Investigating possibilities to develop the BDT in Poland as a MRDB type database

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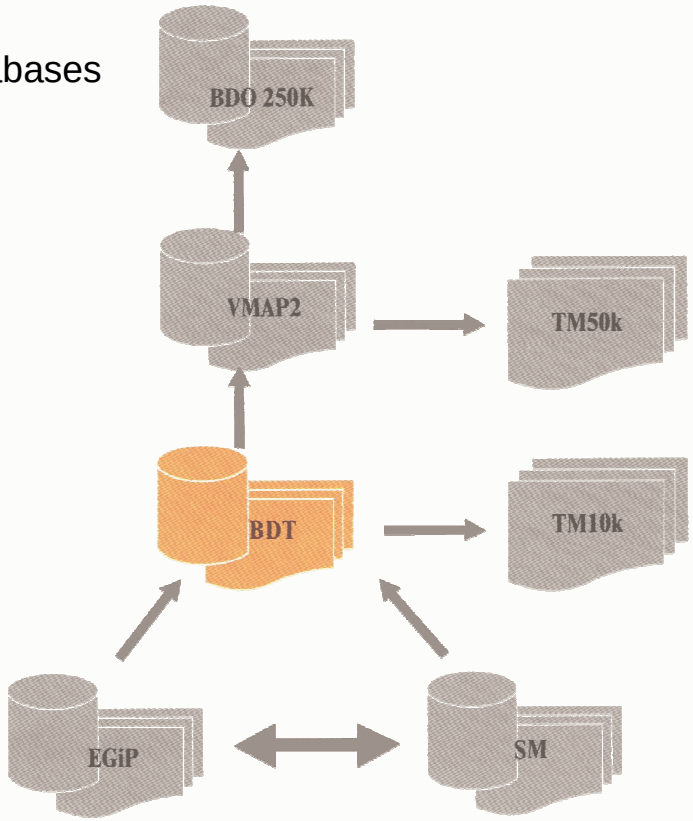
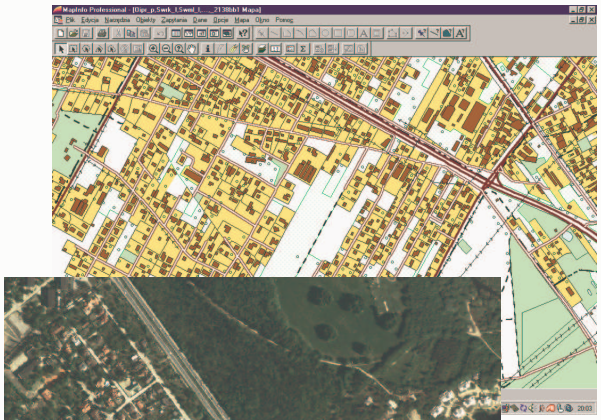
Base elements of SDI in Poland

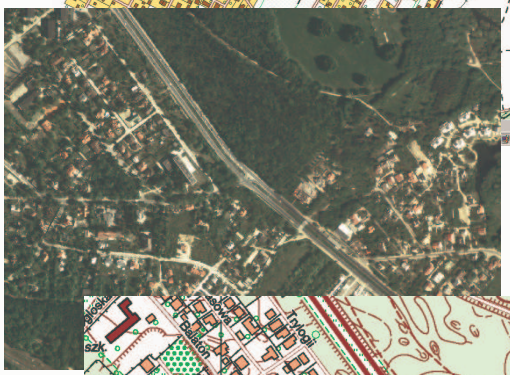
- At the national level: The National Geographical Database (scales of 1: 250 000), based on military VMap Level 1 databases
- At the national level: the military VMap Level 2 database (scales of 1: 50 000)
- **At the regional level: Topographic Database (scales of 1:5000 – 1:10 000)**
- At the district and local level: the Land and Building Register and Utilities Register (scales of 1:500 – 1:5000)

