

Pilot study of Virtual Geographical Lab

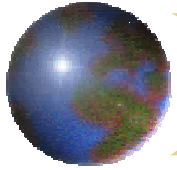
----- take DAZI, Tibet, as a tentative zone

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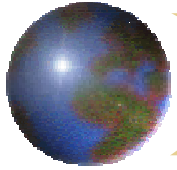
Outline:

✚ Why?

✚ How?

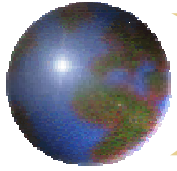
✚ Outcome

✚ Future



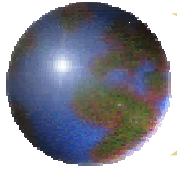
Why:

- ❖ Generally, in geographical research, the GIS data is massive. Geo-scientists have some difficulties in their research work. Such as :
 - 1 data collection
 - 2 data analysis
 - 3 compare the data between historical data and present data or this data and other related data for finding the change trend or relationship
 - 4 difficult to review the object directly, such as study of Tibet.



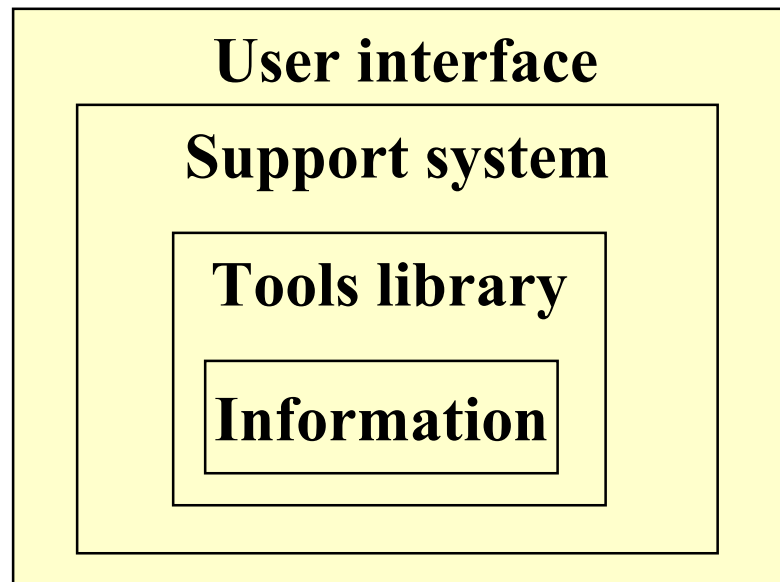
Why:

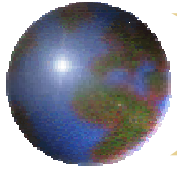
- So we want build a virtual geo-science lab, it should have some characteristics as:
 - 1 Visualization
 - 2 include scientific databases about object
 - 3 have a tool library to help geo-scientists to do data analysis
 - 4 provide a single friendly interface for users
 - 5 provide an open platform for users to add databases and tools



Why:

⊕ The system structure will be :



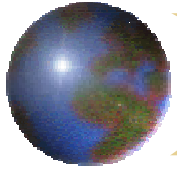


Why:

- Meanwhile, the reason why we select the DAZI , Tibet, as a tentative zone and do such testing work is:

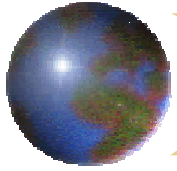
1 important for Tibet research,

2 important for Global Change researching



Why:

- ❖ Now, the development of Computer and network technology make such integrate virtual lab possible.
- ❖ At the same time, GIS, RS, and GPS that were developed fast made the precision research of Geo-Science possible.

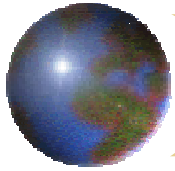


Why:

- ❖ Because running such virtual lab on net, the transport data will be very large. So it needs some support environments, such as high performance computer and high speed network.

