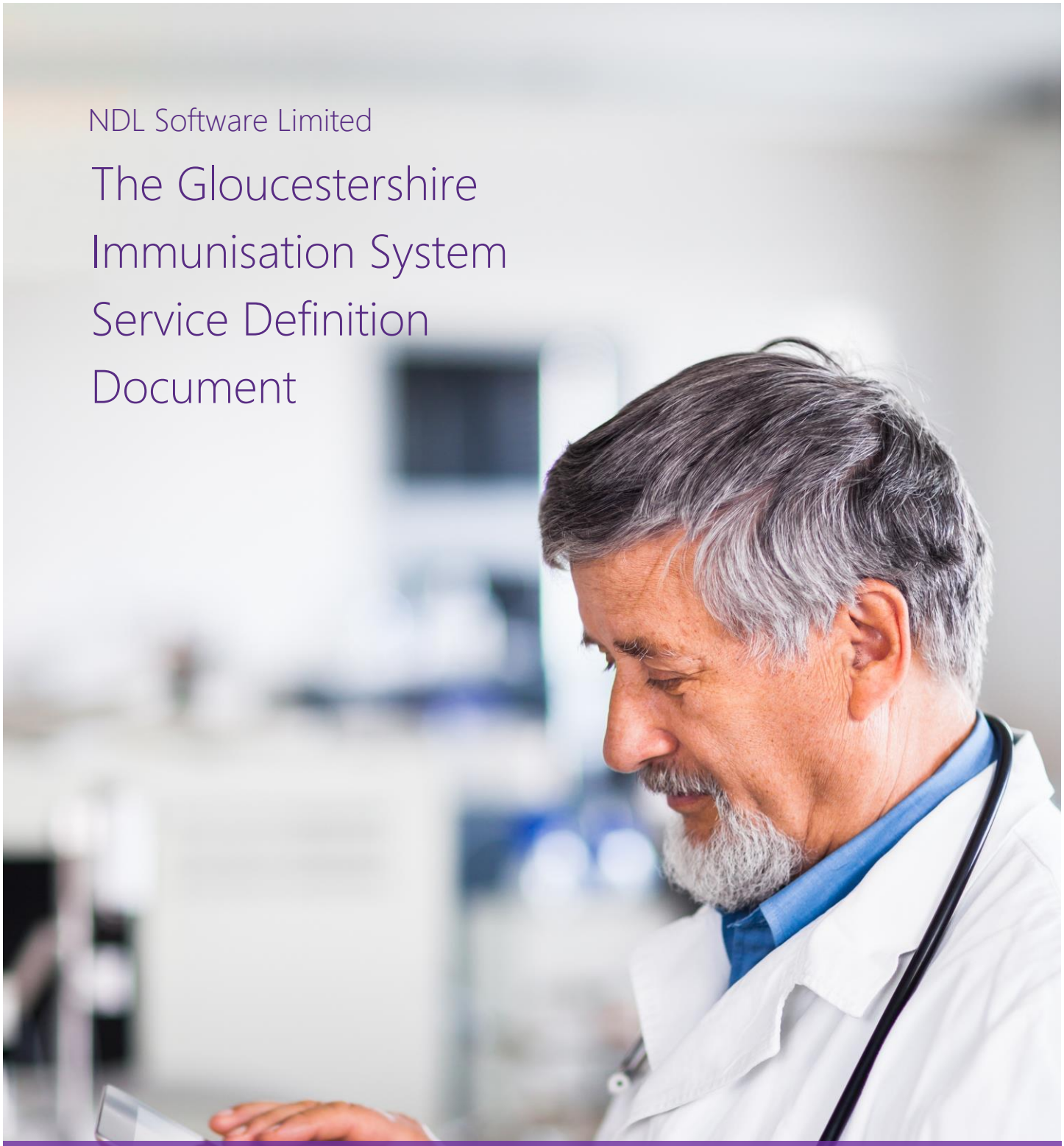
NDL Software Limited

The Gloucestershire Immunisation System Service Definition Document



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Company Overview

At NDL, we believe that information should be available to your staff, and the public, when and where they need it. For us, it's important that we deliver great products, but our focus is ensuring that you get the outcome that you desire. NDL are dedicated to ensuring that your working practices are not dictated by the limits of your existing back-office system and that you are free to work in the way that suits you and your organisation. To do this, we help you eliminate wasteful practices, such as rekeying, and release data and valuable insights that have been locked away on paper.

