

Data recovery, conversion and migration for cloud-based services

Migrating data from legacy systems into cloud-based persistence offerings, including automation, physical collection, processing, and migration of data, as well as modelling data appropriately for different cloud data store solutions and different access cases. Applicable to one-off and recurring data migration scenarios as part of a transition to cloud-based services.

Relatively few software projects are completely new offerings. Many projects replace or enhance other services, whether digital or offline, that already have customers and existing data. This is particularly true of public sector organisations that need to overhaul existing services as they manage a transition to cloud-based products and services.

Leveraging existing data as effectively as possible is key to the success of any new digital system. However, often working with the existing data is challenging for the same reasons that working with the existing system is challenging — the data could be old and largely unmaintained, poorly understood, or perhaps simply not organised in a way that is suited for important new use cases.

For this reason, one of the most important parts of designing a replacement (or enhancement) enterprise system is recovering, converting and migrating data from the previous system. This is a complicated undertaking that involves data modelling, skilled investigation of the existing system, extraction and processing, cleanup and sanitisation, security considerations, and sometimes even detective work to detect and repair mistakes and logical corruption.

Features

- Modelling effective data structures for post-migration cloud-based service
- Designing data models for various SQL and NoSQL storage options
- Analysing legacy systems to mine data for cloud solutions
- Extracting, transforming, and loading (ETL) of data from legacy systems
- Modelling data appropriately for the software using it
- Performant, scalable, and reliable data import and processing
- Initial and ongoing data migration
- Solutions that support changing migration functionality as software evolves
- Feeding back modelling knowledge into systems design
- Equipping in-house teams with skills for future migration projects

Benefits

- Data migration built hand in hand with the destination application
- Quickly and effectively extracts data from legacy systems
- Discovers what data is in the legacy system
- Discovers how existing data can be incorporated into new system
- Cleans data pre-migration and improves it during the migration process
- Reduces the cost and risks associated with migration
- Minimises migration effort with proven tools, processes and staff
- Migrates from legacy systems - reduces expensive legacy hosting
- All work undertaken by highly experienced Equal Experts migration staff
- Creation of migration strategy provides structure for subsequent data migration

Our approach to data recovery, conversion and migration

Our approach produces appropriate solutions as simple as one-off migration scripts, up to custom, bespoke analysis and migration efforts that are an integral and ongoing piece of the larger software projects they are part of.

Often, one of the biggest challenges in modern data analytics is knowing for sure that the data is actually “Big Data”. A lot of our projects have what we call “Medium Data”. This is data that can be stored and dealt with efficiently if it is modelled using cutting-edge techniques. In contrast, clever modelling alone won’t help with Big Data — it will probably take an unfeasible amount of time to even transform the data into the correct shape!

With Medium Data, good data modelling expertise early in the process yields incredible dividends. With Big Data, infrastructure becomes much more important. Figuring out how to apply massive amounts of physical resources to the problem is not only the best option, it’s usually the only feasible option.

Whether a client has Big or Medium data, our Data Recovery, Conversion & Migration service can help with migrating data from legacy systems into Cloud-based persistence offerings. This includes automation of physical collection, processing, and migration of data, as well as modelling data appropriately for different Cloud data store solutions and different access cases. Solutions are available for both one-off and recurring data migration scenarios.

Consider the following example scenario that would normally be considered a difficult migration and security problem:

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An existing system has accounts for hundreds of thousands of users, with passwords hashed with a system such as SHA-1 that was considered relatively secure 10-15 years ago. This data must be migrated to a new version of the system, which has much stronger password hashing requirements: a unique salt for each password, with a variable strength hashing scheme such as bcrypt, scrypt, or PBKDF2.

This is both an opportunity and a security risk: not upgrading the strength of the password hashing scheme weakens the security of the new system, but while the old system is not strong enough, it is strong enough that simply decrypting the passwords is computationally difficult. However, requiring resetting everyone's password is poor usability, and makes the user experience of moving to the system far more challenging. Migrating to the new system without forcing people to change their passwords is an opportunity for a more seamless transition.

