Building a business case for the ArcGIS Utility Network and lessons learned with Northern Gas Networks

Your questions answered

Liam Kelly, Head of Data & Information Centre of Excellence, Northern Gas Networks (NGN) took us through;

- Lessons learned from building the business case and who to engage internally
- How the scope of the project was defined and benefits to NGN and utilities
- The procurement approach and importance of systems, licencing, and data quality
- An update on the project milestones covering the architecture, data modelling and data migration
- Q&A panel session with; **Liam Kelly,** NGN, **Phil Francis**, Solutions Architect, 1Spatial and **Craig Hayes**, Head of Critical National Infrastructure, Esri UK

We didn't have time to answer all of your great questions. We wanted to make sure you have all the information you need, so we have put together all of the answers to your questions below.

Q: You mentioned you used LOTS, were these LOTS what you went to market with (so you could have ended up with multiple suppliers). Or were these LOTS used for the winning supplier as almost small projects/areas to manage?

A: Liam Kelly - Yes, we went to market with different LOTS and awarded them to different suppliers. In making awards we had to carefully consider to cultural fit of each supplier with NGN but also each other. We took time to understand their partnership approach to ensure we could work successfully as a collaborative team.

- LOT 1 – Upgrade and data migration to UN: 1Spatial and Esri UK
- LOT 2 – Migration to AWS: Perfect Image
- LOT 3 – GIS and SAP Integration: EY AgilityWorks and 1Spatial

Q: Was your procurement process subject to OJEU?

A: Liam Kelly - Yes

Q: How did you overcome the issue of not being able to compare "Apples for Apples" because you used a performance spec?

A: Liam Kelly - We had to ask specific clarification questions on certain items and request a detailed cost breakdown for these items. The bulk of the issues related to assumptions made around the required data migration and data cleansing activities. We asked all suppliers to provide a detailed task breakdown, associated costs and worked with them to make sure all assumptions were agreeable. This was time consuming for the internal team and did cause delays in the tender process. However, encouraging thought leadership from suppliers was a key strategic decision we took.

Q: Did you engage in any kind of Proof of Concept as part of the tender process?

A: Liam Kelly - We didn't, however we would recommend this in hindsight. We would recommend some activities to help you to understand what UN will look like for your organisation. The UN design and migration has been a big success in our project so far, however if it hadn't had gone so well, this would have been a big lesson learnt for us.

Q: Will the SAP/GIS integration process be automatic or rely on user swivel chair processes?

A: Liam Kelly - Yes this will be automatic and not rely on manual user intervention. This will conform to current BAU processes.
A: Phil Francis - Yes the SAP integration will be automatic; however initially this will limited to the linear assets (pipes) between SAP and GIS and vice versa. However through careful design we are trying to ensure that the interface will handle an increase in the interface scope to include other network plant and assets. This is definitely the direction of travel.

Q: What data model design was required over and above the "standard" UN model?

A: Phil Francis - In truth we started with the gas foundational model, but have ended up stripping it back and reworking in some areas either to make the utility network implementation more familiar to the existing users at NGN, or just to reflect more of the terminology for gas networks here in the UK.

Q: Can you home in on any business cases that will be immediately supported / improved by this work?

A: Liam Kelly - This implementation will instantly impact BAU processes by making us more efficient and improving the quality of our data. In terms of businesses cases, we believe this project is vital to allow us to get value from most future business cases we want to explore. For example: 3D, digital twins and IOT devices. These are common trends, but without good quality data they will not be possible. Therefore, we believe that UN and the data quality principles it enforces fundamentally underpins our entire digitalisation strategy.

Q: Is there a need to review the SAP data model to ensure alignment the UN data model, if so which takes precedence?

A: Liam Kelly - Yes, this will require constant review. This is one of the reasons why it is important to look at UN as part of a larger data strategy, not a GIS upgrade. The creation of DICE has really helped to encourage this long term, enterprise thinking at NGN.

Northern Gas Networks

esri UK

1spatial YOUR WORLD SMARTER

Q: How deep is S/4 integration given the 'clever' UN data model versus S/4's proprietary database for EAM and the cost of storing inherently large data sets in an expensive in-memory database?

