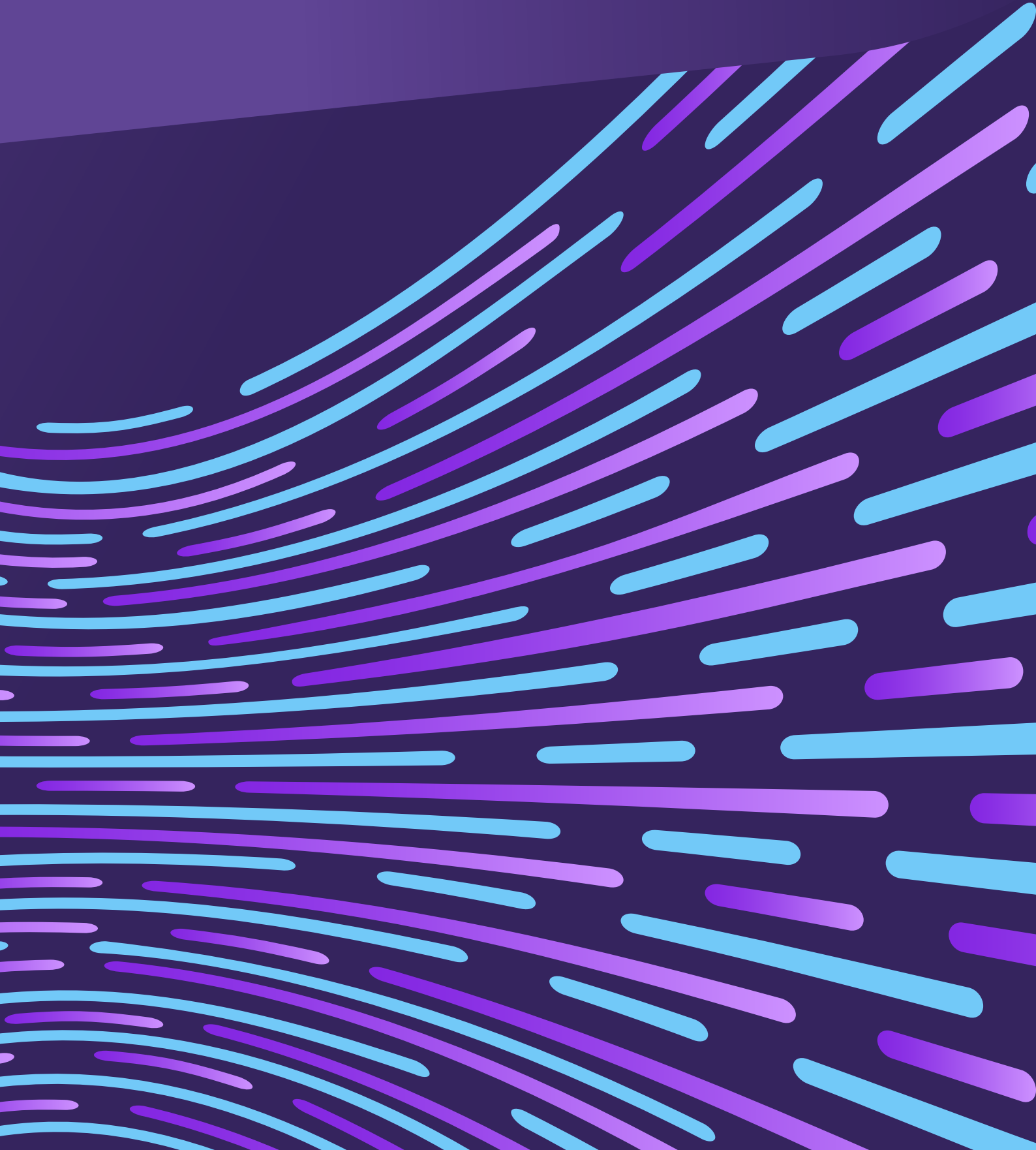


The Composable Enterprise




The Composable Enterprise

In a 2021 report¹, research firm, IDC, asserts organizations are “moving beyond the ‘dinosaur enterprise apps’ to new modular enterprise apps”. While monolithic architecture is still the norm for many software systems and “dinosaur applications” can’t be declared extinct quite yet, the point for many industry analysts, like IDC, is they’re on the way out. Gartner, for example, expresses this shift as one towards the “composable enterprise” – an organization that can innovate and adapt quickly by harnessing modular, consumable business capabilities.