Our digital transformation tools allow the automation, integration and mobilisation of working processes - providing business insights and ensuring that you are in control. Our approach is backed by a team of experienced professionals and an extensive, collaborative, customer community who are eager to showcase their work and share experiences.

Proven with a large number of UK Public Sector license holders, including healthcare, local government and housing providers, NDL has a wealth of experience with the demand facing the public sector. Our comprehensive customer community, of over 100 organisations, drives the direction of our product development and services through one-to-one interactions, research programmes, user group meetings and project facilitation.

Product Overview: The Gloucestershire Immunisation System

Summary

Designed and used by clinicians, The Gloucestershire Immunisation System is an end-to-end immunisation solution targeted at improving the processes and outcomes associated with delivering an effective vaccination programme to school age children. Covering all the main aspects of the process, from the consent, triage and administration, to the delivery and reporting, The Gloucestershire Immunisation System is designed to support Immunisation Services, reducing reliance upon paper records and forms. The objective being to improve uptake and release a significant amount of staff time, meaning that clinicians are able to focus more on the delivery of healthcare services.

It is comprised of four modules covering the current school age Immunisation Programme (FLU, DTP/MenACWY, MMR, HPV) and is composed of three main components:

- Online Parental Consent
- Administration and Triage
- Mobile Vaccination Delivery

The Gloucestershire Immunisation System's workflows are deployed by using a combination of online webforms and a mobile app that works both on and offline. Surrounding these core elements, a range of reporting options provide valuable insights for future service planning. A range of integration technologies are available to make sure that valuable data can be linked with existing back-office systems, ensuring medical is automatically updated and is therefor up to date.

Going paperless is a key objective for the NHS in the 21st century, few areas illustrate this need so clearly as the the Childhood Immunisation process. NDL has successfully implemented a digital approach to consent and immunisation with varying levels of complexity, working alongside seven NHS Trusts in the last twelve months and the results have been significant. The use of hundreds of thousands of paper forms have been saved along with the laborious process of delivering, collecting, manually triaging and storing. The data collected is no longer trapped on paper and has already delivered valuable insights into everything, from the times that consent are given, to simple matters such as the amount of vaccine that Trusts need to order. NDL's customers also report improved moral amongst clinicians, as their administrative workload is reduced and they have more time to deliver care.

Features: Online Parental Consent

Digitising the process of gaining the initial Parental (or Guardian) consent is key to the immunisation journey. Every immunisation has its own form within the system, with each providing a series of common and program-specific questions. These are branded to reflect the identity of the service managing the process and can be further customised if required.

We have found that healthcare professionals, typically nurses, have been spending a significant amount of time transporting and delivering paper-based form to schools, and subsequently collecting them. The online consent solution eliminates the need for manual delivery, freeing up clinician's time to plan for the vaccination period. This also relieves the pressure on schools as they no longer have to hand out the forms and collect them from the children. Instead they are able to send out an email to all parents with the online form. It also means that lists can be supplied to the schools much easier before vaccination day, making for a more efficient and easier process.

One of the most important aspects of the online approach is the immediacy of data collection and the willingness of parents to engage with this approach, which it is very similar to the many other daily tasks carried out digitally every day, for example, banking. All the data sent back and forth is strongly encrypted to ensure security and compliance with the latest data governance requirements.

