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

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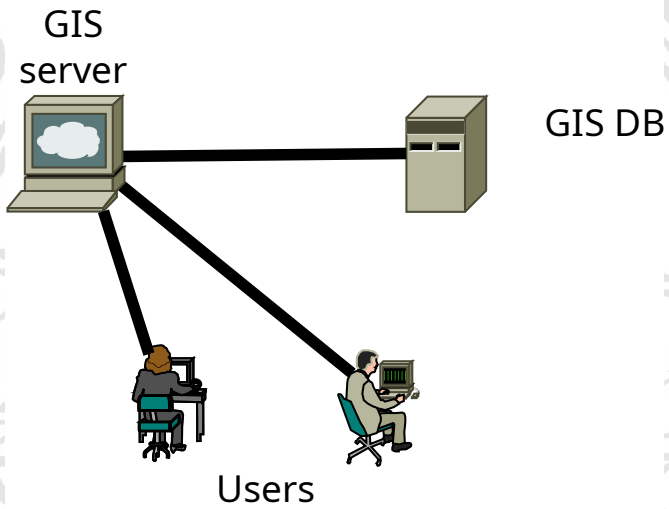

- Web Mapping enables cartographers to maintain a shared map
  - The cartographer accesses the mapping service via a web browser
  - The server generates a web page containing an up-to-date map
  - Embedded links allow the cartographer to navigate and update data
  - The cartographer can see the effect of their changes

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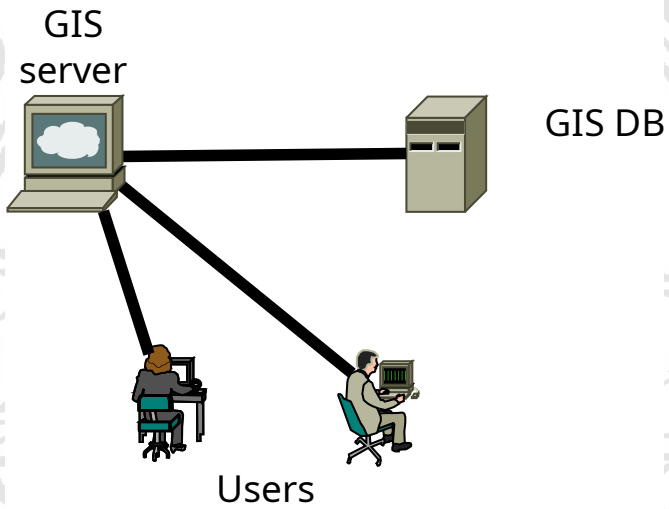

- Web Mapping enables cartographers to maintain a shared map
  - The cartographer accesses the mapping service via a web browser
  - The server generates a web page integrating the map
  - Embedded code connects to a remote database to retrieve and update data
  - The cartographer can review the new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

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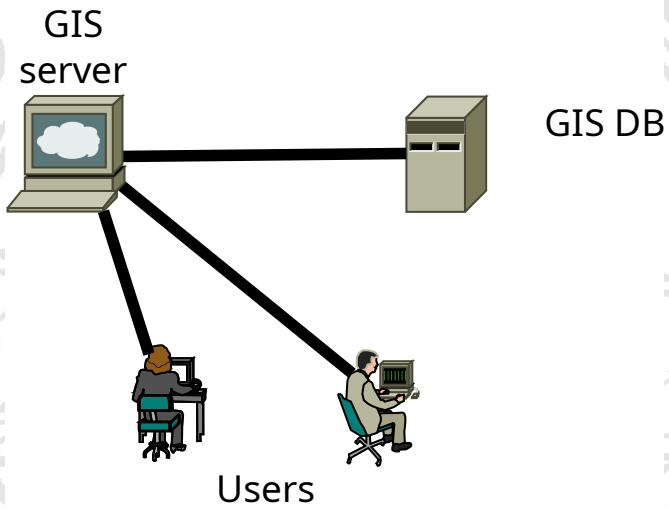

