Royal Flying Doctor Service

Royal Flying Doctor Service digital initiative helps lift service efficiency using Microsoft Azure Functions

Data#3

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Objective

The Royal Flying Doctor Service (RFDS) (Queensland Section) was dependent on disparate data sources and wanted to integrate aircraft, patient, and crew data to give a clear picture of availability.

Approach

Having worked together previously, the RFDS (Queensland Section) identified that Data#3 had the capability to tackle a highly complex data integration project, working through rigorous proof of concept stages to completion.

Benefits

- Access to integrated, real-time data
- Improved accuracy
- Increased data analytics capabilities
- Accelerated ability to respond to calls
- Reliable information available at all locations
- Staff able to make better supported decisions under time pressure

Testimonial

"Azure Functions was a much better cost of operations model for us, and we continued to build out the model and started hooking up new systems and looking at the quality of data. It was a real collaborative effort between RFDS, Data#3 and Lynkz."

Nick Warwick, Data Integration and Analytics Manager, Royal Flying Doctor Service (Queensland Section).

Solutions & Services

- ☑ **Microsoft PowerBI**
- ☑ **Microsoft Azure Functions**
- ☑ **Microsoft Power Apps**
- ☑ **Microsoft Flow workflows**

Project Highlight

"When we could say we had the systems and processes in place that were trustworthy and reliable enough to get our operations centre up and running, it was a huge milestone."

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The Background

The Royal Flying Doctor Service (RFDS) is a charitable organisation that delivers primary healthcare and 24-hour emergency services to rural and remote Australians. Supported by a vast number of volunteers and supporters for more than 90 years, the RFDS holds a special place in the heart of the nation.

As one of the largest aeromedical organisations in the world, the RFDS faces unique operational hurdles. The crews and aircraft at the frontline work beyond the reaches of consistent data connectivity, so providing service involved considerable manual effort.

The Challenge

Before the RFDS was founded in Cloncurry in 1928, Australians living in remote locations had to travel by horseback, cart, or even camel to reach medical help in an emergency. Since then, the fleet has grown to 79 aircraft that operate from 23 bases across Australia.

The RFDS has expanded its services to include primary health care clinics, patient transfers, research, and a host of other essential care. Data Integration and Analytics Manager (Queensland Section), Nick Warwick, said that modernising the mainly manual RFDS systems was essential to ensure the Service could continue to provide the finest care to the furthest corner.

"One of the biggest challenges is that we operate off-grid, where there is no phone data or internet. If we can get data at all, it is usually slow, with very high latency, low bandwidth, and poor connectivity."

"In the sky, there is limited connectivity – we have satellite phones and tracking, but we're not about to be streaming Netflix, and the cost of streaming data is prohibitive. As a result, we operated with a lot of paper-based processes, with many standalone apps operating offline," explained Warwick.

As well as receiving much-appreciated donations from the public, the RFDS also accepts funding from both state and federal governments. Both levels of government supported the RFDS quest to modernise and innovate, and Warwick said moving away from paper-based systems represented an opportunity to improve care.

"It is all about how we can look after the patient better. Queensland Health has been moving all hospitals to electronic records, and we looked at how we provide information to the receiving hospital, and how the information we add works into that process."

In addition to integrating patient data from multiple sources, the RFDS (Queensland Section) wanted an Operations Control Centre for the fleet that would have accurate, near-real time data about its fleet and crews. The potential for increased efficiency and faster response times was an important driving force.

"If, for example, a hospital needed a patient transferred, they would ring Retrieval Services Queensland, a service attached to the 000 centre, who would then ring around to find pilots and nurses who were available and had the right skills for the specific job," explained Warwick.

"We wanted better situational awareness of available flight crews and availability so we could respond to calls faster. In Queensland we have 22 aircraft and 11 crews, and we're operating 24/7 ready to do medical retrievals. Different aircraft have different capabilities; all nurses are intensive care specialists, most are midwives, and all aeromedical doctors are anaesthetists or intensive care experts. We always need to make sure we send the right combination of specialists when responding to calls."

There are many considerations for dispatchers. Some aircraft have cargo doors, necessary for certain situations, or have capacity of multiple stretchers, while others may be better suited to landing on outback dirt strips. The dispatcher must rapidly assess and make decisions based on patient needs, location, pilot, and crew skills and even the aircraft itself.

