

Towards an efficient urban management: Implementation of Geographic Information Systems (GIS) in Ben Mostefa Benaouda and Constantine

Digitalisation at the service of urban management

Promoting sustainable urban management through digitalisation remains a major concern for local authorities. It significantly influences various domains, from the social, environmental and economic to the urban and political sectors. In Algeria, the context of the digitalisation of urban services is experiencing a gradual transformation. However, other challenges persist due to the rapid urban growth, such as the increased demand for infrastructure and the necessity to ensure efficient urban services.

The regional project “City-to-City Cooperation Maghreb-Germany” (KWT II), commissioned by the Federal Ministry for Economic Cooperation and Development (BMZ), was implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH in cooperation with the Service Agency Communities in One World (SKEW) of Engagement Global gGmbH, from March 2020 to February 2024. Among other activities, the regional project supported project partnerships between German and Maghreb cities. The good practices highlighted in this fact sheet have been developed by the partner cities of Ben Mostefa Benaouda and Sindelfingen on the one hand and by the cities of Constantine and Aschaffenburg on the other. These practices will be scaled up as part of the follow-up regional project “Urban Adaptation to Climate Change in the Maghreb”, running from March 2024 to February 2027.



Implementation of a Geoportal for the new city of Ben Mostefa Benaouda

In Algeria, the regional project KWT II was implemented in collaboration with the National Urban Planning Agency (ANURB), of the Ministry of Housing, Urban Planning and the City. The Geoportal project in Ben Mostefa Benaouda (Annaba) is the result of the partnership with the German city of Sindelfingen since 2016. This geoportal serves as a functional tool designed to facilitate the processing of geospatial data, thereby enhancing urban management and planning.



Implementation of a GIS project in Constantine

The project, initiated in 2020 as part of a partnership with the German city of Aschaffenburg, aimed to develop a Geographic Information System (GIS) to enhance urban management through the efficient processing of geospatial data. The project incorporated advanced urban management functionalities to ensure optimal monitoring and management of urban services.



Approaches and actions

The GIS tools in Constantine and Ben Mostefa Benaouda were developed through a well-defined approach (diagram 01):

a) Technical exchanges and workshops: Knowledge transfer on various digital tools (e.g. QGIS, FME) and feedback from the German partner cities on how to approach a municipal GIS enabled the two Algerian cities to quickly develop a vision and an effective action plan to begin the GIS projects.

b) Needs assessment: This step, undertaken with technical managers and decision-makers, identified the challenges related to the lack of geolocated digital data. It underlined the necessity of integrating a GIZ tool to enhance the sustainable management of urban services in Constantine and Ben Mostefa Benaouda.

c) Action plan and GIS implementation: The assessment resulted in an action plan focusing on three dimensions:

➤ **Mobilisation of human and material resources:** In both cities, a team has been set up, to manage and monitor the GIS project. In addition, IT-equipment was procured to ensure the smooth execution of the projects.



Left: GIS work session between the two partner cities Ben Mostefa Benaouda and Sindelfingen, on November 27, 2019 in Sindelfingen (Germany).

Right: Ben Mostefa Benaouda's study mission to Sindelfingen, on November 8, 2022. Practical exercise.

➤ **Capacity building plan:** A series of workshops and training sessions were conducted to support the GIS project teams in the two cities. This covered the basics of GIS, the use of GIS software and the principles of developing a geoportal.

➤ **Data management :** The project teams progressively fed the GIS in Constantine and the geoportal in Ben Mostefa Benaouda by collecting and georeferencing essential data.

