

JOURNAL

PROJECT

DIACCESS - Digital ACCeleration for medium SizE Sustainable cities
 Växjö, Sweden

TOPIC

Digital transition

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Journal 2 DIACCESS project

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This journal provides an update of the progress of the project at the time of writing (November 2021) in the three main domains: the innovative public procurement, the digital lab, and the IT platform.

Executive summary

Despite difficulties posed by the pandemic, the DIACCESS project is well on track:

- Two cycles of innovation partnership are in the R&D stage, moving towards 3 solutions.
- City and suppliers develop solutions for 1) smart heating at schools; 2) Smart snow clearing; 3) smart waste collection/bin emptying
- The cycles took more time than expected, especially the negotiations with suppliers take long and are complicated; this means that the planned 5 cycles of innovative partnerships will not be reached within the project period
- For the third cycle of innovation partnership, the business partner will be selected in November 2021; this will be about smart food distribution
- The project's Digital Lab developed eight prototypes, and successfully hired and trained unemployed trainees; The envisioned link with the innovation partnerships did not materialise but the digital lab delivers good results anyway.
- The IT platform is purchased and active now; yet it remains a challenge to fill it with sufficient data so that it will function as catalyst for data driven smart city innovations.

1. What the DIACCESS project is about

A cornerstone of the DIACCESS project the application of the **innovation partnership model (IPM)**, a procurement model that is not that new (introduced in 2014) yet not widely used. The model is useful when a public authority wants to have an innovation that is not yet available on the market. It is different from "regular" procurement in the sense that the city does not purchase a well-defined and known product or service from a company; rather, it invites one of more companies to co-develop a solution for a broader defined problem or challenge. After a selection procedure, the

authority signs a contract with a company (or consortium of companies), that includes an R&D phase and an implementation phase at the same time. During the development phase, new solution is co-developed by the company and the authority. After this is done successfully, the company will become the city's supplier and will start to make a revenue; the authority does not have to write out a new procurement procedure to implement the solution. In the case of Växjö, the city is not interested in owning the intellectual property rights (IPR) of the new solution, product or service: that will stay in the hands of the company. So, the company can in principle also sell this solution to other cities. This should make it attractive for companies to enter in this partnership.

In Diaccess, five cycles of IPM had been foreseen; in each cycle, companies would be invited to develop solutions for one or more urban challenges, to be gathered from the city or one of the city-owned companies. The project should show a learning curve, in which urban authorities learn how to use this type of procurement in a good way (and obtain better urban solutions that are useful for citizens, city staff and/or save taxpayer money), and in which companies also get used to this new way of dealing with city authorities and may develop new markets. It is hoped that this type of IPP will lead to more digital innovations in the public sector, and also helps companies to explore new markets and hence create economic development and job growth.

Alongside these IPM rounds, the DIACCESS project includes a **Digital Lab**, aimed to develop and prototype new urban innovations. The Lab works in the service of the city: departments can approach the Lab with challenges or problems, to have it explore if there is a possible solution. Another role of the Lab is to make prototypes that demonstrate how digital technology can work in practice. For municipal departments, it may take a lot of imagination to foresee how a solution might work, and in that case, a prototype, even an imperfect one, can help to demonstrate in practice what can be achieved. The Digital Lab has also a social function: it trains unemployed people to obtain new skills that may help them to find a job. On a half-year rotation basis, four selected trainees, supervised by experienced IT experts, learn how to develop digital solutions.

Finally, the project sets out to develop an urban **IT platform** to store, process and visualise the data that are generated by (and used by) the new digital innovations. The platform should provide its users with insights and information for better decisions and automated activities. The platform is to be open for all actors to provide and collect data with a built-in payment mechanism that will encourage private actors to deliver data on commercial terms.

2. Update of the project

This section provides an update of the progress of the project at the time of writing (November 2021) in the three main domains: the innovative public procurement, the digital lab, and the IT platform.

2.1 Update of the innovative public procurement (Innovation Hub, WP4)

The procurement procedures proved to take much more time than expected. In October 2021 (the time of writing of this journal), the project has reached the third cycle. Meanwhile, the projects from the first two cycles are still in their development stages, but they have advanced very well and look set for a good implementation stage.

