



TRANSFERABILITY STUDY



By Willem van Winden, Lead Expert

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THE URBACT GOOD PRACTICE

1.1. Introduction

This section contains a description of Bilbao’s AS-FABRIK as good practice city in the AS-TRANSFER network. It starts by sketching the European policy context: how the AS-FABRIK concept fits into wider European debates and policies regarding digitalisation, industry policy, smart specialisation, and wider sustainable economic and social development ambitions like to UN Sustainable Development Goals (SDGs). Then, in section 1.3 we sketch the context of the city of Bilbao, its development, and detail how the AS-FABRIK project was developed and currently functions. The section ends with a reflection on the transfer potential towards the project partner cities and beyond.

1.2. European policy context

The AS-FABRIK project was set up in 2017 as one of the first projects in the (then new) Urban Innovative Actions (UIA) programme. The UIA programme was designed to let cities experiment with urban innovations, and so contribute to Europe’s wider urban agenda. It provides urban areas throughout Europe with resources to test new and unproven solutions to address urban challenges. UIA supports good-quality project proposals that are innovative, participative, measurable, and, last but not least, transferable: the projects should be to capture their experiences, communicate the results and pitfalls, and lessons learned, so that good practices can be transferred to other European cities. UIA stresses the importance of effective practical implementation, and asks the projects to register and capture implementation hiccups during the project period. For AS-FABRIK, Bilbao received an 80% EU subsidy over a 3,5-year period.

Contribution to the EU policy objectives

This project, AS-TRANSFER, intends to share the many lessons learned with 3 other European cities. Timewise, AS-TRANSFER falls into the new EU funding period, 2021-2027. For this period, EU cohesion policy has set five policy objectives:



1. a more competitive and smarter Europe
2. a greener, low-carbon transitioning towards a net zero carbon economy
3. a more connected Europe by enhancing mobility
4. a more social and inclusive Europe
5. Europe closer to citizens by fostering the sustainable and integrated development of all types of territories

From this perspective, AS TRANSFER mainly addresses Objective 1, promoting industrial development, advanced services, and hence contributing to smart specialisation. Industry is operating in a challenging and very competitive international context, and concerted smart regional strategies are needed to future-proof

this segment of the economy. The main aims are to promote competitiveness of the local/regional industrial sector, by helping them to digitalise, and by strengthening the connection between education and industry); and also to boost the advanced service sector and link it more with the industrial firms.

Objective 2 (towards a greener economy) is also addressed as a basic precondition, assuming that any industrial or service sector growth should take place within the ecological boundaries of the planet.

Contribution to the digitalisation agenda

Digitalisation is a top priority for the EU, and AS-TRANSFER is strongly linked to this agenda. With the Digital Europe Programme, the Commission is determined to make this Europe's "Digital Decade", and set a list of actions¹. On 9 March 2021, the Commission presented a vision and avenues for Europe's digital transformation by 2030. This vision for the EU's digital decade evolves around four cardinal points: skills, business, government, and infrastructures². AS-TRANSFER mainly operates in the first two fields, skills and business.

The skills agenda aims to raise the number of ICT specialists, have gender convergence in the ICT sector, and make sure that a minimum of 80% of population has basic digital skills. The business agenda intends to boost the digital transformation of businesses: 75% of EU companies should be using Cloud/AI/Big Data, and the EU should be the home of more innovators by growing scale ups & finance to double EU Unicorns. Also, late adopters must be helped: more than 90% of SMEs should reach at least a basic level of digital intensity.

Very concretely and recent, the EU's Digital Innovation Hubs initiative³ is highly relevant for AS-TRANSFER. In this scheme, the EU supports cities to develop European Digital Innovation Hubs (EDIHs), that should function as one-stop shops that help companies dynamically respond to the digital challenges and become more competitive. EU funding will be made available for hubs that are already (or will be) supported by their Member States (or regions), in order to increase the impact of public funding. All the partner cities in AS-TRANSFER have concrete plans to develop such hubs, or are already in the process of doing so.

Contribution to the EU Urban Agenda and its Partnerships

The EU Urban Agenda aims to promote cooperation between member states, the European Commission and cities in order to stimulate growth, liveability and innovation in the cities of Europe.

It was developed in 2016 as a new working method to ensure maximum utilisation of the growth potential of cities and successfully tackle the social challenges. This new approach includes the development of a range of European partnerships in which the European Commission, Member States and European cities work together to ensure that the urban dimension is strengthened in EU policies through:

1. Improving the development, implementation and evaluation of EU legislation ('Better Regulation');
2. Ensuring better access to and utilisation of European funds;
3. Improving the EU urban knowledge base and stimulating the sharing of best practices and cooperation between cities.

AS-TRANSFER mainly contributes to the 3rd dimension, by sharing lessons learned on digitalisation policies between cities.

¹ https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age_en

² https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030_en

³ <https://digital-strategy.ec.europa.eu/en/activities/edihs>

Within the EU Urban Agenda, 13 Priority Themes¹ are addressed. AS-Transfer mainly operates in two of them: Jobs and Skills in the Local Economy, and Digital transition in Cities.

Within the partnership of the Urban Agenda for the EU on **jobs and skills in the local economy**, EU countries and the European Commission deal with economic performance and business development at the local level. The new skills agenda², as embraced by the partnership, is important for AS-TRANSFER, as one of the priorities in the project is to learn how to develop the right skills for the digital economy, how to connect education to the needs of business, and how to facilitate job mobility towards growth sectors in the urban economy. The same goes for the many EU actions and programmes in the field of lifelong learning; A lifelong access to education and training possibilities is vital for growth in jobs and skills in the local economy.

Within the partnership of the Urban Agenda for the EU on the **digital transition**, cities, EU countries and the European Commission work together to provide more efficient public services and a better knowledge exchange. They focus on future health and social care services, eGovernment, 5G, urban planning, future learning and skills development. Especially the latter point is highly relevant for AS-TRANSFER. The partnership wrote a digital transition action plan³, in which, among other things, it aims to support European cities in exploiting the possibilities of digitalization, and to assist European businesses to develop new innovations and create new business opportunities for global markets. Both aspects are highly relevant in AS-TRANSFER; moreover, Estonia is the coordinator of this partnership, and one of the AS-TRANSFER partners is Estonia's second city Tartu, opening avenues for collaboration and exchange.

