LIKE!

CREATING DIGITAL DNA FOR CITIES AND NEIGHBOURHOODS

What the LIKE! Project has learned about using data to provide better local services

1. DIGITAL DASHBOARDS

2. LOCAL DATA FOR LOCAL SERVICES

3. IoT - INTERNET OF THINGS

CONTENTS

Partners in the LIKE! Project

Netherlands	Groningen Municipality (lead beneficiary)
	University of Groningen
	Province of Drenthe
	Rotterdam Municipality
Belgium	Roeselare Municipality
Denmark	Aalborg Kommune
England, UK	Suffolk County Council
Germany	Vechta University
	Vechta Municipality
Scotland, UK	Angus Council

About the LIKE! Project

The LIKE! Project is funded by the Interreg North Sea Region (NSR) under programme Priority 1 Thinking Growth: supporting growth in North Sea Region economies.

Project Objectives

LIKE! will significantly enhance the capacity of the public sector to facilitate and deliver innovation. This will result in the development of a wide range of innovative services for improved public service delivery. Local government, citizens, universities and SMEs will come together to co-create smarter, more efficient and more innovative services.

LIKE! is organised around three themes: *Digital Innovation*, *Smarter Services* and *Digital DNA*. Because the three main themes are also quite large, we have broken each of these down into sub-themes. We sometimes call these **Pilots** in this magazine.

Creating a local digital innovation culture across the North Sea Region

1. **DEVELOPING INNOVATION AND SKILLS**
2. **NEW FORMS OF ENGAGEMENT**
3. **INCLUSIVE SERVICES**

Smarter Services

1. **SMARTER SERVICES**
2. **LOCAL SERVICES**
3. **CONTENT AND CHANNEL STRATEGIES**

Create a Digital DNA for Cities and Neighbourhoods

1. **DIGITAL DASHBOARDS**
2. **LOCAL DATA FOR LOCAL SERVICES**
3. **IoT - INTERNET OF THINGS**

Creating Digital DNA for Cities and Neighbourhoods

Theme leads

A key part of LIKE! has been developing new ways for cities and communities to use data to understand citizens - both to design and then deliver better services, and to help managers and politicians and stakeholders to use data to help make better policy decisions for communities.

LIKE! partners focused on developing new ways of using information to understand how cities and communities are working and changing and then using this information to design better services and improve how services target users. Partners identified and then developed new ways to understand and manage the vast amount of data they collect, turning this data into information and knowledge that was used to provide better and more transparent government and services.

The **'Creating Digital DNA'** work in LIKE! has focused on 3 areas of transnational work:
•   **Digital dashboards**
•   **Local data for local services**
•   **Internet of things (IoT)**

That bring together a wide range of local pilots and activities and help us learn lessons from each other. There are strong links between these Digital DNA transnational themes/pilots and those in the other LIKE!   themes **'Creating a Local Digital Innovation Culture'** and **'Developing Smarter Services'**.

OUR THREE THEMES

The **'Digital dashboards'** pilot used a range of platforms to build dashboards that visualised data on maps, combined existing data from multiple sources (e.g. social media, data on communities and neighbourhoods, budgets) and provided customised analyses of services and neighbourhood performance. We brought together local governments, citizens and SMEs to collaborate to develop outputs targeted to key groups in each area, combining information and open data to provide new insights into community needs and service delivery.

Many of the digital dashboards that LIKE! partners produced have been made public and where possible the underlying code has been open sourced. The general learning from our work is designed to be platform agnostic, focusing on what these tools mean for communities, for service design and for service delivery, rather than on the technical details of developing or managing different platforms.

The **'local data for local services'** work brought together governments, community organisations and citizens, and used a combination of local, neighbourhood, regional and national data and information to build tools to help citizens, policy makers and stakeholders understand the detail behind local issues and values. This information was then used in service (re)design and delivery and in the development of new approaches to tackling local problems.

The **'Internet of Things'** activity explored how sensors can be used to deliver better understanding of neighbourhoods and how sensors can help deliver better services and information. Partners combined meetings, workshops and hackathons to engage SMEs, citizens and other interested organisations to understand the potential of these new technologies and to identify and develop use cases in their communities.

This theme uses data and information to understand the 'Digital DNA' of a City or Neighbourhood.

THEME LEAD
Grethe Fallesen

Aalborg Commune, Denmark

What was the goal of the 'digital DNA' work?

Gaining actionable insights that could feed into policy development work by using data and dashboard to provide clarity and communicate effectively.

Did you set these goals? What were the main accomplishments of the Partnership?

Yes, a lot of different dashboards and insights have been achieved for all partners. The main accomplishments for the group were the monthly WebEx meetings where we inspired each other and showed and discussed our results.

What was the personal highlight for you?

The best experience so far was the presentations and workshops at the mid-term conference in Angus, where the partners worked together to share our results and engaged participants to generate value maps at the workshops.

I cannot nominate the best output as all partners have made excellent dashboards!

What do you think are the broad/over-arching lessons that the partnership learned about digital DNA that other organisations should know?

I think that there are a lot of benefits of making dashboards - like data transparency, enabling access to data for all, adding location as key factor in enabling new types of data analysis, better decision making, and therefore more accountability, the rise of interactivity, and the results you can get by adopting gamification.

What were the main challenges partners faced - and what does this mean for other organisations?

Apart from the obvious like shortage of resources - time and money, we identified a number of pitfalls you should be aware of: ownership of data, misinterpretation, insufficient data, and incomparable data. Management sometimes aren't keen on insights into failed policies either!

Theme 1:
DIGITAL DASHBOARDS

The LIKE! Approach

LIKE!'s goal was to create customisable 'digital dashboards' that transform open data, administrative data and commercial/citizen generated data into focused information and insights that citizens, governments and SMEs use to improve services and communities.

Dashboards aren't about data. They are ways to tell stories.
A dashboard is a way users – be they managers, citizens, politicians, staff – can understand the latest information on something – perhaps how a service is running, or data on a neighbourhood.

To have value, the dashboard needs to be created with end users with the goal of helping them understand something.
Co-design is key to a successful dashboard. If analysts work with users in a co-design process, they will produce dashboards that add real value to users. If codesign isn't part of the process, you run the risk of creating technically sound solutions that users won't use.

Avoid the platform trap – dashboards aren't about platforms: platforms are just a way to tell your story.
LIKE! partners use dashboards in a range of different ways. Aalborg uses a dashboard to understand the geographical distribution of how money is allocated and spent on sports and leisure across the Municipality, while Groningen uses dashboards to understand local variation in poverty and the uptake of relevant services. Other municipalities use them to help manage services - Angus uses information in their dashboards to analyse service delivery against their strategic commissioning plan.

723
Datasets

143.024
Views/Viewers

166 LIKE! Dashboards

550
External organisations use them

PILOT LEAD
Peter van Kampen,
University of Groningen, The Netherlands

What was the goal of the Digital Dashboard work?

To exchange experience, and to learn about each other's work of course. We also tried to find ways to build a common dashboard on a theme that covered all the partners, but that wasn't successful. We learned that all organisations were on their own path on developing and using dashboards. Some opportunities to use dashboards for citizens engagement work weren't realised as we had hoped because of conflicting priorities at local levels.

We worked on an inventory of dashboards and different dashboard examples from all partners, that is not necessarily the complete collection of dashboards they implemented. Based on this inventory we will deliver a dashboard about the dashboards from LIKE!.

What were the main accomplishments of the Partnership in meeting these goals/working in this area?

We have exchanged a lot of different experiences and lessons that we have all learned with building and using dashboards. The general understanding and use of dashboards across LIKE! has expanded considerably and every partner succeeded in building their own dashboards.

What was the personal highlight for you?

I think the highlight for me will be the collection and the aggregation of all of the work that we have done into a 'common dashboard' which will bring together everything the partners have done in a visual way and which will show the richness and variety of the use of dashboards that everyone has developed.

Now we are working on a 'nature appreciation' dashboard that will cover all of the partner regions, so we're hoping to deliver a transnational output that will show how citizens values nature across the North Sea Region.

What do you think were the main lessons that the partnership learned when working on this theme that other organisations should know?

I think that a very basic lesson is that it depends heavily on the experience of the organisation; one lesson might be also not to complicate things by setting too innovative goals…. just produce insight with your dashboard based on the information at hand and be as clear as possible on the colors and your presentation so stakeholders/target audience can interpret it easily; this will most probably give the best impact of the dashboard.

Organise your data so it can be easily and continuously updated - see for instance the data offices in Angus, Drenthe and Suffolk.

Connect your data and infrastructure to the regional/national level - like Roeselare, Suffolk and Angus have done. This will allow you to benchmark your local areas and services against other municipalities, and it will help you share knowledge and costs (of services).

What were the main challenges that the LIKE! partners faced when working on this theme - and what does this mean for other organisations?

The main challenge was that while all of the partners were keen to build dashboards, everywhere is unique, so they all have different data, different management/political environments, different services and different objectives and outcomes – but we produced some really interesting dashboards, like Groningen's Neighbourhood Compass.

Capacity and funds are always challenges – but the demands from a developing organisation will push towards innovation in these areas.

Target audience for LIKE! Dashboards

- External
- Internal
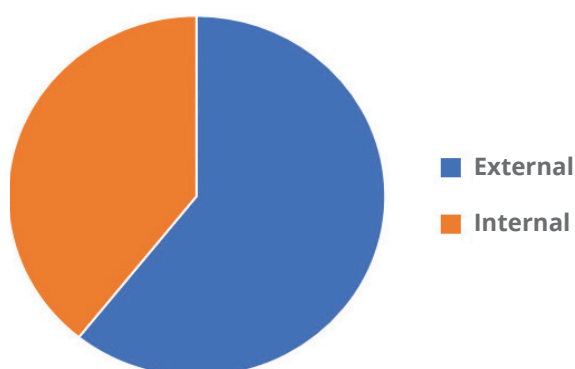
How the LIKE! Dashboards are used

- Benchmarking/sharing with stakeholders
- Engagement
- Improved services/ service insight
- Other users
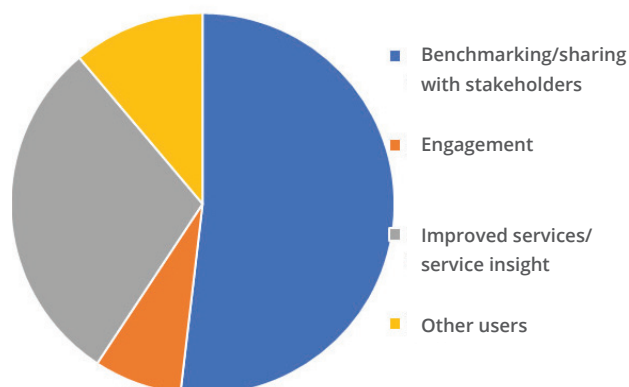
It is not easy to pick the best dashboard since all the dashboards have very different aims and different local contexts.

People learn and work with data and dashboards and then become more engaged and creative. And as a result sometimes the standard solutions or ways of working aren't that convincing anymore.

Zooming in
on Dashboards

Dashboard adoption and development

Lessons from Angus, Drenthe, Groningen and Roeselare

Why adopt dashboards?

Organisations have many different reasons for adopting dashboards and many different ways in which they use dashboards.

LIKE! partners recognised that the volume of data that was available to use required systematic changes in their approach to enable all parts of their organisations if they were to be able to use information in the best possible way across their organisations. Some municipalities (like **Drenthe**) started with a need to develop local capacity:

> *There's a lack of knowledge and tools for modern ways of managing, analysing and presenting (big) data to support the ways we want to work across teams and tasks.*

Roeselare recognised that in their environment data and information was coming from multiple levels and multiple data sources (local, regional, national) and that this needed to be managed systematically. There is a lot of data in Belgium on different themes and domains, but the multi-level government structure makes it complex to find the right/most recent data.

> *To analyse all these data sources locally we needed a good data platform.*

Other partners built on this with more specific goals: Groningen wanted to prevent the compartmentalisation of information within the organization, and to ensure that departments are aware of information from other departments. Groningen recognised the need to make sure that information can be shared and compared in one (agreed) central point. Information on the Municipality

is now offered at both the neighbourhood and thematic levels, providing insights into neighbourhood problems at the local level. Politicians, policy officers, interest groups and residents now have a shared/common information base.

Angus was able to build on the data they had to create an accessible, interactive dashboard for citizens that displayed both demand and performance information for adult health and social care services. Their dashboards also had a secure section which provided more detailed information on the performance of individuals services for managers.

Different approaches to data & capacity development

Different organisations adopt dashboards and data for very different reasons and in quite different ways. The **Province of Drenthe** adopted dashboards as part of a move towards 'task-oriented' working. Drenthe's goal was to be able to make decisions based on data, where data can be used for monitoring services and for policy evaluation. The **University of Groningen** has started to use dashboards to make research available to

the general/informed public and to support specific stakeholders with information and visualisations.

Roeselare recognised that they were not the only Municipality in Flanders who needed to develop more robust and more formal tools to manage all of this data. They worked with the 12 largest cities in Flanders ("Centrumsteden") and the Flemish Community Committee in Brussels to help standardise platforms in Flanders and to deliver a platform where similar data can be compared.

There is a widespread desire to use data to understand what is going on in organisations, cities and neighbourhoods. **Roeselare** also pushed for data providers, platforms and services to provide neighbourhood-level data, enabling users to understand what was happening in Roeselare's 14 districts. This has allowed them to compare information with other cities and to improve local policy decisions as they are increasingly based on (local) facts & figures.

