

# How the Welsh Government migrated their technology to the cloud

## Summary

The Welsh Government:

- organised the Future ICT project to move systems and services to the cloud between 2016 and 2019
- created a multidisciplinary team to organise the migration, which included business and change management, digital, and communications staff
- employed a small developer team for SharePoint and SQL database development
- used an Agile approach throughout the whole project

## Project aims

The Welsh Government wanted to modernise their technology, and developed a strategy that was more aligned with the [UK government's policy](#).

The Welsh Government also saw the opportunity to move away from traditional working patterns and practices. One of the main benefits of the migration was to equip the business with devices, software, connectivity and collaboration tools so that jobs were no longer tied to a particular building or office. By changing HR rules on flexible working and moving away from working at fixed desks, the Welsh Government was able to introduce a smart working policy with greater focus on productivity and wellbeing.

The contract between the Welsh Government and ATOS, who provided a range of services such as application support, was ending and they could not extend it again. The Welsh Government decided they wanted:

- new ways of delivering services
- more control over their commercial lock-in options
- to equip the organisation with better infrastructure and technology, as laid out in their [2016 ICT strategy](#)

## About the Welsh Government

The Welsh Government has devolved responsibility for a portfolio of policy areas such as:

- health
- local government
- economic development
- natural resources
- agriculture

- education

The Welsh Government manages these policy areas through a single government body rather than separate, Westminster-style departments. It has an annual operating budget of about £250m and about 5,700 staff.

## Preparing for migration

Initial preparation for moving to public cloud started in 2014. This was the first opportunity the Welsh Government had to end their outsourcing contract. But after considering a lot of options they decided that public cloud did not yet have the functionality and security they needed, and chose to extend their contract with their supplier. This extension gave them time to revise their ICT strategy and vision, which they completed in 2016. It also gave them time to plan how they would migrate to the cloud.

## Outlining plans and priorities

During the planning stage they decided to start with the parts of their systems that were invisible to users, such as moving the infrastructure to Exchange 365. They chose Azure as the platform for their content management system (CMS) because they were already using that supplier and it was the only product at the time that met all their security requirements.

The project team also planned how to deal with their legacy technology and services. They kept all legacy well maintained and designed their new architecture to take over from the old architecture as it became obsolete. Towards the end of the project they added a [Hyper Converged hosting solution](#) (HCI) for services they could not transition to the new architecture. HCI allowed the team to create a flexible virtual infrastructure for these services. The services were still available, but they were able to run them at a lower cost.

The project team also looked at an initial selection of services that they assessed as being ready for the cloud. During the project planning phase, they prioritised these services based on the security assurance and cyber vulnerability analysis. As the team deployed services, they defined the security and supporting security accreditation processes which allowed them to deploy services faster.

## Carrying out the project work

The Welsh Government continued with their outsourcing arrangements for the business-as-usual work while the in-house team of contractor and staff engineers did the Future ICT project work.

The team worked on:

- migrating to Exchange 365
- moving from GSI email and adopting the latest [email standards](#)
- migrating staff to new smartphones

- doing a major application migration to Azure
- migrating staff to new laptops

## **Migrating data**

Migrating the data was the hardest part of the project. They had at least 33 million documents amounting to approximately 20 terabytes of data. Keeping old and new systems in sync while they migrated this much data was hard and time consuming. During the data migration phase for the Electronic Records and Document Management System (ERDMS) the team had to maintain constant service availability. They created a secure Virtual Private Network (VPN) transit from the storage source to the cloud destination and used the supplier's utilities to bulk copy and sync file data changes.

The whole migration took 2 weeks, but to make that possible, they had spent the previous 2 years introducing and enforcing a rigid data and records management policy. This policy includes auto deleting any content stored in personal drives or One Drive after a certain amount of time. This was not always popular with the staff but it meant that they saved their files in the right format in the records management system, which made the data cleaner and easier to migrate.

## **Moving from the old to new domain**

To make it possible to migrate to a new environment the team invested in some legacy technology to make it stable. The team also created a new Welsh Government domain to set up a new managed network infrastructure. This provided a clear line between the 2 infrastructure domains which meant they could set up the new domain to meet their needs and gradually migrate data and services from the old domain.