1.3. UIA Good practice description

Short description of the UIA city

Bilbao is a city in northern Spain, the largest city in the province of Biscay and in the Basque Country as a whole. It has a population of 345,141 as of 2015; The Bilbao metropolitan area has 1,037,847 inhabitants, making it one of the most populous metropolitan areas in northern Spain. Bilbao has been the economic centre of the Basque Country since the 16th century. From the 19th century, the city experimented its biggest economic development, mainly based on the exploitation of the nearby mines, which promoted maritime traffic and port activity and eventually the development of a very important shipbuilding industry and later also other manufacturing industries.

In the late 20th century, deindustrialisation set in, the city lost many manufacturing jobs and was struggling economically. The opening of the Guggenheim Museum is widely considered as a turning point; it helped to revitalise the city (especially former port areas), improve its image, attract tourists, and boosted the self-confidence of the city. Despite further job losses, the region has kept a strong and innovative industrial sector (especially located in the surrounding region of Bilbao), and the city itself developed strongly as city of services, knowledge, innovation and tourism. Its universities and knowledge institutes play an important role

¹ Priority themes for EU cities: Air quality in cities, Circular economy in cities, Climate adaptation in cities, Culture and Heritage, Digital transition in cities, Energy transition in cities, Housing in cities, Innovative and responsible public procurement in cities, Inclusion of migrants and refugees in cities, Jobs and skills in the local economy, Sustainable use of land and nature-based solutions in cities, Urban mobility and accessibility, Urban poverty

² <https://ec.europa.eu/social/main.jsp?catId=1223&langId=en>

³ <https://futurium.ec.europa.eu/en/urban-agenda/digital-transition/action-plan/digital-transition-action-plan>

in the innovative power of the region, and the city became a reference for its advanced cluster policies, uniting the triple helix (companies, knowledge institutes and government) in specific sub-industries to boost competitiveness.

Currently in Bilbao, advanced services (defined as financial/insurance services, ICT, and professional/scientific/technical firms) generate 23% of the GDP and 18,7% of employment, meaning 30k individuals.

Contribution of the Advanced Services to Bilbao's GDP	
Sub-sector	%
Information and Telecommunications - ICT	7,1
Financial and Insurance Activities	6,1
Professional, Scientific and Technical Activities	9,7
ADVANCED SERVICES	22,9

Source: Bilbao Ekintza and Estimación de Ikei. 2019.

Summary of the UIA Project

The why of AS-FABRIK

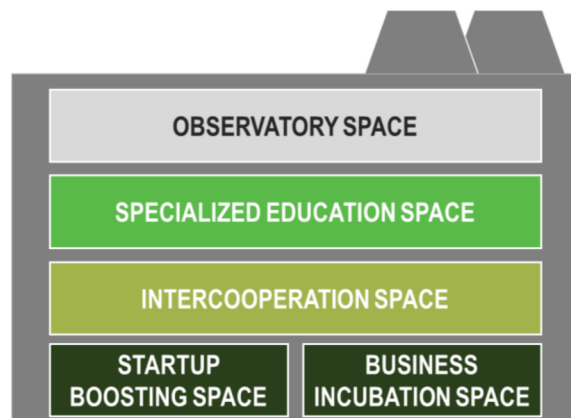
AS-FABRIK was conceived in 2017 to increase the competitiveness of the local KIBS (Knowledge Intense Business Services) sector of Bilbao and prepare them to supply the digital transformation demands of the manufacturing sector (Industry 4.0). A strategic alliance with the city, businesses, universities, local service providers and entrepreneurs was set up in order to create a new ecosystem based on innovative pillars and hosted in a tailor-made space for experimentation and incubation of new services. AS-FABRIK was also conceived as a catalyst for urban development of Zorrotzaurre (a large brownfield near the city centre with an industrial past) as an innovating ecosystem and a reference in the field of advanced services for industry 4.0 and the digital economy. The physical heart of the project is a public building with an industrial past located there, that was conditioned as a reference centre for the project and meeting point for the planned activities.

AS-FABRIK was set up from the strong awareness that the local and regional economy is affected by significant changes due to digitalisation. It is evident that the pervasive influence of digital technologies and servitization requires a strategic re-orientation of manufacturing firms, urging them to invest in new skills and competences within their own company; “manufacturing 4.0” may leave obsolete the present-day skills of professionals and jobs. At the same time, it opens new avenues for connections between manufacturing firms on the one hand, and companies that offer knowledge intensive business services (KIBS) on the other. The latter include IT and software firms, consultancies, marketing firms, but also financial service providers. Their knowledge and expertise can be very valuable for manufacturing. Also, new market niches open up for start-up companies that develop digital technologies and solutions. In the last few years, the project has initialised a lasting infrastructure to promote the digitalisation and modernisation of the regional manufacturing industry and advanced services. The landmark AS-FABRIK building will remain relevant as hub for industry 4.0 education and as meeting point/network venue for industry, services, education and startups, where members of the industry 4.0 and advances services community will find a homebase and a

joint R&D hub. The leadership team of AS-FABRIK -now in the hands of Mondragon- has made progress in various respects; It elaborated a membership model, detailing various types of membership of AS-FABRIK urban labs (for large players and smaller ones), including conditions under which members can use the facilities.