The Equal Experts approach to this problem features both migration from the old system and modification of the new system. Old passwords would be migrated in their original form, with additional flags in the user record indicating the strength of the password hash. The system is given the ability to hash passwords via both the old mechanism and the new mechanism. When users first log in to the new system, passwords with weak hashes could be subject to an additional security check (such as a security question about other user information, or perhaps an SMS check to a mobile number if one is on file for the user).

If the user passes the additional security check and presents a password that matches the old hash, the system takes advantage of the fact that the user's password is momentarily available in an unhashed state ("in the clear"), and rehashes it to the new, more secure standard. Whenever a new user is created (or a password is changed), the system only ever hashes the password via the most secure mechanism available.

In addition to a one-time migration, this approach is beneficial over time: the system can periodically upgrade the strength of its security as better password hashing approaches become available.

The service normally features the following activities:

Investigation

In-depth investigation and analysis of the current or legacy data model, to determine what data can be extracted from the existing system and what improvement or cleanup is necessary.

Data modelling

Effective data modelling is much like effective software design in that there is simply no substitute for raw talent and experience. Our highly experienced and highly trained developers and architects will construct an appropriate data model that is simply better than what other options are capable of. Both the requirements of the new system and the data available from the existing system will feed into this model.

Migration

Test-driven development and migration of a provably reliable solution that extracts data from the old model, cleans and transforms it appropriately, and deposits it into the new model, preferably via an API that validates the data via the exact code path as direct user input of new data. As with all Equal Experts' work, this development and migration is done using best-of-breed engineering practices.

Examples of data recovery, conversion and migration in action

We have in-depth experience with both big and medium data projects. We've helped a major retail client deliver personalised services to loyalty customers by retaining all purchase receipts (whether in-store, online or through affiliates), and querying the Terabytes of data captured to build user behavioural patterns - we can now make offers or purchase recommendations to individuals based on the nutritional value of their shopping choices.

For O2, we helped open up new revenue streams by providing insights based on the behaviour of crowds to help companies and public sector organisations make informed business decisions. O2 uses its anonymised and aggregated mobile network data and extrapolates from it to provide insights representative of the total population demographics in each area e.g. retail customers can understand the footfall in each local area to help decide where to open new stores by analysing the trends of crowd movements in clear and simple graphs and figures.

Equal Experts is also helping a major government department establish its data engineering capability in Manchester, whilst advising on third-party implementation of a new data lake (Enterprise Data Hub ("EDH")), consolidating 11 existing data warehouses. These data warehouses are coming to the end of their life and currently cost tens of millions to maintain and run. In addition to the restrictive running costs, a lot of the data is isolated per head of duty and subsequent data warehouses, making it hard for our client to

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maximise yield by better understanding the status of individuals and corporations across disparate regimes.

The chosen technology for EDH is Cloudera's distribution of Hadoop, which comprises (at a high level) Flume, HDFS, HBase, Yarn, Spark, Hive, Solr, MapReduce and Impala. The analytical packages running across the integration, storage and management capability that Cloudera provides are SAS, Pentaho, Splunk and R-Studio, with R-Studio and Pentaho bundled with Cloudera into rapidly deployable Docker containers.

Providing a capability to analyse large sets of data using a hybrid approach, including open source solutions, ultimately aims to provide a better service to UK citizens and improve operational efficiency for this government department.

Our client wanted to create a data engineering function with the vision of an internally controlled delivery group with responsibility for building and supporting analytical capability across legacy and new capabilities within the department. This new delivery group provides the management and optimisation of all datasets, data security, technical design and governance, BAU support, user management, reporting and BI.

