Short Communication

Picture of GIS in Recent Years

Manvi Rana¹* and Niharika Rana²

¹*Department of Engineering, Amantya Technologies, India*

²*Department of Engineering, ABES Engineering College, India*

*Corresponding Author: Manvi Rana, Department of Engineering, Amantya Technologies, India.

The field of Geographic Information Systems (GIS), which gained significant traction in the early 1990s, has become a cornerstone of the modern IT industry. Its impact stems from its unique ability to transform disparate spatial data into coherent, actionable insights. This capability, often described as "telling a story through data," is indispensable across a multitude of sectors, driving informed decision-making and strategic planning.

Consider the critical application of GIS in maritime security. Here, GIS empowers nations to safeguard their borders and interests by meticulously collecting, verifying, and integrating data from diverse sources – including satellite imagery, radar feeds, vessel tracking systems, and intelligence reports. This comprehensive data aggregation allows for the real-time identification and tracking of suspicious activities, unauthorized incursions, and potential threats, thereby enhancing situational awareness and enabling rapid response.

In the financial sector, GIS offers powerful analytical tools. For instance, when a country receives a loan, GIS can be deployed to meticulously monitor its financial health and growth trajectory. By spatially analyzing economic indicators, infrastructure development projects, demographic shifts, and resource allocation, financial institutions can gain a clear understanding of how funds are being utilized, identify areas of risk or opportunity, and ensure the effective and transparent deployment of capital.

Even in the grim realities of geopolitical conflicts, such as the Ukraine-Russia war, GIS plays a crucial role. It helps to quantify the devastating impact on human lives, civilian infrastructure, and national economies. Through the analysis of satellite imagery, damage assessments, displacement patterns, and humanitarian aid distribution, GIS provides an objective and comprehensive overview of the conflict's toll, aiding in humanitarian efforts, reconstruction planning, and historical documentation.

Historically, the foundational GIS roles were primarily focused on this core data-to-information transformation:

- **GIS Analyst:** This role involves the interpretation of complex spatial data to generate insightful maps, detailed reports, and sophisticated visualizations. Their work directly supports decision-making processes across various industries by translating raw geographical information into understandable and actionable intelligence.

- **GIS Technician:** The technician is responsible for the meticulous gathering, management, and digitization of geographical data. This foundational work ensures the accuracy and integrity of the data that fuels GIS systems, often involving tasks like georeferencing, data cleaning, and feature extraction.

- **GIS Developer:** These professionals are at the forefront of creating bespoke GIS applications, plugins, and web services. Utilizing a range of programming languages (such as Python, JavaScript, and C#), they customize and extend GIS functionalities to meet specific organizational needs and integrate GIS capabilities into broader IT infrastructures.

- **GIS Specialist:** This role signifies a deep level of expertise in particular sub-domains of GIS, such as remote sensing (analyzing satellite and aerial imagery), spatial modeling (creating predictive models based on spatial relationships), or advanced cartography (the art and science of map-making). They often tackle highly specialized projects requiring in-depth knowledge and advanced analytical skills.

- **GIS Manager:** The GIS Manager oversees the entire spectrum of GIS projects, leading teams, managing resources, and strategically implementing GIS solutions within an organization. They are responsible for aligning GIS initiatives with broader business objectives and ensuring the efficient and effective deployment of GIS technology.

However, the GIS industry has undergone a rapid and transformative evolution between 2020 and 2025. This acceleration has been significantly influenced by governmental initiatives and technological advancements. A prime example is the Indian government's SVAMITVA scheme, a groundbreaking program that leverages advanced drone technology for property mapping in rural areas. This initiative not only provides clear ownership records but also facilitates rural planning, land management, and financial access. Similarly, the Karnataka State Natural Disaster Monitoring Centre (KSNDMC) exemplifies this evolution by providing real-time disaster information, utilizing GIS to monitor weather patterns, flood levels, and seismic activity, enabling proactive disaster response and mitigation.

This rapid evolution has, in turn, led to a discernible shift in the skill requirements demanded by the industry. Consequently, this has introduced a degree of ambiguity and, at times, confusion in job descriptions. It is now common to find job postings for "GIS Developers" that, upon closer inspection, seek a skill set more closely aligned with that of a GIS Analyst. This blurring of lines highlights a significant gap in the market for clearly defined, standardized, and accurately titled professional roles within the GIS sector. Addressing this ambiguity is crucial for both employers seeking specific expertise and professionals aiming to navigate their career paths effectively within this dynamic and expanding field.