The forms used by the system work on mobile devices as well as in traditional computer browsers. This has proved important, as a large percentage of the consents submitted to-date have been on mobile devices. System dashboards mean that the service can see exactly when a school has sent out the email to parents. Likewise, the percentages of those who have responded is also immediately visible alongside form completion date and time – allowing for better data analysis, for example; it has been noted that a large amount of forms are submitted after midnight. This

also means that the Service has visibility of potential take up problems in an individual school, so can take proactive measures to encourage agreement.

In addition to the increased simplicity for the Service, the School and the Parent, data quality is also improved. This is due to the structured content within the form and the ability to validate responses against criteria, for example; is a Post Code or NHS number in the correct format? Even improvements in legibility have significant implications for administrative time savings. It is also possible to provide multilingual versions of the forms to improve clarity for Parents around the data and consent being sought.

The digitisation of the consent process alone, brings huge benefits and savings to all involved.

Features: Administration and Triage

Bringing together the processes of gaining consent and the delivery of an immunisation programme are not trivial. To support this, The Gloucestershire Immunisation System comes with a central administration system and is only visible to authorised staff. It allows appropriate members of the immunisation team to perform the following administrative tasks:

- Set up and administer schools, year groups and classes
- Set up and administer clinical teams, including ad hoc 'catch up' sessions
- Import school data (if available)
- View consent forms – A list of all people within a cohort can be viewed, along with their consent forms and any other information that is held within the system
- View and manage exceptions – When information provided on a consent form does not match with the information already held by the system, it produces an exception to highlight the potential problems
- Triage forms – Review forms that highlight issues that may be preventing vaccination or where special measures may need consideration. This is presented on a Red, Amber, Green (RAG) basis, even picking up such items as where consent may not be clear; for example, where there is a conflict between separated parents. As the data is structured, issues like this are quickly highlighted to clinicians and administrators for their attention rather than being buried in piles of paper.
- Schedule and manage sessions – Sessions are where a member of the Immunisation team is scheduled to provide actual vaccinations to children in a school or other setting. Each session is for only one immunisation, although multiple sessions can take place at any one time. This also accommodates multi-hand working where more than one clinician is attending a session.

In all, the central Administration and Triage component is a powerful planning and management tool for the service, especially when combined with the system reporting elements.

Features: Mobile Vaccination Delivery

Having gained consent and planned a session, recording the information about individual patients and cohorts is key, as is having access to core clinical information for reference by the clinician in the event it is needed.

Data network coverage is not 100% reliable in the UK and there are always settings where this can prove problematic. This is why The Gloucestershire Immunisation System also comes with a mobile element that works on or offline, depending on network availability. The clinician does not need to be aware of the mode in which they are working, they can carry on with the planned sessions regardless, with data synchronising when a network is available.

The mobile element works on all common varieties of tablet or notebook devices and can even run on mobile phones, although these devices are usually considered inappropriate for the process. Data is held and transmitted in a highly secure manner and is strongly encrypted both in transit and 'at rest', and has been designed in a way to only store the information that is outstanding for the session(s) in progress. Devices are part of the Trust's domain and subject to normal security, identification and authentication; however, The Gloucestershire Immunisation System can also wipe the app and delete data as an additional security measure - to guard against lost or stolen devices.

The app itself holds details about the session(s), the cohort to be vaccinated along with historic vaccination data (if known and uploaded by the service) and current medical details including consent etc. It can also highlight any special instructions or flags for the clinician to be aware of. This means that the clinician can be well prepared for the session without having to having to carry boxes of paper.

The system then allows the clinician to book into a session, record who was vaccinated or missed, and add any notes or vaccine data, such as batch number. As all of this data is captured electronically and synchronised to the back-office, paperwork is eliminated for the clinician and information is readily available for use in reporting or integrating into other backoffice-systems.

