Development of petroleum database

CCOP EPPM workshop
1-3 April 2009

Seonghyung Jang

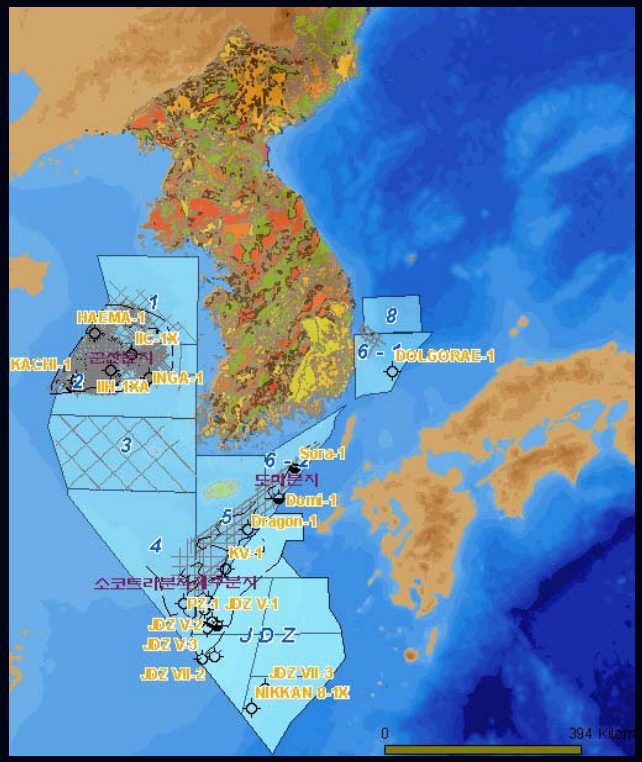
KIGAM

overview

- Background of Oil & Gas activity
- Standard & metadata structure
- PDMS of KIGAM
- Recommendations

Background of Oil & Gas activity

- Petroleum legislation
  - -1970, Laws of petroleum development
  - -1980, KNOC
  - -1998, Find gas field, East sea
  - -2004, Developing gas field
  - -2007, Revised ver. of the laws



- Data management policy & strategy

  - Effective developing offshore
  - Need for policy decision
  - National ownership of data for expl. & devel.
  - Effective managing petroleum data
  - Easy access to petroleum data
  - Archive for managing data

- History of petroleum database

Phase 1 2006 – 2008	**Developing PDMS prototype and operating**
Phase 2 2009 – 2011	**Evaluation petroleum database and supplement**
Phase 3 2012 – 2015	**Service petroleum database and supplement**

Petroleum Data Management System

2006

- Design basic PDMS and developing prototype
- Design Metadata
- Design S/W & H/W

2007

- Improving prototype and supplement
- Gathering information on blocks of Korea continental shelf
- Designing core data
- ISO19115

2008

- Improving prototype and supplement
- Gathering information on the South Sea
- H/W supplement: file server, map server
- Transforming tape data

