Enterprise Case Study: UK's vehicle agency becomes more customer-centric by turning to the AWS cloud

How DVSA changed from a restrictive profit-driven solution to a customer-centric solution

Summary

Catalyst

The Driver & Vehicle Standards Agency (DVSA) is an executive agency sponsored by the Department for Transport charged with the responsibility for improving road safety in Great Britain. Part of this remit covers the annual Ministry of Transport (MOT) test certification required for all motor vehicles over three years old. Under previous government policies, this service was delivered on a private finance initiative (PFI) contract over 10 years. The PFI was designed around the premise that the service was a profit-orientated approach (pay-per-MOT pass) where the incumbent was not incentivized to modernize the solution. Today, the need for greater agility and the rise of mobile technologies have changed people's expectations about what a service comprises and how it should be delivered. DVSA recognized that it has a wealth of information that could be offered as value-add services to a range of different customers, from citizens to garages. This report looks at how DVSA managed to successfully complete a transformation from an old legacy mainframe solution to a modern cloud-hosted solution delivered on time and on budget.

Ovum view

The ability to respond to the needs of customers and deliver a good customer experience is an essential requirement of any modern service. The transition from old legacy systems based on a traditional architecture is the area where organizations can deliver the maximum impact, but these systems can also be the most difficult to transition. DVSA designed its next-generation solution based on four key principles: having a services-led design, incorporating a multi-vendor agile approach, being based on a cloud architecture designed to scale, and being mobile-ready. The choice of partner and the execution of a well-designed plan were key elements in the success of the DVSA's project.

Key messages

- Plan up-front for the non-functional aspects of any agile development and ensure that these are built in to the development process.
- Ensure you have the correct skills and experience to avoid "reinventing the wheel" or rely too much on vendors.
- Develop metrics and standards to monitor supplier performance and deliver value from any agile development process.
- Assess the providers against a common framework and use this to regularly review how they are delivering against expectations.
- Make the best use of supplier expertise, such as AWS's "Well Architected" framework and Amazon's RDS managed database service.

Recommendations

Recommendations for public sector organizations

One of the biggest transformations in the public sector is the push toward a more collaborative approach to dealing with citizens, suppliers, and businesses in order to demonstrate that the public sector is engaged with helping the economic wellbeing of the country. The DVSA used the cloud to open up a wealth of data that could benefit, for example, citizens by making the MOT history of a motor vehicle discoverable online, as well as SMBs, including garages and other businesses associated with the motor trade, by providing access to data that can be used to drive new business opportunities, and suppliers by delivering new ways of engaging with the public sector and customers. The cloud-first message is now a realistic strategy for all public sector organizations to adopt because the cloud market has reached maturity in terms of its offerings and delivery capability.

Companies in highly regulated industries, such as the public sector, financial services, and healthcare, must comply with numerous regulations related to privacy and sensitive data, including PCI DSS, ITAR, SOX, GLBA, HIPAA, HITECH, and many others. These data compliance regulations offer specific guidance on handling personal information and cloud compliance for sensitive data, and companies have to ensure that their information security policies and IT systems comply with the guidelines. Cloud providers have worked with governments globally to ensure services are designed to meet the requirements of the public sector where citizens are the main customers. Ovum recommends that any public sector organization looking to adopt cloud services should commission an independent third party to review and confirm that the service provider's assertions on security and compliance conform to recognized standards.

Recommendations for vendors

The key learning for vendors is that any project in the public sector, even the old legacy systems, can be migrated/replaced with new, more agile solutions. The key for vendors is to change how they work with government agencies and to understand that it is now about creating a partnership. Vendors should promote the idea that to be agile requires customers to be clear about how they measure the value of any agile development. Customers must then monitor suppliers to ensure they are meeting these requirements. This approach will change the working relationship between vendors and government agencies as the long-term fixed contract approach is superseded by more focused short-term project-based engagements. This shift in how government agencies will engage with vendors will mean that vendors must have service delivery and quality as key attributes, and that if vendors fail to meet the expected standard, they will be replaced.

