

# **The Importance of Integration Solutions in Spatial Data Applications**

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## **Key words:**

SDI, Integrated Solution, Netcad Integrated Solutions

## **SUMMARY**

Integration means consolidation and adaptation.

Software platforms that ensure embedded integration in spatial data applications save the users from time loss and simplify the usage. The most common and important integration processes of spatial data applications;

- CAD and GIS integration,
- MIS and GIS integration,
- GIS and GIS integration (integration of different GIS platforms)
- GIS and e-Government integration.

In that scientific work, the importance of integration in spatial data applications, simply transition between CAD and GIS platforms, sharing of the data with GIS-OGC services without leaving CAD platform, simply integration with MIS systems, integration of different sections with current varied GIS platforms, simply integration of maps, orthophoto,, land administrations, cadastre and address data provided by public authorities with CAD & GIS & MIS & e-Government integration solutions provided by Netcad, widely used software in Turkey, will be presented.

## **1. INTRODUCTION**

Integration means consolidation and adaptation. Information systems could be defined as a mechanism that stores, produces and distributes the data for supporting administrative functions of the organizations.

For simply tracking budget, accounting activities, personnel and the formal documents, a need for automatisisation software has risen for the institutions and to meet that need they have used a system named Management Information System (MIS).

Likewise, the institutions need engineering, drawing and Geographical Information System software to do technical activities easier. While one of the mentioned software that works mainly on engineering is called as Computer Aided Design (CAD), the other one that works mainly on Geographical Information Management is called as GIS. Both CAD and GIS solutions could be used in different software platforms with different software tools.

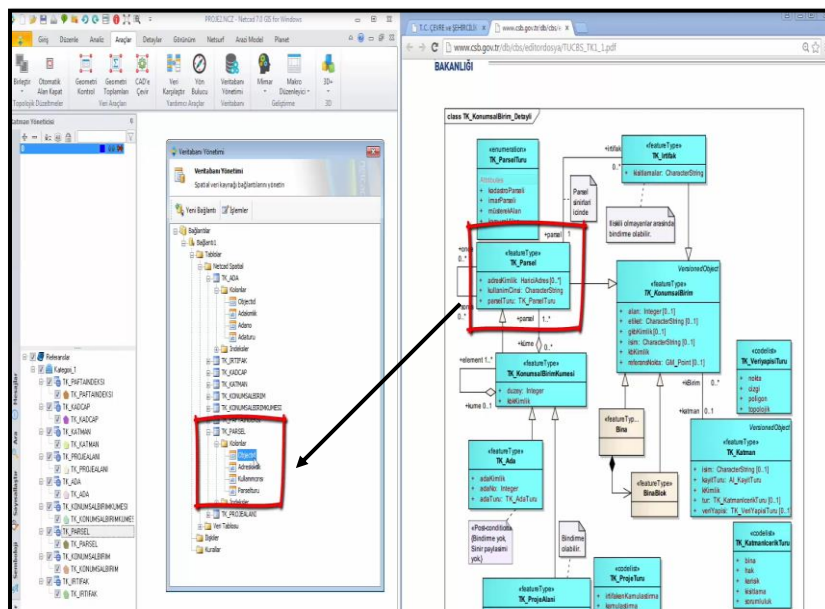
On the other hand, many applications in the scope of e-Government have been provided by portals and that situation makes the GIS solutions an important need for using the mentioned systems.

Those solutions differently run by departments meet the needs of institutions to large extent. But the data, which is increasing and complicating day by day, creates new needs. The solution of those needs can only be possible by the integrated design and application of the systems run by different departments.

To provide that applications without any data loss as quickly and easily, it is needed to develop software platform that ensures

- Support for CAD and GIS platforms at the same platform,
- Support for the solutions of different platforms at the same time,
- Quick and easy integration with MIS solutions developed in different Data Base Management Systems,
- Support for the services presented from e-Government portals.

