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ERP Takes Flight

How a Pioneer in Electric Aircraft Manufacturing Selected an ERP Platform That Would Not Ground the Business Before it Took Off

A European business at the forefront of developing electric aircraft is currently evolving from developing prototype aircraft to becoming an approved aircraft builder. The business required an enterprise resource planning (ERP) platform to run its core business processes, become an accredited aircraft manufacturer, and professionalize its business technology estate. As a four-year-old business with a strong data and digital services component, the ERP platform had to be cloud-native and avoid unnecessary complexity that could lead to delays or increase business costs.

The organization is developing all-electric aircraft with vertical take off and landing (e-VTOL) capability, which requires no runway. That makes this type of aircraft ideal for short-haul taxi services. Founded in 2016, the business has grown to 200 employees and secured important business partnerships with aerospace leaders.

The electric aircraft manufacturer has three prototype vehicles capable of carrying one to five passengers in what will be one of the world's first certified e-VTOL. These electric aircraft vehicles will travel at 300 kilometers per hour and have a range of nearly 200 kilometers.

Challenge

Manufacturing and operating aircraft requires effective business processes that collate and track procurement, parts management, quality control, invoicing, and payment. The CIO of the business says, provenance is vital to the manufacturer, operator, and passenger of a flying vehicle. "You have to show that provenance and that the business has carried out due diligence," she says.

The company is aiming to secure certification of their production aircraft from the European Union Aviation Safety Agency (EASA) and the Civil Aviation Authority (CAA) in the U.K. in 2023. Once certification is approved, the company can then begin providing commercial flights.

As the business took off from a single concept to three prototypes and began heading towards certification, the company had to ensure the business processes were in place to produce and operate electric aircraft to aviation industry standards.

"Everyone knew they didn't want a big system," says the CIO of the decision to not adopt a major ERP platform such as SAP. The company's ERP had to be cloud-based and fit four principles the CIO says are vital to any business, whether a pioneer in an emerging industrial sector or an established organization. "We don't build what we can buy, and that is part of the DNA of the business."

Those four principles the ERP system had to fit are:

1. Highly architected
2. Zero bespoke development

3. Cloud only
4. Zero-trust security

“To grow quickly, you have to have these four principles,” says the CIO. “They mean I can have a really slim IT team, and we looked hard for a system that could fit our initial small budget, allow us to grow and not require an army of consultants to implement. Rootstock was one of the few that met these hard constraints.”

From its early days in 2016, the electric aircraft manufacturer used Microsoft Sharepoint with a Microsoft Power Apps “widget” for many of the processes the ERP system would take on as the company grew. “That did the job when the business was just 20 people.”

By now the company’s requirements have expanded. “The business needed an agile system that was quick to implement, and could be configured,” she says of the decision to opt for Rootstock Software cloud-based ERP for the manufacturing, supply chain, and distribution sectors.

Rootstock ERP provides modules for order management, manufacturing operations, supply chain, and financial management. Built on the Salesforce enterprise cloud computing platform, Rootstock ERP leverages many of its core components and can integrate with Salesforce’s customer relationship management (CRM) platform.

Solution

Rootstock ERP took three months to implement, with a Statement of Work (SOW) in place between the electric aircraft maker and Rootstock. The ERP vendor provided two staff—manufacturing experts based in Sweden who worked closely with the procurement team at the European aircraft business. The basic elements of the ERP system went live as part one of the implementation. Then a series of iterations completed the roll out. The CIO reports Rootstock’s configurability was really beneficial to the business. Implementation was completed during July and August of 2020.

“Big systems become a cottage industry themselves within your business, and they create a massive amount of work, and that was not what the business needed. It also needed to be cost-effective to implement, run, and license—and I mean a magnitude cheaper than a system like SAP,” says the CIO.

Result

The electric aircraft maker’s technology strategy operates along the following pillars:

- Engineering
- Manufacturing and Assembly

- Maintenance Repair and Overhaul
- Services and Digital
- ERP & Finance
- Human Resources & Learning and Development.

