

Disruptive Technology workshop minutes

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Session I – Disruptive technology and NMCA's view

Martin Salzman welcomed participants and introduced the topics of the workshop.

- Colin Bray, from OSI, talked about NMCA view of DT and how do they interact with this industrial revolution. It is matter how we think how we plan, it is not a threat but it is always an opportunity.

People do use the innovation, so it is more about people than about technology. People are getting smarter. Smart maps for smart people. Innovation is needed for our survival, it is affecting work place. Risk management is necessary, without that no changes.

Are we ready for the Internet of Things? Vision is not about data, it is about the interaction of data and it is about everybody others' data. We need smart NMCA's solution and service. It is a journey.

- Rollo Home, from OSI: "We live in interesting times, role of the location data is being recognised, we are location-based businesses. All these things represent opportunities and we have to take advantage of it. Unless somebody is not benefiting from that, there is no sense of being disrupted!"

- Mick Cory from EuroGeographics presented on policy and technical disrupters. Policy decision can create disruption. Behind this policy decision there is a significant funding for innovation. Digital disruption is people problem. DT is very high on EU agenda, it is funded and is here to stay.

- Michael Schulz Rasmussen, COWI Mapping & Surveying, presented the use case of new technology with sensors, disruptive content models.

Session II – focus groups

Joep Crompvoets introduced the concept of the next session and focus groups:

1. Data acquisition chaired by Rollo Home
2. Data quality chaired by Martin Salzman
3. Organisational structure chaired by Joep Crompvoets
4. Data dissemination chaired by Daniel Steudler

Ad. 1. Data acquisition focus group

Q 1 & 2: How are data collected now and which technologies are in use?

Summary on how data is collected now:

Emphasis on use of sensors: patterns of change included higher resolution imagery, higher currency (capture programmes), new sensor technologies (LiDAR, mobile mapping) and integration of multiple technologies (e.g. EO). Interest in non-topo. domains – e.g. bathymetry.

Use of ground survey is limited (used mostly for boundaries and attribution)

Ground survey team described as “collectors” rather than surveyors (collating/ validating data from local sources in addition to in person)

Supply from 3rd parties (mostly government, emergency services – some but very limited use of commercial suppliers)

Summary of Technologies in Use:

New sensors – increased/improved data volumes/quality, new products (e.g. vegetation types)

Increasing use of cloud computing; automated processing and abstraction (faster, cheaper output – of more importance than improved quality?)

Cloud computing ability to manage fluctuations in data storage requirements

Interesting discussion around ‘cheaper’ – not simply relative to the data capture element of the process, but of the entire product through-put (of which downstream processing is currently the largest %). AI/ML is likely to significantly reduce those elements but might increase initial capture cost (higher image redundancy leads to massively improved ML outputs – faster and more accurate outputs).

More Detail:

Spain (AA & MC) –

Most important data acquisition is orthoimagery, on 3 year capture cycle; 10cm in urban areas, 20cm for whole country

Lidar – 1 point per sqm every 6 years; detailed surface and elevation model (30cm for whole country)

Remote sensing – every year from high to medium resolution

Mobile mapping – cover most important roads for whole country

Current issue is bathymetric capture with sensors – not many different sensors on the market and Spain has over 6000km of coastal zone

Challenge in the amount of data being captured, high number of points per sqm for Lidar = huge amount of information to process

On the ground (traditional) survey limited to boundaries between administrative areas, e.g. municipalities

France (DL):

3rd party sources of data used where available

Crowd sourcing (public) to indicate areas of change

Data from public services (fire, police etc.) integrated straight into systems

Person in regional area co-ordinates activities on 3rd party data (“collector” not surveyor)

Italy (MS)

There are data available also from other institutions which are not currently being used or served – there is a desire to collect and service consistently for all authorities

Data capture can also be about harvesting, not just processing

Other general points (not attributed)

Analysis and certification of data from 3rd parties to confirm it’s fit for use

Looking at research on the use of AI from sentinel data to support activities such as addressing

Q3: What impact could disruptive technologies have on the data acquisition for your organisation?

