

GIS in Seoul Metropolitan Government : Overview



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- Cyber GIS educational system

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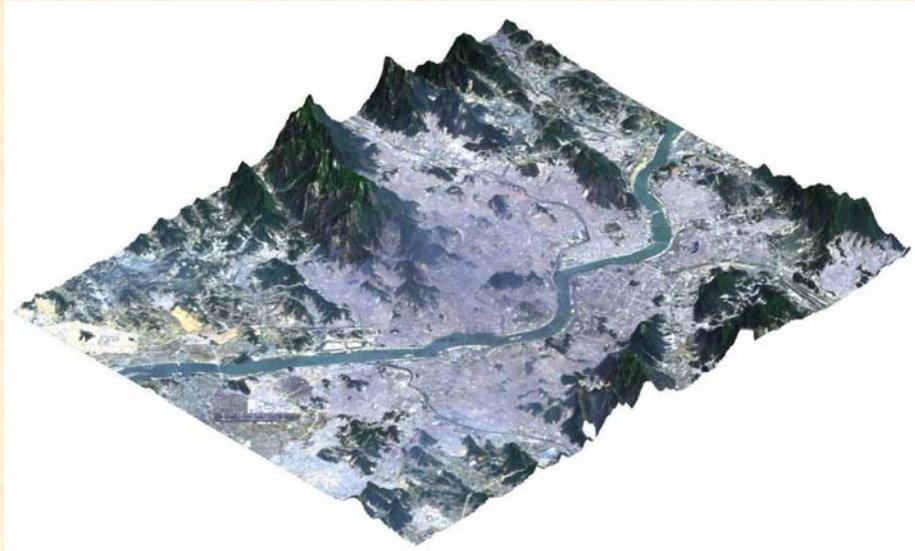
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I. Introduction of GIS in SMG

- About Seoul
- GIS works in SMG and SDI
- GIS administration in SMG
- History of GIS development

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About Seoul



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GIS works in SMG



1. Creates, updates and maintains GIS data and Digital topographic map
2. Trains and promotes GIS to public officials
3. Develop the GIS system
4. Participates in joint utilization and coordination of underground facilities map
5. Deals with production of thematic map
6. Distributes and manages geographic information system and data
7. Manages security of GIS system and data

GIS work in SDI

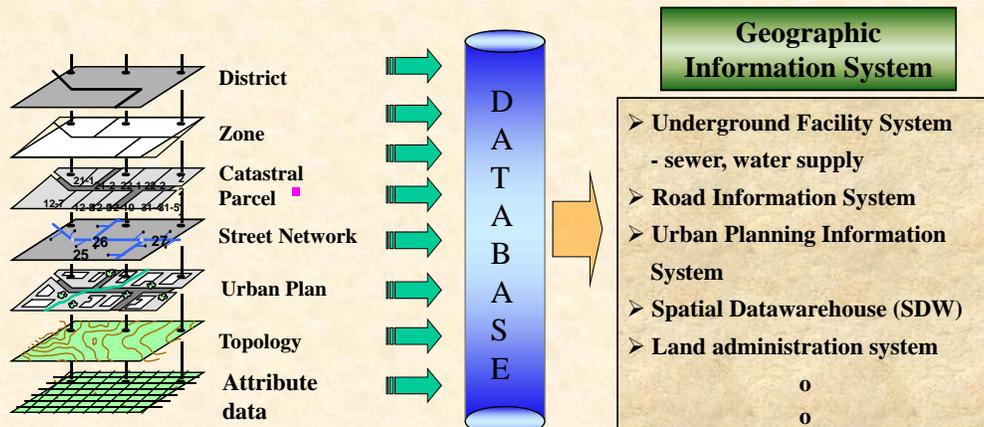
Research and support to develop the GIS in SMG



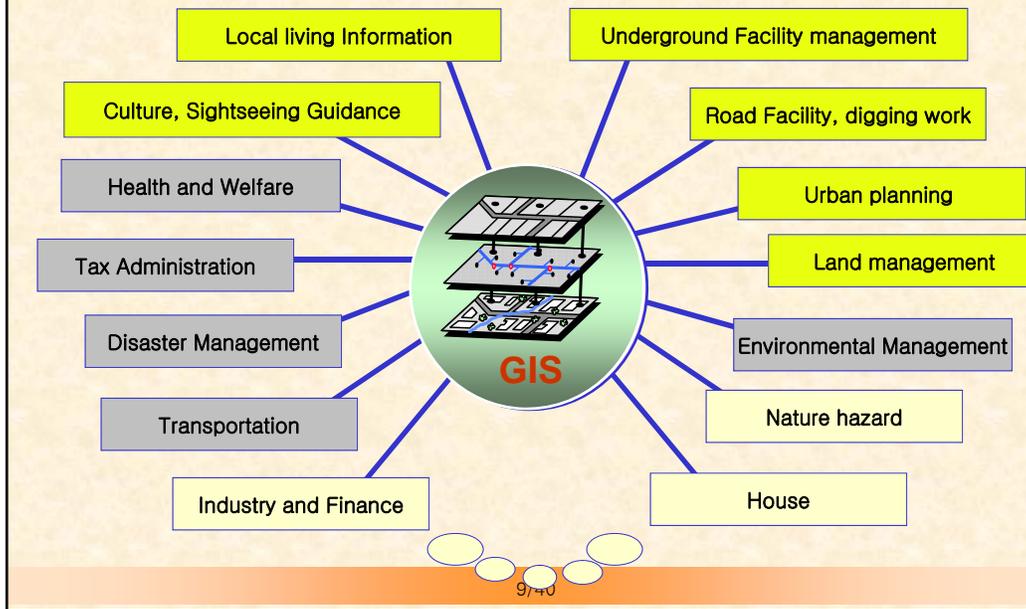
1. Establishes strategic and implementation plans for GIS systems
2. Support to developing GIS applied system for urban planning, environment, river, underground facility and disaster prevention
3. Developing plans for standardization and maintenance of GIS data and digital topographic map.
4. Research for database design for urban infrastructures.
5. Spatial datawarehouse and Enterprise GIS