Groningen has recognised that if information is fragmented within the organization, or if information can't be accurately compared, then the city will make poorer policy decisions which will then have an effect on residents. By developing more appropriate neighbourhood
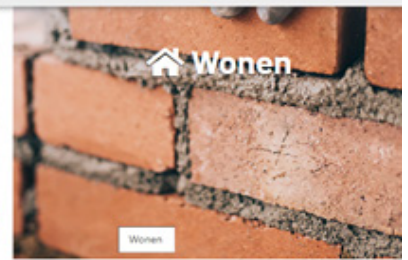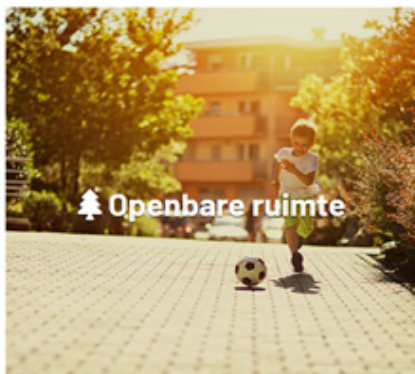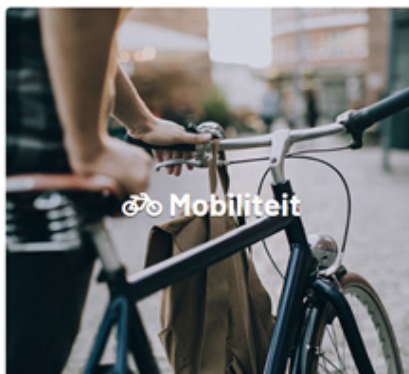
initiatives Groningen believes it can get closer to citizens – developing and delivering the right information at neighbourhood level is central to this. If everyone has a shared understanding of the local data, then there is a common starting point for conversations about services and policies. This reflects their belief that information about the Municipality should be freely accessible, easy to access, and provided in user-friendly, helpful ways.

Moving from data to information

A key objective all partners shared was to not provide data, but to provide *information* that was relevant to a wide range of users. **Angus** has worked to create an 'open data approach' towards data and information. This not only delivers accessible performance information to citizens and staff, but also uses their involvement to deliver better services, to improve services, to measure customer satisfaction, and to deliver the culture change that is required to deliver knowledge-led improvement.

Good democracy has been helped with transparent information provision. Making information accessible and comparable makes it possible to start a better discussion about policy options: using new techniques like interactive data visualizations in dashboards means that **Groningen** can now include a much wider audience in these conversations.

Roeselare sees turning data into information as a way to provide better and more transparent governance and services: building easily accessible and useful dashboards that can be used for policy making (internally) and by their community (externally) – this lets everyone look at 'the city in numbers'.

Similarly, **Drenthe** believes it needs to provide open and transparent data and information to its citizens, it's partners and to itself. This means that new skills have to be developed internally to allow the Province to provide information and new tools like interactive dashboards.

Decisions have to be made and these decisions have to be reproducible, since organizations and citizens are more and more mature in collecting and interpreting data.

Learning from other dashboard users

The LIKE! partners quickly realised that they were all at very different stages of their data/information/dashboard journey, but that didn't stop partners from learning from each other and sharing good practice.

Roeselare quickly realised that while everyone had different technical and policy goals and objectives, everyone had the common goal of presenting information and figures easily and clearly – and Roeselare were particularly keen to adopt the use of maps alongside dashboards to display information.

As they have been working on data and dashboards for a longer time than many other partners, **Groningen** was able to show how they were using data to support policymaking. Their experience allowed them to provide insights into managing and categorizing data, and the Groningen Compass has helped show partners what is possible with local data visualisations.

Angus used the opportunity to learn how other partners created interactive dashboards that displayed demand information and performance information. This learning allowed Angus to adopt open source software to provide their dashboard solution.

Drenthe used the LIKE! network to de-mystify the 'new business intelligence dashboard-hype' and set themselves realistic, relevant objectives as they adopted more data-led approaches. Drenthe learned a lot from partners about the practical overlap of existing internal GIS (geographical information systems) with new and perhaps more trendy data-driven dashboard approaches.

Like many other organisations they already had GIS teams, so Drenthe vowed to better integrate these teams and not to "throw the baby out with the bathwater" (so the dashboard teams would not duplicate the GIS learning and infrastructure).

Adopting dashboards - Lessons learned:

Moving to dashboards is a big change for many organisations. While many organisations have worked with data in many forms for a long time, that doesn't mean that there will be a straightforward transition to this new way of working.

Interpreting and presenting data the right way is not easy

Angus was very clear that this is not one transition, but two linked challenges – one technical, and the other cultural.

The most difficult challenge for our pilot was around encouraging people to use the new data, website, and using dashboards for decision making, commissioning etc. Traditional health and social care services have been paper or telephone - based systems

Managing this change is difficult, and organisations need to actively work to support this cultural change and shift in ways of working. Drenthe saw a lot of interaction between policy makers and data teams, but felt they still haven't found the perfect way to get their teams to collaborate to design new tools.

It is vital to spend time planning the move to dashboards and more data-led analysis and decision making. Organisations need to build consensus about what they are building and how it will be used by stakeholders.

Groningen's experience is common:

*We started building too quickly
in the beginning, while we still had no
consensus about the (end) result.
This ensured that a lot of work was done
on things that we didn't use in the end.*

Roeselare found that deciding what indicators make the most sense, and choosing the appropriate presentation method for them, was more difficult that they'd expected.

*It is very interesting to check whether
the customers understand the indicator.
Consultation with other cities ensures
a faster focus on what works and
what doesn't work.*

This was similar to Groningen's experience in developing their Compass:

*Selecting the correct indicator for the
compass was a time-consuming process
with many consultations. Collecting
the data within the organization
has been another challenge.*

What was the main lesson you learned?

Despite the local challenges, there were many shared lessons and experiences. From Drenthe:

*It was good to learn from the lessons
of others. And good to see that other
organizations struggle with exactly the
same issues, whether they are German,
Belgian, Scottish, Danish or Dutch.*

Focusing on (internal and external) customers to make sure that you have the right focus for a dashboard was the key lesson from Groningen, - "consult experienced cities so you don't make the same mistakes, and then, just do it!"

Angus learned that a good idea with the right commitment can lead to a very good result. By working together with other organisations, citizens, and SME's, Angus was able to develop solutions or opportunities for the greater good of Angus' citizens.

*Transnational work - both knowledge
sharing and solution scoping - has been
a great way for us to further develop
our work in the 3 pilot areas we have
been working on (better communication
and engagement, data driven services,
sharing of information).*

LIKE! The Common dashboard project

Interreg North Sea Region Like!
European Regional Development Fund

EUROPEAN UNION
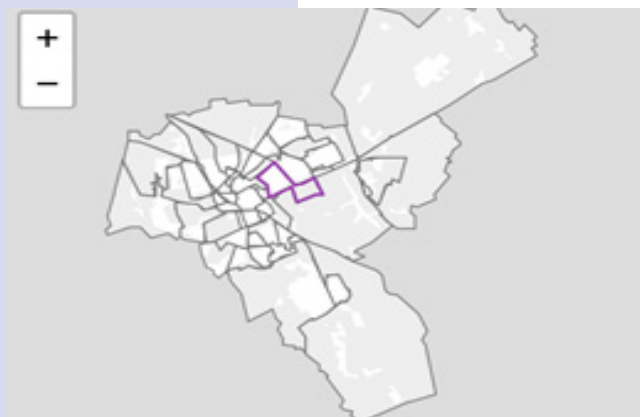
Like! the common dashboard project

ONLINE COLLABORATION

TRANSNATIONAL

Within the common dashboard project we've created more than 160 dashboards with more than 200 creators; which resulted in more than 140.000 views!

DASHBOARDS USED IN THE COMMON DASHBOARD

Aalborg Kommune	2
Angus Council	5
Drenthe Province	127
Groningen Municipality	3
Roeselaere City	14
Rooterdam Municipality	1
Suffolk County Council	5
University of Groningen	7
University of Vechta	1
Vechta Municipality	1

Almost 60% of the dashboards were used for external communication with citizens

THE TRUE SPIRIT OF THE WP5 TEAM: CREATING A DIGITAL CULTURE TOGETHER!

We shared the dashboards both internally and externally (where possible) with our target audience, also drew lessons learned with local stakeholders and disseminated our insights in two major workshops at Like! NSR events in Scotland and Germany and of course the final conference in Groningen.

We fully enjoyed working on dashboards

THE COMMON DASHBOARD PROJECT TEAM

Throughout the partnership and the project period we held webex meetings to exchange experience, to support each other in creating the dashboards, using & aggregating data and making visualisations stakeholders could understand.

Through maps, graphs and visuals we shared (aggregated)data and insights into our north sea region.

Around 58% of the dashboards were used for internal use and 42% had an public audience.

In these dashboards viewers could have a better understanding of specific services, socioeconomic themes, the accountability of public effort and there were dashboards to share data where local stake holders could make use of in their own context.

These dashboards contributed to the forming or increase of digital culture within our regions, helped to give insight to improve services and supported policy making.

- policy 18%
- accountability 9%
- service 21%
- engagement 6%
- sharing 46%

We worked intensely together in the transnational setting through online webex meeting (frequently held online work sessions), where we exchanged our knowledge and experience on all dashboard aspects (e.g. data handling, creation of visuals, use of tools, interpreting and using them in the local context).

The common dashboard is captured in an digital inventory, available through the like! repository and in the palette of visuals below.

Dashboards contain graphs, numbers, visuals and maps
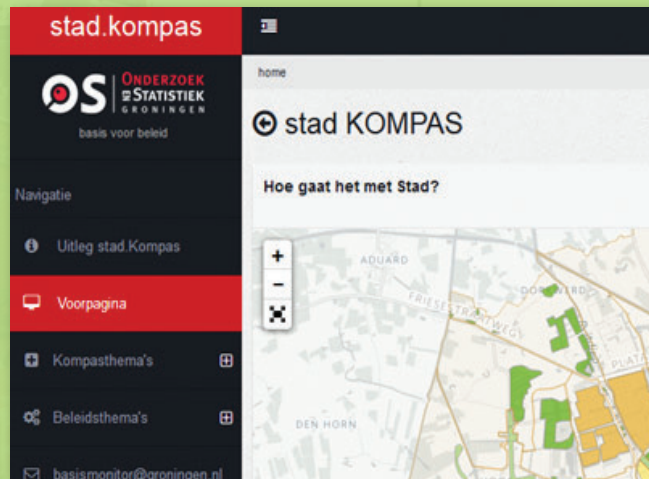
Groningen Compass

Marcel Daalman,

Groningen, The Netherlands

Groningen is a city of 231.000 people and 44 neighbourhoods in the North East of The Netherlands.

Groningen had an existing data portal with data and information on neighbourhoods, but this was a static website that could only be updated by a specialist.

Users weren't able to compare what was going on in different neighbourhoods, and a fair degree of technical knowledge was needed to get the most out of the website and the data it held. Groningen wanted a tool that provided much more structured information about neighbourhoods.

Groningen had four strategic aims for the platform:

- It should be able to **tell** stories about Groningen's neighbourhoods.
- Users should be able to **share** the outputs and the underlying data.
- The lay-out should be **flexible**, so users could choose what was relevant for them.
- The platform should always have the most **up-to date data**, including live data collected from services, users and citizens.

Groningen used a five-step process to prepare for this transition. Rather than moving directly to re-developing the platform, they focused on ensuring that the underlying approach was correct.

1. **Usability of indicators** – making sure that the data they used was correct and was interpreted through the platform in ways that made sense to users.

2. **Flexibility of framework** – making sure that the platform that was developed was flexible and could be adapted as policies changed and as user requirements changed.

3. **Identify the target group** – understanding who your users are and what they want/need from the platform is key to developing and delivering a sucessful platform that is used and relevant.

4. **Focus group for usability** – once the users were identified the next step is to make sure that the platform was going to deliver the information and data that they want in the format they wanted it so they could use the data/visualisations immediately.

5. **Reusability of the software** – making sure that the platform was designed so it could evolve and that other organisations could deploy it if they wanted to.

The BasisMonitor – the data behind the compass

The BasisMonitor (Basic Monitor) was created by Groningen's *Onderzoek Informatie en Statistiek* (Research Information and Statistics) to provide a data platform for Groningen. The BasisMonitor supports local management and accountability, aids policy formation and prioritization for urban programs and neighbourhoods, provides information to support cooperation with external partners, and provides information for citizens.
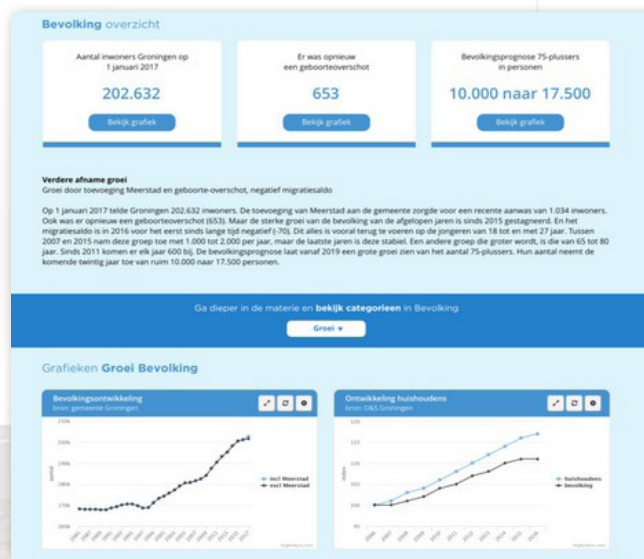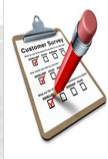
The BasisMonitor combines data from three very different data sources. It starts with data from Groningen's data warehouse, which brings together a range of local service and administrative data. External data from a range of sources is then added. Finally Groningen adds data from their biannual citizen survey of 8,000 citizens.

Why a compass?

All of Groningen's neighbourhoods have their own unique characteristics. The challenge we had was how to present all of this information in an understandable form. Groningen decided to use a compass to show how a neighbourhood is doing at a glance.

The compass uses two colour schemes. The traffic light colours – red/yellow/green, indicates variation from the neighbourhood average across Groningen: red stands for less favourable and green more favourable than the average.

The blue colour scheme is neutral, showing variations in the data without comparing it to other areas. If a neighbourhood has many children for example, then the box for children will be shown in darker blue.

The Compass quadrants

Groningens' compass is divided into four main areas or themes – these are in the centre of the compass. These are:

- **Environmental profile**
- **Physical environment**
- **Quality of life**
- **Social living environment**

The outer ring of the compass shows the values for each of the 36 neighbourhood indicators. The values of each indicator are translated into Z-scores. Z-scores are a statistical measure that shows the variation of the neighbourhood score from the Groningen average. As you move towards the centre of the compass the indicators are combined into broader sub-themes, which are then combined into the four main themes. Users are able to drill down from the compass and get comparison data in the forms of maps and charts so they can compare neighbourhoods in greater detail.

Dashboards result in improved conversations and highlighted priorities.

What Groningen Learned from the Compass Pilot:

Dashboards are effective
Users find them easier to use than tables of data, as they find it easier to interpret llustrations.

