GEOPXHERE

CLOUD GIS SERVICES

AN INTRODUCTION TO XMAP
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2. About GeoXphere

2.1. Our Background

GeoXphere is a UK-based company specialising in Cloud GIS, spatial data management and cost-effective geospatial survey solutions. Our vision is to continue to adapt and grow our end-to-end concept of fast and efficient data capture combined with easy-to-access cloud delivery of mapping.

GeoXphere launched in September 2016 with the aim to accelerate and advance innovation around digital mapping technology. Our two keystone services are XMAP and XCAM.

XMAP is a cloud-based GIS software platform which is used by private and public sector alike to share geospatial data across an organisation in a structured and intuitive way. XMAP has been built completely in-house using a variety of modern web and mapping frameworks. Our USP is the way organisations can create and share business mapping data without the risks involved in using open source silos of GIS or the expense of traditional GIS suppliers. Our software provides aerial photography and Ordnance Survey mapping, amongst other datasets to over 1,000 Local Government users as well as a range of commercial clients. We are OS Partners and are experts in working with UK spatial datasets.

XCAM is our suite of aerial survey camera systems which meets the demands of a rapidly evolving aerial photography market. The system is designed to cater for the rapid capture of data such as orthophotos, oblique imagery, height data, Near Infrared, Thermal and 3D models. XCAM systems mount to light aircraft making them a flexible and cost-effective solution for many organisations wanting to capture or commission high quality mapping data.

Combining our two areas of business creates a powerful set of solutions for our customers. We spend our time constantly improving and enhancing these services to give our customers the best possible value for money.

2.2. Our People

The GeoXphere team has decades of combined experience in the geospatial industry and has a wide skillset ranging from remote sensing through to web development. We all worked together in another company before we spun-off in 2016 so have customers who have been using our services since 2009.

We have a culture of attention to detail, open discussion to find the right solution and we thoroughly enjoy what we do. We are motivated by delivering successful survey or GIS projects on time. We like to build strong, long term relationships with our customers who like our honesty and trust us with their critical GIS services.
2.3. Notable Successes

Here’s a brief overview of some of our recent notable success stories using our XMAP platform. The focus of the company is provided where we are not able to share their name:

**Bath & North East Somerset District Council**
This Local Council have been using XMAP since 2010. It is the cornerstone of their corporate data sharing platform and is used daily by over 400 staff, both on-site and remotely. Over the years we have improved and extended our software to meet their growing needs. These updates have filtered through to other customer accounts, showing that where we improve one thing it benefits many. B&NES are subscribed to the complete XMAP platform and also commission regular aerial and ground-based surveys from us. We visit them on a regular basis to run ‘health checks’ on how they are managing their data and how their users can get the most out of the software. We also run an annual event which brings together users from the 50 Parish Councils within the B&NES region.

![Figure 1: OS mapping overlaid with customer vector data showing road schemes.](image)

**Private Company providing specialist insurance**
This company has been using XMAP for over 2 years. It’s used by a team of assessors based all around the UK. They use XMAP to plot the outlines of properties that they cover and add attribute information to the map of assets. They value having a system that can be used anywhere at any time without needing to use VPN or remote desktop to central office systems. Their asset maps give them a single source of truth, so they know that the data they see in the system is the defacto master copy.

They subscribe to a regularly updated feed of high resolution satellite imagery which gives them a reliable base for seeing changes to the built environment.
Central Government organisation
A Whitehall-based government organisation uses XMAP as a mapping communication tool to share project updates to a variety of stakeholders. They use many Map Layers of information that are updated regularly by the user to communicate statuses and critical areas of interest.

They use the annotation and print tool to produce up-to-the-minute snapshots to share in reports and briefings. XMAP is also used in presentations as a ‘live map’ to show a constantly changing picture.

XMAP has been tested against a range of vulnerabilities and attacks and shown to protect the customer’s data without any breaches. This means they can trust our system to hold their digital mapping data.

