Mieczysław JAGODZIŃSKI*

IFS APPLICATIONS SOLUTIONS FOR THE AGILE ENTERPRISE

Abstract

Main purpose of this article is to present selected functionalities if integrated management system IFS Applications.

IFS Applications are the state-of-the-art applications suite designed to meet modern business pressures and needs. The IFS Applications suite is a full client-server Graphical User Interface (GUI) system making full use of Object Oriented development techniques. The IFS system will be able to provide a modular, flexible solution that will satisfy your business systems needs utilising a combination of the modules illustrated in the IFS Tower diagram.

1. INDUSTRY - DRIVEN SOLUTIONS

IFS' industry solutions are based on the functional breadth of IFS Applications combined with cutting-edge features and packaged industry know-how. This gives our customers the tools and processes they need to set themselves apart from the competition and get fast payback on their investment. To stay ahead of the competition, companies need to differentiate. Meeting these needs with business applications does not necessarily mean customizing or developing in-house software.

With a library of add-on industry-specific components, IFS Applications helps companies quickly increase productivity and profits, adding many important features and functions for vertical markets while maintaining an easy-to-use, core solution. Based largely on customer input, the industry-specific components offer new ways to improve efficiency and take advantage of business opportunities.

Industry components include functionality that adds value for a specific industry segment. They are often developed in collaboration with selected customers, transforming their competence into standard industry-specific functionality that can be used by many. Like our core applications, the industry-specific components are based on our standard component technology. This makes it easier for our customers to continuously tailor the software to their industry needs without adding complexity, and to install and upgrade components quickly and easily.

To meet the market's increasing demand for solutions with broad functionality combined with in-depth industry knowledge, IFS focuses on a number of industries where we build

* D.Sc. Silesian University of Technology, Institute of Automatic Control, 44-100 GLIWICE, ul. Akademicka 16, email: mjagod@zeus.polsl.gliwice.pl

competence and deliver customized solutions, often in collaboration with market-leading partners. Today, we are focusing on the following industries:

- Aerospace & Defense,
- Automotive,
- Commercial Aviation,
- Construction, Contracting & Service Management,
- Energy & Utilities,
- High-tech,
- Industrial Manufacturing,
- Life Sciences,
- Oiil & Gas,
- Process industries,
- Project-Based Industries,
- Rail & Transit,
- Retail & Wholesale Management,
- Service & Facilities Management,
- Telecommunications.

With major new technologies appearing-and disappearing-every two to three years, business application will need to outlast them if it is to provide maximum return on investment.

To meet this challenge IFS has adopted a strategy of building for change that allows technologies, tools and components in IFS Applications to be changed and upgraded over and over again. Not all at once, which would mean big interruptions, but piece by piece.

With the building-for-change strategy we give our customers leading-edge technology today along with a unique way to continuously introduce new technologies. This way, our customers can continue to benefit from advanced technology that makes their life easier. Today, next year, and every year.

Our building-for-change strategy has four key elements:

- Robust architecture
  Technologies come and go, but with a robust and well-designed architecture the solution will always be right.
- Components
  Components enable changes to be done step-by-step, minimizing risks and interruptions. IFS Applications and our technology platform IFS Foundation1 are built with components.
- Commitment to standards
  By adopting established industry standards in our product development we can be sure that our products integrate well with complementary products supporting the similar standards. Supporting standards also allows us to be cost-efficient, using low cost or free software components in our product development.
- Design to change
  In the world of IT, designs and solution models live longer than specific implementations. We develop designs and models that allow us a high degree of reuse when introducing new technologies.

1.1 Service-oriented Component Architecture

Our service-oriented component architecture divides an application into a number of business components. Each business component contains software objects that shape the implementation and interfaces of the business component.

The business components communicate with each other, and with other applications, to create a complete business solution. They can be installed, upgraded, and replaced step-by-step and independently of each other [4,5].

Our service-oriented component architecture is designed to fit a modern IT environment, integrating business processes across applications. A range of connection technologies such as SOAP, MQ, file import/export, and e-mail are available. In addition to supporting the IFS user interfaces the component technology allows integration of IFS functionality into any user interface—be it an enterprise portal, a Microsoft® Office® template, or an in-house application. All components are accessible to Java, COM, and .Net developers in their respective native technologies. This way, the user gets a feeling of using only one application, while in fact business processes are integrated across divisions, companies and applications.

The IFS service-oriented component architecture combines the efficiency and benefits of object-oriented development and implementation with the ease of use of service-oriented interfaces.

