IRELAND 2015
20th Annual Conference

Friday 2nd October, 8.30am

GIS 2015

at DoubleTree by Hilton, Burlington Road, Dublin

Parallel Session Speakers - Full Paper Abstracts

Demelza Guy - CadCorp

Demelza is currently employed as a Business Development Manager at Cadcrop having previously held a number of other positions in the company including; Account Manager and GIS Technical Specialist. Demelza's main areas of expertise lie in spatial analysis, and database and data management.

Better, cheaper, faster – enhancing government websites with location intelligence

The introduction of a national postcode system and seamless national mapping, means that government, businesses and citizens in Ireland now have access to a consistent and authoritative system for spatial referencing.

This presentation focuses on a particular opportunity this presents for eGovernment in Ireland – an opportunity to inject location intelligence into government websites. It is not simply about making maps available online – valuable though this is. Rather, it is an opportunity to use GIS and web mapping as web-enabling technologies. These spatial technologies have the capacity to dramatically improve a citizen's experience in accessing to a public sector website, and in doing so encourage online self-service as the channel of choice.

There is evidence that most people who access a government website are not doing so in order to 'browse' content. They are usually looking for answers to questions about a particular locality – very often their home address. 'When should I put out garden waste for collection? What are the details of my neighbour's planning application?' They want answers quickly and easily without having to wade through pages of text, and very often without having to consult a map.

We argue that location intelligence can be used to hide much of the complexity of a government website and to generate personalised queries based on location. The outcome is often an online experience which is better, faster, and cheaper.

·   Better: because it delivers information based on a citizen's needs; it is suitable for a range of devices; and it comes with a simple, personalised, and intuitive interface.

·   Faster: because it uses advanced spatial database techniques behind the scenes to automate many of the data processing activities, and cut out many of the steps in the user's journey

·   Cheaper: because it recognises that the average cost of a digital transaction can be nearly 20 times lower than a transaction conducted via phone, and 50 times lower than a transaction conducted face-to-face.

We provide a live demonstration of smart searching using a responsive application on a range of devices.

Neil McDonnell - National Freight Association

As General Manager of the FTA, Neil has over 10 years of senior logistics industry experience behind him and was a founding member of the organisation, serving on its first National Council and contributing to the creation of the FTAI accreditation scheme. Neil contributed as part of the panellist discussion regarding Eircode at GIS Ireland 2014.

Eircode: Opportunity Missed? …Or Just Postponed?

We are now some three months into the Eircode roll-out.

We have made the views of a certain section of the commercial freight and energy delivery market known. But are these views extreme, are they too subjectively linked to one business sector, or will these objections simply decrease over time?

The freight and parcel sectors were thoroughly consulted on the process back in 2006. Most of the frustration from this quarter is due to the fact that Eircode differs so much from the model proposed at this time.

BUT, Eircode has scored a number of important successes in its introduction:

1. It has overcome the objections of the only two on-the-record objectors to the postcode project, An Post and the CWU.
2. It has provided Ireland with a powerful accountancy tool for the administration of state services, which is likely to result in long-term savings for the HSE, and Social Welfare in particular.
3. Its introduction has required the cleansing and standardisation of state databases.
4. It has accustomed a large section of the population to the benefits of a postcode.
5. The introduction of a unique identifier postcode has provided a degree of security for on-line payment confirmation.

So where does industry, and Ireland Inc., go from here? We see a number of factors suggesting that Eircode in its current form may be short-lived:

1. The need for a postcode solution for "everything else" remains unfulfilled by Eircode. Eircode is unlikely to be structurally capable of handling "everything else"
2. M-commerce is a coming force. It will not be address-bound. It will be governed by where people's mobile devices are, not where their address is.
3. Postal mail, and the USO model, is in terminal, irreversible decline. A postcode which is wedded to a dying business model has a finite time horizon.
4. While retention of Eircode as a background unique address identifier would be desirable, we are one "Wikileak" or "Liveleak" away from loss of confidence in Eircode.

What, therefore, might a successor to Eircode look like?

Richard Cantwell - Gamma

Richard has been a member of the IRLOGI executive committee since 2012 and currently holds the position of vice president. Richard is also the Senior GIS consultant and technical manager at Gamma Ltd, where he is responsible for project inception and delivery along with data management and analysis.

How a postcode for Ireland will impact on spatial analysis

In July of this year, Ireland's new postcode system, Eircode, was launched. With the release of the new dataset, a building level spatial data file that could be easily mapped to an address became available.