Geographical Data Responsibilities are defined by Regulation in Turkey. Besides, INSPIRE data schemes are based as geographical data production standard. Netcad provides ready to use digitization menus including database and symbology that proper to INSPIRE schemes to the users. (Figure 1)



**Figure 1:** Ready to use digitization menus that proper to INSPIRE schemes

## 2. THE MOST COMMON INTEGRATION PROCESSES OF SPATIAL DATA APPLICATIONS

### 2.1 CAD and GIS Integration

Most spatial data like surveying, mapping, planning, land arrangements (cadastre, expropriation, land consolidation, zoning applications etc.), upper structures like roads/dams/tunnels/bridges/buildings/ sites/factories and parks as well as infrastructure networks such as water, electricity, waste water and sewage are all designed as CAD data structure. Then all the spatial data are transferred to the GIS system for query, analysis, reporting, and thematic mapping and for sharing via web. During that transfer process, symbol data may be lost and time loss may occur. The software that supports the CAD and GIS data at the same platform can prevent the symbol data and time loss. So, in that platforms there would be no need to work in different software.

The expropriation and mining engineering applications developed in CAD platform of Netcad software could be automatically transferred to the Netcad GIS platform and presented in both desktop and web environment in GIS data structure. Sample application interfaces could be seen in Figure 2.

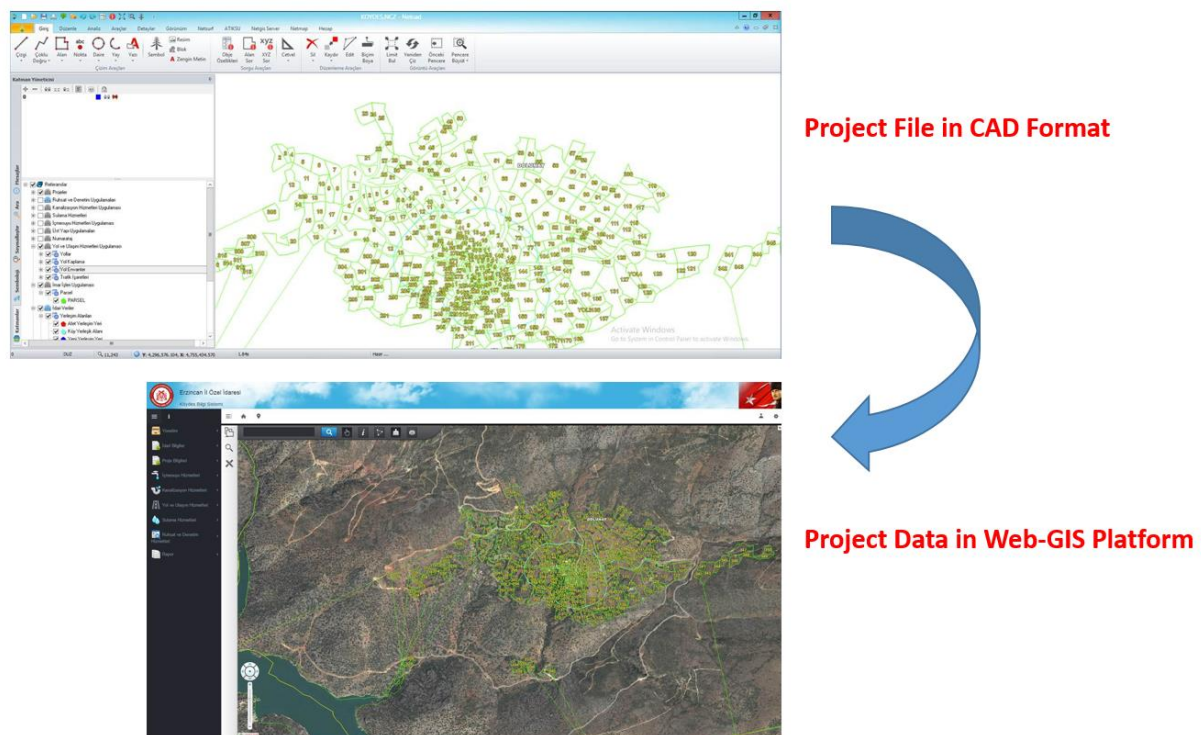


Figure 2: CAD to GIS Example

## 2.2 MIS and GIS Integration

Another important integration is MIS and GIS integration. Nowadays, many MIS projects are nested with spatial data. So, the data transition need from text db platform to the spatial and from spatial to the text db would arise. The importance of that integration increases in planning, taxation of spatial data, management of spatial data and in the management of immovable values.

