Chapter 5 Hypermaps & Websites for Urban Planning

5.1 Hypertexts & hyperdocuments

- hypertexts & hyperdocuments

  : non-linearly organized texts & documents

   window presentation & mouse clickable access

Multimedia spatial data

- pictures, sounds, signals w/ conventional text- & map-oriented DB

- possible domains of use of multimedia data in urban planning

  : urban & regional planning   environmental planning

   hazard prevention & management   fire fighting

   tourist industry   road maintenance

   historical garden & sites   history of the city

   engineering networks   information for investors
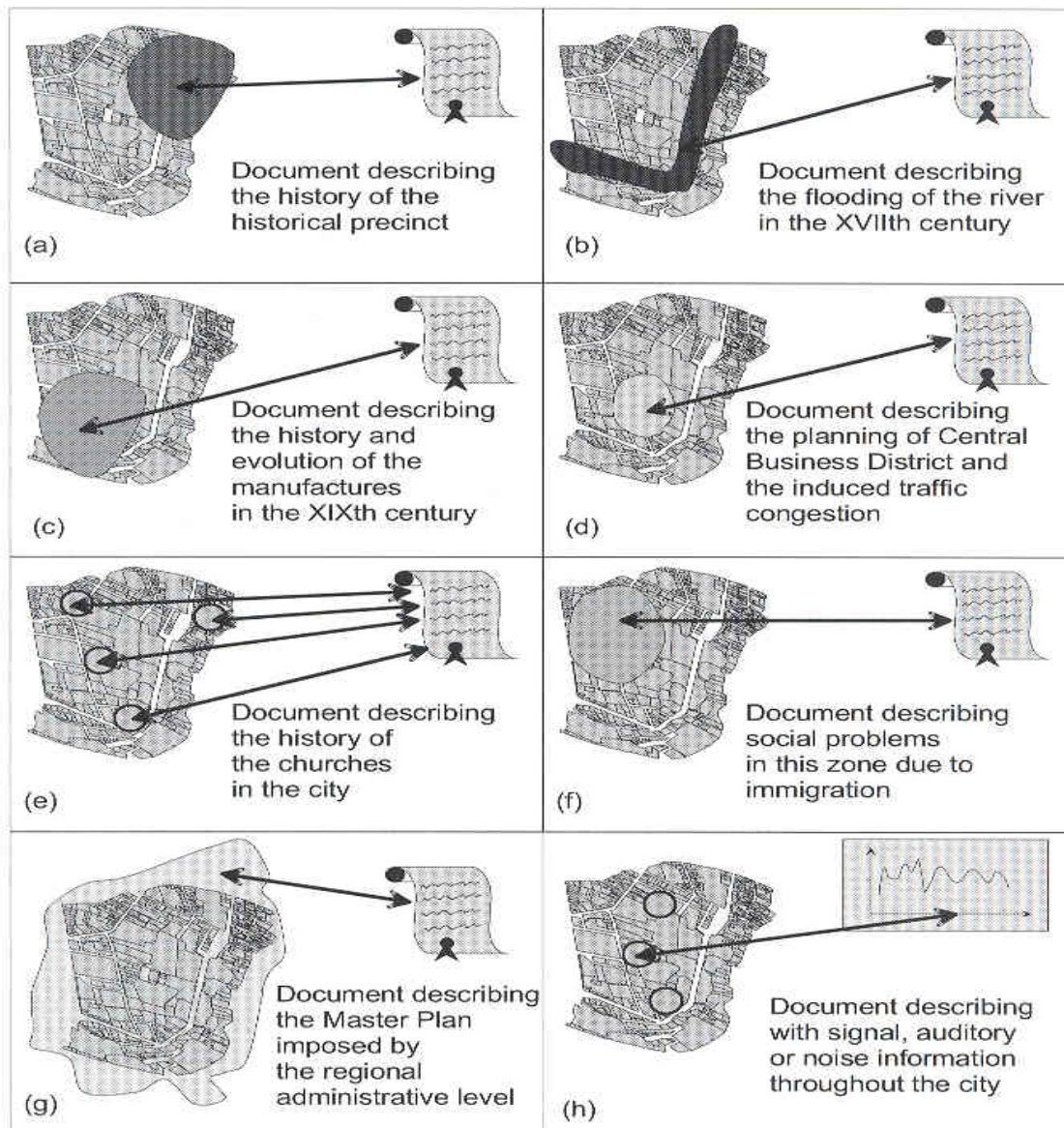
   new home seeking

Figure 5.1 Example of co-ordinate-based documents. (a) Historical documents. (b) Documents concerning floods. (c) Documents relative to the history of manufacturing. (d) Study regarding the impact of the Central Business District to traffic conditions. (e) Document describing the architecture of some churches. (f) Study describing some social problems due to immigration. (g) Connections with the Regional Master Plan. (h) Document describing auditory or noise information with signals.
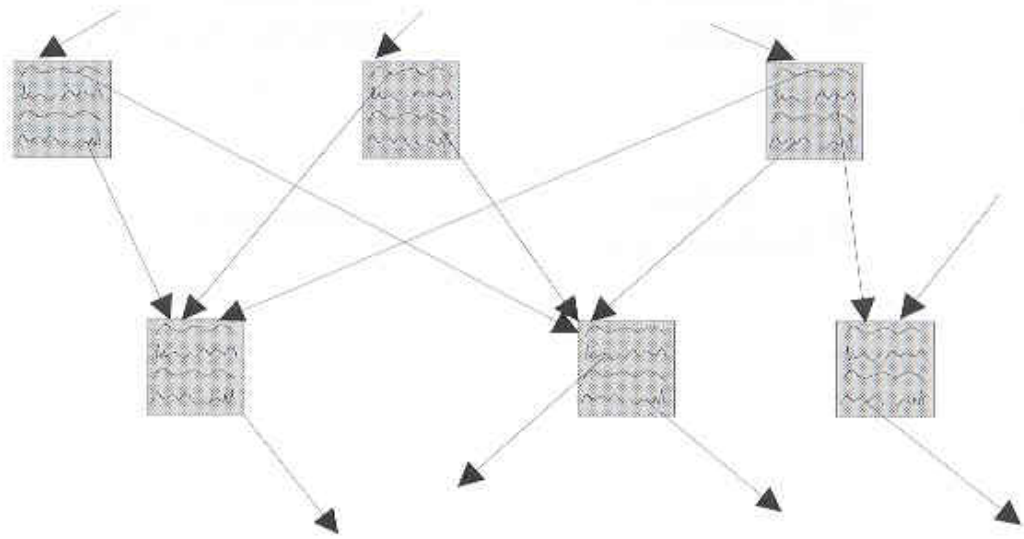
Figure 5.2 A web of semantic units.
From Laurini and Thompson (1992).