The new data has opened up a whole host of possibilities for the use of GIS in Ireland. With the end of the non-unique addressing issue in Ireland, granular analysis down to an individual letterbox is now possible.

A number of organisations will be quick to market with the new data and will be able to offer some really interesting and modern skews on traditional GIS services. The lunch of Eircode will give rise to a small band of start-ups and established companies who can utilise the building level code to offer new and improved services to Irish citizens.

This talk will examine how the release of the code has acted as a catalyst for spatial analysis as private and public sector bodies look at new and innovative ways to harness granular data. Looking at the technical capabilities of the code, the early uses of the code and looking at future possibilities of what the code will enable people to do with their data, this talk will offer a look back at the first months of Eircode and point to the future of the code as people begin to understand its full capabilities.

David McQuillan - Mallon Technology

David has 14 years of experience in the GIS Industry and currently heads up the Software Development and Document Capture departments of Mallon Technology. He also owns and runs start-up Cianad Software, the creators of web based mapping platform 'Azimap'. With a BSc Hons Degree in Business, David's day-to-day role at Mallon's centres around project management, product development and business administration.

Serving Large Datasets across the web using Open source GI tools.

Web based GIS has long been limited by its ability to successfully serve large datasets across the web in a standards compliant way.

In this presentation we will touch upon the different considerations to take into account when attempting to serve out large datasets using open-source tools.

We will also discover how the development roadmap of the Open source stack had an effect on our project, both adversely and positively.

In this presentation we will describe our experiences during the research and development cycle of our web GIS application and highlight how we successfully implemented a solution which is capable of serving maps with a combined feature count of over 100 million via the web. By attending this presentation, any potential developers of web gis application will be made aware of the potential problems and the resolutions to those problems.

Mark Conroy - Galway County Council

Mark is the GIS Coordinator with Galway County Council and has been with the organisation for over 14 years. Mark has been working in the field of GIS since 1998 both in the private and public sector and has continued his education in the area of IT and Spatial Planning. Most recently, Mark on behalf of Galway County Council won the IRLOGI award for "Best Location based Web Application" for the implementation of a Self Service Pre Planning System for Galway County which is powered by FME.

Automated and On-Demand Spatial Reporting in Galway County Council

Galway County Council have implemented cutting edge spatial reporting capabilities across a number of sections, in particular the Planning Section. The reporting capabilities are a powerful means of aiding the decision making process in Galway County Council as well as assisting in the proper sustainable development of a county with a rich environmental heritage. These spatial reporting capabilities have been implemented using FME (desktop and cloud) and allow for maximum flexibility in terms of the format and delivery of the spatial reports.

Ciaran Kirk - IMGS

Ciaran has worked in the IT industry for nearly 15 years, initially as a software developer and for over 10 years in the GIS sector working with IMGS, where he is now General Manager. Since working in the GIS industry he has worked with utilities and government agencies across the island of Ireland to evolve their GIS from back office systems to critical mainstream enterprise wide solutions. Ciaran has also been at the forefront of the next generation web and mobile GIS development in Ireland.

Fostering Economic Growth through the Exploitation of Space

Sterling Geo, Hexagon Geospatial's UK Partner, has been a founding and resident SME partner of SAC since 2013. Fully supported by Hexagon, Sterling Geo have developed application prototypes utilising the new Hexagon Geospatial Smart M.Apps cloud-based geospatial platform. Amongst the early developments, are:

- The Green Space Analyser - developed for local authorities to understand the changing availability of open space within the urban environment and provide the basis for future monitoring.

- Protected Landscape monitoring – aimed at delivering a sustainable and cost-effective solution for identifying changes in area and relative health of large numbers of disparate sites

- New build monitoring – using satellite and airborne techniques to identify changes in the built environment

This has now led Sterling Geo to partner with the UK Space Agency under the Space for Smarter Government Programme (SSGP) aimed at driving the uptake and use of space products, data and services across government departments. Ciaran will present on how this innovative program and technologies are growing the use of satellite data in local government in the UK and how this can be adopted in Ireland.

Dr. Seamus Coveney - University of Glasgow

Seamus is employed as a lecturer in GIS, Remote Sensing and Geoinformatics in University of Glasgow, and previously spent time as a research fellow in the National Centre of Geocomputation in NUI Maynooth. Seamus has over 15 years of experience in GIS, RS and Geo-data acquisition and processing, and was a developer of 3D Environmental Feature Recognition.

3D Feature Recognition from point cloud and DEM data sets.