Package Components: Online Consent Forms and The Online Administration System

- ### Client Component
  Consent is given and the administration managed via a series of industry standard HTML5 and JavaScript web pages containing the forms. These work on all major browsers and the consent forms are fully 'responsive', meaning they can be used on mobile devices as well as more traditional PC desktops.

- Server Component
  Program files handling database connections and operations, removing data processing from the browser. Must be published to a standard IIS website.

Package Components: Mobile Vaccination Application

- App Server
  A central server-based service which synchronises data between mobile devices and back-office systems, stores global configuration settings, manages which users have access to the app and provides detailed auditing and logging facilities for governance and diagnostic purposes. Stores configuration in a Microsoft SQL Server database.
- Mobile Client
  This is a cross platform (IOS, Android and Windows) native mobile app, required on each mobile device running the Mobile Vaccination Application. The Client runs the app in its own secure 'sand box' and communicates with the central App Server over encrypted channels so no data is available to device users outside the application. In addition to any device or Trust domain security, the app can demand additional credentials and log in if required.

Both components store relevant data in industry standard SQL databases. This data will always be hosted by the Trust (Cloud or on-premise) and can be accessed via the organisation's chosen data security and governance policies. In addition, the database(s) can be interrogated by the Trust's chosen reporting or Business Intelligence tools.

Minimum Requirements

Minimum Requirements for the Online Consent Forms and The Online Administration System:

Configuration settings and audit data are stored within a SQL database using Microsoft SQL Server 2016, 2014, 2012 or 2008 R2. Microsoft's minimum specification for the version of SQL Server you are using should be sufficient, but if you are using a shared instance, you will need to bear in mind the requirements of other users when specifying the SQL Server machine.

The server component of a webform must be hosted on an IIS web server. The Client component can be hosted on the same IIS web server or installed separately, in which case it can be hosted on any web server which supports HTML5 and JavaScript web pages. End-users completing the webform can access the form using the latest versions of the most widely used desktop and mobile browsers.

Minimum Requirements of the Mobile Vaccination Application:

The server components require a server, either physical or virtual, running Windows Server 2012, 2012 R2, 2016 or 2019 with access to Microsoft SQL Server 2012, 2014 2016 or 2017. Although, the server components themselves should run within the minimum specification for your chosen operating system, you will need to consider the number of users and the volume of data requests when specifying your server hardware. We recommend at least 1 GB RAM above your operating system's minimum requirement and sufficient disk space to maintain the operating system. Microsoft's minimum specification for the version of SQL Server you are using should be sufficient for use with Offline Immunisation Application.

Virtual servers can be run on the Microsoft Azure platform using the above server configuration. A pre-installed Azure VM is also available from the Azure Marketplace.

The mobile client on your mobile devices will connect to the App Server via an Internet connection.

Ongoing Software Support & Upgrades

Product Support

As part of every licence, NDL provide an extensive range of services to ensure maximum results are achieved. Every licence holder will be assigned a customer services contact and have access to our support desk.

The Product Services team are available via a freephone support line and email, with all queries answered in a timely manner (please see table on page 9 for targeted response times). The support team is equipped with high-skilled technical problem solvers, for those occasions when things don't go as planned, however, they are also available for help, guidance, consultancy and education in the use of any of NDLs licenced software.

Response Times

Priority	Severity	Description	Example	Commitment	Response Time
1	Critical	High impact on the customer's business due to a Fault that is preventing the customer's operational use of the NDL software product.	Consistent operational system crash, data corruption, loss of production, loss of major functionality.	These calls are handled before all other calls and receive our top priority to diagnose and identify the cause of the issue and provide an early resolution. A call management plan will be agreed with you where this is appropriate.	4 Hours
2	Important	Customer's business is significantly impaired or restricted due to a Fault that, while not preventing, is seriously degrading the customer's operational use of the NDL software product.	Intermittent operational server failure, workstation crash, performance issues, features not working.	We will attempt to deal with these issues as soon as we can, taking into account the circumstances of the individual call and the impact of the issue on your business. A call management plan will be agreed with you where this is appropriate.	1 Working day
3	Standard	Less serious issues or those for which a viable workaround is available and which have little or no impact on the customer's operational use of the NDL software product.	Non-critical or intermittent software failure, feature not working to customer preference, alternative method of working available, feature enhancement request, information request, documentation error.	We will discuss the issue with you and mutually agree if, how, and when the issue will be resolved.	3 Working day