The cloud enabled a major transformation of MOT services

Setting the business context

A 10-year outsourcing contract was coming to an end

Ten years ago, the MOT system was modernized from a paper-based system through a PFI outsourcing deal with Atos. This provided some advancement in the digitizing of the MOT process, but it was a profit-driven pay-per-MOT pass contract where the provider was not incentivized to improve the system. The DVSA had a short timeframe in which to replace the old system so it needed to engage with a partner that could provide a wide range of assistance from training to infrastructure. The DVSA conducted an extensive assessment of suppliers against a framework that covered aspects including security, scalability, performance, and cost. One of the key aspects for James Munson, the director of digital services and technology at DVSA, was to regain control over the infrastructure. According to Munson, "AWS enabled DVSA to rapidly develop and deploy new services that would meet the needs of its customers" and provided a fully flexible infrastructure environment that could be used as a common platform for service delivery. AWS was also selected as the primary partner because its cloud offering was capable of undergoing department accreditation in line with Communications Electronic Security Group (CESG) Cloud Security Principles in terms of security. This ability to hold data classified as official meant that AWS could meet the security requirements of the DVSA, as well offering a wide range of added benefits such as an architectural consultancy, training, and support. AWS was also able to offer its availability zone approach to resiliency where customers can architect their services to run on multiple zones to provide continuous availability.

The ability to deliver better services to the customers and citizens

The DVSA has four main pillars of responsibility:

- Motor vehicle MOT testing
- Commercial vehicle testing
- Driving test management for both drivers and riders
- Regulation enforcement

While the MOT is the first of these services to be addressed, the long-term objective is to transform and modernize all the DVSA theaters of operation and to become more agile with the ability to scale to meet demand. DVSA developed an assessment framework so that the correct workloads could be executed in the most appropriate environments. The MOT system had a wealth of data on motor vehicles that was not being utilized. With the new AWS cloud approach, however, this data has been made available to provide citizens with the ability to check on the MOT status and research the history of any motor vehicle. One of the key aspects of any service is its reliability and availability. AWS, with its availability zone approach to data centers, provided DVSA with the ideal solution to match cost with service availability. AWS uses the concept of Regions, where each Region is completely independent. Within each region are two or more Availability Zones (AZs), where each AZ is isolated, and the AZs in a region are connected through low-latency links. Customers can launch an AWS instance, select an AZ, or let AWS manage the process. The advantage for customers is that if the

AWS instances are distributed across multiple AZs and an instance fails, applications can be designed so that an instance in another AZ takes over.

Change was a slow and painful process

Under the old PFI contract there was only one major refresh. The DVSA wanted to regain control of the environment and to be able to release changes more frequently to deliver continuous service improvement. A major problem with the previous system was that it ran on fixed hardware with specialist access equipment needed in every (23,000) participating garage. The garages used dial-up modem connection that was slow and unresponsive, and the mainframe was shut down when maintenance work was required. The proposed move to the AWS cloud was predicated on their ability to scale to meet demand, to provide standard browser-based access, and to deploy an agile methodology. The MOT service was worth more than £1.2bn in revenue to the garages (42 million MOTs multiplied by the fee of £35), so any disruption to this service will have significant financial implications for the 23,000 garages.