Our work has included devising and building the data engineering operating model in conjunction with senior client stakeholders, designing the team structure, including roles, responsibilities, skills, experience, and grades, and initiating recruitment activities. We have helped to define the governance structure, reporting regime and service levels, built a knowledge centre, planned and supported transition to the new model and processes, and transferred knowledge to client staff. We have led the cultural transformation required for a shift to new ways of working and data exploitation within the department. The intent is to help build internal capability to take over the long-term operation of the data engineering function.

We are also responsible for building and implementing critical data capability within major programmes of work, e.g. new risking capability and complex reporting, search and analytics across all data captured by the new system. We are replacing legacy solutions and providing increased automation, and have successfully migrated significant amounts of sensitive data from a legacy data warehouse to the new enterprise data solution.

Services

We have four core UK-based teams that provide expertise and advice to the organisation, our clients and our partners:

Data and AI

The Data and AI service helps clients make better use of data and create powerful AI solutions that improve and transform any business. We use our deep expertise in data engineering to improve the quality of data that flows through the organisation, providing better insights into customers and operations. Applying our expertise in MLOps, Generative AI, AI in the SDLC and algorithms, we help upskill client teams, automate key services and create new ones.

Design and Product

The Design and Product service helps clients increase adoption and user satisfaction by designing exceptional digital products and services. We use our expertise in user-centred design and product management to discover and solve the most valuable problems, aligned to a client's digital strategy. We help to create delightful customer experiences that deliver real business value, increased user engagement, better brand reputation and additional revenue.

Technology Strategy

Our Technical Strategy service helps teams to confidently navigate the technology landscape and make decisions that will sustain long-term value. Our expertise covers all aspects of technology strategy, including architectural choices, operating model changes and the adoption of emerging technologies. Using our extensive industry and technology experience, we help to plan the practical steps clients need to be ready for the future.

Modernisation and Platforms

Our Modernisation and Platforms service helps to accelerate time-to-value and reduce total cost of ownership, while scaling digital products and systems. Using modern engineering practices, we help to build and run cloud-native services and improve heritage systems. We bring deep expertise in cloud architectures, secure delivery, "you build it, you run it", and platform engineering on AWS, Azure and GCP clouds.

Team

Our core culture and business model prioritise providing value and doing what is best for all our stakeholders, particularly our clients, rather than maximising short-term profits and shareholder returns. Our founders sold the business to an Employee-Owned Trust (EOT) in May 2024 to secure the long-term future of our collaborative approach, highlighting this commitment. The EOT trustees include the founders and representatives of our

employees, Associates and clients, ensuring the interests of all stakeholders are considered and balanced in our operations.

Equal Experts is a worldwide network of technology experts who are dedicated to driving innovation. We have Business Units in the UK (London and Manchester), USA, South Africa, Germany, the Netherlands, Australia and India. Our resourcing model is based on a core of permanent senior consultants and a supply chain of 4,000+ carefully selected, expert, independent SME consultants - our Associate network. On a typical engagement, we pass ~£2 in every £3 of our contract income directly to this network, creating opportunities for entrepreneurship and helping new SMEs to grow.

90% of our consultants have more than 12 years of experience (average more than 18 years) in the development, delivery, operation and maintenance of digital services using agile methods. Many have significantly more and, in some cases, are global influencers, authors and presenters. Their maturity and pragmatism mean they are highly collaborative, happy to transfer knowledge and keen to help clients build internal capability.

We have grown organically, mostly through personal referrals, prioritising quality, experience and cultural fit above all else. After a rigorous selection process, experts are added to our network, whether we need them immediately or in the future.

We select the most suitable people for any contract role from this large pool, not just from a bench of off-charge employees. Our model is resilient and efficient; we form small expert teams, reducing cost and risk for our clients, while achieving outcomes faster than less experienced teams. Our experts train and upskill the whole supply chain, including client staff and those of other suppliers. We have delivered many public and private sector systems (e.g., for HMRC, HMPO, Defra, DWP and MoJ), including CNI, over the past 17+ years using this model. Our approach is data-driven, user-focused and sustainable, allowing us to deliver results quickly and efficiently, using small teams of real experts.