2009

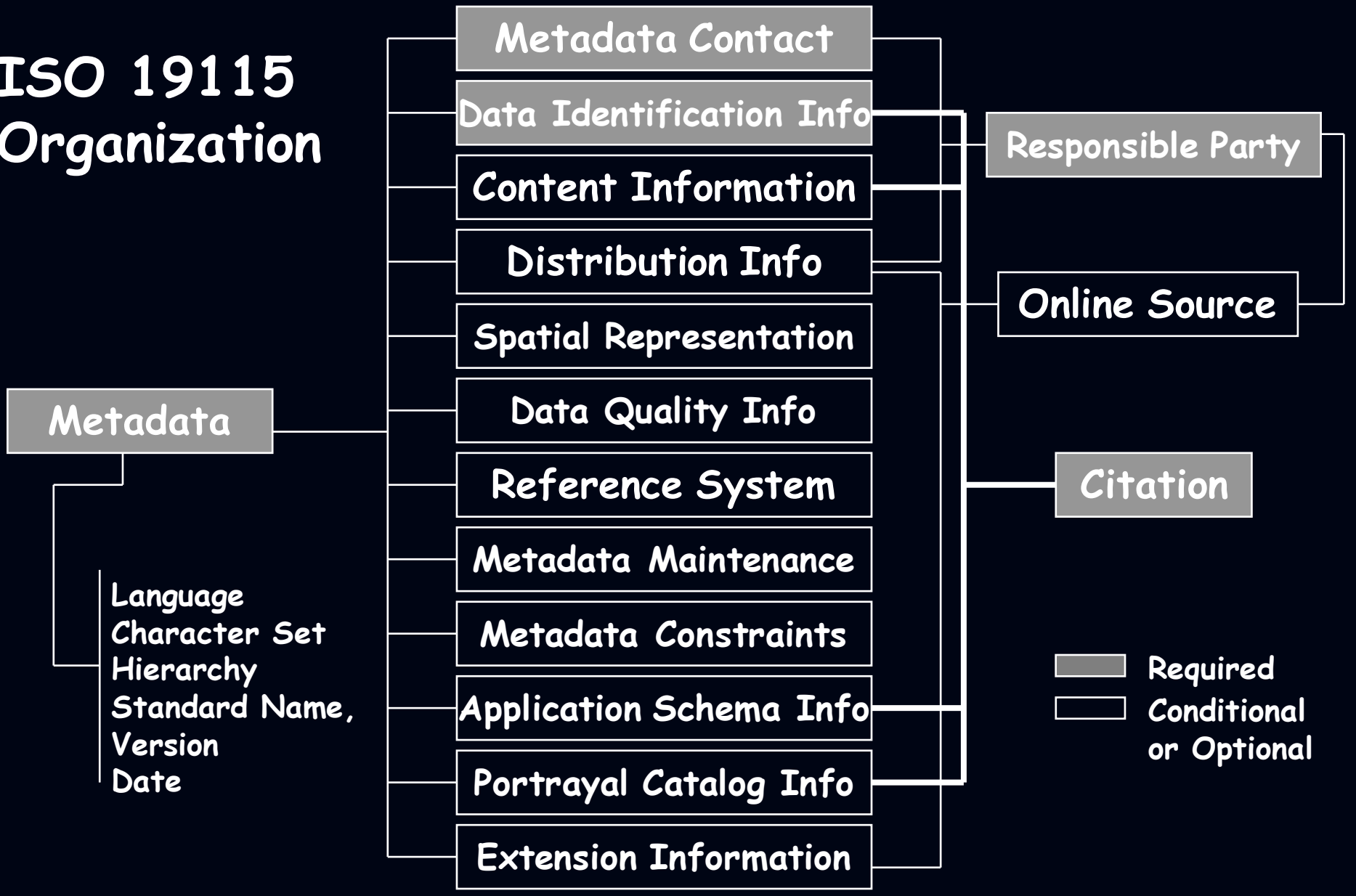
- Improving PDMS and supplement
- Gathering information on the East Sea
- Reprocessing for evaluation
- Basin report

- Organizations for PDMS

  - KIGAM
  - Korea National Oil Company
  - KORDI(Korea Ocean Research & Devel. Inst.)
  - Ministry of Knowledge and Economy

Standard & metadata structure

ISO 19115 Organization



• PDMS structure

Integration system

- **Design integration system: DB engine using LAMP, System design, web design**
- **Developing tools for seismic data input**
- **Transformation tape data**
- **Massive storage system and media**
- **Data format: SEG-Y, SEG-D, disk image, PDF, JPG**

Field data

- **Seismic data**
- **Core data**
- **Well logging data**
- **Relative reports**

processing / Interpretation

- **Seismic section, geology inform, basin analysis**
- **Seismic stratigraphy data, petroleum system**
- **Gravity and magnetic data, reports, interpreted section**

- Metadata elements

-Fields: Fields ID, Blocks, . . .

-Seismic: Survey name, survey code, data, survey type, . . .

-Wells: Well name, basin, field, lat., long., elevation, ..