Key activities

Four key activities take place from this building, that are being developed within the project duration (2017-2020), and which have the objective of consolidating the new, more sustainable production model:

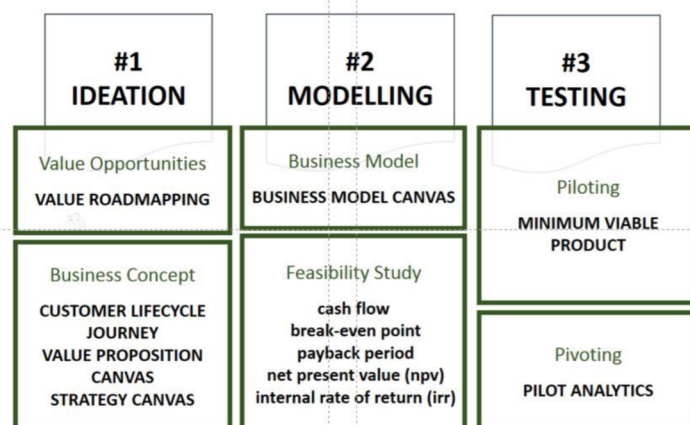


1. *Training programmes for university students, entrepreneurs, professionals and city staff, designed to tackle the challenges of industry 4.0 in the digital economy.* This includes the following elements:

- Technical training programmes for as providers and professionals: embedded systems, data science, advance service design.
- Business trainings for professionals; on servitization, entrepreneurship, continuous trainings
- A new research degree in business data analytics, 40 p/j, mixes tech and business, plus 3 phd thesis
- Customized training for companies, attended by 50+ professionals; on data science, embedded systems, servitisation
- Training programmes for policy makers; 5 training modules

2. *Partnership brokering & networking actions between the main stakeholders.* This action aims to foster new types of collaborations. A distinction is made into several phases of partnership development: Design/scoping/create/manage/sustain. For the design stage, a guidebook was made, with a lot of models and tips how to design partnerships. Scoping involved an assessment of new technologies, and analyse relevant stakeholders; In the “create” stage, partners explore concrete collaboration opportunities; business focused or education/training focused, in workshops with firms from manufacturing and KIBS. The manage and sustain stage includes workshops on IP management, and how to formalize the collaboration. This process was supported by a mentoring programme, in which collaborating firms were supported and mentored by experts. In total, 11 mentored companies were reached.

3. *Start-up boosting.* This includes projects and support for the launch of start-ups based in Bilbao, related to technology, specialisation, and intelligence that need industry 4.0 to position themselves internationally. In total, 36 venture project were supported, 90% was intrapreneurship, especially in existing young KIBS, with 5-6 people. Through time, participating firms go through several stages: 1) low-fi MVP creation and validation; 2) hi-fi mvps for market fit validation; 3) Piloting and assessment of scalability potential, and 4) business incubation.



4. An observatory, where trends in technology, industry 4.0, KIBS, and the digital economy are analysed. The observatory analyses which new concepts are developing internationally (in the broad domain of manufacturing/ICT/KIBS), how the demand side is evolving, what other European cities/regions are doing in this policy field. This can be seen as a tool for awareness raising, a “thermometer” of what’s going on. Moreover, the observatory collects a number of statistics about KIBS and digitalization in city & region, to monitor progress. This helps to identify the challenges faced by local businesses and propose innovative solutions to them, and to monitor the progress of the city and region in time and compared to other cities.

Lessons learnt during the project’s implementation

A number of lessons have been learned during the AS-FABRIK project period 2017-2020. Below, they are categorized in the main lines of activity developed in the project: partnership brokering, education, start-up boosting, and miscellaneous.

Lessons on partnership brokering:

To boost industry 4.0, it makes sense to connect complementary regional actors that otherwise might not find each other. Through well-designed workshops, AS-FABRIK has shown that it is possible to connect players that might be complementary. But it remains difficult to engage with manufacturing companies, especially when their order books are full and there are staff shortages.

New types of partnerships (between manufacturing and KIBS) are needed for companies to remain competitive. AS-FABRIK’s strategy was to explore and develop new local/regional partnerships in a systematic way; first, by looking how existing local/regional firms could combine their complementary resources and team up, and second, by analysing which type of knowledge/expertise is still missing and could be developed by start-ups or new ventures.

Apply innovative workshop templates. In AS-FABRIK, innovative workshop templates were set up to organise these matching process. The project has shown that partnership brokering is 1) time consuming -hence expensive- 2) relies strongly on the credibility of the actor who organises the process -otherwise companies will not participate- and the quality of the workshop templates and 3) it remains a challenge to engage busy companies with little time because of full orderbooks for which future innovation may not be a priority. This implies that partnership brokering will only work when organised by a strong and credible actor who understands the business (as was the case with Mondragon in Bilbao); Also, public funding in whatever form is needed to sustain the brokering activities, as businesses tend to be not prepared to pay for it because the eventual benefits are unclear and unpredictable. The mentoring activities were important to support the

development of new initiatives; but here also, they relies on paid mentors that could be largely funded out of the UIA subsidy. Without subsidy, a mentoring system is difficult to maintain.

Lessons on training & education

Use digital / industry 4.0 hubs to renew education and make it ready for the digital age. New master courses in the field of digitalisation (technical and more business-oriented) have been developed, they will be sustained by Mondragon.

To boost industry 4.0, it is key to establish permanent/lifelong learning. Digitalisation is a pervasive trend, it develops fast, and it affects all aspects of the business. This has two key implications: 1) that (higher) education must work hard to keep their curricula updated and 2) that lifelong learning concepts are more needed then ever. AS-FABRIK caters for both.

Lessons on startup boosting

A key lesson from AS-FABRIK is that startup boosting regarding industry 4.0 should not follow the Silicon Valley model of digital startups. Startup boosting is not only (and not even mainly) about young people starting business from scratch: it also includes the development of ventures from within existing companies. Most companies do have many good and viable new business ideas, but for all kind of reasons they do not come to fruition. An important role of startup boosting is to discover these ideas within companies and set the conditions to develop them in new business lines -not necessarily new companies.

A second lesson is that startups have a much better chance when they are linked to the wider industry 4.0 ecosystem. They will certainly have a market when they develop products or solutions for existing companies in the region. A key challenge is thus to articulate and discover the needs and holes within existing (industrial or service) companies, as a basis for start-up development. Here, the start-up boosting connects with the partnership brokering.

Lessons on observatory & monitoring

It turns out that standard urban economic data are hardly apt to measure progress in KIBS and digitalisation; monitoring largely relies on first-hand primary data from companies. To obtain such data, it is important to engage firms closely in the policy process, so that they feel committed, and it helps if the city, represented by mayor or aldermen, rather than a researcher, asks firms to participate in surveys or other types of data collection.