By choosing this migration method the team could continue to provide a seamless service whether it came from the old or new domain. Keeping the domains in sync was hard but the benefits were that the project team could deploy modern cloud-based user authentication, device management and up to date encryption on the new domain.

The team aimed to migrate all applications to the new domain, but knew that they could not migrate some legacy applications. They decided to keep a small legacy network until they could remove or replace the applications on it.

## **New technology for staff**

One of the last things the project did was migrate all staff onto new laptops. The team did extensive consultation with the staff about their needs and device preferences, and ran a series of pilots with volunteer users from across the organisation.

The complexity in this process came in moving from a Windows 7 Citrix environment. The project team had to configure a hybrid type environment, allowing them to maintain multiple versions of Outlook throughout the rollout and software upgrade process. They had to deal with a fairly complex

migration plan. This included strict dependencies to maintain interoperability between teams of users who were using these different versions of Outlook, and a mixture of on-premise mailboxes and cloud mailboxes.

They had to do all this while balancing the need to future-proof their technology as well. Some of the older versions of Outlook were not compatible with the new environment, making them harder to migrate.

## **Overcoming obstacles**

The project had a few obstacles, some of which had technical solutions and some that the project team addressed through managed communications.

### **Getting stakeholder buy-in**

The main obstacle was gaining the confidence of the organisation that such an ambitious project was possible.

The project team got permission from the organisation for each stage of the project and gained confidence by:

- keeping the Board and staff well informed about plans and progress
- completing one element of the project at a time to show the plan worked
- showing the Board the costs and risks should some of the older technology fail
- showing the Board the poor staff survey results about user satisfaction

Also 2 incidents increased the urgency to complete the project:

- [the 2017/18 WannaCry malware](#) – the Welsh Government was not affected but their systems were old enough to cause concern
- the Welsh Government experienced a couple of ICT service failures which underlined the organisation's complete dependence on its systems

### **Storing some data locally**

The Welsh Government still needed to maintain some data and services on premise for a variety of reasons, including security and system age. To mitigate this the team set up a hyper converged computer system. This has allowed them to consolidate the services they could not transition to the cloud, and also have a secure location for backup copies of key cloud hosted datasets.

The team expects they will always need to store some data locally and host a small number of services. The team does not expect to store 'live' production data locally, but would store things such as security copies and backups of their strategic cloud-hosted data.

### **Improving cost optimisation**

The team had to do active management and [cost optimisation](#) of the cloud

environment so that the organisation did not use more cloud services than they needed. They established a Cloud Consumption Manager role for support teams, to focus on cost optimisation. By controlling the consumption of services they were able to bring their costs down.

The project team recommends that any organisation migrating to the cloud should prioritise resources to cloud optimisation. The important thing to do is to identify and analyse early on any applications that you can configure to consume platform services. This could include databases and web hosting containerisation instead of using virtual machine deployment.

## **Deploying new laptops**

Another obstacle included developing a credible rollout plan for laptop deployment and gaining more resources to speed up rollouts. The variety of operating systems used across the organisation made it a complex project.

The team's solutions were to:

- have good engagement with rollout groups, who nominated champion users to assist with the laptop deployments
- maintain and sync the various operating systems until they could gradually move the data
- issue new laptops with the latest operating system
- mandate a short familiarisation session for all staff as part of receiving their new device

These steps allowed the team to transition to the new laptops while also addressing some technical shortfalls.

## **Completing the project**

The team has confirmed that the new environment is working well. It is stable and the services are all functioning as intended. With the cost optimisation planning the Welsh Government is saving money and gaining from staff efficiency.

Staff running applications can now run a more effective DevOps cycle of improving the applications, because the new platform uses a 'plug and play' infrastructure.

The team did post-project surveys and asked for feedback from the staff. The results confirmed the staff are very happy with their new laptops and are also pleased that everyone gets the same kit throughout the organisation. The surveys also showed that the staff feel invested in, and the change in technology has changed the way the organisation works and communicates.

## **Future plans**

To maintain the new environment the Welsh Government is including IT in their ongoing strategy. Wherever possible, the aim is for their platform service model to only use services where they are the service administrator. This is

instead of managing cloud hosted infrastructure services.