Hypertext concept

- different from traditional form

- organized by semantic units called nodes & associations (or links)

- links can be of several types

  : to connect a node reference to the node itself

   to connect an annotation or source citation to a document portion

   to provide relationships between two objects within the same doc

   to connect two successive document portions

- hypertext has a network structure

- the same structure can be used for multimedia contents (eg. images,
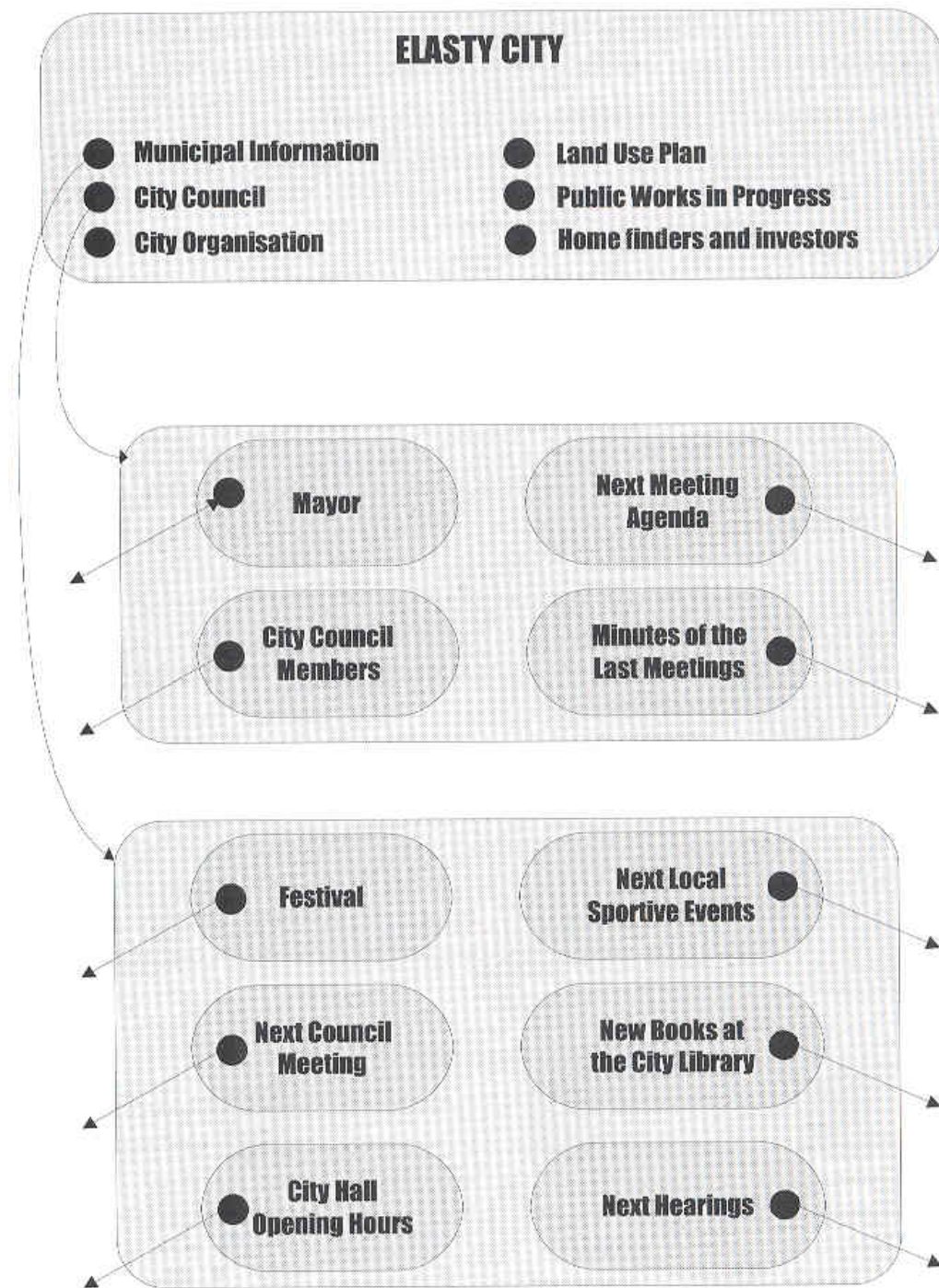 graphics, sounds, signals) -> hypermedia

ELASTY CITY

- Municipal Information
- City Council
- City Organisation
- Land Use Plan
- Public Works in Progress
- Home finders and investors

- Mayor
- Next Meeting Agenda
- City Council Members
- Minutes of the Last Meetings

- Festival
- Next Local Sportive Events
- Next Council Meeting
- New Books at the City Library
- City Hall Opening Hours
- Next Hearings

Figure 5.3 An example of a hyperdocument network for a municipality.

– example of a hyperdocument presenting some local info for a city
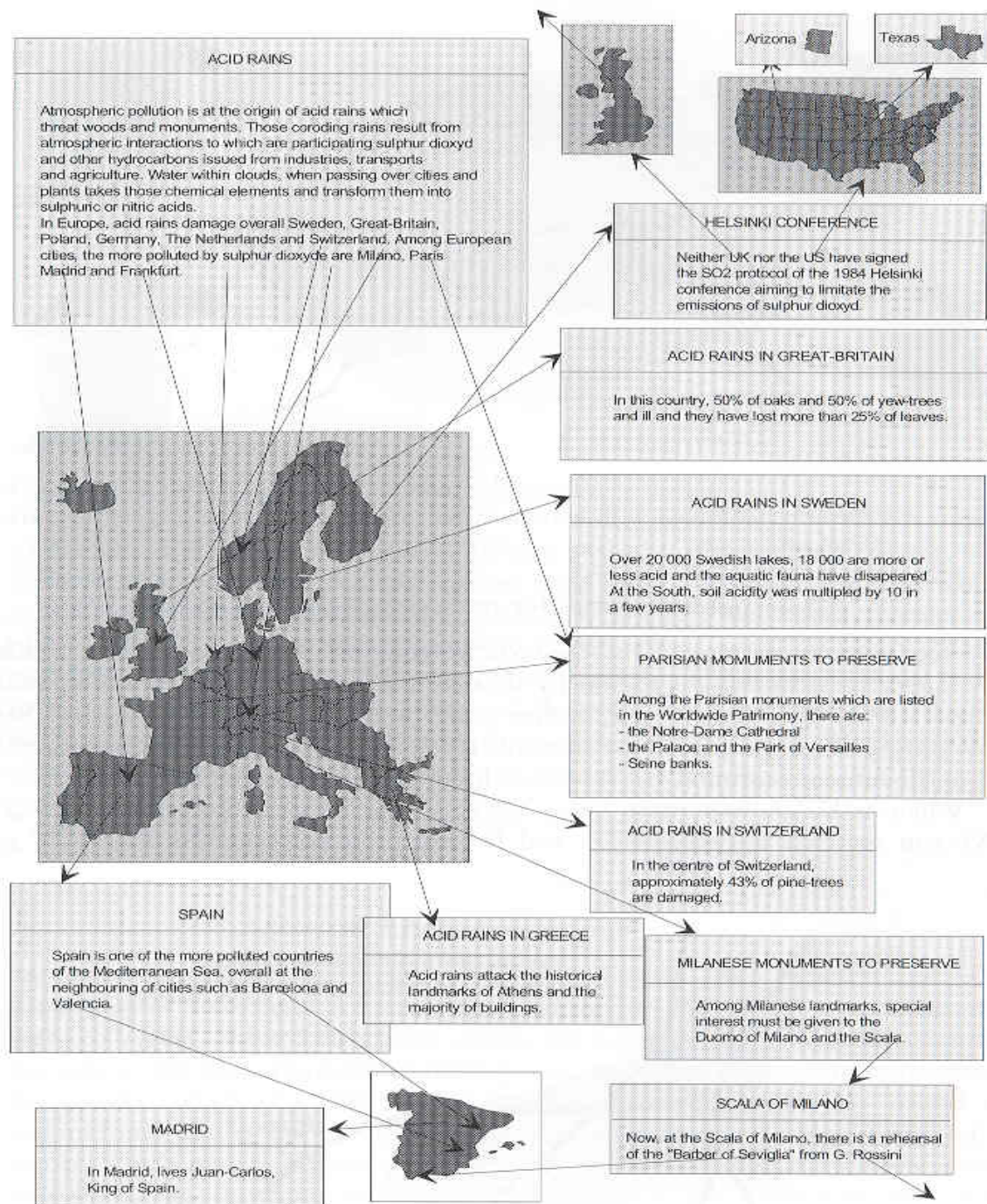
Figure 5.4. Example of a hypermap.