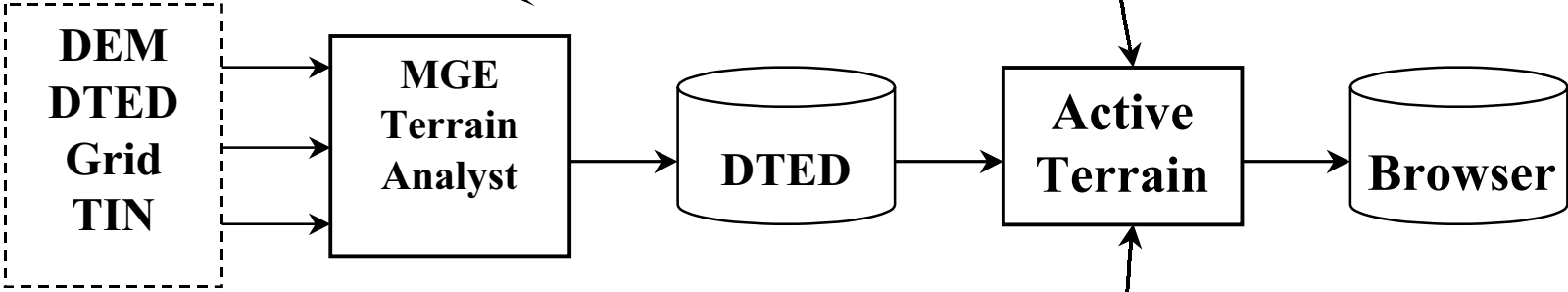
At present, we get the supports by

- 1 Chinese Program-863
- 2 National Science Fund Commission of China

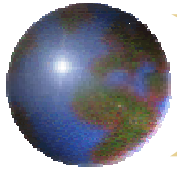


How: 1 Flow chart

This way is to build the 3-D terrain model.



This way is to build and paste texture.