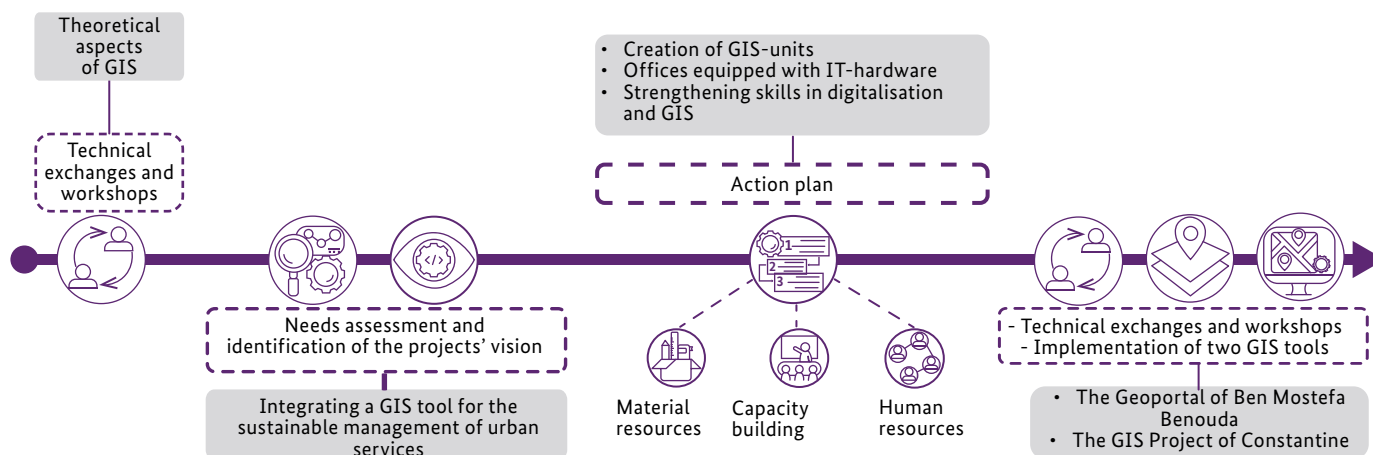


Diagram 01: Methodological approach for the two projects. © GIZ

The projects in Ben Mostefa Benaouda and Constantine applied the same implementation approach. The differences are the following (diagram 02):

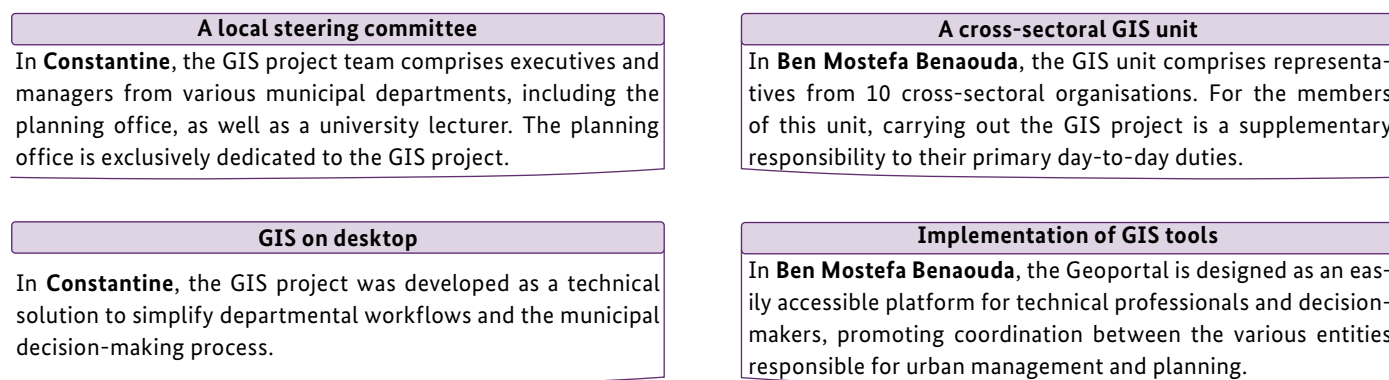


Diagram 02: Methodological differences between the two projects. © GIZ

Achievements

The following results were achieved by the GIS projects in Ben Mostefa Benaouda and Constantine (diagram 03):

