Integrating Esri Software With Third Party Solutions

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Raj Patil - Cityworks
Third Party Integration at the City of Redlands

- Cityworks – Permitting and Work Orders
- RoadVista Model 922 – Sign Retroreflectivity
- CitySourced – Citizen Engagement
Cityworks – made to work with Esri Products

- A map powered by ArcGIS Server is an integral part of Cityworks.
Information from your GIS can be brought into Cityworks

- Here we have selected a parcel and the address information has been automatically added to our permit.
Work Orders can be attached to assets to keep track of costs.

• A tree trim work order is attached to a tree in the GIS data.
ArcGIS can be used for further analysis.

- A heat map is generated to show where tree maintenance costs are the highest.
Expanding on the out-of-the-box capabilities.

- Adding Encroachment Permits to the Road Closure map.
Old Method – ArcGIS Online Editing

- Staff maintains data adding locations and removing them when the permit is closed.
Wait – All the information we need is in Cityworks

- Results of query that pulls all the data together.
The information we need is in four different tables.

### Table 1: CA_DATA_DETAIL
<table>
<thead>
<tr>
<th>CA_DATA_DETAIL_ID</th>
<th>CASE_DATA_DETAIL_ID</th>
<th>CA_DATA_GROUP_ID</th>
<th>DETAIL_SEQUENCE</th>
<th>DETAIL_CODE</th>
<th>DETAIL_DESC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>23709</td>
<td>530</td>
<td>4</td>
<td>M-ENCDOCS8</td>
<td>Anticipated Completion Date</td>
</tr>
</tbody>
</table>

### Table 2: CA_OBJECT
<table>
<thead>
<tr>
<th>CA_OBJECT_ID</th>
<th>ORG_ID</th>
<th>CASE_TYPE_ID</th>
<th>SUB_TYPE_ID</th>
<th>SUB_TYPE_DEFAULT_TEXT</th>
<th>CASE_NUMBER</th>
<th>PROJECT_ID</th>
<th>CASE_NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>260</td>
<td>85</td>
<td>NULL</td>
<td>PALM TREE TRIMMING</td>
<td>E11-4875</td>
<td>NULL</td>
<td>NULL</td>
</tr>
</tbody>
</table>

### Table 3: CA_ADDRESS
| x_coord       | y_coord       | CA_ADDRESS_ID | CA_OBJECT_ID | ADDRESS_ID | LND_OBJECT_ID | OBJECT_ID | STREET_NUMBER | ST | |
|---------------|---------------|---------------|--------------|------------|---------------|-----------|----------------|----|
| -13045560.855 | 4033572.965   | 1             | 260          | NULL       | NULL          | 60715     | 1200 E         |    |

### Table 4: Contractor
<table>
<thead>
<tr>
<th>CONTRACTOR_ID</th>
<th>ORG_ID</th>
<th>USER_ID</th>
<th>BUSINESS_NAME</th>
<th>FIRST_NAME</th>
<th>LAST_NAME</th>
<th>ADDRESS_LINE1</th>
<th>ADDRESS_LINE2</th>
<th>ADDRESS_LINE3</th>
<th>ADDRESS4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>NULL</td>
<td>SIGNRESOURCE</td>
<td>NULL</td>
<td>NULL</td>
<td>PO BOX 549</td>
<td>6235 DISTRICT BLVD</td>
<td>NULL</td>
<td></td>
</tr>
</tbody>
</table>
Create a SQL view to extract the needed data.