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## [PM call with ventilator manufacturers and suppliers: 26 March 2020](#)

The Prime Minister spoke to a number of British suppliers and manufacturers yesterday evening (26 March 2020) about rapidly scaling up ventilator production for patients with coronavirus. The Health Secretary and Chancellor of the Duchy of Lancaster also joined the call.

To date, there are more than 8,000 ventilators available to NHS patients, with another 8,000 expected from existing UK and international manufacturers in the next few weeks. The Prime Minister has been clear that the UK must step up production of ventilators even further to support the UK's response to the virus and save lives.

The Prime Minister's call to manufacturers last week had an overwhelming response, with a wide range of UK and international businesses offering to help provide services, including designing and building new devices, manufacturing components or transporting them to NHS hospitals.

Following this, the government has partnered a number of the UK's leading technology and engineering firms with smaller manufacturers to rapidly build existing, modified or newly designed ventilators at speed, with seven priority projects underway. They are working to improve the speed at which current UK ventilator manufacturers can produce their devices, with larger companies changing their existing operations to help provide the UK with the equipment and personnel it needs for this effort.

Yesterday, the Prime Minister spoke to a dozen of the companies involved to thank them for all their work so far and to discuss ways that the government could support them to build ventilators more quickly and in greater quantities for the frontline in the coming weeks. This included how to accelerate the manufacturing of particular components needed for this equipment. The Health Secretary assured the companies involved that his Department will ensure that regulatory bodies are able to process the new devices and approve those that meet the requirements as soon as possible.

Numerous companies are involved in these critical projects, including among others:

- High Value Manufacturing Catapult
- Meggitt
- Ford
- GKN Aerospace
- Babcock

- Plexus
- Siemens PLC & Siemens Healthineers
- McLaren
- Rolls Royce
- Airbus
- Renault F1
- PA Consulting
- Renishaw
- GE Healthcare Systems

Additionally, the government is also working with many other UK manufacturers to build, design and develop new effective, safe and easy-to-build ventilators.

Government officials are currently working with expert clinicians and health regulators to test all new machine designs, as patient safety is of paramount importance. Any new orders are all dependent on machines passing regulatory tests, but the government, manufacturers and regulators are working at pace to drive this work forward.

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## [UK pledges £544 million to find coronavirus vaccine](#)

The UK government has pledged an additional £210 million of support to accelerate work to find a coronavirus vaccine, in an announcement following a virtual summit of G20 leaders.

The UK has now pledged £544 million in total which makes it the biggest contributor to Coalition for Epidemic Preparedness Innovations (CEPI) – the international coalition to find a vaccine.

Announcing the additional funding, British Prime Minister Boris Johnson said:

While our brilliant doctors and nurses fight coronavirus at home, this record British funding will help to find a vaccine for the entire world. UK medics and researchers are at the forefront of this pioneering work.

Acting High Commissioner to India Jan Thompson said:

This important announcement demonstrates the UK's continued commitment to finding a coronavirus vaccine alongside our key international partners. We already have a strong record of research collaboration with India; at a time like this, international

collaboration is more important than ever.

The additional package of funding will go towards producing rapid tests for coronavirus and testing and developing medicines to treat the disease, for use in the UK and around the world. Quickly identifying those with coronavirus and having the means to treat those most affected will be pivotal in bringing down the number of people killed.

### **Further information**

#### **The new UK funding consists of:**

£210 million to help develop a vaccine. This new funding for the CEPI is in addition to the £40 million already given to the organisation. It will help scientists and researchers continue to lead global efforts to develop a workable coronavirus vaccine, including at the University of Oxford.

£40 million to develop affordable treatments for coronavirus patients. This will support the Therapeutic Accelerator, a fund for the rapid development of anti-retrovirals or immunotherapies against coronavirus which is already backed by the UK-based Wellcome Trust, the Bill & Melinda Gates Foundation and Mastercard. It aims to make 10 million treatments available in the coming months globally, including in the UK.

£23 million to further develop easily-manufactured testing devices. This is additional funding for the Foundation for Innovative New Diagnostics, a partnership between academic organisations and pharmaceutical companies which will build rapid testing technology like the new prototype test developed by the Mologic lab in Bedford, which is currently funded by the UK.