Summary of impact:

More, cheaper, faster

Improved currency for users -Being able to provide data quicker to users can be more important than quality of the data

Processing overheads an issue with volume of data and current workflows

Skills gap - impact on individuals in organisations (recruiting the right skills, maintaining “cutting edge” knowledge)

Business impact – a move away from emphasis on in-house acquisition (traditional survey)

Financial barriers for adoption of the best practice

NMCAs focus on acquisition of data not covered elsewhere (for example, focus on administrative data and less on topographic) and “mission critical” functions of the civil service

More detail:

New sensors provide opportunity for new products to be used/ developed

Discussion around whether faster = cheaper... in commercial terms, usually faster is more expensive. As an end to end workflow for an NMCA, the faster acquisition of data may lead to savings in other parts of the workflow and also result in overall cost savings.

It's impossible to engineer new data sources into existing workflows – new processes and new (non-traditional) technology are essential in order to keep up

There is a general lack of resources to be able to adapt in the way that's necessary – of course organisations want to take advantage, but there are financial barriers to be able to do so

Roles of organisation in context of market changing (also see comments in Q4)

Ensure NMCA role to put user at the centre – and public service role – is maintained.

Q4: Which disruptive technologies concerning data acquisition in the future should we focus on?

Summary:

Emphasis on understanding of roles between public vs private sector

Ensuring engagement with key programmes using disruptive technology at European level

More detail:

Autonomous vehicles with mobile mapping (capturing EVERYTHING), what happens to that data.

Sentinel images are important – the European Commission is developing lots of products in order to demonstrate it is useful (eg Corine Land Cover) and NMCAs must engage with this

Real time information – such as traffic flows and what can be extracted from this

Important to look at collaboration and roles between public and private sector – how might the data captured by private sector be exploited and how can NMCAs engage with this

The role of NMCAs as part of civil service is to ensure citizens have very good data services – discussion on what this means/ looks like in the context of private companies too

Understanding longer term impact of disruption in market generally – whether data acquisition is still a core activity in the longer term (vs being a data integrator; distributor; quality control; advisory role etc).

Q5: What are the key criteria for applying a certain disruptive technology?

Debated the definition of an authoritative source – where does an NMA add value? If a new technology is not adding value to the NMA (efficiency) or improving its product offer to a user set (outcomes) then the technology is not likely to be appropriate.

User requirements must be considered from the start

Benefits to an organisation – when to adapt (bleeding edge vs. leading edge). How much R&D is needed (access to use cases, business models [shared risk/profit model with suppliers]) and levels of skills in house available to implement.

Other points noted:

Annual budget cycles do not make it easy to invest the necessary resources in new technology and processes required to take advantage of disruption in data acquisition

Where some NMCAs are ahead of the curve on adoption, this experience could be shared to provide learning to others

Issues around skills retention, development and attracting the right people inwards (awareness)

Ad.2. Data quality focus group

Different aspects of data quality: accuracy, completeness, timeliness, currency.

The user priority is on the timeliness and the currency. In that perspective thematic consistency is very important and this is a specificity and a strength of the reference datasets maintained by NMCAS. As many other datasets are produced outside NMCAS, the quality of these datasets should be checked against the datasets from NMCAS that serve as reference. This should be considered as a positive point and a strength.

How disruptive technologies might serve or impact the quality?

In organisational matter: will allow a wider stakeholders community to cooperate to the data update, by taking and coordinating volunteers for change currency.

In technological matter: will allow to shorten the update process between the capture of the update and its availability to the users. For example, the mapping process might become a push-button.

In processing matter: will require an adaptation and a better flexibility of the updating mechanisms... and change of workflows.

Some expectation in technical developments:

- Raised issue to update and maintain 3D datasets.
- Tools for analysing and validating the quality of the datasets (like change detection system and validation against specific requirements)

Ad.3. Organisational structure focus group

No impact from new technologies when a traditional and 'old fashioned' organisation.

- It is hard to process change when the organisation has to follow laws and regulations
- Need time to implement change
- When production is outsourced there are no in-house experts to push for change
- Cannot avoid demands from the government

If need to wait for change in now, you are slow to adapt

Finding new ways of working together - swisstopo with the cantons. With digitisation the role might change - government as a platform, stamping (certifying) data. This poses a challenge to manage this

transformation. Ask the question - what is important to the user? To have access to data from one point

Amazed thinking that have 10 years, every NMCA thinking about this, some are hiding behind legislation and law. What if the Prime Minister asks 'What have you done about blockchain?' Are you ready for that question? As a NMCA you need to be ready to answer and be aware, have a real answer - things move too fast, quicker than 10 years.