In Turkey, many public authorities and municipalities apply their corporate automatisations in many different bases. Municipality applications are being in the first place, most of that applications needed to be used with spatial data. Netcad Software could meet that needs by its ability to use the data through connecting to different data bases simultaneously and by integrating the MIS applications with the spatial data as well its data transfer talent MIS to GIS and GIS to MIS.

In that scope, a sample realized with Netcad could be seen in Figure 3.

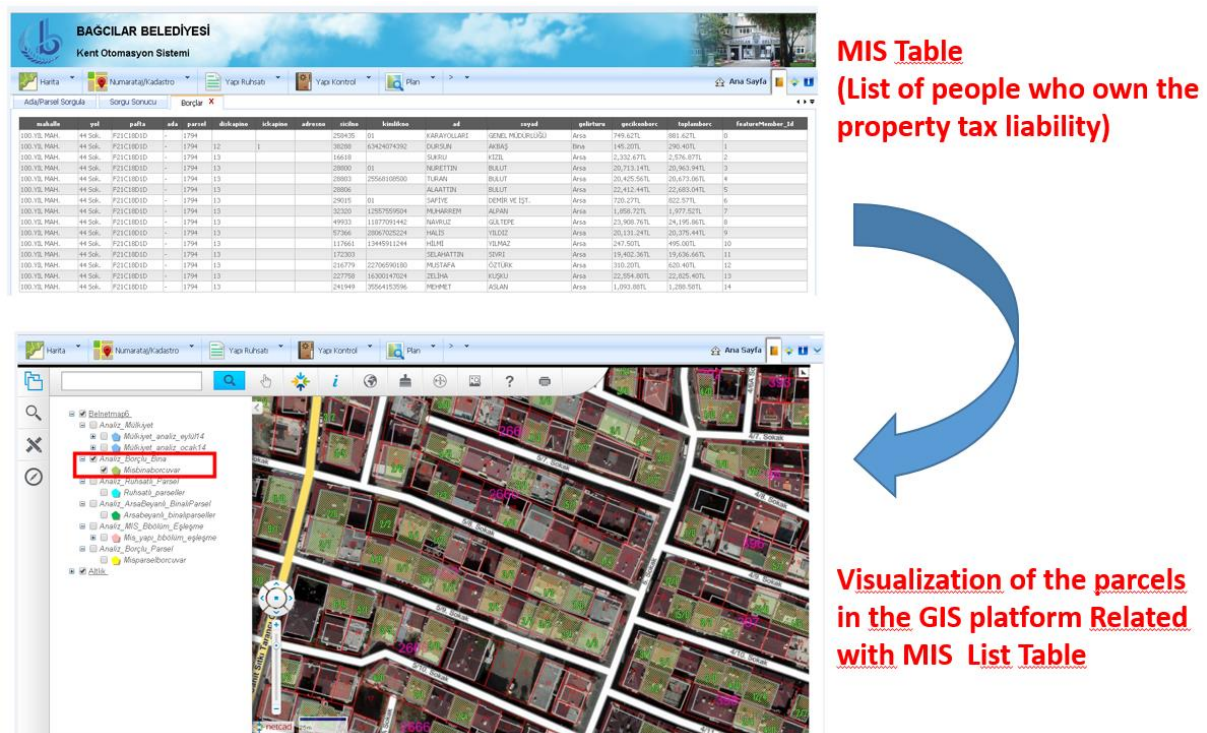


Figure 3: MIS to GIS Example

## 2.3 GIS and GIS Integration

The integration process of GIS projects in different GIS platforms is also an important issue. Both the services that ensure the data transition between GIS platforms and the solutions that ensure the data use without transition provide convenience to the users.