Our standard working model for teams is hybrid remote/on-site, with a core generally based close to client offices, minimising travel costs and environmental impact. This ensures they can be on-site for workshops, meetings and onboarding activities, and can work collaboratively with client team members, stakeholders and other suppliers. In the words of one client, *“your consultants truly leave their Equal Experts badges at the door”*.

Our focus on senior talent means that all our consultants have the skills and experience required to thrive in dynamic, challenging client environments. It means we can focus on work that adds real value, rather than micro-managing more junior consultants. Our non-hierarchical structure also allows us to operate with lower overheads. For our teams,

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this creates a mature, pragmatic and innovative working environment, where they can implement the best solutions of their already distinguished careers. And for our clients, it translates to better services, delivered faster and at lower overall cost. We were ranked 2nd in Glassdoor's UK Best Places to Work 2025, up from 4th in 2024, and 15th in Newsweek's Most Loved Workplaces 2022.

For more information and case studies, please visit <https://www.equalexperts.com/> or contact us at solutions@equalexperts.com.

Roles

Collectively, our consultants have the multi-disciplinary experience and expertise needed for successful transformation to cloud-first delivery, live service maintenance and new operating models. Our network gives us fast and flexible access to the DDaT skills our clients need. We have specialists in all areas required for digital success, including:

- Delivery managers
- Change managers
- Product managers
- Engagement managers
- Strategic advisors
- Security specialists
- Data scientists
- Data engineers
- Data architects
- Technical leads
- Technical architects
- DevOps consultants
- Developers
- Testers
- Business and performance analysts
- Accessibility experts
- Service designers
- User experience designers
- Content designers
- User researchers

When a client needs specialists or niche skills, we can rapidly and confidently engage with other organisations in our established ecosystem of proven partners. EE interviews each

partner consultant to ensure a high level of knowledge and cultural fit before we assign them to clients.

Public sector clients

We're proud to be one of the top suppliers to the public sector via the G-Cloud and DOS frameworks. Our services are also available through RM6190 Technology Services 4, RM6195 Big Data and Analytics (the only supplier on all 6 capabilities), RM6335 DALAS (Lot 2a) and DPS Frameworks including RM3764 Cyber Security 3, RM6173 Automation Marketplace, RM6094 Spark, RM6200 Artificial Intelligence and RM6235 Space-Enabled and Geospatial Services.

The Equal Experts approach has a successful track record of delivery across the private and public sectors. Some recent award-winning deliveries include:

- HMPO's passport renewal service,
 - ranked #1 public service with a score of 81.2/100 in the July 2025 ICS customer satisfaction survey.
 - Winner of Public Sector Project of the Year and Development Team of the Year at the UK IT Industry Awards 2024.
- HMRC's Data Platform Services Core Engineering Platform, winners of Computing DevOps Excellence Awards 2025 Best Implementation of DevSecOps.
- John Lewis & Partners Best Implementation of DevSecOps at the DevOps Excellence Industry Awards 2023

We know what it takes to implement and support cloud-based applications within complex public sector organisations and across large multi-vendor programmes. We understand and adhere to the GDS digital service standards for delivering solutions and handling and securing data within critical national systems. We have experience in consulting, deploying and supporting security-accredited solutions and have passed numerous GDS assessments. Many of our consultants hold current SC clearance (some have DV) as they have previously worked with public sector clients.

Equal Experts has helped implement digital services to government digital service standards (including passing many formal GDS service standard assessments) for:

- His Majesty's Revenue and Customs (HMRC)
- Department for Environment, Food & Rural Affairs (DEFRA)
- The Home Office and His Majesty's Passport Office (HMPO)
- Ministry of Justice (MoJ), His Majesty's Prisons and Probations Service (HMPPS) and His Majesty's Courts and Tribunals Service (HMCTS)

- Department for Work and Pensions (DWP)
- Department of Health and Social Care (DHSC)
- Department for Business, Energy & Industrial Strategy (BEIS)
- Border Force
- Department for Education (DfE)
- Registers of Scotland
- Office for National Statistics (ONS)
- Intellectual Property Office (IPO)
- States of Guernsey
- Cabinet Office
- Government Digital Service (GDS)
- Valuation Office Agency (VOA)

Planning

To build detailed knowledge of the context and domain for any project, an initial phase of planning, definition and knowledge transfer will generally take place at the start of an engagement.