Lessons on governance/management

The governance of AS-FABRIK is in the hands of Mondragon university; This has the benefit that a large player, with strong interest in the further development of knowledge-intensive services and industry 4.0, is now firmly in the driver's seat. It also means that the influence on AS-FABRIK of other players in the city/region (other universities, local development agencies, cluster organisations, public institutions etc) will be limited, despite the fact that the development direction that AS-FABRIK stands for is relevant for the city and the region as a whole. It might have been better to give some type of formal role to such institutions, for example in an advisory board or steering committee.

Lessons regarding the building and its location

The AS-FABRIK building is located in a new urban development area, outside the city centre, that is still under construction. It may work as a catalysts to develop the area. On the downside, putting such a digital hub on a not-so-central location makes it more difficult to attract crowds and facilitate unexpected visits from curious bypassers. At the same time, such a building can become an anchor in the urban regeneration when it manages to develop strong connections with other institutions and people in the area. Time will have to show if this will be the case or not.

Scope for improvement

AS-FABRIK's stage as UIA project is over since 2020; it now functions as independent facility run by Mondragon. In an assessment made one year later, by spring 2021, several points of improvement have been identified for AS-FABRIK:

When it comes to ownership of the project, Mondragon has played a dominant and constructive role. The sustainability of the project is ensured because the building and management of AS-FABRIK are handed over to Mondragon. This will make it lasting, in particular the educational activities that will continue to take place, but also the startup boosting that will continue. At the same time, the more innovative aspects of AS-FABRIK, especially the partnership brokering, are more fragile. These activities take up much time and resources from the side of the organiser and the participants. Already during AS-FABRIK's UIA stage, with 80% EU funding, it was not always easy to engage companies.

With regards to communication, the project has been somewhat inward oriented, mainly directing the communication efforts to the main stakeholders (from education, industry and services); more peripheral audiences, such as residents of the surrounding area or citizens of Bilbao in general, were less addressed. As such, this approach is understandable, but casting a wider communication "net" from the beginning could have been good. First, the AS-FABRIK building is located in a newly developed urban zone, that needs to be embraced by the Bilbao citizens; and second, industry is the heart of the DNA of the region; it is part of the bigger story of Bilbao's history, and hence it makes sense to involve the population at large in the important next steps of industry digitalisation.

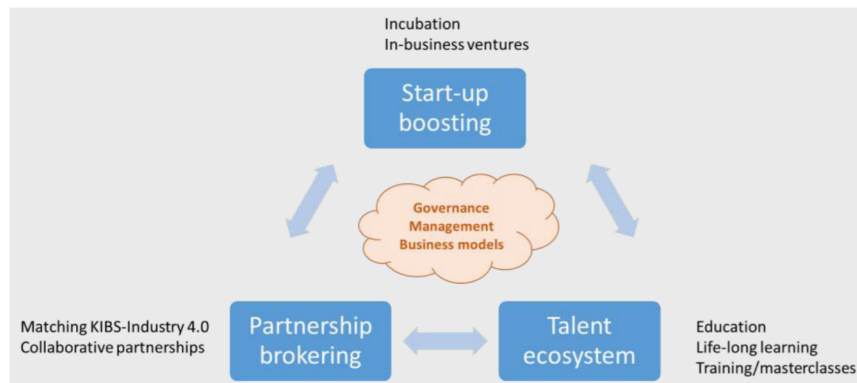
Likewise, regarding participation of stakeholders, the project has always strongly focused on the key stakeholders: KIBS companies, industrial companies, education institutes, policy makers, and local development organisations/cluster organisations. There has been less engagement of citizens, which could have helped to increase the local support for the redevelopment of Zorrotzaure. But in the last two years, significant steps have been taken to engage neighbouring educational institutes in the development of AS-FABRIK, to make sure that it does not become a Mondragon-run closed shop.

For the sustainability of AS-FABRIK, it is necessary to further develop the business model that allows the continuity of the provision of services linked specifically to the activities of the Startup boosting, partnership brokering and AS observatory. The deployment of this new business model should serve to make those services as effective, efficient and sustainable as possible maintaining the integrative perspective of the value proposition of Bilbao AS Fabrik as a whole. It should also take into account the participation and collaboration with public-private intermediary agents.

It might be worthwhile to explore how AS-FABRIK could become part of the European Digital Innovation Hub (EDIH) network that is currently set up (see previous section); this would provide further scope for funding and knowledge exchange, nationally and internationally.

1.4. Overall transfer potential

AS-FABRIK is a comprehensive concept consisting of interdependent activities. In our view, it makes little sense to pursue or foresee a one-on-one copy-paste of Bilbao's experience, first because the transfer partners already have similar activities in place (to a varying degree), and second because AS-FABRIK can be decomposed in several elements that may well be separately transferable. The following modules can be identified that might in principle be transferred to the partners:



1) The collaborative tools and working methods developed in AS-FABRIK (and available for transfer Cities), can help to identify new matches between companies in the ecosystem that might lead to new types of partnerships. It is a promising way to systematically assess Industry 4.0 challenges and competences in the region, find white spots, discover opportunities for interfirm collaboration, identify training needs, and discover where start-ups can explore a niche market. Setting up the road mapping exercise and expert courses can serve as an example for other cities to bring digital skills into service companies and to create a collaborative community, with longer lasting positive effects on the competitiveness of the entire region. As an example, during the last two years, several rounds of moderated matchmaking seminar series (in various forms) were organised within AS FABRIK framework, aimed to bring companies together and see if new partnerships and alliances could be developed. By 2020, this process has resulted in 32 Partnership Agreements (between collaborating businesses), and 6 educational agreements (business-university partnerships). These tools and methods might be replicated and adapted in other contexts.

2) Alternative start-up boosting methods. The start-up boosting process in AS FABRIK aimed to create new companies, mostly new intra-company ventures, in the field of industry 4.0 and advanced business services. The project distinguished 5 boosting stages, from early ideas to advanced/mature: ideation (pitching the idea), prototyping (developing a prototype), piloting (do a first market test), and incubation (making connections to industrial and financial partners to get the venture off the ground). Projects were carefully mentored by a team of experts, to let them make the transition from idea to viable business model. In total, so far 36 new ventures started this activity in seven rounds. This model is transferable to other contexts.