The software objects of each component:

- Support the user dialogue with information, queries, lookups, validations,
- Communicate with other applications,
- Store and retrieve business data,
- Implement business logic and processing.

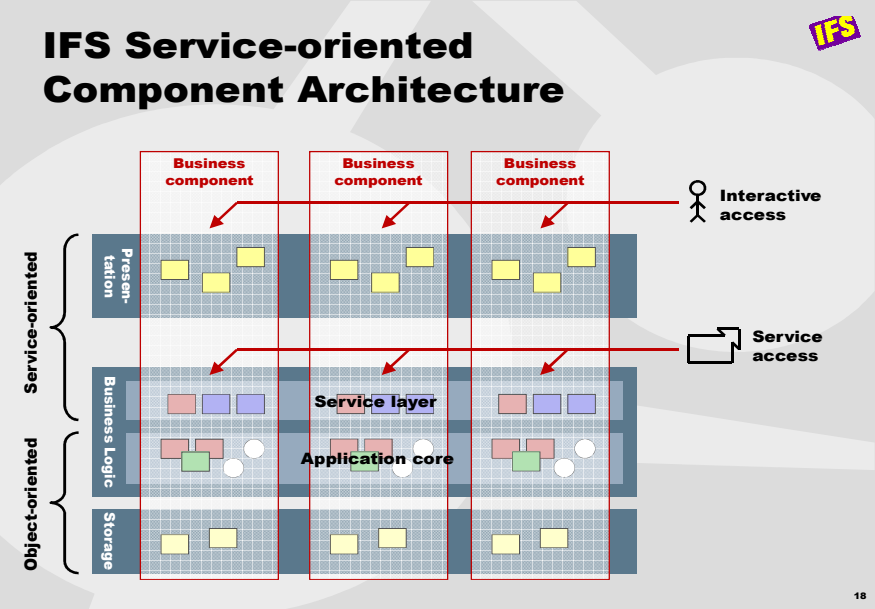

Fig. 1. IFS Service-oriented Component Architecture

1.2 Lifecycle Management – 3LM

IFS Applications goes beyond supporting a company's core process to provide a lifecycle perspective on the three main aspects of business: customers, products, and assets. This includes unique, integrated lifecycle management, enabling companies to share knowledge and gain real-time access to information and processes across the entire company. We call it 3LM.

IFS provides simplified and comprehensible application support to the complex issue of knowledge-sharing in and between organizations, and over the entire lifecycle. When information on assets, products and customers is easily accessible in the same system, users get the right information at the right time, presented the way they choose.

This supports the day-to-day business decisions that constantly need to be made within a company. The component technology, functional breadth, and portal technology of IFS Applications give companies the ability to act fast and provide the best fit for the end customer by optimizing the use of resources.

The lifecycle management approach also provides a foundation for a company's long-term business strategy, making real use of knowledge by bringing together the usually disparate and snapshot views of business information. In the end, it becomes easier for companies to shorten time to market and be fast and agile.

Product Lifecycle Management, PLM, integrates engineering, manufacturing and service to reduce costs, improve quality and reduce time to market. Today, PLM has evolved to include the entire enterprise, which is why coexistence with other point solutions and enterprise applications for product information and operations is so important.

PLM is a business approach to managing the flow from design and engineering, through production control, supply chain management and distribution to after sales service, spare part logistics, overhaul, and feedback reporting. In short, it is a cradle-to-grave solution for a product or plant, integrating people, processes, business systems and information. With IFS Applications, product-related information is effectively managed for each product phase. For example, the manufacturing BOM (Bill of Material) will automatically be created based on the engineering BOM [9,10].

Controlling product data over its lifetime, especially product change data, requires tight cooperation between engineering, manufacturing and after-sales product services. A lifecycle management perspective is also a question of information logistics without double data entry. Product lifecycle information must always be accessible, easy to find and up-to-date for all parties such as customers, channels, suppliers, subcontractors and manufacturers.

Product lifecycle management using IFS Applications gives our customers support for total product configuration management (from program level to unique customer delivery), feedback from customers and different parts of the organization making it possible to reuse and share information and to do it right from the beginning. In the end, our customers will gain cost reduction opportunities, integrated change management with fast impact analyses, and total project control. IFS Applications also provides solutions for collaborative design, which uses web technology to remove organizational boundaries. The result is enhanced product and service quality, which leads to greater customer loyalty.

Applying a product lifecycle management approach also means benefits for the end customer. It is easier to perform customer-specific product design and collaborate with the end customer to enhance product development and do the right thing from the beginning. Product development becomes more customer-oriented and market-driven, and better addresses customer needs.