Portals
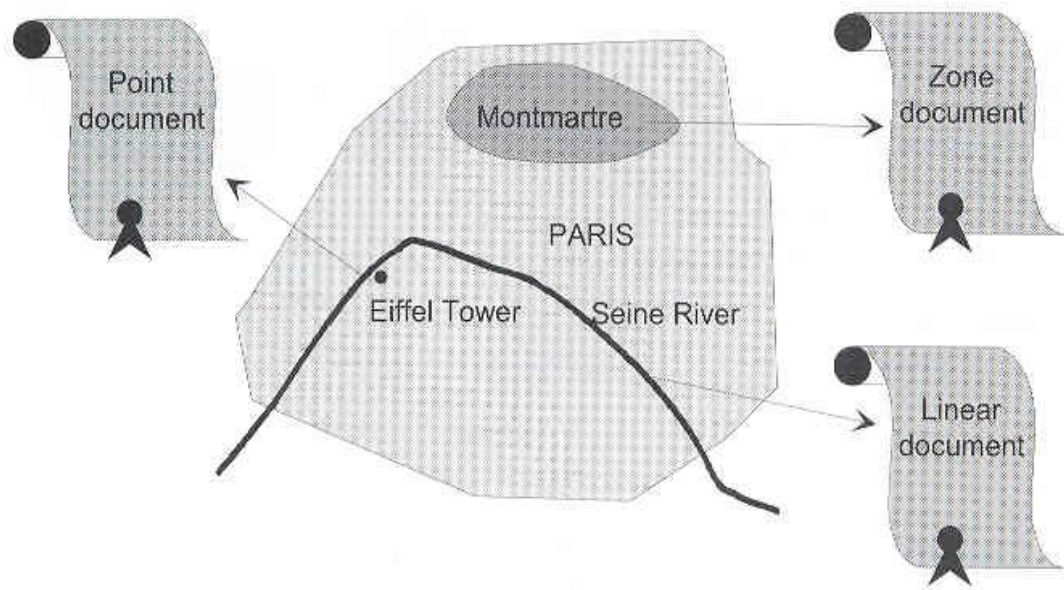
- portal : gateway for WWW sites

Figure 5.5 Documents linked with various types of geographic zones, namely points, lines and zones.

5.2 Hypermaps

- hypermap : extension of hyperdocument concepts by integrating
            geographic referencing
  -> coordinate based document
     employs spatial referencing & spatial queries

Spatial referencing of hyperdocuments

- spatial referencing : spatial ref of document nodes
                        spatial ref of maps & other cartographic documents

- referencing can be done via various types of geographic zones
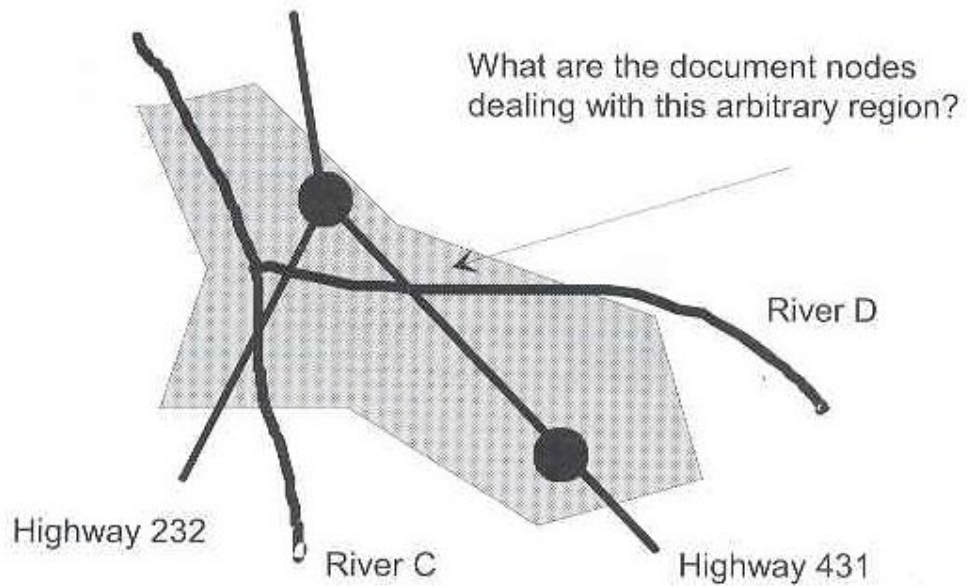 eg. geodetic point, a linear feature, a region

What are the document nodes dealing with this arbitrary region?

River D

Highway 232

River C

Highway 431

Figure 5.6 A hypermap region query.
From Laurini and Thompson (1992).

