HOW TO OVERCOME TEN CLOUD TRANSFORMATION HURDLES AND THRIVE

A BJSS eBook

Contents:

About the Author:

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Tim is an experienced leader and innovator in the cloud and managed service domain. He has over 30 years' experience in delivering complex and scalable solutions for clients across various industries and is still passionate about helping clients get the most out of cloud, data and AI.

As the Head of Cloud and Managed Service at BJSS, he oversees a team of talented and dedicated professionals who help clients transform their businesses with cloud technologies and best practices.

Introduction: Harnessing the power of the cloud to modernise and transform your business

Hailed as the key to unlocking new levels of agility, scalability, and business resilience in the way organisations operate, cloud transformation has become an essential part of modern-day business operations.

And because the cloud serves as the building block for unlocking valuable data insights and integrating AI services, it is the pivotal platform for driving informed decision-making and efficiencies. As a result, the use of cloud to ride the mega trend of AI will continue to put the technology at the forefront of the minds of business and technical leaders.

This, combined with the fact that Gartner forecasts worldwide public cloud end-user spending will reach **nearly $600 billion** in 2023, means that cloud transformation is an even more pressing concern for businesses looking to remain relevant and responsive to their customers' needs.

However, despite the immense promise of cloud and its potential benefits, many businesses, including early adopters, have not realised the value they expected. The good news is that these issues are addressable.

In this eBook we address the 10 hurdles organisations need to overcome if they want to see true value from cloud transformation, as well as the practical measures that can be taken to address them.

This eBook is based on BJSS' extensive experience and expertise at the forefront of delivering successful cloud transformation programmes used by many of the UK's population on a day-to-day basis. And we demonstrate how to overcome each hurdle with an example of how we've helped one of our clients navigate a similar complexity in cloud transformation.

Whether you find yourself embarking on a new role as an operational leader entrusted with supporting business transformation and innovation, are considering the practical use cases of AI, or having already migrated to the cloud but not yet reaped the anticipated rewards, this is tailored to your needs.

Keep reading to uncover valuable insights.

What is cloud transformation?

Cloud transformation is the process of transitioning a business' data, apps, and software to the cloud. It plays a fundamental part in driving digital initiatives, with **75% of organisations** predicted to adopt the cloud as their fundamental underlying platform by 2026 according to Gartner.

# The benefits of successful cloud transformation
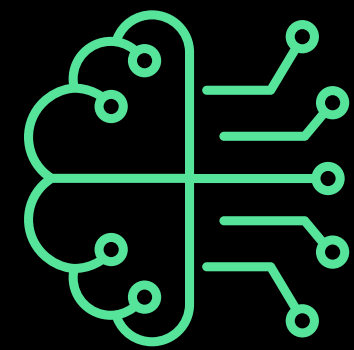
Unlocking the power of data and AI

Using the cloud to power data-driven insight and AI services can deliver the ability to make better use of data for decision making, and unlocking new revenue streams. Getting your data onto a cloud platform will give you a better chance of harnessing the transformative power of AI.

Accelerated business resiliency, adaptability and speed to market

The cloud allows businesses to respond quickly to changing market demands and customer needs by offering near-instant scaling up or down of resources. The cloud also enables faster prototyping and testing of new products and services.
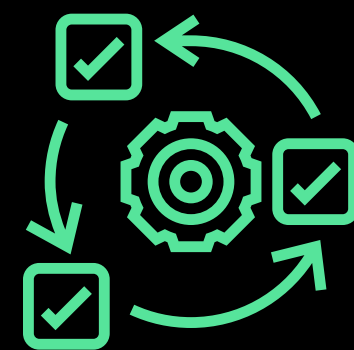
Enhancing operational efficiency

The cloud enables faster access to data, real-time collaboration and communication, and better analytics by eliminating data silos. It also frees up IT staff from routine infrastructure maintenance and allows them to focus on innovation.

Assuring data security

The cloud can provide better data protection and compliance than on-premises systems by leveraging advanced encryption, backup, and disaster recovery capabilities. The cloud also reduces the risk of data loss or theft due to physical damage or human error.

Improving cost management

The cloud can help businesses reduce their capital expenditures and operational costs by shifting from a fixed to a variable cost model. The cloud also offers more transparency and control over the usage and billing of resources.

Getting the cloud platform right will create the foundation for successful transformation and help businesses achieve their digital transformation goals, and gain a competitive edge in the market. However, cloud transformation requires careful planning, execution, and governance to ensure a successful outcome.

This eBook outlines the 10 key hurdles that businesses need to clear to reach the finish line of achieving their transformation goals, providing insight through BJSS customer success stories.

Key Takeaways: The 10 Hurdles to Cloud Transformation

How to overcome them and thrive

1 **Set your vision, strategy, and operating model to get off to a flying start**

Begin with a well-defined vision and strategy, including a set of principles and practices that guide how to leverage cloud services to achieve your goals.

2 **Empower your cloud team with learning and development opportunities to go the distance**

Provide teams with the skills needed to effectively support new cloud platforms and boost their skills, motivation, and productivity.

3 **Ensure security and compliance are built in from day one**

Incorporate security and compliance best practices from the beginning of your cloud journey, and leverage the cloud's native capabilities and tools.

4 **Pick the best cloud for your needs**

Leverage the best capabilities of the major cloud providers – AWS, Azure, Google Cloud – to meet your business objectives.

5 **Lay the foundations to help you scale with confidence**

Use cloud accelerators to rapidly provide a secure foundation for deploying, running, and scaling cloud workloads.

6 **Improve predictability through observability**

Define observability for the performance, reliability, and behaviour of your platform and application by using modern cloud-focused tooling.

7 **Operate and governing with confidence**

Establish continuous security monitoring of resources as well as policies, controls, and compliance mechanisms, to ensure cloud resources are used in alignment with organisational objectives.

8 **Move beyond the 'lift-and-shift' to truly modernise and transform**

Transform and replace legacy systems with modern cloud infrastructure to reap the full benefits of the cloud.

9 **Boost your developer experience and productivity**

Leverage upcoming cloud services to unleash the creativity and potential of developers, allowing them to deliver better solutions faster and more easily.

10 **Ensure cloud, data, and AI are in harmony to drive business transformation**

Ensure your cloud platform is compatible to unlock data insight for better decision making and AI services to improve efficiency.

Hurdle 1: Set your vision, strategy, and operating model to get off to a flying start

The first hurdle is often the most important one to clear. Get this wrong and the whole journey could be knocked off course.

Beginning with the end in mind helps set you up for success, and having a well-defined cloud vision and strategy is essential for a transformation project that achieves its goals.

Given the various stages of cloud maturity, a key activity of the strategy is to define an operating model that works for your organisation. This step is particularly challenging because it involves merging existing procedures with the requirements of the new cloud environment. Unfortunately, there is no one-size-fits-all solution, and many organisations struggle to integrate new cloud services into their existing operating model.

A cloud operating model is a set of principles and practices that guide how an organisation leverages cloud services to achieve its goals. Governance, compliance, and the responsibilities of different stakeholders need to be considered, as well as the policies and standards for cloud usage, security, and performance.

An effective strategy and operating model will enable you to:

- Communicate the purpose and goals of cloud adoption to your organisation.

- Align your cloud actions with your business objectives and values.

- Get ahead of your cloud cost.

- Guide your cloud transition by balancing benefits and risks.

- Choose the best cloud operating model and provider for your needs.

- Consider how you will operate your new services.

- Consider your security approach.

These will help you stay informed and be ahead of the curve in terms of cloud spending while enabling you to maximise the value of your cloud investments.