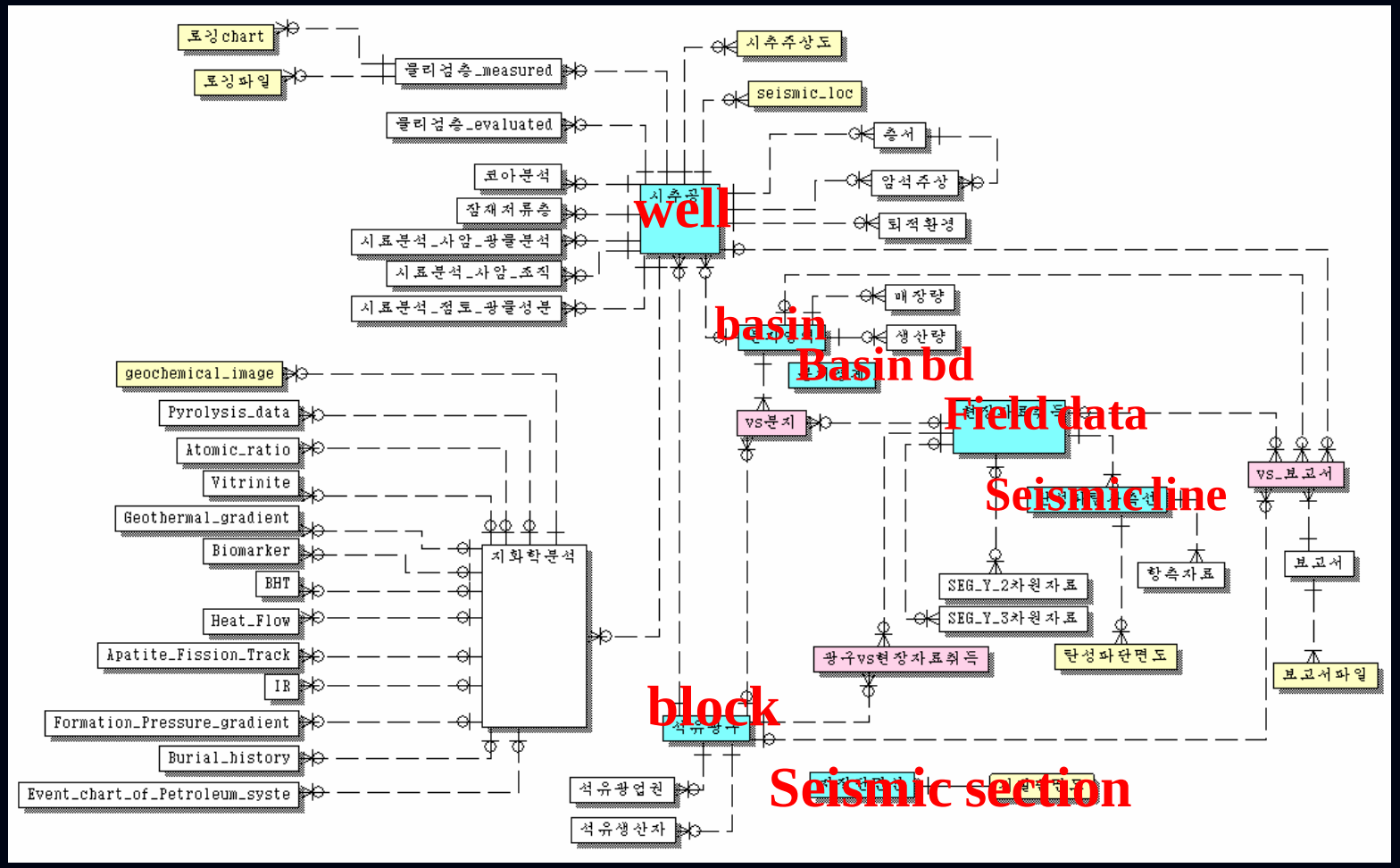
-Other survey : Survey name, survey ID,…

