

JOURNAL
PROJECT

GAVIUS - From reactive
to proactive public
administrations

📍 Gava, Spain

TOPIC

Digital transition

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GAVIUS Journal #1: When AI Serves Common Good

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Municipalities and local agencies are the forefront of digital transformation experimenting to use Artificial Intelligence and Data Analytics to improve process efficiency and user satisfaction. The GAVIUS project will create a virtual assistant for social aids and benefits, making easier for citizens to obtain the grants to which they are entitled in an efficient and personalised manner and provide local policy makers with access to the data and the indicators they need to better plan, allocate and manage resources.

Executive summary

Application of digital technologies, Artificial Intelligence (AI) and data science in the public sector is broad and growing. Many public services managed and delivered by municipalities and local agencies can benefit from the digital transformation and consequent automation of tasks. In particular, those procedures that involve long data processing times, apply clear rules, perform complicated calculations or planned repetitive actions are the most suitable for automation. Nevertheless, the huge potential of AI and data analytics is still underexploited in the sphere of local services.

This put cities at the forefront of several experimentations to use AI to improve process efficiency, user satisfaction and foster a better use of public servants' knowledge and time. Moreover, the COVID-19 pandemic has further encouraged local authorities to explore digitalisation and its benefits to case data management and service improvement.

The GAVIUS project will create a **virtual assistant for social aids and benefits, making easier for citizens to obtain the grants to which they are entitled in an efficient and personalised manner**. It will receive a total of 4.2 million euros of European funds that will be used to design and implement an intelligent system that allows citizens, through digital identification, access to information on municipal social aids and manage them via mobile applications. At the same time, a tool will be developed so that the technician working at City Council's social services' and citizen services' departments can **manage cases, assess applications, report on aids and benefits and execute payments automatically**. In turn, it will **provide local policy makers with access to the data and the indicators they need** to better plan, allocate and manage resources.

The present Journal introduces the key concepts and ideas that are at the roots of GAVIUS. It also illustrates the current status of the activities and the key implementation challenges that the Gavà City Council and its partners are facing and will have to keep a close eye on in the next months.

Background

The promise of AI for public administration

Although the concept of a data-driven 'smart city' has been around for decades, **many municipalities have yet to deploy the fundamental infrastructure required to harness the full potential of data** analytics and AI.

The potential of AI for public administrations is manifold. The development of AI technologies is already having an **impact on how the public sector works and designs policies to serve citizens and businesses**. Applications touch on areas such as health, mobility and security services.

Local, regional and national governments are implementing projects aimed at exploiting AI **to better meet the needs of public-service users and workers**. Many use cases are also aimed to enhance stewardship and promote a more efficient use of public resources (e.g., increasingly saving the time civil servants spend on user support and administrative tasks so as to optimize the use of staff capacities and time to attend to all eligible users and increase quality of the assistance provided)[1].

According to a recent report commissioned by the Administrative Conference of the United States to Stanford University and New York University[2], AI tools are already improving agency operations across the full range of governance tasks, including:

- Enforcing regulatory mandates concerning workplace safety, health care, and environmental protection;
- Adjudicating government benefits and privileges, from social aids to intellectual property rights;
- Monitoring and analyzing risks to public health and safety;
- Extracting useable information from the government's massive data streams, from consumer complaints to weather patterns; and
- Communicating with the public about its rights and obligations as welfare beneficiaries, taxpayers, asylum seekers, and business owners.

Nowadays the AI tools available to governments span the full technical scope of AI techniques, from conventional machine learning to more advanced "deep learning" with natural language and image data. Despite the promising results achieved in many countries[3], European cities are still lagging behind in large scale implementation of AI in public services' design, delivery and monitoring. Several struggles make still difficult for public administrations to keep pace with the dynamic and fast development of AI[2]. Among those, there is the need for further work in terms of legal structures to support data sharing, usage and integration; improving standards; practitioners training; digitalisation for work practice and users support.