The inherent representation of natural and anthropogenic features within high resolution 3D point cloud and 2.5D Digital Elevation Model (DEM) datasets presents opportunities to identify features based upon their morphologies. Given that the identities of many features that occur within natural and anthropogenic environments are related to their morphological form; it is proposed here that the 3D spatial relationships between point cloud data and their horizontal and vertical neighbours might potentially be used to recognise features that are characterised by distinct morphologies.

It is further suggested that this characterisation may enable the classification of a broad range of morphologically characteristic 3D features, vegetation classes and land cover classes. An algorithm is developed to process xyz data from any source, deriving 3D (x,y & z-axis) morphological measurements that are subsequently evaluated as a means for characterising a range of natural and anthropogenic features in the environment. A 2-metre resolution unstructured xyz airborne LiDAR point cloud data set supplied by the Office of Public Works is used for this evaluation. The resulting 3D morphological measurements are then considered as prospective morphological dimensions from which a trained morphological classification is attempted.

Results from the classification evaluation indicate the morphological dimensions result in feature classification at an accuracy level of over 87%, suggesting that the proposed 3D Morphological Classification approach offers potential for the recognition of quite a diverse range of features, vegetation types, and land cover classes from 3D point cloud data.

Furthermore, the 3D Morphological Classification approach is designed to handle 2.5D data also, making it directly transferrable to any DEM or Digital Surface Model data set, and greatly extending its application potential beyond LiDAR only. The approach is also designed to produce a data structure that is directly compatible with image data and image classification, facilitating data fusion and a combination of morphological and image classification, potentially further enhancing feature recognition outcomes.

Gavin Duffy - RealSim

Gavin has a background in geophysics and spent 10 years in industry and academia, working in Canada, Spain, Australia and Ireland. It was while researching how to extract 3-dimensional information from photography that he discovered the potential of gaming technology for real world 3D simulations. In 2008 he set up RealSim Limited, initially providing a powerful planning and communication tool to the planning and development community, but later expanding their services to the marine, archaeological, industrial and medical device sectors.

Making 3D Survey Data accessible to the General Public - The Titanic Belfast 3D Interactive Seabed Display

Ireland has one of the largest and most detailed bathymetric survey databases anywhere in the world. The volume of seabed data acquired in the 90's and naughties posed a real Big Data challenge long before the term was invented. The data jointly managed by the Geological Survey of Ireland and the Marine Institute, required specialist marine GIS software to process and grid to produce bathymetric maps. Until recently, this data was largely inaccessible to the public outside of the marine science community.

Titanic Belfast houses the only dedicated educational outreach centre to marine science on the island of Ireland. Their Ocean Exploration Centre aims to educate young and old on the wonders hidden beneath the waves and the modern technologies employed to map them. In late 2013, they commissioned RealSim to build an interactive 3D simulation of the seabed off Northern Ireland's northern coastline between Donegal and Antrim. The task set to us was to enable visitors to seamlessly fly around gigabytes of seabed data, at multiple resolutions, with location based information tabs, where the entire scene is navigable in first person within the 3D seabed environment or via a connected 2D overview map.

The solution was built around a popular middleware 3D game engine (Unity3D). Game engines can render large volumes of 3D data in real-time and are designed to easily accommodate custom functionality built around their assembled environments. However game engines are not geospatial platforms and require terrain data to be presented in the form of height maps at specific resolutions and in a specific format. The process was not straightforward and involved 10 different steps performed in Global Mapper and Photoshop. Upon hearing of RealSim's work with their platform, Global Mapper recognised the opportunity to offer a direct terrain export option to the global Unity using community, and worked with RealSim in developing the export solution. This is the first attempt by a GIS software company to accommodate the needs of game engine users. Such users are either game developers looking to incorporate real terrain data for environment authenticity or non-game developers like RealSim developing real world applications. Geospatial data has just become a lot more fun!

Claire Byrne – Environmental Protection Agency

Claire is currently employed by the EPA and has over 10 years experience in GIS in both public and private GIS sectors. Claire's expertise lie in developing a number of automated GIS based spatial assessment applications to aid in the EPA's understanding of environmental impacts such as: DREAM, Risk ranking maps for DWWTS, Proximity analysis, CCT. As a deployable team member of MapAction, a UK based humanitarian mapping charity, since 2012 Claire has deployed 3 times, twice to the Philippines in 2012 (Typhoon Bopha) and 2013 (Typhoon Haiyan) and most recently in response to Cyclone Pam in the Republic of Vanuatu in the South Pacific, earlier this year.