- **Advantage**: always up to date.
- **Disadvantage**: slow, 1.7 million records, query takes 20 seconds.

```sql
SELECT object_id, ComplDate, StartDate, Type, Street, Direction, FromStreet, ToStreet, ProjectDescription, x_coord, y_coord, Business_Name
FROM CAST(object CA_OBJECT_ID AS int) AS object_id, MAX(CASE WHEN d.detail_desc = 'Anticipated Completion Date' THEN d.date_value END) AS ComplDate,
     MAX(CASE WHEN d.detail_desc = 'Construction Start Date' THEN d.date_value END) AS StartDate,
     MAX(CASE WHEN d.detail_desc = 'Type of Closure' THEN d.LIST_VALUE END) AS Type,
     MAX(CASE WHEN d.detail_desc = 'Street Name' THEN d.COMMENT_VALUE END) AS Street,
     MAX(CASE WHEN d.detail_desc = 'Direction of Closure' THEN d.COMMENT_VALUE END) AS Direction,
     MAX(CASE WHEN d.detail_desc = 'From Cross Street' THEN d.COMMENT_VALUE END) AS FromStreet,
     MAX(CASE WHEN d.detail_desc = 'To Cross Street' THEN d.COMMENT_VALUE END) AS ToStreet,
     MAX(a.SUB_TYPE DEFAULT TEXT) AS ProjectDescription,
     MAX(a.x_COORD) AS x_coord,
     MAX(a.y_COORD) AS y_coord,
     MAX(c.BUSINESS_NAME) AS Business_Name
FROM Asteca.CA_DATA_DETAIL AS d
LEFT OUTER JOIN
Asteca.CA_DATA_GRP AS g ON g.CA_DATA_GRP_ID = d.CA_DATA_GRP_ID
LEFT OUTER JOIN
Asteca.CA_CUSTOMER AS c ON c.CA_OBJECT_ID = d.CA_OBJECT_ID
LEFT OUTER JOIN
Asteca.CA_ADDRESS AS a ON a.CA_OBJECT_ID = c.CA_OBJECT_ID
LEFT OUTER JOIN
asteca.CA_CONTRACTOR AS c ON c.CA_OBJECT_ID = c.CA_CONTRACTOR_ID
WHERE (c.CASE_TYPE_ID IN (218, 144, 94, 31)) AND (c.CASE_STATUS_ID = 10 OR c.CASE_STATUS_ID = 4) AND (NOT (d.DATE_VALUE IS NULL)) AND (d.DETAIL_DESC = 'Anticipated Completion Date') AND (NOT (c.CASE_NUMBER LIKE '%')) OR (c.CASE_TYPE_ID IN (218, 144, 94, 31)) AND (c.CASE_STATUS_ID = 10 OR c.CASE_STATUS_ID = 4) AND (NOT (d.DATE_VALUE IS NULL)) AND (d.DETAIL_DESC = 'construction start date') AND (NOT (c.CASE_NUMBER LIKE '%')) OR (d.DETAIL_DESC = 'Street Name' OR d.DETAIL_DESC = 'Direction of Closure' OR d.DETAIL_DESC = 'From Cross Street' OR d.DETAIL_DESC = 'To Cross Street' OR d.DETAIL_DESC = 'Type of Closure') AND (NOT (c.CASE_NUMBER LIKE '%'))
GROUP BY c.CA_OBJECT_ID
HAVING (NOT (ComplDate IS NULL))
```
Create a SQL Server Agent Job to copy the records to a table.

- Advantage: Once the table is made accessing the data is fast.
- Disadvantage: Will not always be up to date.
Create the ArcGIS Service

- Create a database connection to the Cityworks database.
Create the ArcGIS Service

- Register the data with your server.
Create the ArcGIS Service

- Add the table created by the SQL Server Agent Job to ArcMap.
Create the ArcGIS Service

- Display the data as an X Y Event Layer.
Create the ArcGIS Service

- Add definition query and symbolize as necessary.

