledge that a company's ability to innovate is at least partly coupled to business process strategy; specifically, agility is realized when processes are easily and inexpensively changed.

ERP 10 delivers the deep global functionality of earlier versions, with dramatically simplified architecture and system management. Committed to a true services architecture, surrounded by strong extensibility, orchestration, and customization capabilities, Epicor ERP 10 is a platform for adaptive ERP as much as it is an application.

Adaptive Data And Services

Epicor ERP 10 services include more than 1,300 independent services and nearly 20,000 operations. All access to the application logic—whether from an Epicor client application or any other enterprise system—is managed by calling one or more of these services. Each application service has a number of standard operations for retrieving or updating entities such as customers, parts, and manufacturing orders. Depending on the specific needs of the user, there are also other utility operations. There are no proprietary APIs, application logic, or data unavailable for use by implementers or integrators to solve problems.



Entity Documents

- Hierarchical data containers for non-scalar results
- Extensible for custom data

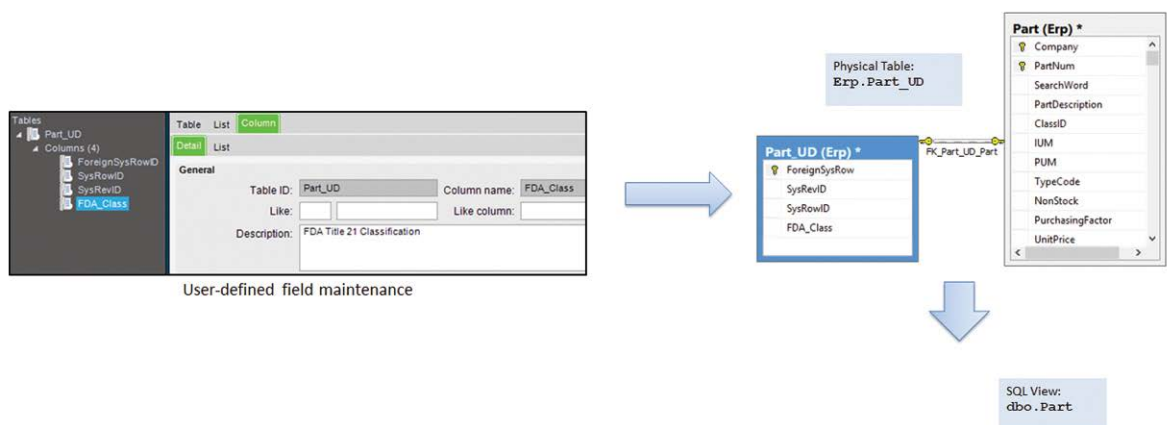
1600 Individually Addressable Services

- Entity/document-oriented
- Extensible data and behavior
- All provide "standard" operations plus any number of service-specific operations

GetByID	Returns an entity document for a given natural key
GetList	Returns a summary list of entities for given search criteria
GetRows	Returns a set of documents for given search criteria
Update	Validates an entity document and saves to the database
UpdateExt	Same as Update, but optimized for bulk updates
DeleteByID	Deletes the entity and child records given the natural key
GetBySysRowID	Returns an entity document for a given GUID alternative key
GetNew[X]	Creates a new record attached to an entity document

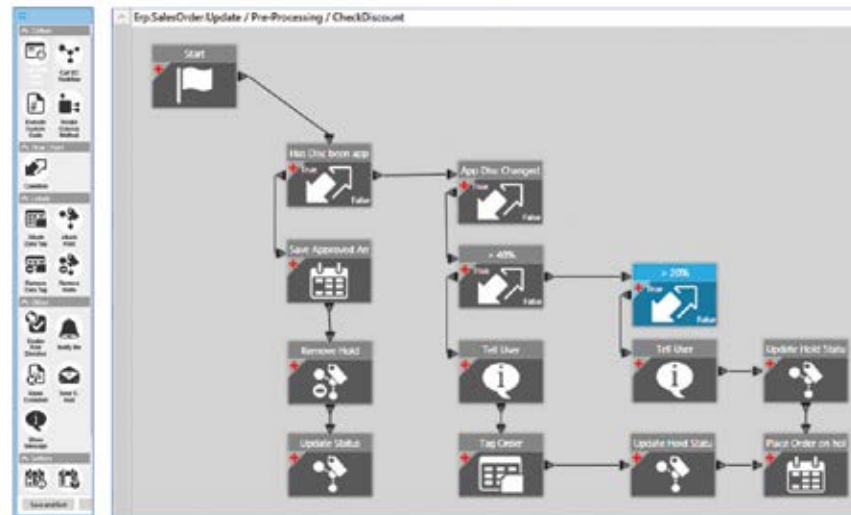
The ERP 10 database is well normalized and easy to understand after a bit of study. Baseline tables and columns are documented in an online data dictionary. The system includes metadata defining relationships and data typing information that makes the information schema readily accessible. Baseline tables by convention belong to Epicor-defined schemas, which means user-defined tables can be added to the physical database without creating naming conflicts.