In this whitepaper, we explore this shift and examine what it means for customers of enterprise software:

- Why are monolithic applications being broken into smaller chunks?
- What is the composable enterprise and what are its benefits?
- How does IFS Cloud let you transform to the composable enterprise?



1. Why are monolithic applications being broken into smaller chunks?

Monolithic software – i.e. self-contained, tightly-coupled applications built as one unit – risks growing into what software developers often term the “Big Ball of Mud”. This is a sprawling application that – due to financial and time pressures, piecemeal growth, too many patch fixes/quick hacks, and a haphazard structure – ends up having no perceivable architecture.

It’s a situation where no single developer, or even group of developers, can understand the application as a whole.

This results in an application that’s difficult to maintain and extend, with ever-growing technical debt. It’s also hard to create customer roadmaps with meaningful timelines due to the difficulty in creating accurate developer estimations. Sales revenue forecasts can be adversely affected as stakeholders may be left waiting for improvements that are consistently late or simply don’t materialize.

TechTarget² encapsulates some other key drawbacks to monolithic architectures:

“If any program component must be updated, the whole application has to be rewritten, whereas in a modular application, any separate module (such as a microservice) can be changed without affecting other parts of the program. Modular architectures reduce the risk that a change made within one element will create unanticipated changes within other elements, because modules are relatively independent. Modular programs also lend themselves to iterative processes more readily than monolithic programs.”

In a Gartner report, *Future of Applications: Delivering the Composable Enterprise*³, the research firm summarizes the situation as follows:

- Current application portfolios were designed to address the challenges of the past. They are an obstacle to innovation.
- Most organizations today are limited in their ability to adapt. This is primarily due to the state of their application portfolio, which is often bloated, difficult to change and aligned to the strategy of the past. To deliver on the future strategy of the organization, application leaders need to modernize the application portfolio. The application portfolio must operate at the pace of business change.
- Organizations need to evolve from their current state of inflexible, monolithic applications toward a portfolio that is more modular and adaptable to business change.

² TechTarget, [monolithic architecture](#)

³ Gartner, [Future of Applications: Delivering the Composable Enterprise](#)



2. What is the composable enterprise?

Today, businesses are rethinking their approach to enterprise applications to ensure they're focused on delivering outcomes. But to deliver innovation quickly and adapt applications dynamically, they need to evolve to the pace of business change, reassembling the capabilities they need.

This is where the composable enterprise comes in. Calling for a new way of running an organization, a composable model takes the building blocks of your business, along with their underpinning technologies, and enables you to orchestrate them like LEGO bricks. It lets you mix and match different capabilities, based on your specific business requirements and adapt to new opportunities through a common user interface.

Gartner⁴ sums up the composable enterprise as having the following three characteristics:

1. It's an organization that can innovate and adapt quickly to changing business needs through the assembly and combination of packaged business capabilities (PBCs). PBCs are application building blocks that have been purchased or developed. They are software components that represent a well-defined business capability. They should be functionally recognizable as such by a business user. For instance, a shopping cart or an expense approval mechanism would meet the definition of a PBC.

2. It sources PBCs outside from third parties or composes them internally.
3. It delivers increasingly contextualized and personalized experiences to its application users (i.e., customers and employees).

The underlying technology

APIs and automated workflows are the key technology underpinning composable applications.

1. APIs

At its most basic, an Application Programming Interface (API) is simply a software intermediary that allows two applications to talk to each other. While not being a new concept (with origins stretching back as far as the 1940s), the major recent shift has been in how they are used. Historically, APIs have been used in monolithic applications to exchange data between the entire application and external applications and services. But in composable software, there are two important differences:

1. The exchange is from individual modules (not from the entire application) to external applications and services.
2. APIs exchange data within the application too – from module to module.