Cannot have a strategy long-term because things are too fast and volatile, it is a VUCA World (Volatile, Uncertain, Complex and Ambiguous). So need to develop a strategy that allows you to be relevant in a VUCA world. Cannot decide beforehand because you do not know the products and services are required. Method to dealing with uncertainty is not to provide products and services but to define role in society. User can have many alternatives, expects peer-to-peer interaction. What is service, how can they use/interact if selling product? NMCAs have to provide an experience, more than products.

The reason the OpenStreetMap is attractive is the common data model and licence. The data are not so good.

Define what are the authoritative data that are important to the government; people should be able to go to one place. Which data are authoritative, and they are only 'authoritative' because you call it that! Raster images are authoritative - obligations to maintain, need to have a common source, authoritative versus 'authentic map'. Examples of authoritative data - boundaries, addresses, cadastre. Authoritative not only because the truth, but because everyone uses it. Does this then make Google Maps authoritative? The role of NMCAs is the opposite of fake news.

Can NMCAs be sustainable in the future? To be funded they need to continue to be relevant. What is the business model to enable us to do so? It is no longer about the mapping but about providing access to the mapping/data.

If governments consider public agencies need to stay public they will fund, if not find new business models.

Organisations as a group of functions - if these different functions are taken over by others, the role of NMCAs could be smaller. So yes they will still exist, but in a very different form.

Collated notes/thoughts from the discussion

- Recognise that the role of NMCA is changing and that is the main driver for organisational change
- More traditional organisations (based on legislation) less likely to change, slower to change
- Broker role, facilitate platforms, offer an experience to users, no longer product oriented
- Open to innovation and processes to be open to ideas, rather than the actual technology
- Speed is important, how fast to change/adapt, 10 years is too long, things move much faster
- Open to technology, but also open to providing the data/products of others - point users to best service that meets their needs
- NMCA role will change, we provide opposite of fake news
- NMCAs can remain sustainable in the future, but will be changed, smaller, different form, different functions, need to remain relevant to be funded. What is the business model that will enable this?

Ad.4. Data dissemination focus group

The most disruptive is about how the people discover, so it is most about people not about technology.

Combination of the data is the most value adding.

How to identify that one particular technology that could be fruitfully used?

A community is needed, as there are a lot of linked data and they are not disruptive yet. It must be a use case.

We disseminate geo data but it doesn't come to us, as we all use a Google map to get to the venue or to the dinner, sometimes accompanied with one-page written instructions- something is wrong!

We do not react to users' demand and we are sitting on the golden mine.

People started to use Google maps as an evidence at the Court and in some cases it is accepted and will be accepted at one point.

Advanced society has advanced processes, an update cycle and maintenance work only in such environment.

The value of the data is in its use.

When you get free and open data, then you get a better place in the market – if you don't somebody else will do that.

And it is possible to open and to protect – with new tech.

What is the authoritative data – is it because we are the part of the Government? Blockchain will change this.

Opening platforms to third parties where they can add their services is a solution.

Exchange of verification code system is disruptive thus the security of the data & service, and responsibility of the users are important for DT.

Different approach to open data: some are giving it away and don't want to know what was done further and who the users are; some customers centres had been closed; the others requires users registration and manage open data flow and usage.

"Just in time" process for dissemination not just in case.

Session III - Panel discussion

The prospective of authoritative data is changed already. The way we provide data will be changed significantly.

We'll have to deal with completely different sets of partners and users.

Our role is more important than ever been, governments are undergoing changes and they need skills to be able to respond to the very quickly changing environment.

Authoritative data (in a new world) is something we have to work on even though it is very narrow. We have to look what is our unique selling point. We must be much more flexible in accepting new tech.

Think to start to get new profession into our field. We in EG should support each other on this journey.

We need flexible short term working group with special assignments. A leaflet is appreciated.

Challenge is in the next 20 years, not next 2 to 3.

We should be more target in applying a use case, to investigate the use case first and then to look appropriate tech. Focus and pick piece by piece and then you can put it in the bigger context.



What could be done in term of EuroGeographics? Establish a new KEN or Focus group? Workshops like these - a lot of choices on how to move this forward. It doesn't have to be decided today. EuroGeographics has incredible amount of resource for collaborating.