User-defined (UD) fields can be logically added to any baseline table. The system transparently stores user-defined fields in a child table linked to the baseline table via an alternate key. ERP 10 also maintains an SQL view in the "dbo" namespace that joins the baseline and user-defined fields into a consolidated object that users can conveniently bind to custom reports or data management processes.



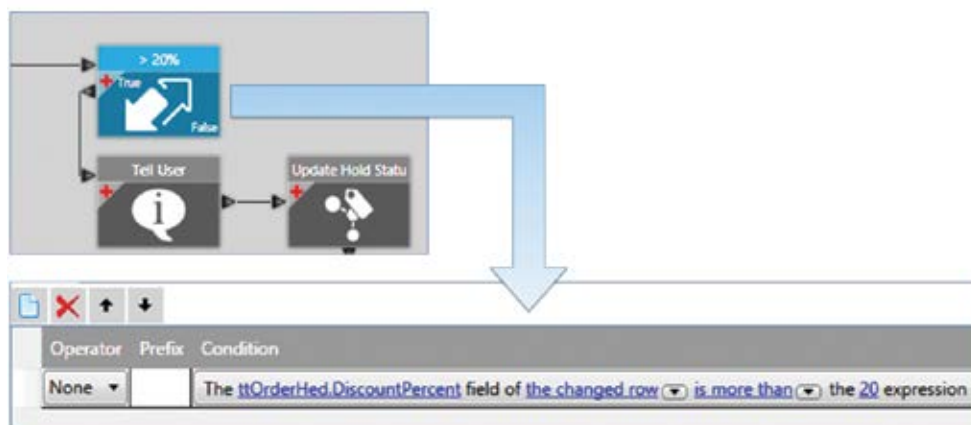
Business Process Management

A powerful and unique feature in Epicor ERP 10 is Epicor Business Process Management (BPM) that allows administrators to augment or replace service behavior with custom rules or managed code. Any of the nearly 20,000 service operations that comprise ERP 10 can be intercepted and incorporated into a rules-based workflow. BPM workflows can be triggered to run before, instead of, or after the baseline processing. For updates to application data, these rules can be executed within the overall transaction or asynchronously after changes are committed to the database.



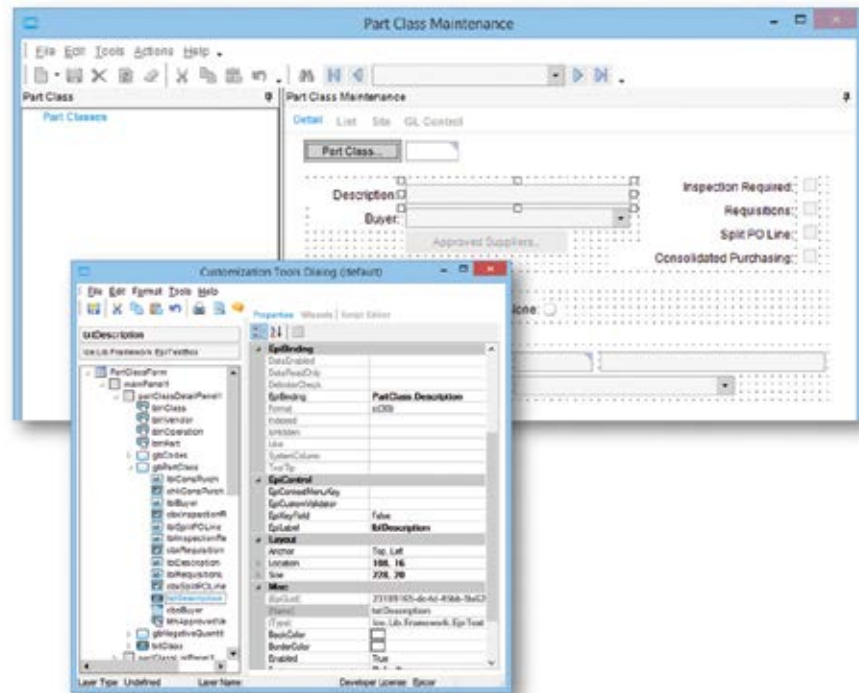
BPM has two kinds of directives: those bound to service operations and those bound to physical operations (methods) or from a database intrinsic (CRUD) point of view. BPM also includes “business holds” that are user-defined artifacts used to constrain or route processing logic. Similar to how a credit hold might restrict receiving new orders for a customer, a business hold can be defined between a user-defined concept (e.g., Nuclear Materials) and an entity such as a part class. Business holds are bound to processes using BPM to restrict actions on the entity when the hold is in effect.