Data transparency
A well-designed dashboard provides on-demand access to all of your most important metrics.

At a glance
Information is faster to 'read' for most users.

Better decision-making
Dashboards provide a foundation for dialogue and great decision making.

Interactivity
The best dashboards provide a dynamic experience. Rather than providing static information, you and your users can filter data, interact with charts to see changes over time, and even add ad-hoc components on-the-fly. That means users can get as much or as little detail on specific metrics as they want.

Gamification
You can design dashboards and platforms to gamify some user metrics to increase the likelihood of user retention and increase the level of platform use and adoption.

Through the LIKE! Project Groningen wanted to build a much more flexible tool that could tell the stories of each neighbourhood. It should use live data wherever possible, and should always use or re-use existing data.

What do users do with LIKE! dashboards?

The LIKE! Partners surveyed a range of managers and stakeholders to find out how they used the LIKE! dashboards and what were the benefits to them of having access to the dashboards.

Users generally used the LIKE! dashboards for two reasons – to understand more about particular neighbourhoods, or to understand how services were working.

How do managers and stakeholders users use the Like! Dashboards?

- Understanding more about neighbourhoods
- Using data to inform service planning and delivery
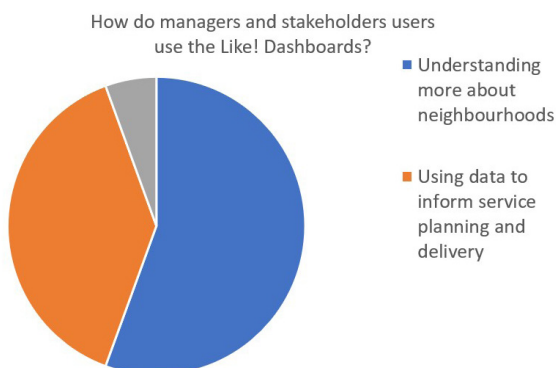
The combined insight we get from using dashboards is the most important one – and this insight goes across several policy areas.

STAKEHOLDER RESPONSES

- To get information on neighbourhood level
- To get local stats for my area
- Understanding needs and performance of health and social services in my locality
- Reviewing local data
- Getting information about my locality
- Comparing different localities in Angus
- Trying to extract local information about priority mental health issues
- Dashboards give a lot of information about our city and the differences between the neighbourhoods
- Finding data + information about my city and smaller areas of my city

MANAGERS RESPONSES

- To see how services were working
- To help when commissioning services
- Data information to inform service planning and priority actions
- Monitoring KPI's
- For statistics and background information about the city
- Looking up numbers to set up infographics (external analyses of the organisation).

USERS HIGHLIGHTED

- Improved visualisations

- Quicker access to the right data

- Supporting policy decisions

- Have data in one place – you can use it or refer other people to the same single source of information

- You have relevant information that is based on local statistics and information

-

Dashboards provide accurate data for sharing and helping design our services to meet needs locally.

Have the LIKE! dashboards changed how you manage/deliver services?

73% of respondents said that the LIKE! Dashboards had helped them change how they managed or delivered services.

Have the Like! Dashboards changed how you manage and deliver services?

27%

73%

■ No
■ Yes

Using Open Source software to deliver dashboards for local partners and citizens

Paul Feltham, Angus Council, Scotland

Scotland aims to integrate health and social care services, and to develop co-production approaches in the development of public services. Angus is made up of four localities, each of which has different health and social care needs and different population profiles. Angus is using a locality-based model in our work to drive improvement in the planning and delivery of integrated health and social care services. Our pilot used open source solutions to build public dashboards that partners and staff would use to get information to support decision making in their local areas.

We aimed to develop and deploy an accessible, interactive dashboard that displayed two sets of information – firstly needs information, that partners could use to understand the expected demand for services, and secondly performance information on the delivery of adult health and social care services in Angus that citizens could use. There is a secure section in the dashboard which provides more detailed information on performance of individual services for managers across the partnership.

We wanted to deliver a solution that allowed us to control the content on our website/dashboard, and to have only 1 place to update. An initial review of platform/dashboard options was done, and a short list was identified for user testing and cost comparison.

Angus HSCP decided to explore the use of open source technology as we felt it was the best opportunity to develop a presence that works for our intended audience.

After initial testing of our options our focus groups identified WordPress as the more intuitive and functional option, as it was a platform we would be able to deploy within a short period of time.

Using Open Source technology for dashboards shows the LIKE! Project the opportunity of using this technology to improve and make services smarter. It also allows organisations to explore ways of beginning digital and sharing information, and to rapidly deliver services to partners and citizens.

We may eventually reach a point where we need to procure a dedicated dashboard/information platform, but the knowledge gained from developing and deploying our open source solution will enable us to better specify the technical and operational requirements of any future platforms.

DASHBOARD
Turning Data into Knowledge

Home
Needs Assessment
National Performance
Strategic Delivery Plan
Locality Profiles
- North West
- North East
- South West
- South East
Partnership Website

Individual Locality Profiles can be found by following the links below.

North West   North East   South West   South East

Using open source technology has allowed the Angus Health and Social Care Partnership to develop our own solution, where we can directly manage/update our platform while benefitting from a broad support community.

The plugin features of WordPress have allowed us to add more functionality than our partners websites can offer, including graphs and charts and feedback and web forms. We have also been able to develop our social media presence and integrate it with our web presence.

Our platform choice means we can develop a solution that works for our audience while easily getting feedback on how this is progressing.

NORTH WEST

Map of the North West locality withing Angus

The North West is the largest locality in Angus at 1,143 square kilometers which covers 52% of the entire Angus area. It is a predominantly rural area consisting of Forfar, Kirriemuir, Sidlaws, Birkhill and Muirhead. The North West also has the biggest population of the four localities. As of 2017, there were a total of 35,921 individuals living in the North West meaning it is the least densely populated area in Angus with only 31 people per square kilometer. With 23% of people aged 65+ it has the second highest proportion of those aged 65+ in Angus.

North West Adult Population: 29,224
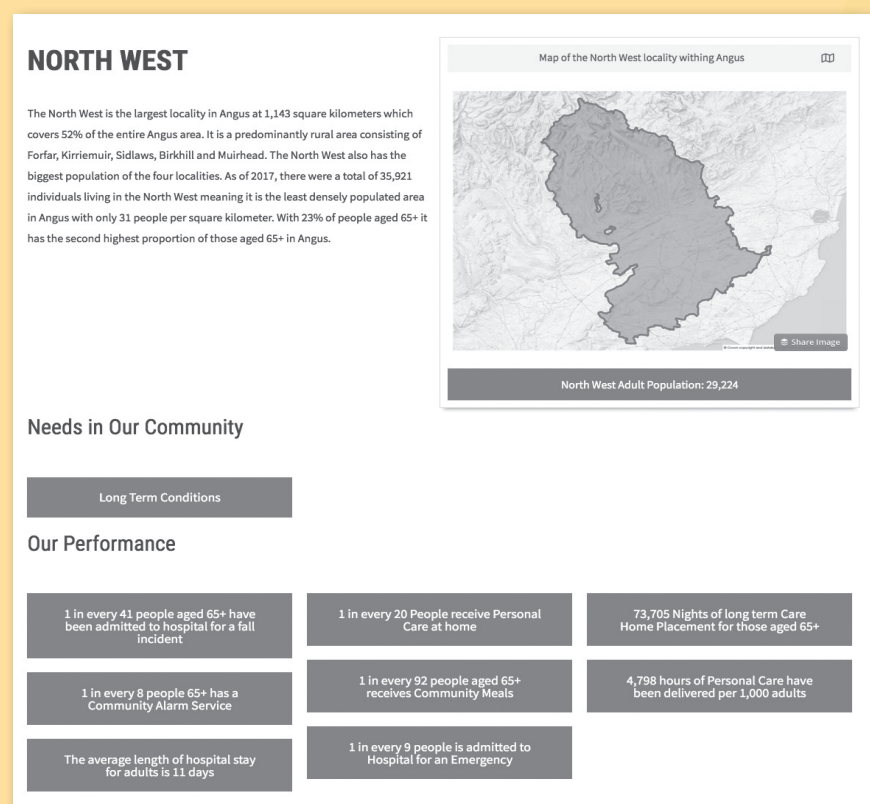
Needs in Our Community

Long Term Conditions

Our Performance

1 in every 41 people aged 65+ have been admitted to hospital for a fall incident	1 in every 20 People receive Personal Care at home	73,705 Nights of long term Care Home Placement for those aged 65+
1 in every 8 people aged 65+ has a Community Alarm Service	1 in every 92 people aged 65+ receives Community Meals	4,798 hours of Personal Care have been delivered per 1,000 adults
The average length of hospital stay for adults is 11 days	1 in every 9 people is admitted to Hospital for an Emergency	

Using dashboards
to deliver better services

LESSONS LEARNED

We surveyed the LIKE! partners to get them to tell us the key things they think organisations need to do to successfully develop, deploy and use dashboards.

LESSON 1
Understand what you want the dashboard to do
This was the overwhelming #1 tip from partners, mentioned by almost 40% of responses:

- Understand the questions that need to be answered
- You need to know what you want to measure
- Understand what your target audience wants to know
- Set up specific dashboards for specific needs
- You can use it to show service improvement

LESSON 2
Work with your users
Just because you've built a dashboard, it doesn't mean users will definitely use it. You need to work with them to deliver a tool that supports them. Listen to the user! That is really key:

- Involve the end user in the development of the dashboard
- Involve the people who use the information in the development of the dashboard
- Use the dashboard to help operational managers to understand data and performance better

LESSON 3
Keep it simple

- More data sets does not mean better insights
- The usability of the site needs to be very good otherwise people will not use it
- Give a good overview of all the key indicators in one big dashboard

LESSON 4
Address your capacity issues
Dashboards are a new way of working for many organisations.

- Don't be frightened to try something to find it doesn't work. Build your dashboard as you go
- Data is not always available from all partners, leading to "patchiness" of dashboards.
- We are still developing tests of required information using excel spreadsheets – we don't need to build a platform first
- Have workshops - you need to deliver know-how on how to work with the dashboard to your users!

LESSON 5
Make sure your data is good and that it's correct

- Get the data sorted and consistent before using it on a dashboard or map
- Look at key data sets, ensuring they're modelled correctly and use technologically agnostic approaches to platforms so you're not locked in to a platform
- Try and make sure that your data model is as granular as possible - so that the data can be re-used to answer other questions
- Provide comparable information (and context) as well as your real (local) numbers
- Remember to collect data "before" and "after" so you can help users look for trends

Dashboards are the future, the start of a new era when it comes to fact-based policy

The data at neighbourhood level of the city of Roeselare can be a first step for better data informed policy making.

THE CITY IN NUMBERS
How Roeselare uses dashboards

In Belgium, there is a lot of data available about different themes and in different domains (health, education etc.). Belgium's multilevel government structure – local, regional and federal – makes it more difficult for users to find the right and the most recent data for their area of interest.

Roeselare decided to bring together data and information from a range of external sources and then make it available on a public platform. To reach this goal, it was crucial to have the cooperation of different government agencies, a data-focused team, and a customer friendly digital platform.

Roeselare chose to use the SWING dashboard platform (see **https://roeselare.incijfers.be/dashboard**) to build a portal where all the relevant data is brought together in one place. Citizens, employees, corporations, organisations, associations, etc. can now find the city's core data in one accessible place.

The pilot made an accessible and useful dashboard that can be used for policy making, but also by citizens to look at the city in numbers

To do this, Roeselare didn't work by itself - the Municipality worked with the 12 largest cities in Flanders ('Centrumsteden') and the Flemish Community Committee in Brussels. This collaboration worked to ensure consistency across the various data platforms in Flanders, and to allow users to compare similar data for many sources and areas.

The introduction of **Roeselare.incijfers.be** was a great success. Roeselare organized a series of workshops to introduce the platform and encourage them to use it. The SWING sessions showed staff what they could do with data in their jobs.

It raised awareness about what data sources could be used and how accessible the data is now. Staff no longer have to request data and wait: they can now download their data in a few clicks. The era where people need to spend hours and hours searching for data is starting to disappear.

The platform also has community benefits, as it enables citizens and communities to learn more about their city and their neighbourhoods. The site also empowers them to use the data and information, for example to respond to policy proposals or to questions.

Publishing data helps to achieve an open, transparent climate and can increase the trust in the local government
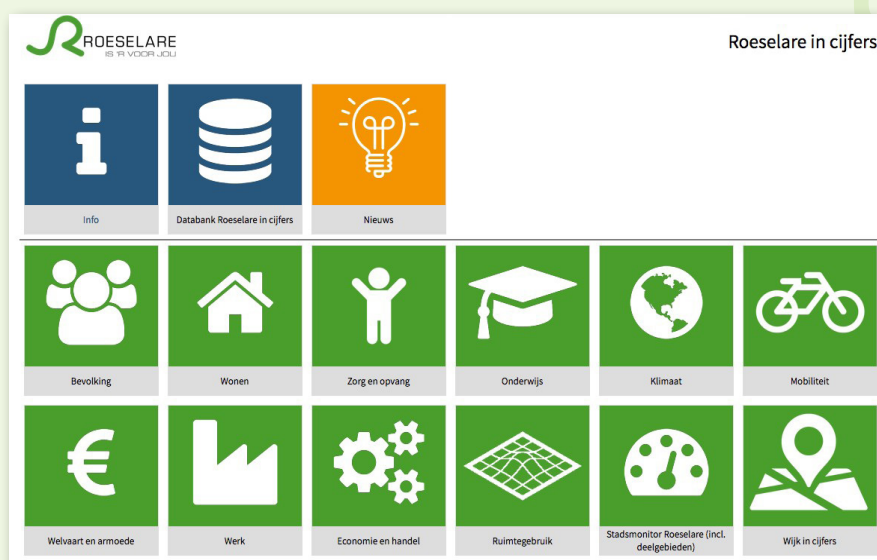
Rethinking how to use dashboards - Updating the Suffolk Observatory

Quick Ward Profile
Enter a post code or click on a ward on the map below to view an overview profile
Search by postcode

Suffolk County Council and its local partners had access to a wide variety of local and national data sets in a previous version of the Suffolk Observatory, which combined large amounts of data about the services they deliver, local demographics, and trends, together with a large number of relevant national datasets.