Current Query
StartDate <= getdate() and CompDate >= getdate()

Future Query
StartDate > getdate()

The SQL query that creates the table only selects permits that are not closed so the permit is automatically removed when the permit is closed.
Map with Encroachment Permits Displayed

Contractor: PAR ELECTRICAL CONTRACTORS, INC
Project: R&R POLE #178305E AND #2101689E WITH ELECTRICAL EQUIPMENT
Description: Lanes
Type: Lanes
Street: ROOSEVELT
Direction: S SAN MATEO
Start Date: May 21, 2015
Estimated Completion Date: June 21, 2015
Code Enforcement Cases

Need to display Code Enforcement Cases so Building Permits will not be issued until case is cleared.
Code Enforcement Cases

Code Enforcement is kept in separate Cityworks database.
Create a View to Extract the Data

```
SELECT CAST(Azteca.CA_DATA_DETAIL.CA_DATA_DETAIL_ID AS nvarchar(30)) AS objectID, Azteca.CA_DATA_DETAIL.DETAIL_CODE, Azteca.CA_DATA_GROUP.CA_OBJECT.CA_OBJECT.CASE_NUMBER, Azteca.CA_OBJECT.CX, Azteca.CA_OBJECT.CY, Azteca.CA_OBJECT.STATUS_CODE, Azteca.CA_OBJECT.DATE_ACCEPTED
FROM Azteca.CA_DATA_DETAIL INNER JOIN Azteca.CA_DATA_GROUP ON Azteca.CA_DATA_DETAIL.CA_DATA_GROUP_ID = Azteca.CA_DATA_GROUP.CA_DATA_GROUP_ID INNER JOIN Azteca.CA_OBJECT ON Azteca.CA_DATA_GROUP.CA_OBJECT_ID = Azteca.CA_OBJECT.CA_OBJECT_ID
WHERE (Azteca.CA_DATA_DETAIL.DETAIL_CODE > '15.03' AND Azteca.CA_DATA_DETAIL.DETAIL_CODE < '15.53' OR Azteca.CA_DATA_DETAIL.DETAIL_CODE > '18.' AND Azteca.CA_DATA_DETAIL.DETAIL_CODE < '19.') AND (Azteca.CA_OBJECT.STATUS_CODE = N'OPEN')
```
Code Enforcement Cases

Python script creates a shapefile using MakeXYEventLayer

arcpy.MakeXYEventLayer_management(CodeEnforcement_dbo_aaaDenyPermitCodes, "CX", "CY", TheLayer, "PROJCS['WGS_
Code Enforcement Cases

Use the shapefile in the service that is used by CityWorks Permitting.
RoadVista Model 922 – Sign Retroreflectivity

Using the Collector App for better results
RoadVista results are not always accurate.
Use existing sign data.

Add Barcode attribute to link to RoadVista results.
Field Crew uses the Collector App

Select the sign and enter the barcode.
Can also add signs if necessary.
Data is downloaded from the RoadVista

Exported as a shapefile.
Script transfers RoadVista info to sde database.
Another script applies the chart below to determine if the sign passes or fails.

<table>
<thead>
<tr>
<th>Sign Color</th>
<th>Beaded Sheeting</th>
<th>Prismatic Sheeting</th>
<th>Additional Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I</td>
<td>II</td>
<td>III, IV, VI, VII, VIII, IX, X</td>
</tr>
<tr>
<td>White on Green</td>
<td>W*; G ≥ 7</td>
<td>W*; G ≥ 15</td>
<td>W ≥ 250; G ≥ 25</td>
</tr>
<tr>
<td></td>
<td>W*; G ≥ 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black on Yellow or Black on Orange</td>
<td>Y*; O*</td>
<td>Y ≥ 50; O ≥ 50</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Y*; O*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White on Red</td>
<td>W ≥ 35; R ≥ 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black on White</td>
<td>W ≥ 50</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. The minimum maintained retroreflectivity levels shown in this table are in units of cd/lx/m² measured at an observation angle of 0.2° and an entrance angle of -4.0°.
2. For text and fine symbol signs measuring at least 48 inches and for all sizes of bold symbol signs.
3. For text and fine symbol signs measuring less than 48 inches.
* This sheeting type shall not be used for this color for this application.
Scripts are scheduled to run every workday.
Results are displayed using ArcGIS online.
CitySourced – Citizen Engagement
CitySourced – Citizen Engagement
CitySourced – Citizen Engagement