3) New types of education & training programmes. Several training programmes for professionals have been developed and run in the project, including technical courses (on topics such as Data Science, Embedded Systems and Advanced Services Design), and more managerial ones (on servitization, finance and management). Also, companies received an in-company training. A quite innovative action in this regard was the setup of specific training sessions for policy makers, about rather technical topics such embedded systems, data analytics, servitization, innovation alliances, and industry 4.0. These training programmes might be transferred to other cities.

4) The design of the building where it all comes together. A crucial part of AS-FABRIK has been the creation of Centre for industry 4.0 and KIBS. It is becoming a physical hub where companies meet each other, where they can explore and develop new partnerships, where start-ups are incubated, and where training activities take place, all under one roof. It should become a hotspot for the industry 4.0/KIBS community, not only in Bilbao but the wider region. The centre is being built in the heart of the Zorrotzaurre district, a former industrial area (including residential and retail functions) that is being transformed into a mixed innovation quarter in the coming decades. Sharing all the learnings about this new building uses, operational mode, location as well as architectural details can also help other cities projecting a similar structure.

5) Additionally, to facilitate the transfer of the model there is a need to provide other cities or regions with practical and useful tools. In this sense the Guidebook created –now in English- with strategic roadmaps and tools for partner seems to be helpful for other regions as well.

Transfer challenges and conditions

Contentwise, the above-mentioned elements all lend themselves for transfer. But transfer is likely to meet a number of challenges:

1) Partnership formation is key to transfer the UIA practice and can be a difficult trajectory. Building trust among the key stakeholders is key, and this level of trust was already very high in Bilbao. In this sense, it will be also key for each transfer city to select a good pool of entities within the URBACT local groups (ULG), members to cooperate openly, to co-create, to exchange knowledge, and with sources enough to complete this process and build a collaborative culture.

2) Local leadership is key: these type of initiatives rely on strong public leadership, balancing the interests of all stakeholders.

3) Stakeholder participation: the participation of the private sector (KIBS and manufacturing firms) and higher education/knowledge institutes is mandatory as they are key players to cover all the value chain of the capacity building process of the advanced services sector, as well as to know first-hand the current and future demands related to the digitalisation and evolution of the industry towards the Industry 4.0 concept.

3) Financial sustainability: Transfer cities will need to access public funds (from cohesion funds, for example) to implement the AS-FABRIK model in their cities once this UIA Transfer Mechanism is completed. This financial plan must be explained in the mandatory investment plan. But then, on the longer run, it remains to be seen how these initiatives will be able to be effective without EU support: this would require structural financial commitments of all partners, to update courses, to maintain start-up support, to fund the brokering/networking activities, and to keep an advanced services observatory in the air.

4) Reaching the main beneficiaries of these actions: The AS FABRIK experience shows that reaching some beneficiaries –companies in manufacturing, KIBS, startups, students- can be easier because there are closer to Innovation Ecosystem and belong to already existing networks. However, reaching smaller and traditional SMEs can be more difficult. For this reason, specific communication actions for this sector must be tailored, considering their particular characteristics.

5) The Bilbao experience rests on the strong role of the Mondragon collective, in which university and companies are under one umbrella and tend to collaborate easily. Such situation is quite unique and unlikely to be found in the partner cities, making the transfer more complicated -but not necessarily impossible.

2. PARTNER PROFILES

2.1. Introduction

Below is a summary of the three cities that have joined the partnership. The remainder of this chapter provides more information about these cities, their current state regarding industry 4.0, and their ambitions regarding the several aspects of the AS-FABRIK project. Also, for each city we sketch an outline of their ambition to transfer the good practice, as well as assets and barriers that affect the transfer process.

Table 2.1 Partner summaries

Partner	Population	Country
Bielsko-Biała	172,000	Poland
Tartu	95,090	Estonia
Timisoara	191,734	Romania

2.2. Bielsko-Biała

Introduction

Bielsko-Biała has 172,000 inhabitants and is situated in the southern part of the Silesian region, Poland. Bielsko-Biała was established in 1951 as a result of a merger of the two neighbouring cities: Bielsko (with its origins back in the Middle Ages) and Biała (established in XVI century). The city is known as "little Vienna", because of the beauty of the city's architecture, and the landscapes of the surrounding mountains. Bielsko-Biała is an important industrial, trade and cultural centre of the southern sub-region of the Silesian Voivodeship. The city enjoys high level of investments and low level of unemployment. It has an innovative high-tech industry, including multinationals (many well-known international companies established their factories in Bielsko-Biała, among which FCA, ABB and Philips), and a well-developed SMEs sector which more and more invests in R&D centers. Over the last years, the IT sector and a related start-up scene have been developing. The city has three universities, a large one and two smaller ones. The biggest university has about 5,000 students, and offers studies in technical, medical and social science fields.

The cities' industrial base has developed favourably in the last decades and has become more innovative and knowledge intensive. The ICT sector has grown substantially, with an emerging start-up scene and a consolidating base of service providers. There are locally owned software houses (mostly preparing code for larger companies); foreign owned software houses (larger teams, and tend to grow faster), and companies offering their own software products/solutions.

The Good Practice challenge in the city

Regarding the topic and sub-modules of AS-TRANSFER, the city faces the following challenges:

- Companies realise they need to invest in digitalisation and robotisation to remain competitive
- It is a challenge to keep and attract young talents in STEM fields; The city tends to lose young people to larger cities or abroad
- Too few young people choose STEM fields; here, action is needed.
- For firms, it is hard to find qualified, well-educated staff. Remote collaboration with staff elsewhere (as done under COVID-19) is not a permanent and sustainable solution.
- Despite positive signs and a new pro-active rector, the university still has a long way to go to come closer to business needs. Curricula are largely theoretical, there are still few opportunities for students to obtain practice-based training (and for firms to collaborate in a structured way with the university). There are still many bureaucratic hurdles to overcome and allow for more dual courses combining classroom learning with internships and on-the-job learning.
- Practical and lifelong training: better conditions are needed for the development of the competence of the employees of the companies operating in the city and region
- The city is somewhat underdeveloped in terms of incubators and accelerators for ambitious startups, and access to capital. There are some initiatives, but they are not very visible. The city participates in an Interreg project to have develop better access to venture capital in the region.
- There is seemingly a gap between the manufacturing industry and the local service sector. The cities' advanced manufacturing sector is still dominated by branches from multinational companies. They tend to be less inclined to work with local KIBS, but rather source their service needs from the mother company of multinational service firms.