The severity level of a call should be agreed jointly between the caller and the helpdesk. Honest appraisal of a call's severity level is a key factor in ensuring a consistent response to support issues.

Product Services are responsible for:

- Receiving and responding to customer requests for technical assistance
- Documenting customer descriptions of technical issues, problems and calls
- Diagnosing reported issues and researching possible solutions
- Providing maintenance updates for a product or individual files within a product, if covered by the licence contract
- Recommendation of possible remedies, workarounds and fixes, as available
- Communicating with the customer on a regular basis, regarding status of open calls until mutual agreement on closure is reached

Throughout the progress of a call, the Product Services team maintain a record of the history of a call and this information is kept for future reference after the issue is resolved and the call has been closed.

Customers are provided with documentation explaining how we triage and handle calls, including our escalation process. In most cases, subject to specific 'Access Agreements', we supplement our telephonic and onsite services with remote systems access. This means we can provide enhanced diagnostics and fixes should the need arise.

Upgrades

Licence holders are entitled to receive major, minor and upgrades of the licensed products at no additional cost during the term of the agreement. This also includes new features that are introduced to add additional value to the product.

Implementation & Onboarding

Delivering a successful outcome is not just about the software, it is about the whole package, the project and the services surrounding it. This is why we have built on our experience delivering tools and projects with other public sector customers to design a programme for the implementation of The Gloucestershire Immunisation System.

Led by a dedicated NDL Project Owner, the programme consists of a number of steps which reside inside a set of core modules. These are:

- Discovery
- Gap analysis and refinement
- Implementation
- Ongoing care and development

Discovery

- Stakeholder identification: This includes representatives of frontline staff delivering the service in the field as well as management and technical officers.
- Kick Off Meeting: This is to introduce the teams to each other, to establish expectations and a working methodology that suits all concerned. Typically, it will be led by project owners in both your organisation and NDL respectively.
- Stakeholder meetings: We then meet with the different stakeholders to understand their individual needs so we can gather key information and learn from them.
- Product Education Sessions: We will then demonstrate the core system to all the different stakeholders in overview, but then also in-depth at 1:1's from the perspective of their particular speciality. This is key because apart from socialising and educating everyone on how the system works, it also allows us to develop a detailed 'gap' analysis for later discussion.
- Project and process meetings: A structured series of joint meetings will be set up and run by the project owners. These could be face to face or using tele-conferencing.

Gap Analysis and Refinement

Having met with the stakeholders to introduce them to the core system, understand their working methods and identify required outcomes, we will begin the process of defining the 'as is' system 'fit' to your bespoke needs. In our experience working with multiple organisation, we know that no two are the same.

Once we have the gap analysis documented, we will then need to decide how to proceed. Where the fit of the existing system does not reflect the desired working practice or outcome, then there are three main options:

- Change the core system to reflect the requirement: As the system is built and runs using elements of NDL's tool sets, it is usually far simpler for us to amend than it would be for more traditional software providers who have to hand-write code. This allows us to be flexible and not insist that one size has to fit all.
- Change the working practice to fit with the system's methodology: Some change is inevitable due to the introduction of a paperless approach. Usually this is very positive, however, unless there is a strong desire to change the core working practice, we would seek to minimise change to avoiding upsetting the workflow and balance of a team - and therefore the acceptance of new technologies.
- Implement a combination of both: This is by far the most common scenario, although we would seek to minimise day-to-day working practice changes, in particularly for the clinical teams.