How:1 Flow chart

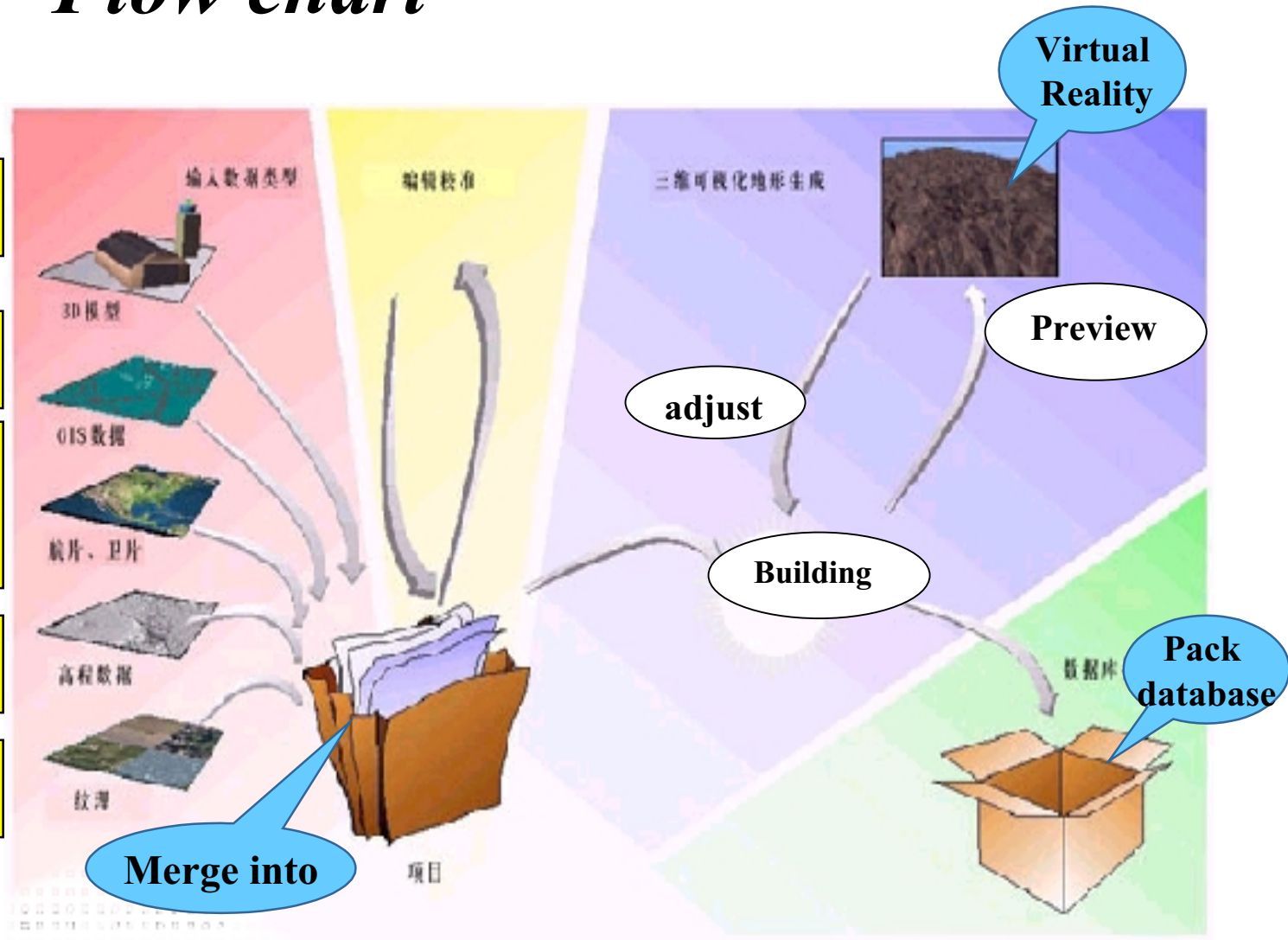
3-D model

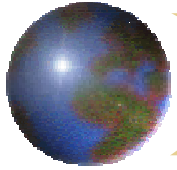
GIS-data

Aerial and satellite imagery

DEM

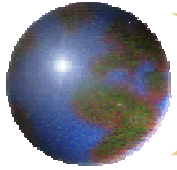
Texture





How:2 preparation

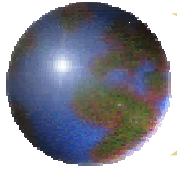
- 1 select a tentative zone
DAZI county ,Tibet
- 2 get the six aerial images covered
500 km² area & the size was about
3.5 G. These images are saved on
the Dawning-2000, a super computer