Introducing a new type of procurement proved to be far from straightforward, because it entails a completely different relation between the city and companies. For both sides, it requires effort, change, communication, a willingness to learn, and acceptance of some risks and hiccups that any innovation always brings. The pandemic put a big challenge, making f2f meetings difficult if not impossible, whereas the development of new approaches asks for a lot of communication and trust, which is better facilitated when you see each other in person. Also, the pandemic asked a lot from the flexibility, capacity and ingenuity of the city staff to maintain their daily work; it was not easy to engage people in a new way of working with IPP. Other challenges have caused the slower-than-expected progress; Negotiations with the "winning" bidder proved to be very complicated and took more time than expected. For example, the winner of the bin-emptying optimization challenge proposed to develop a smart solution that would be integrated in the existing IT systems of the municipality and its suppliers. For that however, the company needed to know many details about those systems, which the city could not give because of all kinds of NDAs. It took much time to solve this. Other hiccups were the delayed delivery of sensors (affecting the school heating project and the bin emptying optimization project). Moreover, it proves difficult to envision what the end product will be.

There have also been very significant improvements and learning in the subsequent cycles; the project team has shown an ability to learn fast and adapt to new situations. A key improvement has been in the field of communication. In the beginning of the project, the information provision to companies was too broad and unclear, and project relied strongly on passive communication, "sending out messages". During the first two rounds of procurement, companies (the prospective suppliers) found it hard to understand what the new procurement model is about, and how it is different from normal procurement. A new proactive communication manager turned this around; among other things, she created a detailed Q&A, actively approached networks of entrepreneurs, set up a blog and article series (written by project partners and suppliers), put up a social media presence. As a result, DIACCESS is now known, understood and

appreciated by many more firms.

It turned out that the management of the procurement projects was more complicated than expected. For the first two challenges (the school heating and the snow clearing), the project budget had foreseen a project manager to oversee each challenge; but not so for the following challenges. However, it turns out that a true co-development process between need owner (municipal department) and supplier asks for a lot of management and coordination, especially in projects with a high level of technical and organisational complexity.

An ongoing debate concerns the management of the data that are generated/collected by the urban innovations developed by the suppliers. As a principle, the city wants to own (and be able to use) the raw data generated by the sensors that the projects install. But the suppliers (companies) have their own data systems, and in some cases want a degree of control over the data, because data are valuable from a business perspective. The project evokes discussions how to manage data ownership and management, but the situations vary widely with the types of challenges addressed.

It is also still a problem to find good challenges in the city departments and city-owned companies. They are still not used to this new way of procurement; moreover, the pandemic puts more pressure on middle managers and department leaders to run their daily business, leaving less leeway for innovative approaches.

2.2 Update of the Digital Lab

A key role of the Digital Lab (DL) is to make prototypes that demonstrate how digital technology can work in practice. For municipal departments, it may take a lot of imagination to foresee how a solution might work, and in that case, a prototype, even an imperfect one, can help to demonstrate in practice what can be achieved. During the reporting period, the lab developed several new prototypes, and improved existing ones. The original philosophy of the DL was to work in close harmony with the suppliers and need owners of the procurement process (as described in 3.1), but in practice, this did not really materialise mainly because the selected suppliers preferred to work with their own staff. As a result, the prototypes developed in the DL were very useful indeed, but have had little if any relation to the solutions developed by the suppliers. To address this, the DL has taken the step to pro-actively develop a prototype for a food distribution solution, preceding the latest round of procurement that also tackles this topic. It remains to be seen however to what extent the work of the DL and that of the procurement round will be aligned.

Importantly, the Digital Lab is committed to train unemployed people with some distance to the labour market to obtain new skills that may help them to find a job. Along the way, the trainees learn not only technical skills, but also more generic skills like Swedish language or the work culture in the Swedish context (especially relevant for migrant trainees). The first batch of trainees did a remarkable job, but not all found regular employment after their training yet. This also has to do with the difficult labour market, as due to the pandemic the number of vacancies, also in IT, has decreased dramatically. In the last two batches (6-month periods) it proved easier than before to find qualified trainees, perhaps due to the fact that the labour market had become tighter.