2. ABOUT IFS APPLICATIONS SOFTWARE COMPONENTS

The IFS system will be able to provide a modular, flexible solution that will satisfy your business systems needs utilising a combination of the modules illustrated in the IFS Tower diagram shown below [6].

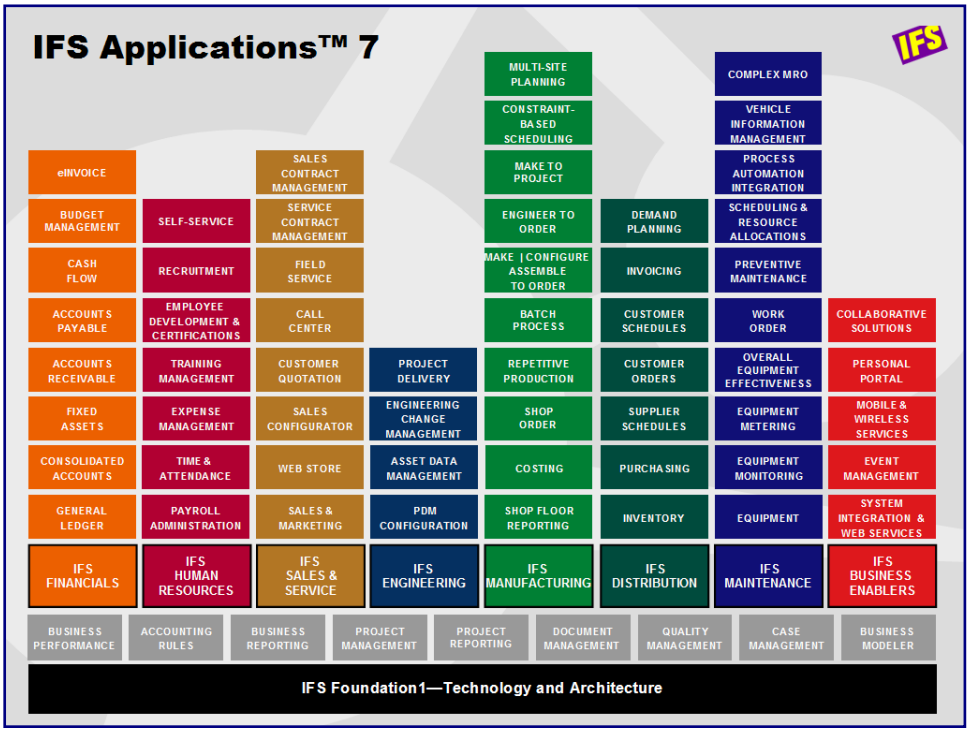

Fig. 2 IFS Applications

General features of the system include:

- A high degree of integration, allowing access to all the relevant data from a single transaction or report, enabling management access to up-to-date information on such issues as profit, stock levels and throughput. A single report can access any systems running on the Oracle database in the organisation.
- Improved visibility across the supply chain providing users with access to all of the information that they might need using extensive drill down capability from a single screen.
- Improved speed and accuracy of system transactions via the use of overview screen capability. This allows users both to view and action multiple selected data records simultaneously.
- Flexibility and adaptability in the way the system is used, ensuring the system can be implemented quickly and in a structured and cost-effective manner.
- Ease-of-use with facilities such as windowing and graphical access to information directly from existing Windows tools, such as Lotus and Excel, resulting in a reduced

learning curve and enhancing the value of the system to users at all levels within the organisation.

- Multi-currency, multi-language support.

2.1 Collaborate with customers and suppliers

The Internet presents new opportunities for companies to deepen their relationships with customers, suppliers and partners. With IFS Applications, the step into the Internet becomes easier and more natural thanks to IFS' efficient, user-friendly IFS eBusiness™ software. Return on investment is fast and tangible; instant communication of requirements, changes, requests for quote, etc., with less physical paperwork, lowered transaction costs, greater accuracy, compressed lead times and more time for employees to focus on value-adding activities. Products offered on the market are becoming increasingly similar in look, content and quality. At the same time, customers are demanding more individually tailored products and services. IFS Applications makes it easier to adapt your products and services to meet your customers' requirements.With IFS eBusiness, you can offer your customers their own Internet portal with access to on-line catalogs containing complete product information and access to their own price and warranty agreements. Customers can also register their orders and access information about which products are available [3].