In Turkey, Netcad Software could integrate most of the projects developed in different GIS platforms by its talent to read and write varied GIS platforms developed in different Data Base Management System like PostgreSQL, SQL Server, Oracle etc. This DBMS can be used by different Opensource Products like GeoServer, MapServer, MapBox, QGIS, Open Layers etc. and other COTS Products like ESRI, Autocad, Geomedia, Microstation, MapInfo etc. In that scope, a sample realized with Netcad could be seen in Figure 4.

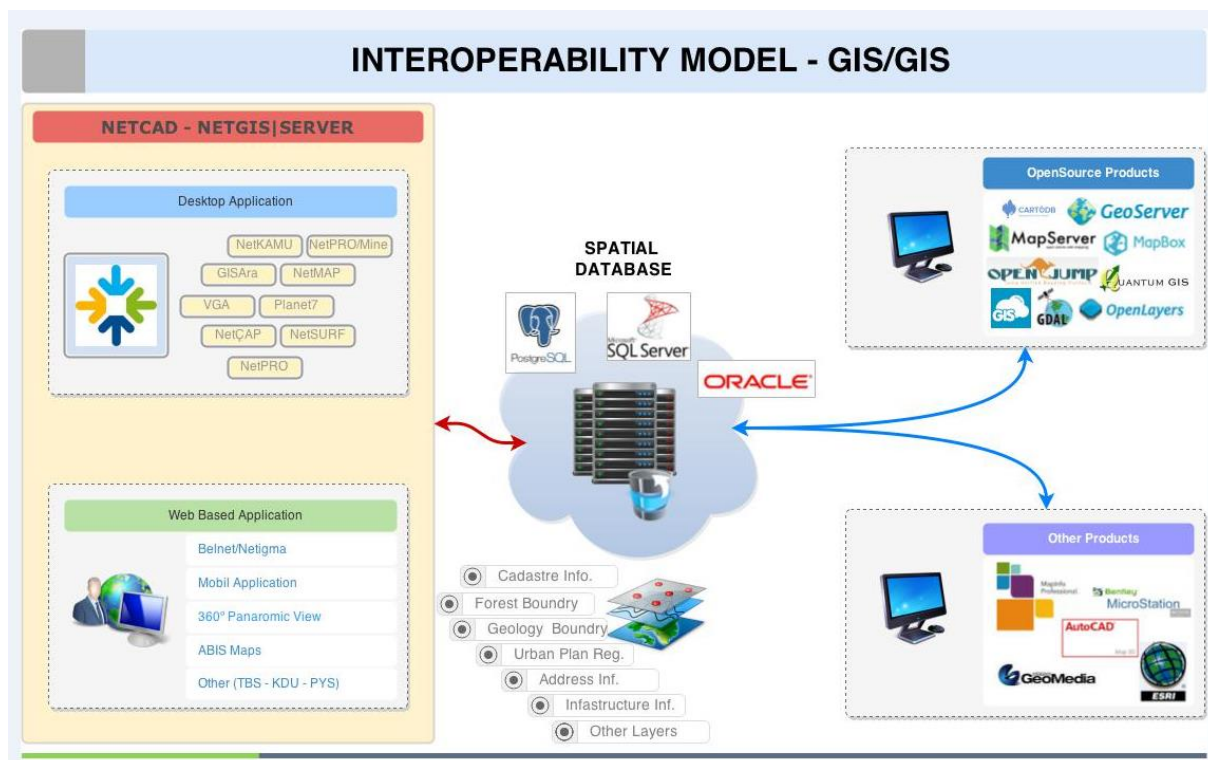


Figure 4: GIS to GIS Example Conceptual Model



## 2.4 GIS and e-Government Integration

The other important integration process is the integration of GIS projects with e-Government data. To ensure that integration, both the e-Government portals provide service and the end user software get service should support OGC services.

In Turkey, the data like address, property and ortophotography are still presented by institution portals as an e-Government application in the scope of GIS.

Netcad could be integrated with all that mentioned e-Government services by its unique talent of OGC and provide convenience to the users.

In that scope, a sample realized with Netcad could be seen in Figure 5.

