Unity In diversity

ArcGIS JS API as an Integration Tool

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Introduction

Integrating the processes of an entire City Hall is not an easy task. Decision making requires updated information in a fast and easy way. Online maps are a great tool for viewing and validation of spatial data. This paper presents a proposal for integration, analysis and storage of the information of infrastructure works and projects in the City of Rio de Janeiro, using the JS API for ArcGIS.
The Problem

The City Hall of Rio receives a large number of files with projects to be analyzed and approved by the technicians before their execution. To ensure the quality of the GIS information, it is very important to check if the files are in the correct location.

- These projects are elaborated by different and heterogeneous sources such as engineering firms, architecture offices, etc.
- Each project has its own specifications.
- The projects contain drawings (CAD files) and technical data (Spreadsheets, text files, reports etc.).
- They are analyzed by different departments to verify if they are in accordance with the legislation.
The Challenges

- How to:
  - Achieve standardization?
  - Create an agile workflow?
  - Automate the processes?
  - Improve the quality?
  - Ensure the correct georeference of these files?
  - Integrate the information?
  - Maintain a large number of files?
  - Combine geometry and technical data?
  - Make them available in an agile and efficient way?
The Solution

The strategy is to build a website using the ArcGIS JS API to receive the applications and emit online licenses for the entire City Hall. Online maps can be used by citizens and companies for:

- Consult the legislation of the different zones of the city.
- Download all the necessary input for the elaboration of their projects.
- Pre-validate the technical data and make sure that the project is in the correct location before submitting the files.
- Upload the files and track the status of the applications.
Why ArcGIS JS API?

The API provides an extremely efficient way to bring geoprocessing power and geographic information to users.

- Maps can be viewed on any device, anywhere.
- The information in JSON format combines attributes and geometry.
- It is lightweight and can be exchanged and stored in an easy way.
- The use of HTML and JavaScript allows great flexibility and opens up infinite possibilities in the development of applications.
The Path to Integration

Steps Required

- Unifying
- Improving the Workflow
- Standardizing
- Increasing Quality
Structure the legislation in a database.

Define the set of data required for each Department.

Define the zones on the maps according to the legislation.

Define the validation criteria for each project to be received by each department.
Working Together - Improving Workflow

Planning and Development
Parks and Gardens
Public Works
Utilities
Transportation
Environment
Housing

Enterprise Service Bus

JSON

OK?

Database
We must provide companies and citizens with resources so that they can elaborate the projects according to a defined standard. Map Servers are ideal for this purpose.

Centralized information is easier to maintain and it is accessible to everyone, from anywhere. Users can view or download the information such as streets, rivers, elevations and profiles, neighborhood limits, areas of environmental protection, risk areas, etc.
Defining the zones on the map we can automatically apply the spatial analysis to the projects that are submitted for approval.
Online Application
Making it Possible

- The User Interface
- Converting the Data
- Data Integration
- Conclusion
The User Interface

Resources and Forms

- Zoning
- Legislation
- Codes and Standards
- Guides
- Downloads
- Open Data

Application Online

- Forms
- Fees
- Schedule
- Status
Many projects are received in AutoCAD format. To incorporate this information into our GIS the geometry of the drawings is converted into two formats:

• Spatial Data - this way we can transfer it as text, lightly over the internet and save it directly in MS SQL Server.

LINESTRING (662239.88115704048 7458058.7541700574, 662226.94430760888 7458054.9296349883)

• JSON - using this format we can display it on maps and perform spatial analysis using map services.

var polylineJson =
{"paths": [[[662239.88115704048, 7458058.7541700574], [662226.94430760888, 7458054.9296349883]]], spatialReference}
The Geometry is Converted to Text

Spatial Data

JSON
Uploading to the Cloud
The file is parsed, validated and saved in the MS SQL Server.
Information Available Everywhere
The Bic Picture - Data Integration

Resources
- Rivers
- Streets
- Elevation
- Neighborhood
- Buildings

GIS

AutoCAD®

Convert

Spatial Data

JSON

Connect

Publish

Query
Conclusion

The ArcGIS JS API

- Provides geoprocessing power to the user.
- Information exchange in an agile way.
- Increase and improvement of collaborative work.
- Enables quality improvement through validation and monitoring of data.
- Light and interchangeable format.
- Provides seamless integration between CAD and GIS.
- Reduced costs, greater transparency and greater efficiency.
- Information with great availability.
Thank You!

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