We have found that this takes place most effectively through a short time-bound inception to develop a shared understanding and agreement on vision and objectives across a broad stakeholder group. This covers the business, technical and user aspects of the project and the outputs may include user personas and scenarios, key user journeys, as-is and desired business processes, a prioritised backlog of user stories, technical constraints and vision, and a release roadmap and plan. The techniques and principles applied are also used on an ongoing basis throughout the course of delivery, to ensure the solutions developed are fit for purpose and meet real and changing user needs.

This initial inception phase can be contracted separately if required.

Setup and migration

In addition to ongoing development and operation of live cloud-based services, we can help with the initial set up and migration as part of a transition to cloud. We look for opportunities to automate processes (for example, test, deploy) that will yield real benefit and high ROI. Our approach helps to address integration, dependencies and risk early. We capture actionable metrics to measure and manage progress towards meeting the agreed success criteria and KPIs identified for building and operating the service. The highly collaborative, interactive processes we follow foster continual learning and improvement of services. They help to establish and evolve the overarching service design, management processes and the team capabilities.

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We can ensure projects hit the ground running through our experience in designing, configuring and setup of many continuous delivery and automated cloud deployment environments. These techniques allow software to be repeatably and reliably deployed and tested through each stage into production on the cloud. We have substantial experience when it comes to the tooling required for continuous delivery and automated software deployment, greatly facilitating the software set up, build and migration process, which increases programme productivity and reduces project risk and cost.

Quality assurance and performance testing

We hold ISO9001:2015 Quality Management System certification. All our consultants have extensive experience in both manual and automated testing, including performance testing, continuous integration and delivery into production environments at scale. With all clients, we actively encourage the adoption of robust and meaningful automated test coverage, delivery and test techniques, to reduce risk and safely increase delivery velocity. We are happy to work with a client's existing quality management system (QMS) where appropriate.

Security services

We hold ISO27001:2022 Information Security Management System, Cyber Essentials and Cyber Essentials Plus certifications.

We can provide the following security services if required:

- Security strategy
- Security risk management
- Security design
- Security incident management
- Security audit services

Training

For every client, we aim to transfer and embed knowledge of technology and process innovation. Our consultants have the expertise, skills and enthusiasm to help transfer knowledge of new technologies and ways of working to our clients' team members, upskilling staff and helping to build their internal delivery competence and capability. This improves internal competencies and builds long-term sustainable capability, as clients migrate to modern cloud-based products and services. We tailor particular practices to address specific organisational constraints – we recognise that every organisation is different and there is no “one size to fit all”.

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We tend not to offer classroom-based training as our consultants are happy to share their knowledge throughout a project. They take responsibility for helping individual client team members adopt new practices and ways of working.

Ongoing support

Our operational philosophy is “you build it, you run it”. The delivery team responsible for the development of a live service usually also takes responsibility for its operation. We have found that development teams which support their own products are motivated to deliver higher quality, more robust and maintainable code.

When a service is live with real users, we expect the delivery team to provide 2nd line (infrastructure, in conjunction with hosting support agreements) and 3rd line (applications) support during business hours. We can agree on an appropriate model for 24/7 on-call coverage if required - see our G-Cloud On-Call Support offering for details. We typically establish an on-call rota with delivery team members assigned weekly.

Our experience is that digital services are never really finished and that it is important to retain some level of investment to allow the addition of new features as the needs of customers (both internal and external) change. Our design of the end-to-end service can include establishing Service Level Agreements for ongoing service evolution and operational support (ensuring agreed levels of service availability).