[no screenshot available]

Private Company providing commercial rates analysis
A UK-based company uses XMAP to analyse the difference between old and new aerial photography. They gather this information and use it to assess properties for structural changes. Their business involves using this data to accurate assess business rates. XMAP is an essential tool for this work as it allows quick switching between different layers of information.

The shared editable layers are used to ensure there’s no duplication in effort between staff working on sites in close proximity.

[no screenshot available]
3. **XMAP Cloud GIS**

3.1. **Overview**

Our solution for exceeding your requirements regarding GIS is to supply our cloud-based mapping service, XMAP Cloud GIS. This service is used by over 2,000 users across the UK in a variety of public sector and commercial scenarios so we are confident it will work for you.

XMAP Cloud GIS (herein ‘XMAP’ or ‘the GIS’) is fully cloud-based which means it is very quick to deploy across a multi-site organisation and adaptable in the way it can be configured to meet certain customer workflows.

XMAP is not designed to match 100% of all traditional desktop GIS functions, simply because even the most expert users of desktop GIS do not use all those features. Instead, XMAP includes all the common GIS functions that all ranges of GIS users typically need such as search, print, measure, edit and style. It also includes an intuitive admin dashboard that allows key administrators to control user permissions and data flow.

XMAP is adaptable to any organisation so we’re confident we can find a solution that fits your requirements.

3.2. **Functions**

**Display of Mapping**

XMAP has a clean, modern and intuitive interface. It has a focus on displaying high quality mapping and enabling the user to quickly get to the data they need. The interface is configurable to allow client logos to be displayed instead of ours. This gives your users a better sense of ownership to the service.

The interface is split into 3 key sections;

- **Top Menu Bar.** This menu bar along the top of the screen includes the account logo, tools available to the user, a search box and a Log Out button.

- **Layer Menu / Action Pane.** This vertical section on the far-left of the screen includes some quick-access navigation buttons and an expandable list of all the layers available to the user to view. This panel is collapsible to give more map space.

- **Map.** The rest of the screen is for the map. It is interactive and can be controlled by mouse or touch.

*Figure 3: XMAP Cloud GIS displaying OS MasterMap Topography Layer.*
Info Click

By clicking on any location on the map, the software will interrogate that position and return the information about any object it finds there. This is a quick and easy way of displaying information held within each map object.

As well as the attribute information inputted by the user, automatically calculated statistics also show including who the object was created by and it’s area. This aids accountability and accuracy of the data.

![Object Info](image)

*Figure 4: Info Click panel showing object attributes and metadata.*

Layer Control

The Layer Control allows the user to switch Map Layers on and off. This hides or displays them on the map. They are switched on simply by clicking on them. A tick appears to show if a layer is switched on.

The layers are organised into Collections (folders) so that themes of data can be found easily. This arrangement is controlled at administrator level.

![Layer Control](image)

*Figure 5: The Layer Control showing how datasets can be easily ticked on and off.*
The collections (folders) of layers are either coloured in teal for base maps (i.e. OS mapping, aerial photography etc) and the grey collections are vector maps (i.e. company assets, addresses, etc). In some scenarios this area is replaced with key options for a particular tool, e.g. printing.

It can sometimes be hard to remember what collection a Map Layer is in, so there is a search tool that finds layers based on their title.

![Layer Control](image)

*Figure 6: Searching within the Layer Control.*

**Search**

The main search tool on the top menu bar gives the user the option to search a variety of datasets including Postcode and Place. Other datasets can be added into this section if different datasets or gazetteers are loaded. We help with this process.

Carrying out a search and clicking on the results takes the user to that location.

![Search Results](image)

*Figure 7: Searching for a postcode.*

**Printing**

The print tool allows the user to create high quality PDFs in A4 or A3 in Portrait or Landscape with a Title, Description, Legend, and other useful information.
The tool prints everything that’s displayed on the map at the correct scale.

Some customers require specific print template designs so we produce these as required.

**Figure 8:** Setting the bounds, format and text for a PDF print.

**Figure 9:** The resulting PDF printout.
Editing
Administrators can define which users are able to edit specific Map Layers. This granularity of permissions means data integrity can be retained by only giving editing access to people who require it and have the relevant training and responsibilities.