2.3 Update of the IT platform

Last year, a licence was bought for a smart city IT platform for IoT data, operated by partner Wexnet (a 100% publicly owned network company), for the limited period of one year. The platform should become a clearing house for a large number of IoT datasets from many sources (public and private); it was hoped that innovators could and would use these data to further develop new smart city solutions.

In the last year, the platform has been tested extensively, and the experiences so far are positive, the technical features of the platform enable to handle the IoT data, the visualisation features are good, and also, importantly, it allows exchange with other platforms in other European cities. A problem is however to fill the platform with relevant data; As for now, it has sensor data coming from the DL's prototypes and other city sensors. But the suppliers with which the city works in the DIACCESS Innovation Hub are less enthusiastic to stream their data to it; overall the number of datasets in the platform is still too limited, and as it stands, it does not work yet as a catalyst for data-driven smart city innovations.

3. The challenges

3.1 Leadership

The leadership in this project functions well on two levels. On the project level, the leadership is effective, adequate

and on top of things; there is a good connection between the work packages. On the level of the city management and also politically, there is a strong interest and support for the DIACCESS project. The city CEO and her strategy team regard the DIACCESS project as crucial element in the innovation strategy of the city. Especially the innovation partnership approach in the Innovation Hub seen as a way of co-creating innovations with suppliers and implementing them on a larger scale. The leadership team is already pondering how to continue the deployment of the innovation partnership model after DIACCESS expires in 2022.

3.2 Public procurement

In this project, public procurement is a central element, if not the foundation: a key objective is to co-create digital urban solutions with private suppliers, through innovation partnership method.

In 2014, the EU has opened the option for member states to deploy the innovation partnership model. Basically, it allows for a close collaboration between city and supplier during the innovation process, and does not require a new procurement round when the development stage is successful. The innovation process happens during the contractual phase, once the innovation partner(s) is (are) selected and awarded the contract. In other procedures, innovation typically occurs in the pre-contracting phase and at the moment of the conclusion of the contract; the public procurer already knows what type of solution it is buying. In innovation partnership, the public procurer is entering into the contract with the best potential supplier(s) of innovation who should be able to create the innovative solution and supply its real scale implementation for the public procurer. Throughout Europe, the method has been underused, there is little experience with it in Sweden and beyond.

The process can be ended in three ways: by the city, by the supplier, or by a third party issuing a lawsuit. A tricky aspect is the degree of novelty required. It is only allowed to enter into an innovation partnership when the sought-after solution is not available on the market and has a sufficient degree of "newness".

The project so far demonstrates three key things:

- First, **negotiations with suppliers are quite complex**, because of uncertainty at both sides: the city does not specify exactly what it is purchasing, and the supplier has no certainty as to what it is selling.
- Second, for companies and city departments alike, **it takes time and effort to understand what innovation partnership is about and how to work with it**. It is far from straightforward for city departments to formulate challenges, based on which private companies can develop innovative solutions. Departments are not used to work in this way, their procurement methods are still traditional. It will take much effort, and a change in mind-set and culture of the municipal organisation. Companies also need to get acquainted to this way of procurement as well; this asks for a strong communication effort. Hence, capacity building is important, both for city staff and for companies (especially startups and SMEs). In the early days of DIACCESS, there was much unclarity, companies tried to sell consultancy hours, or offered off-the-shelf solutions. The procurement department has set up a procurement course for (smaller) companies, for them to get more acquainted with public procurement and giving them a chance to become supplier of the city.
- Third, **matchmaking meetings/events are crucial for innovators to find other innovators**. Perhaps the one innovator is not equipped to deliver on his own, but if he finds a matching partner, it might end up with creation of a new company. connect problem owners (city departments) with prospective suppliers. These meetings turned out to be critical to clear up issues, to improve mutual understanding, and to answer many questions from the side of the companies.