How:2 preparation

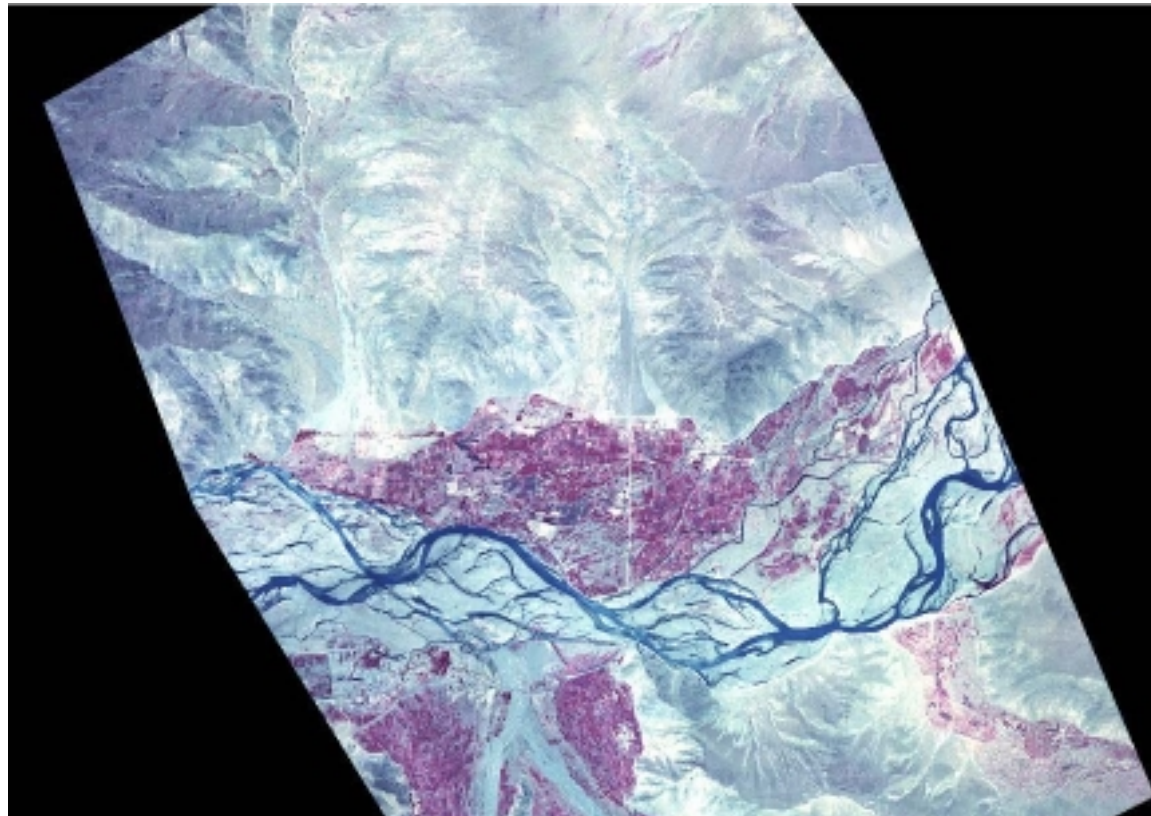
- 3 build 58 databases about DAZI
these database includes
**topography, weather, buildings,
population, education, agriculture
and other cultural features**

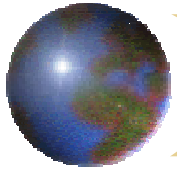
All these databases was managed by
ORACLE which was run on the
Dawning-2000



How:2 preparation

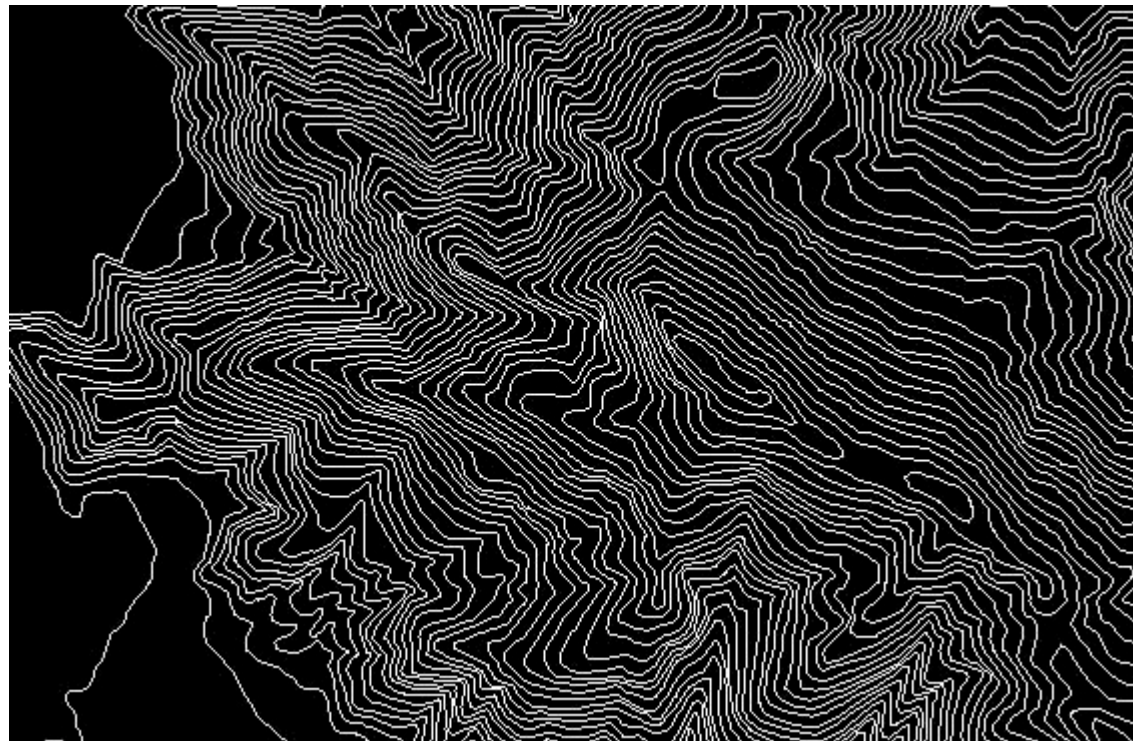
- ✚ The selected aerial images, these images will be used as texture in virtual screen.