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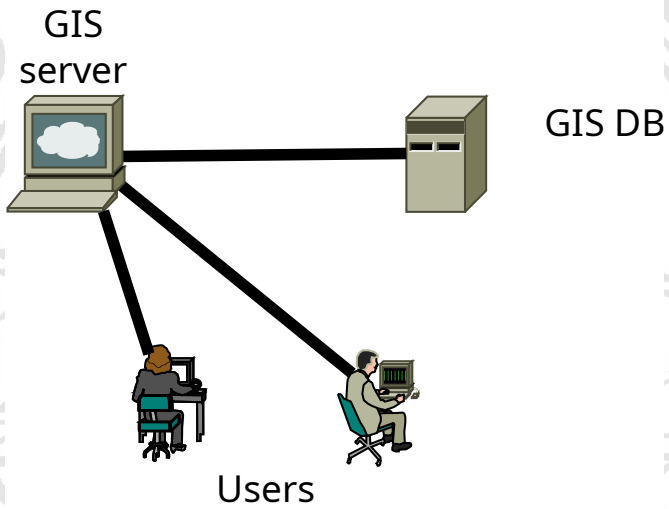

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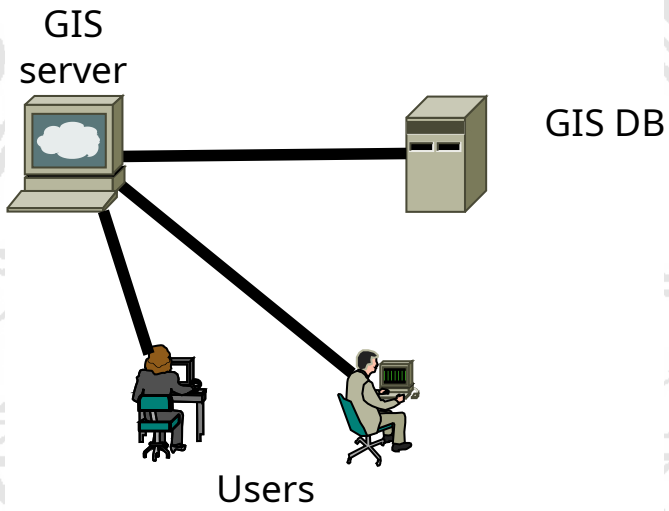

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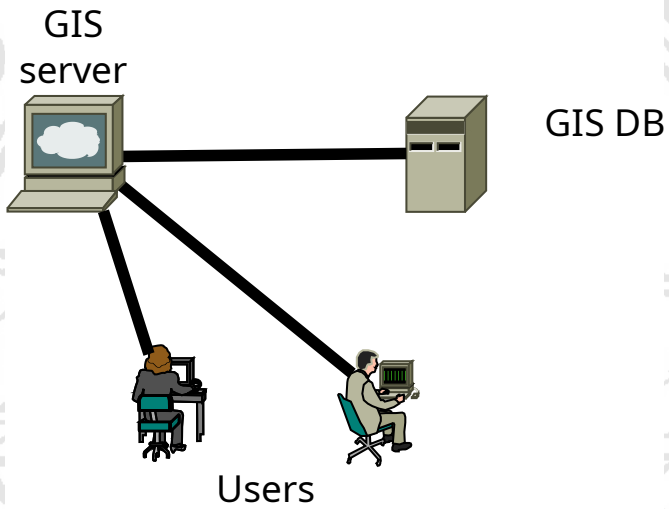

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Web GIS vs. Desktop GIS Applications

- 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 Web application requires a specialized JavaScript library

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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
- We will explore OpenStreetMap which is implemented using the *Leaflet* library

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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:

- Using the built-in iD editor:

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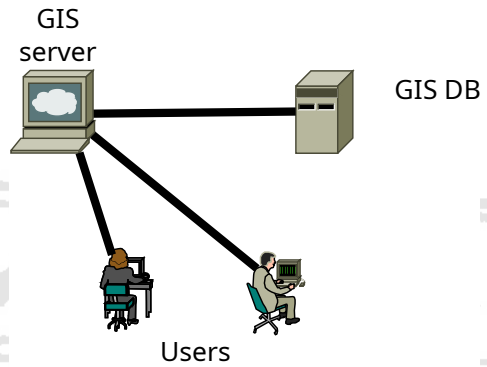

- Public Collaboration:
  - Anyone with a free account can edit the database—all changes are publicly visible
  - There is no notion of separate workspaces
- Using the built-in iD editor.