Spatial queries for retrieving hypermaps nodes

- retrieving a spatial document requires delimiting a region by a mouse

- four types of spatial query
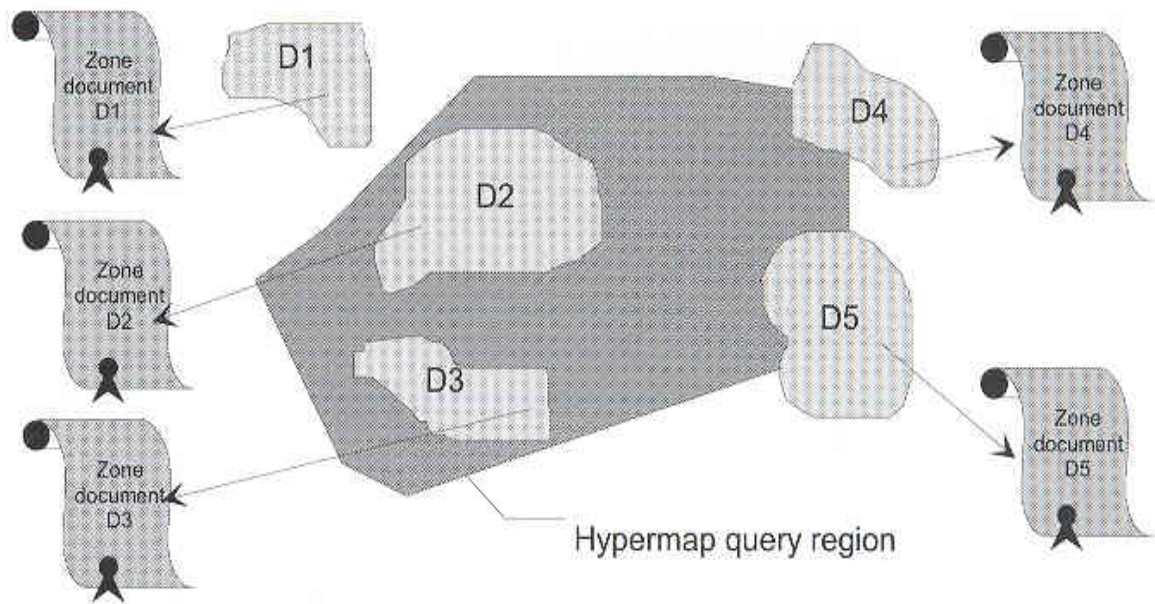
  : point, buffer zone, segment, region query

Figure 5.7 Relevant, partially relevant, and irrelevant documents.

- several situations when making a hypermap query
  : fully relevant, partially relevant, irrelevant
    eg. D2 – 100% fit, D4 – 20% fit

- main challenge is how to organize both locational relationship &
  document relationship
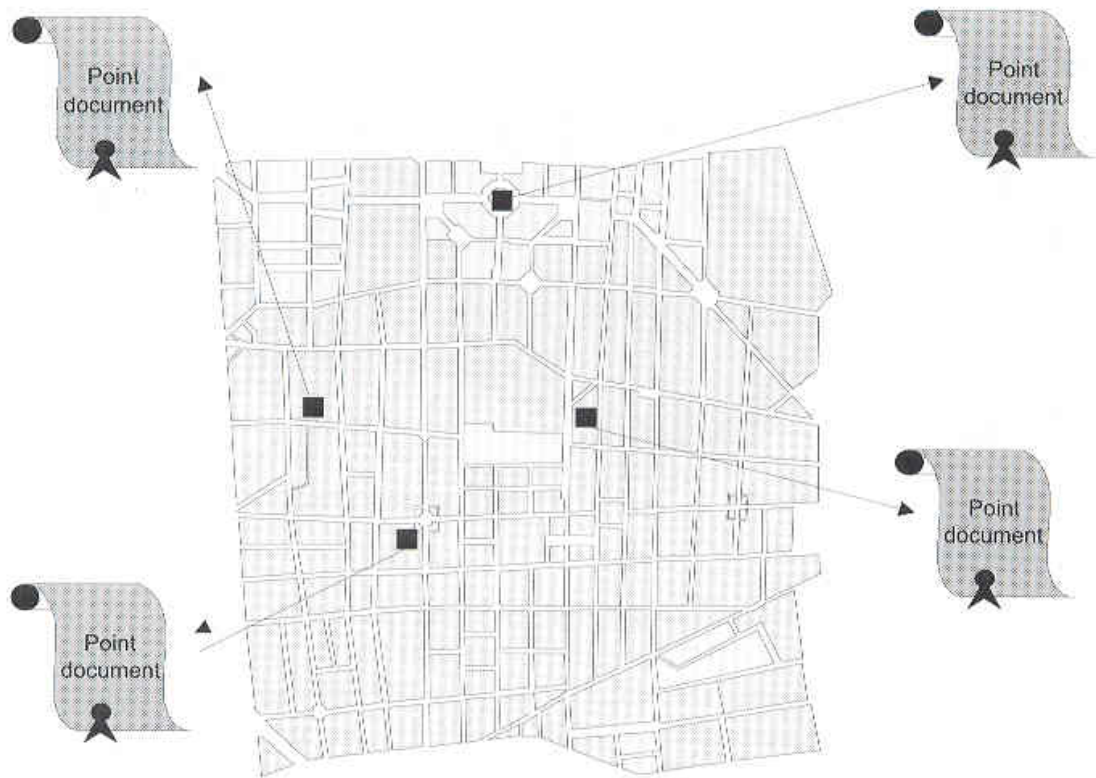 : the document-to-map relationship
    the map-to-map relationship

Figure 5.8 This map shows only four active zones represented as small squares used as entry points to documents.

Active zones

- activation can be done partially

  : limited access to information

Figure 5.9 Example of URL anchored on building within a movie (Murao *et al.* 1999).
Used with permission of Michihiro Murao.

Mobile anchors for images & movies

- mobile anchors

  : during evolution of the movie, the name & URL are moving to be still

   written on images

5.3 Navigation in hypermaps

- navigating in a hypermap features two aspects

  : thematic navigation & spatial navigation

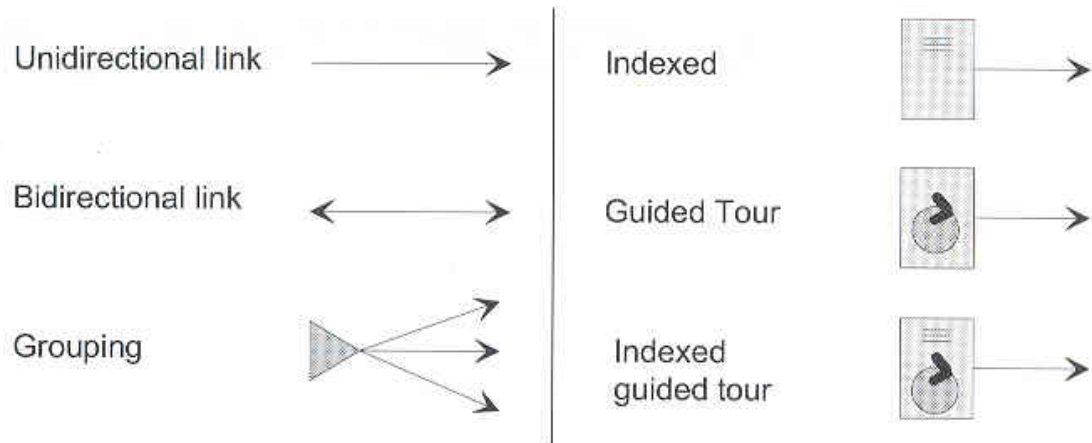- several modes of navigation for several kinds of user

  : novice mode & expert mode

Figure 5.10 The RMM primitives which are added to the entity-relationship model.