GIS in Administration

- GIS systems in SMG support many administration works by integrating spatial and attribute data related spatial features



Application Field



History of GIS development in SMG

- ❖ GIS Strategic Plan 1 step : 1995
- ❖ Digital Topographic Map Production : 1996 – 1998
- ❖ Digital Topographic Map revision : 2001 – 2003
- ❖ Unified Underground Facility System : 1999 – 2002
- ❖ Air-photo imagery Map : 2000 – 2003
- ❖ GIS Strategic Plan 2 step : 2002
- ❖ Spatial Datawarehouse : 2001 – 2005
- ❖ Urban Planning Information System (UPIS) : 1999 – 2004
- ❖ Road Management System (RIS) : 1999 – 2003
- ❖ Sewer Information System : 2000 – 2003
- ❖ Supply water information system : 2000 – 2003
- ❖ Cyber GIS Educational System : 2003 – 2004
- ❖ GIS Portal System : 2003 – 2005

II. GIS Data

- Digital Topographical Map (Base Map)
- Air-photo Image Map
- Statistics and attribute DB

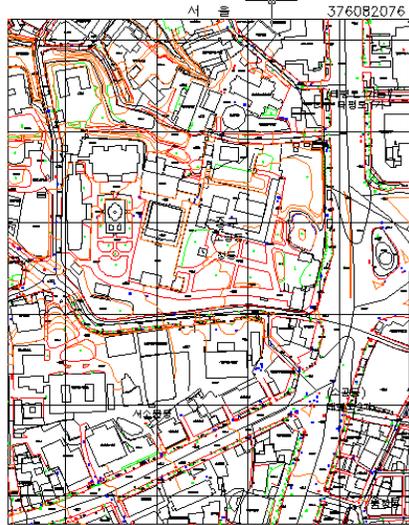
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Digital Topographic Map (Base Map)

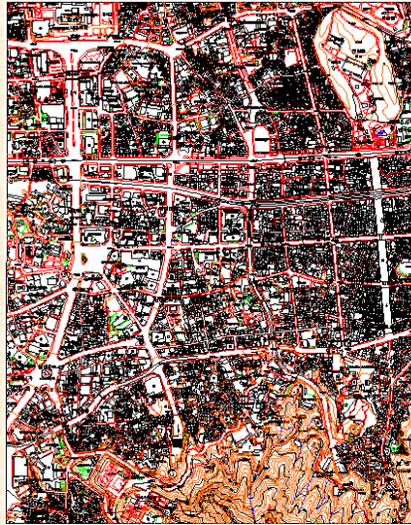
- Scale : 1/1,000
 - Areas, number of map : 524km² 2,303 maps
 - production Period : 1996 – 2003
 - Revision : Per 2 years
 - layers : 150 features (have attribute)
 - Data format : dxf, dwg, shape
 - Total amount : about 12 million dollars
- Scale : 1/5,000
 - Areas, number of map : 605.5 km², 133 maps
 - production Periods : 1996(120 maps), 2001(13 maps)
 - layers : 250 features (have not attribute)
 - Data format : dxf, dwg, shape

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1:1000



1:5000



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Air-photo Image Map

- Since 1971, Air-photo has been taken. This air-photo was digitalized in image and support the various work for administration. Especially, monitoring the unadmitted house

사업년도	제작량	비고
2000년	6,705매	▪ '99년 촬영사진 모자이크 제작
2001년	16,953매	▪ 항공사진 스캐닝 및 웹 검색시스템 구축
2002년	13,998매	▪ 위성영상 및 칼라항공사진 관련 추진
2003년	647매	▪ 위성영상 및 칼라항공사진 관련 추진
합 계	44,133매	▪ 칼라항공사진 관련 추진

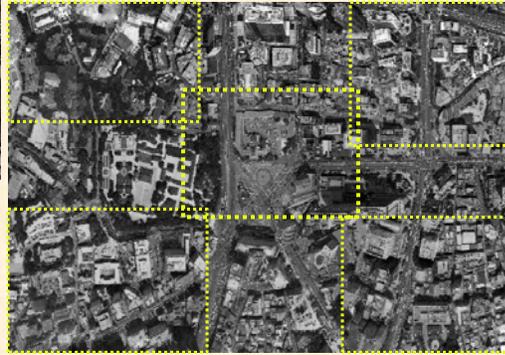
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❖ Mosaic Image production