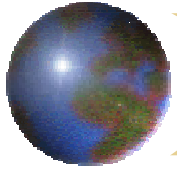




How: 3 process

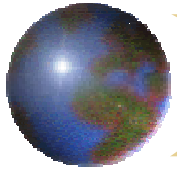
- 1 Digitization and get a contour map





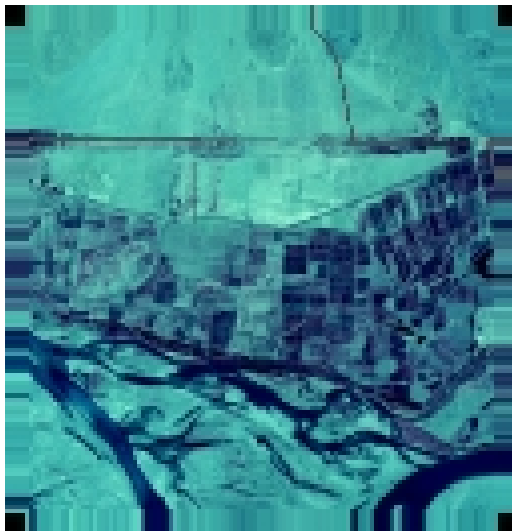
How: 3 process

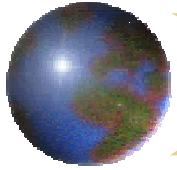
- 2 Get the DEM, and transform about DEM and DTED
- 3 Build 3-D terrain model which can be used in many 3-D virtual browsers such ActiveTerrain's ActiveFlight, and Terra Vista's Audition



How: 3 process

- 4 Make the texture image and paste the texture image onto the 3-D terrain model





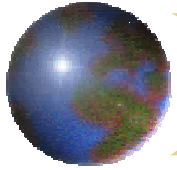
How

✦ 5 construct the databases about the DAZI

In V-Lab of Geo-sciences, we not only provide a real 3-D representation of DAZI, but also provide 58 scientific databases for users.

These databases include :

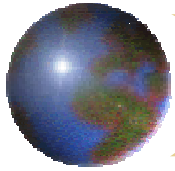
**topography, weather, buildings,
population, education, agriculture
and other cultural features**