User support

We provide an engagement manager on all G-Cloud engagements with responsibility for ensuring clients objectives are met and for addressing any issues with service delivery. Our engagement managers act as an escalation point and can be reached via phone or email to respond to issues beyond the control of the team providing the service. Engagement management is included within our service pricing.

When a service is live with real users, we expect the delivery team to provide 2nd-line (infrastructure, in conjunction with hosting support agreements) and 3rd-line (applications) support during business hours, within the agreed service cost. We can agree on an appropriate model for 24/7 on-call coverage if required - see our G-Cloud On-Call Support offering for details. We typically establish an on-call rota with delivery team members assigned weekly.

Social Value, the Environment and CSR

Our values and ethos extend beyond our organisation and people, and we take our corporate social responsibility seriously. We are committed to working with all our clients to share our knowledge and learnings, and contribute to their CSR goals, e.g. we will facilitate discussions with their designated digital sustainability leads, to collaborate on environmental policy goals, discuss current practices for greening software and agree enhancements aligned with industry policies, like the Greening Government Strategy.

We willingly collaborate closely with our clients, other suppliers, competitors and the wider ecosystem to discuss, share and test innovative environmental and social value ideas and initiatives, to improve sustainable practices and create added value throughout any contract.

We will follow our proven social value methodologies for any G-Cloud 15 contract, aligned with the UK's Public Services (Social Value) Act 2012, PPN002 (PA2023) and the Social Value Model, and the UN Sustainable Development Goals, to actively create additional opportunities to develop, measure and improve social value for our client and their entire supply chain. In a recent [Government Transformation Magazine interview](#), Mike Potter, ex-UK Gov CDO recalled his HMRC experience partnering with us for transformative results. *"We didn't just buy their capability - we bought their culture,"* he said. *"Cultural alignment is key. When you pick partners who share your values and ways of working, you find areas of mutual advantage."*

We review, update and publish our Carbon Reduction Plan, Modern Slavery and EDI statements annually, are a Disability Confident employer, a member of the Business Disability Forum and a participant in the Government Digital Sustainability Alliance (GDSA). Our commitment to providing a fulfilling workplace for everyone is reflected in Glassdoor's Best Places to Work in the UK, voted for by our staff, ranking us 4th in 2024, 2nd in 2025.

We complete the [EcoVadis](#) assessment tool, which evaluates performance across four dimensions: Environment, Labour and Human Rights, Ethics and Sustainable Procurement. We complete the assessment, create an improvement plan and review and update it annually. We willingly share the results with clients and use their feedback and learnings to influence our improvement plans.

Examples of other social value initiatives for clients include:

HMRC Joint Value Initiatives: we work closely with HMRC to organise and fund JVs, e.g.:

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- [School visits](#) to encourage children to pursue STEM careers & find future data engineers,
- Data Engineering Academy - supporting HMRC to onboard and upskill new starters and develop their technical expertise through bootcamps and placements on EE projects,
- Hosting the [Women in Tech & Leadership Conference 2025](#) in collaboration with HMRC's Women in Tech Network.

Hace: We co-funded a [project](#) to develop an AI-based data analysis tool to objectively quantify a company's Child Labour performance.

Médecins Sans Frontières (MSF): We staffed a pro bono project to build the [Malaria Anticipation Project \(MAP\)](#), deployed in Lankien, South Sudan and being planned for Anka, Nigeria.

John Lewis: We shifted to lower-footprint GCP cloud data centres in Switzerland to meet JL's environmental sustainability goals.

Government: We are an active member of the Government Digital Sustainability Alliance ([See more details here](#)) and are actively working with Defra to implement exemplar projects such as:

- Implementing Green coding Standards ([See Version 1 Github](#)) in our teams working with Defra to help support learnings for wider Government.
- Working with Defra and our partner [Heata](#) to develop an innovative decentralised cloud compute project. The aim is to reduce the carbon footprint of cloud workloads by 80% and heat farmers' domestic water tanks to save them money.