INTEGRATION: CONNECTING IFS FIELD SERVICE MANAGEMENT WITH OTHER APPLICATIONS
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Companies typically need to integrate their service management system with other software applications such as financial accounting, manufacturing (ERP/SCM) and sales (SFA/CRM) systems. IFS Field Service Management enables comprehensive connectivity and seamless data sharing by adhering to the latest software industry standards and best practices as a leading service-oriented architecture (SOA) solution. Integrating other applications with IFS Field Service Management, allows for the following benefits and more:

- Decreased service operations cost
- Automation of optimized business processes
- Elimination of manual data and duplicate data entry
- Increased flexibility, agility and adaptability
- Leverage existing systems, investments and resources
- Real-time service performance management
- Improved user productivity and business profitability

Integrations often improve processes involving multiple organizations, and departments and the systems they use. For example, when a field technician (an IFS Field Service Management user) closes a service call, they will record their labor and parts used, which will price these transactions. The invoice is prepared in IFS Field Service Management, and passed to an accounting system (ERP like SAP or Oracle), where it is taxed, printed for distribution, and automatically updated in the customer’s accounts receivable balance. The service system thereby is used for quicker invoice generation, creates a single point of entry, and reduces workload in the finance department. It is important to think through the entire business process and identify the key steps, decision points, stakeholders, data elements, dependencies and error handling requirements for common use case scenarios before you go-live in production.
IFS Field Service Management (IFS FSM) has successfully integrated with just about every significant software supplier in existence over our 30 year history of helping customers automate their service business processes. Below are just a few of the types of integrations we have done for customers:

- Financial systems to handle invoicing, tax calculations and price/cost rules
- Parts planning and forecasting systems to optimize spare part stock levels
- ERP systems for order fulfillment
- Warehouse Management systems for shipping and receiving
- Purchasing systems for parts replenishment, as well as subcontractor goods, and services
- Payment services to process credit cards transactions
- Transport shipping carriers for pick up and delivery of products and parts to and from customers
- Knowledge Management systems to troubleshoot complex service problems
- HR systems for tracking automated time sheet and expense entry

**THE IFS FIELD SERVICE MANAGEMENT SOLUTION**

IFS FSM solution is the first of a new generation of software applications designed with a service-oriented architecture (SOA) where all clients (web, portal, smart, mobile) communicate with the server through eXtended Markup Language XML messages using the Windows Communication Foundation (.NET 3.5 WCF). External applications can also communicate with the IFS FSM server through XML messages sent either through a middleware Enterprise Service Bus (ESB) like BizTalk, Netweaver or WebSphere which act as an intermediary, providing a degree of freedom, or the IFS FSM Integration Service, which supplies a standard HTTP Web Service for receiving XML messages.

Different types of integrations can be broadly classified into three different categories; Server, Client and Database level.

**SERVER-BASED INTEGRATION**

The IFS FSM Application Server has three primary components; the communication manager, object manager and data access manager. The Communication Manager provides the ability for any application (internal or external to IFS FSM) to communicate with IFS FSM using XML messages over Hypertext Transfer Protocol (HTTP).
The Communication Manager receives an XML message, authenticates the request, and sends the XML message to the Object Manager. The Object Manager validates the data before processing the request and returns the result to the Communication Manager. Any exception that occurs during this process will result in an error message.

**Outbound XML Messages**

Outbound XML messages can be sent to SOA-enabled applications through standard HTTP, SMTP, file-based, or Microsoft Message Queue (MSMQ) protocols. Outbound messages can be triggered by any data update, including 3rd-party applications.

IFS FSM can notify external applications of updates to information stored in it. For example, if an ERP application wants to keep customer data in sync with IFS FSM (service related customer data is stored in the PLACE table in IFS FSM), changed Place records can be extracted to a URL that is monitored by a middleware application which transforms IFS FSM’s XML message to a format that the ERP application can accept, so that the corresponding customer data gets updated in the ERP database in near real-time.