Scanning Air-photo Image



Mosaic Image



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Statistics and Attribute Data

Various administrative statistics are connected with GIS through data mart

Administrative management : budget, financial

Social and Welfare : Welfare facility distribution

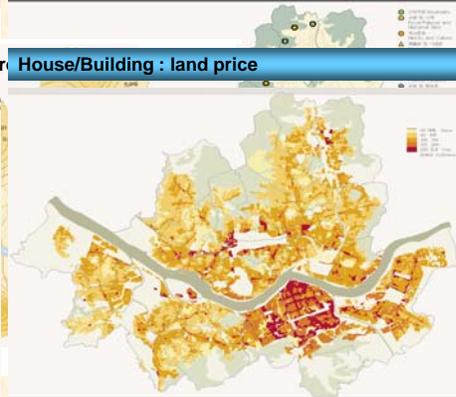
Industry : Number of business

Culture/Sightseeing

Environmental : Air pollution, ozone

Transportation : Transportation capacity in main str

House/Building : land price



These data are serviced to public officers and citizen through GIS portal

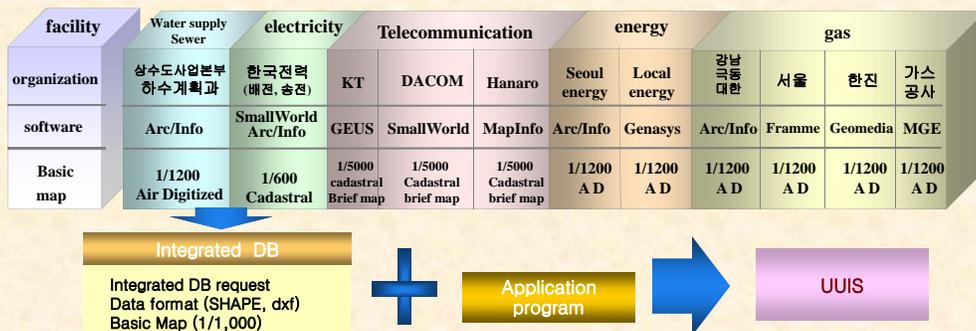
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III. GIS Application

- Application System
 - Unified underground Facility Management System (UUIS)
- Data share and Integration System
 - Spatial Datawarehouse (SDW)
- GIS Portal
- Cyber GIS educational system

Unified underground information system (UUIS)

- Water supply, sewer, electricity, telecommunication, energy and gas data are integrated
- Prevention of accidents by digging at absent of any information
 - We had big 3 gas accidents in 1994, 1995, 2000



❑ Lack of management of underground facility



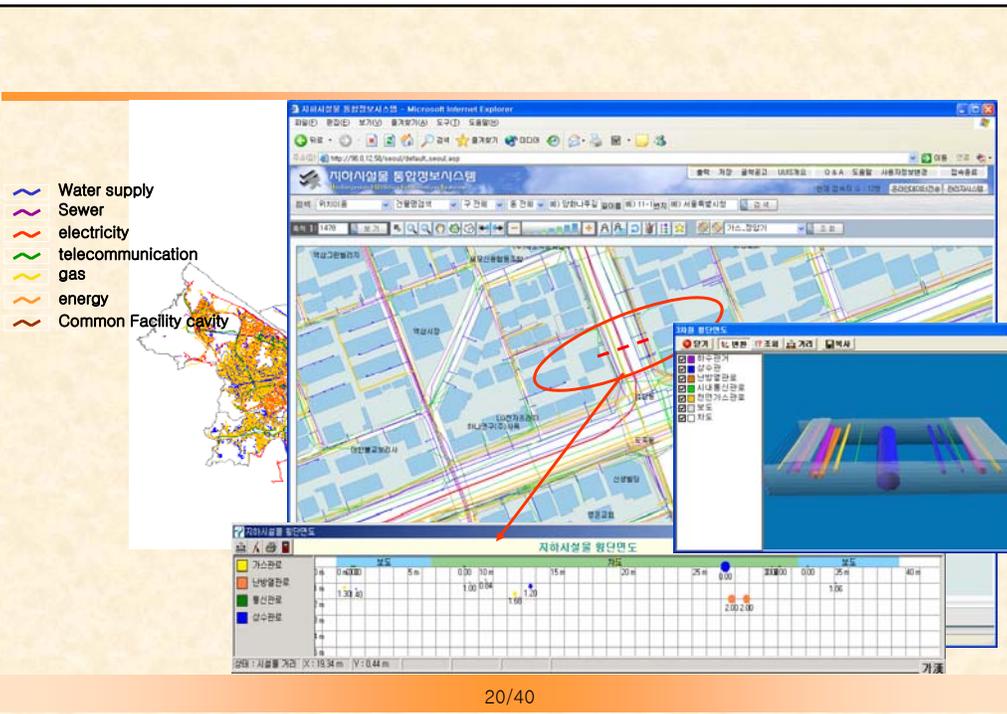
1994. 12. Urban gas supply base exploded in Ahyeon-dong