The editing tool can be enabled for any Map Layer owned by the organisation and allows the creation, editing and deletion of map objects and associated attribute data.

**Figure 10: Updating a Line object geometry.**

**Figure 11: Creating a new Polygon map object with attribution.**
Annotation
A user may want to annotate a map without having to create a new structured Map Layer. This is achieved with the Annotation tool and allows the addition of text, points, lines and polygons to be added. These are private and temporary to each user.

![Annotation tool interface](image)

*Figure 12: Adding annotation to a map ready to print.*

Measuring
The measuring tool allows distances and areas to be calculated on-the-fly. This, again, is temporary and private to a user.

![Measuring tool interface](image)

*Figure 13: Performing a line measurement. The distance is live-updated.*
List View
This gives a spreadsheet-style view of a Map Layer. It shows a row for each map object along with its attribution. This is searchable and can be used to find an object based on attribute criteria and then navigate to it on the map.

![List View](image)

*Figure 14: A table view of a Map Layer showing IDs and attributes.*

Optional Addons
There are a range of non-standard tools that can be added to XMAP as required. These include:

- Street-view style panoramic imagery viewer
- Aerial oblique image viewer
- 3D model viewer
- TravelTime analysis

We’d be happy to include these as demo tools after the system is deployed.

3.3. DATA

Included Data
We try to include as much free and public-sector data into a new account as possible. However, we work with the customer to gauge the requirements upon initial setup.

In the UK we can include datasets from providers such as Ordnance Survey, Environment Agency, Historic England and DEFRA, among many others. The administrator can control whether these datasets are made available to their users.

We maintain these datasets by applying updates as they are made available by the source.
Figure 15: Ancient Woodland layer included as a 3rd party layer.

Figure 16: Road noise grading included as a 3rd party layer.
Sourcing of 3rd Party Data
As mapping data specialists, we can source a variety of 3rd party datasets, including those in the Data Supply section. At any point throughout the term of the subscription to XMAP, the customer may enquire as to availability, cost and coverage of datasets. We are also able to capture bespoke aerial imagery for our customers, providing higher resolution and more up-to-date information than is already available. This is great for customers who need regular updates of a specific site.

Database Connections
As a cloud-based solution we can connect to a variety of sources of information, including those on a customer's own databases. Of course, to achieve this we would need the relevant permissions to read and/or write data.

We have the in-house skills to work with the customer to create these connections. Other XMAP customers have similar connections where data is synchronised in nightly updates.

Uploading
XMAP has the facility to allow users to upload mapping files to display within the system. There are a few methods for this ranging from a drag and drop upload through to structured secure FTP transfers. We can work with the customer to create a configuration that works for them.

3.4. Administration

Overview
XMAP includes an Admin Dashboard which allows the customer to self-serve the creation of users, configuration of datasets and editing permissions, among others.

We recommend Admin Dashboard accounts are given to administrators who understand how the flow of data should happen within the organisation. We provide additional training for these users to ensure the setup goes smoothly.

Users
Administrators can use the Admin Dashboard to create, edit and delete users with no interaction from us. They can issue password-reset emails and change their profiles to reflect what data they can view and edit.
Figure 17: Admin Dashboard displaying the User Manager.

Permissions
The Administrator can define what Map Layers a user, or group of users can view and edit. The Admin Dashboard can be used to give permissions at organisation level, profile group level or individual level, offering advanced levels of granularity.

Figure 18: Options for setting editing permissions for a Map Layer.
Styling

XMAP has an advanced styling tool that allows Map Layers to be styled based on attribution. This gives greater visibility of the underlying data. For example, a layer that has a ‘Freehold’ or ‘Leasehold’ field in the data can be styled to show Freehold records in a different colour. This immediately shows the user more information about the object.

The tool also includes advanced labelling options and settings that restrict viewing a particular zoom scale.

Figure 19: Creating dynamic styling based on an attribute. In this case, a holding type.