-All titles: Title ID, Type status, issued data, expiry data

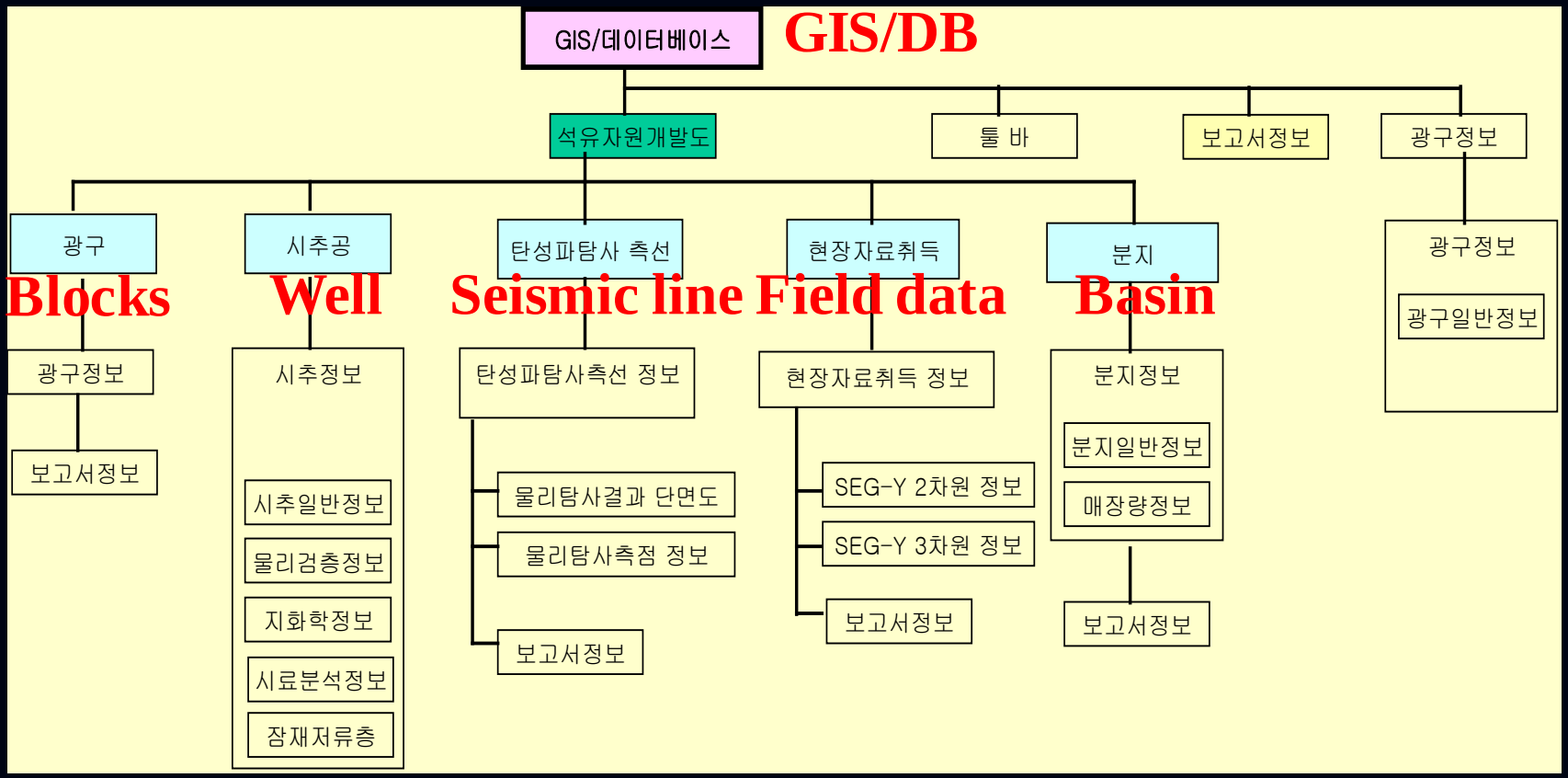
-Surface facilities: Facility name, facility type, …

-GIS DB: World Geodetic System (WGS84)

