

be generalisable to other countries. Other national mapping agencies may not have the same unique characteristics of Ordnance Survey, nor do their nations have the same political landscape. Where NMCAs have already conducted their own surveys on customer needs (Lantmateriet, Sweden and GUGiK, Poland), the findings from this study can provide a point of comparison. Where NMCAs have yet to conduct any requirements gathering exercise, the methods and approaches used in this study can be easily replicated and adapted for their country. This will allow other national mapping agencies who are looking to establish their own 3D national mapping product (or products) to capture country-specific 3D requirements.

5.7 Further work

The work presented in this study presented the first iterations of user requirements gathering for 3D GI. Several opportunities for future work arose from this study. Firstly, repeating the exercises with a larger sample and with non-GI users would be beneficial. The challenge here is in capturing a representative sample of adequate size to encompass the multitude of GI-applications as well as acquiring enough detail to elicit detailed requirements. It would also provide a validation for the requirements collect so far. Secondly, repeating the exercises in 1, 5 and 10 years' time would be valuable in assessing any change in requirements. As technology evolves and improves, what were previously barriers may no longer exist, and as 3D data becomes more common place the end users' understanding of their requirements will evolve – i.e. it is important to remain up-to-date with the requirements of the user. Lastly, other requirement elicitation methods such as on-site observation and focus groups may be beneficial in later iterations of the development life cycle, allowing for a deeper understanding of the user. Creating and testing prototypes will allow the confirmation and refinement of the user requirements over time. Note that this must not be a linear process; for 3D GI, new use cases are expected to emerge over time thus there is also a need for continued requirements gathering to capture any new applications.

6. CONCLUSION

Understanding the user perception of 'usefulness' is an important step towards designing 3D data that is effective and usable. This study has shown that 'Air quality engineering', 'Infrastructure & transport' and 'Environmental services' present the most positive outlook on the usefulness of 3D GI in the United Kingdom. The results further showed that users perceived non-building classes and building attribution to be more useful than additional detail on building geometry. Cluster analysis showed that appetite for 3D information not only varies between sectors, but also within sectors between different practitioners. While an initial set of five potential product groups and features was derived from correlation analysis, the cluster analysis was unable to offer a clear result of whether a 'one-size-fits-all' or multi-product approach is most suitable for 3D GI production. The current study has only examined existing GI practitioners. Further work is required to incorporate both non-GIS users and 3D users outside the GIS domain.

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