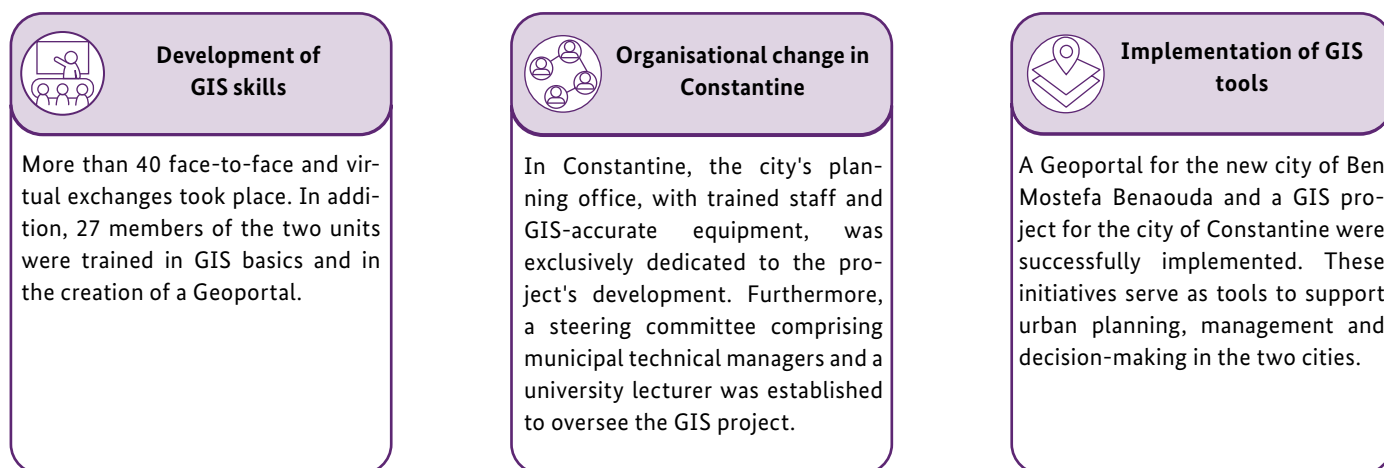


Diagram 03: Achievements of the two projects. © GIZ



Challenges

Several challenges were encountered, necessitating tailored solutions. Here are the challenges in more detail (diagram 04):

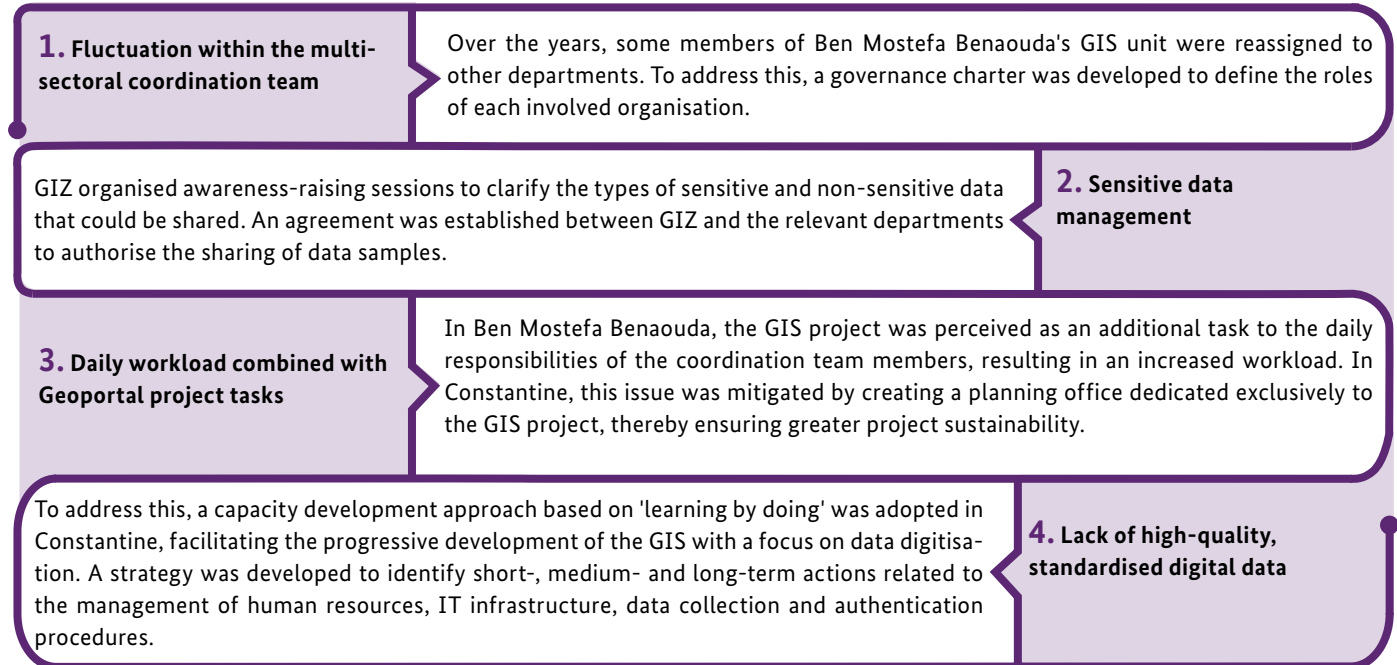


Diagram 04: Challenges encountered during the implementation of the two projects. © GIZ



Innovative aspects and strengths

The innovative aspects of the projects were extensive and pivotal for urban management and development (diagram 05):