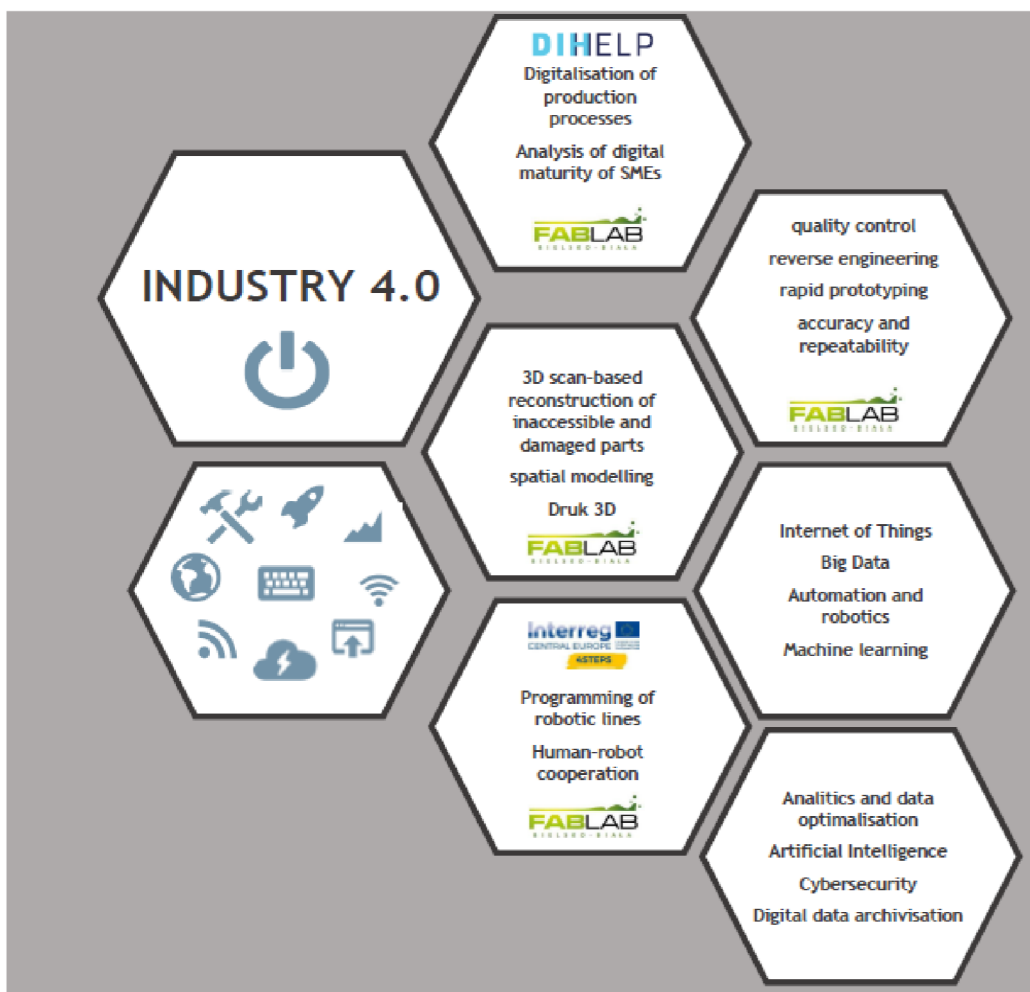
Key activities and initiatives

°The city and the development company (ARRSA) have taken several actions to promote digitalisation and the modernisation of industry in general:

-The Regional Development company ARRSA (80% owned by the city, 20% by smaller municipalities and region) is currently developing plans for a renewed digital innovation hub (DIH), which will be part of the international network of EU DIHs. The building has been acquired; It is currently negotiating with the city about urban planning issues. It will be a 2-storey building; the focus will lie on digitalisation for companies, notably in the field of Industry 4.0. It should become a home and meeting point for the growing number of local companies that deal with blockchain, sensors, cybersecurity, and other digital challenges. Also, it will host activities for training, social innovation, cybersecurity, and helping elderly with digitalisation; also there might be a coworking space.

-Since 2014, ARRSA runs a FabLab, the first fabrication laboratory in the south of Poland with the aim to promote a novel, bottom-up approach, building on open, technology-driven innovation and acting as an education platform. The FabLab has modern equipment and offers a range of services in Industry 4.0 range for everyone; it has developed a wide network of contacts and relevant stakeholders. The equipment of the current FABLAB is funded by EU sources. Some funding comes in from renting out 3d printers.

-Following the concept of smart specialization, digitalization trends and Industry 4.0 principles, ARRSA decided to create a Digital Innovation Hub (BBLAB): a one-stop-shop for innovation, to raise awareness about cutting-edge technologies and help companies modernize their business/production processes, products or services using digitalization. It is currently located in the premises of ARRSA and its FabLab. The DIH has state of the art technology available (3D printers, 3D scanners, laser cutter and vinyl potter) allowing to run projects from the ideation stage (through digital modelling production, prototyping, small series) to the development of the product itself.



In the view of an entrepreneur we interviewed, the DIH can and should become a meeting place for people with new and good ideas; it should develop as an ecosystem with many elements (workshops, equipment, services, access to capital, training facilities). Critical elements of a good DIH would be: a great indoor venue for coffee, meals, meetings; offices where experts can be contacted; a showroom that highlights regional products and successes. The DIH should be selective, not allowing any type of business but focus on ICT and creative people including creative designers, engineers, architects. It should be run by someone with business acumen, rather than a city or university staff member.

The city stakeholders to be involved in the URBACT Local Group (ULG)

- Development company
- Municipality
- Regional authority
- Industrial companies
- Suppliers
- University
- IT companies
- Startup company

The funding for the investment plan will be largely EU funding (for the DIH), with local co-investments.