The Communication Manager’s outbound message queue manages the process and the address to send the message to is set up through the IFS FSM User Interface. Application administrators can specify the table, columns and constraints using the “Audit/Extract” screen found under the “Admin” menu.
Adapters
Adapters are responsible for receiving (listening or polling) and sending data using a particular transport and protocol. Adapters are data agnostic and not always necessary. For example, the IFS FSM server natively speaks XML over TCP/IP and IFS Field Service Management Connect, IFS FSM’s XML Integration tool, natively speaks XML over MSMQ. Adapters are nevertheless useful communication conduits and IFS has developed various pre-built connectors to many different technologies and business applications including the following:

<table>
<thead>
<tr>
<th>Adapters</th>
<th>XML Integration tool</th>
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<td>MSMQ</td>
<td>Virtual Earth</td>
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<td>HTTP(S)</td>
<td>MapQuest</td>
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<td>Flat File (FTP, Folder)</td>
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<td>SMTP (Email)</td>
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<td>Bluetooth</td>
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<td>GPS</td>
<td>BizTalk</td>
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<td>Barcodes</td>
<td>SeeBeyond</td>
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These adapters can be used to rapidly implement complimentary functionality frequently used in service application software implementations: Bluetooth for mobile printing, GPS for vehicle and technician tracking and location based services, Mapquest and Virtual Earth for driving directions and site location identification, SQL/Server and Oracle for database access, and so forth.

Extensions
IFS FSM uses the concept of Metadata throughout its application offering. Metadata describes how and when and by whom a particular set of data was collected, and how the data is formatted. Metadata is essential for understanding information stored in databases and has become increasingly important in XML-based Web applications. Essentially, metadata is data that describes data. The IFS FSM metadata can be extended via IFS Field Service Management Studio with customer-specific tables and business rules. New tables and rules are tracked separately as Customer Metadata, support

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<th>PARTIAL LIST OF IFS FIELD SERVICE MANAGEMENT INTEGRATIONS</th>
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inbound/outbound messaging and can be displayed in the UI. IFS FSM is completely metadata-driven, enabling customer-specific configuration changes to be seamlessly upgraded from one release to the next by leveraging .NET reflection.

The IFS FSM server itself can also be extended with server-side code in the form of custom .NET assemblies. These plug-ins can enhance or even replace the standard IFS FSM business processes and are particularly useful for executing synchronous transactions that are dependent on legacy systems. For example, a call can be made to an IBM mainframe application to IFS get warehouse inventory on-hand and part transfer prices prior to executing a field stock replenishment process.

**IFS Field Service Management Connect**

IFS Field Service Management Connect (IFS FSM Connect) is an IFS-developed middleware service that can be used to simplify integration between IFS FSM and other SOA applications using XML messages. IFS FSM Connect can receive messages from multiple sources (HTTP, MSMQ, flat files, databases, ODBC, SMTP, HTTPS) in multiple formats (XML, CSV, Fixed Position) and then utilize

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**PARTIAL LIST OF IFS FIELD SERVICE MANAGEMENT INTEGRATIONS**

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<th>Other Data Sources</th>
<th>Adapter</th>
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<th>Queues</th>
<th>XSLT Maps</th>
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TeleVoice
TNT Chainware
TNT Delivery
Touch Logistics
Trimble GeoManager
TrimbleFS
UPS Logistics
UPS Online
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XSLT maps to transform the data and take action. Actions include output files, updates to M5, function calls, SQL results, XML or HTTPS posts.

IFS FSM Connect accepts HTTP commands to do a variety of tasks, including suspend, resume, get system state, get software version, get processed message information, get error information, get map information, and get queue information and control. IFS FSM Connect also provides key administration support, including system monitoring, error logging and re-try transaction logic.

IFS FSM Connect is often used by customers that don’t have an enterprise service bus (ESB) middleware solution, like BizTalk, to act as an integration hub and message broker. IFS FSM Connect uses Microsoft message queues (MSMQ) and multi-threading to quickly and efficiently deliver messages. For more information, please refer to the IFS FSM Connect Administration Guide.