Moreover, when it comes to utilize AI based systems for the adjudication of social benefits, which is the core e-Government domain that GAVIUS aims to address, the public needs to be confident that the algorithms powering machine learning are fair and verifiable. For this reason, **robust information governance and explainability of the algorithms** are key prerequisites when deploying AI in the government sector.

[1]OECD (2019), Artificial Intelligence in Society, OECD Publishing, Paris,<https://doi.org/10.1787/eedfee77-en><https://doi.org/10.1787/eedfee77-en>.

[2]Engstrom, D.F. et Al. (2020), Government by Algorithm: Artificial Intelligence in Federal Administrative Agencies (February 1, 2020). NYU School of Law, Public Law Research Paper No. 20-54, <http://dx.doi.org/10.2139/ssrn.3551505>.

[3]Andreasson, U. & Stende T. (2019), Nordic municipalities' work with artificial intelligence, <https://doi.org/10.6027/NO2019-062>.

[4]Bernd W. Wirtz, Jan C. Weyerer & Benjamin J. Sturm (2020) The Dark Sides of Artificial Intelligence: An Integrated AI Governance Framework for Public Administration, International Journal of Public Administration, 43:9, 818-829, <https://doi.org/10.1080/01900692.2020.1749851>.

Policy context

Many national governments around the world have devoted considerable resources into developing strategies to foster innovation and development in AI technologies based on a widely shared belief that these technologies can and will deliver very significant benefits in terms of enhanced efficiency, productivity and service delivery.

A comprehensive overview of **national AI strategies** is made available by the European Commission through the [AI Watch](#) platform aimed to monitor the implementation of the Coordinated Plan on Artificial Intelligence on the development of AI in the EU and built in close collaboration with the [OECD AI Policy Observatory](#). In parallel to this ongoing effort, the European Commission published its 'White Paper on Artificial Intelligence: a European approach to excellence and trust'[5] in February 2020.

Moreover, a number of other reports have been drafted and show that most Member State AI strategies centre on how to support AI research and development, skills development, and infrastructure. Most strategies do make explicit reference to some sort of ethical framework, whether that is merely a **commitment to “human-centred” approaches** or an explicit mention of human rights.

While the policy context at EU and national level is rapidly evolving **AI initiatives at local and municipal level are increasingly widespread in the EU territory**, as testified by the recent AI Watch report on the use and impact of AI on public services[6] which signals that 70 out of the 230 initiatives surveyed are brought forward by local and municipal authorities. This positions cities, local governments, and their associations in a key role to build an “ecosystem of excellence and trust in AI in Europe”[7] and highlight the main opportunities and challenges that EU cities encounter in their current efforts towards AI development and adoption.

In this framework, Catalonia has truly excellent capabilities that make it one of the ideal European territories to take the lead in the field of AI. With this goal, the Government of Catalonia is promoting the **Artificial Intelligence Strategy of Catalonia** – under the name CATALONIA.AI – that will implement a programme of specific actions to lead knowledge generation, social and business applications and the creation of solutions based on artificial intelligence[8].

The digital transformation of the region is undoubtedly championed by the Catalan capital, Barcelona, which has recently announced through an institutional declaration that the City Council will have soon a pioneering municipal AI strategy in Europe supporting a reliable, ethical municipal technology model. However, **small and medium sized cities across Catalonia are eager to embrace digital transformation** and AI adoption too and are likely to become forerunners in the European landscape of smart human-centred cities.

[5]European Commission (2020), White Paper on Artificial Intelligence: a European approach to excellence and trust, Brussels, 19.2.2020, COM(2020) 65 final. Available at: https://ec.europa.eu/info/sites/info/files/commission-white-paper-artificial-intelligence-feb2020_en.pdfhttps://ec.europa.eu/info/sites/info/files/commission-white-paper-artificial-intelligence-feb2020_en.pdf.

[6]Misuraca, G., van Noordt, C. (2020), Overview of the use and impact of AI in public services in the EU, EUR 30255, EN, Publications Office of the European Union, Luxembourg, 2020, ISBN 978-92-76-19540-5, <http://dx.doi.org/10.2760/039619>, JRC120399.