In our experience, defining the strategy and vision is often formed from concerns about managing compliance or costs, which leads to a more thorough review. Having a North Star will help you keep on track when you are in the weeds of migration or modernisation initiatives. This is discussed in the following case study, where we helped a UK challenger bank deliver its operating model and address concerns over potential cloud costs.

Case Study: Developing an ops model to support Unity Trust Bank's migration to the cloud

Unity Trust Bank is an award-winning, independent, commercial bank that uses banking to improve the lives of UK communities.

Living by its principles of banking with integrity, Unity's purpose is to help create a better society, not simply maximise profits. For almost 40 years, Unity has supported like-minded organisations that share its values and address social, economic, and environmental needs. Unity aligns every lending proposal against one or more of the United Nation's Sustainable Development Goals (SDGs) to ensure that all funding has demonstrable impact.

Challenge

Though well-established in the marketplace, Unity is a small bank unable to undertake a wholesale digital transformation programme. Instead, it had been gradually modernising its technology stack to better service clients and achieve growth.

However, Unity wanted to go further and develop a strategy for migrating its entire on-premise systems to the cloud. To support this migration, Unity also needed a FinOps model that would promote shared responsibility for the cost of new cloud-based systems between finance and IT.

Unity engaged BJSS because it needed more IT expertise and capacity to complete the strategy and had become aware of the cost-based challenges other organisations faced when undertaking similar projects.

Moreover, Unity wanted a comprehensive strategy to manage the cost and technicalities of cloud migration and to access more services without increasing operational overheads or investing in on-premise resource.

Solution

BJSS began by completing an overall Cloud Readiness Assessment tailored to Unity's specific needs, allowing the Bank's leaders to understand the requirements of cloud adoption.

Recommendations following the assessment included the development of a governance model for managing key cloud decisions, and creating learning paths to educate and upskill the wider business.

To ensure Unity received the best possible outcomes, BJSS conducted a number of interviews with the Bank's C-suite personnel to understand individual departmental goals and ambitions.

The information gleaned was used to align cloud value with each of the Bank's business units and strategies, and to highlight the many advantages of cloud adoption.

With the Cloud Readiness Assessment and interviews complete, BJSS examined Unity's existing knowledge of the cloud against the six FinOps Foundation principles. From this exercise, we defined an operating model describing the structure, skills, and capability required to manage cloud costs and benefits to ensure Unity realised a healthy return on investment.

Case Study: Developing an ops model to support Unity Trust Bank's migration to the cloud (continued)

Outcome

BJSS developed a Cloud Decision framework to determine the appropriate migration path for Unity's critical business applications, together with a Migration Roadmap that aligned with the bank's current IT Change Roadmap.

Benefits arising from the FinOps model include the ability to assign metadata to cloud services using tagging. The process allows Unity to search 'tags', for example, customer onboarding, and get immediate visibility as to how much the system is costing, whether any action needs to be taken, and how it measures against budgets.

By establishing principles and controls, Unity has enhanced its ability to optimise its expenditure and can undertake thorough reviews comparing predicted spend to actual spend.

Today, Unity feels assured about its travel direction with a clear roadmap of migration options and sequencing. The Bank understands the governance changes required, the operations that better support cloud usage, and have clear visibility of ongoing costs and return on investment.

"As much as we wanted to complete a migration to the cloud, we had concerns around costs, complexities, and our ability to arrive at the right solution for the business. The BJSS team we engaged alleviated those concerns with their introduction and development of a FinOps model. It was clear from the outset that they were committed to helping us reach our objective and demonstrated outstanding knowledge, expertise, and care throughout the process. As a small bank that cares deeply about our customers and their sustainability goals, we are now in an excellent position to manage our costs more effectively while leveraging the cloud's full power to achieve growth for ourselves and those we service."

Mark Clayton, Chief Operating Officer, Unity Trust Bank

unity trust bank

Hurdle 2: Empower your cloud team with learning and development opportunities to go the distance

Transitioning to the cloud represents a major technological shift that can profoundly impact an organisation's culture. It necessitates careful attention to the human skills required to effectively support the new platforms.

Providing your team with learning and development opportunities is a great way to boost their skills, motivation, and productivity. By investing in your team's growth, you can help them stay updated on the latest trends and technologies in the cloud industry, enhance their creativity and problem-solving abilities, and increase their engagement and loyalty to your organisation. Learning and development opportunities can also help your team collaborate better, communicate more effectively, and deliver high-quality results for your customers. In short, providing your cloud team with learning and development opportunities is a win-win situation for everyone!

Think about the following areas to empower your cloud team with learning and development opportunities that will help your digital transformation go the distance:

- Clearly define the purpose and goals of cloud adoption and effective communicate them to your cloud team, recognising that cloud adoption entails significant adjustments in working methods, including the adoption of new processes, tools, methodologies, and best practices.

- Assess the existing skills and knowledge gaps within your workforce and design appropriate learning interventions to address them.

- Ensure that your team receives essential training and support to enhance their skills and enable them to work effectively in the cloud environment.

- Offer continuous and personalised learning opportunities that are easily accessible, engaging, and effective.

- Involve your team members at every step of the cloud adoption journey to foster a sense of ownership and ensure the success of the transition.

- Cultivate a collaborative, innovative, and learning-oriented culture that encourages experimentation and aligns with modern, cloud-native ways of working.

- Equip your cloud team with the necessary skills, tools, and support required to implement the cloud strategy and realise the organisation's cloud vision.

At BJSS, we often collaborate with clients to plug skills gaps. We have developed a capability framework and assessment that helps with understanding existing capabilities and the supplementary resource needed to bridge those gaps.

Don't be afraid of utilising a blended team to leverage the skills of consultancies like BJSS to address shortcomings in your existing team. A notable example of this is in the next customer success story, where we used one of our accelerators and helped a team upskill with the latest technology, accelerating their ability to use the cloud in an efficient and secure manner.

Case Study: Upskilling with BJSS Enterprise Cloud in the Scottish Government

The Scottish Government's Rural Payments and Services department manages various schemes for people in rural areas, including projects for conservation, climate, development and innovation.

When the department engaged BJSS, they had already taken their first step into the cloud with a single solution and gained the benefits of scalability, availability and speed of development. But it was a challenge to reproduce those benefits as they considered adding new public-facing services.

With a relatively small team, managing issues around security and application migration was a real concern. We deployed BJSS Enterprise Cloud in less than two weeks, providing the department with an enterprise-ready platform to migrate and host applications quickly and safely. The security monitoring they needed was built-in alongside a wealth of best practice for cloud configuration. Accelerating cloud deployment was just the start.

We also led interactive knowledge transfer sessions so that the department's team was empowered to go forward without external assistance. We used a coaching approach based on pair programming,

a proven agile technique. This has upskilled the team and given them the confidence to operate and develop the platform in response to the organisation's changing needs.

"Using BJSS LZs for our AWS estate has not only provided us with AWS best practices and adhering to the well architected framework but it also provided us with the ability to spin up AWS accounts and their environments within minutes. Furthermore, BJSS LZs also gave us the ability to provide isolated AWS environments for other government departments which required an immediate need for an AWS account – such projects as Scotland's redress service and Ukrainian refugee response."

Neil Smith, CTO, Scottish Government, Agriculture and Rural Economy
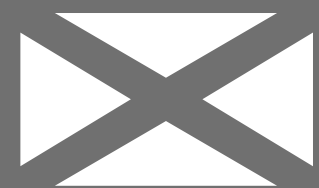
Scottish Government
Riaghaltas na h-Alba
gov.scot

Hurdle 3: Ensure security and compliance are built in from day one

The more we work on cloud transformation projects, the more we think that embedding security principles is at the heart of success. This is an upfront activity, part of shaping your vision and goals, as getting the security element wrong will overshadow everything comes afterwards and will reduce velocity, sometimes to a complete halt.

