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## Case Study: A Data Warehouse for a National Institute of Geological Environment Monitoring

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The China Institute of Geo-Environment Monitoring assumes a responsibility for providing national hydrogeology, engineering geology and environment geology information services. However, its data is stored in databases and could not support Online Analytical Processing (OLAP) well, so the institute built a Data Warehouse (DW) to integrate various geo-environment data to support upper application systems.

The system is composed of a DW design module, metadata management module, data retrieval module, search engine module, OLAP module and data mining module, covering the whole process from design, building, utilization to presentation.

北京市地下水地点	时间	指标		
		水质总体情况	平均PH值	平均碳酸根离子
-所有位置	+所有时间	1	7.82	287.32
-北京市	+所有时间	1	7.82	287.32
-县	+所有时间	0.748	7.87	234.611
-密云县	+所有时间	0.737	7.77	239.667
1102280501	-所有时间	0.643	7.84	217
	-2002	0.66	7.87	217
	-5月 2002	0.66	7.87	217
	-26-5月 -2002	0.66	7.87	217
	+2003	0.63	7.67	220
	+2004	0.64	7.97	214

Figure 1: Drilling-down operation in OLAP

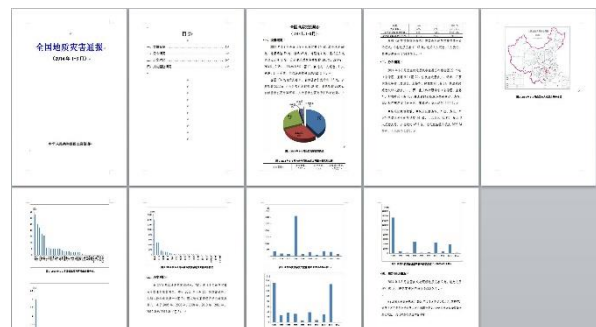


Figure2: A national geo-disasters monthly report

Compared with the similar DWs[1,2], it has two advantages:

1 Support users to create dimensions, measures and cubes in a couple of steps rather than to use Oracle Warehouse Builder (OWB) with complex operations;

2 Supplies a tool to generate reports in Word, html and pdf format from the data retrieved from data storage, automatically or semi-automatically. Figure 2 shows a national geo-disaster monthly report, in which a table and charts are also created by the system.

The GDW, which has been running for 2 years without crash, evidenced the correctness of the design and development of the system. The future work will emphasize improving the performance of data mining.

*References:*

[1] Da Silva, J et al. (2010). Info Sys 35 (5): 592 - 614

[2] Glorio, O et al. (2009). LNCS 5592. 505-519