The role of ICT/services in solving the problem

Existing landscape and solution selection

The old system, which securely processed 42 million transactions a year, was based on a mainframe solution accessed via a dial-up modem from specialist equipment in the garage. The PFI contract was due to expire in September 2015 and the DVSA wanted a new cloud-based system that could be accessed via the Internet and could support agile methodologies. However, because the DVSA had outsourced the service 10 years previously, it had limited internal IT resources, so it needed an approach that blended suppliers, contractors, and civil servants. AWS was selected based on its ability to provide services capable of department accreditation by leveraging AWS industry certifications such as ISO27001, SOC2, and PCI DSS level 1. The DVSA manages official-level government data that needed to scale to meet demand, and support a wide developer community enabling the DVSA to use modern application development tools, as well as providing resiliency so that the service was available when needed. One of the key capabilities offered by AWS was the ability to deliver availability and performance that the old system consistently could not. As part of the selection process, AWS helped the DVSA to understand which services it should perform for itself and which it should delegate to others. The Amazon RDS managed database service was one such service that enabled the DVSA to focus on the aspects of database development while leaving the lower level database activities to AWS.

Table 1: Before and after ICT snapshot

| Before				
Central fixed mainframe	Access via modem dial up	Specialist hardware installed in 23,000 garages	Inflexible, only one major hardware refresh in 10 years	Contract-based driving incompatible behaviors with new services-centric ethos
After				
Flexible cloud instances based on AWS	Access from a browser over the Internet	Access from any device including mobile	In 12 months 168 releases have been made to the system	Blended multi-supplier teams with flexible contracts to reflect need

Source: DVSA

Bringing the strategy to life

Implementation/rollout

The implementation plan was designed to be delivered rapidly but securely. The switchover from the old system to the new system was completed in 12 weeks, and was successful because DVSA used AWS services including Premium Support and Amazon RDS database service to ensure that the correct people were doing the correct tasks. The first stage involved engaging all the stakeholders, from civil servants to independent garages, to understand what any new service was expected to deliver. This investigation led to the production of an outline business case based on the premise that any replacement service must be easy to access from a standard computer or mobile device and must be able to scale to meet demand. The alpha testing phase enabled detailed designs to be produced, and led to the concept of blended teams working in a multi-vendor/supplier arrangement. The subsequent stages were iterations of earlier stages but with greater detail, which led to the production of a minimum viable product being developed for beta testing. The current phase is live-beta where all the garages are using the new system and the DVSA is actively gathering feedback on performance and capability. The MOT system is expected to enter live running in mid-2017.

Figure 1: Implementation timeline
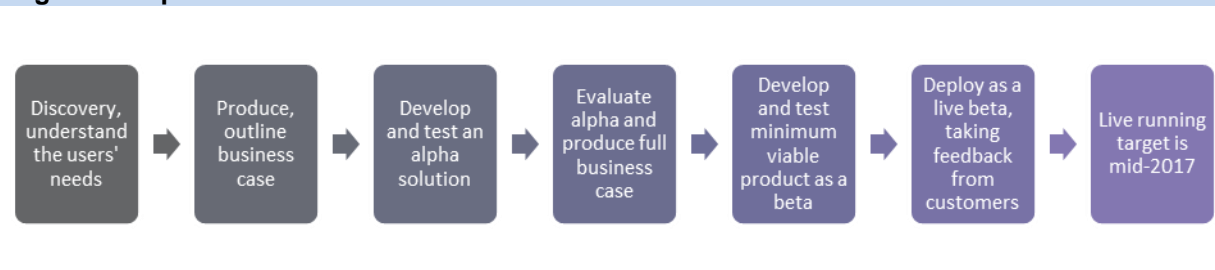
Source: DVSA

Outcome assessment

The success of the project was based on four key aspects that were missing from the previous contract-based approach. The most important outcome was DVSA's need to regain control of the service delivery and to ensure that the government could change the service rapidly and simply in response to regulatory and technology changes. One of the design principles was that civil servants could design smaller-scale developments and prioritize these as circumstances dictated. The DVSA's aim was to deliver weekly releases, and in the past 12 months 168 change requests have been released to the system.