Domestic Wastewater Application

A new regime for inspecting DWWTSs (aka septic tanks) has been established in Ireland. The Environmental Protection Agency is responsible for the development of the National Plan publishing the first National Inspection Plan in February 2013. The aim of the Plan is to protect human health and water from the risks posed by domestic waste water treatment systems by using a two-strand approach of education and awareness strategies linked with a risk-based inspection process.

The Plan is delivered by Local Authorities and the number of inspections for each county is allocated on a risk basis. 'Risk-based' means putting resources where the risks are greatest to human health and the environment. The inspections have, for the first time, allowed for the systematic collection of information on the condition of DWWTSs in Ireland. This data is gathered through the Domestic Waste Water Application (DWWA) available through the EDEN portal. The application is a centralised application for all information and tasks relating to the inspection of Domestic Waste Water Treatment Systems.

The DWWA is primarily a CRM application with an embedded JavaScript map application giving the user a simplified map while providing detailed GIS information back to CRM. To log the results of an inspection, an inspector uses the map to select the location of the inspection site. This is achieved by simply using zoom and pan tools or through a selection of gazetteers allowing a search by County & Townland or by providing specific coordinates in WGS84, ING or ITM. The new inspection site is created by simply clicking on the map. At this point the GIS application queries numerous datasets from an Esri ArcGIS Server map service and returns data relating to exact coordinates, County, Townland and so forth. Further attributes relating to the breakdown of the environmental risk-ranking results of the site location are also returned. All of these spatially derived data are then stored against the site in the CRM application. Linking this data with National Inspection Plan targets allows for effortless progress assessment and reporting. Once a site is created it must also be linked to the associated property in the GeoDirectory. The user achieves this by simply clicking the relevant GeoDirectory point on the map. In the background a separate WCF service is called which retrieves the unique address reference for the point and returns this and the full address to the CRM application where it is stored against the site and can be used for correspondence and notifications.

In addition to the embedded map interface, an additional resource is available through the DWWA in the form of a standalone Silverlight WebGIS. This map interface provides all GIS data that is used in the detailed spatial assessment performed in risk map generation, on which the National Inspection Plan is based, thus providing transparency of GIS methodology and data used to all stakeholders. Through this webGIS the user may also run assessment reports from National, LA to townland and 1km grid scale. The variance in scale of such reports allow managers to plan inspections at a local authority level while also allowing inspectors to generate reports and maps to bring into the field for use during their inspection. A data download package is also available from here for integration in Local Authority native systems.

Pat Murphy & Steven Fox - Teagasc and Compass Informatics

Pat has 9 years experience working with Teagasc and currently holds the position Head of Knowledge Transfer within the organisation, having previously held a role as Assistant Director - Advisory.

Steven is an experienced Systems Developer and Analyst with Compass Informatics and is involved at all stages of the Project lifecycle, from business case development during pre-sales, to ensuring scope delivers maximum business value during requirements gathering, through to ensuring the agreed business objectives have been met during UAT.

Nutrient Management Planning system for Irish farmers

Teagasc, the agriculture and food development authority for Ireland, is currently preparing for the go-live (September 2015) of Nutrient Management Planning software tools to serve the nutrient management planning needs of Irish farmers. Using web-based tools, digital mapping, and a nutrient management planning wizard the technology team has developed tools which allow farmers to target increasingly limited nutrients to where they are needed on their farms.

Emphasis has been placed on ease of use as the system will be used by up to five hundred farm advisors, who will use the system to produce Nutrient Management Plans for farmers. Up to 50,000 plans per year will be created using the solution.

In order to help farmers to make full use of their plan the system is presented in a user friendly manner and contains meaningful information that will assist with nutrient use at farm level. This will have advantages for cost effective farming while also taking good environmental practice into account. The new tools provide a centralised web-based software system to deal with fertilizer planning (and subsequently derogation fertilizer plans) and to ensure quality control on the information being delivered to farmer clients. The system is also capable of enhancement over time to reflect changing needs and regulations and will be capable of handling the expected increased demand for Plans over coming years.

The system used best practice IT tools and development approaches using Microsoft .Net plus GIS technologies, and integrates with selected other Teagasc and Department of Agriculture systems for effective management of soil samples, ownership boundaries, land movement systems, and other data required for the nutrient management planning process.

John O'Flaherty - Microelectronics Application Centre

John has over 35 years experience of technical project management and development, particularly in the areas of technology innovations, trends and opportunities and engineering these into commercial products for global market. John has been with the National Microelectronics Applications Centre since 1987 when he joined as Managing Director.

