An Integrative Approach to Web GIS for Local Building Departments

A CASE STUDY IN PERMITTING AND INSPECTIONS

Presenter: Dave Ostrander
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• States grant local governments (e.g., counties and municipalities) the authority to regulate construction activities to encourage the health, safety, and well-being of their residents (55 Illinois Compiled Statute 5/5-12).

• Current building department permitting and building inspection practices rely on paper-based system for issuing permits and conducting building inspections.

• Communicating permit approvals and building inspection results requires in-person office visits, phone calls, or written correspondences.

• Building permit files are compiled and then maintained in physical storage spaces and some is manually transcribed into a digital format.
Key Features of a Web GIS System:

- **E-permitting**
  - Online Permit Submission
  - Online Permit Review

- **Integrating Applications**
  - Benefits
  - Easy to do

- **Data Collection Applications**
  - Survey123 for ArcGIS- Form-Centric
  - Collector for ArcGIS- Map-Centric

- **Leveraging Webhooks**
  - Automate Back-End Processes
  - Adds Fail-Safe

- **Smart Layers**
  - Definition Query Based Services
  - View Based Services
A Use Case Scenario:

Using GIS to Conduct Building Inspections
Why Integrate?
Data Collection Applications

Survey123:

• Released in 2016
• Form centric (Surveys)
• Surveys are created via the web or a spreadsheet editor
• Surveys are published as feature services
• Supports editing new and existing data
• Supports smart forms
• Supports disconnected editing
• Supports anonymous access
• iOS, Android, Windows (7, 8, 10), Mac, Linux, Web
• Supported by Esri

Collector:

• Released in 2013
• Map Centric (points, lines, polygons)
• Data collection maps are created using AGOL or Portal
• Data is published as feature services
• Supports editing new and existing data
• Supports disconnected editing
• iOS, Android, Windows 10
• Supported by Esri
What do these terms really mean?

**FORM CENTRIC**

- Data Collection that is more Concerned with Questions
  - Attribute data centric
  - Best suited for complex attribute collection
  - Geo-Capable, but not the focus

**MAP CENTRIC**

- Data Collection that is more Concerned with the Where
  - Geospatial data centric
  - Best suited for simple attribute collection
  - Attribute capable, but not the focus
Using Survey123 with Existing Feature Services

The easiest way:
- Publish data as a hosted feature service or to an ArcGIS Server that is federated with Portal for ArcGIS
- Launch Survey123 Connect > choose New Survey > click the radio button “Feature Service” > choose your feature service > Create Survey
- Surveys From Related Tables
  - Delete Questions Not Found in Related Table
  - Fill in the form_id property with name of the related table in the settings tab of your spreadsheet

The harder way:
- Publish data to non-federated ArcGIS Server
- [http://support.esri.com/technical-article/000014793](http://support.esri.com/technical-article/000014793)
URL Scheme

Provides a protocol for launching apps and invoking actions:

- Launching the Survey123 app from Collector
- Opening a specific survey
- Prepopulating survey questions

Example URL:

```
arcgis_survey123://?itemID=d6141937cfe740c9a144a817fd3b26&field=BldPerm={PermitNum}&Owner={TaxName}&Inspector={Plumblnspct}
```
Integrate Survey123 with these services:

Webhook Usage Example:

Use HTML and payload attributes to dynamically create a consistent and polished report that is then converted to PDF format on the fly.

- Incoming Survey123 payload
- Convert HTML to PDF
- Send boilerplate email making use of the payload attributes and include PDF report from previous step as an attachment

If the process fails immediately, send email notifying GIS staff of the problem.

- Send email
- New step
- Save
Completed Building Inspection Forms
## Feature Layers Published with Definition Queries

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<th>Title</th>
<th>Type</th>
<th>Modified</th>
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<tbody>
<tr>
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<td>Feature Layer</td>
<td>Jan 24, 2020</td>
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<td>Closed Building Permits and Inspections</td>
<td>Feature Layer</td>
<td>Jan 24, 2020</td>
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<td>All Active Building Permits and Inspections</td>
<td>Feature Layer</td>
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<td>Active Building Permits and Inspections (Not Past Estimated Completion Date)</td>
<td>Feature Layer</td>
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<tr>
<td>Building Inspections View</td>
<td>Map Image Layer</td>
<td>Oct 4, 2019</td>
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</tbody>
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### Layer Symbology

- `C`
- `C`
- `C`
- `D`
- `F`
- `G`
- `P`
- `S`
- `SF`
- `RI`
Map Image Layer Published Using a Geodatabase View

Popup Without View

Popup With View
Software Demonstration:
Building Department Office Staff...
(Not included in slide deck due to file size limitations)
Software Demonstration: Building Department Field Staff...

(Not included in slide deck due to file size limitations)
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Thank You!