> **"When we look at the board, we can see information about aircraft maintenance needs, and understand the current situation."**
>
> **Nick Warwick, Data Integration and Analytics Manager, Royal Flying Doctor Service (Queensland Section).**

Data#3 Customer Story

Royal Flying Doctor Service

"We knew at the end of phase one there would be a disengagement process, and if we were successful, we would have produced what was needed and have the skills to maintain it, and this was absolutely achieved."

Nick Warwick, Data Integration and Analytics Manager, Royal Flying Doctor Service (Queensland Section).

"We had a duty tasking officer whose job it was to advise Queensland Health from the moment of the request, organising everything that was needed for the best patient outcome from assigning the right aircraft and crew, through to making sure that the receiving hospital was ready for them and had a bed reserved."

Much of the needed information that documented aircraft capabilities and crew skills was held offline, so the tasking officer would have to manually look through hard copy information in multiple locations before an aircraft and crew could be sourced. A task that required manual checking of every piece of information, often with several phone calls.

"We were depending on paper-based processes and stand-alone systems, with someone figuring out what aircraft had what capabilities, and remembering it all in their head. We asked ourselves, how do we get our records all available electronically, and get our systems talking? The goal was to get the right information to the right person at the right time," outlined Warwick.

"We couldn't find anything commercial off-the-shelf that would do the job of emergency and flight planning for an airline where we have no advance knowledge of where we'll being flying to on any given day."

IT Outcome

The RFDS (Queensland Section) began to automate some processes, extract simpler data, and load it into their data warehouse. They gained the ability to run some reports however they were not in real time. They still needed to integrate patient and aircraft data, and to find a way to display the information. All this needed to be managed within a strict budget, as the RFDS team was very conscious of their responsibility to get the most from every dollar of funding.

"We had to find all the bits of information and get them into a spot we could use. Prior to coming on board, Data#3 had done some work with the RFDS around data processing strategy to produce reports. We were initially looking at Azure Data Factory and had done discovery work, and we chose to work with Data#3 and their partner Lynkz for a proof of concept to show if it would work and prove beneficial," explained Warwick.

"As we evaluated the cost, we realised that Azure Data Factory would not be the right tool, and the team identified that Azure Functions applications would be better suited. We rebuilt the prototype, and it exceeded performance and costing expectations."

Azure Functions is a serverless solution that allows you to write less code, cut infrastructure requirements, and reduce costs. With the needed resources residing in the cloud, and streamlined development, the affordability factor soared.

Part of the limited proof of concept, for a single view of aircraft information, was the build of a simple dashboard displaying real time details. Even then, Warwick said that getting the go-ahead was "by no means a given", and the project was put through a strict approval process to ensure that it offered significant value to patients and staff.

"Azure Functions was a much better cost of operations model for us, and we continued to build out the model and started hooking up new systems and looking at the quality of data. It was a real collaborative effort between RFDS, Data#3 and Lynkz," said Warwick.

As more systems were integrated, some were determined to be no longer fit for purpose, and alternatives were considered for functions such as flight manifests and tracking.

"Data#3 helped us to design and build a new manifest system, and we chose a new partner for a flight tracking system that sends API calls. The capability of our system is now far more advanced than we had previously."

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Business Outcome

A key moment was the launch of the RFDS (Queensland Section) Operations Control Centre. This was made possible when key systems were integrated successfully and marked a milestone in RFDS' commitment to growth in innovation.

"We can now see exactly where we are, whether any of the crew has limitations we need to be aware of, we can see their location, and no longer have to make calls to know where people are, the information is just there. When we look at the board, we can see information about aircraft maintenance needs, and understand the current situation."

"At a glance, we know which aircraft is loaded with NICU (neonatal intensive care unit) equipment, or which staff are available with the right specialist skills. If we're asked a question, we can just look up and see it on a big display board that shows real time information," Warwick said.

Display boards are also installed in each of the RFDS locations around Queensland, so that wherever they are, crews, support staff and engineers can access accurate information at a glance.

"The work we're doing ensures that pilots, nurses, and doctors have the right information. Rather than a 000-dispatcher calling multiple places to find the right aircraft, we can tell them straight away. For example, we had a critically ill patient who needed to travel to Brisbane, and we could see that the closest crew was not the best match for the patient's needs and could immediately locate the best option."

"At the Operations Control Centre, we have integrated flight systems, manifests, and tasking systems plus the first of our clinical systems, so instructions can be preloaded onto the clinician's iPad, used offline during flight and the data uploaded at the other end. We can be saving five to ten minutes per patient by passing data over, and the process can remove up to half an hour in tasking communications."

