Mastering ArcGIS Platforms to Build a National Census Web Mapping Tool

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• What is AIRO
• The Census in Ireland
• Building National Mapping Infrastructure
  – Demographic Profiling through a map single layer
• Process and Automation
  – End User Requirements
  – Analytics & the Geographical Hierarchy
  – Automated Processing
    • Data Processing
    • Scripts
    • Automated Html pop ups
Outline

• Based Maynooth University, Ireland

• AIRO is a research unit and spatial data website focused on improving evidence informed planning in Ireland
  – Collects, analyses and provides evidence and tools to support better planning and decision making
    • Maps, data resources, policy advice, research and training
  – Maximise the usage and benefit of publically funded and readily available datasets

Who do we work with?

– Government Departments
– Semi-State bodies
– Regional Authorities, Local Authorities, Local Partnerships etc
– Academics and Researchers
Census in Ireland

• Every 5 years - Detailed snapshot of Ireland
• Carried out by the Central Statistics Office

• Outputs: Multiple geographies, 15 themes, 777 Indicators
• So where do we come in??
• Appetite for data: Planning, policy/decision making, funding – Government Reform
• Technical (data/GIS) skills deficit
• AIRO sign MoU with CSO to visualise the Census

**Project Objective:** Create a non-technical, accessible demographic profiling and analysis toolkits.

• Not just a map!
• Leverage the html pop up to provide comparison/benchmarking across geographical hierarchy.
The Census Web App
Development Workflow

1. **Raw Data**
2. **Data Prep**
3. **Production of Development Framework**
4. **Visualisation**
5. **Analytics**
6. **End User**
Process begins with the end user
- Who is the user?
- What are the user needs?

Raw Data
Census 2016
15 Theme
777 Indicators

End User
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- Who is the user?
- What are the user needs?

Two core user demands:
- Assess wider spatial trends
- Detailed local level profiling & benchmarking
• Analytics is the discovery, interpretation, and communication of meaningful patterns in data
• Develop an analytical component to the WebApp
• Coined the “Comparative Geographical Hierarchy”
• Bottom Up – Top Down Comparisons
• Driven by Html Pop Up
Spatial Scales - Nesting Hierarchy

- State (1)
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- Local Electoral Area (137)
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- Electoral Division (3,409)
Spatial Scales - Nesting Hierarchy

- State (1)
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- Local Authority (County) (31)
- Local Electoral Area (137)
- Electoral Division (3,409)
- Small Area (18,641)
Small Areas

- Smallest Irish administrative geography
- Unit used for mapping in WebApps
- 18,641 Units
- Average 100 Households per SA
- Average pop Pop 250 per SA
- Allow very detailed levels of spatial analysis
- SA’s nest within most Irish Admin/political geographies
- NB: We can aggregate SA to (almost) any of the key Admin Geographies in Ireland
Development Workflow - Visualisation

Visualisation

Data Prep

Standardised Development Framework

Analytics

2nd User

Raw Data
Development Workflow - Visualisation

Visualisation

- Content hosted ArcGIS Server
- Web Map/Pop Ups hosted/configured AGOL
- Web App Configured WAB Developer Edition
  - Modified Launchpad Theme
- Clean, simple user friendly WebApp.
- No unnecessary widgets. Focus on analysis, benchmarking and profiling
  - Modified Chart Widget
  - Annotate/Draw
  - Print (custom template)
  - Street View
- All very simple stuff...
3 Key Automated Outputs:

Datafile: Mapping layers required for each feature.
- 5 Mapping layers generate 80 columns of contextual data for pop ups. Make it 240 for Time series!
- Aggregated geographic layers hard on resources

Scripts:
- Working with your National Statistical agency requires high grade outputs
- Headings, alias, number formatting - also a key consideration for working within AGOL

Html
- Pop Up configuration in AGOL is cumbersome to say the least… automation is KEY.

- Automated Masterfile is Excel!
Datafile

- Comparative Geographies automatically calculated
- Rates (%) automatically calculated
- .gdb (<10) and alias headings automatically calculated – logic based codes added to indicated number format, spatial scale
- Output mapping file based combines all data and headings – joined to .shp and imported to .gdb
Development Workflow – Scripts

Scripts

• **Important step** - Poorly formatted data is cumbersome to format in AGOL. No bulk approach to editing in AGOL

• Masterfile automatically generates:
  – AddField, CalculateField, DeleteField & AlterField. Py scripts

• Lack of Alias names, poor formatting reflected in WebApp widget outputs, pop ups. App loses credibility with untidy outputs.

• Auto generated scripts exported to Visual Studio
Html PopUps

- Each map layer contains a geographical hierarchy pop up (777).
- Pop up contains 25 to 55 links to underlying data.
- AGOL not configured for large scale customised popups. Html editor makes it possible.
- Standardised pop up linked to column headers produces pre-set html code.

Custom Attribute Display

Use the area below to define, format, and lay out the information you want to display.

Customised html required to align AIRO/CSO branding/colours.
Key Points: Automation & Development

- National Mapping toolkit – Highest standards of presentation required
- Shape content/outputs around end user needs.
- Design and build mock up – Consult & Test
- Working backwards: plan, identify and automate processes as required.
- Planning, structure and logic the pillars functioning system
- ERSI suite has unbelievable potential – It’s just about fitting it around your end user.
Thanks

Questions?

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