How: run environment

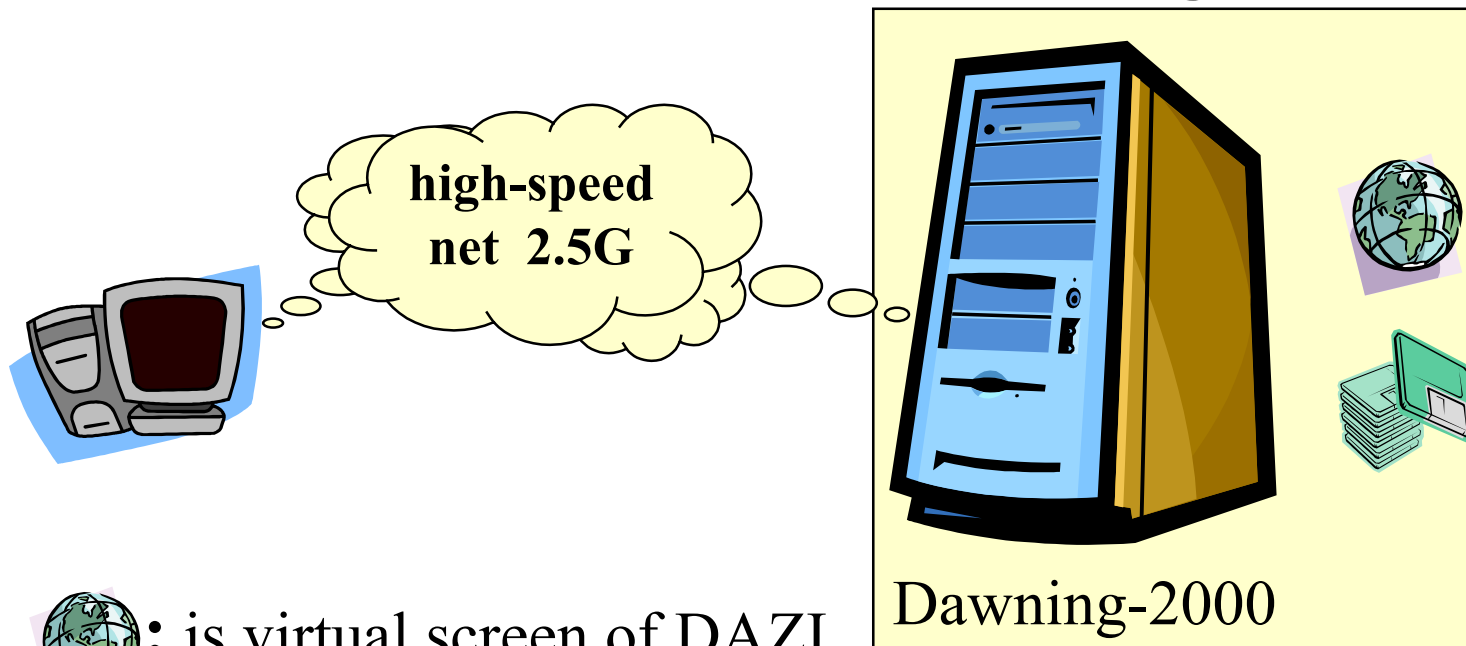
❁ Run environment for testing Demo

- 1 Browser runs on PCs with high configure, such as display adapter with 32M or more, 128M memory or more, P III 500 or higher. Such configuration will be easy met at present.**
- 2 We run the database of testing Demo on the Dawning-2000, a super-computer, managed by ORACLE.**
- 3 Connect the database and browser through the net which backbone is 2.5G.**
- 4 All the virtual screen model were saved in the Dawning-2000, But now, We can not support browser through Web access.**



How: run environment

✪ Run environment for testing Demo

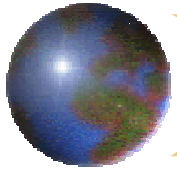


: is virtual screen of DAZI



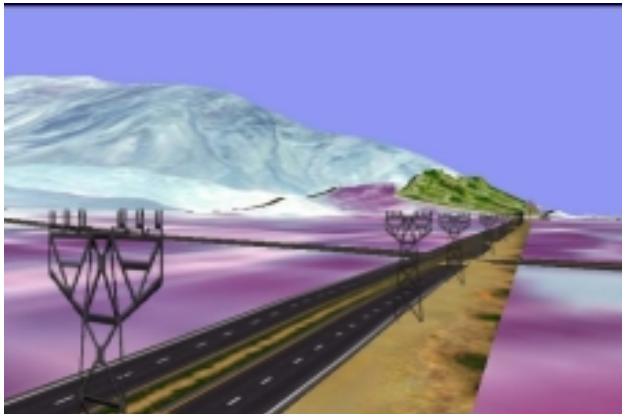
: is database about DAZI managed by ORACLE

