Dynamic Web Map Services

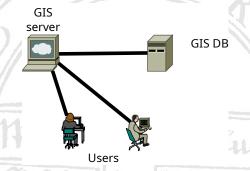
Summer School on Digital Humanities
Web site: https://bit.ly/dt4h-gis

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10 giugno 2025

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

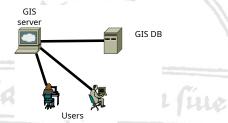
- Compared to a desktop GIS application (like QGIS):
 - No installation required
 - Platform-independent (works on any OS)
 - Responsive design for different devices (PC, tablet, smartphone)
 - Designed for sharing requires access control mechanisms
- Developing such a dynamic application requires a 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
 - ...and explore Leaflet in the last session

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...