3.3 Organisational arrangements within the urban authority (cross-department working)

DIACCESS is a city-wide project involving, in principle, every city department that wants to develop a smart city innovation with a supplier. The procurement department takes a central role, as they are the ones to support the departments and help to draft the contracts. The communication about the project is well developed (after a slow start). Importantly, the city CEO (and her team) is a strong advocate of the project and "sells" the project among the department leaders. So far, several municipal departments/companies have taken up the role as problem owner: Vöfab, the municipal real estate company that owns the public buildings, such as the schools (the school heating challenge), the infrastructure department (snow clearance), the municipal waste company (waste collection and separation projects), and the Meal administration.

3.4 Participative approach for co-implementation

In DIACCESS, urban innovations are developed in interaction between the city (and its departments/companies) and suppliers. The resulting innovations are intended to benefit the end users, which can be, depending on the innovation: citizens (in their various roles), civil servants, school children, commuters. But the innovations can and do also affect

the daily routines of municipal workers or contractors (as is the case in the snow clearing and waste collection solutions, that imply new routings for the drivers). Hence in DIACCESS, participation has two aspects: the involvement of end users, and that of workers/contractors who have to work with the innovation.

In the DIACCESS project, the users mostly do not participate directly in the development of the innovation. It is taken for granted that the need owners (urban departments) engage with them during the process. In the school heating project for instance, the headmasters of the schools are involved in the discussions what temperature in the building is desirable, and that informs the calibration of the system. But the system as such is designed without much discussion with them. In some projects, the feedback of citizens comes in the form of data on the behaviour of the users.

Second, the innovations can affect the roles and daily routines of municipal employees (or the ones of contractors). This is clearly the case in the snow clearance solution, that will lead to new, optimized routes (data-driven), and probably also will reduce the total amount of snow clearance needed. This implies that the snow clearers will increasingly rely on apps that tell them which routes to clear; It may also mean that less snow clearance is necessary. It also implies that the planning of snow clearance routes is no longer based on years-long experience of planners (stored in their heads) but on data. But so far the innovation is largely developed without the active participation of the snow clearance drivers, which might lead to resistance when it is implemented next winter; A collection of drivers have been involved and educated, but so far not the extended majority.

3.5 Monitoring & evaluation

In DIACCESS, monitoring and evaluation is taken care of on different levels; most evidently, the project leadership monitors if the project goals, timelines deliverables and milestones are met. As the procurement cycles take longer than expected, it looks like the 5th cycle will not be implemented during the DIACCESS project period.

On a second and more complicated level, monitoring & evaluation is about result indicators for the innovations that are developed during the project. The question here is: to what extent do these innovations improve the baseline situation, and how to measure that.

For the various challenges, it turns out difficult to find/collect baseline data and results/performance indicators for the specific challenges, but in the end, for the three challenges addressed (snow clearing, school heating and smart waste collection) the project has managed to make it. Also, it is not so easy to qualitatively monitor the wider overall objectives of the project, such as “increased supplier participation”, “satisfaction with suppliers”, or “satisfaction with the municipality”, again there is a lack of baseline data, departments so far have delivered little relevant information, partly because they do not have it and partly because they are occupied with so many other things due to the pandemic. Hence, it is still a challenge for the project to collect the needed data, but also to develop more qualitative methods to assess the various types of impacts.

3.6 Communication with target beneficiaries and users

Communication with the external interest groups (potential suppliers/innovators, other municipalities, public sector, etc.) has improved significantly in DIACCESS, thanks to the new communications manager who has experience in business and uses her networks well, and pro-actively reaches out to the business community, not only in the region but also nationally, and also within the municipal department; Online communication is not enough, a personal touch is needed to go after the right audiences.

The communication team also supports the other WPs in the project: they analyse and rewrite the call texts; they do the marketing of DIACCESS internally and externally, including pointy press releases when contracts are signed with suppliers; The project was featured on local TV when the challenge of waste management was started. The project made several presentations during the National Innovation Week in Sweden (4-8 October 2021) to discuss the approach & challenges; this raised a lot of attention and interest, and some of the suppliers were approached by other cities to discuss collaboration. Note that one of the purposes of DIACCESS is to open up new markets for companies, and thus this already is beginning to work.