The starting point
While this brought all of the data that partners had together in one place, the problem users faced was that the data was often in quite a raw format, and needed a lot of manipulation/ analysis for it to become valuable for less technical users if they were to be able to use the Observatory to support local priorities and deliver services in the most appropriate way.

These new audiences needed data presented and analysed and summarised in new and different ways that reflected their needs, and which were useful to them.

The goal – where Suffolk wanted to be
Suffolk decided to use learning from the LIKE! Project to update how the Suffolk Observatory worked and help it transition from a data storage asset into a resource for a different and wider audience - policy makers, strategists and decision makers.

The revamp of the Suffolk Observatory would therefore improve both the user experience and broaden the user base to reach new audiences and provide them with more interactive and relevant experiences.

The upgrade plan
The local partners formed a Steering Group to decide the requirements of the new site. Most importantly, it was felt that the tools and underlying data in the Observatory needed to be developed to allow users to obtain **place-based information**.

This meant that the Observatory would now enable users to analyse and see a range of relevant background information for local areas which enabled policy makers to make better decisions about the distribution and types of public services for different areas, according to their needs and local contexts.

Being able to see 'data on a place' was a key part in being able to support both locality budgets and wider strategic investments in services.

It was also felt that the underlying data model in the site should be flexible and allow the user to 'slice and dice' the data in a variety of different ways so they could focus on the

Total resident population
756,978
2017
Source: Office for National Statistics

Total Number of Busines
29,470
2018
Source: Office for National Statistics

Total Claimant Count Ra
1.8%
2018-09
Source: Office for National Statistics

Unemployment Rate
3.6%
2018-06
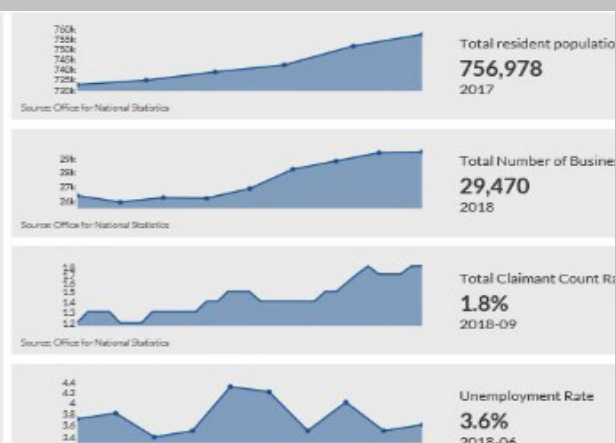
issues that were important to them. This meant that users could look at broad areas of interest (such as population and the economy) and also be viewed through specific relevant themes - such as crime, deprivation, health, social care etc.

The new Suffolk Observatory has this data modelled 'under the bonnet', turns the data into information and allows the information to be viewed through a "thematic lens".

What can users get from the new Suffolk observatory?
The user can pick how they want to access information held by the Suffolk Observatory:

- **data tables**
- **graphs**
- **pie charts**
- **infographics**
- **widgets**

What's in the Observatory for me?
Data in the Observatory is still available in the more traditional raw format, but the upgrades Suffolk and partners have delivered means that the site isn't just used by data analysts anymore. Citizens who are looking for information about the area they live in can see the indicators and information about their town, village or parish. Politicians can use the data to see what the trends are in their constituencies, and council strategists and policy developers can use the data as a guide to what the effect is of applying certain policies in certain areas.

LOOKING TO THE FUTURE

Analysts and policy makers in Suffolk are now starting to use the Obervatory as a foundation for analyses on how Suffolk might change in the future. They are using the data and resources in predictive models to forecast (with bounds – forecasts aren't guaranteed to come true!) what might happen in the future under a variety of different policy scenarios.

Some of the data held in the Suffolk Observatory has been used in a project to estimate what the population of Suffolk might look like in twenty years' time.

The Suffolk population as a whole is expected to grow by 7% over the next twenty years. In contrast, the number of people in Suffolk who are over 75 years old is expected to grow by 65% by 2030.

This analysis shows both the value of data and of analysis to support longer-term planning. It highlights the need of for the Council to develop a appropriate plans to provide care services for older people and so, knowing this, new strategies and policies can be devised that look at early help and support for older people.

FYI

COMMON PITFALLS YOU MIGHT FACE WHEN DEVELOPING DIGITAL DASHBOARDS

LIKE! identified four key issues that could hamper efforts to develop and deploy dashboards:

1. **Inaccessible** or **bad** data

2. Starting with the **data** instead of the **problem**

3. Lack of communication between **data people** and **decision people**

4. Not enough understanding of the **business problem**

Other tips from LIKE! partners:

• Some data needs background information to understand what it means or how it should be used: be aware of this

• Usability is key – if you don't pay attention to usability then users won't use the dashboard

• Don't overwhelm users with data: allow them to drill down from an overview

• Don't make your dashboards and data too abstract: stick to the facts

STARTING OUT WITH DASHBOARDS:
A Practical Exercise

If you're new to dashboards, they can seem complicated and you may wonder where to start. LIKE! suggests you sit down with colleagues and stakeholders and ask yourselves the following 5 questions. This will help structure how you think about dashboards, what you want to get out of them, and identify who you need to work with and what resources you have to work with.

Dashboard Planning Exercise

1. List your potential dashboards

2. Identify the key audiences and users for each dashboard

3. What's your co-design approach to working with these users?

4. What analysis does each dashboard need?
   What policy outcomes should it support?

5. What data is available? What's not available?

Greenmapper – A new tool to connect people and places

University of Groningen

Greenmapper.org is a new way to connect people with their favourite natural places – be they local, regional, national or anywhere in the world. Users can mark these places on the Greenmapper map using either the website or our companion app, and Greenmapper will tell you if there are issues (such as land development proposals) that might affect your favourite places.

Supporting important places

In our rapidly developing and globalising world many new developments will affect valued natural areas and green spaces. Roads and houses are being built, agriculture and mining activities claim ever more land, park managers have to make strategic choices on what and what not to preserve, and so on. To make better land-management decisions in these situations it is essential to have sound and detailed knowledge of how many people appreciate particular green and natural areas, and why.

When land-uses change and investments are made, a range of people are affected – not just those with an economic interest in the area or the area's immediate neighbours. It is logical to let people who love natural areas have a voice. And when people have a say, they can choose to support a range of different options and outcomes. But how can we do this more easily? How can fans of the same area connect with each other? And how can land-owners, policy makers, nature managers, and project developers reach these fans?

Why Greenmapper?

Greenmapper was created with a double mission: it makes it easier to connect fans with their favourite natural places, and it adds to the limited body of academic and policy knowledge on nature/place appreciation. Greenmapper also allowed us to test innovative digital mechanisms for financing nature conservation.

Greenmapper is part of LIKE!'s work on developing new forms of citizens' engagement. The data collected through Greenmapper can be captured in dashboards, maps and visuals that can improve the design and delivery of relevant public services.

The value of this approach

Online platforms can not only provide data, but also help us understand the 'digital DNA' of each place. Digital technologies provide new opportunities to identify and develop new types of infrastructure to help citizens enjoy nature and support its conservation.

Organisations can use the results of this study to understand how their citizens would like to enjoy nature, and to deliver appropriate management and support activities. We have seen that when people are free to say how they enjoy nature, most of them prioritise activities like walking, running or simply contemplating nature.

More than one-third of the people who took the Greenmapper survey are interested in being digitally connected to open/green spaces. Each participant was asked to mark their favourite natural places by drawing up to four polygons (shapes) on the Greenmapper map. Citizens were able to select local, regional, national and international areas.

Polygons give more information than points: they allow citizen to be precise about the size of their favourite areas. Through this process the tool can identify the natural places which many citizens are interested in, identify the overlaps in natural place selections from different users, and show us this overview on a map.

To understand the types of natural places people valued, participants were given a random 'budget' of 10€ / 100€ / 1000€ to 'allocate' to the places they selected on their map. We saw that citizens preferred to give funds to their local areas (vs. regional or national or international areas) – and this preference increased as their 'budget' increased.

58% of participants said they'd like to have some way to fund/financially support their favourite green places, with almost half wanting to support landscape ownership or landscape security activities.

New ways to connect and engage

Greenmapper shows us how we can use online platforms to understand how citizens actually like different places, which kind of activities they prefer, and how they would like to be 'connected' with their favourite natural areas. Citizens want to have a say in what is happening to their favourite natural areas, and this is particularly true of areas that are closest to their neighbourhoods.

What Greenmapper has also shown us is that while citizens were generally supportive of the funding/support models we tested, they weren't enthusiastic about them so we still have work to do to identify and develop and refine new innovative approaches which citizens will support.

About LIKE!

Local governments, citizens, universities and SMEs come together to co-create smarter, more efficient and more innovative services

LIKE! and the Greenmapper.org have created a survey to learn about preferences concerning nature appreciation. At the same time, the survey investigates preferences concerning innovative – and digitally supported – economic mechanisms for financing nature conservation.

Online platforms can provide not only data,

This report is produced by

University of Groningen

Local data for local services

The LIKE! Approach

The 'local data for local services' work brought together governments, community organisations and citizens, to build tools to help citizens, policy makers and stakeholders understand the details behind local issues.

This information was then used in service (re)design and delivery and in the development of new approaches to tackling issues.

Pilot lead
Vivienne Davidson

Angus Council

What was the goal of the Local Data for local services work?
To create a transnational approach that builds on lessons learned from across the North Sea Region on the development of data dashboards that would provide local data for use by both the public and by service providers in the development of new local approaches to tackling local issues.

What were the main accomplishments of the Partneship in meeting these goals/working in this area?
Angus published a development guide to developing and deploying simple data dashboards that only used open source software. The aim was to support the third sector (social organisations, charities etc.) and SMEs, and to show how they could also use and provide data to support local service development.

Groningen developed a 'compass' that brought together a wide range of geographic information and data for the 44 neighbourhoods in Groningen for the use of policy makers, stakeholders and local services. Suffolk used Microsoft's BMI tools to provide live data to management in the County Council. This was very successful, but was aimed at a different audience to the work in Angus and Groningen.

What was the personal highlight for you?

The latest version of the Groningen data dashboard website uses both the Angus approach and delivers a compass-style visualisation to provide an excellent overall approach to providing local information for local services, citizens and managers.

The Angus dashboard has been successfully supporting our locality improvement groups who are now producing improvement plans for their areas based on the information we have provided.

What do you think were the main lessons that the partnership learned when working on this theme that other organisations should know?

Transnational working was challenging – but we saw real benefits from the sharing of ideas and different approaches.

What were the main challenges partners faced when working on this theme - and what does this mean for other organisations?

Getting together and sharing information and approaches has been a challenge, as all partners have been pressed to deliver very different local solutions as our local partners and colleagues are depending on the development of these tools. This meant that bringing together the key themes and outcomes was more of a challenge for us.

Understanding
what poverty
looks like
in our area

Armoedemonitor,
Groningen, The Netherlands

Groningen, a city in the north east of the Netherlands, has some of the worst poverty in the Netherlands – with almost 20% of the population affected by short-term poverty and over 10% affected by longer-term poverty. Over 4,000 children are directly affected by poverty in Groningen.

In the 'Armoedemonitor' project, local municipal data from Groningen was combined with income data from Statistics Netherlands (CBS) to better understand the makeup of the population within the Municipality whose income is lower than 110% of the minimum-income threshold set by the Dutch government.

While national data will tell us the percentage of people across the city affected in this way, local data is also needed if we are to truly understand the environment and condition of this particular population and to be able to place/analyse this within a broader local and national context - to understand how poverty affects different groups of people, different cities, and what it means for both local and national governments.
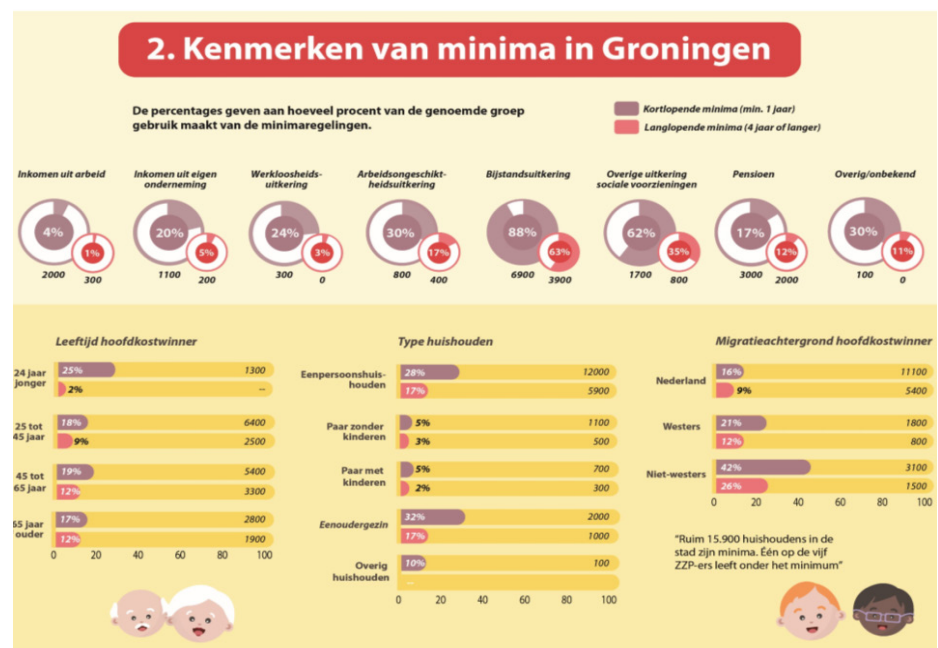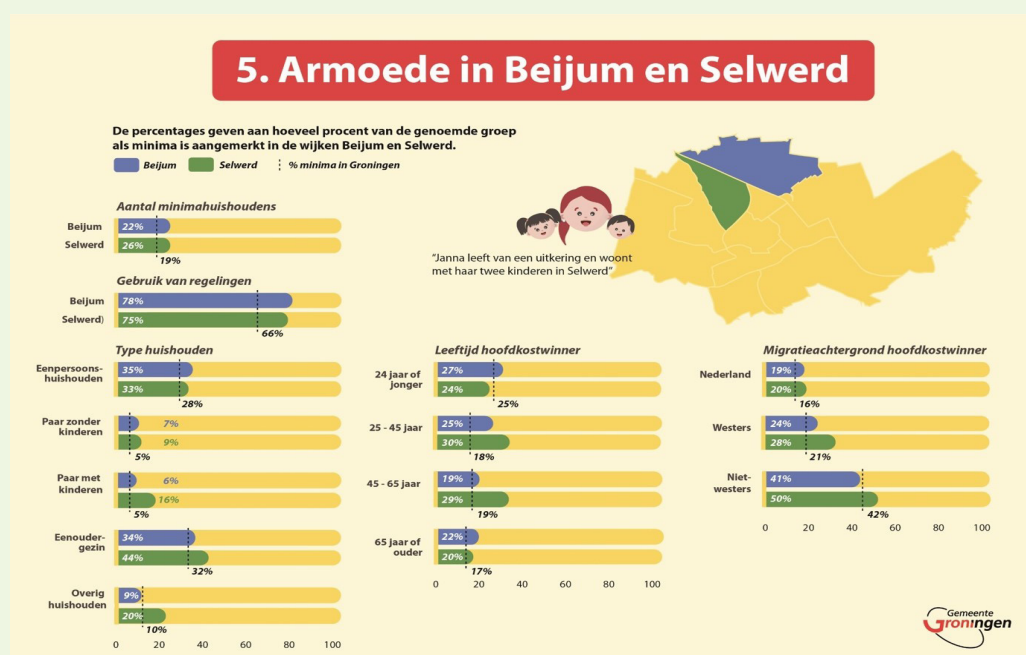
De-identified data from Groningen was provided to Statistics Netherlands, who anonymised the data, linked it with other anonymised nationally-held data sets, and returned a file of anonymous data on the target population to the Municipality for further analysis. Without linking local data with data from Statistics Netherlands we cannot fully understand the nature of the local population affected by poverty,

It is the combination of the two data sources that does the job for us – previously we did not have access to the data from Statistics Netherlands so we weren't able to develop a tool like this

The pilot certainly was successful, as it gave us a great deal of insight into the characteristics of low-income families in Groningen. We learned that a substantial proportion of the population that had low incomes were actually employed in small jobs – this was a surprise to both local and national policy-makers.