It's not only in the Operations Control Centre that efficiencies have been realised. Warwick noted a reduction in effort when aircraft come in for servicing. Engineers can quickly notice when an aircraft will be waiting for a few hours for a patient's return journey or a hospital handover, thanks to the screens in each location.

"We can now show clearly which aircraft are on call, and which aircraft our engineers can work on. When an aircraft is on the tarmac, engineers can know whether they have time for routine maintenance. Now we have visibility of information, we can improve our operations and work more efficiently."

For Warwick's IT team at RFDS (Queensland Section), one of the key success factors was knowledge transfer, with Data#3 specialists providing documentation and helping internal resources to gain confidence in working with Azure Functions.

"We knew at the end of phase one there would be a disengagement process, and if we were successful, we would have produced what was needed and have the skills to maintain it, and this was absolutely achieved."

"**Data#3's biggest strength was their attitude. The account manager saw us as a relationship, and had a professional, constructive approach based on mutual respect. They could see what we were trying to do, and their attitude was that we will find a way together to make it work.**"

Nick Warwick, Data Integration and Analytics Manager, Royal Flying Doctor Service (Queensland Section).

Conclusion

With real time information available on screens at each of the RFDS (Queensland Section) locations, the project has been highly visible within the organisation. This has led to demand for additional data to be integrated as the possibilities are considered. Warwick said that the project has highlighted the core RFDS spirit.

"As an organisation, innovation is at the core of what we do. In 1928, nobody had used planes to transport sick people. We're always looking for the best ideas. Our aircraft now have stretcher loading systems to go straight from the aircraft to ambulance. We have connectivity options at every site we operate. We're looking for ways we can improve telehealth, and how we can put equipment like cardiac monitors and diagnostic equipment where they're of most use."

As an organisation, the RFDS is ever conscious of spending funding wisely, and this impacts the way that technology projects are approached. This makes proof of concepts especially important, and Warwick said that "we'll give it a go but stop if it doesn't work", something that requires a supportive technology partner.

"Data#3's biggest strength was their attitude. The account manager saw us as a relationship, and had a professional, constructive approach based on mutual respect. They could see what we were trying to do, and their attitude was that we will find a way together to make it work," praised Warwick.

"If we had more work, there was always give and take, and they were able to find another person."

Looking to the future, the RFDS has plans to roll out additional services that are much needed by the remote and rural Australians they serve. Warwick said that as well as increasing demand for primary care and dental clinics, the health practice now offers youth mental health care, maternity health, and operates a system of medical chests that he hopes will be integrated, so that status can display for the operations centre staff.

"We're considering projects around geospatial technology, so that when someone calls needing help, we can get lifesaving medications to them from the medical chests faster than an aircraft can arrive."

Given the RFDS spirit of innovation, it is unsurprising that Warwick sees modernisation efforts less as a project with a start and finish and more as an ongoing progression where there will always be opportunities to improve services as new technologies emerge. There's "no endpoint" when striving for the best patient outcomes. Still, he said it's also important to reflect on the advances already made.

"When we could say we had the systems and processes in place that were trustworthy and reliable enough to get our Operations Control Centre up and running, it was a huge milestone."

"At the end of the day, we had information locked in folders, in boxes, in people's heads – as we start unlocking data and making it accessible, we can look at what we can do with it to improve lives. That's why I get up in the morning," concluded Warwick.

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Data#3, Microsoft and Lynkz

Since 1994, Data#3 has combined forces with Microsoft to help our customers adapt and grow. Today, we are Microsoft's largest Australian business partner with the highest level of competency across the Microsoft ecosystem. Our hundreds of accredited consultants are ready to help our customers deliver the digital future; from enhancing productivity and collaboration with Microsoft 365 and the latest Surface devices, to transforming business processes with Dynamics 365, to ensuring our customers get the most value from Azure cloud. Our scale and expertise enable our unparalleled support to customers selecting, deploying, managing and securing Microsoft applications, products and devices.

Lynkz is an entirely Australian-owned IT consultancy, specializing in the precision delivery of data through cutting-edge technologies like Machine Learning, Artificial Intelligence, and Cognitive Services. Collaborating closely with organisations, Lynkz excels in crafting solutions that enhance data delivery using a wide array of platforms and services, including Microsoft Cloud, IBM Watson, AWS, Google Machine Learning, Bots, and an adaptable service layer, incorporating PowerBI and tailored front-end UI development.

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