BPM directives and business holds work together to build complex business processes. Directives can even interrupt the normal processing sequence to query the user for an approval or for more information. Other directive activities include attaching and removing data tags and business holds, evaluating static or data-driven conditions, and invoking service orchestration workflows for integrations.



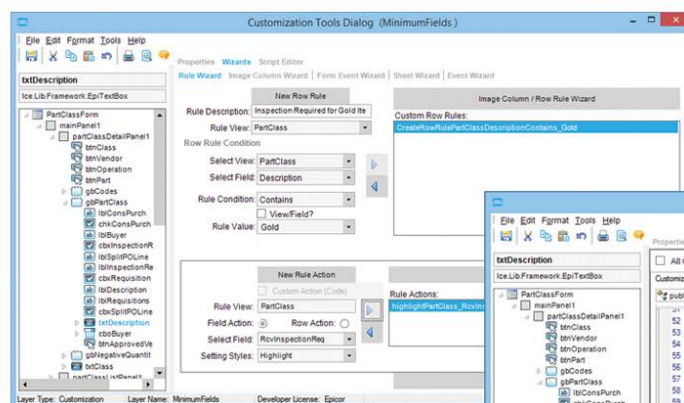
Most BPM directives are configured using easy rules wizards, similar to rules editing in Microsoft® Outlook®. Developers can add custom programming code in C# to any BPM workflow. The BPM AwPI provides all necessary access to original and changed values present in the relevant entity document. All rules are stored as metadata resources, which means there is no impact when servicing ERP 10 with fix releases.

Together, user-defined fields and BPM provide the means to manage server behavior. Epicor ERP 10 also has a powerful and easy-to-use customization stack for defining rich and productive user experiences. The ERP 10 Client includes an embedded, integrated development environment (IDE) that allows controls to be moved, dropped, or added.



Agile Customization

Developers can declare dynamic “row rules” to create data-driven behaviors such as changing color or style. Moreover, form logic can be created in C# or VB.NET and assigned to form, panel, or control events. All customizations are managed and stored as metadata that is propagated to deployments automatically and on demand. More importantly, the metadata-based approach for customizing Epicor ERP 10 is “non-invasive” to Epicor-supplied application resources. This means customizations do not touch baseline code, keeping the deployment of service packs an easy process, regardless of how much customization has been done. This approach enables Epicor ERP 10 users to realize the agility they need today without creating barriers to future agility. So in ERP 10, it is remarkably easy to modify workflows as business practices evolve—a critical advantage in today’s accelerating and rapidly changing marketplace.