The second outcome was to release the operational expenditure to be used to develop new services. This was made possible by the use of cloud computing, where the environment was provided by AWS as infrastructure on demand. The DVSA is only paying for the IT resources it needs when it needs them, and does not have to fund a separate IT operation team to manage the service delivery. This resulted in a 50% reduction in the cost of delivering the service. The AWS account team works with DVSA on an ongoing basis to help it evaluate the use of different AWS services/resources and to identify more appropriate AWS services. Ovum believes that this proactive approach by AWS is key to the reduction of operational expense.

The third outcome was that the DVSA wanted to move away from a position where it was reliant on one supplier for an extended period in a locked-down contract basis. The new model was designed to

be multi-supplier and to combine the supplier, contractors, and civil servants in one team. AWS formed part of the team, providing the infrastructure as well as other services on a pay-as-you-go basis, while development suppliers/contractors were retained on short-term project-based arrangements. This approach allowed the DVSA to manage the quality of the service and to change components if needed without large financial penalties or service disruption.

The final outcome was to move away from fixed infrastructure that needed to be maintained and sized for estimated demand, to a more dynamic environment where the infrastructure scaled to match demand. The move from hardware ownership was seen as critical, and the partner needed to demonstrate a commitment to develop the infrastructure environment, allowing the DVSA the freedom to manage the environment to meet demand and budget. In fact, the flexibility and scalability of the AWS solution was needed as a key part of the transition. Munson said that "to reduce the risk of a capacity problem with new service, AWS was needed before the service hit a critical mass".

Lessons learned

Agile is not easy and must be well thought through

The concept of agile is still relatively new and for many it is a radical shift from the traditional waterfall approach to development. The DVSA discovered that it lacked the necessary skills and recognized the need to hire and train staff to ensure it was operating effectively. The DVSA highlighted three major findings from its early experiences of implementing agile.

The first was to make sure that the agile team structure was designed to match the needs of the objectives. The DVSA initially did not include testing in the agile scrum teams. This led to a situation where the code was being generated and released in sprints, but was then going into a traditional testing and release process. This resulted in delays in code being delivered to live environments. The fix was simple, the testing team was included in the agile team, and members of the release team were also trained so that they knew how to treat any agile releases, confident that these had been tested according to the agreed standards.

The second finding was subtler. The DVSA soon learnt that it had split its developments into functional and nonfunctional (security and performance) aspects. The fix for this was a more fundamental change, where the non-functional aspects were designed and built into the release upfront, and not treated as an afterthought.

The third finding involved working with suppliers/contractors. In order to manage these suppliers, it was necessary to develop clear metrics and use them to monitor the different teams. This is particularly important for agile developments because these are usually developed on a time and materials basis, and keeping a close watch to ensure standards and quality are being maintained is important when development cycles are shorter.

The partnership with the vendor and the management of suppliers are critical to success

When operating in a multi-supplier approach, the DVSA found that it was important to have an internal colleague, a supplier relationship manager (SRM), with overall supplier relationship responsibility. For

government agencies, the ability to manage all the suppliers is critical because in a multi-supplier environment there is not a single contract, but instead many different contracts designed to meet specific needs. AWS provided the DVSA with a dedicated team that works with the SRM to ensure all the different constituencies are receiving the correct level of service and support.

The DVSA also recognized that it needed to provide clear expectations of the process, so that it could perform regular checks to ensure quality was being maintained. With AWS support the DVSA team was able to define the terms of engagement to match these needs. This was critical for the different elements of the service delivery. The infrastructure contract was optimized with AWS support on a monthly basis, while the development contracts were better aligned with the specific developments.

The final finding from the DVSA was that to ensure that the best value was being obtained; regular assessments of all suppliers should be conducted to ensure that the correct suppliers are being used for the correct solutions.

Ensure the IT organization is structured for the new reality of cloud and agile delivery

The use of a multi-supplier strategy has numerous benefits, but one obvious drawback: there are many different relationships to manage and coordinate. To ensure that a multi-supplier strategy can operate successfully requires the IT organization and the business users to adopt new roles and responsibilities. Suppliers also have to recognize that working in this environment requires a clear line of engagement and communication, an area that AWS provides with its dedicated teams. This partnership model is even more important because the business users and civil servants need to assume responsibility for the service delivery capability supported by the suppliers. AWS, with its training and consultancy practices, can ensure that it has the people who can speak to the business users as well as discuss the technical details.

