

Dynamic Web Map Services

Summer School on Digital Humanities

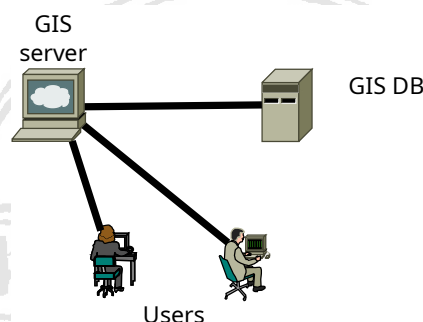
Web site: <https://bit.ly/dt4h-gis>

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Dynamic Web Map Services

- A local application does not facilitate map sharing
- We need an **interactive** web-based map service



- Web Mapping enables cartographers to maintain a shared map
 - The cartographer accesses the mapping service via a web browser
 - The server generates a web page integrating the map
 - Embedded code connects to a remote database to retrieve and update data
 - The cartographer can modify the view or input new data

Web GIS vs. Desktop GIS Applications

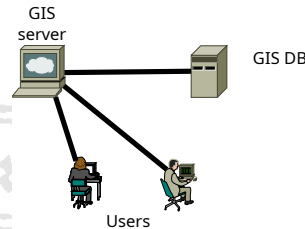
- Compared to a desktop GIS application (like QGIS):
 - No installation required
 - No dependency on local computing power
 - Platform-independent (works on any OS)
 - Responsive design for different devices (PC, tablet, smartphone)
 - Designed for sharing—requires access control mechanisms
- Developing such a dynamic application requires a specialized JavaScript library

Tools for Web Maps: JavaScript Libraries

- JavaScript enables complex functionalities in web pages
- The **Leaflet** library allows web pages to interact with GIS servers and store user data
- Users can modify and update the map interactively
- This setup creates a complex architecture:
 - The user downloads a web page (designed by the cartographer)
 - The page interacts with a PostGIS server and a raster data repository
- We will explore OpenStreetMap, which is implemented using the *Leaflet* library

Example of an Open Web Map Service: OpenStreetMap

- The OpenStreetMap server (www.openstreetmap.org) renders a dynamic map in the browser, drawing data from a public database



- Public Collaboration:
 - Anyone with write access can update the database—all **changes are publicly visible**
 - There is no option for a private workspace
- Using the built-in **Id** editor:
 - Easily create features like a bar, swimming pool, or street
 - **Save** changes cautiously—they **become immediately visible to everyone**

Getting Started with OpenStreetMap

- Open a browser and visit OpenStreetMap
- To access the service:
 - **Sign in** with an existing account or a third-party service (e.g. Google, Microsoft, Facebook) or
 - **Register** a new account

Creating a Point Feature in OpenStreetMap

- To add a point feature (**but do not press Save**):
 - Zoom in using the trackpad until **Edit** is enabled
 - Select the **Edit** option (opens the *iD* editor)
 - Zoom until the "Zoom in to edit" banner disappears
 - Click the **Point** tool in the top toolbar (it turns blue)
 - Click on the map to place the point
 - Choose a feature type (e.g., **Café**) from the left sidebar
 - Fill in relevant attributes
 - Press **Undo** (back arrow next to "Save")

Additional Editing in OpenStreetMap

- To draw a Line or Area:
 - Click to place each vertex
 - Press *Esc* or double-click to finish
- To edit an existing feature:
 - Right-click to access transformation options:
 - Convert to a circle
 - Convert to a point
 - Align angles to 90°
 - Flip or rotate
- Keyboard shortcuts:
 - **Ctrl+C** / **Ctrl+V** to copy and paste
 - **Ctrl+Z** to undo changes
- Pressing **Save** commits changes to OpenStreetMap—**please refrain from saving test edits**

Lab Activity

- Scenario: South of Pescara lies "Francavilla al Mare," a seaside resort town
 - Locate "Lido Merope"
 - Add an Area for the beach
 - Set Beach Resort as the **feature type**
 - Set the **Name** field to "Spiaggia del Lido Merope"
 - Undo...