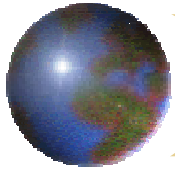
All of them were run on the Dawning-2000



Outcome:

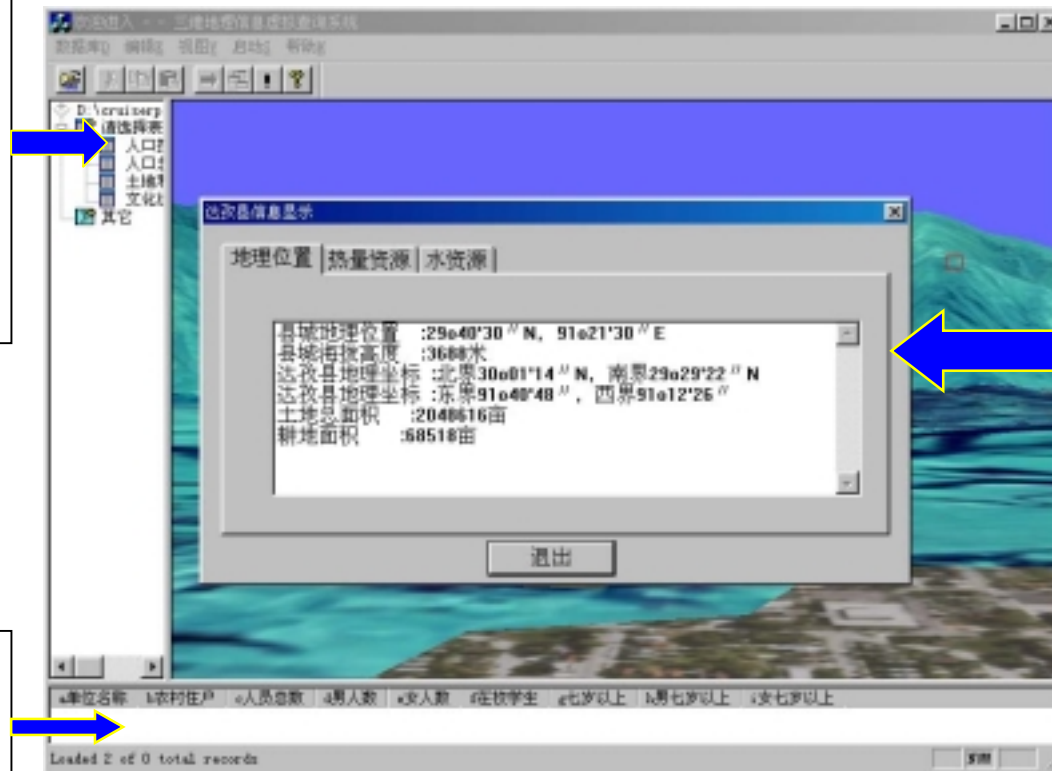
❁ **A 3-D representation of DAZI**





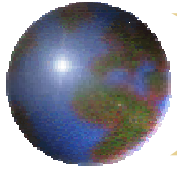
Outcome: data query

In the left of the Picture, Load the all of the table, and can select the table



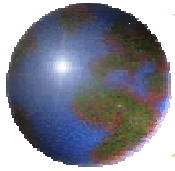
If you want to query the data about the surface features, you can click the features with your mouse, a pop-up menu will show the data.

Bottom is the place to show the data.