This new way of leveraging APIs enables businesses to keep legacy applications relevant amid the rapid pace of technological change. It's much easier for providers of modular applications to make business capabilities available for their customers to reuse and consume in other parts of their enterprise, as business requirements dictate. This approach lets businesses scale up key business functions more quickly, without having to re-tool monolithic applications or redevelop current capabilities.

4 Gartner, [Future of Applications: Delivering the Composable Enterprise](#)

By exposing APIs, application teams can repurpose capabilities and build available services into new and different applications for customers. Capabilities can be combined quickly and efficiently to cater for unique business needs and use cases.

2. Automated workflows

Today, modern enterprise applications are increasingly leveraging AI and machine learning to automate business processes. Such applications can make predictions and decisions without being explicitly programmed to do so – to “think for themselves” through machine learning that automatically builds a model based on sample data, known as “training data”.

Typically, customers can expect their application’s machine learning service to be based on one/both of the two different types of model. The two models deliver different benefits to the customer and require different levels of input from them.

Pre-built models

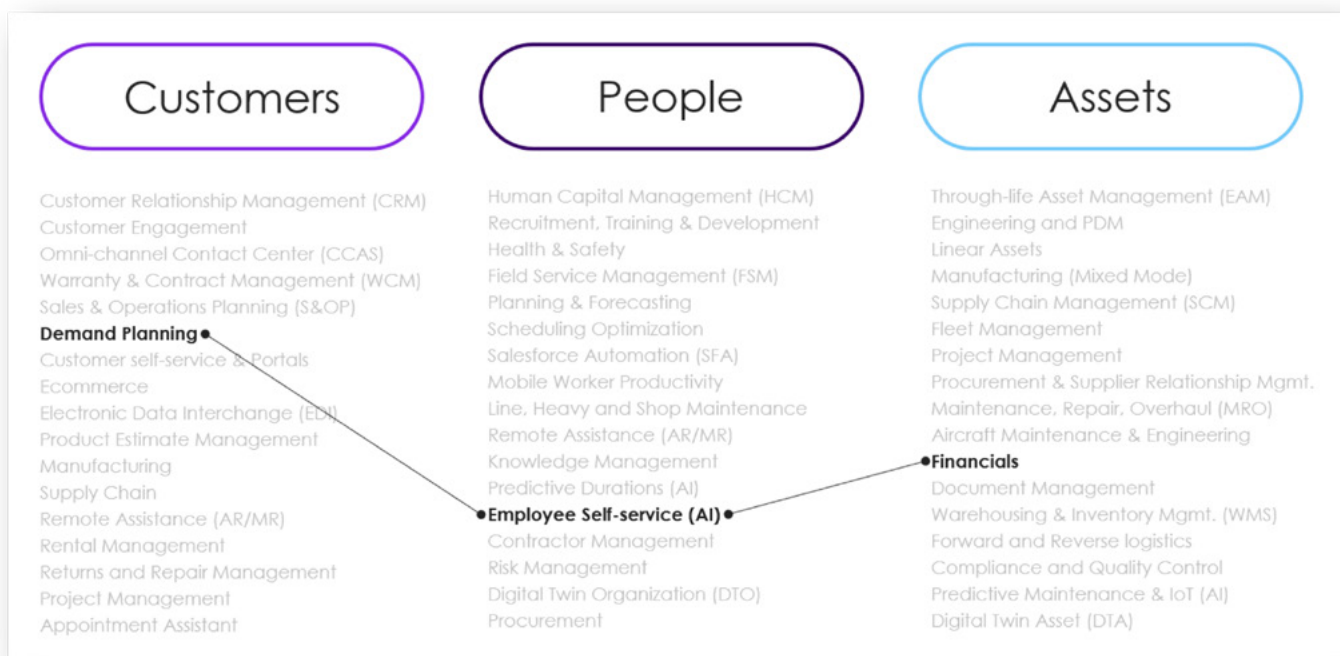
These are trained using data taken from multiple customers or from across a whole industry. Pre-built models are robust and available within the application for use out of the box. This alleviates the problem of customers not having enough historical data to train their own models and makes it easy to add the power of machine learning into their business processes and workflows.