5.4 Designing hypermedia

- many methodologies for designing hypermedia (i.e. websites)

Example of RMM (relationship management methodology)

- extension of the entity-relationship methodology

- components : hypermedia entities, attributes, links
    e.g. unidirectional links, bi-directional links, grouping, indexed, guided
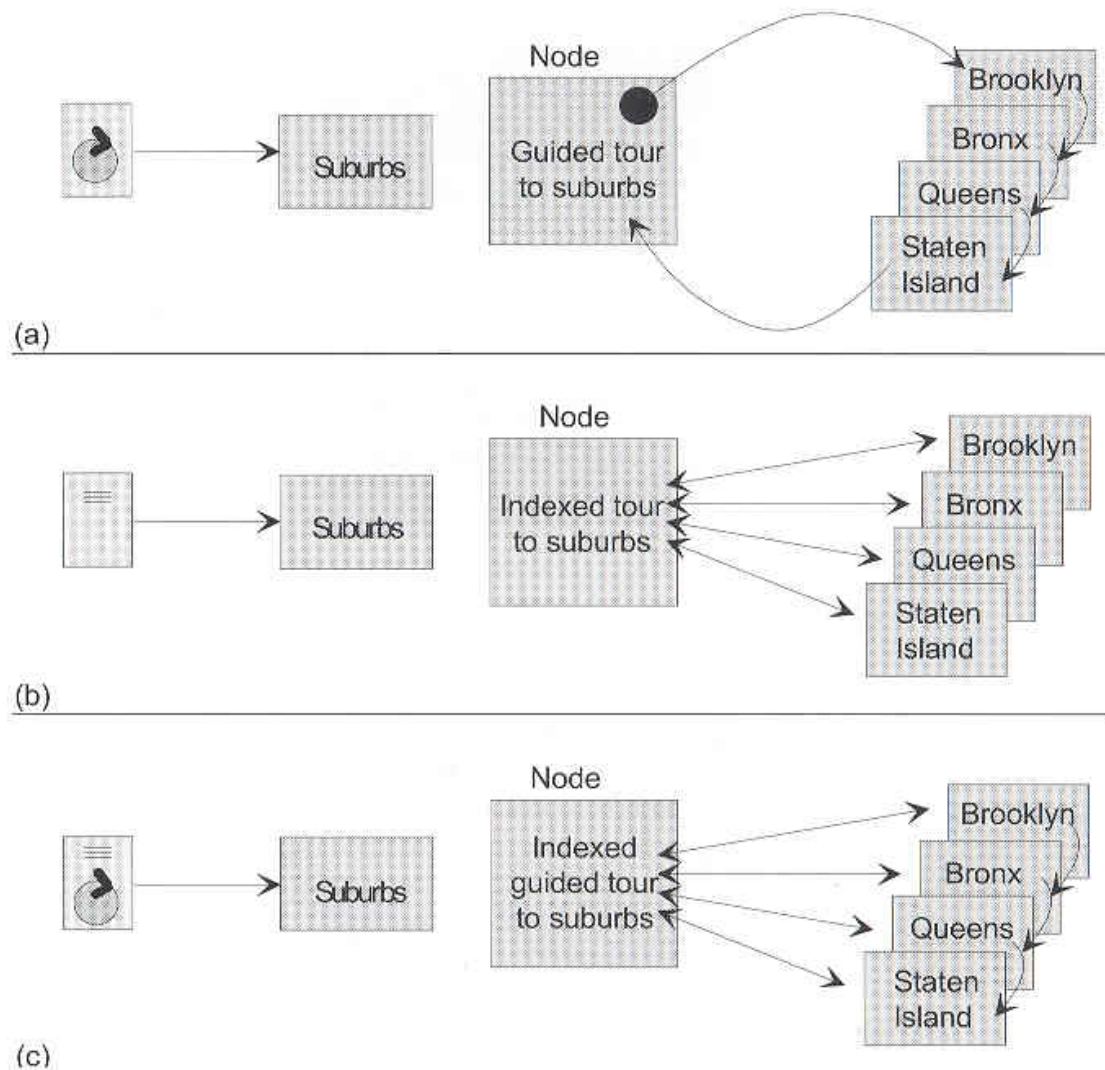   tour, indexed & guided tour

Figure 5.11 Examples illustrating ways to access to hyperdocuments. (a) Guided tour.
(b) Indexed tour. (c) Indexed guided tour.

- examples illustrating ways to access to hyperdocuments
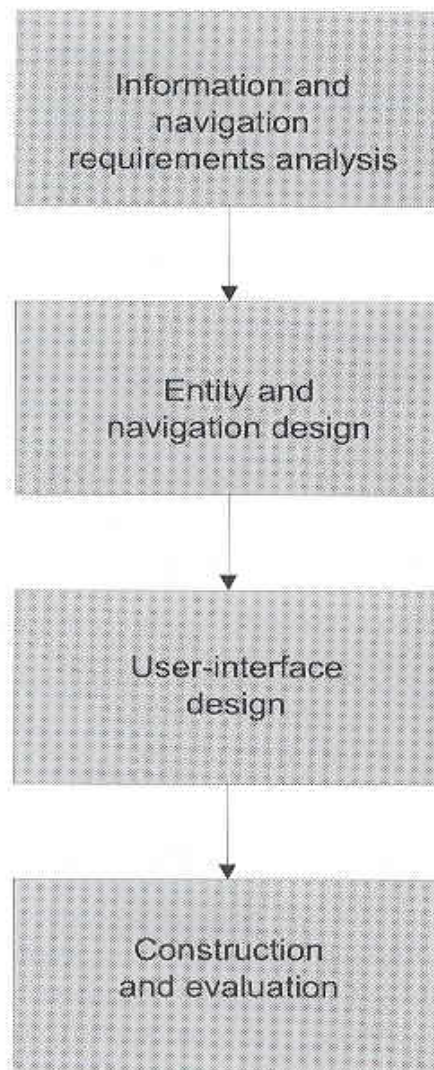
  : guided, indexed, guided & indexed tour

Figure 5.12 The main steps in the design of a hypermedia (RMM).