The thing that surprised us the most was the fact that the population Statistics Netherlands identified as having an income of less than 110% of the income treshhold differed considerably from the population group who were being supported by local measures in Groningen to compensate for the fact that they had low income.
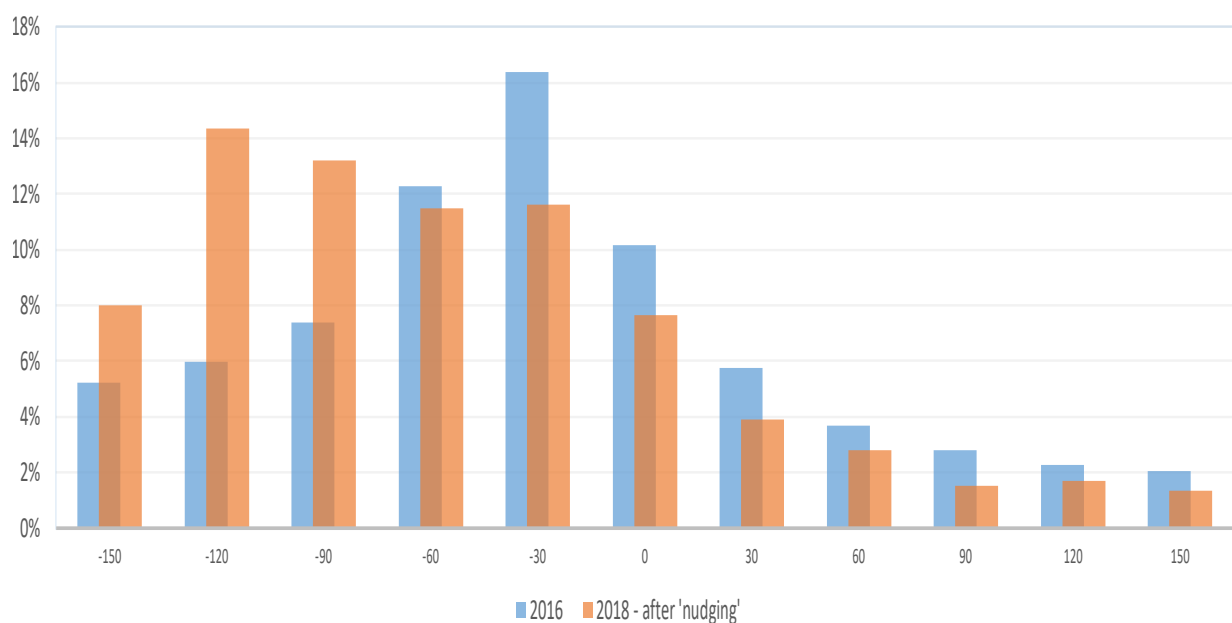
Now that we know more about which groups and families fall below the income standard and what their situations are, we can now develop more appropriate national and local policies to address their needs.

5. Armoede in Beijum en Selwerd

De percentages geven aan hoeveel procent van de genoemde groep als minima is aangemerkt in de wijken Beijum en Selwerd.

Beijum   Selwerd   % minima in Groningen

Aantal minimahuishoudens
- Beijum: 22%
- Selwerd: 26%
- 19%

Gebruik van regelingen
- Beijum: 78%
- Selwerd): 75%
- 66%

"Janna leeft van een uitkering en woont met haar twee kinderen in Selwerd"

Type huishouden

	Beijum	Selwerd	% minima
Eenpersoonshuishouden	35%	33%	28%
Paar zonder kinderen	7%	9%	5%
Paar met kinderen	6%	16%	5%
Eenoudergezin	34%	44%	32%
Overig huishouden	9%	20%	10%

Leeftijd hoofdkostwinner

	Beijum	Selwerd	% minima
24 jaar of jonger	27%	24%	25%
25 - 45 jaar	25%	30%	18%
45 - 65 jaar	19%	29%	19%
65 jaar of ouder	22%	20%	17%

Migratieachtergrond hoofdkostwinner

	Beijum	Selwerd	% minima
Nederland	19%	20%	16%
Westers	24%	28%	21%
Niet-westers	41%	50%	42%

Gemeente Groningen

Using Data to help nudge citizens to change how they use services
AALBORG, DENMARK

Number of days before passport expiry when renewal applications are received 2016 vs 2018

Legend: ■ 2016 ■ 2018 - after 'nudging'

X-axis values: -150, -120, -90, -60, -30, 0, 30, 60, 90, 120, 150
Y-axis values: 0%, 2%, 4%, 6%, 8%, 10%, 12%, 14%, 16%, 18%

In Aalborg in Denmark, the local Municipality is responsible for working directly with citizens who want to renew their passports. Aalborg noticed that citizens tended to forget to check the expiration date of their passport and often discovered that their passports had expired just before they planned to go on holiday. This meant that Aalborg had to process a peak in passport renewals at certain times of the year.

Since 2018, local residents have been sent a letter in their digital mailbox 4 months before the expiration date of their passport, with information about the need to get their passport renewed and when to come to the Citizens' Service Centre.

This nudging of citizens has removed the peak in passport renewals close to their expiration dates, and saved time for citizens as they are no longer waiting in long queues. Previously, citizens just had to wait in long queues to be served.

This is a good example of local data being used to provide good outcomes for citizens. Citizens are very satisfied with the nudging and information they get and they are happy to avoid long queues. The employees experience much less stress from waiting and impatient citizens before the peal holiday season.

We learned that using local data can provide us with ideas to change the way we are working and at the same time improve services for citizens and make it less stressful for employees.

USING DATA TO IDENTIFY SOCIAL SECURITY FRAUD

Groningen, The Netherlands

The team found that their model was not only able to predict fraud, but to provide unexpected insights into how the system was actually working. I think this approach will be continued. It will probably be one of the ways (the department will use) to detect fraud

To tackle the problem of social security fraud Groningen delivered a pilot that developed an integrated database of social security claimants that brought together information from a range of sources which was linked at a personal level. This allowed the team to develop a range of customer profiles which were used to determine the risk of a fraudulent social security claim.

Employee involvement was really important - it is not just a technical trick. Our outcome was only achieved because of the interaction between the employees and researchers.

The tool was built by a research team in the Municipality to help the department which delivered local social security services. The team who developed the tool found it was very important to work very closely with the team that collected and
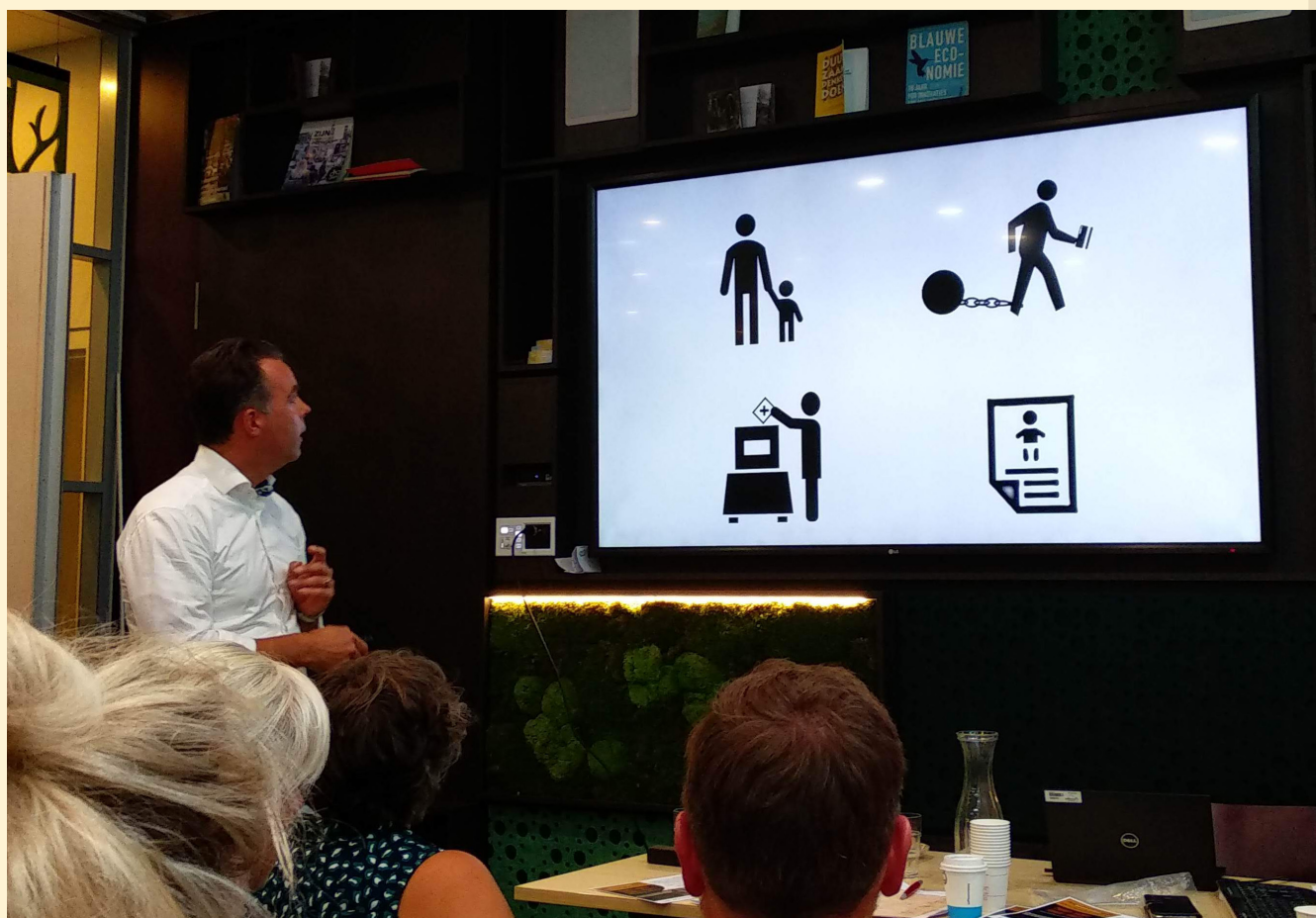
managed the data that they used in their fraud prediction model – it was essential to work with the delivery team to understand the experiences of the people using the systems. This allows you to get a good view of the meaning (and of the quality) of the data that you are working with.

One of the unexpected results of this work was when the research team identified weaknesses in the systems they were analysing.

In the Netherlands asylum seekers are entitled to social security benefits. At first glance, It seemed that asylum seekers seemed to commit a lot of fraud. But on closer

inspection it became clear that this impression was actually caused because the application procedure itself is too complicated, and not necessarily because of intentionally fraudulent claims. The solution to this problem is relatively obvious:

improve the guidance and training for these applicants and the teams processing their claims.

RAUM für VECHTA
Getting citizens involved in local planning in Vechta, Germany

The City of Vechta (Lower Saxony, Germany) along with the University of Vechta delivered a pilot called "Raum für Vechta" which gave citizens an opportunity to give their views of the overplanning of local urban areas via a website with an online survey tool (**www.raum-fuer-vechta.de**). The feedback captured from this form of citizen participation are then incorporated into municipal planning discussions.

In an increasingly digital society, there are many new ways to involve citizens in municipal decision-making processes. Unfortunately, our experience in Germany is that we don't actually understand if citizens are actually willing to take advantage of this opportunity. In Vechta we believe that more participation opportunities must be created, so that citizen participation and capturing citizens views becomes more and more common and the normal way to work with citizens.

In urban planning we see that not all citizens understand what kind of developments are planned. At the same time, we don't always know the views of the citizens who are directly or indirectly affected by planning decisions. So as part of the LIKE! Project we developed a website and a questionnaire which the Municipality would use to learn more about the attitude of citizens to proposed change on a limited number of hypothetical "test" sites. We did this to validate this approach and the questionnaire, so we could then further refine it to then use it with citizens on real planning decisions in on real areas in Vechta.

We hope that capturing more information about the range of citizens' wishes and views on planning decisions in their neighbourhoods will help to reduce local conflicts over planning processes and planning applications.

The information gathered from citizens' surveys on land use changes should help the administration to develop better planning tools and deliver better outcomes for citizens. This tool should also make sure that planning issues and potential conflicts are highlighted to the local administration at an earlier stage of the planning process.