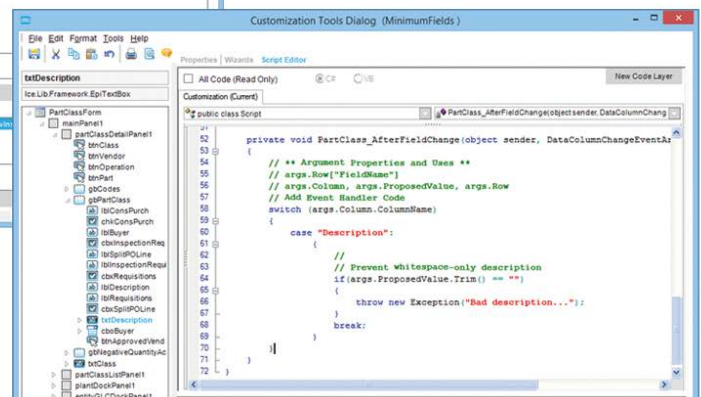


Rules-based logic

- Visual Behaviors
- Event Triggering

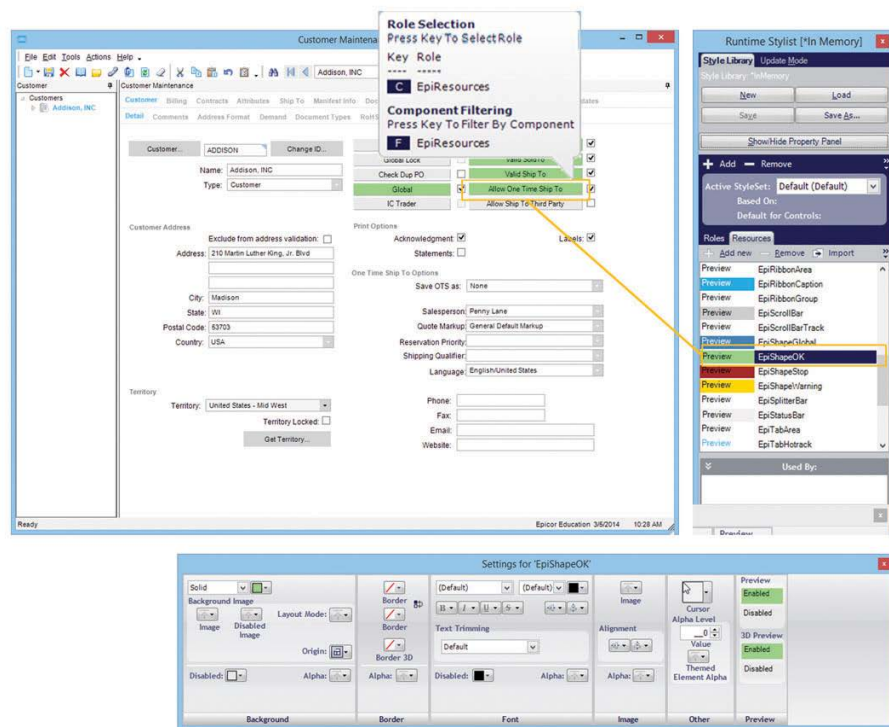
Code

- Event-based code snippets
- Externally referenced assemblies
- C# or VB.NET

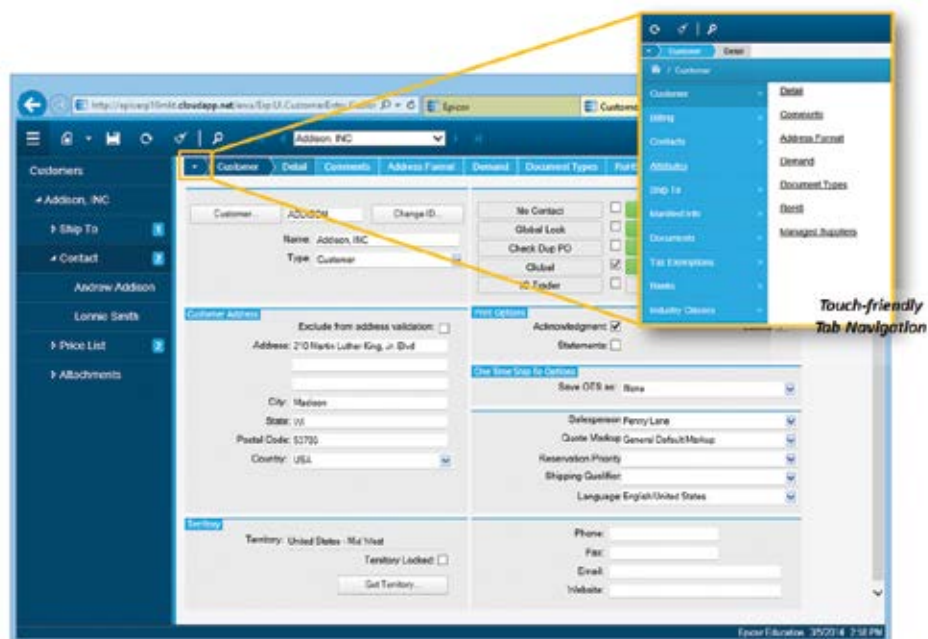


The Epicor ERP 10 customization architecture supports seven levels of customization and personalization. This allows collections of base forms to be repurposed for specialized products to fit industry-specific requirements. Other customization levels support localization requirements for world-ready ERP and extensions created by Epicor partners and developers.