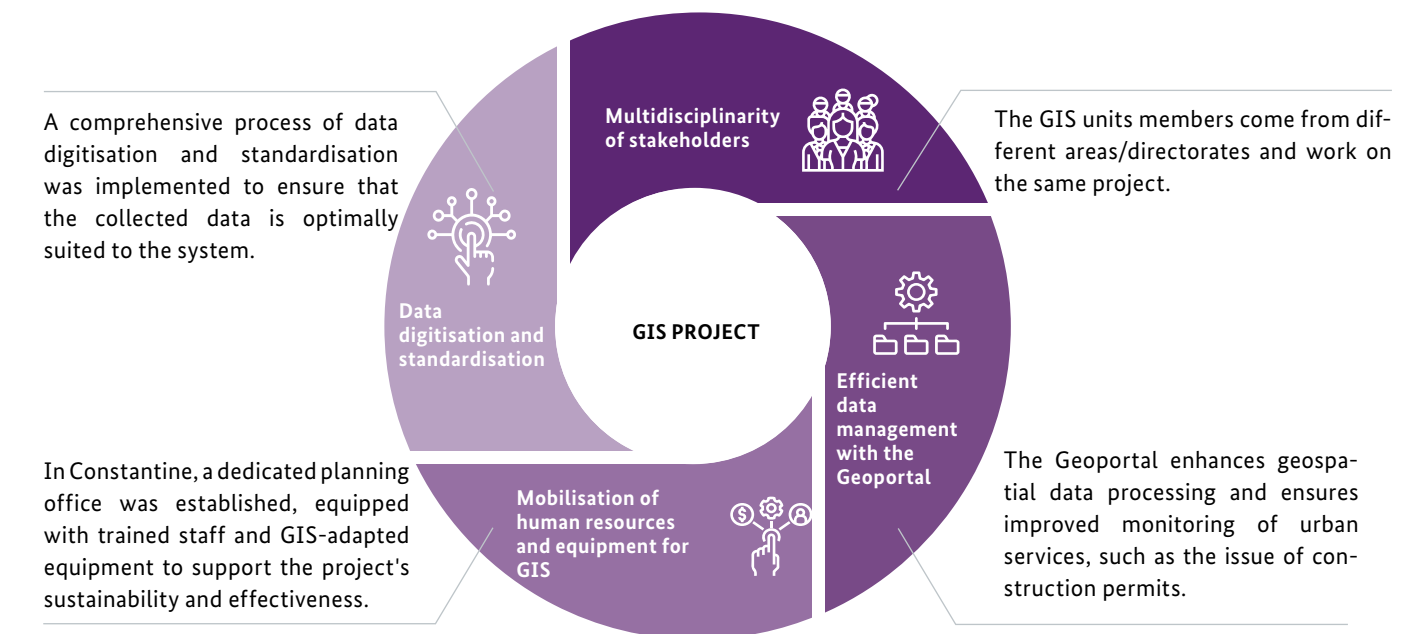
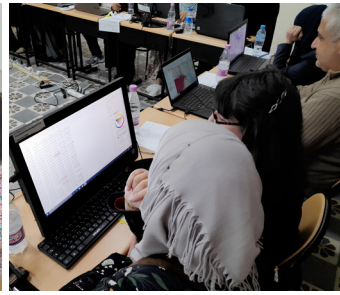


Diagram 05: Innovative aspects of the GIS projects of Ben Mostefa Benaouda and of Constantine. © GIZ



Left: Qualitative survey with the Human Resources Department on the capacity of the city of Constantine to implement a GIS.

Right: GIS and cartography training. Introduction workshop on QGIS, City of Constantine.

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Best practices, lessons learnt and advice

Several lessons have been learnt and best practices identified from the experiences of the two Algerian cities, Ben Mostefa Benaouda and Constantine, which should be considered when implementing a GIS project:

Building on existing experiences

Germany's 20 years of GIS expertise have enabled the Algerian cities to avoid common pitfalls and gain valuable insights when launching their GIS projects. For instance, Constantine drew inspiration from Aschaffenburg's experience, which involved integrating academics into the GIS project to expedite the implementation process. The academics provided support in data collection and GIS development.

Start small, then evolve

A key lesson from Ben Mostefa Benaouda's experience is to start small and evolve gradually, avoiding cross-sectoral involvement at the beginning. Involving multiple departments in the early stages led to delays. Constantine opted for a modest start to ensure better project control.

Mobilisation of human resources

The experience in Ben Mostefa Benaouda highlighted the challenges of assigning additional tasks to the steering committee, which can lead to inefficiency. In response, a dedicated planning office with trained staff was established for the GIS project in Constantine, ensuring exclusive focus on project development.

Capacity development

Tailored technical training courses for the steering committee members facilitated a 'learning by doing' approach in Constantine. This led to rapid progress and reduced project implementation costs.

Focus on cost-effectiveness

Ensure that GIS investments are cost-effective by regularly assessing costs and benefits and making necessary adjustments to maximise return on investment.

System security

Ensure that the collection, storage and dissemination of data integrated into the GIS adhere to interoperability standards (according to the Open Geospatial Consortium) and security protocols to safeguard the system. Additionally, ensure compliance with Law 18-07 of August 10, 2023, on personal data protection for both, institutional and individual data.

Diagram 06: Best practices, lessons learnt and advice. © GIZ

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