Using GIS technologies to improve data communication in local government

Improving access to authoritative data for emergency response.

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GEOG596A Capstone Proposal
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Pennsylvania State University

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Agenda

- Introduction
  - Local Government & Emergency Management
  - Issues: Why is it important?
  - Proposed Solution

- Methodology
  - Workflows
  - Data Sources
    - Prototype Development

- Potential Limitations
- Expected Outcomes and Benefits
- Projected Timeline
- References
Background

“GIS is an ‘intelligence nervous system’ where information bridges across multiple organizations, bridging people and technology to transform how to see, think and act” ESRI, (2019)

- IT Analyst (GIS) for local government
  - Understanding GIS and using GIS

Local governments provide services to the community

- Roads, streets lights are on, clean water
  - Use of GIS in local government improves processes

- Tasked to reduce community risks through emergency management processes
California’s PG&E PSPS Shutoff: October 2019


Why is this important?

- Gaps in communicating data between various stakeholders in local government
- Those in emergency management need access to local government specific data
- Recent local emergency events have proven that there is a need for up to date information
  - *Wildfires*
  - *California’s PG&E Power Safety Power Shutdown*
    - PG&E Websites Crashed
    - Community turned to Local Govt. maps
Challenges

- Data sharing practices need to be improved
  - Organizational constraints
    - Social
    - Monetary
    - Policy
    - Personnel
- Data needs to be applicable at the local level
- Lack of authoritative and quality geospatial data
  - No electronic data standards
  - QA/QC of geospatial data need improvement
  - Future coordinate system changes
“In a case study of regional GIS sharing practices in New Jersey, the authors noted that the highest requester of utility data came from emergency managers.”

Proposal

To address issues of improving access to authoritative data for the City of Fairfield, California.

Development of a prototype to link geospatial information to previously inaccessible authoritative data.
### Current Status: Utility Data

<table>
<thead>
<tr>
<th>Issue</th>
<th>Details</th>
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<td><strong>Need to know where utilities are located during emergencies</strong></td>
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| **Water, Sewer, Storm, Transportation Utility data** | Enterprise geodatabase  
No data standards |
| **Is GIS data = survey level data?** |  |
| **Scanned copies of survey level project plans housed in file folders** | Not easily accessible  
Not always georeferenced  
**AUTHORITATIVE!** |
Current Status: Processes

- Previous GIS assessments
- No written standard operating procedures.
- GIS Data currently available through existing intranet GIS web applications
  - Eliminated widespread use of printed map books of utilities
- Data creation priorities
  - Still use paper / pdf files
  - Constraints in creating geospatial data
Current Status: Other applications

Similar studies have been made on developing geospatial products that link files and maps in historical/architectural fields.

There are existing applications that have linked files:
- Los Angeles City Airport
- San Mateo County
- ESRI web template
Methodology

How do I get there?
Literature Review

- Further literature review on organization issues affecting local government
  - Effective data sharing practices
  - Emergency Management
Public Works & Emergency Management Workflows

- Current Capabilities & Constraints
  - Authoritative Data
  - Personnel
  - Systems: SQL, ESRI

- Data Needs Requirements
  - Emergency Management links

- Promote the importance of authoritative data sharing between stakeholders
  - Meetings
  - Surveys
Data Sources

City Municipal Files of City Projects, Subdivisions
  Pdf scan files
  Set naming convention exists

Existing Enterprise Utility GIS data
Prototype Development

- Develop & run Python script to read current folders into a table
- Follow up with stakeholders to identify additional data needs
- Develop prototype for linking data to geospatial layer
- Work on editor prototype and data viewer prototype
  - Web App Builder → Portal/ArcGIS Online
  - Open Source
- Provide to users for testing
Potential Limitations

- Network connection issues
  - *Mitigation: Consult with City IT staff.*

- Data access not allowed across departments
  - *Policy and/or technical constraints*
  - *Mitigation: Present a proof of concept to management, city attorney review and approval.*

- Organizational reluctance to change
  - *Mitigation: Departmental permission to conduct research, management level support.*

- Personnel Issues:
  - *Retirements, Leave organization*
  - *Mitigation: Ensure organization continuity, build redundancy*
Expected outcomes and benefits

- Increased interdepartmental awareness of data/responsibilities
  - *Increased access to authoritative data*
- Efficient workflows to access data
- Improved response in emergencies
- Data governance improvements
  - *Incentivize data management practices* → *quality data*
- Future: implement electronic data standards and workflows
Phase 1
- Literature Review
- Initial Data Source Identification

Phase 2
- Workflow Identification
- Needs Assessment Development

Phase 3
- Gather Data
- Technology Review

Phase 4
- Prototype Development
- Testing
- Obtain application approval

Phase 5
- Present results

Timeline:
August – October 2019
November – December 2019
January – February 2020
February – June/July 2020
Late Summer / Early Fall 2020
Questions & Feedback

Thank You.
References


References


References


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