Communication is not without problems; first, there is still a lack of appealing visuals that show what the project is about. Second, DIACCESS as a project has no direct access to the municipal communication channels, which makes more direct communication with citizens and companies more complex. Third, the budget for communication proved to be on the low side, given the amount of communication efforts needed to do this project well.

3.7 Upscaling

The upscaling in DIACCESS has three dimensions:

1. The project should, on the longer run, lead to a wider application of innovation procurement methods

(especially innovation partnership) and a culture of co-development and experimentation in the city. Here, progress is being made, DIACCESS is becoming better known among the departments.

2. Scaling is relevant for the suppliers that co-develop solutions with the city. The city prefers not to own the digital solutions developed by the companies, but rather buy a licence, and the IP remains with the companies. There are already signs that companies manage to attract new clients because they have Växjö as their launching customer; but effective communication about the results (as done during the national innovation week, see under “3.6 Communication”) will be crucial in this respect.
3. DIACCESS may scale up in the sense that it acts as catalyst for the adoption of innovative procurement and digital innovation for smaller municipalities in the wider region. Also, here it is too early to tell, but it would be good if DIACCESS would help to build capacity in those smaller and less resourced municipalities. This is already happening in the school heating subproject, where a regional network of schools are following the results and may join in a later stage.

Apart from upscaling, it makes sense to think about “mainstreaming” in the period after the UIA funding ends, in 8 months from now. The city leadership is already pondering how to keep things going without external funding. The city leadership is confident that some structural changes are already in progress. Suppliers increasingly understand the method; the procurement department and city departments have gained experience they will use to continue with IP projects after DIACCESS. A point of concern is the mobilisation of more need owners in the municipality: who will do that, after DIACCESS ends? And second, the IP processes done so far are quite complex, and take extra resources: additional project management proved needed to guide the snow clearance, school heating and waste collection projects. The city leadership sees much opportunity in using IP to address less complex urban challenges, but more work is needed to elaborate this.

4. Conclusion and lessons learnt

Despite some delays due to COVID-19 and slower-than-expected negotiation stages, DIACCESS is developing well. The city is gaining a rich experience how to work with innovation partnership (IP) model of procurement, and three concrete and useful urban innovations are under development.

Due to strong communication effort, suppliers now better understand what IP is, and how it works; Matchmaking events have been successfully held to connect suppliers to municipal need owners, and in later rounds, also smaller innovative firms have been reached. A lesson for other cities that consider to use IP is to invest heavily in communication: to suppliers, but also internally to city departments and need owners. And communication must be done by somebody who understands both the business world and the city bureaucracy.

Within the IP sub-projects, it turned out that after a supplier was selected, difficult and lengthy negotiations followed. This is mainly due to the inherent uncertainty in IP: the city does not know exactly what it buys, and the suppliers does not know exactly when it will earn money and how much, and also in the case of smart city innovations, suppliers need to have much information about current IT systems in the city (and the city cannot always give the details due to NDAs).

A lesson for other cities is to start with simpler projects; in Växjö, the projects started so far have been quite complex, asking for the integration of many different IT systems.

A great result is that the DIACCESS project is getting noticed, and that the solutions under construction already attract the attention of other cities, even before they have been fully implemented. This is good news for the suppliers involved in DIACCESS that see new market opportunities emerge (one of the goals of DIACCESS).

A point of improvement is the lack of early involvement of employees in the projects that will be affected by the smart city innovations (such as the snow clearance workers, or the drivers collecting the bins); They are the ones to use the innovations, their work will change, so it would make sense to involve them in an earlier stage.

Concerning the digital lab, it is showing amazing results both in terms of outputs (8 prototypes have been created) and its role in educating people with some distance to the labour market. But it has proved difficult so far to connect the prototyping work there with the larger challenges of the IP process. Hopefully, this will improve for the newest challenge (food distribution), in which the Digital Lab will develop a prototype solution before the suppliers starts its work.

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