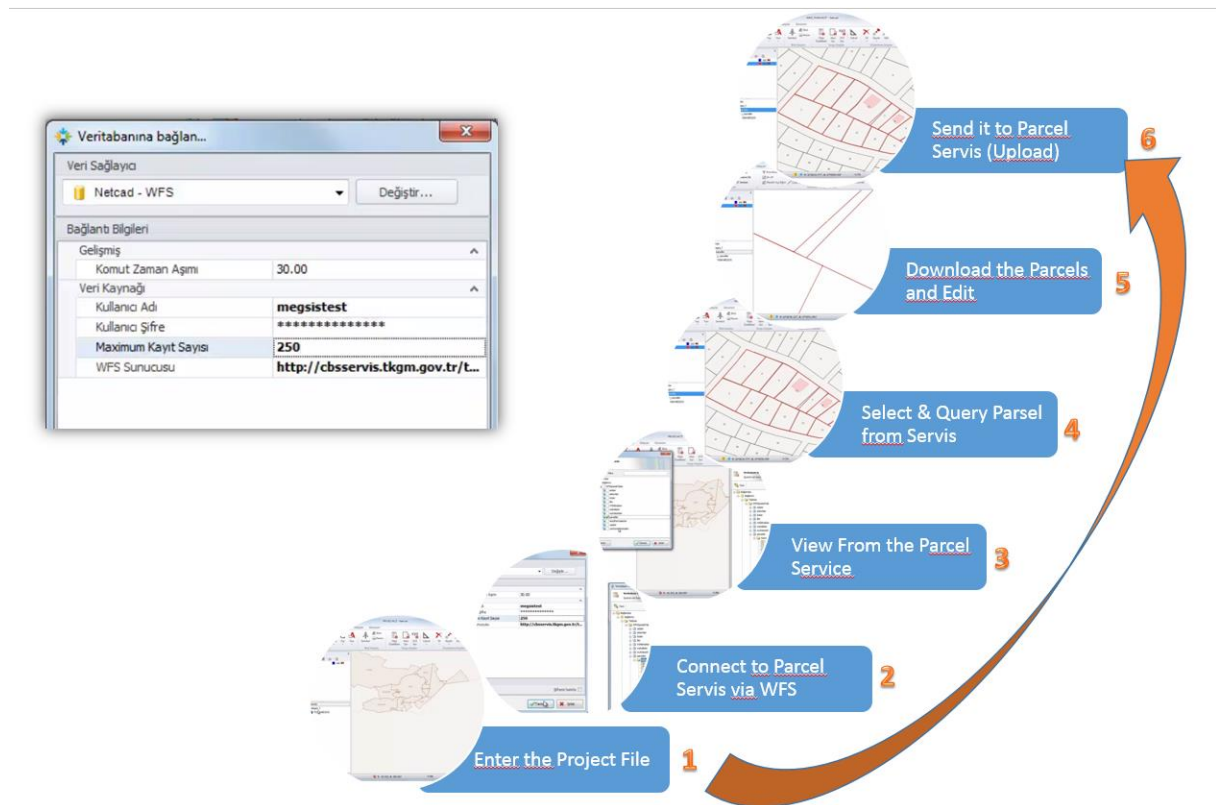


Figure 5: GIS and e-Government Integration Example

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## BIOGRAPHICAL NOTES

Dr. Emin Bank is Geodesy and Photogrammetry Engineer. He has been completed Master and PhD education in the field of GIS. He has served 20 years in the General Command of Mapping as GIS Expert in mostly Spatial Data Infrastructure projects in national wide. After retiring in 2000, he has served 7 years in the GIS private companies as GIS Expert. After, he has served 4 years in the Ministry of Interior as GIS and e-Government Expert. After that he has served 2 years in the Scientific and Technological Research Council of Turkey (TUBITAK) as GIS Expert and 2 years in TUBITAK Space Technologies Research Institute as Deputy Director. He was retired in 2013 from TUBITAK and he has been serving in Netcad software company since April - 2013 as the Corporate Representative Dr. Emin Bank is experienced in Intergraph, ESRI and NETCAD software platforms. He is also experienced in the implementation and the project management of enterprise GIS projects in national wide.

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