CENTRE OF EXCELLENCE IN TERRITORIAL MANAGEMENT AND CADASTRE (CENTRIC)

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Abstract. The establishment of a Centre of Excellence specialized in land management, mapping and cadastre is expected to promote synergies between science and technology based on the use of advanced information and communication technologies. CENTRIC will act as a knowledge transfer and innovation hub for multiple national and international networks.

Key words: geospatial data, RD&I, education, partnership, strategy

1. Introduction

CENTRIC is a H2020 funded project, with the long-term goal to establish, in Romania, a Centre of Excellence on territorial management and cadastre. The project is based on the creation of a long-lasting joint venture among partners from both advanced and low performing countries, including an institutional cooperation between the Romanian Cadastre Agency (ANCPI – project coordinator) and its counterpart in the Trentino region (Italy), considered a best practice at EU level. The project involves also the following research and innovation (public or private) institutions: KU Leuven (KU Leuven, Belgium), Fondazione Bruno Kessler (FBK, Italy), TRILOGIS SRL (Italy), TECHNOPORT (Luxembourg), INI-NOVATION GmbH (Germany), INCD URBAN-INCERC (Romania).

The activity of the future CENTRIC will be centred around the management and control of the territory, promoting at the same time scientific excellence in domains and scientific disciplines such as: airborne and satellite imagery processing, 3D/4D geospatial big data analysis and analytics, linked geospatial data (of high importance for the National Mapping and Cadastral Agencies - NMCA), photogrammetry, surveying, simulation, feature extraction, land classification, change detection, and territorial monitoring from remotely sensed data. CENTRIC will deploy a strategy for the creation of an **innovative ecosystem to support and facilitate innovation.**

2. Main results

The main results of the first 9 months of the project, are shortly presented below:

2.1. CENTRIC Research and Innovation Landscape

(Author and responsible of deliverable: URBAN)

An analysis of existent research and innovation activities in the fields that are relevant for CENTRIC was conducted both for Romania and at international level, which provided an understanding of the RD&I landscape and a base for the development of the future centre's scientific and innovation strategy.

Existing strategies in Europe and Romania, as well as priorities for RD&I have been identified and the priority axes, objectives and resources that could support some of the CENTRIC future activities have been emphasized. Finally, based on the research findings, a set of recommendations was proposed, as well as a prioritized list of the topics relevant for the future centre.

The R&D priority areas identified, in line with the scientific and innovation profile sought for the future Centre are: e-Government and social media, cloud computing, open data, big data, interoperability and cyber security, ICT in education, societal challenges, ICT in health, culture, e-Inclusion, research-development-innovation in ICT, broadband, digital services infrastructure and e-Commerce.

By comparing these priority areas with other innovation techniques employed at international and national scale, a final list of topics and R&D issues specific to cadastre and territorial planning resulted, being organized in order of their level of priority. Thus, in order for CENTRIC to reach its objectives, it is necessary: to improve 3D geo-information research in territorial planning, to develop 3D city and landscape models, to improve the quality and availability of cartographic products and geo-data by obtaining the 3D data version, to ensure interoperability, to promote smart city approaches together with strategic scenarios and applications of 3D city models, to promote new generation of LBS services, to contribute to the extension of current standards.

2.2. Technical and Regulatory Best Practices

(Author and responsible of deliverable: PAT)

An analysis of existing best practices and regulations in the areas of mapping, territorial management and cadastre was performed, while taking into consideration existing regulations, as well as important relevant technologies in these fields. Particular attention has been paid to the issue of how technological aspects are intertwined with regulatory issues. It was outlined the impact of emerging technologies (e.g. 3D, photogrammetry, etc.) in planning and territorial management activities, which is fundamental to determine when developing the business plan of the future Centre of Excellence. The Centre shall focus on **cadastre** not only by integrating urban planning, transportation, mobility, commuting, water resources, waste, energy, but it shall also provide a base to the diverse actors involved in the governance process that would help them learn and manage the territory.