2000. 2. Fire at common facility cavity in yeuido

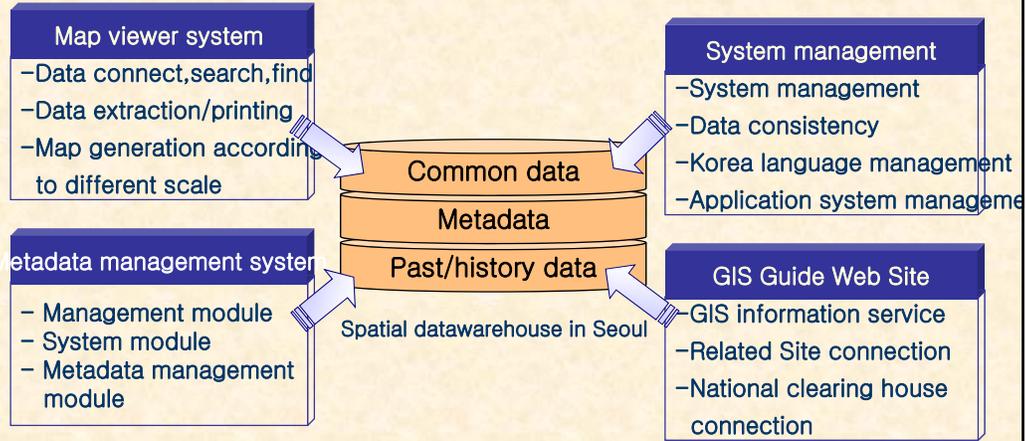


'95. 4. Gas explosion at subway in Daegu



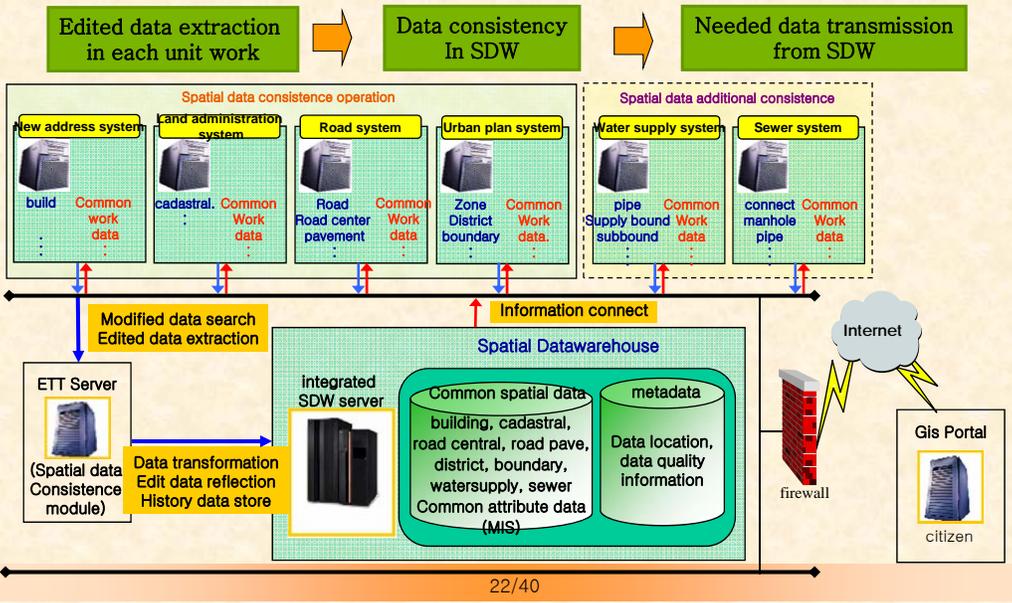
Spatial Datawarehouse (SDW)

- For data share and common use in each GIS application system



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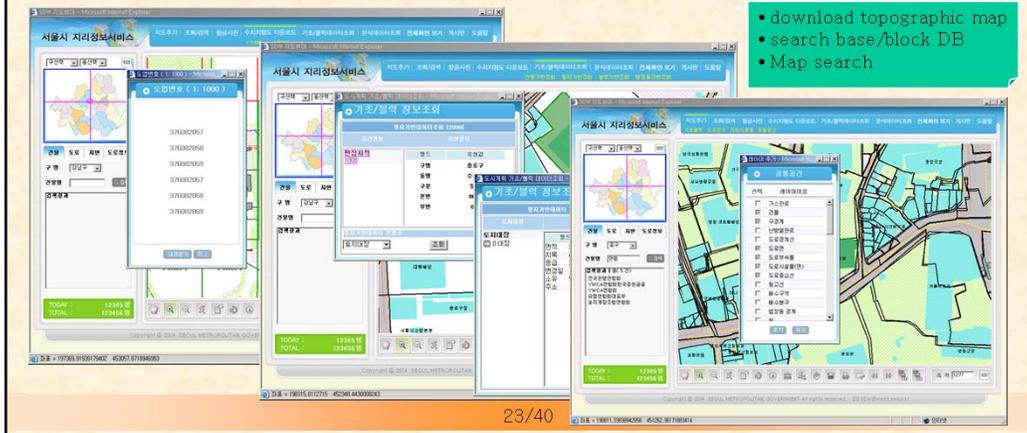
- SDW : data extraction, consistency (transformation), transmission