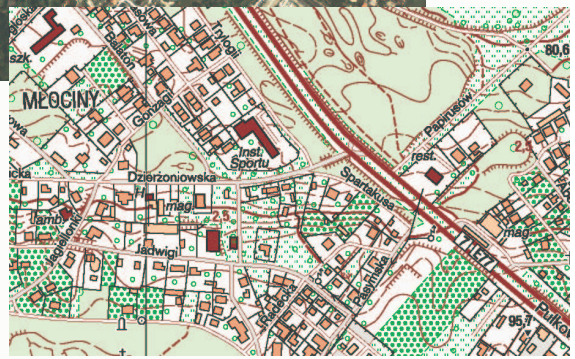


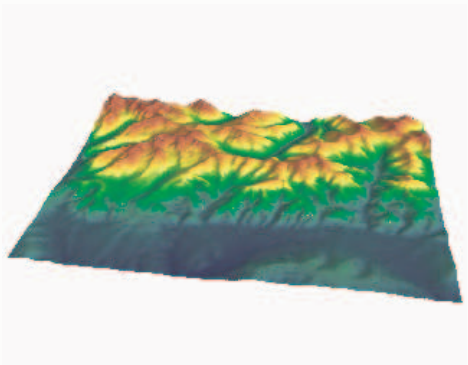
Topographical Database (BDT) in Poland

- In Poland the development of the Topographic Database (BDT) was started a few years ago.
  Data collecting process has started in 2003
- Level of details is close to a topographic map at 1:10 000 scale
  The conceptual model of BDT database,
  defined by appropriate Technical Guidelines,
  already allows to integrate data, which has been presented in maps at the scales of 1:10 000 and 1:50 000.
- Basic information sources for BDT are orthophotomaps based on aerial photographs at the scale of 1:26 000
- The Database consists of four components:
  - the vector database „TOPO” (DLM)
  - the set of orthophotomaps „ORTO”
  - the digital terrain model “DTM”
  - the set of numerical topographic maps „KARTO” (DCM)









Problems to resolve

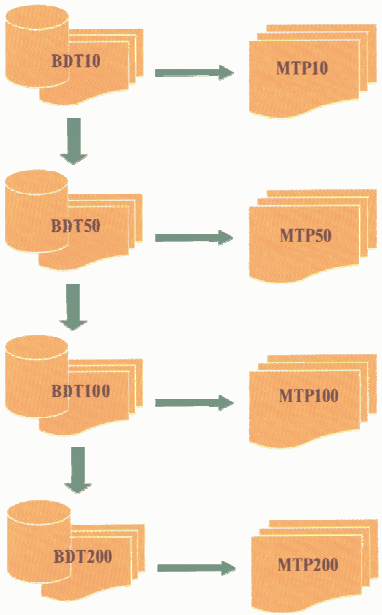
- Maps generation within the entire scale ranges, basing on spatial data stored in various geographical databases.

- It is important in this case to assume an appropriate approach to the process of supplying and updating particular databases, as well as to generalisation – with respect to databases and maps.

- Development of a concept of information flow and data generalisation between those databases is possible with the use of mechanisms of MRDB type databases; however it is difficult due to diversification of data.

Four approaches to the process of generalisation

a)



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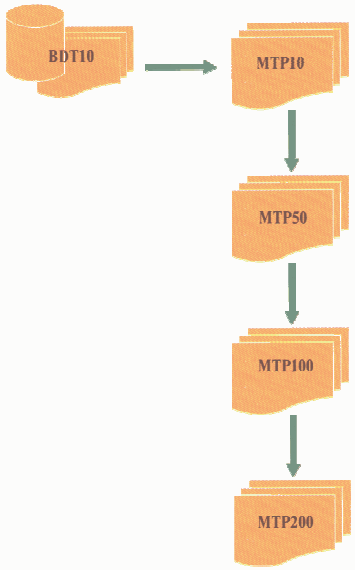

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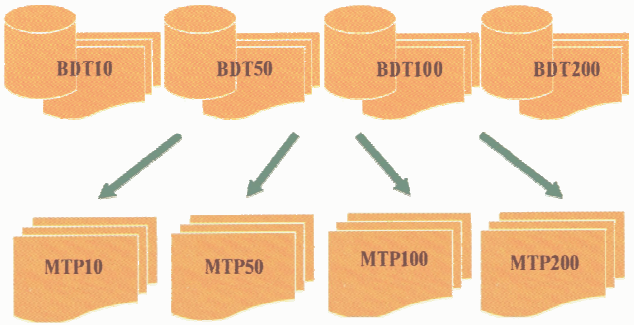

