AGH UNIVERSITY OF SCIENCE AND TECHNOLOGY

The Cadastre in Poland – The Current Status and Possibilities of Transformation into 3D One

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Rome, 8 May 2012

Systems containing information on cadastral parcels and real estates in Poland

There are two systems containing information on cadastral parcels and real estates in Poland:

- The Land Register
- The Cadastre for Grounds and Buildings

The Land Register

- The Land Register objects in Poland are mainly real estates.
- The real estate may consist of land parcels, buildings or premises/apartments. The most typical real estate consists of land parcel (parcels) and building (buildings).

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The Cadastre for Grounds and Buildings

The Cadastre for Grounds and Buildings data are mainly objects spatial description, cadastral objects attributes, values and corresponding official documents.

The cadastral objects are as follows:

- The cadastral parcel
- The building
- The premises/apartment

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MAIN REFERENCES INTO 3D SITUATIONS IN LEGAL REGULATIONS IN POLAND

- The Surveying and Mapping Law
- The order on cadastre from grounds and buildings
- The Act on Ownership of Premises
- The technical instruction G-7 "Geodetic registration of utilities networks"
- The order concerning database of geodetic registration of utilities, topographical objects database and base map (final draft)
- The technical instruction K-1 „The basic map"
- The Act on Transmission Passageways (draft version)

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REFERENCES INTO 3D IN INTERNATIONAL REGULATIONS

- There are some references into 3D situation in international regulations that Poland is or will be obliged to implement.
- There are Land Administration Domain Model (in future ISO 19152) and INSPIRE Directive.

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Land Administration Domain Model

Land Administration Domain Model (LADM), that is in the final
    draft version and is going to become an International
    Standard in 2012 or 2013
- LADM allows the representation of 3D objects.
- LA_SpatialUnit (LA_Parcel) are refined into two specializations
  LA_LegalSpaceBuildingUnit and LA_LegalSpaceUtilityNetwork.
- For real 3D boundary representations LADM uses boundary
  faces, which can be vertical or non vertical 3D boundaries.
- On the threshold of 2D and 3D representations the liminal
  spatial units can be used.

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INSPIRE Directive (generally and parcels)

- The specifications on particular data themes goes together with
  INSPIRE Directive
- The INSPIRE Data Specification on Cadastral Parcels and The
  INSPIRE Data Specification on Buildings (draft version) are among
  them
- The INSPIRE Data Specification on Cadastral Parcels has not got
  the harmonized solutions for rights and owners on 3D cadastral
  objects. In recapitulative check-list, it is mentioned that some use
  cases are at least of interest for 2,5D cadastral parcels and there
  are possible need for 3D parcels, in future.
- 3D parcels may be useful now for non-environmental or
  environmental use cases in future. Moreover, some users have
  expressed the requirement (in future) to combine cadastral parcels
  with 3D data like DTM or buildings. So it is possible to extend the
  INSPIRE Data Specification on Cadastral Parcels for 3D data if
  there is requirement and consensus to do so.

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INSPIRE Directive (buildings)

The INSPIRE Dat a Specification on Buildings contains 3D data models.

- Generally the modelling of 3D building changes with level of detail (LoD).
- It starts from LoD1 (the same H coordinate for all object), LoD2 (shape of roof added) to LoD3 (accurate description of exterior - openings like doors, windows added.)

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EXAMPLES OF 3D SITUATIONS IN POLAND

- The problems appear when we have the irregular 3D objects.
- The problem may be more serious when the ownership changes or overlaps vertically.
- It usually concerns buildings.

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Cases with a requirement for 3D cadastre:

According to the author there are four cases with a strong need for 3D registration. They are:

- Different owners or users of "spatial" real estates, especially owner of parcel varying from owners of building or its parts located over cadastral parcel,
- Varying number of floors in the different parts of the building and some additional elements like connectors between buildings or way under the aboveground building parts,
- Projections of aboveground and underground parts of the building are different,
- Nonstandard shapes of buildings.

All the examples of 3D situations are from the city of Cracow.

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Case 1 - The ownership of parcel different than the building

The street is situated under the aboveground parts of building. The building is managed by housing cooperative and the parcel containing street belongs to the city of Cracow.

Photo by author   12

Case 2a – Building with varying number of floors

Photo by author

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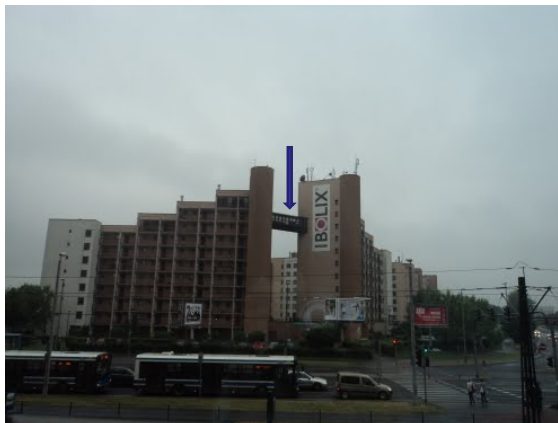**Case 2b - Building with aboveground connector**

Photo: www.panoramio.com

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Case 3 - Aboveground and underground parts of building do not coincide vertically

Photo by author

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Case 4- Buildings with irregular shapes

Photo: http://en.wikipedia.org

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Buildings with irregular shapes

Photo by author

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Buildings with irregular shapes

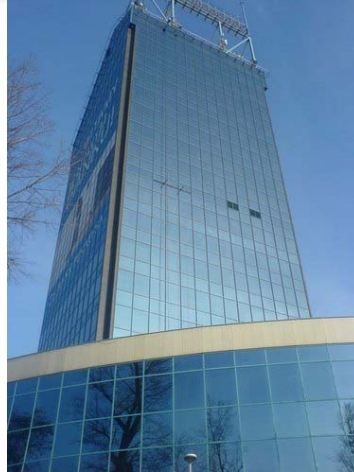Photo: www.panoramio.com

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Buildings with irregular shapes

Photo: www.panoramio.com

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Buildings with irregular shapes

Photo by author

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POSSIBLE IDEAS ON DEVELOPING 3D CADASTRE IN POLAND

Author thinks that there is the strong need to create the 3D cadastre in Poland and it should be done in several stages.

- Requirements collecting and feasibility study,
- Pilot projects,
- Implementation.

The first stage seems to be the most important.

- The future 3D cadastre model, suggested legislation and estimated costs of implementation should be determined there.
- Such study should be prepared in several scenarios, first of all taking into account planned costs and necessity for new legislation.
- Some iterative methods may also be used here.

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3D CADASTRE INTEREST IN POLAND

- FIG joint commission 3 and 7 Working Group on 3D Cadastres activieties resulted in increasing interest in 3D cadastre development in Poland
- The first conference with leading topic „3D cadastre" is organized on 21-22 June by Association of Polish Surveyors in the city of Kalisz.
- And then ….

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