[7]EUROCITIES (2020), People-centred Artificial Intelligence (AI) in cities Response to EU's white paper on AI, April 2020. Available at: <https://eurocities.eu/wp-content/uploads/2020/08/Eurocities-statement-on-AI.pdf><https://eurocities.eu/wp-content/uploads/2020/08/Eurocities-statement-on-AI.pdf>.

[8]Government of Catalonia (2020), CATALONIA.AI: Catalonia's Artificial Intelligence Strategy. Available at: https://politiquesdigitals.gencat.cat/web/.content/Telecomunicacions/catalonia-ai/Estrategia_IA_Catalunya_ENG_VF.pdfhttps://politiquesdigitals.gencat.cat/web/.content/Telecomunicacions/catalonia-ai/Estrategia_IA_Catalunya_ENG_VF.pdf.

Two cities committed to digital transformation



Gavà City Council

Gavà and Mataró are two municipalities of the Barcelona Metropolitan Area with a population of 47,057 and 129,661, respectively, and an intermediate population density (Statistical Institute of Catalonia, IDESCAT, 2020).

Both cities have **several e-government services** and have developed their own **Open Data portals** indicating their commitment to digital transformation, citizen participation, transparency and willingness to generate economic and social value through the use and reuse of data. The portals currently host respectively 129 datasets in [Gavà](#) and 43 in [Mataró](#). The huge number of records stored will be paramount for the machine learning process that is currently under development in the GAVIUS project.

In the same direction, in 2017, the **Big Data Gavà project** was launched. In order to value the data generated around citizens in the closest administration, i.e. the city council, it seeks to standardize and systematize the core data of the municipal system, avoiding duplications, incorrect or outdated information and, in turn, feed a Big Data system from which to draw dashboards for decision making support.

GAVIUS specifically focuses on social services as these are core pillars of the pivotal role played by municipalities in promoting equality and equal opportunities relating to education, employment, housing, health and care and cultural and leisure activities. In particular, social aids and benefits are crucial to enable inclusion and thus a precondition for a sustainable welfare society and for individuals to be able to live free and independent lives. Moreover, overall, social services represent a substantial part of local administrations' budgets, which is planned to reach approximately the 9,4% and the 9,66% in 2021, respectively in Gavà and Mataró.



Mataró City Council

Based on their shared goal to increase efficiency and effectiveness of social policies, Gavà and Mataró have joined forces and been successful in obtaining funding from the Urban Innovative Actions Initiative to implement the GAVIUS project. GAVIUS has been **collaboratively designed by the departments of Innovation and Social Services of the two municipalities** and the main local entities involved in the delivery of social services thus bringing on board the voice of a diverse and significant group of stakeholders from civil society.

Where we are

It has been a year and a half since the kick-off of the project. Although the Initiation Phase took longer than

planned due to administrative issues to be dealt with, the Managing Urban Authority has been successful in keeping the project on track avoiding that the administrative delay affected the co-design and technical development work. In addition, the **COVID-19 pandemic** has disrupted the activity flow as it arose when GAVIUS team was defining their strategy to engage citizens and planning their first participatory dynamics. This has obliged to identify alternative modalities and adapt to the restrictions enforced during the three pandemic waves Spain has gone through and partially still in place today.