Security and compliance are not just technical issues, but also business and strategic ones. They affect your reputation, customer trust, and regulatory obligations. By incorporating security and compliance best practices from the beginning of your cloud journey, you can avoid costly and time-consuming remediation later on. You can also leverage the cloud's native capabilities and tools to enhance your security posture and compliance readiness.

Some of the steps you can take to ensure security and compliance are built into the start of your cloud journey are:

Ensure security considerations are part of your vision and strategy setting, and built into your operating model design, by conducting a thorough assessment of your current security and compliance status, gaps, and requirements.

Implement a cloud governance framework that defines roles, responsibilities, policies, and procedures for managing your cloud environment. Consider the emergence of DevSecOps as a discipline and the necessary skills needed to embrace this capability.

Ensure security observability services are in place to monitor, audit, and test your cloud environment regularly so that you may detect and respond to any security or compliance issues.

Use encryption, identity and access management, firewalls, and other security measures to protect your data and resources in the cloud.

Adopt a secure-by-design approach that applies security principles and controls throughout the cloud lifecycle, from planning to deployment to operation.

Train and educate your staff on cloud security and compliance best practices and responsibilities.

The customer success story on the next page highlights how a security first approach led to moving sensitive data to the cloud without compromising the nature of the data.

Case Study: BJSS & Scottish Agency delivered a European First

Highly sensitive police data was migrated from an aging infrastructure onto a next-generation public cloud platform without compromising security standards.

With high levels of accreditation, such as ISO27001 information security standards, the service includes a secure environment that is backed up with best of breed technologies and industrialised processes to ensure both data security and integrity.

The environment is fully automated, repeatedly changing, and adapting itself against real-time security threats. This combination of mapping and security measures is innovative and largely unmatched. Not only has this project delivered significant cost savings for the agency, but it has also provided the foundation for a wider digital transformation programme. This cloud-first approach is delivering a faster, more accessible, and accurate digital disclosure service for the people of Scotland.

"This cloud migration project is the first of its kind in Europe and is a vital component of our wider transformation project.
The combined client and BJSS team created this next-generation highly secure platform that provides quick access to information. It's a great example of how we're investing in protecting our local community, and shaping a safer environment to live and work."

Programme Director

Hurdle 4: Pick the best cloud for your needs

Can clouds co-exist peacefully? There is a lot of debate about the binary choice of either choosing the right cloud for the job or going all-in with a single cloud provider.

The reality, however, is that multiple clouds can coexist and probably do already in most enterprises. Indeed, a multicloud strategy can help you leverage the best capabilities of different cloud providers while meeting your specific business needs.

Additionally, it's no longer just a choice about the best infrastructure services - there now needs to be a consideration of data requirements, how AI will be used, and how easy it is to overcome operational security and observability requirements.

We believe there are clear benefits to adopting a multicloud strategy, including:

Choice and avoidance of vendor lock-in

Flexible distribution of workloads across different cloud environments, providing improved reliability and better failover options

Reduced impact of brute force cyber attacks

Versatile DevOps environments and performance optimisation

However, choosing the right provider and service model can be difficult and confusing, considering factors such as performance, availability, security, compliance, pricing, support, and compatibility.

The other downside is, given that skills are already short, having multiple teams with differing domain knowledge could aggravate the problem.

However, help is at hand if needed. Our perspective is centered on selecting the most suitable cloud solution for each task, without hesitating to embrace multicloud environments when the advantages are evident.

BJSS has developed robust platforms across various cloud providers, seamlessly integrating them with existing services and ensuring their utmost security.

The following customer success story highlights how a multicloud cloud strategy was used to ensure that UK Health Security Agency used the right cloud for the job.

Case Study: UK Health Security Enterprise Cloud platform

The UK Health Security Agency (formerly the Department of Health and Social Care) is a UK Government Department that is responsible for protecting every member of every community from the impact of infectious diseases, chemical, biological, radiological, and nuclear incidents, and other health threats.

Since the start of the Covid-19 pandemic, it has played a significant role in the UK's fight against the virus by introducing the Test and Trace service.

Together with the UKHSA team, BJSS rolled out its Enterprise Cloud Landing Zone to speed up the delivery of the Azure and AWS-based cloud platform that is still operated by BJSS today.

Challenge

NHS Test and Trace is a programme of work within the UKHSA to help halt the spread of Covid-19. For the programme to succeed, it needed to be delivered securely and at pace, all while meeting the anticipated demands on the service.

The service needed to be supported by cloud technology, bringing existing hosting and tooling within the control of NHS Test and Trace. UKHSA did not have the resources available to deliver a new platform to the scale required within the tight timeframes.

Solution

BJSS was successful in securing the opportunity to deliver the Azure and AWS-based Test and Trace cloud platform for UKHSA.

To achieve this, we introduced the BJSS Enterprise Cloud. This framework enables the UKHSA to vend new accounts at pace and provides a single pane of glass for all its accounts. It also provides thousands of hours' worth of code, which compressed down the delivery timescales from months to just a few days.

When the programme puts forward new requirements for the platform, we can stand up new services and vend new accounts exceptionally quickly. All of this is achieved without compromising the platform's security posture.

Benefits

Accelerated delivery: Similar cloud deployments to this usually take months to deliver. The BJSS Enterprise Cloud contains thousands of hours' worth of code that has helped the UKHSA to stand up the Test and Trace cloud platform in a matter of days. All the necessary guardrails have been built in, resulting in a cloud platform that has been securely delivered at pace.

Ability to quickly scale: The ever-changing nature of the pandemic has resulted in fluctuations in demand on the Test and Trace service. As a result, it needs to be quickly scaled up and down in line with demand. Without BJSS Enterprise Cloud, it would have taken UKHSA longer to deploy new workloads and stand up new services.

Tailored to meet demands: We tailored the BJSS Enterprise Cloud to meet UKHSA's specific requirements by folding them into the platform. While we can continue to add requirements to the platform, UKHSA also has access to the Infrastructure as Code to quickly make any changes autonomously. It also allows them to iterate on top of the platform and evolve it in line with changing requirements.

UK Health
Security
Agency

Hurdle 5: Lay the foundations to help you scale with confidence

Establishing solid foundations is crucial to build the future, just as it is when building a house. Strong foundations future proof the build and enable you to scale with confidence. Using a cloud landing zone offers the optimal beginning to this process.

We believe that a correctly implemented cloud landing zone provides the building block on which to plot modernisation activities and build future business enhancing services to become more data driven and productive through the embedding of AI.

What is a landing zone?

A landing zone is a modular and scalable configuration that enables organisations to adopt cloud services for their business needs. It provides a secure and well-managed foundation for deploying and running cloud workloads, and consists of several elements, such as identity and access management, resource management, security, networking, logging, and auditing.
To build a landing zone, you should follow the best practices from your cloud provider and consider your specific requirements and goals. It will allow you to help you achieve faster and smoother cloud adoption, lower operational costs, improved performance and reliability, and enhanced governance and compliance.

We believe in the concept of a landing zone accelerator as part of the building block to future proof your transformation.

Working with BJSS has the benefit of thousands of hours of investment, delivered as experience-as-code, with necessary guardrails to make delivery of services faster.

The key benefits can be summarised as:

- Supporting your business objectives by promoting innovation, fostering agility, enabling scalability, and ensuring resilience.

- Ensuring that security and compliance are seamlessly integrated into the foundation. This strategic approach enables you to migrate to the cloud securely and efficiently.