- Global RMM methodology

    first step   : requirement analysis

                      nice idea is to start w/ a prototype

    second step : design of the diagram w/ tools previously introduced

    third step   : design of user interface

    last step   : real construction of the hypermedia

Some recommendations

- some guidelines for effective linking

    a. links should reinforce messages, not replace them

    b. most links should point to your site, not away from it

    c. most links should appear as footnotes, away from the main text

    d. links to outside sites should open a new browser window

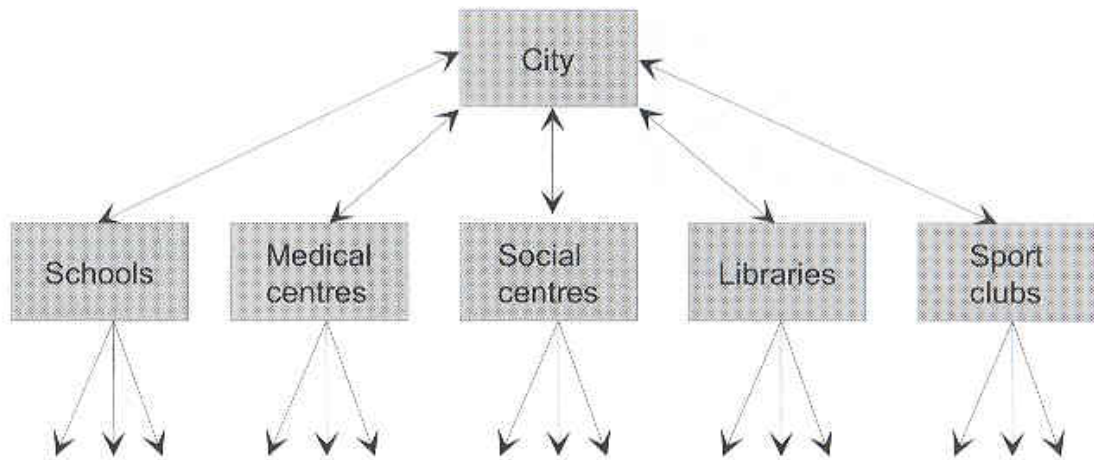   e. every link is a maintenance issue : link sparingly, if at all

Figure 5.13 Portal of a hypermedia for municipal public services.

5.5 Some examples of hypermedia design

- examples of public services, land-use planning, road maintenance,
  home seeking & investors, out-of-my-backyard

Public services in cities

- organize info targeted to citizens, relative to public services
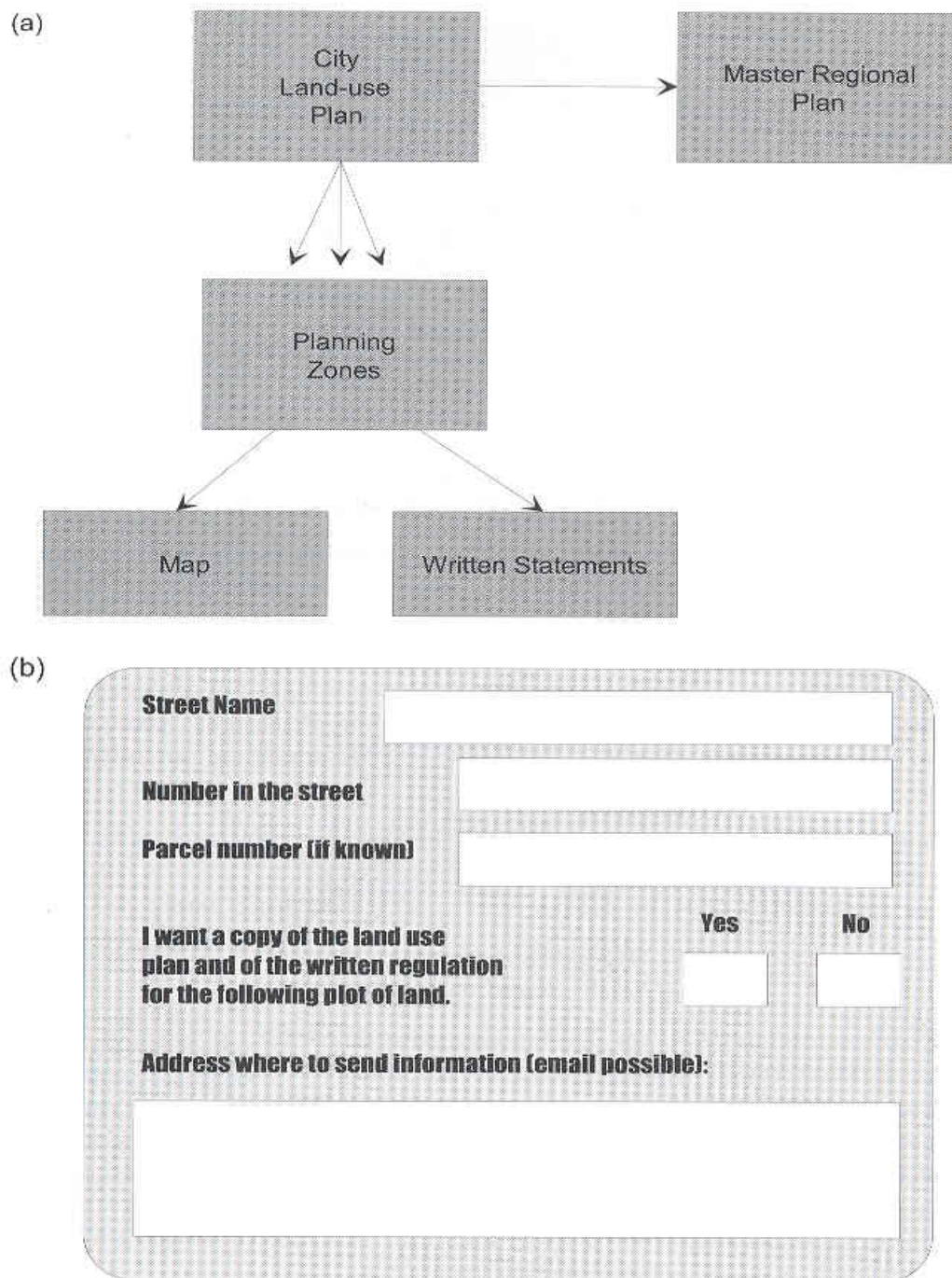- portal can be either a map or a space-filling treemap

(a)

City Land-use Plan → Master Regional Plan

City Land-use Plan → Planning Zones

Planning Zones → Map

Planning Zones → Written Statements

(b)

Street Name

Number in the street

Parcel number (if known)

I want a copy of the land use plan and of the written regulation for the following plot of land.