Several hundred citizens filled out the questionnaires for the test areas. This is a very good result for our small Municipality. We held a public event, in which the city, the university, citizens and companies took part, which gave us an opportunity to clarify many questions about our approach. Now we can improve and optimize the website and the questionnaire based on this feedback.

RAUM FÜR VECHTA

Our approach to service delivery will now change as a result of getting this local data. It is important that administrations and citizens understand and learn more from each other –both will benefit from this, and there are only winners from this. We hope that other administrative units in Vechta will adapt this participation method and that other municipalities will adopt and adapt this tool.

Everyone involved now understands that the Municipality can do a better job of working with citizens and organising ways in which citizens can feed into and participate in decisions. As a result, we've found that citizens are now more willing to become involved and to participate in civic activities – so this is a prerequisite if we really want many people to get involved.

While it was important to communicate with citizens about the new service through the print media, we learned that it was extremely important to use social media.

We probably would not have succeeded in persuading so many citizens to participate if we hadn't used social media.

We have learned that we had to work to draw attention to the work we are doing at a very early stage, very intensively and again and again. This also applied to events with interested citizens. There were several times during the project when we thought that it would be sufficiently well known, but when we talked to citizens we learned that this was not true!

It would have been helpful if the questionnaire we developed should have been tested by an even larger group of testers – as many weaknesses were only identified when we sat down with the citizens who had completed the questionnaire. We'll remember this in future civic participation projects!

SAFE ROUTES TO SCHOOL

STAD VECHTA, GERMANY

Background

Following the good experiences and results from www.raum-für-vechta.de the City of Vechta's LIKE! pilot on using GIS-based questionnaires to collect citizens' view on future land use, Vechta decided to develop a tool which could be used to teach the use of GIS in Geography lessons, and which could collect information about the routes pupils use to get to school and their perceptions of their travel routes.

This idea was eagerly adopted by the school "Gymnasium Antonianum Vechta" and the City of Vechta. As the pilot developed the approach was expanded to include students of the local University.

Methodology

To deliver the pilot's two objectives an online survey was developed. The survey was tested and modified to be appropriate for the digital and geographical knowledge of the target group - pupils who were 12 years of age or older. The screenshots below illustrate the approach.
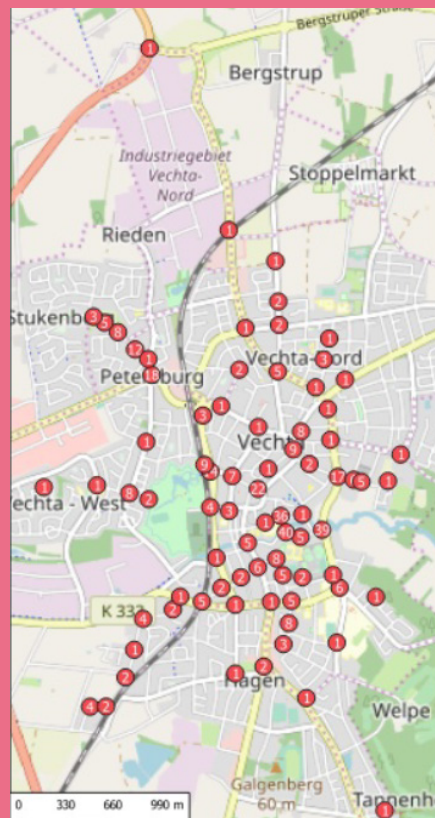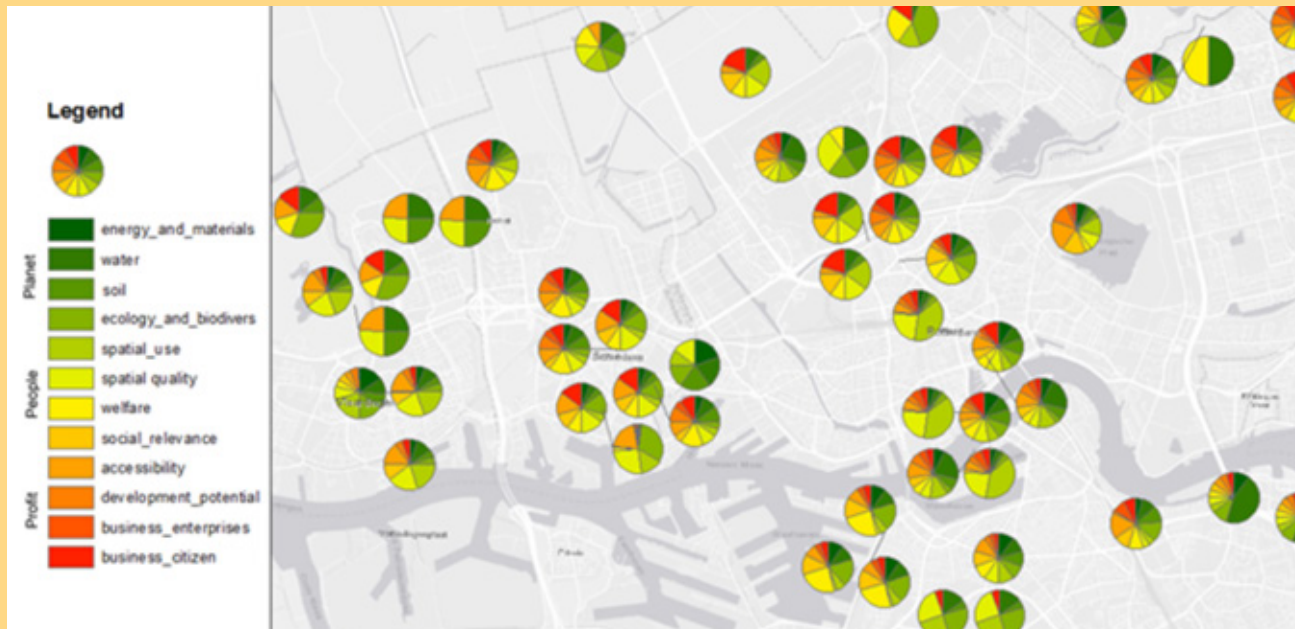
Results

In April, May and June 2019 the geography teachers at Gymnasium Antonianum Vechta were asked to use the online tool in their classes – at the same time an email was sent to all Grade 11 and 12 students asking them to use the tool. We received 140 responses from the survey.

The school's catchment area is clearly visible on the transport map - there are other secondary schools around Vechta in Cloppenburg, Wildeshausen, Quakenbrück and Diepholz. Within Vechta, most pupils use their bicycles or walk to school. The pupils who go to school by train tend to walk to schools and don't use "second bicycles".

To understand how safe these routes to school were, the pilot looked at official data on the number and location of traffic accidents in Vechta in 2017 and 2018. This data shows all the accidents which were reported to the Police Force - undoubtedly there are even more accidents which were not reported! This map shows the locations of all traffic accidents which resulted in injuries in Vechta in 2018.

When we look at accidents and injuries involving bicycles, we see a similar picture. If we look at the immediate area around the Gymnasium Antonianum we see that the pupils thought that there were many dangerous local areas: however there were only a few places where the perceived danger and recorded accidents actually overlapped.

Legend

Planet
- energy_and_materials
- water
- soil
- ecology_and_biodivers

People
- spatial_use
- spatial quality
- welfare
- social_relevance

Profit
- accessibility
- development_potential
- business_enterprises
- business_citizen

The Place Value Identifier

In a densely populated country like the Netherlands, space is limited, but demand for space is high for living, working, recreation, traffic and transportation. This often leads to conflicts across different interest groups, delays are common, and planning processes can take a long time. Projects with significant spatial impacts – such as roads or the development of new neighbourhoods - often lead to sharp discussions amongst users, stakeholders, communities and policy makers. This can be made worse if there isn't a good understanding of the views of local communities about places and their views on changes and different uses. Resistance to (any) change may be an underlying reason for local concerns.

While many people assume that an integrated approach to spatial planning should be better than other approaches, we need to develop tools to show how to bring together a range of different views from different users (citizens, owners, communities) that capture a range of different perspectives (place / neighbourhood values, economic values, utility, future options etc.).

We believe that an integrated approach to planning needs to incorporate specific (soft) place values from citizens to facilitate the selection of acceptable alternatives when places change. Therefore, this should start with a shared understanding of what citizens' key place values really are. This can only come from the use of data that is generated by (instead of about) citizens and stakeholders in order to identify acceptable plans and alternatives.

We developed and tested a novel online interactive value mapping tool called the **Place Value Identifier,** which allows users to mark points, areas and lines to describe particular areas.

This tool gives authorities and practitioners new skills and knowledge to develop new ways to engage with communities and to turn data into information that will be used by citizens, policymakers and researchers to understand how cities and neighbourhoods work.

Increasing use of value mapping techniques may assist policy-makers in designing and selecting from planning alternatives to minimise public resistance/concern.

In our test 1227 Dutch citizens indicated which places they valued in their living environment, and why. They identified 3690 valuable places: 55% marked a point, 36% an area, and 9% a route. Participants told us whether they thought these places need to be either maintained (64%), strengthened (20%), improved (12%) or, connected (3%).

The tool allowed participants to value all of these places against each other by distributing a limited amount of points over them, which tells project owners about the eventual trade-offs citizens would be willing to make if one of their key places might be affected by proposals – information which can accurately inform planners and stakeholders of citizen's views on areas and how they would like them to be changed.

This location-based experiential information can be a welcome addition to the other layers of information in evidence-based planning, where the active use of a wide range of various types of knowledge and different ways to collect, analyse and deliver data are essential elements of planning.

Transnational support and collaboration to enhance PVI
We worked with a wide range of LIKE partners in the development and testing of our tool, bringing in a range of skills and learning from across the North Sea Region. We worked with the city of Rotterdam to test a range of different digital tools to improve citizen involvement, including the Place Value Identifier (PVI) tool. We tested the tools with people who had visual impairments, or cognitive disabilities, or who were functionally illiterate. We co- designed the PVI tool with the University of Vechta, and shared information on our experiences with GIS (geographic information system) tools. We collaborated with the Municipality of Groningen and the Province of Drenthe to develop a map dashboard to present the PVI data in an accessible and understandable way. We are now using this tool to help Roeselare in Belgium to develop a co-designed citizen involvement service which is based on the PVI.

These transnational knowledge exchanges and collaborations enabled us to re-design our Place Value Identifier tool so it could reach more citizens and to be more accessible and more understandable. The development of the mapping dashboard to bring together and present the PVI data wouldn't have happened without this transnational collaboration.

Theme 3:
IoT
Internet of Things

What is IoT?

The Internet of Things is a set of enabling technologies that allow a range of devices/machines/sensors etc. to be connected to the internet – some by physical/wired connections, but more commonly through a wireless connection of some sort (e.g. Bluetooth, WiFi, LoRaWAN).

Like most enabling technologies, it's not clear to many users what the value of IoT is – while it sounds good to be able to connect almost anything to almost anything else, what is the value of actually doing that? Because the answer to this isn't always clear, the value of IoT is sometimes obscured by the hype.

But what IoT does do is create opportunities for us to build new and relatively inexpensive systems that link sensors in the real world to our networks so we can understand what is going on in areas without having to actively, and expensively, monitor them.
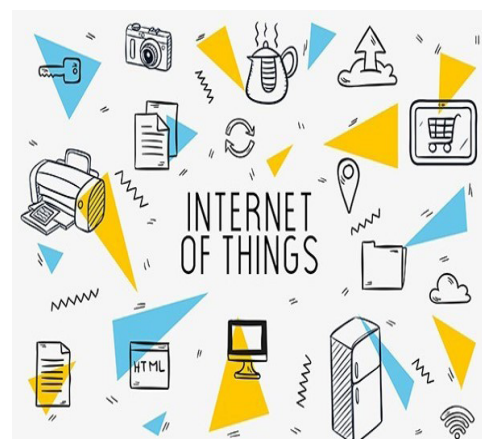
What is LoRaWAN?

The communication technology which makes the IoT possible is called Long Range Wide Area Network (LoRaWAN). A LoRaWAN network is designed to be highly energy efficient (transmitters usually are self powered with extremely long-life batteries that should last for over a decade. LoRaWAN has low bandwidth requirements (below 2G), and transmitters can have a very long range - up to 10 km in rural areas.

The LIKE! Approach to IoT

LIKE!'s partners set out to explore how sensors can be used to deliver better understanding of neighbourhoods and how sensors can help deliver better services and information.

We did this in two ways -through a series of public events and hackathons, and by developing local pilots to use sensors to capture information to help understand how neighbourhoods were being used.

Pilot lead **Esmeralda Top**

Drenthe Province, The Netherlands

What was the goal of your theme?

To boost the use of Internet of Things (LoRaWAN) for creating smart solutions and smart services.

What were the main accomplishments of the Partnership in meeting these goals/working in this area?

In the LIKE! Project we've experimented with a hackathon as a means to develop new techniques to build and strenghten multi-stakeholder relationships to enhance co-design activities and to deliver better services. A hackathon is an innovation marathon. With the partnership we've organized an international Internet of Things hackathon, participants and challenge-owners have created smart solutions for societal challenges by using IoT/LoRaWAN, just within a 30-hour pressure cooker setting. Smart solutions were created for challenges on health, mobility, sustainability and safety, and partners are now working out how to deliver these solutions.

What was the personal highlight for you?

The international hackathon was my personal highlight. We've organized it from A till Z. It was awesome to see 80 enthusiastic participants working on challenges from the LIKE! partnership regions.

What do you think were the main lessons that the partnership learned when working on this theme that other organisations should know?

We proved to ourselves that the Internet of Things can help to provide a range of new and innovative smart solutions to create smarter services and address wider societal challenges.

But we also learned that the Internet of Things part of the LIKE! Project was sometimes hard to deliver, as not all partners were initially interested in this work or had potential projects or understood the potential of the technology.