Custom-built models

These are trained and validated on a customer’s own data, to capture the complexities and nuances of decisions that are unique to a particular business. For certain scenarios, these models tend to be more accurate as they better represent a customer’s business but are typically more complex to build and deploy.

3. Putting it into practice: use cases in IFS Cloud

Historically enterprise solutions were purchased in silos, creating complex integrations and additional cost. But IFS Cloud enables our customers to compose their enterprise solution using only the components that bring them value across their customers, people and assets. Every component works together seamlessly, providing a solution that is assembled or composed to the requirements of each customer:



IFS Cloud delivers the full spectrum of our class-leading capabilities through solutions geared to specific industries and solution areas – all from a single product and supporting platform. You start with the functionality your business needs and can deploy additional capabilities as your business needs change and grow.

Customer Relationship Management	Commerce	Finance	Human Capital Management	Projects	Procurement	Manufacturing	Supply Chain Management	Service Management	Asset Management	Aviation Maintenance
Proactive customer engagement	Catalog management	Accounting rules	Employee & organization management	Engineering & design	Strategic planning	Sales & operations planning	Demand forecasting	Planning & forecasting	Asset planning & realization	Multi-horizon planning
Omni-channel contact center	Trade agreements	General ledger & parallel accounting	Recruitment	Sales & subcontract	Supplier relationship management	Material & resource planning	Supply chain planning	Call & case management	Asset operations & maintenance	Fleet management
Lead management	Storefront	Fixed assets	Qualifications development & training	Contract change management	Sourcing	Visual planning & scheduling	Warehouse management	Contracts & warranties	Asset performance management	Lineforward maintenance
Opportunity management	Storefront connectors	Accounts payable & receivable	Health & safety	Project planning & follow up	Operational procurement	Product estimate management	Inventory replenishment	Schedule optimization & dispatch	Maintenance planning	Airframe maintenance, repair & overhaul
Contact management		E-invoicing	Expense management	Resource management	Contract management	Configure & make to order	Sales order	Service order management	B2B contracting	Complex assembly maintenance, repair & overhaul
Campaign management		Project finance	Time & attendance	Project manufacturing	Supplier self-service	Discrete manufacturing	Shipment management	Mobile worker productivity	GIS integration	Component maintenance, repair & overhaul
Engagement studio		Cash flow	Employee & manager self-service	Construction & installation	Employee self-service	Batch process manufacturing	Rental management	Service logistics	Document management	Disconnected operations
Automation & self-service		Business planning	Payroll integration	Project financial control		Repetitive manufacturing		Contractor management		Technical content management
		Consolidation		Project reporting & invoice		Quality management				Aviation material support
		Financial reporting & analysis		Risk management		Sustainability management				Quality, reliability & compliance

Our customers start with a pre-defined solution set fit for their industry, and then add or remove individual components for an even closer fit to their business needs. Customers appreciate the ability to combine capabilities across traditional functional silos – for example one combination that unlocks huge business value is the synthesis of assets, projects, and service. By eliminating silos, IFS Cloud provides holistic visibility and control across this complete lifecycle delivering lower operational costs, improved customer satisfaction and supporting growth through different business models.

3.1 Composability by industry

At IFS, many of our customers benefit from running our wall-to-wall solution – the full IFS Cloud software suite. However, the alternative we offer is different from that of many legacy technology providers. Rather than forcing companies into the traditional software categories of ERP, CRM, EAM, etc., we uniquely provide an agile, composable product able to address the complex and changing needs of organizations that address the full assets, projects and service lifecycle without the need to replace, for example, your ERP solution. Four of the key industries this plays out in are Manufacturing; Energy, Utilities, and Resources (EUR); Service; and Construction and Engineering (C and E).