The assets and barriers the city brings to the transfer process

	Assets	Barriers
<i>Fit with cities' strategic priorities</i>	Good fit with priorities	Challenge is not top priority in the educational sector
<i>Level of political support</i>	Strong support	
<i>Available resources (infrastructure & people)</i>	Good & balanced local team	
<i>Availability of finance</i>	Strong experience in accessing (EU) funding	Potential difficulty in acquiring private funding
<i>Other</i>	Strong industrial competence; growing levels of innovation	Low flexibility of education sector Over-reliance on public sector and EU funding Poor linkages between multinational branchplants and local service providers (KIBS)

2.3. Tartu

Introduction

Tartu is the second largest city of Estonia, and has 95,000 inhabitants. It is situated 186 kilometres southeast of Tallinn, the national capital. Tartu is known as a university town, being the home the nation's oldest and most renowned university, the University of Tartu, but also a university of applied sciences, and a large vocational training centre; all have strong competences in ICT and digitalisation. Tartu also has a strong industrial tissue. The region has 3 dominant industry sectors: metal, food processing, and wood, each one with more than 3,000 workers. Many firms are not high tech, do not have their own product lines but rather work as subcontractors for firms based in Nordic and Western European countries. Many of them do top-notch subcontracting and have moved up in the value chain. Engineering capabilities have improved, they do more complex jobs. For example, the cockpit of Volvo cars was first manufactured from a blueprint, but now firms also collaborate with Volvo in the design stage. Over the years, since independence of Estonia, the number of firms with own product lines has grown, and also many firms have been bought back from foreign investors. Slowly but surely, there is a shift towards servitization.

Since the beginning of the 21st century, many ICT enterprises and other high-tech companies¹ have taken a foothold in Tartu. Notable examples include Playtech, Pipedrive, Veriff, Nortal (formerly Webmedia Group), Reach-U, Fractory, Bercman, Powerup, Skeleton, IRebel, Fortumo. ICT and digital are also strongly developed in the educational sector: The Vocational school has over 500 students in IT/digital; The UT has very strong Institute of Computer Science with 200+employees, 50% of which are from abroad. They provide Ba, Ma and PhD courses. There are five chairs; data science, programming languages, theoretical, software engineering and distributed computing.

The challenge

Estonia has a good image as being a frontrunner in ICT and digitalisation, and made strong progress since its independence. At the same time, according to the EU's yearly DESI index, Estonia (ranked 7th in 2020) still has some work to do on digitalizing its industry. The integration of digital technology in enterprises is just below EU's average (15th place in 2020). Only about 20% of Estonia's companies are highly digitized, whereas more than 40% scored very low in digitalization.

As one of our interviewees put it, digitalisation is not a goal in itself; it should help firms to become leaner and more competitive. Many firms in Tartu, especially the SMEs, have still much to learn in terms of how their processes actually work, before implementing new expensive IT systems sold by IT vendors as a solution to all problems. Otherwise, they run the risk of “digitalising their own garbage”. A related challenge is the lack of people with skills in lean, industrial engineering, mechanics, operating machines, and ICT systems development, analysis, management, etc. The availability of more skilled personnel will result in the higher level of digitalization for SMEs because they will be able to develop and put into use the technical advancements that are needed for the implementation of Industry 4.0 solutions.

The shortage of skilled staff might be addressed by introducing new automation and AI technologies; In the coming funding period, much effort will be put on that. But still, people are needed to work with these machines.

More in general, employers see a shortage of graduates with practical skills; university graduates tend to be too theoretical (some come back to vocational school to learn practical skills).

¹ a list of all the tech companies in Tartu: <https://startuptartu.ee/companies/>

Manufacturing has an image problem (young people perceive it negatively); moreover, the number of STEM students should be higher. At the same time, salaries for people with vocational training in manufacturing, construction or logistic can be high, but few people realise that; a university degree is the holy grail for (too) many people.

Servitization in industry is a trend; but there are only a few programmes to support firms with that. Moreover, the link between manufacturing firms and local KIBS seems weak at the moment.

It is a remaining challenge to match education with labour market: Tartu Vocational Education Center and the universities in Tartu want to offer education and training programs that are matching more and more the needs coming from the labour market and the structure of education system will enable an easier adaption to the needs of the labour market. The German dual system services as example but is difficult to introduce in the Estonian context.

For the university, many problems of SMEs are not interesting enough as research or innovation topics; university prefers to work with larger firms.

Vocational education has a problem to keep up with speed of industry. The teaching corps is ageing, salaries are low, it is difficult to hire new teachers, the image of teaching is moderate, there are limited means to provide extra practical training for teaching staff.

Most funding schemes for economic development or digitalization are on a national level (about 90%), the city and region have limited competence and resources in these fields.

Most industrial companies are currently not taking the lead in addressing the skills shortage issue, they see that as prime role for the educational institutes and the (local) government. The latter ones do what they can but more communication between the private sector and the education & public sector is needed to reach more effective and efficient policies and solutions.

Tartu has a strong and growing startup ecosystem, physically mainly located in the city centre and the university science parks. There is little interaction between them and the industrial firms (located outside the city on business parks), and here is room for improvement.

The formation of the Local Group is much welcomed by the city government and the educational sector. However, it will be a challenge to connect with local companies, and with national players. In the works of one consultant we interviewed: “policymakers should spend more time with companies”.

Key activities and initiatives

Tartu Business advisory center (governed by state and part of County Development Centres) gives out financial support and services for companies, with a focus on smart industry. One example is lean manufacturing workshops (6 courses in 9-10 weeks, after which you receive a certificate), where firms learn to map and reorganise their processes according to the “lean” philosophy, before implementing digital solutions. 22 firms took the course in 2019-2020. 50% of costs are subsidized, the rest (250-300 Euro) is paid by the participating company.

Since September 2021, County Development Centres is organising digitalisation support for firms outside the two biggest cities in Estonia – Tallinn and Tartu. It undertook a survey of how larger service providers are helping manufacturing firms. Also, they recommend a tool for firms to make a first quick scan to see where

they stand in terms of digitalisation (www.diginnotool.eu); after that quick scan, firms can apply for 2000 Euro subsidy (and pay the same amount from their own pockets) to solve the problems.