2.2 Collaboration between suppliers, distributors and customers is critical for competitiveness

IFS Applications contains pre-packaged e-business solutions that make it easy for trading companies to collaborate with customers, suppliers and partners via the Internet. The solution enables you to create personal portals that offer unique opportunities to tailor the portal environment for different user categories. As a result, all users, regardless of their role, can concentrate on the information and functions they need for their work. Everyone involved in a company—employees, customers, and suppliers —can use portals.

More efficient supply chain management [1].

High service levels and lower prices have become strong means of competing for most companies today. But balancing goods replenishment in the most optimal way, based on shifting market demands, is not easy. IFS Applications provides advanced support for vendor-managed inventory (VMI), an inventory model whereby the supplier takes responsibility for replenishing the customer's stock and ensures that agreed volumes, service and quality are maintained. This can also be combined with consignment stock.

IFS Applications simplifies the supply chain by enabling shorter order cycles, so that the customer and the supplier can maintain lower stock levels. Easier handling also means that customers get faster, better service. Customers don't need to spend time monitoring inventory and orders and can focus instead on strategic, value-adding activities thanks to the IT support that IFS Applications provides. While facilitating supply chain planning and execution, IFS Applications goes even further. Integrated into the system is IFS/Business Performance™, which includes all the functionality you require to perform business analyses and check key performance indicators (KPIs). In addition, the demand planning software doubles as a tool for testing future scenarios, enabling you to make more accurate forecasts. Likewise, the employee portals can also be used to enable operational and strategic analysis [2].

IFS Applications offers easy-to-use role-based functionality to support each step in supply chain planning. Via individually tailored portals, employees can access internal and external purchase and customer orders with ease while retaining security. Demand planning and

multilevel forecasting across and within sites becomes much easier, and intersite transfers, including internal cross-charging, are no longer major problems. Furthermore, the solution's event management functionality automatically triggers key supply chain occurrences, enabling users to focus more on value-adding tasks.

IFS Distribution and IFS Manufacturing™ make your supply chain work. You can issue multisite blanket orders if required. The global part catalog ensures basic commonality for the same part in different sites and makes stock levels more transparent. Whether transfers are intrasite or intersite, they are made with the same degree of ease. And since the business applications and the supply chain functionality are completely integrated, orders need only be entered once. Global sourcing and available-to-promise (ATP) capabilities also increase the efficiency of your supply chain. Online visibility of customer order status throughout the supply chain and the ability to handle returns at different sites contribute further to the flexibility of your processes. With multicompany customer and supplier payments, consolidation of accounting data and internal invoicing capabilities, IFS Applications enables you to implement a supply chain management strategy with breadth and depth.

2.3 IFS Manufacturing

Since many manufacturing companies need to be able to adapt quickly, they require extremely flexible manufacturing support. IFS Manufacturing is a modern concept for controlling production and assembly. The solution offers a number of functional models that can be combined to support almost all your requirements. For example, it supports several different production models, including autonomous groups, and contains advanced functionality for handling tools and barcodes, as well as traceability based on lot and serial number. In addition, Seiban techiques for multi-level demand pegging, Lean production and Kaizen Costing are all supported. IFS Manufacturing provides efficient support for medium-size distribution companies as well as large corporations that already use complex supply chain management solutions. IFS Manufacturing is an extremely flexible system that handles all types of manufacturing, from mass production of high-volume products to mass customization. Regardless of the nature of your present or future manufacturing systems, IFS Manufacturing provides the IT support you require.

Manufacturing processes vary greatly between different industries depending on the type of goods being produced. Companies that mass-produce high-volume products will focus on continuously cutting costs and removing all activities that do not add value to the product. However, for companies that produce special products that are unique to each customer, the challenge lies in reducing lead times in order to speed up the process from design to finished product. In between these two extremes, there is a variety of other manufacturing methods, from make-to-stock to production that is very standardized but still requires some degree of configuration for each order.

Most companies have some form of production, i.e. a range of products that require some form of control. Moreover, as products usually pass through different stages during their life cycle, they often require different types of manufacturing methods [7].

Increased globalization and a faster rate of change also mean that new production units are acquired, which must be incorporated into the company's existing manufacturing system.

To handle all this you need a flexible manufacturing system capable of coping with all forms of manufacturing.

And there's more. IFS Manufacturing also offers you a system that is built entirely using modern technology, with readymade e-business solutions to rationalize collaboration with partners and suppliers [8].

IFS Manufacturing also enables step-by-step implementation. Start with the most important applications and take the rest when and as you need them. You can even do it in parallel at several plants. The projects are small—and take very little time. By investing in small steps, you also reduce your risks. We can even support global projects, since we're represented in more than 40 countries worldwide.
IFS Manufacturing includes support for the following types of manufacturing:

- Repetitive,
- Make to Stock,
- Configure to order,
- Make to order,
- Engineer to order.