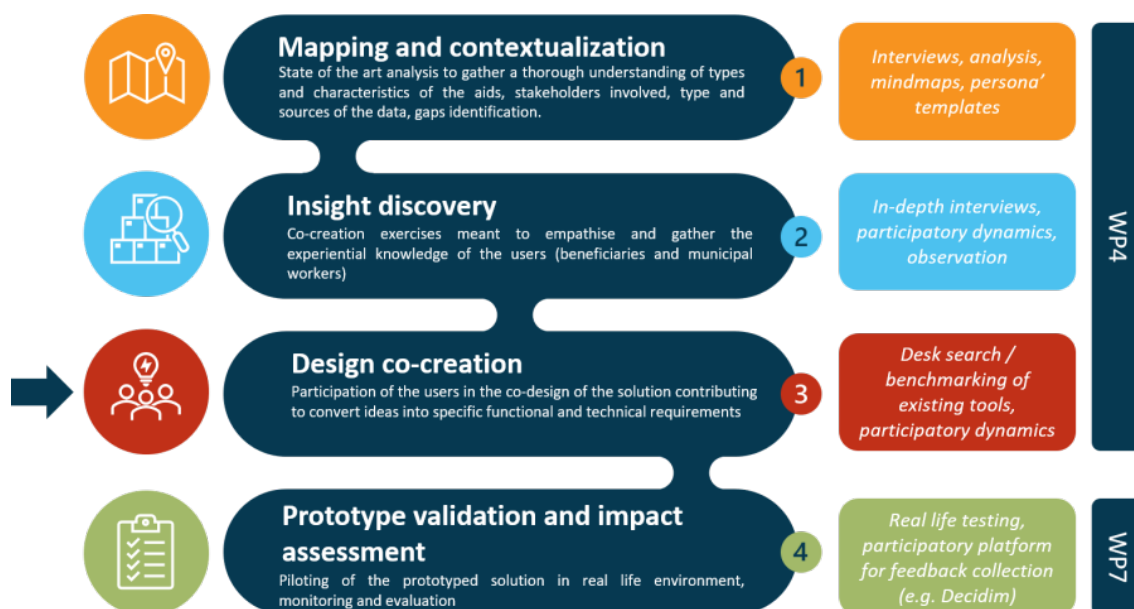
Co-creation sessions have been carried out via a series of online focus groups, coupling the use of Zoom for videoconferences with specific applications for the development of the participatory dynamics (e.g., Miro and Mural).

At the same time, the **legal, ethical, cultural, social and organizational issues** requiring specific attention have been addressed. They are being collected in a living document that is developed throughout the project and will be condensed in a Manual at its end.

On the other hand, an important strand of the work has involved the **analysis of the types of aids granted** by the two city councils and the data formats and sources. Work is also underway on the **conceptualization of the technology platform** and the **harmonization of data** which is a prerequisite for the design of AI algorithms.

Stakeholder engagement and co-creation

In spite of the obstacles posed by the COVID-19 restrictions, the GAVIUS consortium has designed **robust stakeholder engagement methodology** (see figure below) and it is currently carrying out the activities foreseen in its 3rd Phase “Design Co-Creation”.



GAVIUS co-creation strategy

Technical development: work in progress

Overall, the innovative solution that GAVIUS aims to develop and test is composed by:

- **A virtual assistant for municipal workers:** it allows municipal technicians to anticipate the needs of citizens and / or improve their relationship / interaction with the administration, adapting services to the needs of the citizenry through their personalization, improving the citizen's experience while reducing the time spent by technician in repetitive and automatable tasks.
- **A virtual assistant for municipal managers and politicians** it will provide access to a dashboard visualizing all the data and the indicators to help them efficiently allocate resources for social services.
- **A virtual assistant for citizens** through secure identification mechanisms citizen can autonomously access and perform simple but time-consuming tasks to be granted municipal aids and services.