Geospatial Linked Open Data for the GeoTechnology of the Future

- How can Geospatial Information (GI) best be integrated with other data on the Web?
- How can machines and people discover that different facts in different datasets relate to the same place, especially when 'place' is expressed in different ways and at different levels of granularity.
- The SmartOpenData EU project has spent 2 years identifying and assessing existing methods and tools, and helping to create a framework for their use.

GI is a major element in defining context for knowledge that can be exposed in many different ways to end users. The societal, economic and scientific benefits of integrating GI into commercial and institutional processes is potentially huge. The process would be substantially aided if data were published on the Web with the appropriate GI at the source, thus allowing discovery and access using the standard mechanisms of the Web. The SmartOpenData project is one of many international efforts being made to integrate Linked Data with Geospatial Information.

In SmartOpenData our aim was to help bridge the gap between the worlds of Geospatial Information involving SDI/INSPIRE based on OGC (Open Geospatial Consortium) standards and Linked Open Data (LOD) from the Semantic Web based on the W3C (World Wide Web Consortium) collaborative standards movement.

SmartOpenData (www.smartopendata.eu) has created a Geospatial Linked Open Data framework (including software tools and data) fed by public and freely available data resources, existing sources for biodiversity and environmental protection, and research in rural and European protected areas and its National Parks, driven by the practical needs of 5 pilots across Europe.

The Irish pilot focused on the Burren National park and explored the provision of SmartOpenData enabled services to support the Burren GeoPark Tourism for Conservation, Ground-Truthing potential Protected Monument sites and input to the Irish Open Government Partnership (OGP) Open Data Strategy development process.

The Geospatial Linked Open Data framework provides significant opportunities for SMEs to generate new innovative products and services that can lead to new businesses in the environmental, regional decision-making and policy areas among others.

Adam Leadbetter - Marine Institute

Adam is a Data Management Team Leader at the Marine Institute in Galway. Adam's main areas of expertise lie in Information Science, Data Structures and Geoinformatics and he is currently responsible for the redevelopment of Ireland's Marine Atlas as well as writing the Marine Institute's data strategy.

Where did my layer come from? The Semantics of spatial data release paper?

In his lecture, "Theory of Creative Fitting", Ian McHarg introduced his vision for cross-disciplinary data and information sharing networks with the end goal of producing detailed overlay maps for the purposes of ecological architectural planning. Within McHarg's networks, experts in various fields, such as hydrology or surface geology, would provide data layers to the final overlay map with full provenance, such that the users of the overlay maps would know the originator of the data, the "value systems" by which the data were created and could place their trust in the outcomes.

In the light of McHarg's statements and in order to allow the encoding of value systems in a cyber-GIS, analyses of: data quality; data publication networks; trust in collaborative research networks; and the metaphors of data publication, data release and data ecosystems have been synthesised into a logical model of the data release lifecycle. This model concerns the actors in the data release process; the data-information-knowledge ecosystem through the various stages of the data release process and the impact of data release on perceptions of trust through the data release lifecycle.

Finally, the lifecycle of data release involves the initial release of a data-layer, possibly with a Persistent Identifier (PID) more generic than a Digital Object Identifier (DOI). A data description paper can be written about the dataset, which then necessitates the assignment of a DOI to the datasets; the DOI can be seen as an indicator of trust through "benevolence". A technical document citing the dataset may then be informed by the dataset release or the dataset description paper. These citations may show the "competence" (in terms of a trust model) of the original datasets, and the dataset description papers or other technical articles show the integrity of the dataset.

The synthesised logical model has been represented in freely available ontologies, such that data layers can be annotated with metadata about their provenance and stage within the data release lifecycle before incorporation into a cyber-GIS, in which distributed data providers provide for a collaborative research environment.

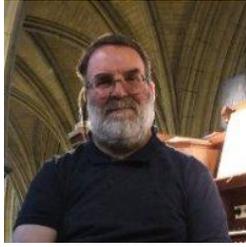***Chris Brunsdon - National Centre for Geocomputation***

Chris is currently Professor of Geocomputation, and Director of the National Centre for Geocomputation, at the National University of Ireland, Maynooth, having taken up the position in January 2014. His areas of expertise include spatial statistics, exploratory spatial data analysis and visualisation.