We then work with the stakeholders to apply a MoSCoW (Moscow) process.

- Must Have
- Should Have
- Could Have
- Won't Have (this time)

Wherever change is required there is a financial or time cost. It is important that these are kept to an absolute minimum, especially in the first iteration, and are rigorously evaluated before deciding to proceed.

It should be noted that although there is often an imperative to get the system in and working as quickly as possible, to maximise the benefits of going paperless, the opportunities for future process improvements and redesign are never lost. The MoSCoW process can be repeated over the life of the system build. This is a common approach to modern systems development and has been shown to be a highly effective way of maximising benefits whilst reducing overall project risk.

NDL provide a package of 5 days for the Online Consent module and 5 days for the Mobile vaccination module in year 1. These days should be used for gap analysis, system customisation and training. Our services team will make amendments to any of our components as agreed during the Moscow process. In addition, we will also apply your brand identity, styles and colour schemes to the system to make it fit. We find this assists with users adoption as well as helping with promoting the service being offered by your organisation to parents and clinicians.

Implementation Phase

Implementation is again split into several subcomponents.

- Dev Ops
- System Customisation
- Reporting
- Training & Documentation

DevOps

This is where we work with the relevant teams to set up the correct technical environment upon which to host the core system, web page elements and communications infrastructure for mobile workers.

Our technicians can work with your team to configure your environment if required, setting up the necessary permissions and implementing core server components, if applicable. We also look to make sure that your security policies are strictly adhered to due to the extremely sensitive information involved.

It is also possible if required to set the infrastructure up in the Cloud as NDL's offerings have been tested and certified for use in the Microsoft Azure environment and a number of customers have deployed using AWS (Amazon Web Services).

This work is all documented and we generally provide training for the DevOps team as part of this, including not only the product technologies but also formal support and change control processes too.

Reporting

Reporting would normally form part of the customisation process and this as an often-overlooked area. Screens and User interfaces tend to grab the attention during a project, however it is the accurate data insights that the system produces that bring the biggest value. We see this in two main areas:

- Static Reports: These are automatically generated on a scheduled or on-demand basis for various stakeholders.
- Dash Boards: Again, this will differ depending on the user / stakeholder, however, rather than being a static report, this will be a living view of 'live data' graphically represented and offering drill downs into the data. This is particularly useful for day to day management and flagging KPI's.

The individual requirements will have been identified as part of the discovery phase and further on demand reports can be created in future as required.

Many customers also have a department who are using Business Intelligence tools to view organisational data in a variety of contexts. The core SQL technology employed in NDL's products is fully compatible with the vast majority of these tools. As part of the system hand-over, we will explain how the databases are set up so that your own BI teams and analysts can provide new reports for users as required and without having to involve NDL. (It should be stressed that this will be read-only access to the data as writing directly to the database could compromise the integrity of the system so is not allowed without the explicit permission of NDL).

Training & Documentation

The following training options either forms part of the implementation and onboarding process or can be provided as a standalone service to customers.

Staff need to have training in the usage of the system. We take a hands-on, 'train the trainer', approach supported by documentation. We can then support these trainers with refreshers and by accompanying them and the end users in their systems usage to make sure that the training 'sticks'.

Hosting

This product can be hosted in the Cloud (public or private) or on-premise depending on the organisation's requirements. It can be deployed via the customers chosen Cloud supplier, our hosted option typically utilises our partner, Microsoft Azure. Hosting can be purchased directly by an organisation through the Azure Marketplace using their own subscription to Microsoft Azure. Alternatively, The Gloucestershire Immunisation System can also be deployed through AWS, in either case NDL can provide support through the process. The costs associated with hosting will be dependent on specific requirements. Please contact NDL for further information.

For queries or for further information, please contact our G-Cloud Desk: G-Cloud@NDL.co.uk or call 01937 543500.