3.5. Training

Our training programme is based on a train-the-trainer method where we give in-depth tuition to a small group of ‘power-users’. This gives them a complete understanding of the structure of the system and how it is operated efficiently. It will then describe and coach the users on the practical day-to-day activities that will be required. Training will be adapted to fit the requirements of the organisation, but will include topics around:

- **Editing**. This will include detail on the editing tools that will allow effective data capture. This will also guide them through the permissions available to allow them to delegate editing tasks to others in a controlled way.

- **Layer Management**. Creating data structures is an important task that has implications on how the data will be viewed and analysed. The training will give examples of good and bad data management and tune advice towards the organisation’s specific needs.

- **User Management**. This will describe and how users will access the service and receive the data and tools they need.

- **Analysis**. This will give practical examples for how information can be interrogated and used to benefit the organisation. With good data structures, enhanced visualisations and analysis can be performed.

Our training is supplemented with an online Knowledge Base which can be used both for advanced users and general users alike. It is updated on a regular basis and adapts as the software changes.
Our team are always on-hand to answer questions either via our support ticket system or via email or phone.

This method has worked extremely effectively with other organisations using XMAP with either an on-site or remote workforce. The train-the-trainer method empowers the team and allows them to self-serve and impart knowledge across the organisation. From our experience it is also prudent to find advocates in different departments. They generate awareness and best-practice to others.

3.6. INSTALLATION
There is no installation required for XMAP. We create the account and populate it with the initial mapping data required. The Admin Dashboard is then used to add users and data as required.

There may be some on-site work needed if required to establish database connections, but the detail of this can be arranged when planning the deployment of the system.

3.7. PERFORMANCE
XMAP comes with a 99.9% uptime SLA and outperforms this on a consistent basis.

Map refreshes typically take between 0.5 and 2 seconds but this can vary depending on local network speeds.

XMAP performance scales with the number of users, so adding additional users does not affect the speed of the system.

Our system has had very few outages (planned and unplanned) which has built up a confidence in our userbase. They know that they don’t have to worry about it and it will perform consistently for all their users.

We have constant monitoring processes on our infrastructure and software services. Not only do they monitor, they can also action automated remediation actions if they notice an issue. Our technical team are immediately notified of these automated actions through mobile phone push notifications. If there are ones that can’t be solved automatically then our technical team seek to resolve them straight away. In the rare cases where a component experiences issues, we are already in the process of solving it before any customer gets in touch to report the issue.

3.8. COMPATIBILITY
XMAP works on all devices that have an Internet connection and a modern HTML5 web browser.

It is designed for Desktop and Tablet devices natively but can work on very small screen devices.

3.9. DATA INTEGRITY
XMAP has undergone rigorous testing by external Penetration Testing specialists. The aim of these tests is to identify vulnerabilities in the software that, under a real hacking scenario, could lead to the exposure and leak of data. Our software has been shown to provide excellent protection against attacks so we can provide assurance to customers that their data is safe on our infrastructure and software platform.

We provide XMAP services to a number of Central Government organisations where integrity of data is critical. They have conducted their own tests to assess our encryption and architecture and our systems have passed those, giving them confidence to use our service.
We regularly analyse our infrastructure to ensure it is fit-for-purpose and secure. This can often result in updates and patches to software, modifications and improvements to how data is transferred, and regular changes to our infrastructure passwords.

3.10. GDPR
For customers subscribing to our service there are no issues regarding GDPR. We will retain points of contact with our customer under ‘legitimate interest’. This is essential to be able to provide support and service update notes.

GeoXphere will not use, sell or distribute customer information or customer data unless explicitly agreed. We subscribe to updates from the ICO regarding best practice for dealing with data management which allows us to keep aware of changes and put plans in place should anything need to be changed.

XMAP is a GIS system and can therefore hold geographic data and associated attribution. If a customer uploads or stores personal data it is their responsibility to provide guidance to other users on how that data should be used. This would be covered under their own personal data guidelines.

3.11. Licence
XMAP is provided on an Annual Subscription basis for a defined number of users.

Unless explicitly expressed regarding a particular map layer or 3rd party provider, there is no limit on usage.