Finally, a personalization layer is reserved to allow individuals control of the colors, look, and feel of their ERP system. Users (with sufficient permission) can launch the ERP 10 Runtime Styling Tool (RST) at any time when running the ERP 10 Client Application. With the RST active, users can hover the cursor over form and menu areas to see what resources are present and how they can be modified. Individual style choices can be collected and shared with other individuals or across the enterprise.



Epicor Web Access (EWA) allows users access to ERP 10 forms using a browser. EWA renders the client application content using pure HTML, without dependencies on browser plug-ins. HTML forms are derived directly from the same metadata that defines ERP Client Application forms. Many constructs supported by the Client Application customization tools are also supported by EWA. That means it is possible to customize Epicor ERP using the embedded IDE tools and for those changes to appear in the browser versions of the form.



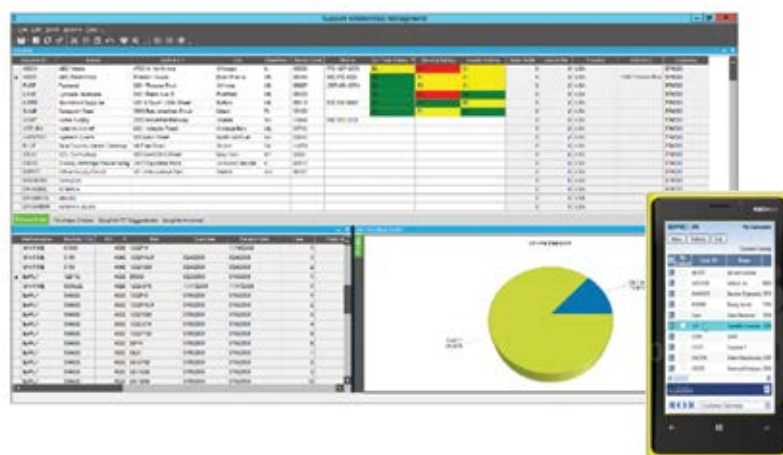
BAQS and Dashboards

Two foundational capabilities of the Epicor ERP architecture are the Business Activity Query (BAQ) and the ICE Dashboard. As their names imply, a BAQ defines a data query and the ICE Dashboard renders that query on any number of easily accessible devices. It is hard to overstate the usefulness of these two technologies. Many ERP 10 system implementations rely on BAQs for defining relevant data for searching, monitoring, or for use in integrations.

A BAQ is essentially a T-SQL query definition that can be defined once and then run safely by others. BAQs bridge security automatically, meaning 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. However, ERP 10 also has a number of other global security partitions (e.g., company, plant, department, territories) that the BAQ system also enforces.



Epicor ICE Dashboards render BAQ data either as a basic grid or as a chart or graph. Dashboards are usually combined into portal pages aligned along a role-based or functional area such as sales analysis. All ICE Dashboards have publish/subscribe capabilities that allow users to interact with one ICE Dashboard while another changes views in reaction. A typical scenario has a portal page with an orders list dashboard, a details dashboard, and a graph showing sales relative to plan. Clicking between orders in the first dashboard causes the other dashboards to update automatically with the order in scope.



Dashboards are also available on mobile and tablet devices through Internet browsers. On tablet devices, ICE Dashboards are usable in the browser or as live tiles on the ERP Home Screen. For phone form factors, the ICE Dashboard system provides easy touch-based navigation optimized for smart phone screens.

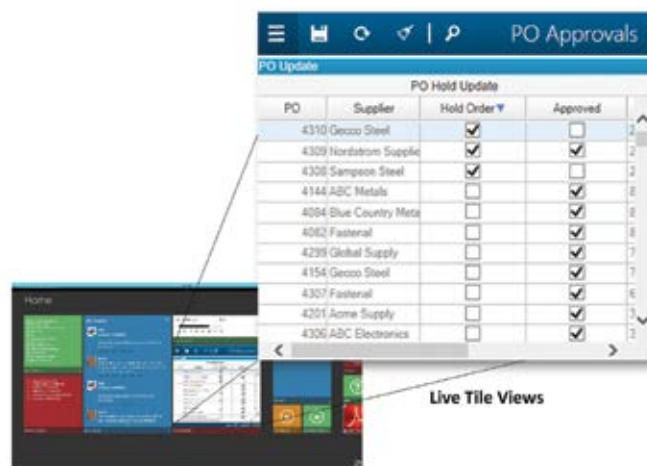
Unleashing the Power of the Personal Dashboard

For users anywhere in the enterprise network, mobile dashboards are updatable in real time if the organization desires, a feature often used for actionable queries or expedited approval processes. This feature enables Epicor ERP 10 customers to create their own “My ERP” with precise control over what can and cannot be updated and deployed to mobile devices. Users are not dependent on Epicor making the solution mobile; the tools enable them to build out from the Epicor framework to deliver any part of Epicor ERP 10 to any mobile device.