Yes   No

Address where to send information (email possible):

Figure 5.14 Hyperdocuments and hypermaps for land-use planning together with a form to fill in to receive by post a copy of the regulations. (a) Hypermap structure. (b) Form to fill in.

Hyperdocuments for land-use planning

– provide a prescriptive land-use map & written regulations
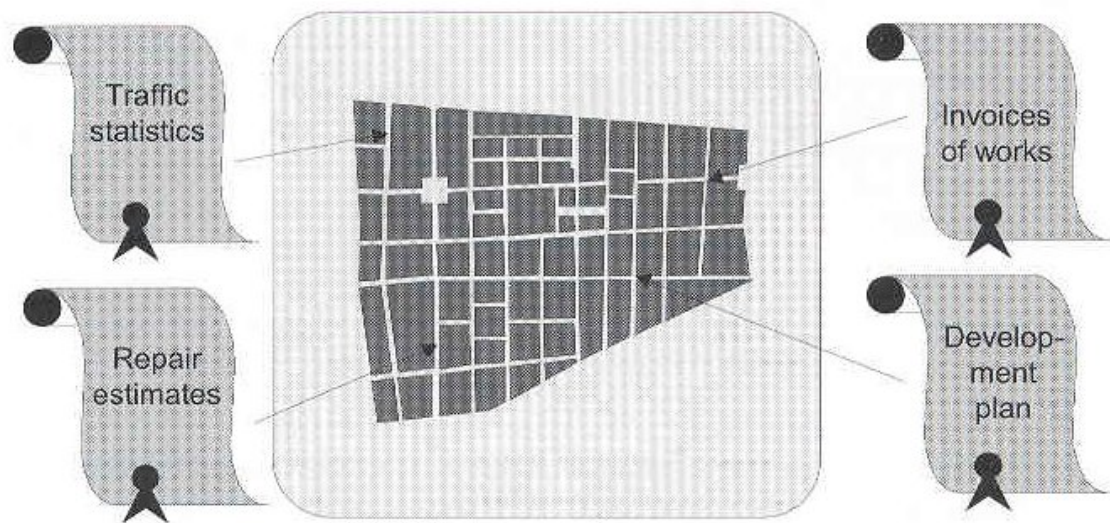
Figure 5.15 Example of a hypermap system for road maintenance.

Road maintenance

- info include reports, maps, plans, estimates, invoices, traffic statistics, photographs
- info is not only located in space but corresponds to special dates
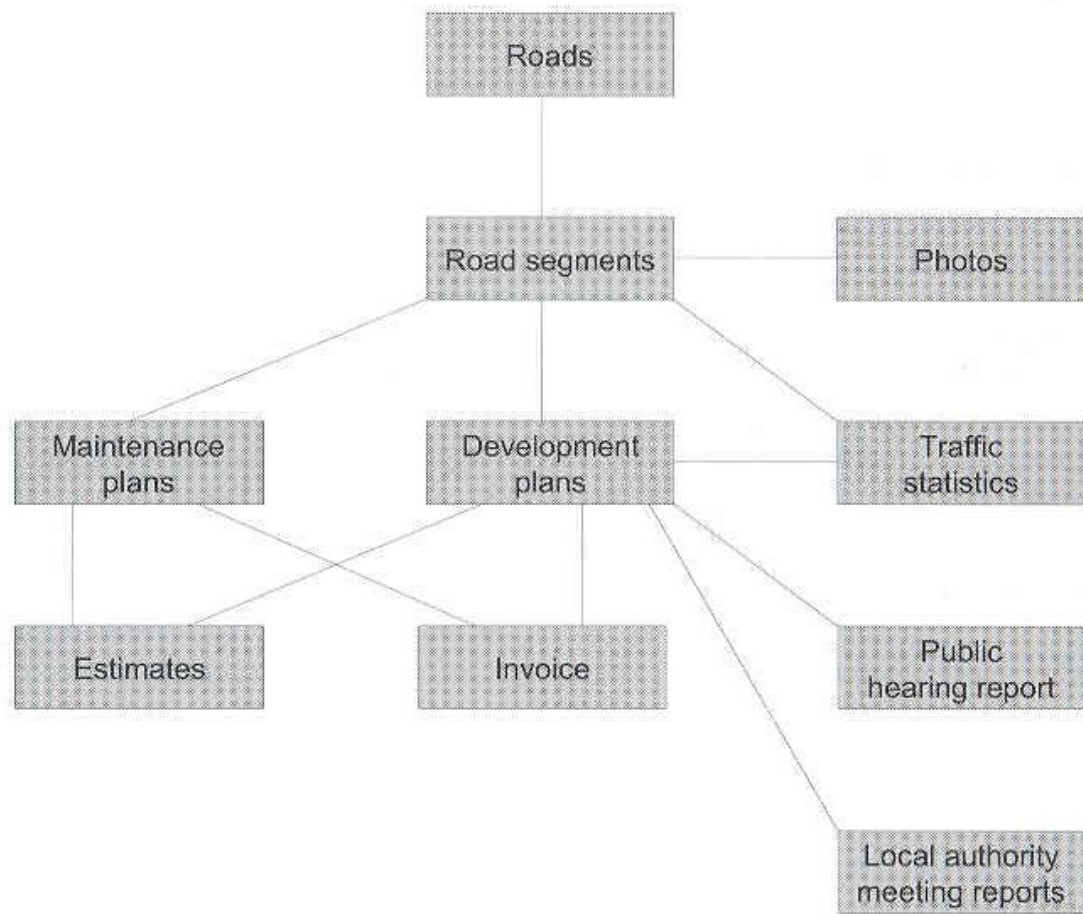
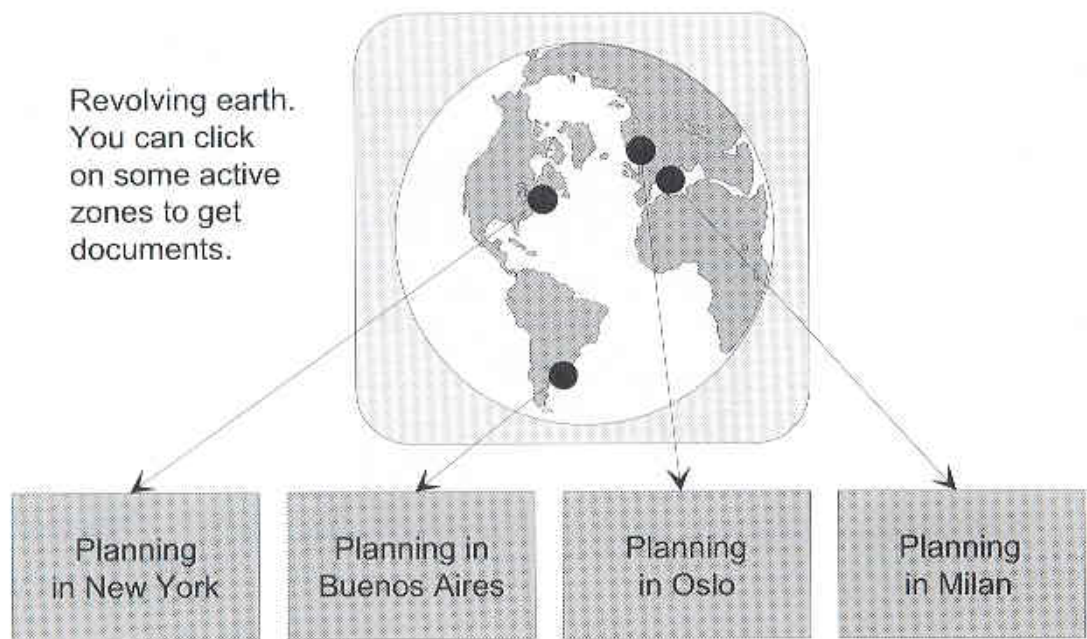*Figure* 5.16 Structure of a hypermap for road maintenance.