Manufacturing

IFS Cloud offers one total solution that is built for the industry, is composable and enables manufacturers to pick and choose the capabilities that matter most where and when it's really needed. Empowering organizations with a single "plug and play" solution that can grow and scale as required helps accelerate time to value and drive overall ROI. IFS Cloud offers manufacturers leading capabilities to streamline all or some of the processes involved from first design through engineering and manufacturing, to final delivery of the asset. Furthermore, IFS Cloud offers a total set of asset and service management capabilities to support those manufacturers who also want to offer after-market services or maintenance for their products and assets.

Our single product and platform supports all phases of the manufacturing process for construction or engineering based projects that involve the delivery of a complex asset that needs subsequent servicing and regular maintenance. More specifically, IFS Cloud enables the smooth delivery of the project with an advanced set of management tools tailored for project-orientated manufacturers.

Energy, Utilities and Resources

IFS Cloud uniquely combines composable, enterprise asset management (EAM), a project solution, field service management (FSM), and mobile workforce management (MWM) designed for the needs of the EUR industries to compliment your existing ERP system.

Leading capabilities for asset lifecycle management, linear assets, offline remote sites, joint ventures, and AI scheduling and optimization address the complex needs of organizations whose businesses revolve around assets, projects, maintenance and service.

Service


IFS Cloud enables service industries to complement their existing system landscape with a best-in-class service management solution for operational efficiency and revenue growth. Delivering consistent service excellence requires efficient planning, optimal workforce scheduling, an integrated supply chain, and project oversight with interconnected business functions. It's an industry-focused, single, composable solution for forward-thinking service organizations on a digital transformation journey to deliver outcome-based service and customer satisfaction.

Construction and Engineering

IFS Cloud offers a complete solution that supports the entire lifecycle of an asset including project management and delivery regardless of how simple or complex. It enables your organization to successfully complete projects on-time and on-budget while giving total visibility to best manage and then service your assets.

One of our key differentiators is a strong project solution for construction organizations – their entire business model is project orientated and that's where the primary challenges are. As a result, assets and service as well as other complementary ERP areas like Finance and HR are secondary solutions.

More specifically from a service perspective, we deliver a dedicated environment to services and facility management specialists and provide a complete solution to handle facilities, property, service and maintenance management ensuring the customer is in complete control throughout the entire asset lifecycle.



4. Becoming the composable enterprise with IFS Cloud

IFS Cloud, our flagship single product and platform is built to meet the specific needs of your business and the markets you serve. It combines deep industry and functional strength with intelligent and autonomous capabilities that can be put to work from day one.

IFS Cloud delivers real choice in how you deploy and make it yours. While you always manage your IFS Cloud solution from our cloud, you can choose whether your product environments also run in the cloud or somewhere else like in your cloud or even on premise. IFS Cloud is simple to use and tailor, making it easy for you to extend and connect to your business and application landscape.

One of the core aims of IFS Cloud is to enable the composable enterprise. We've built the product to let you:

- Innovate and adapt quickly to changing business needs through a component-based approach
- Connect and extend out of the box
- Benefit from an intuitive and personalized experience

4.1. Innovate and adapt quickly

Delivering rapid business value through fast, simple implementations speaks to the heart of IFS Cloud. As software vendors around the world scramble to deliver emerging technologies, too many customers are left burdened with generic sets of new software that lack clear business relevance. Businesses may also find themselves laden with expensive proofs of concept or integrations and trials with a high degree of uncertainty, cost and risk.

With IFS Cloud, our single product enables you to quickly unlock value with established IFS functional solutions and embedded applications of emerging technology. For example, some of our customers benefit from bringing asset sensor data into our EAM capabilities through the Internet of Things. Others used mixed reality to enable experts to provide remote assistance to technicians. Validated by clear business-use cases that stand the test of time, our new product gives you the right tools to bring innovation to life.

To keep our customers' environments secure and help them innovate more easily, we release new features and innovations twice a year, along with monthly service updates containing fixes and security patches.