A: Phil Francis - Integration is primarily for linear assets (pipes at) present. The assets are mastered in SAP and then interfaced for placement / replacement through the GIS tools. Once added some pipe network and geometry information is then interfaced back to SAP. However the direction of travel is clearly that users want to surface more and more information about a wider range of assets through the GIS and mobile systems; so we are trying to build a flexible integration approach which can scale.

S/4 Hana was a consideration for the 'enterprise geodatabase' as part of the early architecture decisions we needed to make; but we didn't pursue this route partly owing to the associated costs of an in-memory db.

Q: Do you foresee any benefits of the UN model for, for instance, exchange via CIM to the wider community?

A: Liam Kelly - We see Utility Network as a pre-curser to these inevitable initiatives as we will have simplified data model to allow us to explain and share data more easily.

Q: Were there any opportunities to go down an incremental road rather than a big-bang approach - i.e. agile rather than waterfall?

A: Liam Kelly - We are using an agile, incremental approach designed collaboratively with 1Spatial.

Q: How much of the solution is cloud-based rather than on-premise?

A: Liam Kelly - All the software is hosted in AWS. In terms of a SaaS offering, 2023 is the target date to have UN available in ArcGIS Online.

Q: How well embraced was the UN by data experts in NGN who may previously have been passionate/ precious about their own home-grown data sets and models?

A: Liam Kelly - As an organisation we were really open to UN because we recognised that we needed to do something different. We have big ambitions around supporting a greener future, sustainability, automation and improved customer service. These are all underpinned by our digitalisation strategy, which ultimately will not be successful if we continue to deliver in the same way we have done for the last decade – innovation and change is absolutely necessary. This issue was only applicable where we've had to bring in new data sets that were not already in our legacy GIS. However, after providing an explanation it seems to make sense to everyone and we haven't had any major challenges in this area. Ultimately, we need to be more efficient, and this project is enabling that.

Northern Gas Networks

esri UK

1spatial YOUR WORLD SMARTER

Q: What kind of difficulties were with the SAP integration?

A: Liam Kelly - This part of the project is not yet in full swing. However, we envisage the main challenges to be around the functional locations and components on above ground assets. This is due to the set hierarchy structure in SAP.

Q: What sets utility network apart or above of modelling your network with the attributes and materials you have and presenting data inputs to ArcGIS to analyse results?

A: Craig Hayes - To list just a few of the reasons that set the Utility Network model apart from traditional ArcGIS methods of recording assets:

- Data is ready to be analysed from anywhere, anytime. This might by dynamic analysis in a Dashboard for example. This prevents silos of GIS data when generating reports, which traditionally were exported out before analysing.
- Everyone can access the UN, whether that's on a tablet, desktop, laptop or mobile device. This reduces the need for specialist hardware when users want to view analysis outputs, like tracing.
- The UN model allows you to analyse your assets at a much higher level, including connectivity analysis. Traditional ArcGIS models, such as the geometric network, did not easily allow for dynamic analysis such as tracing. Utility Network allows you to much more rapidly provide trace analysis tools across your organisation over the web, in a standardised way. Trace analysis are configurable, rather than having to be built from the ground up using a model builder in the traditional geometric network.
- The Utility Network model has increased performance compared to traditional ArcGIS methods of storing utility network data. This is because the UN model has been designed to reduce the number of feature services storing assets, and therefore means calls to your enterprise servers or databases are quicker and are at a lower frequency.
- The Utility Network model has versioning and quality assurance built in to editing workflows, which means that your analysis is more accurate with higher quality data.
- The Utility Network model is built into the ArcGIS System, preventing copies of data being taken from another modelling system and the time taken to bring this into ArcGIS to analyse.
- The Utility Network model runs on web hosted feature services, meaning you can integrate other systems more easily, such as CRM's.

Email 1Spatial: jessica.hampton@1spatial.com
Email Esri UK: chayes@esriuk.com
Visit us: 1spatial.com / esriuk.com

Northern Gas Networks

esri UK

1spatial YOUR WORLD SMARTER