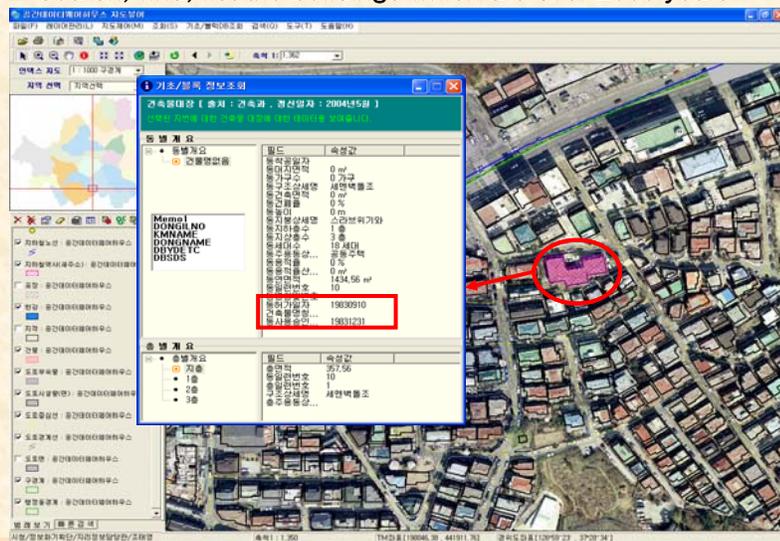
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□ Main functions in SDW

- Develop the GIS work through GIS system and MIS system connection
- Embody the integrated data and the system under C/S and Web environment
- Directly re-search data on the other GIS DB server



□ Search, find, list the buildings which are over 2000 years



GIS Portal (<http://gis.seoul.go.kr>)

There were many GIS homepages at each department in SMG
 These homepage are integrated within unique GIS portal
 and are serviced to public officials and citizen

Discrimination of private sector

- ❑ By the law related with GIS, SMG have to open the GIS data to citizen
- ❑ GIS data which have advantages at public characteristics are provided

Promote the user efficiency

- ❑ Easy to handle map search and edit by standardization of user interface.
- ❑ Provide Interactive information between system and user

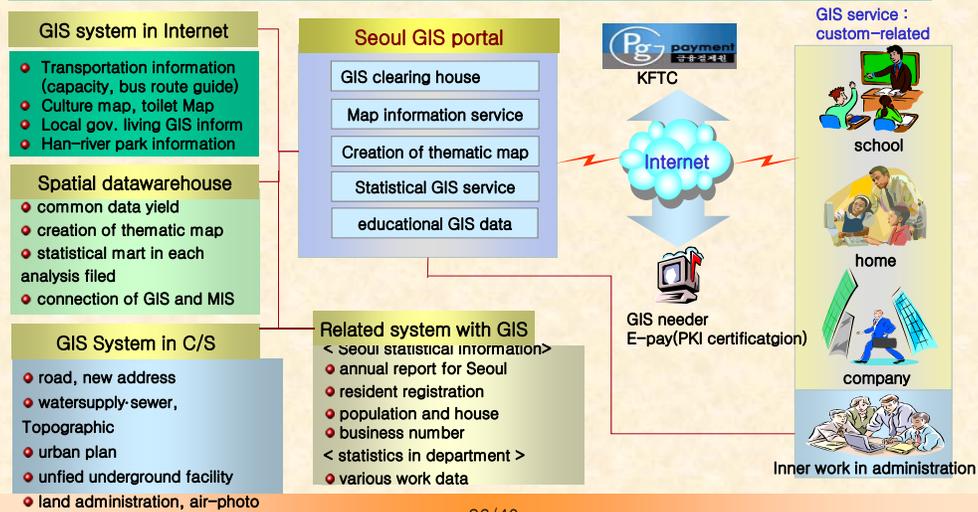
provide the high level service

- ❑ the newest data by rapidly editing the geographic features
- ❑ Imaged thematic maps which are already designed by expert
- ❑ Various GIS educational contents

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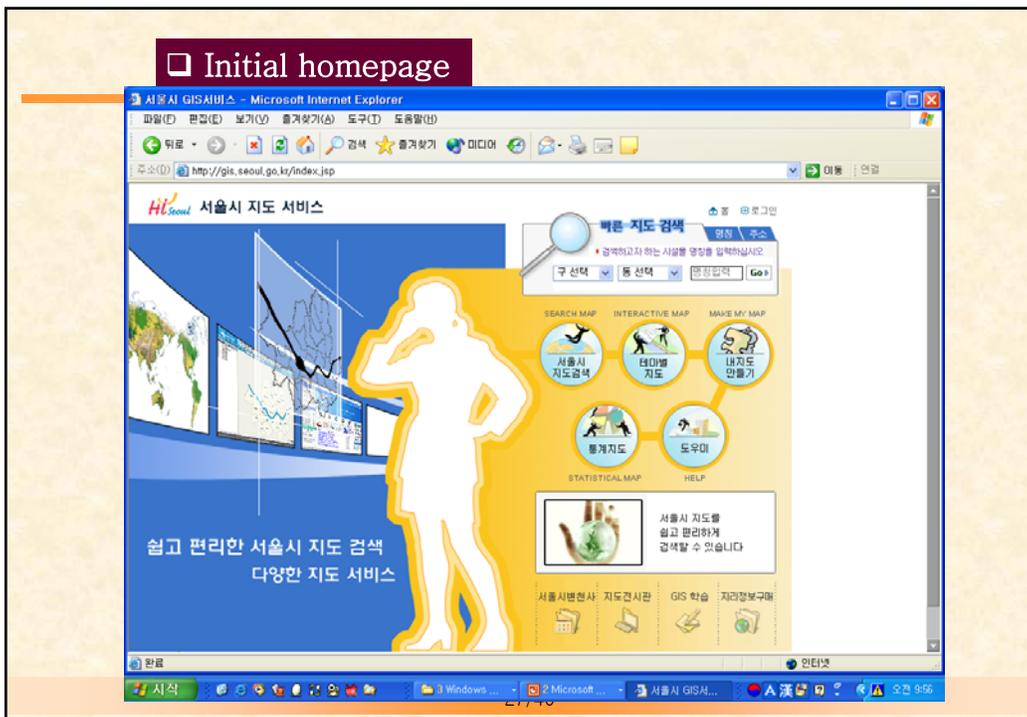
❑ GIS portal system