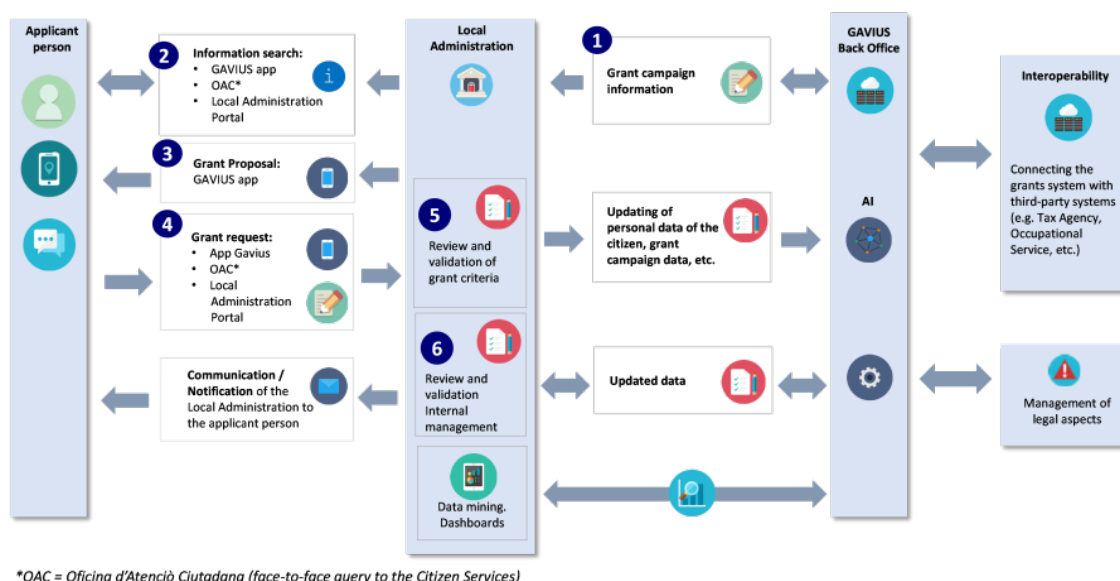
A “Proposal - Application – Feedback” system is the backbone of the technological platform thus **evolving from**

the traditional reactive model “Application – Feedback” to a proactive one.

Broadly speaking, the process would be:

- The AI module analyses the characteristics of the potential beneficiary and crosses them with the data included in the historical database of aid requests and responses. This way, it will draw up a proposal fitting the needs and characteristics of the potential recipient.
- The citizen is notified of the aid proposal (Proposal).
- If the citizen agrees, he or she formalizes the aid application (Application).
- The aid management process begins. The compliance of the citizen to the grant eligibility criteria are reviewed and validated and the applicant is notified of the decision (Feedback).

The picture below illustrates the **GAVIUS “data journey”** across the different steps of the planning, implementation and monitoring of a grant campaign.



GAVIUS Data Journey

Ethics, Privacy and Security

One of the keystones of the project is the **Handbook on the “legal, ethical, cultural, social and organizational limitations of the project”**. This handbook aims to analyse ways of making the use of AI in the administration compatible with the full exercise of our fundamental rights.

The legal overarching framework is provided by the General Data Protection Regulation (EU) 2016/679 (GDPR) which makes no direct reference to AI, or similar technologies, though it does refer to automated large-scale data processing, as well as profiling and automated individual decision-making (where AI systems could be framed).

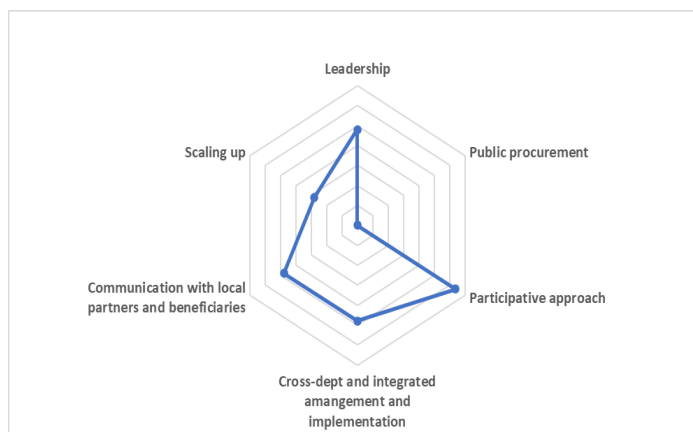
In Europe, the general principles of protection of the rights and freedoms of individuals have been detailed in the guidelines released by the High Level Expert Group on AI^[9], according to which the reliability of AI is based on three components that must be met throughout the life cycle of the system: AI must be lawful, ethical, and robust, both from a technical and social point of view.