Issues are displayed in the CitySourced Console

<table>
<thead>
<tr>
<th>Id</th>
<th>Date Created</th>
<th>Report Type</th>
<th>Nearest Address</th>
<th>Boundary</th>
<th>Status</th>
<th>Privacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>167127</td>
<td>06/29/2015 @ 08:30 AM</td>
<td>Water Leak</td>
<td>1510 South Center Street, Redlands, CA 92373</td>
<td>Redlands, CA</td>
<td>Received</td>
<td></td>
</tr>
<tr>
<td>167096</td>
<td>06/29/2015 @ 06:56 AM</td>
<td>Street Light</td>
<td>20 San Gorgonio Drive, Redlands, CA 92373</td>
<td>Redlands, CA</td>
<td>Received</td>
<td></td>
</tr>
<tr>
<td>167066</td>
<td>06/28/2015 @ 10:04 PM</td>
<td>Other (Please Describe)</td>
<td>1340 East Lugonia Avenue, Redlands, CA 92374</td>
<td>Redlands, CA</td>
<td>Received</td>
<td></td>
</tr>
<tr>
<td>167036</td>
<td>06/28/2015 @ 03:18 PM</td>
<td>TREE - INSECTS</td>
<td>933 East Colton Avenue, Redlands, CA 92374</td>
<td>Redlands, CA</td>
<td>Referred To Dept</td>
<td></td>
</tr>
<tr>
<td>167011</td>
<td>06/28/2015 @ 12:01 PM</td>
<td>Other (Please Describe)</td>
<td>1412 East Palm Avenue, Redlands, CA 92374</td>
<td>Redlands, CA</td>
<td>Received</td>
<td></td>
</tr>
<tr>
<td>167005</td>
<td>06/28/2015 @ 10:12 AM</td>
<td>Street Light</td>
<td>20 San Gorgonio Drive, Redlands, CA 92373</td>
<td>Redlands, CA</td>
<td>Referred To Dept</td>
<td></td>
</tr>
<tr>
<td>167000</td>
<td>06/28/2015 @ 09:38 AM</td>
<td>Homeless Encampment</td>
<td>120 East Colton Avenue, Redlands, CA 92374</td>
<td>Redlands, CA</td>
<td>Received</td>
<td></td>
</tr>
<tr>
<td>166990</td>
<td>06/28/2015 @ 08:29 AM</td>
<td>Parking Illegally</td>
<td>415 Terracina Boulevard, Redlands, CA 92373</td>
<td>Redlands, CA</td>
<td>Received</td>
<td></td>
</tr>
<tr>
<td>166994</td>
<td>06/28/2015 @ 08:03 AM</td>
<td>Homeless Encampment</td>
<td>Fluffo Trail, Redlands, CA 92374</td>
<td>Redlands, CA</td>
<td>Received</td>
<td></td>
</tr>
</tbody>
</table>
CitySourced – Citizen Engagement

Service Requests can be created in Cityworks using the PUSH to option

Report ID# 167127: Water Leak

Assignment & Status
- Assigned To: MUED
- Current Status: Submitted
- Status Last Updated By: MUED

Report Details
- Privacy: Public
- Description: Across the street from this address there is water bubbling up from the street.

Author & Device
- Tel: Unknown
- Submitted On: Apple iPhone 6

Integration Details
- Ticket ID: N/A
- PUSH to

Public Comments
- City of Redlands, CA 06/29/2015 @ 08:31 AM PST
- This report has been submitted directly to Redlands, CA.
CitySourced – Citizen Engagement

Data can be downloaded for further analysis.
CitySourced – Citizen Engagement

Heat map showing the distribution of incidents reported.
Future possibilities:

Using the collector app to update the status of work orders.

Using the collector app to capture street light surveys and create a work order to record the results.
Future Possibilities

Using the collector app to update the status of work orders.

Using the collector app to capture street light surveys and create a work order to record the results.
Never let your stomach know you are a poor man.

Mark Caldwell – Bicycle Racer