It was the way we worked through this and changed partner's perceptions that makes European projects and European cooperation so interesting. As we worked on this it was great to see that more partners from across the project realized that the Internet of Things can help to provide smart solutions for societal challenges and to create smarter services, and by the end of the project allof the partners had developed use cases or project ideas that used IoT.
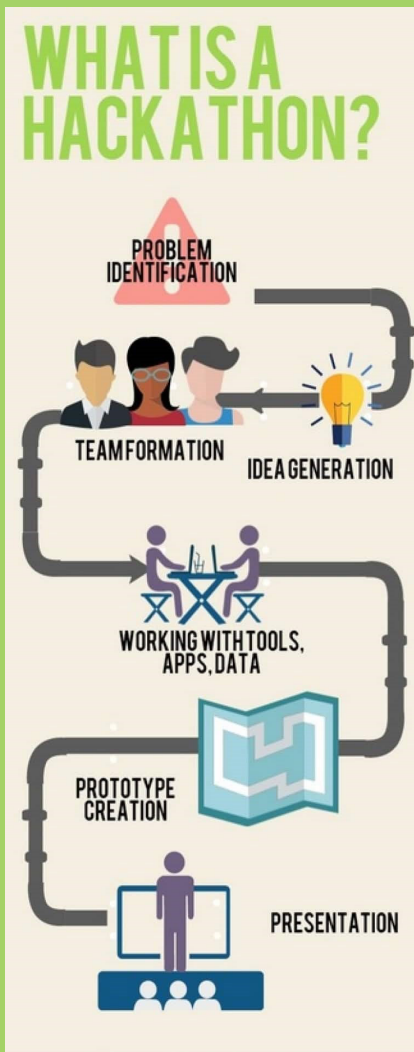
It was also interesting to see that the various European regions have similar challenges. For example we found that many partners were interested in understanding how they could monitor road or land use and how they could make their infrastructure smarter.

What were the main challenges partners faced when working on this theme - and what does this mean for other organisations?

Within our theme it was really hard to get the LIKE! partnership in 'action mode'.

I think the IoT part was a bit of an outsider within the scope of the LIKE! Project. The project partners were mostly of different policy fields and in the beginning the potential of IoT/LoRaWAN wasn't really well known or understood. However, I'm very proud that during the project more partners became interested in and active with IoT.

A lesson learned is firstly to collect the 'right' people (with similar policy fields background) and together outline the common vision/mission and make work arrangements. You need 'skin in the game' otherwise it will become very hard to keep people committed.

WHAT IS A HACKATHON?

PROBLEM IDENTIFICATION

TEAM FORMATION

IDEA GENERATION

WORKING WITH TOOLS, APPS, DATA

PROTOTYPE CREATION

PRESENTATION

One of the key problems organisations have when they start to think about IoT is how they can use this enabling technology. As an enabling set of technologies, there are a wide range of possible ways to use data and the technology to help with service design and delivery. This plethora of opportunities often makes it difficult to know where to start, as organisations can find it difficult to understand both the art of the possible, and then need to consider which of many possible network/hardware/ software combinations is the most appropriate for them.

The LIKE! International IoT Hackathon

What is a hackathon?

A hackathon is an innovation competition where bright, creative people try to come up with solutions to a set of challenges provided by the organisers. Hackathon participants are organized into small teams – we had teams of 5-6 people. Every team member usually has their own roles and tasks.

The LIKE! International IoT hackathon

LIKE! hosted a large-scale, three day long IoT hackathon in March 2019 to create smart solutions for societal challenges based on IoT/ LoRaWAN technologies. Organised by the Provice of Drenthe, our hackathon was a 30-hour inventors marathon at '**Technologies Added**' in Emmen, the Netherlands' first shared smart factory.

This provided partners with an opportunity to first develop IoT use cases that were relevant for them, and then to bring them to the hackathon and see how experts would turn these ideas into products or prototypes at the hackathon. It was awesome to see 80 enthusiastic participants working on the challenges from the LIKE! partnership.

LIKE! IoT Use Cases from the International IoT Hackathon

Hackathons need themes – our IoT Hackathon had 4:

1. **Mobility**
2. **Health**
3. **Safety**
4. **Sustainability**

1. MOBILITY IoT THEME

Challenge number 1: Smart Urban Freight Logistics

Interreg B project SURFLOGH and University of Groningen
Transportation companies drive around with half empty trucks and often go into city centres to drop off just one package. This is inefficient and leads to traffic jams and unnecessary vehicle emissions in cities. Information flows are too big and dynamic to centralize planning of all freight transportation. But what if freight itself could talk, and

packages and pallets could self-organize their distribution? **Solution:** *A package tracking solution* with temperature sensor, humidity sensor, accelerometer, weight sensor, NFC and location. *Team Dogs of Assen, Hanze University of Applied Science, The Netherlands*

Challenge number 2: Parents bring and pick up kids from schools by using their cars *Municipality of Roeselare* This causes traffic jams and dangerous situations. How can we dynamically guide traffic in school areas?

Solution: *Kidz&Ride* sending notifications of kids entering and exiting the school. *Team Tegendraads - Toolbox, The Netherlands* **(Winner – best design)**

Challenge number 3: Bridle ways *Municipality of Vechta* First, find a way to identify the frequency of use of the official bridle ways in Vechta, Germany over a long period

of time. Second, find a way to identify whether the bridle ways are just used by equestrians or if they are also used by pedestrians and cyclists.

Solution: *Geophone Movement tracker, team Hack The Pony – individual mix, International (London, Berlin.)*

2. HEALTH IoT THEME

Challenge number 4: Healthy ageing *Angus and Suffolk County Council*

How might we use IoT to ensure people stay well hydrated and fed, reducing the risks of dehydration which can lead to other complications such as Urinary Tract Infections. How could IoT help the person by monitoring physiological conditions (e.g. wearables) and providing prompts and escalations at appropriate times?

Solution: *Carrie the Care robot with AI* that would check that people have eaten or drunk as well as being used to support customers with memory difficulties to sequence specific tasks. *Team KIB – Hondsrug College, The Netherlands*

Challenge number 5: Caring for carers *Suffolk County Council*

How might we use IoT to reduce the reliance / burden on carers, to empower the cared for more and provide a better quality of living for both the carer and the cared for? How might IoT enable more remote based support rather than one-on-one care?

Solution: *A platform with IoT* that integrates existing and future support devices and sensors and links them with services. *Team Zorgloos, individual mix, The Netherlands*

Challenge number 6: Smart drinking bottles *Bidon-it / Ideas4u (entrepreneur)*

How can we make cyclists drinking bottles smarter and how can we reduce the litter of drinking bottles created during cycling tours?

Solution: *A smart water bottle* that is being tracked via GPS, LoRaWAN and QR *Team Singapore – Rudralabs, Singapore/India* **(Winner – best overall solution)**

3. SAFETY IoT THEME

Challenge number 7: Date exchange via USB *QBIT (company)*

How can a safe and secure exchange of data via USB be created?

Solution: Itis-í covers command and control penetration system via LoRaWAN. *Team Tesseractive, Rotterdam, The Netherlands*

4. SUSTAINABILITY IoT THEME

Challenge number 8: Waste deposit *Municipality of Groningen*

How to detect illegal waste deposit throughout the city? (at underground waste deposit containers). How can IoT be used in waste management.

Solution: A LoRaWAN solution with presure and proximity sensors and sensor that will send notifications when the bin is full. *Team GARBit, ICT lyceum, The Netherlands*

Challenge number 9: Recycling & IoT *Angus County Counsil*

How can we use IoT to help encourage recycling?

Solution: A smart LoRaWAN waste bin with four seperated components. The sensor automatically seperates waste into the right waste component and sends data via an app. *Team GICT, Groningen, The Netherlands* **(Winner - best commercial solution)**

RESULTS
10 different challenges (partner use-cases) at the start of the 30-hour challenge. After 30-hours the teams pitched their solutions to a jury of experts, who decided who won awards for Best Overall, Best Design and Best Commercial Potential.

- **Best Overall** was won by the team from Singapore/India who designed a solution for the challenge by BidonIt. They've added intelligence to a drinking **bottle for cyclists.**

- **Best Design** was won by team Toolbox who created a solution for the challenge of the Municipality of Roeselare about using IoT to **prevent traffic jams at schools.**

- **Best Commercial** was won by team Gict who pitched a solution for the challenge provided by Angus Council about **encouraging citizens to recycle more.**

What the IoT hackthon Suffolk County Council

Two of the seven IoT challenges/use cases that were developed by Suffolk County Council were used during the LIKE! International IoT Hackathon.

1. **How might we use IoT to ensure (elderly) people stay well hydrated and fed?**
2. **How could we use IoT to reduce the reliance/burden on carers?**

Suffolk's IoT challenges were developed in response to Suffolk's strategic health and care policy objective "keeping people living well in their own homes for longer is beneficial to the customer, they are happier and more independent for longer."

Over the course of the hackathon each of the ten participating teams were assigned a challenge from LIKE! partners, and asked to come up with an IoT solution to the problem, and to design a 'proof of concept' to present at the end of the hackathon.

Suffolk met their two teams and provided them with real-life examples of how these challenges affect elderly residents of Suffolk, how local services are provided, and outlined relevant UK legislation. At the end of the first day the teams presented their initial ideas to Suffolk, who helped them develop their ideas with additional information and use-case examples.
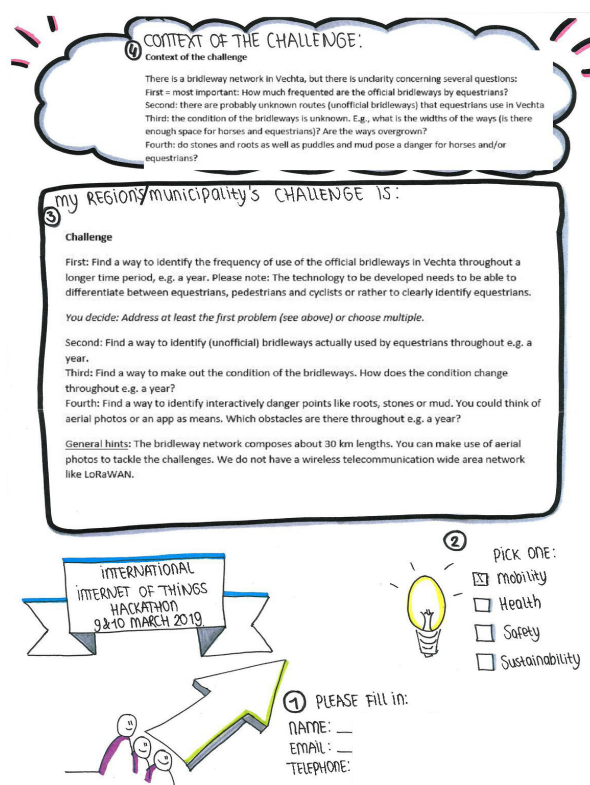
Using IoT to understand bridleway use in Vechta, Germany

Both teams were able to develop - within 30 hours - solutions that have the potential to improve the lives of Suffolk residents. The notion of a system that can not only support customers to sequence everyday events as well as monitoring and feeding back food and fluid intake has the potential for people to remain living in their own homes and delaying the need for traditional care provision.

Suffolk particularly liked the idea of a platform that has the potential to host a range of devices that cover both health and social care needs. With the future of health and social care becoming more integrated, developing the platform proposed by this team can help make this a reality.

#1 Keeping the elderly hydrated

Team KIB explored how to keep the elderly hydrated and fed pitched the idea of a robot with AI that would check that people have eaten or drunk as well as being used to support customers with memory difficulties to sequence specific tasks.

Over the course of 30 hours the team devised a working prototype that allowed the user to select on a screen whether they wanted support to make a hot drink, cold drink, snack or main meal.

Roadmap towards international IoT/LoRaWAN Hackathon 2018
Drenthe, The Netherlands
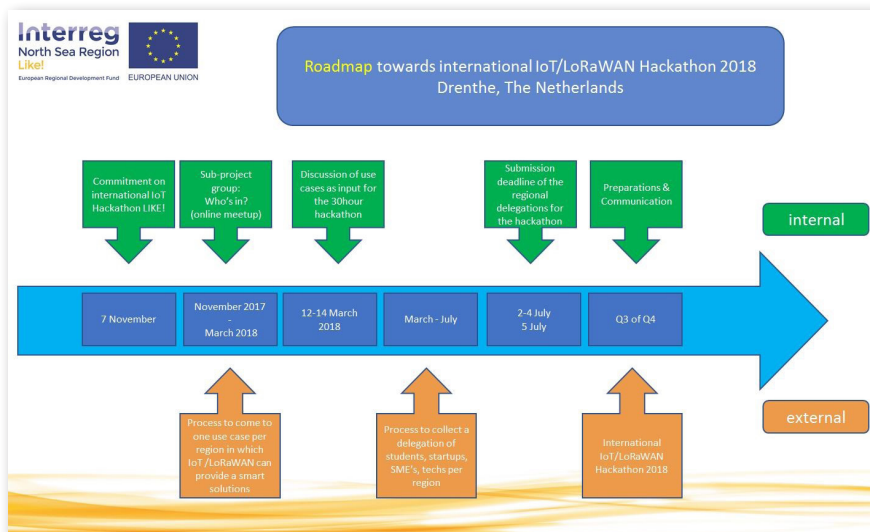
For the presentation the hot drink option was used and the robot showed on screen the various steps required in order to make a cup of tea. This sequence of events included a safety message to remind the user to be careful with the hot water. During the planning and construction process we discussed the potential for including sensors that would monitor and alert others how much of the food or drinks were consumed. Due to the time constraints this wasn't incorporated into the final version but has the potential to be developed further. Sensors including smoke alarms, flood sensors, pendant alarms, blood pressure monitors and blood sugar monitors would be linked to the platform, which would understand who to alert depending on which sensor was active.

#2 Reducing the burden on carers

Team Zorgloos focused on reducing the reliance/burden on carers using a platform that would be integrate existing and future support devices and sensors. This platform would put the customer at the centre of their support network, and health and social care data could be directly shared with relevant parties, removing this task from their carers.

For example if a fire was detected then the emergency services would be notified, a knock at the front door could be sent via an app to a family member who could check ID and grant access to the visitor, and a low blood sugar reading could alert a community nurse.

The prototype that was developed at the hackathon supported blood pressure readings, and analysed readings and sent appropriate alerts.