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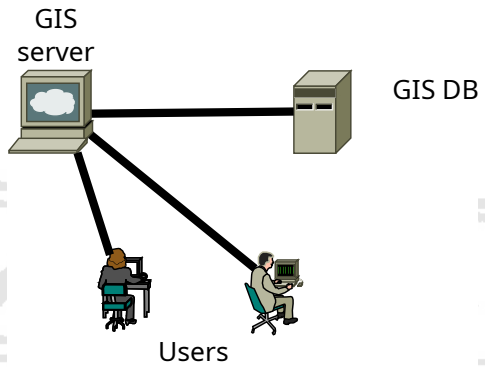

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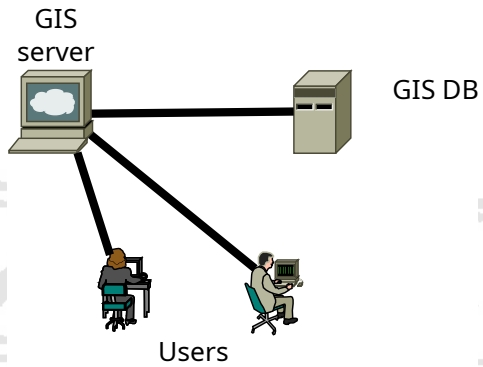

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- Using the built-in Id editor:
  - Easily create features
  - Save changes and fix errors

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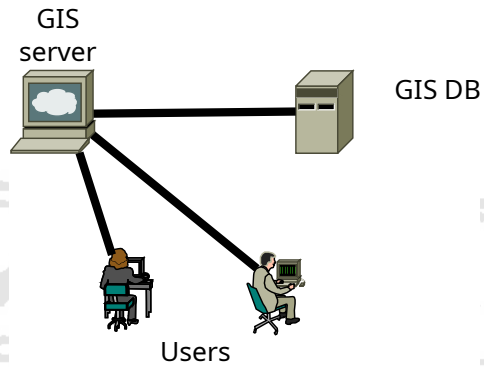

- Public Collaboration:
  - Anyone with write access can update the database—all changes are publicly visible
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- Using the built-in **Id** editor:
  - Easily create features like a bar, swimming pool, or street
  - Save changes cautiously—all changes are visible to everyone

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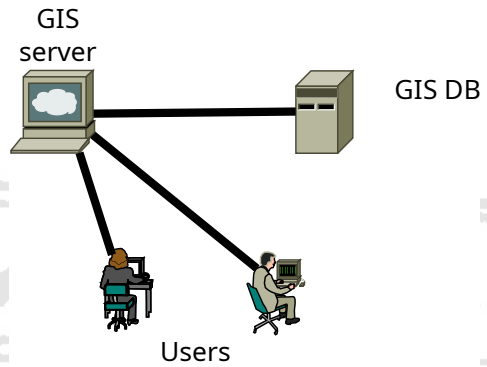

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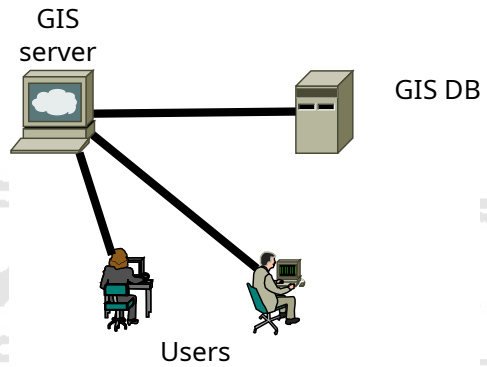

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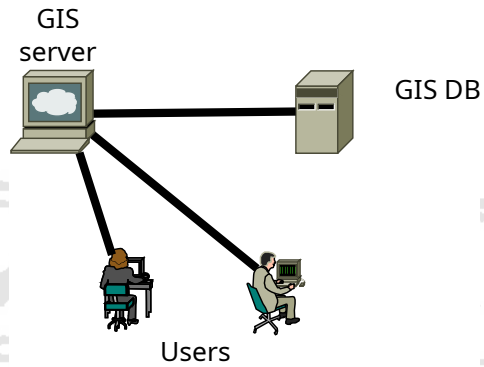

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Getting Started with OpenStreetMap

- 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, ...)
  - Register a new account

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Creating a Point Feature in OpenStreetMap

- To start editing press the Edit button top left
- To add a point feature (but do not press **Save**):
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  - Select the **Edit** option (opens the *iD* editor)
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  - Click on the map where you want the point
  - Choose a feature type (e.g. Gate) from the left sidebar
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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
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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...