Representing Inexact Geographical Information - Algorithmic Map Caricatures

Although much geographical information is exact - such as boundaries for cadastral mapping - this is not always the case. For example, the commuter hinterland of a town or city is certainly a geographical entity, but it would be difficult to specify it precisely. Similarly, analysis of 'big data' such as mining text patterns from crowd-sourced descriptions of places in a city where people felt unsafe can lead to geographical patterns, but they are likely to exhibit some degree of locational 'fuzziness'. Fuzzy information can still provide valuable geographical meaning, and so it is useful to map it. However there is a need to do so in an 'honest' way, conveying its imprecise nature. Also maps may need to combine layers of information with different degrees of fuzziness, or combine layers of fuzzy and exact information - an example of this might be the unsafe urban areas of the considered above overlaid onto a street map. Here it is important to allow the map to communicate which information is fuzzy, and which is not. In other situations it may be important to show the relative degree of fuzziness of different entities being mapped.

This talk will propose a way of addressing these issues, using a set of open source software mapping tools developed by the author which can generate maps containing objects that appear to be drawn by hand. It is argued that in an intuitive way, objects on maps with this 'caricature' appearance convey a notion of vagueness or fuzziness. Merging these with objects represented in the more conventional ways usually provided by mapping software allows the distinction between fuzzy and exact entities. Also, by specifying parameters that adjust the degree of 'roughness' and other aspects of the hand-drawn style, it is possible to represent varying degrees of fuzziness.

The talk will describe the software used to do this and give a number of examples demonstrating the idea in practice.

Martin Charlton - National Centre for Geocomputation

Martin is a Senior Research Associate and Deputy Director of the National Centre for Geocomputation at NUI Maynooth. Martin has been a leading researcher in the area of GIS for over 20 years and is one of the originators of Geographically Weighted Regression and is responsible for writing much of the software for this.

Mapping People

Visualisation is an act of communication. There is an ever-growing body of methods and techniques for visualising our information, but we appear to be stuck to a limited repertoire of alternatives. Why is this the case? GIS users are usually constrained by the choices provided by the software manufacturer. And we seem to be wedded to Irish National Grid or Irish Transverse Mercator as the map projection of preference. Yet these choices might actually lead to visualisations that mislead rather than illuminate or engender deeper enquiry.

If we move away from ING or ITM, we start to free ourselves. Frank Pick's celebrated map of the London Underground shows the stations, and is not tied to a regular map projection. If we're mapping indicators from our quinquennial censuses then we need a projection that will allow us to reveal, rather than conceal, people.

Anamorphic maps (cartograms) provide a convenient solution. Areas of high density are stretched, and areas of low density contracted to achieve uniform density of the chosen indicator (population, for example). The Worldmapper website presents hundreds of socio-economic and environmental indicators mapped as cartograms; so cartograms are no longer mere mapping esoterica. How do you create them… what software is available… what options are possible… what data do you need… how do you use them? Using a range of examples from Ireland and elsewhere this presentation will provide answers to these questions.

Kerry Ryder - Tallaght Hospital

Kerry is a Senior Healthcare ICT manager in Tallaght Hospital. She has over 15 years experience in enterprise programme and project management of healthcare implementation, business intelligence, strategy development, risk management and health innovation.

Designing and Publishing Indoor Maps for Patients and Visitors in an Academic Teaching Hospital.

Introduction: This project improves the service user and provider experience by designing an accessible indoor map in an academic teaching hospital. 28% of service users (n=175) in the Hospital reported disorientation during a project survey. 84% (n=109) of staff categorised indoor maps as a service improvement. Patients who get lost can feel anxiety, shame and even panic. Maps can improve patient autonomy. Internationally large hospitals include maps with signage and letters to support patients to find their way to services.

Initiation: Volunteers completed a hospital survey (n=175) showing 84% of disoriented patients would have liked a map. Up to 18 hours/day staff time is invested in re-orientation of patients.

Planning: Analysis of service user locations included signs, directions, and kiosk locations. Tool choice was Adobe Illustrator (CS6). Map format was paper, either printed as a leaflet or a map on the reverse of a letter.

Implementation: The map was endorsed by senior management and published on the hospital website. Development took 80 hours and was cost neutral. Adopting maps costs €1700 annually.

Evaluation: MAPQUAL quality framework3 identified issues with signage accuracy (69%) affecting map clarity and usefulness. There is no mechanism to ensure uptake in patient letters. Map quality: medium-high.

Conclusion: The HSE Change Model supports developing innovation projects but mainstreaming may require further research where change is not supported by existing processes. Hospitals should understand how service users experience complex buildings by developing wayfinding strategies that assign responsibility for direction and sign consistency.