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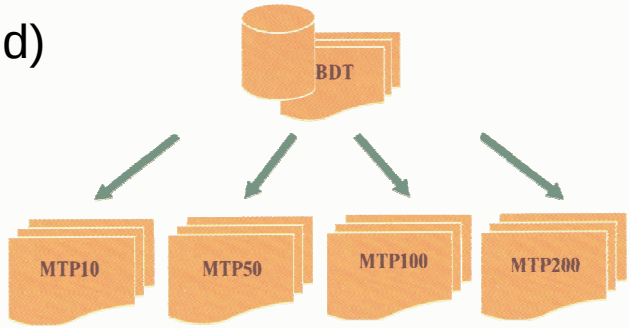
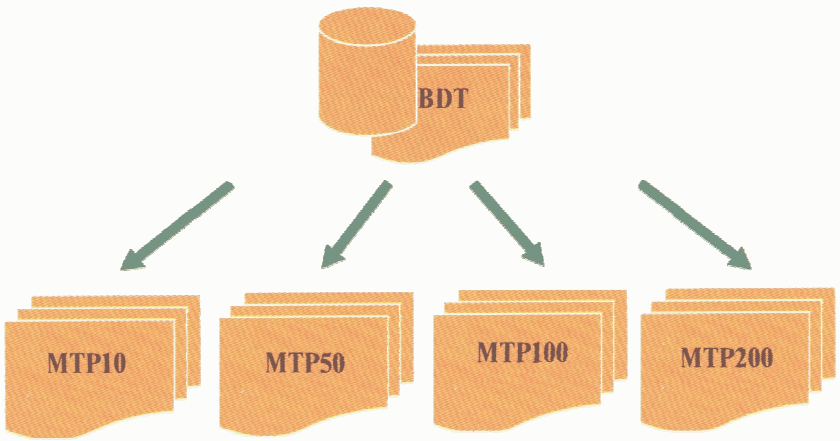
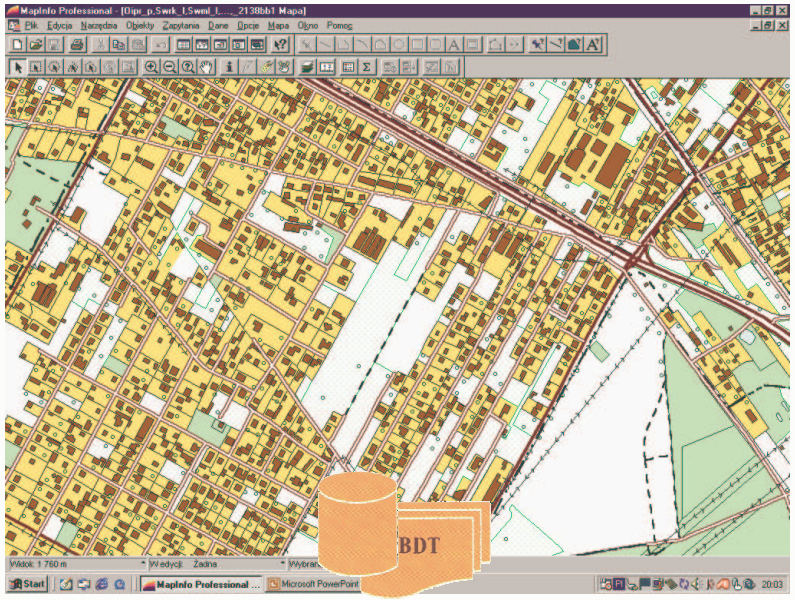


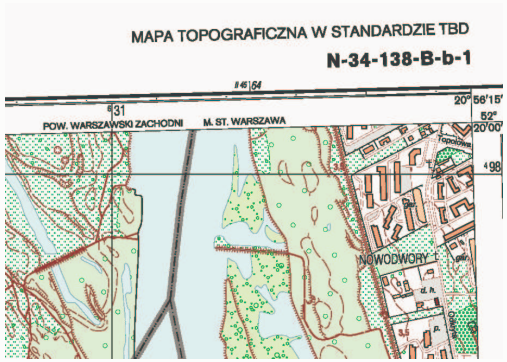
The proposed approach

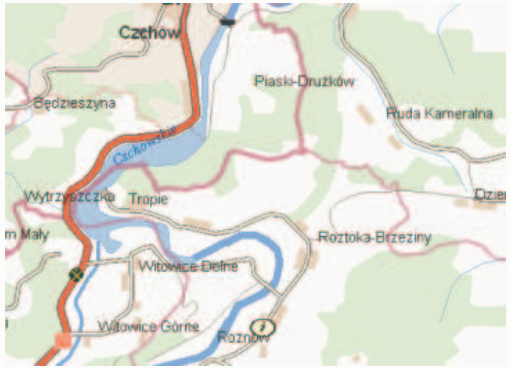
- The variant “d” presents an approach, which seems to be the most interesting for development of the Topographic Information System in Poland.
- This results, first of all, from the fact that the Topographic Database in Poland is under the first stage of development, as well as from the accessibility of an updated orthophotomaps for the entire country.
- Characteristic feature is storing data corresponding to various scale levels in one database, **at one level of accuracy, at various level of details**
- One conceptual model