- provide the data which are not serviced in private sectors
- GIS portal is connected with various GIS system operated in SMG

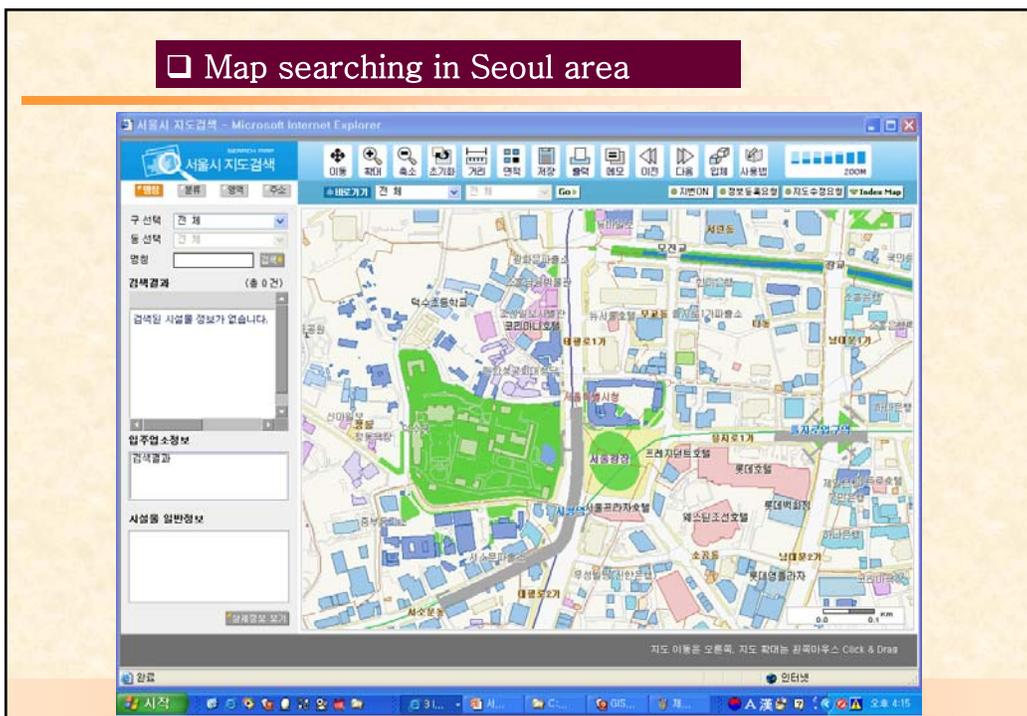


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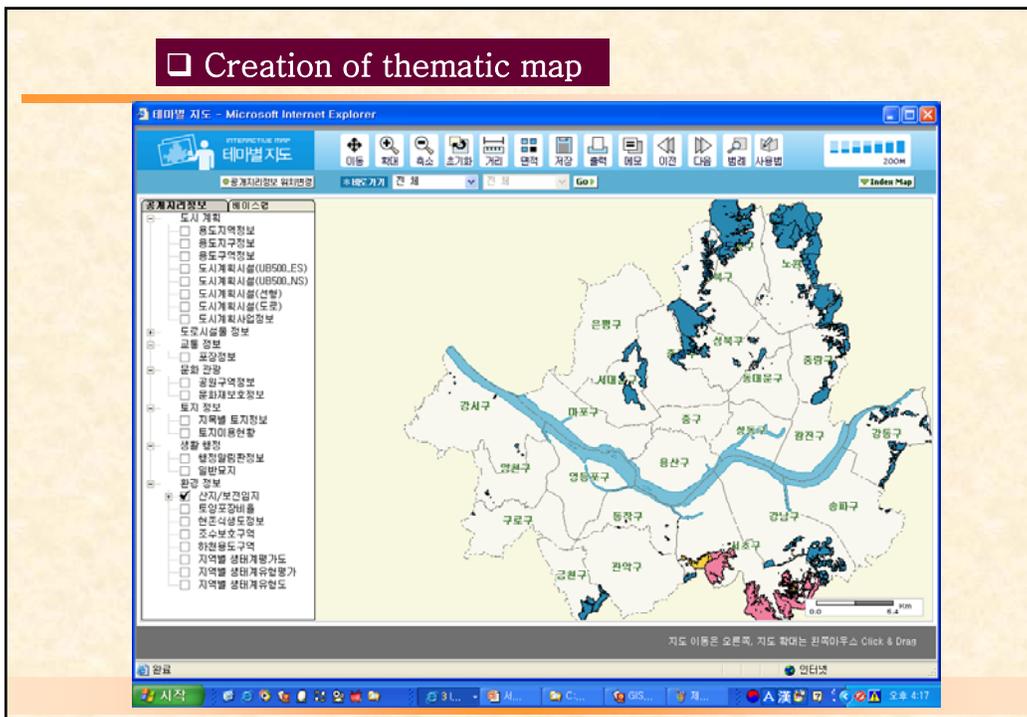
□ Initial homepage