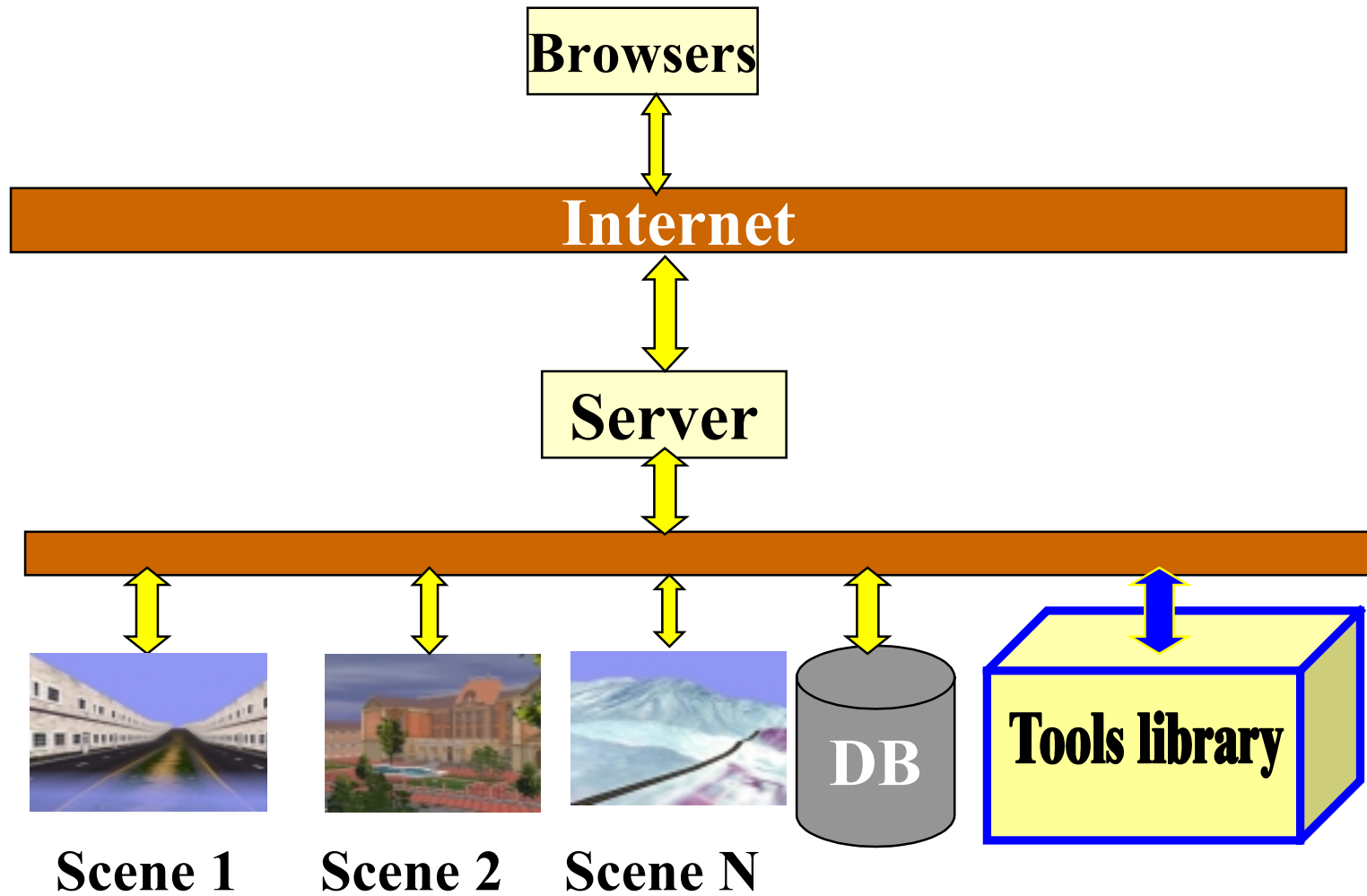


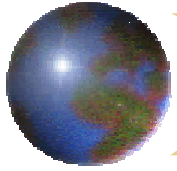
Future:

- ❖ 1 To make the Virtual Lab of Geo-science support the web browsers (such as Netscape, Internet Explore, and so on)
- ❖ 2 Distribute the data and 3-D representations of geographic areas over a number of server across a network
- ❖ 3 Perfect the databases
- ❖ 4 Import the tools library includes full-text index, modeling, statistic tools, dynamic analysis for historical data



Future:





Thank You !