- Enabling consistent and automated enforcement of security policies across diverse cloud environments, including development, testing, and production.

- Reducing the risk of data breaches, unauthorised access, configuration errors, and human mistakes through minimising the attack surface and implementing the principle of least privilege.

- Enhancing the visibility and accountability of cloud activities by generating audit trails and reports for security incidents and compliance audits.

- Enabling the automation and streamlining of essential cloud operations and processes, including provisioning, monitoring, backup, and recovery.

The customer success story on the next page highlights how the use of a solid foundational landing zone provides the groundwork for greater things.

Case Study: Met Office

Challenge

Every fifteen years, the Met Office undertake a piece of work to upgrade their SuperCompute environments to the latest Cray HPCs to improve the accuracy and efficiency of their research workloads. Due to the power and space requirements, The Met Office identified that this wouldn't be possible in their current premises and liaised with Microsoft to find a solution. The agreed solution was to host the new Cray HPC environment in Azure as a service provided and managed by Microsoft. As this was an environment that wasn't visible or accessible to The Met Office, their Enterprise Architects, Cloud Solution Architects, and security teams were concerned about extending their identity domains (Active Directory and RedHat IdP) into the managed environment.

Because of this, they decided to implement a Cloud Adoption Framework Landing Zone to both support the identity services required for the SuperCompute environment, and provide all the governance and foundational aspects to support safer and faster adoption of Azure for their current and future workloads in a controlled manner.

Due to the nature of the workloads, the environment also had to support large amounts of data moving between the two environments, such as weather modelling and processing, and do it in the most secure, performant, and cost-efficient manner possible.

Engagement

As a collaboration between BJSS and Microsoft was vital to the success of this project, BJSS initially engaged with The Met Office by holding workshops to gather the specific requirements of the project, and the challenges they were facing due to the multi-tenancy nature of the environments; the performance, throughput and security requirements, and worked through multiple connectivity scenarios to achieve the correct outcome.

Following these discussions, BJSS then held comprehensive workshop sessions to help The Met Office understand the different aspects of the Landing Zone environment, take them through the implementation approach, and ensure that everything adhered to both the Cloud Adoption Framework standards and The Met Office security and performance requirements to guarantee a successful outcome.

Outcome

BJSS successfully implemented the Landing Zone environment that met all The Met Office requirements and addressed their challenges. The environment is performant, reliable, scalable, and secured against all unauthorised access while giving The Met Office the confidence to accelerate its Azure adoption for any future workloads that require it. The assurance given by the Landing Zone has enabled The Met Office to choose Azure as their platform of choice, and they are now planning to migrate or build service on the platform, whereas, before the engagement, they had few plans for quick adoption.

The Landing Zone delivery also enabled the SuperCompute rollout to become operational due to the high-performing identity solution provisioned into the environment.

≋ Met Office

Hurdle 6: Improve predictability through observability

Following hot on the heels of the foundational building block should be an observability strategy to improve predictability of performance.

We have already discussed the need for security observability, but you should also consider the performance and cost of the new cloud based service.

We believe that cloud observability is not just a nice-to-have feature, but a necessity for modern cloud operations. By implementing a cloud observability strategy, you can take advantage of the full potential of the cloud and deliver better outcomes for your business. Indeed, whatever form your operations team has, they will demand an end-to-end view in order to make sense of new services.

Observability in the cloud is also a crucial aspect of managing modern applications that are distributed, dynamic and complex. It enables you to monitor the performance, reliability and behaviour of your applications by collecting and analysing different types of telemetry data, such as metrics, traces and logs.

Observability also helps you to identify and troubleshoot issues, optimise resource utilisation and improve user experience.

A cloud observability strategy offers several important advantages, including:

- Rapid issue detection and resolution through the correlation of data from various sources, enabling the identification of root causes for prompt resolution.

- Enhanced service quality and improved customer satisfaction by meeting service level objectives (SLOs) and service level indicators (SLIs).

- Reduced costs and simplified operations by leveraging a unified observability platform that spans multiple cloud providers and technologies.

- Accelerated innovation and scalability by gaining insights into the behaviour and impact of changes and experiments, enabling faster and more informed decision making.

Cost management in the cloud is a vital skill for any organisation that wants to optimise their cloud spending and get the most value from their cloud services.

There are several important things to consider with regards to cost management in the cloud, such as:

- Choosing the right cloud service model and provider that suits your needs and budget.

- Monitoring and analysing your cloud usage and costs regularly to identify trends, anomalies, and opportunities for optimisation.

- Implementing cost governance policies and best practices to control and allocate your cloud spending across different teams, projects, and resources.

- Leveraging cloud-native tools and features that can help you reduce your cloud costs, such as auto-scaling, reserved instances, spot instances, and discounts.

- Exploring alternative or complementary cloud solutions that can offer better performance, reliability, or security at a lower cost.

By following these steps, you can achieve cost management in the cloud and enjoy the benefits of cloud computing without breaking the bank.

The customer success story on the next page shows how we helped the NHS migrate to the cloud and put observability services in place to ensure performance and cost are now predictable.

Case Study: NHS e-Referral Service move to the cloud saves taxpayer £50M a year

The NHS e-Referral Service (e-RS) is a flagship NHS system. It's used by over 1,100 NHS organisations and their patients to choose, book, and change over 75,000 referral appointment requests every working day, with over 50,000 services available to book.

Challenge

When BJSS and NHS Digital originally built e-RS in 2015, to replace the previous Choose and Book system, the service was operated by dedicated computer, networking, and storage equipment. This meant that, in addition to the equipment used to provide the service, enhanced resilience was needed too. Spare equipment to automatically take over if something failed, in addition to dedicated data communication and environmental control equipment, was also required. While this dedicated structure made e-RS reliable and secure, it made it expensive to maintain and complex to manage.

However, with time, improvements to public cloud offerings became available. Cloud enables organisations to host their data remotely, rather than maintaining their own computing equipment. NHS Digital was keen to explore the viability of transferring e-RS to the cloud. It hoped that this would save taxpayer money and also support the NHS' Internet First policy of providing access to digital systems by other providers such as dentists, optometrists, and pharmacies. BJSS, drawing upon its extensive experience in executing technology projects for the NHS, was entrusted with the task of assisting NHS Digital in their ambitions. This comprehensive migration, spanning across 18 environments, encompassed the transfer of a remarkable 235 million documents stored in a database, amounting to an impressive total data size of approximately 13 terabytes. This led to the most significant and ambitious cloud migration undertaken by the NHS to date.

Solution

BJSS' extensive cloud experience played a crucial role in selecting AWS as the cloud provider for e-RS and determining the most suitable services.
An initial cross-functional team from BJSS and NHS Digital thoroughly assessed the feasibility of migrating e-RS to the cloud. These recommendations were independently reviewed by NHS Digital's Technical Review Group, who granted project approval. This resulted in a joint BJSS and NHS Digital Delivery Team of 28 covering platform engineering, architecture, application development, functional and non-functional test, delivery management, business analysis, database administration, service management and operations.

They delivered:

- The opportunity to realise significant cost savings from moving to a more flexible and resilient storage and management system.

- Improved ability to manage changes in demand and to understand system performance, providing more responsive support for users.

Throughout the migration process, BJSS employed FinOps principles to gain visibility into the NHS's cloud spending. The team implemented effective cost controls and took responsibility for monitoring costs at a granular level. This approach enabled them to assess the cost versus risk of migrating different workloads, facilitating prioritisation, and contributing to the overall success of the cloud migration.