The Manual aims to integrate the most advanced hypotheses and current top-notch approaches with the objective of supporting the deployment of tools through the GAVIUS project. For instance, the Manual will conceptualise how GAVIUS will integrate the principles of **minimisation** (i.e., ensure that the data collected is minimised e.g., identifying innovative solutions that avoid unnecessary personal identification to access information of public interest) and **privacy by design and by default**.

^[9]High-Level Expert Group on Artificial Intelligence (2019), Ethics Guidelines for Trustworthy AI. Available at: https://ec.europa.eu/newsroom/dae/document.cfm?doc_id=60419.pdf.

Challenges and emerging lessons learnt

The UIA Initiative identifies seven operational challenges, that are considered the most relevant and cross-cutting for implementing an innovation project within a city. The graph illustrates an overview of the UIA challenges and how they are translated to the GAVIUS project. The current state of each of the challenges is described hereafter.



Overall, the COVID-19 measures are the main obstacle to the proper development of the project and they mainly relate with the participative approach and stakeholder engagement modalities. Although the different partners of the project have adapted rapidly, deployed the necessary means to work complying with the restrictions and shifted to virtual meetings and work sessions, the difficulties in the participation of the citizenry and the overload of the municipal departments of Social Services and Informatics remain the key obstacle to comply with the timeline and deadlines set by the project.

Challenge

Observation

Leadership

Challenge level



GAVIUS was born from the initiative and willingness of the Innovation Department of the Gavà City Council. Thus, it might have been initially perceived as a "technology-pushed" project. For this reason, the Innovation Department staff have worked hardly (and will still be doing so along the project's duration) to engage a wide range of Departments so as to make clear the benefits it is expected to bring to the administration as whole and emphasise its utility and collaborative and multidisciplinary nature.

The project's leader recognises that this effort is time and resource consuming and can encounter some difficulties when, for instance, key leaders in the administration change. This happened for instance in the IT Department, which is one of the key areas involved along with Social Service, Economy & Administration, and Citizen Participation. Nevertheless, thanks to the engagement work done so far, the commitment from Department leaders as well as political support from the mayor and the government is definitely strong.

Public procurement


Challenge level



Public procurement is not a central challenge for GAVIUS. There are not major purchases that the Gavà City Council is going to undertake with the exception of contracting new staff for the project. Such process follows the internal well-established rules and procedures for HR management in the City Council.

Nevertheless, other partners have budget items assigned to the "external expertise" category. In spite of having clear processes in place to follow in order to find the best value-for-money option, all administrative procedures for the conclusion of those contracts have suffered some delays due to the huge increase in services' demand that has saturated the capacities of the organisations involved.

Participative approach:
active involvement of
key local stakeholders

Challenge level 

The first iteration of the co-creation process was supposed to come to its end in September 2020 and must have involved representatives from the municipal staff, the citizens and the executive/managerial levels of the administration. Of course, this plan has been disrupted by the COVID-19 crisis and the participatory workshops could not take place. However, the consortium has been working to mitigate this situation in different ways:

1) anticipate other strands of work that could start without physical interaction (other WPs);


2) devise alternative solutions (e.g. online consultation and co-creation sessions) leveraging the presence of partners who are specifically knowledgeable in the techniques and tools for co-design;

3) planning the individual interviews which can be done online while the physical restrictions for meetings are still in place starting from the municipal staff because their vision on the "what" GAVIUS is expected to offer as services and "how" they envisage it will look like is crucial to inform also the way to conduct interviews and co-creation sessions with citizens (once this will be possible);

4) planning measure to mitigate the effects of digital divide and lack of digital and data literacy among citizens: if the co-creation must be run online, in order to secure wide participation of different groups of the population, a space in the City Council premises is being equipped with facilities to connect for those who don't have pc, tablet or good connection.


In conclusion, due to the repeated iterations foreseen, co-creation has undoubtedly represented one of the key challenges although it has been closely monitored and appropriately tackled so far.