4.2. Connect and extend out of the box

One of the ways we enable our customers to connect their systems to IFS software is through APIs. We build our solutions with openness in mind, letting you complement built-in use cases by adding your own innovations – right out of the box. By using 100% open APIs and by putting you in control of your software lifecycle experience, we’re giving you the tools to drive further innovation on top of IFS solutions. Anything you can do in IFS Cloud you can also automate and access from the outside using our APIs—the same APIs that our own user experience, mobile apps, and embedded automation uses. This paves the way for you to tailor capabilities to your specific needs and integrate them into the bigger picture of your business and IT landscape.

For tapping into other systems and services, we also provide connectors in collaboration with our partner Boomi. Boomi are an industry leader that empower us to deliver fast, high-quality integrations with predictable timelines and costs. Our out-of-the-box Boomi connector lets you build connections more quickly and reduce the time spent on development by weeks or months. The Boomi iPaaS (integration platform as a service) is fast and low-code, so far less technical expertise is needed for integration work.

4.3. Intuitive and personalized experience

IFS Cloud is a single product and platform, bringing together multiple enterprise solutions and offering the freedom to tailor and extend, as well as mix and match different capabilities. For this to serve our customers properly, a consistent look and feel, entry points and user experience are key.

The starting point for users of IFS Cloud is the lobby – a page providing, at a glance, the key information you need for your work each day. Each lobby page presents a user with the information and functionality they need to do their work at any given time: a personalized environment that reflects a role, a process, or an industry-specific view.

Lobbies are a powerful way to centralize information pulled from multiple areas into a single view and increase visibility of key business metrics. But more than anything, lobbies reflect one of our core credos: to give our users the best experience, each experience may need to be a little different.

And by taking a people-first approach to software design, we’re replicating the seamless look and feel of mass-market products in our browser-based user interface. By researching the consumer technologies our customers regularly use, and continually adding to the picture of who our users are, we’re making IFS Cloud pages, visual language and interaction patterns feel as familiar and user-friendly as possible.

We’ve also built IFS Cloud using responsive design: every page will display in the best way for the device that’s being used. All the controls and visuals that make up the user interface will optimize their behavior for the device you’re using, whether that’s desktop, mobile or tablet.

Our responsive design brings the best of IFS Cloud to the environment you’re in. But when you need to tightly integrate with device hardware or don’t have an internet connection, our offline-capable mobile apps are ideal. Our selection of offline-capable apps live on your device and let you integrate with other apps on the device, like phone contact lists or barcode scanners. They’re available for specialized roles and tasks in field service, maintenance, CRM, time and expense reporting, notifications and approvals, warehouse data collection, and more.

5. Final thoughts

To compete in today's market, you need the ability to add and remove solution capabilities to support your evolving business needs. That might be offering an after-market service or, as the company grows, adding a stronger financial package or a new recruitment solution as you hire new staff.

With IFS Cloud, customers benefit from a single product and platform, which means:

- Multiple capabilities can share the same release cadence – they're all part of the larger IFS Cloud platform, also sharing the same user experience and API architecture. This is much harder to achieve when capabilities are composed from different vendors – software upgrade planning becomes cumbersome and error-prone as multiple release cadences, experiences and architectures must be factored in.
- Software barriers are broken down. Rather than IFS stipulating a fixed model, customers tell us what they want from a service management, ERP or EAM solution in the first instance. They then have the flexibility and freedom to adapt and change the solution over time, as business needs change.

Learn how IFS Cloud can help you transform into the composable enterprise ifs.com/cloud

About IFS

IFS develops and delivers enterprise software for companies around the world who manufacture and distribute goods, build and maintain assets, and manage service-focused operations. Within our single platform, our industry specific products are innately connected to a single data model and use embedded digital innovation so that our customers can be their best when it really matters to their customers—at the Moment of Service™.

The industry expertise of our people and of our growing ecosystem, together with a commitment to deliver value at every single step, has made IFS a recognized leader and the most recommended supplier in our sector. Our team of 4,500 employees every day live our values of agility, trustworthiness and collaboration in how we support our 10,000+ customers.

Learn more about how our enterprise software solutions can help your business today at ifs.com.

#MomentOfService