NHS
Digital

Case Study: NHS e-Referral Service move to the cloud saves taxpayer £50M a year (continued)

The migration of e-RS to the cloud stands as a significant milestone in the NHS' digital transformation journey. While optimising costs, the service's performance has also seen substantial improvements. Leveraging 21 best-of-breed AWS cloud tools and services, e-RS was developed with scalability, availability, and durability at its core.

Given the sensitivity of medical data and personally identifiable information, robust security measures were meticulously implemented during the migration process. The service now benefits from enhanced security, including sophisticated and regularly updated protection and firewalling measures.

Outcome

Moving to the cloud has resulted in e-RS achieving significant performance, security, and cost-saving improvements.

Handling outpatient hospital appointments, e-RS provides real-time information about available services and clinicians. After the migration e-RS served 85,000 active users with 400 dynamic weight web pages a second. At peak load, 20,000 patient units can now be accommodated. The service has largely replaced paper-based referrals, slashing the time to process a referral by 75 percent and reducing missed appointments by half.

The National Audit Office (NAO) estimates that these improvements are saving secondary care providers over £50.5m every year. These long-term cost savings will enable the NHS team to continue to enhance the e-RS service, instead of managing spiralling costs. In turn, it improved the resilience and quality of the service. The migration also enabled the integration of NHS apps and improved management of referrals while reducing its carbon footprint.

Through BJSS' support, NHS Digital has delivered its first major cloud migration and has created a system that will make the health service more connected and efficient than ever before. Above all, the successful migration to the cloud has produced real benefits that have improved the lives of NHS patients.

"There is a wealth of benefits that come from moving large systems like e-RS to the cloud. Costs are lowered, reducing pressure on the public purse, there is better security and reliability, as well as greater flexibility, performance, scalability, and availability, to name a few."

Neil Bennett, Director of Services, NHS Digital

NHS Digital

Hurdle 7: Operate and govern with confidence

Having a team ready to run and evolve your cloud environments is crucial to confident cloud operations, yet many organisations fall at this hurdle, leaving things too late and resorting to passing new platforms to already overstretched operations teams.

We believe that effective operations and governance play a pivotal role in the realm of cloud management, where the dynamic and scalable nature of cloud environments requires careful attention. Indeed, we are expert practitioners in blending more traditional ITIL services with the principles of agile, lean, and DevOps, which emphasises the importance of collaboration, communication, and integration across the various teams and functions involved in IT service management.

Operations encompass the day-to-day management, monitoring, and maintenance of cloud resources to ensure optimal performance and reliability. A well-structured operations strategy includes continuous monitoring of resource utilisation, automatic scaling, and efficient troubleshooting to promptly address any issues that may arise. With proper operations, businesses can minimise downtime, enhance user experience, and maximise the value derived from their cloud investments.

Governance, on the other hand, focuses on establishing policies, controls, and compliance mechanisms to ensure that cloud resources are used in alignment with organisational objectives and regulatory requirements. Effective governance involves defining clear roles and responsibilities, implementing security protocols, and enforcing data privacy measures. By exercising strong governance, organisations can mitigate risks related to data breaches, unauthorised access, and regulatory non-compliance while maintaining transparency and accountability throughout their cloud infrastructure. In combination, robust operations and governance practices provide the foundation for a well-managed, secure, and efficient cloud environment that empowers businesses to leverage the benefits of the cloud while safeguarding their assets and reputation.

Effective cloud operations offer a range of benefits that contribute to the overall success of an organisation's digital infrastructure:

- Cross-Team Collaboration: With well-defined operational practices, teams across an organisation can collaborate more effectively. DevOps, IT, and development teams can work together seamlessly, accelerating the delivery of applications and services.

- Business Agility: Cloud operations facilitate rapid deployment and testing of new applications, enabling businesses to innovate and adapt quickly to changing market conditions. This agility provides a competitive edge in today's fast-paced digital landscape.

- Cost Efficiency: With careful resource monitoring and management, organisations can identify and eliminate underutilised resources, reducing unnecessary costs. Effective operations also enable the selection of the most cost-effective cloud service models, resulting in optimised spending.

- Faster Issue Resolution: Active monitoring and proactive troubleshooting lead to quicker identification and resolution of issues. This minimises service disruptions, mitigates potential damage, and maintains the stability of applications and services.

- Enhanced Security: Strong operational practices involve implementing security measures such as access controls, encryption, and regular security audits. This helps protect data and sensitive information, guarding against cyber threats and ensuring compliance with industry regulations.

In summary, effective cloud operations not only optimise technical aspects of a cloud environment, but also contribute to business success by improving collaboration, reducing costs, enhancing security, and fostering innovation.

Our next customer success story provides an overview of how we helped DVSA to deliver operational and governance surety for a new digital system.

Case Study: DVSA: An Award-winning Digital Support Service

The Driver and Vehicle Standards Agency (DVSA) is an executive agency of the UK Department for Transport. It carries out driving tests, approves people to be driving instructors and MOT testers, carries out roadside checks, and ensures the general safety of road vehicles.

As part of the agency's digital, data and technology strategy, it is aiming to provide modern, efficient, and sustainable technology to support a mobile workforce and build brilliant digital services for its users.

To achieve this, the DVSA has migrated many of its core services to AWS Cloud. The services are supported by a unique 24/7 BJSS Technical Support Service that combines a helpdesk with key ITIL processes, agile development techniques and a DevOps culture. As a result, the DVSA benefits from stable, secure and modern cloud infrastructure, helping it to focus on delivering its core services and achieve its transformation ambitions.

Challenge

The DVSA is on a mission to develop modern, efficient and sustainable technology to support a mobile workforce and build brilliant digital services for its users.

However, it needed to overcome several challenges to achieve this. Its IT infrastructure was originally housed on physical server infrastructure. This was costly to maintain and was hampering the agency's ability to transform and respond quickly enough to the demands of the modern age. Furthermore, its services and legacy infrastructure were supported by a traditional outsourced service desk which was responsible for resolving incidents. While the service desk played a vital role in incident resolution, it was not fit for the digital age and the DVSA's transformation ambitions.

A vital enabler of the agency's digital transformation programme was the migration of its core services to the cloud such as its MOT testing service, testing and registration system and roadside payments service.

For each of these cloud migrations to be a success, the DVSA required a managed service partner from the outset who would be responsible for working with project delivery teams to ensure that monitoring/alerting was in place and the right environment management controls were delivered.

As the DVSA's digital partner, BJSS was chosen to support the migration of several services to AWS and provide a modern Technical Support Service (TSS).

Solution

The aim of the BJSS TSS is to provide 24/7 operational support for all DVSA's digital services in AWS. We have overseen the migration of ten DVSA core services to the cloud, ensuring service management controls were in place from the outset of each migration.

Our ISO27001 accredited TSS team supports each of the ten digital services with:

- Service management – Focusing on key process areas such as incident and problem resolution, service requests, release, change, availability, capacity, and continuous service improvement.

- Comprehensive service level performance governance and reporting.

- Integrated security incident management with DVSA SOC and IMS.

- On-call engineers that are available 24/7, resolving 15 service incidents and 10 releases out of hours per month.

- Digital delivery release coordination and dependency management across digital services.

Driver & Vehicle Standards Agency

Case Study: DVSA: An Award-winning Digital Support Service (continued)

Our TSS has helped to ensure the stability of the DVSA's digital services, supporting the handling of £12m worth of monthly payment transactions. We deliver 20 releases a month across the services and provide specialist AWS expertise to ensure the cloud platforms are up to date and running smoothly. Crucially, we have successfully handled over 500 incidents, requests, and events every month.