2.3. CENTRIC Innovation Cluster

(Author and responsible of deliverable: TECHNOPORT)

The CENTRIC innovation cluster will be a key intermediary organisation between the research organisations, businesses and public institutions involved in territorial management, cadastre, GIS and other geospatial-related fields and the final users of their technologies and

services at national and international level, in the scope of establishing a functioning, sustainable and powerful innovation network around CENTRIC, by fostering successful collaborations between the research community, the public institutions and the private sector.
A short-term and long-term strategy for the development of the cluster was drafted, as well as several success indicators and target services were identified. The report also included a list of best practices identified at international level. The strategy for the cluster is heavily based on the strengths and weaknesses of the existing ecosystem and is aimed at leveraging the expertise available among the members, as well as filling some perceived gaps in the ecosystem, such as international visibility or access to private growth funding for the members.

2.4. Setting up Cooperation, Strategic Alliances and Long-Term Partnerships

(Author and responsible of deliverable: ANCPI)
In order to make CENTRIC recognized as an important player and to create the innovative ecosystem, an analysis was conducted regarding the potential of what kind of cooperation, strategic alliances and long-term partnerships will be established by and around the centre.

The main action lines for the future Centre of Excellence and the main players in the fields of cadastre and territorial management which could be involved in the centre's activities were presented. The action lines will bring CENTRIC in line with the major innovative developments in the geospatial sector, by becoming part of the community of public or private stakeholders. Through the establishment of cooperation, alliances and long term partnerships CENTRIC will operate as a meeting point between research, companies and public administration.

2.5. Definition of Long-Term Scientific Strategy

(Author and responsible of deliverable: FBK)
The long-term scientific strategy of the future Centre of Excellence in Romania includes the scientific vision and research strategy of CENTRIC.

The strategy presents an integrated working approach that will contribute to the technological innovations in the fields of terrestrial management, cadastre and mapping.

The CENTRIC Centre of excellence will be a science-driven centre that will be set up to empower its innovators, enabling them to focus on research, develop their skills and follow ideas for extended periods, and thereby fulfil their potential while contributing to the success of the centre.

2.6. Strategic Innovation Path

(Author and responsible of deliverable: TRILOGIS)
The strategy of CENTRIC is intended to support the development of the business community around CENTRIC to form the basis for the creation of an innovative ecosystem. By establishing an innovation management system, CENTRIC aims to promote entrepreneurship, new business creation, and young people's initiatives for self-employment.

Through its activities, the Centre will create the infrastructure for significant leverage concerning the process of supporting terrestrial management, cadastre, mapping, and geographical information systems.

2.7. Decision on Location, Logistics and Legal Structure

(Author and responsible of deliverable: INI Novation)

From a business perspective, the strategy of CENTRIC is aimed to be simple and direct: maximizing opportunities to generate revenue by utilizing the access to internal and external expertise and intellectual property while minimizing costs in order to be self-sufficient and sustainable in its operation.

CENTRIC will be established in order to perform tasks and activities in public interest. Accordingly, CENTRIC **has to be established either in the shape of a public organisation or as a private-public partnership.** In any way, CENTRIC will have to act as a **non-profit organisation (NPO) or R&D institute under the provision of the Romanian legislation.**

Two scenarios are considered at this stage for a proposed legal entity form for CENTRIC. In the **first scenario**, CENTRIC is functioning within the ANCPI. Its legal structure can be characterized as:

- **within the ANCPI legal entity**, as an internal department;
- operating **in parallel with CNC** (National Centre of Cartography): they will share the same geo-information domain, but CENTRIC will provide services and activities different from CNC;
- **without** a legal entity on its own until CENTRIC will reach its fully operational status.

This scenario would imply a full control of ANCPI in the development of activities.

In a **second scenario,** CENTRIC would be a separate legal entity, characterized as:

- the **supervision/coordination from ANCPI or the Ministry** and in full cooperation with ANCPI;
- operating also **in parallel with CNC**;
- **with** its own legal personality.

This scenario could be considered for the form of R&D Public Institute or as a new private NPO.

3. Conclusions

Both CENTRIC centre and CENTRIC innovation cluster will participate in the market competition, and will contribute to implementing innovative approaches and techniques in territorial management. **A viable and realistic solution for CENTRIC would be to act as a R&D Institute**. Such an alternative would grant more flexibility to the functioning of the new centre, benefiting from the characteristics of both public and private legal structures. Another possibility for CENTRIC would regard the constitution of **a private NPO**, requiring participation of ANCPI. In this situation, CENTRIC could benefit from the facilities offered by the public utility status, if such status is granted.

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