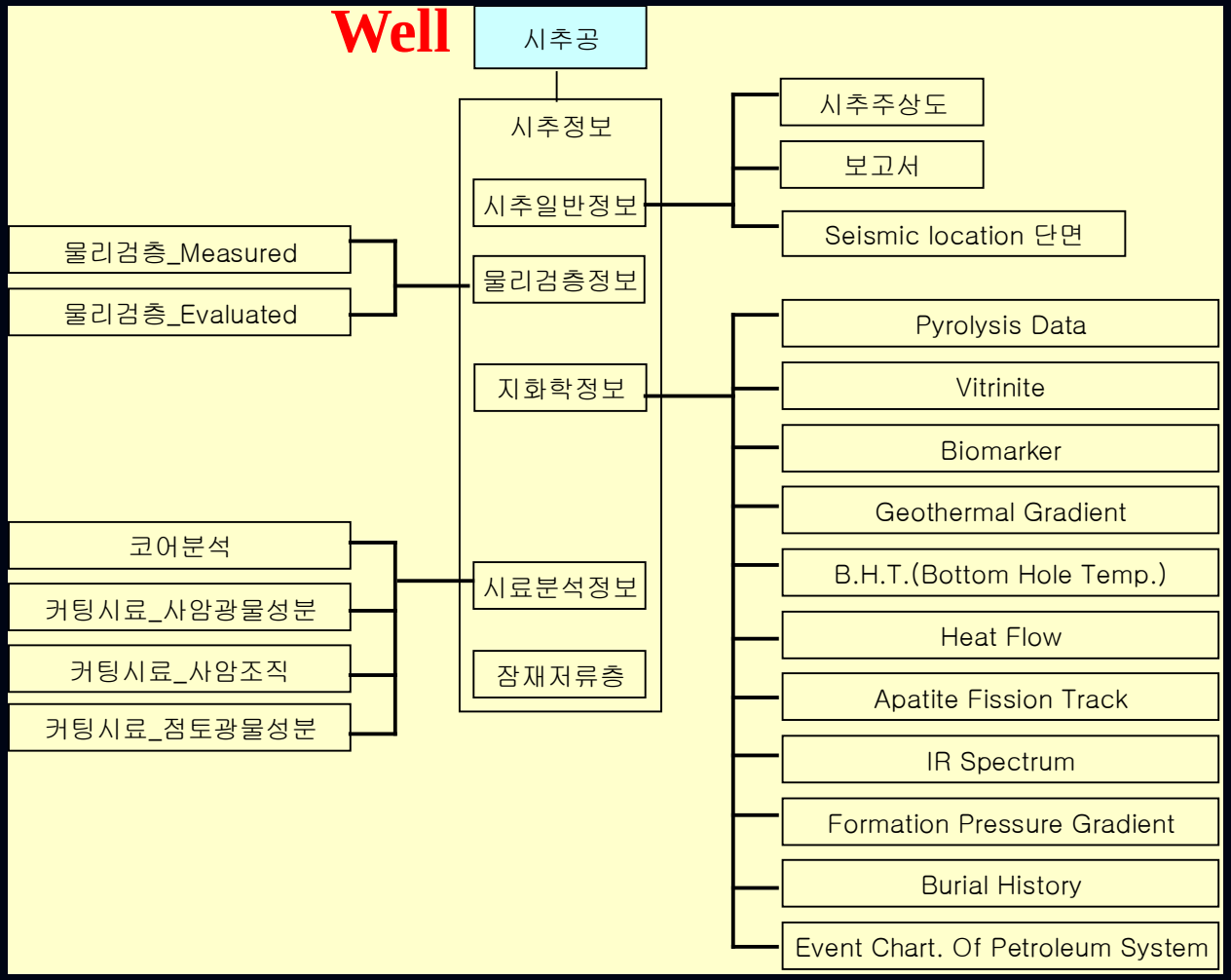
- PDMS structure



- Web GIS / DB service structure



- Well information structure



- Quality control for PDMS

-monitoring system changes and update

- monitoring environment changes

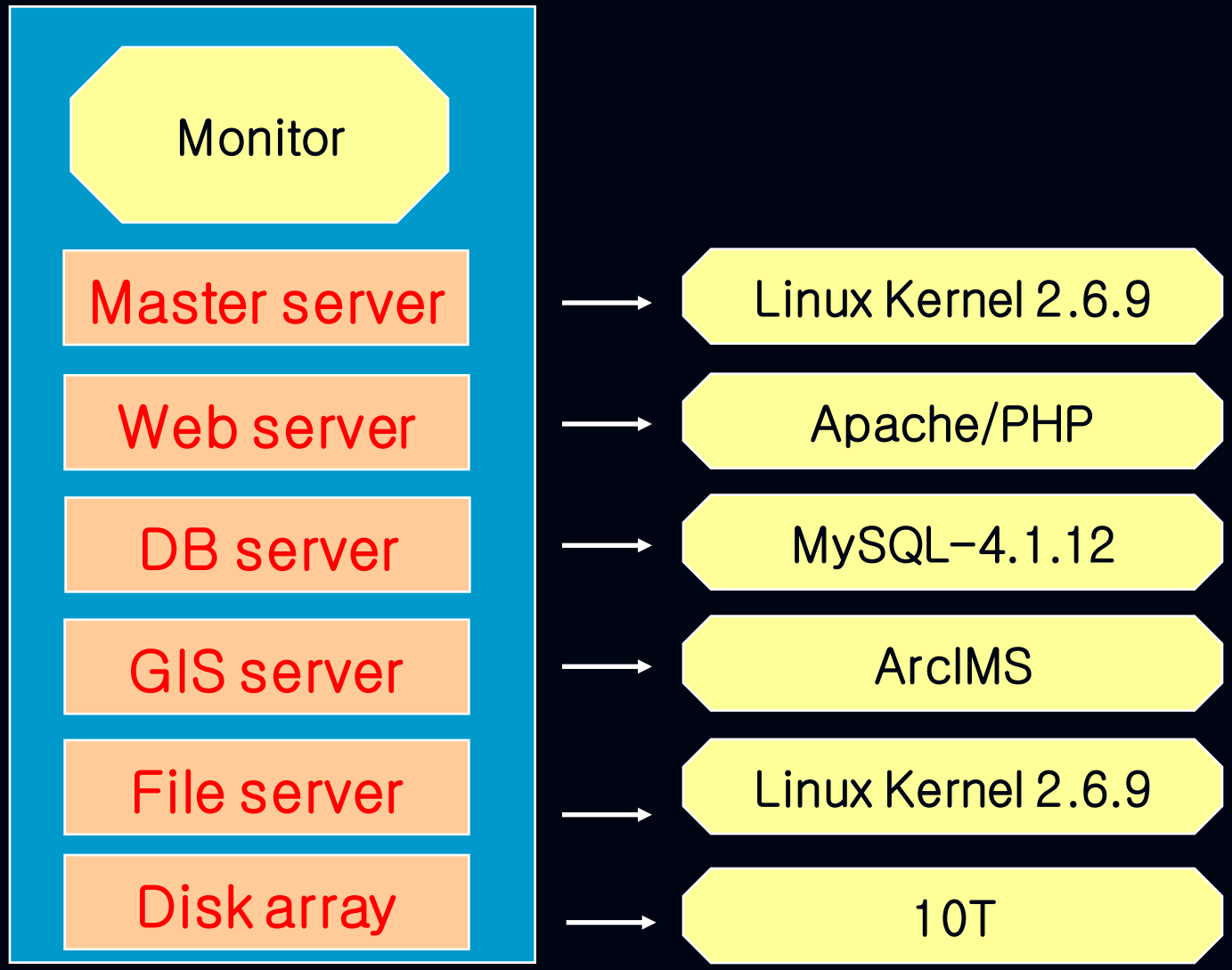
- seismic tape data to disk image file