Best overall solution from the LIKE! International IoT Hackathon

1. Standalone module on cycle (bottle cage) – one-time installation of a lightweight circuit
- IR Receiver
- GPS - To track location
- GSM/LoRa WAN/NB-IOT - Gateway to send location data to the cloud whenever the bottle is thrown away

2. Water bottle has a sticker which has both
- IR blaster (low cost) and - This is to identify if the botle is within proximity of the IR transmitter of the standalone module
- QR Code

3. Fans scan the QR code on water bottle after finding them, and share on social media
- Based on the number of bottles collected by the fans, they can be rewarded (Branding & Broadcasting)
- Application for Fans - in that they can see all the bottles that are thrown away

4. Prediction
- Previous track records
- Predict thirst based on weather, player physical build, last water consumption time, distance cycled, water consumed by riders

Hack the Bridge – counting visitors in the National Park in Drenthe

The 'Hack the Bridge' pilot is a part of the LIKE! Project that is testing how Internet of Thing (IoT) technologies can be used to monitor visitor flows in the Drenthe's network of National Parks. In the Province of Drenthe it is our ambition to become a field lab for technological development: creating smart solutions for societal challenges. Drenthe is part of The Things Network (TTN), and we have rolled-out our own free IoT network – the *Drenthe Internet of Things Initiative* (DIDI). The Internet of Things is a set of cross-cutting enabling technologies which open up a wide range of new possibilities for governments and businesses.

'Hack the Bridge' is a proof of concept project for Drenthe's Internet of Things LoRa-network – and here our challenge was to measure the invisible. There is no fence around the Drentsche Aa National Park, but we still want to collect data and insights in visitor flows. In one part of the park there is one bridge that every visitor uses. So by using smart sensor solutions we have been able to capture some insights into the current makeup of visitors (bikers, hikers, animals etc.) and bridge users.

IoT applications have been developed to monitor visitor streams, and the data from this is then processed and published through a dashboard. This provides the Park Management with insights into how the National Park is being used and it provides them with data on which they can review and adjust their policies. In a follow-on stage we hope to be able to provide an open data service that will be useful for local entrepreneurs. This pilot shows how LIKE! is combining smart technology with better and more efficient services.

The Hack the Bridge pilot has been executed by students of NHL-Stenden, Windesheim and Saxion and entrepreneurs of IoT Nederland and JENG. During the pilot they've experienced struggles with the Lora connection and with vandalism - the poles that hold the sensors have been destroyed several times. But the team has managed to continue with the pilot and it has given them various useful insights.

Hack the Bridge was a local pilot in Drenthe, but it is part of a broader group of similar local IoT pilots in LIKE. Roeselare has also fitted a bridge with smart IoT sensors, and Suffolk has used IoT to measure visitor flows in Felixstowe. During LIKE we've exchanged information about our projects and produced a series of use cases and publications and updates on our activities and learning. The IoT market in Suffolk was really interesting to us and helped us understand what other local governments were trying and learning in the IoT space.

An idea matched with enthusiastic students and entrepreneurs always results in something. So if you want to create a digital innovation culture, like the LIKE! Project, then just start and see what happens. Innovation is about going behind the usual paths. Hack the Bridge was a new concept for us, and it has resulted in new ideas which we can now follow-up...!

USING IoT TO MONITOR FOOTFALL in Felixstowe, Suffolk

Suffolk wanted to understand how people visited the town of Felixstowe in the south of England. They particularly wanted to find a way to understand if people used the retail high street and the seaside promenade in different ways.

Suffolk was keen to explore the impact that technology can have on better understanding how many people visit two areas of Felixstowe - the seafront and the high street (the main shopping street). Geographically the two locations are adjacent to each other but separated by a cliff: events are held in both areas and stakeholders were keen to understand how people access and use the different parts of the town when events are held, as well as understanding more accurately how many people are visiting the town normally and how this changes on event days.

This pilot is part of LIKE's work on Creating Digital DNA for Neighbourhoods, with the pilot using innovative tools and techniques to incorporate information and data. A dashboard was created to enable the Felixstowe Forward team to plan future events based on numbers visiting the area, and this is being used to support the development of the Felixstowe area by helping local services better understand local issues and provide informed solutions.

Suffolk's IoT pilot used two LoRaWAN antennae mounted on two buildings (marked as A and B on the map) one on the promenade, and one in the High Street. Seven Wi-Fi sonars and cameras attached to streetlights helped to measure the footfall down the main High Street and along the promenade between the two antennae.

The monitors and cameras work to count the number of people on the street and calculate how many people are in an area at any given time. This data is represented on a dashboard which can give both real time and historical information so the Council and retailers can compare visitor numbers and the flow of visitors across the town.

The results gave some insights into the number of people who were visiting Felixstowe on a normal day and allowed Suffolk to compare this with the number of visitors on event days. This information will be used to help plan future events, such as where to locate emergency services, information stands, additional facilities etc.

Supporting the adoption of IoT services

This project was more used to share information on how Suffolk used Internet of Things and LoRaWan technology in a project. We were able to share information on sensors, the different kinds of sensors we used and how we positioned the sensors, the positioning of antennae and all the other deployment challenges we faced with this project.

This was one of the first Internet of Things projects in LIKE. This project was a huge help to Suffolk employees in understanding of Internet of Things (IoT) and LoRaWan when we were putting together challenges for the LIKE IoT Hackathon. Having this project to draw on helped us develop a deeper understanding of the capabilities of Internet of Things (IoT) and that created more opportunities for more challenges to be developed and for employees to think outside of the box.

Deploying IoT services

We faced a number of challenges during the roll-out and deployment of the project, including:

- Mounting of the monitors and cameras
- Tight timescales
- Connectivity – the geography of the beach and town location (which were separated by a cliff) meant that signal lines were disrupted from the antennae and the monitors
- Supplier issues, i.e. we relied on a single supplier which caused problems
- Cost overruns
- Street furniture - hanging flower baskets were put up for the summer for 'Felixtow in Bloom', which meant we had to move some of the equipment to ensure there was still good visibility for the monitors and cameras

Many of the same project challenges were faced by the other 4 councils Suffolk was collaborating with as part of a

UK Digital Catapult IoT programme. The location of the two LoRaWAN antennae, monitors and cameras; as well as the beachside location and prominent cliff edge posed the most issues, followed by connectivity and issues with the mounting of the monitors and cameras. Briteyellow also had a supplier issue when their main camera supplier went out of business!

The project did not go to schedule, which meant we missed the main events that Felixstowe Forward had wanted to capture data on - the Book Festival and the Carnival. However, once all the cameras and monitors were working, we were able to get useful data. We looked at different events to get the information we needed on how many people were visiting the town. We wanted to extend the pilot to cover the Christmas period, but we were unable to as the Christmas lights required the same power source as the cameras we were using.

There are many things that happened on this project which we would do differently! Primarily it would be to understand the capabilities, experiences and understanding of the technology companies you are working with and to adjust time-lines and project expectations accordingly. Make sure that you understand what events are going on, and that you understand how these will affect your project!

FIND YOUR SHEEP!

DRENTHE, THE NETHERLANDS

Why sheep?

The 'Find your sheep' pilot tests the use of smart technology to create better services, and is a proof of concept (PoC) project for Drenthe's Internet of Things LoRa-network. The pilot has been developed by the ICT academy in Hoogeveen - a public-private partnership where students work on real life challenges.

The Province of Drenthe is well-known for its scenes of sheep in heather fields - a lot of tourists visit them, and the Province supports these sheepfolds. The ICT academy has created a PoC of 'Find your Sheep' as a low-key way of connecting smart Internet of Things (IoT) solutions with tourism and local shepherds. Tourists often ask to visit a sheepfold to see the typical Drenthe sheep and experience an authentic part of Drenthe's culture. However, most of the time the sheep-folds are empty and the sheep are out in the fields. And that's why a smart and creative IoT solution is being developed.

Building an IoT testbed in Drenthe

Through the Internet of Things (IoT) an increasing number of things are being connected to the internet. Cars, refrigerators, bridges, buildings, lights, farms, healthcare; the possibilities are endless. The Province of Drenthe wants to become a field-lab for technological development that aims to create smart solutions for societal challenges. We already support work on the digitization of SMEs, the development of smart industries (you can find the Netherlands' first shared smart factory in Drenthe), on smart mobility, on smart farming, on cybersafety, and on big data.

The communication technology which makes all of this IoT activity possible is called Long Range Wide Area Network (LoRaWAN). The network is energy efficient (<15 years battery life), low bandwidth (below 2G) and long-range (10-15 km). Drenthe is part of The Things Network (TTN), a Kickstarter initiative to create a worldwide, crowdsourced and crowdfunded IoT network.

Drenthe has decided to roll-out a free IoT network, the 'Drenthe Internet of Things Initiative' (DIDI). It is a free to use network for the 500,000 inhabitants of the Province, for government organisations, for schools, and for non-profit organisations. Entrepreneurs and start-ups can use the network for free for six months, which gives them an opportunity to experiment with new ideas and applications.

The data that is being collected from this network will be made available as open data, and LIKE! made it possible for us to create an open data portal where you can find information about IoT, ask for keys to enter the DIDI network, be inspired by various pilot projects, and obtain data. DIDI aims to boost innovation and entrepreneurship in two ways - on the sensor and smart solutions development side, and through providing new open data. By combining different data sets, new applications can be developed.

What was the main lesson you learned?

This pilot highlights the value of the LIKE! project's aim of combining smart technology with better and more efficient services. Find your sheep isn't a transnational project (yet!), but we have worked hard to share more macro-level knowledge about developing IoT projects and services. We have learned to build on the enthusiasm of local stakeholders. The ICT academy in Hoogeveen was eager to create IOT applications and smart services, and the Province has provided them the dancefloor' (with DIDI IoT), the challenge and they've created the PoC.

SEE.SENSE
– piloting intelligent cycle light technology

Local Situation

Cycling to work is an effective way to travel in an environmentally friendly way, with added health benefits. Making the decision to cycle to work in the UK is not an easy one, as there are very few dedicated cycle paths, so this pilot is testing ways to eliminate those hurdles and make cycling more accessible.

The development of policies to encourage the uptake of cycling to work is an important one in the East of England. Transport is the responsibility of the Westminster government in England. Some people link the lack of a joined-up national and local approach to transport strategy for the absence of truly integrated ways of getting the population from their homes to their places of work in a timely way whilst simultaneously delivering the green travel agenda. As a result there is the perception that people are still using their cars to travel relatively short distances to work, when other options such as train, bus and cycling could be utilised if they were available.

In Ipswich in particular, local air quality monitoring indicates that there are several "hot-spots" of poor air quality on some of the arterial roads in and out of the town. This may be linked to the high volumes of motor vehicle traffic on these routes. Policy makers within local government are particularly interested in being able to identify safe and efficient routes to and from places of work.

The See.Sense pilot

Suffolk County Council are working with technology partners at British Telecom (BT) and have engaged volunteers from local authority staff in Ipswich to trial Internet of Things (IoT) enabled bike lights, designed and built by See.Sense, an innovative start-up company.

The bike lights use advanced sensor technology to monitor their environment, reacting by flashing brighter and faster when the cyclist is undertaking more hazardous manoeuvres. The lights are paired with a smartphone app that provides additional connected features for the cyclist, including crash detection and theft alerts.

Over the course of the pilot, we've started to capture real-time data on the way people use different cycle routes and cycle parking - especially in and around Ipswich, and at Adastral Park - BT's European research HQ based 10km outside Ipswich's town centre.
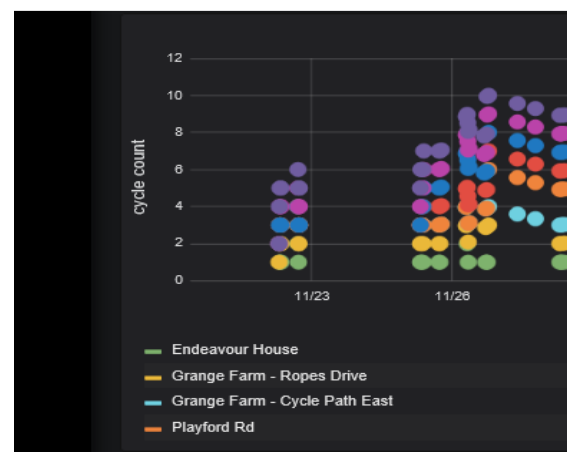
Our pilot had a broad set of objectives:

- Proving that we can count cycling journeys in real time over a relatively large area
- Testing whether the collection of real-time data from the cycle lights is feasible
- Examining whether factors such as the weather and temperature affects cyclists' decisions
- Developing data presentation layers and dashboards to visualise the information gathered by the IoT sensors
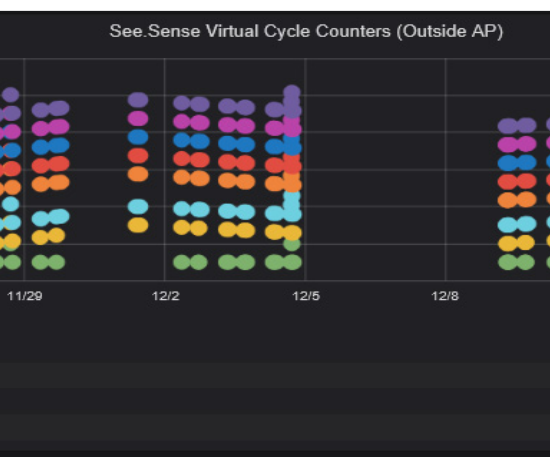
This pilot focuses specifically on the cycling element and aims to use the latest IoT technology to identify safe and efficient cycle routes between citizen's homes and key employment hubs in the area. This directly links with LIKE's work on Data and Dashboards and brings together the theme's three focus areas:

- The data collected in real time from the interactive bike lights is visualised in the form of digital dashboards
- Dashboards have been built that provide local data, and are also "mashed" together with weather-related data sets
- The pilot uses Internet of Things technology embedded in the cycle lights to generate data

Transnational co-operation and outcomes

During the April 2019 LIKE! partner meeting held in Suffolk, all partners visited Adastral Park, the home of BT's European research HQ. Adastral Park also hosts Innovation Martlesham, a hi-tech cluster of over 100 companies ranging from tech behemoths such as Intel, Cisco and Huawei to very small local companies such as Coderus. The LIKE! Partners were introduced to the IoT technologies including that used in See.Sense and partners made several linkages to the projects being undertaken at Adastral Park via Suffolk County Council.

The issues of cycling, traffic reducing, the environment and green travel are shared by all the partners in the LIKE! Project. Suffolk was especially lucky to have partners from Groningen, a major cycling city, to learn from. Other partners have undertaken pilots on IoT and cycling and Suffolk certainly learned from their findings. In addition, we'd like to think that Suffolk has added a new dimension to this area of work by being able to visualise the data in dashboards as well as linking the IoT data sets gathered by the pilot to other datasets such as weather and temperature. By doing this, we have shown how you can add additional value to IoT data.

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