Moving to the cloud brings with it value-added benefits

Some of the benefits of moving to a cloud-based architecture were not initially obvious, but have subsequently been proven to be valuable. Using the consistency of AWS's Region/Availability Zone architecture enables the DVSA to implement releases during the operation day without downtime. This benefits the DVSA in a number of ways, by reducing the cost and inconvenience of IT working at unsocial hours to release changes. It also improves the quality of the service by performing it when staff are available to resolve any issues quickly.

Security is a prime concern for all government and enterprise customers. The AWS cloud delivers a secure and reliable solution that enables users to focus on other things. AWS is certified by many government agencies worldwide, and in the UK, AWS provides services that can be used to build solutions in accordance with the Communication's Electronic Security Group (CESG) cloud security principles published under the cloud security guidance for data classified as official.

The DVSA found that the major benefit from AWS cloud was its ability to auto-scale to meet demand. This was highly valued by business users dealing with an even-increasing, yet variable volume of customers throughout the year. Another major benefit of using AWS was cost savings. Using AWS made a significant contribution to the over 50% cost reduction compared to the outsourcing contract.

Why AWS cloud was selected

The DVSA conducted a rigorous analysis of the cloud market and shortlisted several cloud companies: Google, Microsoft Azure, Skyscape Cloud Services, VMware Cloud Air, and AWS. AWS was selected based on four main criteria.

First was AWS's ability to scale to meet demand. The MOT service is typically conducted during the 9-5 working day, with 42 million transactions per year and this figure expected to rise. Any service has to ensure that peak demand can be satisfied. Second, AWS contributed to a 50% reduction in operational costs, where the money saved could be reinvested into new service development. Third, the service was resilient and was provided from EU-based data centers. Post-Brexit this may well be changed to be UK-based, as AWS opened its UK Region on 14th December 2016. These data centers must have an in-built architecture that provides for a variable degree of resiliency dictated by demand and service requirements. Finally, the cloud service must be secure and aligned with CESG cloud security policy.

Appendix

Methodology

Ovum Enterprise Case Studies leverage in-depth interviews with key enterprise stakeholders as well as a review of any available documentation such as strategic planning, RFP, implementation, and program evaluation documents.

Further reading

AWS sets the path for practical multimodal IT, IT0022-000737 (July 2016)

Author

Roy Illsley, Principal Analyst, Infrastructure Solutions

roy.illsley@ovum.com

Ovum Consulting

We hope that this analysis will help you make informed and imaginative business decisions. If you have further requirements, Ovum's consulting team may be able to help you. For more information about Ovum's consulting capabilities, please contact us directly at consulting@ovum.com.

Copyright notice and disclaimer

distributed or transmitted in any form or by any means without the prior permission of Informa Telecoms and Media Limited.

Whilst reasonable efforts have been made to ensure that the information and content of this product was correct as at the date of first publication, neither Informa Telecoms and Media Limited nor any person engaged or employed by Informa Telecoms and Media Limited accepts any liability for any errors, omissions or other inaccuracies. Readers should independently verify any facts and figures as no liability can be accepted in this regard – readers assume full responsibility and risk accordingly for their use of such information and content.

Any views and/or opinions expressed in this product by individual authors or contributors are their personal views and/or opinions and do not necessarily reflect the views and/or opinions of Informa Telecoms and Media Limited.

CONTACT US

www.ovum.com

analystsupport@ovum.com

INTERNATIONAL OFFICES

Beijing

Dubai

Hong Kong

Hyderabad

Johannesburg

London

Melbourne

New York

San Francisco

Sao Paulo

Tokyo