CLIENT-BASED INTEGRATION

Most end-users of IFS FSM access the system through one of our standard client frameworks; Smart Client, Web Client, Portal Client or Mobile Client. Prior to going into production, customers will typically tailor the IFS FSM user interface to meet their business needs and maximize usability.

IFS FSM Studio can be used to quickly and easily change the look and feel of the client. In addition to changing labels, adding/deleting fields, creating composite views, etc., customers can integrate external applications, data and web services into the client and have them invoked by an event. For example, the customer address can be retrieved directly from SAP when an IFS FSM user creates a new service request. Credit card transactions can be authorized upon signature capture. Or, buttons can be added to get an addresses latitude and longitude coordinates, launch Google Maps, and access the UPS website to show the current status and location of a shipment.

Web/Portal

IFS FSM is designed to leverage other web-based applications, via context integration (URL or cookie-based). For example, a customer service rep can click on a IFS FSM tab displayed in your CRM application to view the specifics of a dispatched service call. Conversely, IFS FSM can provide the context, for example, invoking a knowledge management application to provide step-by-step help to a field engineer performing a complex service procedure. The IFS FSM Integration Service supplies a standard Web Services Description Language (WSDL) interface to the IFS FSM application server enabling access via standard web pages that can be easily modified by your organization.
IMPORT/EXPORT
IFS FSM includes a client-based integration tool for users to quickly import or export data through an easy-to-use, wizard-driven user interface. Users can access the Import/Export wizard from the “File” Menu to rapidly import and export files to multiple file formats like Excel, CSV and more.

DATABASE-LEVEL INTEGRATION
IFS FSM can support high volume, batch or real-time integration at the database level through an extensive set of temporary tables called “T-Tables.”

T-tables mirror the schema of the associated IFS FSM production table but allow any type of data to be inserted. External data can be bulk-loaded into a T-table through an efficient direct-to-database connection using standard SQL Extract, Transform, Lead (ETL) tools such as Oracle IMP or SQL Server Integration Services, then scrubbed for data errors or missing information through an automated process built into the IFS FSM server. Information on data type discrepancies or missing information is stored back into the T-table, allowing the database administrator to easily correct and re-import using standard SQL tools.

In addition to T-tables, IFS FSM Connect includes database adapters for SQL Server and Oracle enabling integrations to query, update and execute stored procedures in external databases directly without requiring translation into XML messages.
REAL-WORLD EXAMPLES

The following illustrate only a fraction of the customer pain-points that we have fixed by integrating business systems to achieve real service results:

Company A uses a CRM system to manage customer information. Each night, the CRM system produces a report with newly-added customers. The company wants to automatically add these customers to IFS FSM.

- IFS consultants created an interface map using IFS FSM Connect to parse the report file and create messages that update customer information in IFS Field Service Management.

Company B uses an inventory management system that has an adapter that can send XML messages to external systems. The company wants to automatically send stock updates to IFS FSM in real time.

- In-house resources customized the adapter to send XML-based messages to IFS FSM every time stock information was changed in the inventory management system.

Company C uses a purchasing system whose database contains information on goods and services from approved vendors that the organization can purchase. This database is updated every month. The company wants IFS FSM use this data.

- IFS consultants set up IFS FSM to read the purchasing system database in real time and display the approved vendor’s goods and services to users.

Company D runs a repair center and wants to provide tracking information to call center representatives for fixed items that have been shipped back to customers.

- Company D added a button in IFS FSM on the RMA screen that, when clicked, causes the assigned carrier’s tracking information to appear in a new browser window.

IFS can help you determine the best integration approach based on our experience working with customers worldwide on hundreds of different integration projects.
IFS is a public company (OMX STO: IFS) founded in 1983 that develops, supplies, and implements IFS Applications™, a component-based extended ERP suite built on SOA technology. IFS focuses on agile businesses where any of four core processes are strategic: service & asset management, manufacturing, supply chain and projects. The company has more than 2,000 customers and is present in 50+ countries with 2,800 employees in total.

More details can be found at www.IFSWORLD.com.

For further information, e-mail to info@ifsworld.com