The proposed approach

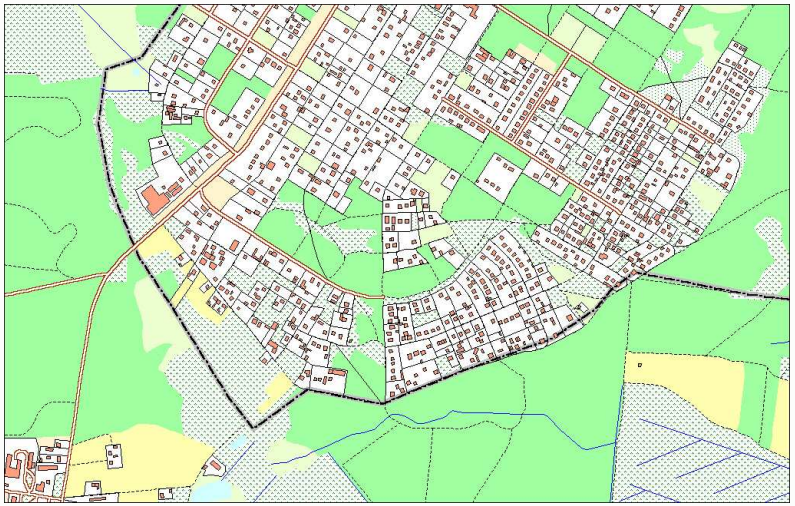


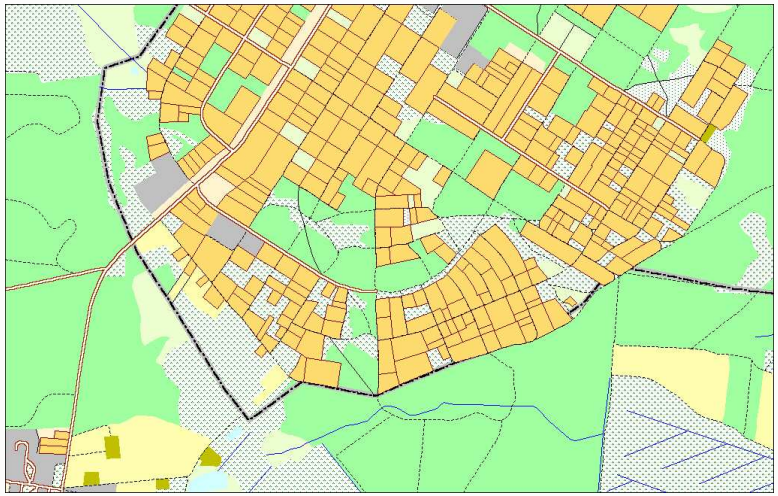




The proposed approach

- The information level, which comprises all objects visible on topographic maps in the entire scale range (for certain areas it is possible to neglect objects, which correspond to larger scales, in such locations where detailed works are not required)





The proposed approach

- The same level of location accuracy for all objects stored in the database and various level of detail
- This will mean the necessity to manage the database which will contain objects from various levels of classification hierarchy, for example “built-up areas” and “built-up, village areas”.

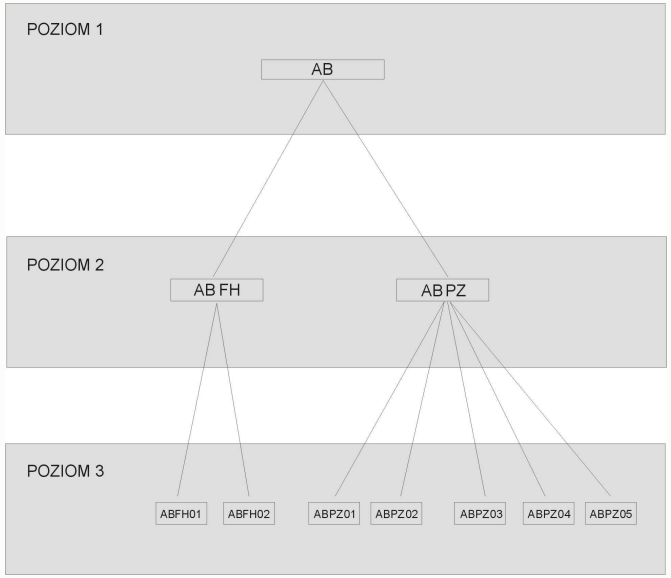
The proposed approach

- The database contains all object classes, required for development of derivative databases and maps at smaller scales than the scale of the source database

- It has been also assumed that each geometric object is referred to an appropriate term – a real object.

The proposed approach

- The basis for such operations will be the introduction of an appropriate coding system. Objects at lower classification levels will obtain codes from the upper level, extended by additional elements. In some cases, it will be sufficient to expand the classification code in order to raise the level of details. If, full-detailed volume of data does not exist for a certain area, the “abbreviated” code may be introduced.



Conclusions

- Basing on performed investigations, it may be assumed, for example, that it is difficult to produce Vmap L2 and BDO250 through generalisation of the Topographic Database.
  Different database for every scale level – not the best solution

- Our proposal is to build one „**Source Topographical Database”**

- This approach has been proposed within the research Project financed by the Committee for Scientific Research (KBN). Experimental works are currently performed within successive investigations at the Warsaw University of Technology.
  The first implementation of this concept will be probably performed in 2005,
  when the Head Office of Geodesy and Cartography will present new version of „cookbook”
  for development of the Topographic Database „with the reduced information content”

- This approach originates not from scientific considerations only; it also results from high pressures of data users in Poland, claiming for faster data access for the entire country.