Benefits

Platform innovation and cost optimisation

By selecting to work with BJSS, the DVSA has access to our leading AWS certified platform engineers. This has enabled the agency to continuously improve its AWS platform through innovation. We've led the way in terms of helping the DVSA adopt new cloud features which have improved performance and reduced the overall cost of ownership. In just six months, our TSS and platform engineers were able to reduce the run costs of the DVSA's MOT AWS platform by 50%.

Flexible and adaptable

The TSS we provide DVSA is both flexible and adaptable. Having overseen the agency's digital transformation, we have evolved the service continuously in line with requirements and priorities. Our agile approach to service management, combined with our cross-functional team, allows us to rapidly switch resources to meet the needs of the DVSA. This flexibility and adaptability has played a crucial role in helping us achieve a 100% incident resolution within SLAs and zero penalties since the start of our service.

Integrated service management and project delivery

We pride ourselves in having a collaborative approach to service management. Our TSS team are fully integrated with project delivery teams across the DVSA's supplier ecosystem. We ensure that service management processes are considered from the outset for all cloud migrations, which is essential in achieving a smooth transition from project delivery into our TSS. We also bring our expertise in DevOps, agile delivery and continuous improvement to support all DVSA digital projects. A peer review completed by the Government Digital Service (GDS) – confirmed that the support our TSS team provided during the MOT Service migration, was an exemplar of how to deliver an agile project. The BJSS TSS for the DVSA was also awarded 'Service Transformation Project of the Year' by ItSMF UK, the IT service management community.

"BJSS, through its Transformational Support Service has been instrumental in supporting our digital transformation and the efficient use of the AWS Cloud Services both during development and in live. BJSS has shown that they can work in a true client/supplier partnership delivering tangible benefits."

Alex Fiddes
Head of Digital Operations, DVSA

Driver & Vehicle
Standards
Agency

Hurdle 8: Move beyond the 'lift-and-shift' to truly modernise and transform

Modernisation transcends the traditional focus on 'lift-and-shift' strategies of moving compute, storage and applications to the cloud and is now increasingly focussing on data as enterprises rely on cloud platforms to accelerate their business transformation to a data-driven enterprise.

It is a crucial part of becoming more agile and responsive to customers and market opportunities given the rapidly changing nature of technology and the marketplace.

Typically, a standard lift and shift approach is initially employed to enter the realm of cloud technology. However, this approach often fails to reap the full benefits of the cloud, as it often replicates challenges from legacy systems, and introduces new complexities in the cloud environment. Whilst this has been an acceptable strategy, more enterprises are embracing cloud native options and developing specifically for the cloud environment. Whilst this has been an acceptable strategy, more enterprises are embracing cloud native options and developing specifically for the cloud.

While modernisation presents more challenges, it is often highly rewarding. This process involves rebuilding or refactoring applications from scratch, optimising them specifically for the cloud. Modernisation includes transforming or replacing legacy systems - outdated, inefficient technologies - with modern infrastructure and technologies that reduce IT costs and complexity, improve agility and collaboration, and enable future innovation. Migration and modernisation activities can exist perfectly well together as part of a transformation journey and the following case study highlights this.

The benefits of cloud modernisation include:

Enhanced business resilience with the ability to add new services to respond to competitive pressures

Leveraging cloud-native features and services to enhance capabilities and productivity

Reducing operational overhead and maintenance costs

Becoming a more data-driven enterprise and improving decision making

Scaling resources according to demand

Not everyone is ready for modernisation. We believe that migration and modernisation activities can exist perfectly well together as part of a transformation journey and the customer success story on the next page highlights this.

Case Study: National Highways: New GDS Approved Digital Service in Nine Weeks

In just nine weeks, BJSS delivered a GDS approved digital service for the Department for Transport (DfT) and National Highways. The solution, which is hosted on Google Cloud (GCP), has provided DfT and National Highways with a brand-new digital service that is designed to help bridge owners find and procure temporary bridge solutions.

Challenge

Like all UK Government organisations, the Department for Transport (DfT) and National Highways are mandated to follow GDS delivery guidelines. When the departments recognised the need for a new digital service for bridge owners, they wanted to find a technology partner that could help them to move through the GDS delivery phases at pace.

A significant proportion of GDS projects take over a year to receive full approval, with some failing to make it past the discovery phase. Keen to accelerate through the GDS stages, DfT and National Highways sought BJSS' help due to its reputation for delivering over 40 GDS approved digital services.

Solution

To accelerate through the GDS phases (discovery, alpha and beta), BJSS split the delivery into:

- A lean start-up three-week sprint to validate assumptions and design the right solution.

- Six one-week sprints to deliver the working solution into live.

BJSS also organised a show and tell at the end of every week to showcase progress, review objectives and revalidate the agreed vision.

By following this approach, the BJSS team rapidly developed a new cloud-native application on Google Cloud, using tools such as Google IAM, App Engine, Identity-Aware Proxy and Identity Platform. This resulted in a partial solution being tested and improved with end-users by week three of the delivery. Having passed the alpha phase, the BJSS team migrated the solution to DfT's Google Cloud Platform, where it was continuously improved and prepared for launch.

Benefits

The intuitive nature of GCP, combined with BJSS' expertise in delivering GDS projects, resulted in DfT and National Highways obtaining full GDS approval nine weeks after the project began. Several other factors led to the delivery's success, including:

- The full commitment and support from the key stakeholders at DfT and National Highways.

- Efficient use of collaboration tools such as Miro, Zoom and Office 365.

- Appropriate trade-offs between creating reusable assets and writing throw-away code.

- A determination to test early, regularly and to iterate our solution.

- Open communication with all stakeholders, including the GDS assessors.

Case Study: National Highways: New GDS Approved Digital Service in Nine Weeks (continued)

- Strong awareness of what everyone's responsibilities were and a sense of accountability that was established in the kick-off workshop and reiterated in the agile ceremonies.

- Show & tells proved to be an invaluable communication tool and helped gather stakeholder support as well as involve the GDS assessors regularly before the final assessment. During each session, time was made for everyone to share their opinion on the current progress.

- All agile ceremonies, show and tells, and assessments were conducted remotely, and all key stakeholders were invited and attended.

- All user research and testing was conducted remotely, enabling further reach, accelerating the discovery and saving previous time and energy.

With our agile approach, commitment to collaboration, and the use of best in class Google Cloud products, DfT and National Highways have been able to execute one of the fastest GDS deliveries since the programme began. But most importantly, it has acted as a blueprint for how government can deliver new digital public services at pace.

Hurdle 9: Boost your developer experience and productivity

Moving into the home stretch, you now have the ability to really fire up business transformation initiatives by enabling the often-frustrated development community by providing rapid, secure access to platforms without the faff.

We believe that cloud technologies play a crucial role in driving transformation and empower businesses by facilitating the rapid flow of ideas from business owners to service designers and then the developer, enabling them to move swiftly to create and amend new applications that meet the needs of the organisation.

Cloud technology is also transforming the way developers work. By leveraging cloud technology, developers can enjoy many key benefits that improve their experience and productivity. With its adoption, developers can unleash their creativity and potential, and deliver better solutions faster and easier.

To address the accessibility challenge, major hyperscale cloud providers like Microsoft, AWS, and GCP (Google Cloud Platform) are introducing new services that seamlessly integrate with foundational offerings, making them almost self-service in nature. These advancements unlock accessibility barriers and facilitate a smoother adoption process for organisations.

There are many benefits of adding developer experiences modules to the cloud foundation, including:

Scalability
Cloud technology allows developers to easily scale up or down their applications according to the demand and resources available. This means they can handle more users, data, and features without compromising on performance or reliability.