Cross-department and
integrated
management and
implementation

Challenge level 

The project has a well-functioning organisational arrangement based on periodic meetings and continuous follow up with the diverse levels and departments involved in the administration. The solution they opted for is a "flexible" model, thus the follow up meetings are not attended always by the same persons in each department, instead they identify case by case the needed ones to secure that the objectives of the meetings are fulfilled and decisions are taken.

Monitoring, evaluation
and measurement

Challenge level 

Goals and objectives are clear and well established. The evaluation indicators have been the subject of a careful revision during the initiation phase thanks to the support of the UIA officer and are now stronger and better defined. However, this doesn't preclude the possibility to have additional indicators emerging as long as the execution of the project will run and possibly more granular and detailed measurements can be done.

Furthermore, the project work timeline has been adjusted to accommodate the 6-months extension granted by UIA in order to mitigate the impacts of the COVID-19 pandemic and the barriers posed by the restriction measures in place in Catalonia to counter the spread of the virus. Thus, the project's length has been extended from 36 to 42 months and will end on February 2023.

Communication with
local partners and
beneficiaries

Challenge level



Although the project has a well-structured plan for communication and dissemination and is aiming to update it every six months, of course communication with local stakeholders and associations started with some delay due to the COVID-19 and slowed down in the peaks of the pandemic waves.

Moreover, the public health emergency has also provoked a shift in the communication priorities. First and foremost, the City Council had to concentrate their effort on communication actions related to essential services, counteract unreliable information, educate and foster compliance to the measures as well as provide assistance to the most hit and vulnerable categories.

Thus, similarly to co-creation, communication is a challenge that requires attention and close monitoring.

Scaling up

Challenge level



The project was born with the very inherent intention to have social services as the first use case to which GAVIUS solution would be applied in the experimental environment offered by the UIA initiative. Thus, from the very beginning, it has been supported by the government also for the opportunity of adaptation and scaling up that it presents. Once the validation phase will be concluded, it will be possible to develop novel algorithms to expand the functionalities of the app to other types of services and make better use of the diverse types of big data streams that are being already collected by the City Council.

In addition, regional scaling up opportunities are secured by the participation of the Open Government of Catalonia Consortium, a public agency aimed at fostering the digital transformation in 2,200 public administrations, which has provided about 35 e-government services for the last 16 years.

Gavà and Mataró are also both part of the Metropolitan Area of Barcelona (AMB), the metropolitan space where scalability and transferability will be investigated and pursued.

Lastly, broader transferability at national level will be sought via the engagement with the [Red Innpulso](#), which is a Spanish forum for sharing experiences and projects between cities to foster the design of innovative local policies. Gavà and Mataró are two of the ten Catalan cities belonging to this network for having been labelled as “Cities for science and innovation” by the Spanish Ministry for Science, Innovation and University. Similarly, at international level, both cities have a strong international projection and are willing to interact and network with other cities with similar plans and priorities as soon as appropriate opportunities will come up.

Conclusions and lessons learnt

GAVIUS is a timely and innovative project for many reasons:

- technologies to automatise and increase efficiency in public services' planning and delivery have reached considerable maturity and several similar local experiments are flourishing across Europe;
- the European Commission, Member States and regional governments are increasingly aware of the potential of AI-based solutions but also the need for clear rules and mechanisms protecting fundamental rights;
- the COVID-19 crisis has further highlighted the need to invest on technologies that can ease the work of public

administrations and secure that all citizens in need of support are reached also under extraordinary circumstances and restrictions.

The project team has been working hard to establish a continuous dialogue and collaborative environment with all the involved local stakeholders and has made relevant progress on the technological, legal and ethical aspects. The next steps will have to focus also on:

- strengthen the communication strategies at both local and national and international level;
- reflect on critical aspects for future adoption and scalability such as training and skills gaps for the administration's workers or necessary inter-institutional agreements which will be needed to secure interoperability;
- continue to work on the ethical and legal framework for GAVIUS also in the light of the new European Commission proposal to regulate AI which will be presented in the coming days and represents one of the cornerstones of the ongoing Portuguese presidency of the Council of the EU.

Digital transition

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