#### **UK-India joint research on vaccines:**

Rotavirus causes half a million infant deaths from diarrhoea every year. Through an innovative trilateral global research partnership between India, UK and developing country researchers, new trailblazing research is being carried out to test the rotavirus vaccine to improve vaccine performance in immunisation programmes across India and Africa. This is an excellent example of collaboration between the UK and India on research and innovation to address global challenges, in turn bringing benefits to the UK, India and developing countries and contributing to global public goods.

For media queries, please contact:

Sally Hedley, Head of Communications  
Press and Communications, British High Commission,  
Chanakyapuri, New Delhi 110021  
Tel: 24192100; Fax: 24192400

Mail to: [BHC Media Delhi](mailto:BHC Media Delhi)



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## [Supporting our health workers](#)

Health and care workers are the frontline of the country's response to the coronavirus pandemic. Along with other businesses, we are keen to do all that we can to support doctors, nurses and care workers to respond safely.

To help, we are providing personal protective equipment (PPE), where we can, to priorities established by the Cumbria Resilience Forum.

Initially, we are donating items including 2500 disposable respirators; around 500 suits, gowns and lab coats and several hundred pairs of gloves.

As we better understand our own need, we are likely to be able to make more equipment available. The protective equipment comes from Sellafield Ltd, contractors and suppliers.

It can be spared without impacting on nuclear safety or emergency preparedness. It would ordinarily be used to support the delivery of work and projects on the Sellafield site. Much of this work has been temporarily paused while the country focuses on responding to the pandemic.

Mark Neate, Director of Environment, Safety and Security said:

As the largest employer in West Cumbria, we are doing all we can to support the community response to the pandemic.

It became clear that one of the simplest and most effective things we could do would be to share personal protective equipment. This will enable doctors, nurses and others on the frontline to do their essential work to care for those who are or may be suffering.

We are working with other key partners and businesses in Cumbria to ensure that our response is coordinated with everyone else's. This includes the blue light services, councils, and business networks. Working together ensures that resources are prioritised to where there is the greatest need.

Mark added:

I am delighted to see how community agencies, businesses and charities are all working together, along with the public, to help address the impact of coronavirus. This is the community spirit we

are used to in Cumbria.

Businesses and organisations who have a request for PPE should contact the Multi-Agency Support Team in the first instance. This group is coordinating requests. email [mast@cumbria.gov.uk](mailto:mast@cumbria.gov.uk).

Companies who have spare PPE they would like to donate can also contact the MAST by email.

The team is unable to respond to requests from individuals.

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## [Coronavirus \(COVID-19\) – update on VOA services](#)

The outbreak of coronavirus (COVID-19) is causing unprecedented disruption to public services, businesses and individuals across the country.

The majority of our employees are equipped to work from home and are doing so to avoid unnecessary travel and social contact. We are operating as close to normal as possible and are prioritising work related to coronavirus.

We are working hard to manage queries online and via email, but it is taking longer than usual to respond to customers. We would like to apologise to anyone who might be affected by changes to our services.

### **Support for ratepayers**

The Government has published [guidance for employees, employers and businesses, including a 12-month business rates holiday](#) for certain sectors of businesses in England and a package of funding and loans. Further [support has also been announced for certain small businesses](#) previously outside the scope of the business grant funds scheme.

Any enquiries on eligibility for, or provision of the reliefs should be directed to your local council. The Welsh Government has also published [guidance for businesses](#) in Wales.

Please note we are currently unable to offer telephone support or accept hardcopy post. If you need to contact us please use the [Contact Form](#), which also contains links to useful self-help guidance. It is taking us longer than usual to respond to customers but please be assured that we will get back to you as soon as we can.

We provide a range of reasonable adjustments to customers where they are required. Customers can let us know through the Contact Form or ask a friend

or family member to complete on their behalf.

## **Face-to-face appointments**

Property inspections are being put on pause and we are focusing on gathering the information we need remotely, where it does not add an additional burden on our customers.

We are unable to accommodate requests to view hard copy rental information we hold, such as Rent and Lease Details, Forms of Return and proposal forms.

## **Penalties**

We are cancelling outstanding penalties in regards to non-compliance with requests for rent, lease or ownership details. For hardship cases, we are being as flexible as we can with customers when we require information.

## **Keeping you updated**

We continue to monitor this situation as it develops and will publish any new or updated guidance.