IFS Manufacturing is a production solution that helps you get things right from the very beginning in addition to supporting continuous cost reductions. You can eliminate an enormous amount of administration without diminishing the traceability of your products. Since demands on companies that mass-produce large volumes of products are already very high—and are constantly increasing—you need an IT solution that supports all aspects of the unending improvement process.
Our guiding principle is that work should be done correctly from the very beginning. So we support quality control systems such as QS-9000 and Six Sigma. In traditional quality control systems, information is usually contained in folders, which often simply collect dust.
IFS Manufacturing integrates the quality control system with the manufacturing system, making it a natural part of the daily work.
For example, the system can be set so that the control plan can be made mandatory before you start to manufacture a particular product. In addition, Statistical Process Control (SPC) is completely integrated in the report flows.
With the help of orderless rate-based manufacturing, you eliminate much of the administration associated with traditional production orders. At the same time, rescheduling is simplified considerably.
Instead of the traditional "push" principal that MRP entails, you can achieve "pull" with the aid of Kanban. IFS Manufacturing supports a wide range of Kanban solutions, from manual Kanban with cards to fully electronic Kanban via the Internet.
Our solution even enables you to combine MRP and Kanban to create a hybrid system with all the benefits of "pull" and "push", but without the drawbacks [7].
Our solution allows you to strip away the administration and other work that does not add value, without losing traceability in the process. On the contrary, it provides all the functionality you require to ensure complete traceability and control of production material and products. As a result, problems that arise can always be traced back to their source, and you see the customers who might have taken delivery of defective products.
For suppliers to the automotive industry, it is not unusual that customers demand cost reductions of up to 10% per annum. IFS Manufacturing provides powerful support for analyzing where reductions can be made, Value Analysis, as well as support for administering and planning cost reduction programs, Kaizen Costing. Targets and investment rules can be set up centrally, but with implementation decentralized. Tools for analyzing levels of common components drive the standardization process.
IFS Manufacturing offers exceptionally flexible functionality for managing customer and supplier schedules. It handles various EDI standards, including EDIFACT and ANSI X12 as well as XML messages via the Internet.

The solution also handles tolerance checks in agreement with suppliers. Extremely advanced and complex conditions can be stipulated in the solution. As long as the deliveries remain within agreed tolerance limits, the system runs everything automatically. Only if tolerance limits are exceeded will the system notify those responsible.
For small suppliers who might find the cost of integration too high, you can publish the schedules in web format and let them access the information themselves to see what has to be delivered.

3. SUMMARY

The modules were described in the paper; make up part of IFS Applications system, which support all business processes in an enterprise. IFS Applications system makes possible full support for complex technical environment in this flow coordination of information concerning product life cycle. Application of IFS system in an enterprise guarantees economic growth of enterprises and quick adaptation to changeable market conditions that allows gaining considerably competitive advantage.

References

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[1] **ALVARADO U.Y; KOTZB H**.: Supply chain management: *The integration of logistics in marketing. Industrial Marketing* Management 2001 pp. 183-198.
[2] **BERRY L.L.**: *Listening to the customer: The concept of a service-quality information system.* Sloan Management Review 1997 pp. 65-76.
[3] **BRANDERBURGER A.M**., **STUART H.W**.: *Value-based business strategy*. Journal of Economics and Management Strategy 1996 pp. 5-24.
[4] **BOOCH G**.: Object-Oriented Analysis and Design with Applications, Benjamin/Cummings, Redwood City, CA, 1994.
[5] **ERL. T**.: *Service-Oriented Architecture: Concepts, Technology, and Design*, Prentice Hall, Upper Saddle River, NJ, 2005.
[6] **JAGODZIŃSKI M**., *IFS Applications 2000 –introduction, WSIiZ Bielsko-Biała, 2002*.
[7] **LANDVATER D. V**.: MRP II Standard system – Workbook, Oliver Wight Publications. Inc. 1989.
[8] **PTAK C**.: *ERP Tools, Techniques and Applications for Integrating the Supply Chain*, CRC Press LLC, Boca Raton FA, 2004.
[9] **SCHEER A.W**.: *CIM (Computer Integrated Manufacturing) – Towards the Factory of the Future*, Springer-Verlag, 1994.
[10] **SCHEER A.W**.: Business *Process Engineering. Reference Models for Industrial Enterprises.* Springer-Verlag, 1994.