Flexibility
Cloud technology gives developers the freedom to choose from a variety of tools, languages, frameworks, and services that suit their needs and preferences. They can also access their applications and data from anywhere and any device, as long as they have a secure internet connection.

Security
Cloud technology provides developers with high levels of security and privacy for their applications and data. They can rely on the cloud providers to handle the complex and evolving challenges of cyber security, such as encryption, authentication, backup, and compliance. They can also customise their security settings and policies according to their specific requirements.

Collaboration
Cloud technology enables developers to collaborate more effectively with their peers and stakeholders. They can share code, data, feedback, and insights in real time and across different platforms and devices. They can also leverage the power of cloud-based communities and networks to learn, innovate, and solve problems together.

Velocity
Using cloud technologies can accelerate the release and deployment of new features.

At BJSS, we have been building Application Developer Accelerators in conjunction with hyperscaler technology to create a fast-paced capability designed to unleash the developer and remove the long wait for services, improving productivity.

Case Study: Specsavers Find & Book

Challenge

Key to the online customer journey is the ability to search the Specsavers website for a local store and book an appointment for any of Specsavers' services - a hearing test, a contact lens consultation, or an eye test – including an optical coherence tomography (OCT) scan, which helps view the health of the eye in greater detail than a typical eye test.

However, the two systems on the website facilitating this process, 'Find' and 'Book', were part of a monolithic application that had, over time and successive updates, become increasingly outdated, complex, and difficult to change. This meant that:

- Deploying new features to the Find & Book system – for example, a change to the user interface a customer interacts with – could only be done through fortnightly or monthly release cycles.

- A lack of robust testing capabilities meant there was a growing risk that making updates to Find & Book could result in bugs affecting the performance and stability of the live system.

- There was no centralised view of analytics that could give Specsavers observability into when or why customers abandoned the Find & Book journey without making an appointment.

- The underlying Drupal technology was nearing end of life and presenting risk that needed action and mitigation.

Specsavers realised that it needed to overhaul these systems in a way that would allow it to make frequent, rapid improvements to Find & Book and clearly understand the impact of those changes on customers. Having worked together for several years on a number of different projects, Specsavers approached BJSS to find a solution.

Solution

As part of a blended, cross-functional team including Specsavers and other vendors, BJSS redesigned and replatformed the Find & Book system on a new, cloud-based technology stack, introducing several improvements over the legacy system:

- A proper continuous integration/continuous deployment (CI/CD) pipeline to provide a process for designing, engineering, and deploying features daily instead of the previous fortnightly and monthly release cycles.

- A robust automated test suite and rigorous quality checks, including blue-green switching – in which two identical production environments are run, one live (blue) and the other not (green), and the final stages of testing are done on the not-live environment before switching traffic to it – to allow for low-risk deployments with zero downtime for customers.

- The creation of a consolidated API layer, to simplify the integration between Find & Book and numerous third-party and in-house systems. This provides a standard interface to all back-end systems associated with Find & Book to develop new customer journeys, configurable by market and appointment type, without writing custom APIs for each journey.

- The integration of a more comprehensive suite of monitoring and observability tools, as well as the introduction of Monetate, an A/B testing tool that allows slightly different versions of a new customer journey to be tested to determine which one produces more conversions. Built on Azure and taking advantage of the inherent scalability of the cloud, the new Find & Book system was successfully rolled out to five of Specsavers' international markets, and we continue to rollout to the remainder.

Specsavers

Case Study: Specsavers Find & Book (continued)

Outcome

Specsavers can now make changes to the Find & Book journey daily, easily test those changes with targeted portions of its customer base, and use improved analytics and monitoring tools to fully measure the impact on conversion rates. As a result, Specsavers can rapidly and easily experiment with enhancements to the customer journey – for example, changing the number of fields customers must fill in or the order in which they appear – and validate whether this results in more successful bookings. It is also now easier for Specsavers to implement these new journeys for other demographics and markets to see if they have a similar impact.

Key results:

- Over 200,000 bookings per week are being made using the new Find & Book system across 1,200 Specsavers stores.

- An 11% decrease in bounce rate for customers viewing store pages through the new Find & Book system.

- 360 production deployments a year, compared to fortnightly or monthly releases.

- Significant improvements to page performance and Google Core Web Vitals.

- Move to modern cloud technology, enabling the pace and ability to enable the ambitious digital agenda.

"BJSS' solution gave us the ability to gradually migrate the UK Find and Book journeys to the new platform in a controlled and low-risk manner, and gave Specsavers the confidence to accelerate the pace of rollout into additional countries where Specsavers operates worldwide.

We've come a long way with BJSS. We've bottom-up re-architected the solution, wholesale changed the technology, and moved from a monthly release cycle to a platform that we can use to demonstrate value daily and scale as we grow. We continue to work with them because they add value beyond the technical achievements, bringing expertise in agile and quality engineering, and a collaborative approach to allow us to achieve our ambitions globally."

Glen Leakey, Global Digital Transformation Director, Specsavers

Specsavers

Hurdle 10: Ensure cloud, data, and AI are in harmony to drive business transformation

Now the cloud platform is built, secure, and operational, the final hurdle is how to truly unlock data insight to enable better decision making and incorporate AI services to improve efficiency.

The cloud is a game-changer for data-driven insight and AI, and it offers many key benefits that can help you achieve your goals faster and more easily. Get over this in one piece and the finishing line is in sight.

AI assists in automating routine activities which increases productivity. AI also enables data analysis and insights that can help improve decision making and customer service, delivering differentiation to those who embrace the convergence.

Here are some of the benefits of harnessing the power of the cloud to unlock data-driven insights and AI:

Innovation
You can tap into the cloud's cutting-edge capabilities and innovations to power your data and AI. You can access the latest technologies, such as machine learning, deep learning natural language processing, computer vision, and more, to enhance your data and AI solutions.

Collaboration
You can collaborate with other data and AI experts and enthusiasts in the cloud. You can share your data and AI assets, insights, and best practices with others, and learn from their feedback and experiences.

Scalability
You can scale up or down your data and AI resources as needed, without worrying about hardware limitations or costs. You can handle any amount of data and complexity with the cloud.
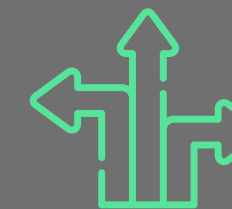
Flexibility
You can choose from a variety of cloud services and tools that suit your needs and preferences. You can mix and match different data sources, platforms, frameworks, and models to create your own custom solutions.

Security
You can trust that your data and AI are safe and secure in the cloud. You can leverage the cloud's advanced encryption, authentication, and compliance features to protect your data and AI from unauthorised access or misuse.

The following case study brings everything together, demonstrating how the use of cloud foundations can lay the building blocks for business success.

Case Study: Care Fertility

Care is an international fertility group and the largest provider of IVF services in the UK. Focused on innovation and the highest quality clinical care, it is how they combine patient centricity and scientific excellence that makes Care one of the world's leading IVF groups.

Challenge

In 2020, Care Fertility (Care) challenged BJSS to find a way to improve and accelerate the process of embryo selection during IVF using the power of artificial intelligence (AI). Care was already a market leader in embryo selection, and identified this project as an opportunity for further innovation.

During optimal IVF treatment, multiple eggs are collected and fertilised to produce several embryos. From these, embryologists must select the one they believe has the best chance of life. This procedure is critical to achieving a successful pregnancy but, as these embryos often look incredibly similar, the standard selection process has been shown to be fairly subjective.