- well log data: image file, numerical data

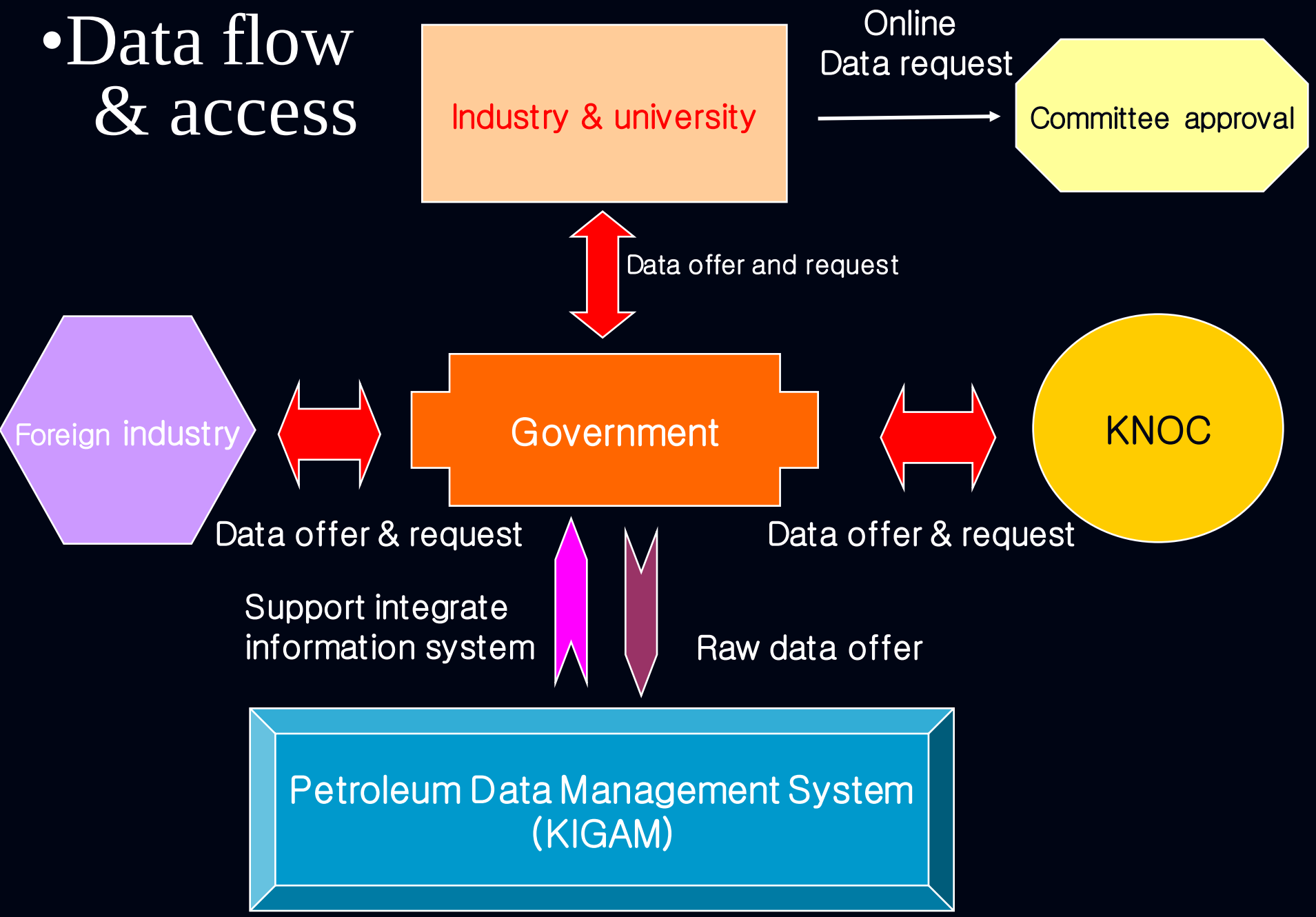
- storage : Disk array based on RAID 6

- media backup: tape, CD, DVD, blue ray

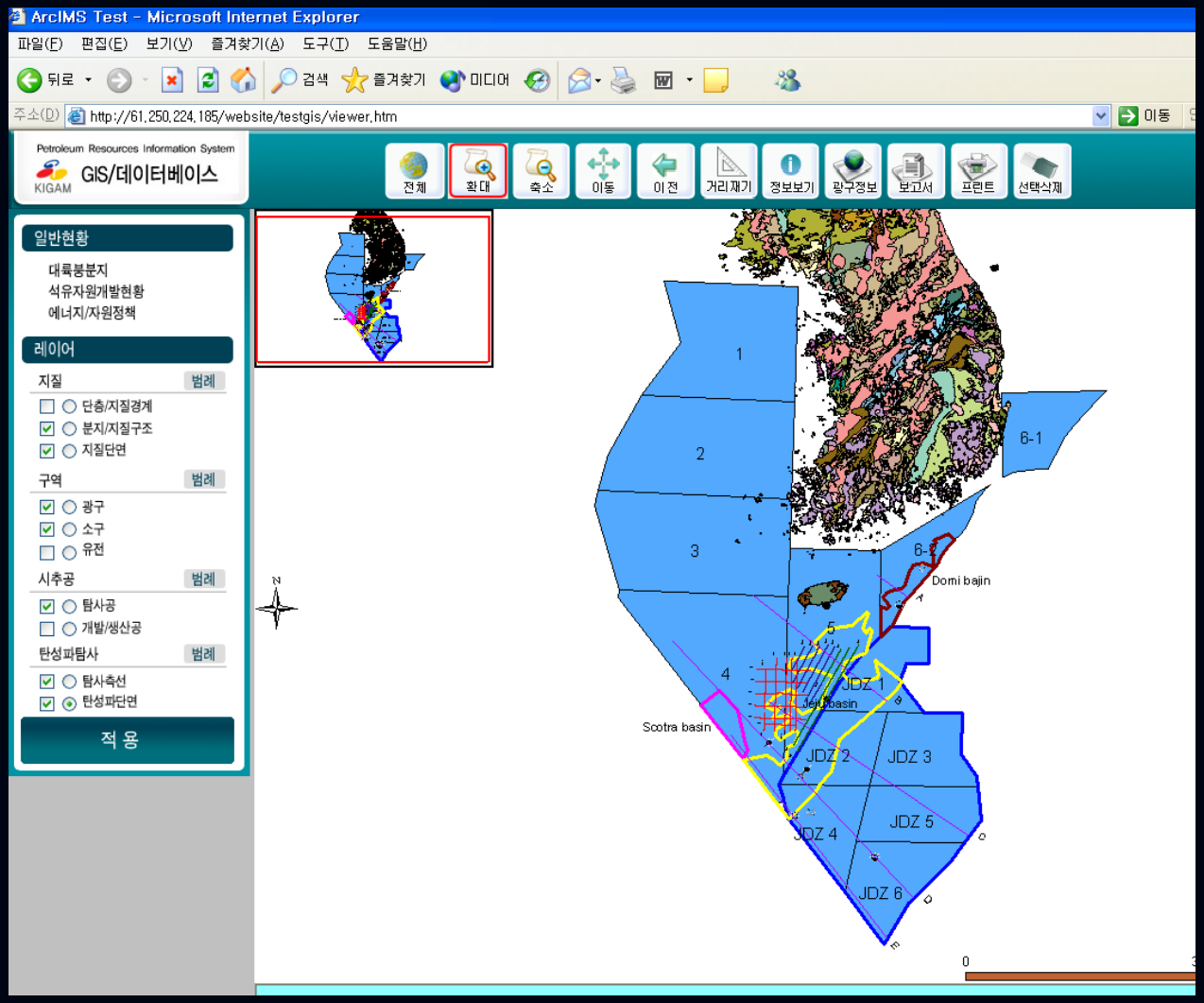
•System & technologies



•Data flow & access



PDMS: www.petroDB.net



- Challenges to database management

- Budget, Human resources, Technology

- Technology
  - Gathering seismic data
  - Transcript tape data to disk image or SEGY file
  - Heavy GIS and map server – optimization
  - Easy accessible system
  - Huge file server
  - Security problem
  - Using open source

- Ongoing and future plans

  - Ongoing plans
    - gathering seismic data of the East sea
    - navigation data
    - seismic image

  - Future plans
    - Map & GIS server
    - security
    - Open source system

Recommendations

- Sharing information on metadata design & structure
- Grouping data set could be opened
- Cooperation for metadata