Contrast this feature with other ERP solutions, where organizations are bound to wait for the software provider to develop specific mobile applications for parts of their ERP functionality. Instead, it empowers the user to be truly adaptive and in control of the organization’s ability to respond and deliver the necessary support across the network when and where needed.

BAQs can be updateable, which means that any BAQ can become an instance data-driven API to the ERP system. Updatable BAQs accept data in the defined BAQ format and then automatically call the relevant update operations on one or more ERP services. This capability is extremely powerful in that it provides administrators with a way to create a view from data perspective and then make updates to the ERP system through the services logic (including BPM directives). An updatable BAQ can be coupled to an updatable ICE Dashboard, which together form an easily defined data entry form.

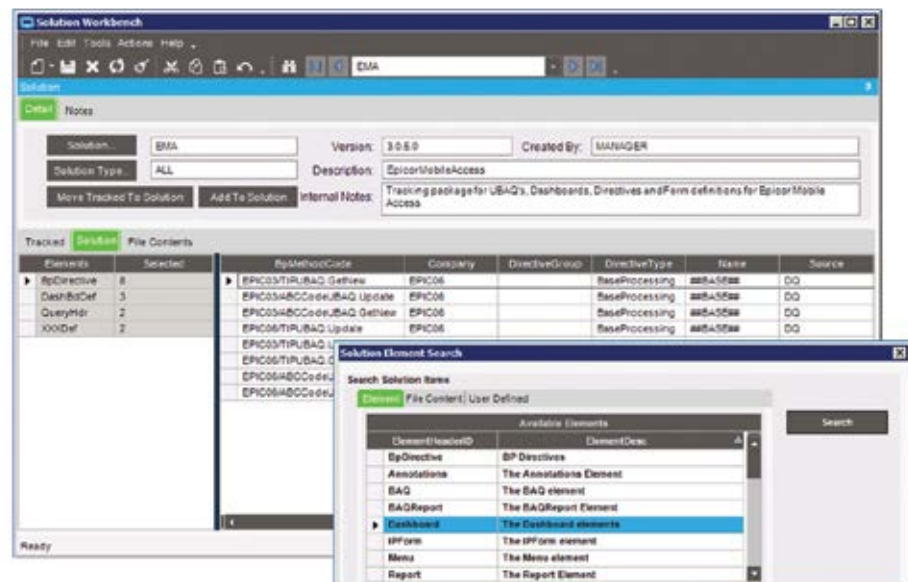
BAQs drive many other important ERP 10 subsystems besides ICE Dashboards. For example, BAQs define the indexes managed by Epicor Enterprise Search, along with added information to drive how search results are ranked, presented, and linked to forms and other resources. Search functions in almost every ERP 10 form can be extended with BAQs. Users can create queries—subject to limitations established by administrators—for use as personal search dialogs. Full-featured reports can be defined from a BAQ. Epicor Social Enterprise allows administrators to design BAQ-based entities that users can “follow” and converse about. Finally, any BAQ can drive an ERP Home screen live tile view.



Any updatable BAQ can be a two-way integration API and a first-class resource for Epicor’s service orchestration engine, Epicor Service Connect. New in Epicor ERP 10: BAQs can be defined for non-Epicor data sources via ODBC. Administrators can now add metadata that provides useful definitions, documentation, and linkage hints for users defining External BAQs.

Customization Solution Workbench

Most projects that require ERP customization involve many artifact types (e.g., form customizations, special menu options, BAQs, dashboard definitions). To help administrators stay organized, Epicor ERP 10 includes the Solution Workbench. The Solution Workbench defines projects where items can be added and versioned. Solutions are then packaged and can be exported to share with other ERP instances or simply shelved until needed.



The ERP 10 Solution Workbench is a great improvement over the Solution Manager included in earlier versions of Epicor ERP. Almost anything can be added to a solution, be it an ERP 10 object or an external resource. Usability and performance have improved, especially for managing larger, more complex projects.

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