The company's CIO describes the first level of the cloud computing estate at the business as being the core compute capacity for business operations. Digital is the "second horizon" of the business where the vehicles will report real-time data back to the business. That data will go into a data lake to provide the business with meaningful information on maintenance, performance, and flight routes, all of which will be used for business planning, predictive maintenance, and training.

This is why it was critical for the aircraft business to have an ERP platform with a digital architecture. The CIO says cloud-based ERP with a digital architecture requires low to zero bespoke development, but they can optimize the platform to suit the unique business needs. "We wanted to leverage SaaS and have the ability to configure, but with no need to change the application's code."

A further benefit is the ease of working with outside experts. The CIO has a team of just four, supported by an outsourced service desk and the cloud providers. Implementing Rootstock ERP was completed in the summer of 2020, with manufacturing experts from Rootstock working remotely in Sweden during the global Coronavirus pandemic.

Single-sign-on is also part of the technology strategy of the electric aircraft maker, and this was the first Rootstock ERP implementation to demand and address single-sign-on. The vendor tried to persuade the CIO not to use single-sign-on, but they persisted and Rootstock has now adopted single sign-on as well.

In the future, there will be continuous improvements to the technology, which is important to the electric aircraft business as it aims to offer a data-driven approach to vehicle maintenance and service.

Beyond the immediate changes to the system, the CIO says the platform will be central to the three stages of aircraft maintenance: maintain, repair, and overhaul. Via the ERP, the business will be able to look at the configuration of a vehicle and the parts supply, and therefore ensure the vehicle spends the minimum amount of time out of service.

"Every aircraft will have many different parts, and you need to know every configuration and for the engineer to have at their touch all the repair manuals and documentation for that vehicle. These will be bespoke to each aircraft and not generic manuals." Generic manuals typically increase the cost of the maintenance, repair, and overhaul costs.

Implementing Rootstock ERP has provided the aircraft manufacturer with the technology

underpinnings to further professionalize the organization from an experimental prototype builder to accredited manufacturer and operator. Rootstock ERP provides the business process platform for collating and tracking procurement, parts and order management, manufacturing operations, supply chain quality control, and financial management. As a result, the aircraft manufacturer is ready for what its leadership describe as the second horizon: a digital and data oriented business architecture for maintenance, performance, business planning and training.

Lessons Learned

The CIO reports implementing Rootstock ERP was relatively simple, but the financial modules have been more difficult. A lesson for her and the organization was ERP and finance should be delivered in one phase.

Also, because the business is an engineering startup, they did not have access to large teams for testing the technology and the implementation. However, an open purchase order (PO) with Rootstock triggers a set of sprints to resolve issues. “We made the basics live, and then we iterated,” she says.

To improve the Rootstock deployment in the finance team, the business is collaborating and sharing best practices with Boston Dynamics, a robotics engineering firm that also uses Rootstock ERP. There will also be a business analyst joining the finance team to work more closely on system configuration.

About Mark Chillingworth

Mark Chillingworth has been observing, speaking, writing about, and hosting chief information officers (CIO) community events and podcasts since January 2008. Over the last 12 years he has interviewed CIOs from across the globe and in every vertical market, ranging from the CIO of the British Army, major Dutch ports, international media conglomerates, global manufacturers, and retailers through to national and local government as well as startup technology pioneers.

Today Chillingworth works as a writer, editor, and moderator for leading publications, including Diginomica, the Financial Times, HotTopics, iCIO, and IDG Connect. CIOs and IT Teams as well as foremost technology service providers commission Chillingworth as a professional storyteller to write and convey how technology is reshaping organizations, cultures, and business processes. Alongside writing commissions, Chillingworth chairs the Horizon CIO Network, a specialist community of European and UK CIOs and CTOs.

Chillingworth entered the CIO and CTO community in 2008 as the Editor in Chief of CIO UK magazine. During his editorship, he created the CIO Summit, at the time the largest CIO event, and the CIO 100 powerlist formats in a tenure that took the title from failure to award winner. Leaving CIO UK magazine in 2016, Chillingworth and a business partner created the first podcast for CIOs.

Away from the world of CIOs and CTOs Chillingworth is father to two daughters and is obsessed with

mountain biking in France or the North Downs.

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