Revolving earth.
You can click
on some active
zones to get
documents.

Planning
in New York

Planning in
Buenos Aires

Planning
in Oslo

Planning
in Milan

Figure 5.17 'Out-of-my-backyard' hypermap for urban planning.

Out-of-my-backyard hypermap

- info of planning experiences thru the world

- visual interface : conventional 2-D map

　　　　　　　　revolving earth

5.6 Intranets & extranets

- intranet : a network architecture designed to serve the internal info
  needs of org using the internet concepts

  <u>typical user interface applications</u>

  a. publishing corporate documents
  b. providing access to searchable directories
  c. publishing corporate, departmental, & individual pages
  d. providing access to groupware applications
  e. distributing of software
  f. providing e-mails

- intranet is relatively safe within the organization's firewalls

- extranet : targeted to users outside an org, but tightly linked w/ org
  e.g. for companies extranet users are customers & providers

Figure 5.18 Portal of the city of Turin.
Used with kind permission of Comune di Torino.

Figure 5.19 Accessing cartography services.
Used with kind permission of Comune di Torino.

– extranet of the city of Turin, Italy
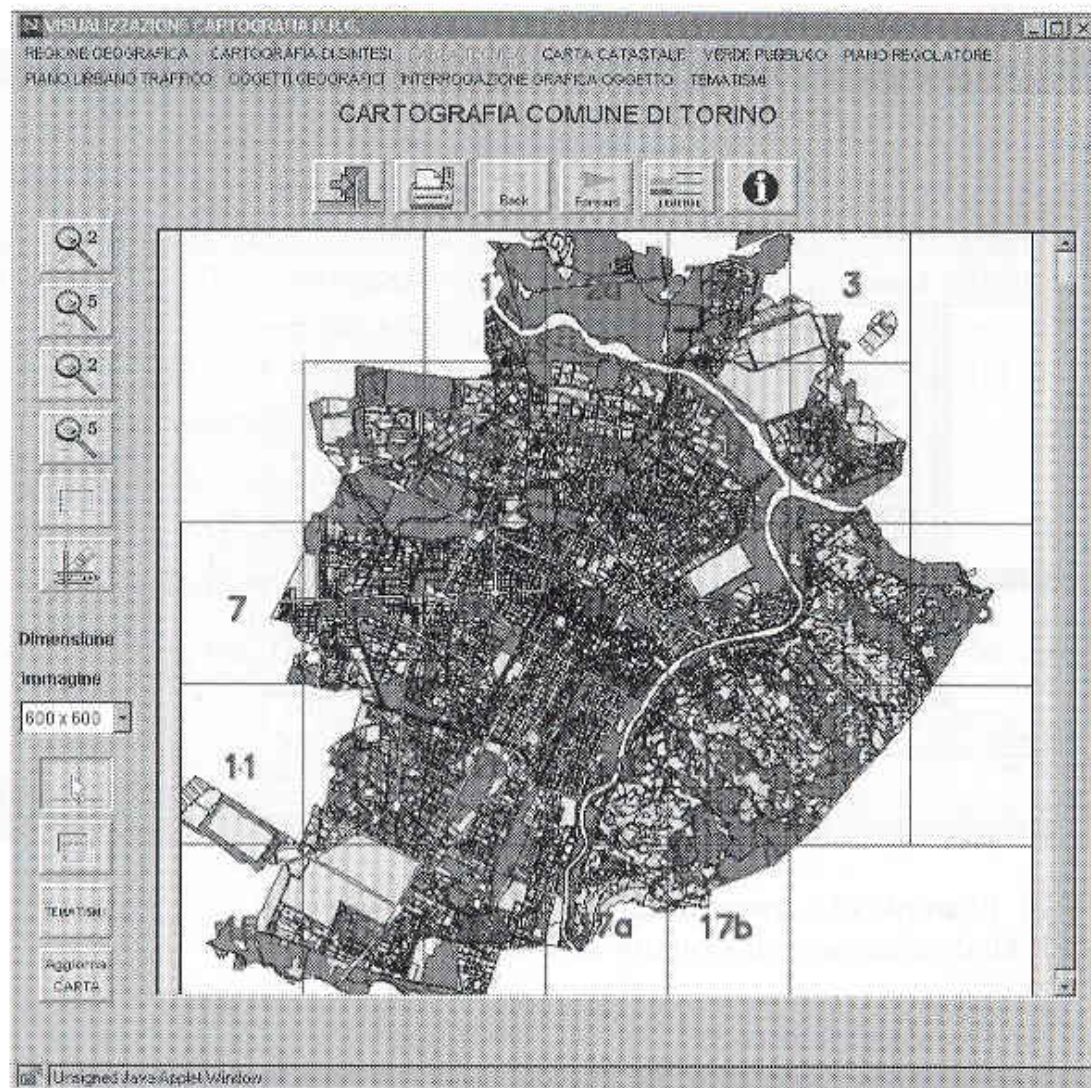
Figure 5.20 The Turin land-use plan (Piano Regolatore Generale).
Used with kind permission of Comune di Torino.

Figure 5.21 Example of a query result.
Used with kind permission of Comune di Torino.

<u>On-line permitting</u>

- digital submission of document & online permitting

- example case : Comune di Torino

   ->   user can submit a new permit

           give his comments regarding the permits under study

           know about the status of his own submission

           get info regarding the system & legislative context

City of Elasty-City

Online building permitting

- Online submission

- Online comments

- Permit status

- Get information

- Quit

Figure 5.22 Example of front-page on line permitting.

– similar examples

http://www.ci.indianapolis.in.us/

http://dep.state.wv.us/permit/