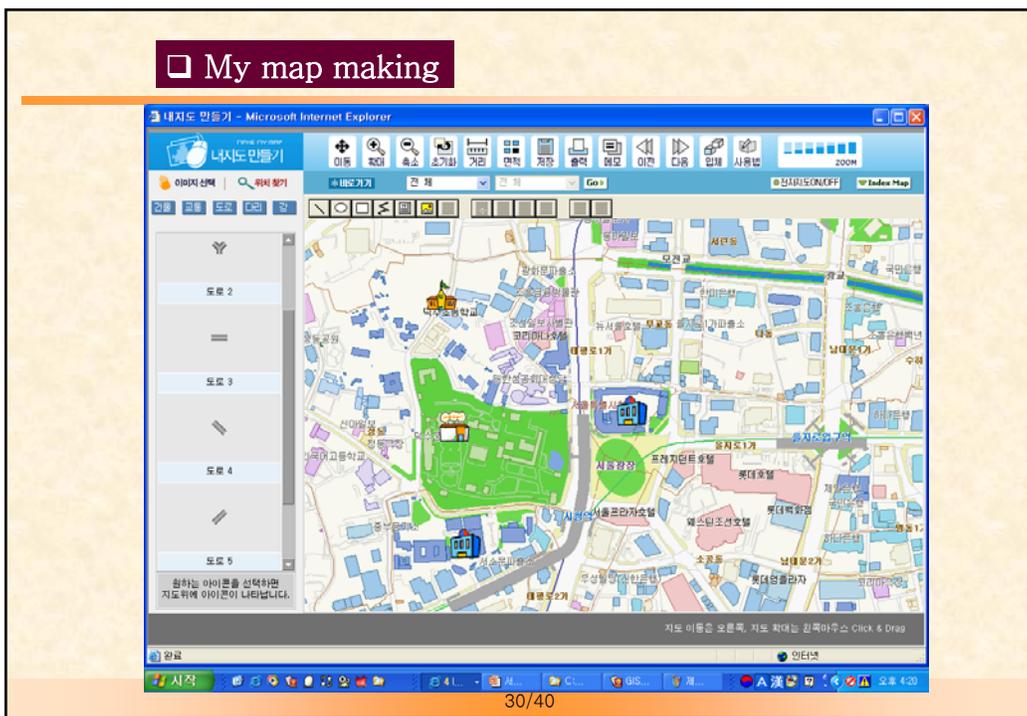
□ Map searching in Seoul area



Creation of thematic map



My map making



Creation of statistical map

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GIS data supply

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Access Seoul GIS portal
(<http://gis.seoul.go.kr>)

To buy GIS data
(<http://seoul.ngic.go.kr>)

Affiliation

Search and select map
(map kind, scale)

Check by credit card

Download

Cyber GIS educational system

□ Purpose

- Give the chance to learn the GIS without the limitation of time and place
- Magnify the capacity of public officials for GIS

□ Present condition

- Contents : GIS educational text and movies, practical use
- Educational courses : general(9), expert(5), application system (8)- theory and practice
- Access : internet or intranet
 - civil internet class : cyberedu.seoul.go.kr
 - educational e-public office : elearning.seoul.go.kr
 - Seoul GIS portal : gis.seoul.go.kr

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IV. Pending problems and implementation plans

- Data maintenance
- Data accuracy
- Data standardization and share

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Data maintenance

□ confronted pending problem

○ Digital Topographic Map

- Use air-photo picture photographed in last year
- Takes 2 years to make DTM
- Difficult to obtain national finance support

⇒ Old geographic features effected DTM
 ⇒ Therefore, difficult to obtain newest data