To make this process more reliable, Care utilised time-lapse incubators to develop an embryo selection tool. This tool, or algorithm, uses data recorded from key events in the developing embryos to calculate scores relating to their potential for becoming a baby. However, these key events still have to be identified and annotated by manual inspection of thousands of time-lapse images by trained embryologists. This time-intensive work creates training and quality assurance challenges. Care recognised that accelerating this process could have major benefits for embryologists and, subsequently, their hopeful patients.

Care engaged BJSS to investigate whether AI could be used to automatically annotate images with the same or greater degree of accuracy as manual annotation.

Solution

BJSS' data scientists worked side-by-side with Care's embryologists, conducting a series of experiments into the potential for AI to improve embryo selection. Close collaboration between the teams was essential to ensure the complexities of embryology were understood and accurately modelled.

Within nine months, BJSS had developed a robust deep learning model, applying modern techniques in computer vision and time-series analysis, which when applied to Care's existing embryo selection tool, performed at least as well as expert manual annotation.

The model draws from a significant historic data set of almost 500 million images and two million manually annotated events (from eight UK Care clinics collated over a decade). With this information, the model can not only identify the key stages in an embryo's development, but also predict when these are likely to happen. Rather than having to sift through thousands of images, embryologists now only have to verify those selected by the model.

Once the AI model had been validated, BJSS moved on to developing a platform to host it, and integrating it with the embryoscopes and various other technologies across Care's estate. The new cloud-based platform ingests embryoscope image data, making it available for embryologists to view via a modern web interface. During ingestion, the platform augments the images with relevant metadata, and the machine learning models are used to auto-annotate the embryos. Images are ingested and annotated hourly, enabling embryologists to view the progress of the embryos.

At the time BJSS developed and delivered this model, there were only a handful of other solutions on the market developed on combined and relatively small datasets. The work of BJSS' technologists – immersing themselves in a highly-complex and unfamiliar scientific field – combined with Care's expertise and expansive dataset, enabled them to provide a far more accurate solution.

CAREfertility

Case Study: Care Fertility (continued)

Outcome

In less than eighteen months, BJSS developed, tested and productionised Care's proposition – taking it from an idea to a fully-operational service with life-changing potential. The project is now being rolled out across Care's network of 15 laboratories in the UK and Ireland, with a view to introducing this into their international clinics in Spain and the US at a later date.

Due to the collaborative work of BJSS and Care, the role of the embryologist has been transformed. This tool drastically reduces expert time spent on embryo assessment, freeing up approximately six months of embryologist time per year – half an FTE (Full Time Employee). It also reduces the time spent on training to get embryologists to the standard needed to accurately analyse these images. These significant time savings will enable embryologists to focus on patient care, research, and protocol improvements.

But the benefits go beyond efficiency; crucially, this tool has direct impact on patient treatment. By increasing the reproducibility and reliability of the embryo selection process and the accuracy of predictions, Care can ensure they give patients their best chance of having a child.

"The BJSS team approached this complex project thoroughly and confidently. They communicated regularly and clearly. The project hit a few challenges which were tackled swiftly and competently by the talented multidisciplinary BJSS team. The resulting minimum viable product is world-class and something BJSS and Care Fertility can all be proud of. Importantly, the ML (Machine Learning) tool, developed by BJSS, to help Care Fertility assess human embryos, will help improve the chance of patients reaching their goal of having a baby."

Alison Campbell, Care Fertility
Chief Scientific Officer

CAREfertility

Our Approach

Based on our interactions with numerous customers who have successfully completed their cloud transformation journey, our approach is focused on helping you maximise the potential of the cloud, enhance the developer experience, and embrace a more data-driven approach.

We begin by gaining a comprehensive understanding of your current situation and engage with key stakeholders to collaboratively define priorities, and shape the strategy and supporting operations. To kickstart the process, our launch phase utilises our extensive accelerators, developed over 100,000 hours of engineering effort, to expedite your time-to-value realisation. Once the initial phase is validated and successful, we possess the capability to scale up to meet your enterprise requirements, ensuring your service is seamlessly transitioned into production, and supported during its early stages.

The journey doesn't end there however, as there are constant demands for new features and improvements, so we stay with you and work as long as required to make your service something that you can be proud of. Once any system is built, we can help you run it, optimise it, and embed it back into your organisation when you are ready.

Our unique feature is being able to provide an end-to-end service, to let you focus on addressing the business opportunity as we bring together engineers, creatives, and strategists into one team to focus on a quality outcome.

How do we engage our customers and the market?

Our proposition is designed to engage our super powers across our value chain and has four activities to make it easier to engage with us. Each phase leverages BJSS' expertise to unlock the business opportunities of cloud transformation.

Understand

- Start to take action.
- The Art of the Possible in Cloud, Data & AI.
- Your challenges and aspirations.
- Ideation/Envisioning workshop offer.
- Strategy/Process/COM.
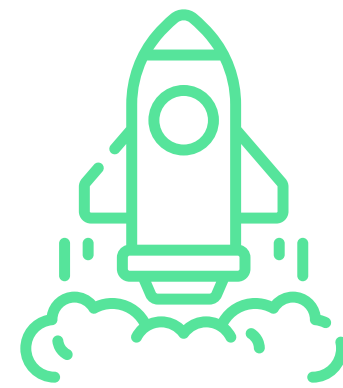
Launch

- Build on actions identified in Understand phase to accelerate.
- Launch services based on BJSS Accelerators for rapid deployment, reducing time to value.
- MVP Development using accelerators.

Scale

- Expand on Launch activity and Scale to Enterprise.
- Harness BJSS Modernisation and Migration services.
- Reuse accelerators where needed.
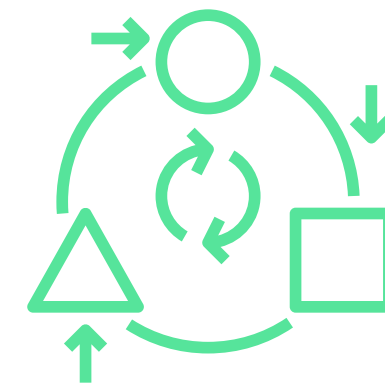
Optimise & Operate

- Refine the services and embed into your business-as-usual operations.
- Option to run services we co-create.
- Embed FinOps/SecOps/Observability.

We take pride in our easy engagement, flexibility, and creativity, while providing various options for collaboration.

Here's an overview of a typical interaction:

- **Understand** - Our clients are naturally curious about our experiences and challenges in building new cloud services. To assist in shaping their thoughts and ideas, we offer briefing sessions that provide valuable insights.

- **Launch** - The next step involves bringing people together to further develop the idea and turn it into something tangible. We are proud of the diverse expertise we bring to these sessions, which helps transform the concept.

- **Scale** - Bringing the idea to life through building an MVP (Minimal Valuable Product) is a powerful way to enhance the business case. By rapidly iterating and demonstrating progress, we generate momentum and an appetite for change.

- **Optimise & Operate** - Our expertise in transforming critical services within the UK and transitioning from MVP to enterprise production is unparalleled. We are well-prepared to support you in reaching the production stage, continuously evolving the solution, and achieving the transformation initially planned to support your business initiatives.

Start your cloud transformation journey today

BJSS' cloud transformation team can help you achieve your business objectives by providing the expertise, guidance, and support you'll need to successfully migrate your applications to the cloud.

You can engage us in a simple conversation for an hour to discuss the art of the possible, or extend this to workshops with key stakeholders, lasting from half a day to three days, or attend one of our innovation taster sessions.

Leading on from this, we can help build an MVP and then take it further and scale to enterprise.

We can also help with supporting you on your transformation journey to help you hit the finishing line ahead of your competitors.

Learn more at **bjss.com/what-we-do/services-cloud-and-platform** or get in touch with us directly.