

Chapter 8

Geographic Information Systems

ABSTRACT

The chapter presents the geographic information systems. A geographic information system (GIS) is a computer system that allows various sources to gather and organize, manage, analyze and combine, develop, and present geographically located information contributing in particular to the management from space. A geographic information system is also a database management system for entering, storing, retrieving, querying, analyzing, and displaying localized data. It is a set of data located in space, structured so that it can conveniently extract syntheses useful to the decision.

INTRODUCTION

A Geographic Information System (GIS) is a computer system that allows from various sources, to gather and organize, manage, analyze and combine, to develop and present geographically located information contributing in particular to the management from space.

A geographic information system is also a database management system for entering, storing, retrieving, querying, analyzing, and displaying localized data.

It is a set of data located in space, structured so that it can conveniently extract syntheses useful to the decision.

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BACKGROUND

During last twenty years Geographic Information System (GIS) becomes a field of information technology increasingly used in public decision-making process, including design of Public Policies and Territorial planning Aronoff, S. (1991).

Early GIS applications where automated mapping systems whose main focus was replacement of paper maps. The geo relational model opened opportunities for other GIS applications.

GIS is part of Geomatics Technology, defined as a discipline for the management of spatially referenced data that uses science and technology related to its acquisition, storage, processing and dissemination.

GIS is a component of Geomatics (Geography, Cartography, Remote sensing, Photogrammetry, LIDAR, Geodesy) and make use of statistics, computer science, and mathematics

The GIS technology is taking advantage of the evolution of the geospatial Technologies described by The UK Geospatial Commission (Gray, P., Lawrence, H., 2019), has identified eight emerging technologies that could impact the geospatial industry:

- **Cameras, Imaging and Sensing:** “The platforms used to collect Earth Observation (EO) data and the equipment and instruments used to collect, store and process EO data.”
- **Unmanned Vehicle Systems and Drones:** Vehicles that are either controlled remotely or operate autonomously, by sensing their environment and navigating including without human intervention.
- **Survey, Measurement and Scanning:** Provide the foundation upon which the geospatial ecosystem is built. The report focuses on downstream GNSS chipsets, GIS data capture, 3D scanning hardware, software and value-add services.
- **Artificial Intelligence:** Refers to systems or programs that can complete tasks that would normally require human intelligence, such as data analysis, visual perception, speech recognition or decision-making.
- **Smart Sensors and Internet of Things:** Are the networks of physical objects that contain embedded technology to sense changes in their internal states or in the external environment, and communicate this information with other connected devices.

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