○ Thematic map

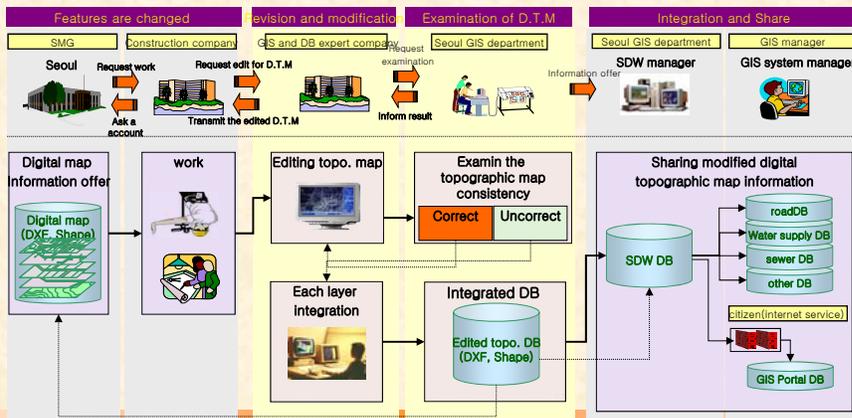
- Insufficiency of organization system for revision about map and attrib
- Duality works are happen (official work and GIS editing work)

⇒ lack of effectiveness for systematic maintenance and operation

□ Implementation plan

○ Improve the work system for revision of GIS data

- As the feature are changed, digital map have to be edited immediately
- When the construction work are finished, survey results are given to SMG
- Law : Public survey results have to be given under an obligation



Data Accuracy

❑ Confronted pending problem

- Discrepancy of reference points in digital topographical map
 - Digital topographical map used old reference point until new reference point are made
 - There are some areas with mixed reference point (old and new)
 - Survey, input, edit errors produce local distortion
 - ⇒ Therefore, various thematic maps based on digital topographical map also produced the location errors
- Discrepancy of underground facility layers
 - Location accuracy are different in each underground facility management organizations because they have individual accuracy level
 - Each GIS data are developed without standard guidance

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❑ Implementation plan

- Usage of urban reference point and continuous management
 - Reorganization of various reference points in Seoul area
 - Prevention of loss and damage for reference point
- Improvement of data accuracy for thematic map and attribute
 - Some errors are founded in SDW and each GIS systems, so consistent editing work system is needed through a singular window
- Improvement of locational accuracy for underground facility
 - After appraising the each underground facility management organization, recommend the standard guidance

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DB standardization and share system

❑ Confronted pending problem

○ Data development guide is not present

- Standardization for DB and layer design is not presented
- Cooperation between departments is insufficient due to the lack of standardization for exchanging data

- ⇒ Duplication of similarity data
- ⇒ Difficulty of data connection and compatibility

○ SDW is now starting

- Difficult for identification and definiteness of data source

- ⇒ Restriction of data share and usage
- ⇒ Occurrence of data duplication

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❑ Implementation plan

○ Provide data standardization

- Analyses design for existed data -> integration of similarity map and attribute data
- Offer the standardization for new data -> prevent data duality

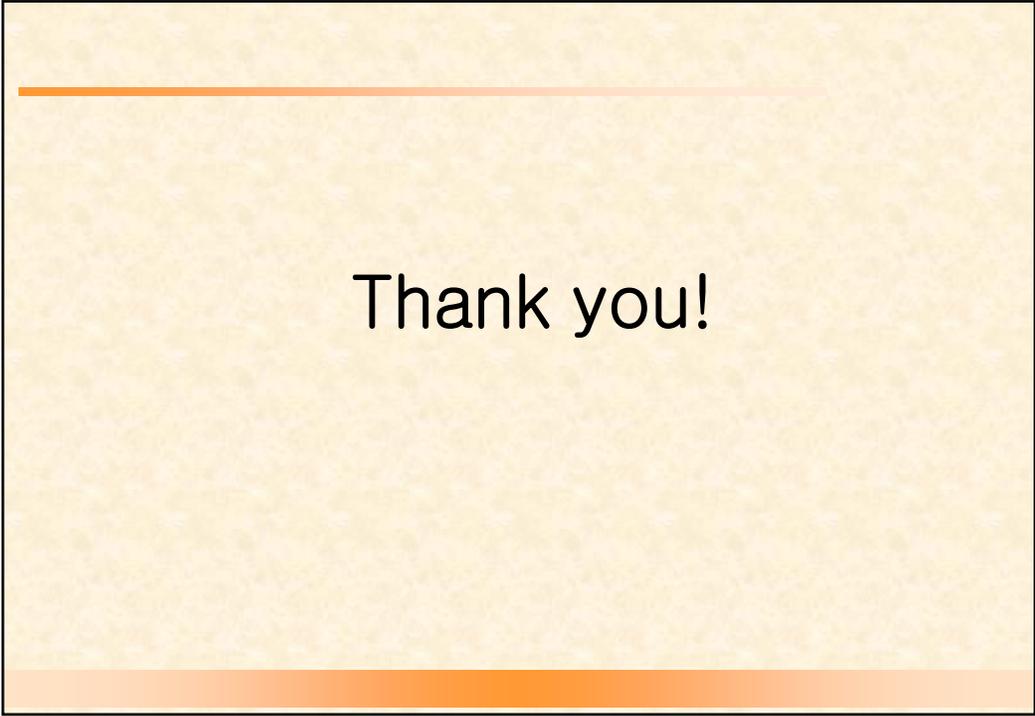
○ Provide technical standardization model

- Operate the technical reference model/standardization profile (TRM/SP)
- Present the technical guide considering Seoul GIS structure

○ Improvement of data share system

- Make and manage the DB based on integrated data model
- revise and distribute the GIS data through SDW

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Thank you!