Access to national subsidies can be hard for SMEs. Therefore, Tartu launched in 2019 a digitalization voucher scheme for local manufacturing companies (max 5000 subsidy, to be matched with 30% own investment). This grant has helped manufacturing SMEs to improve their warehouse management systems, quality control procedures, customer relationship management and other services that needed to be digitalized.

Tartu Vocational Education Centre is a municipal vocational school, meaning Tartu City Government funds the school, thus also has more possibilities to influence the curricula and initiatives organized. The vocational school has been working closely with some of Tartu's manufacturing companies in developing the work-based-learning system to make the graduates better equipped for the actual needs of the labour market. In a project, TVEC sends teachers to companies to do "job shadowing" so they see what is going on in practice; However, there is no permanent funding for this activity.

University of Tartu's Institute of Computer Science has a range of activities to connect with companies. Among many other things, it has recently decided to pilot its [Industrial Master's Program in IT](#) into the manufacturing industry - a study format for the first-year Master's students in Software Engineering, Computer Science and Data Science curricula, where 50% of the student's studies take place at a partner company. Another example is the Conversion Master in IT, in which employees without ICT background get an IT training.

Tartu city is supporting the startup ecosystem via events like sTARTUp Day festival (one day dedicated for cooperation between manufacturing companies and startups), industry hackathons and by supporting incubators.



SPARK DEMO is a business support structure for entrepreneurship in South Estonia, created in 2016 under the leadership of Tartu Science Park and with the support of the city of Tartu. The demo hall, located in the downtown area of Tartu brings together the most successful manufacturing companies, exporters, image-makers, employers, brightest startups and business support organizations in southern Estonia.

Tartu takes part in the Interreg BSR InnoCAPE project on meeting the challenges of Industry 4.0.

In October, the artificial intelligence and robotics innovation hub (AIRE) was established, which is advising Estonian manufacturing companies on the application of artificial intelligence and robotics in product and service development. The innovation hub is supported by the Ministry of Economic Affairs and Communications and the activities are implemented by the Estonian universities and science parks. Professional associations, clusters, the chamber of commerce, telecommunications companies, developers of robotic systems, banks, robot importers, etc. are also involved as cooperation partners.

The artificial intelligence and robotics innovation hub is Estonia's link to the network of European Digital Innovation Hubs (EDIH). The preparation and launch of the Estonian hub is supported by the Ministry of Economic Affairs and Communications as of 1 June 2021. Another important objective of the hub, besides consulting, is to mobilise additional funding to support companies' innovation projects (e.g. from the European Regional Development Fund, the Horizon programme and investors).

AIRE will run 5 types of services:

- Assess the digital maturity of companies
- Consultancy & training on AI and robotics
- Financing
- Connecting and networking
- Test before invest: demo projects with (manufacturing or other) companies where the solution must be open source, and applicable in other firm.

UT is in the lead for the AI activities, and also in Tartu, there will be a first point of contact for companies that want to participate.

The city stakeholders who will be involved in the URBACT Local Group (ULG):

The ULG will focus on improving the talent ecosystem, mainly how the connection between education and industry can be strengthened on all levels. This means that the educational institutes (from vocational to university levels) will be involved in the ULG, but also a number of companies.

Members:

- City of Tartu
- University of Tartu
- University of Applied Sciences
- Tartu Vocational Education Centre
- A set of companies, to be decided which ones.

The funding for the investment plan will probably mainly come from the city, but also the educational institutes may co-invest, depending on the outcome. The funding of the EDIH will largely be provided by the EU, with local co-financing.

The assets and barriers the city brings to the transfer process

	Assets	Barriers
<i>Fit with cities' strategic priorities</i>	Good fit with priorities of both city and educational institutes	Companies reluctant to co-invest
<i>Level of political support</i>	Strong support	
<i>Available resources (infrastructure & people)</i>	Good & balanced local team	Mobilization of more private resources would be good
<i>Availability of finance</i>	Strong experience in accessing (EU) funding; strong national support for DIH	Potential difficulty in acquiring private funding Lack of finance in vocational training
<i>Other</i>	Innovative higher education sector Strong record of digitalisation LG can build on many existing activities & policy programmes New EU digital hub is key opportunity	Dominance of national level in policy making, limited local competences & resources Risk: treating digitalisation as solutionism Distance between manufacturing and ICT firms

2.4. Timisoara

Introduction

Timisoara is the largest city in Romania's West Region, with about 330,000 inhabitants.

Based on its proximity to the western border and thanks to its knowledge base, Timișoara has managed to attract many foreign investments in recent years, especially from Italy, Germany and France. The region has a diversified economy, with a significant industrial base (dominated by automotive suppliers), a growing service sector, and a strong ICT cluster. The larger industrial companies in the region are foreign owned, there are many more local suppliers, which have become more knowledge-intensive and innovative in the last decades. The region is especially strong in embedded software, and has a cluster of firms that are cutting edge in software development for the automotive sector (Conti and Hella are big names). The automotive industry is specialised in particular parts or systems (notably brake systems, cables, moulding). A recent big investment was from Draxlmaier: a large battery plant for electrical cars. The electronics and electrical engineering industry is a successful branch of Timișoara's industry, especially due to the investments of large companies with activities in high tech production (Flex, Bosch, ABB, AEM, ELBA, Ericsson, etc.), which determined a development of local companies, suppliers or subcontractors. The chemical and petrochemical industry, traditional in Timișoara, has developed especially through the investments made by Continental, Procter & Gamble and Azur. Timișoara's ICT sector is also strong, including well-known companies such as Google, Microsoft, IBM, Intel, Nvidia, Siemens, Nokia, Huawei, Atos, and Accenture, but also with a thriving start-up scene.

The positive local economic development is reflected in the unemployment figures. In December 2019, the unemployment rate in Timișoara was among the lowest in the country, with only 0.8%.

The city has a continuous inflow of young talent, thanks to its two main universities, and some smaller ones. Politehnica University has about 13,500 studies and 10 faculties, employing 700 teachers 500 auxiliary and administrative personnel. West University of Timisoara includes 11 faculties comprising about 16,000 students and over 700 academic staff.

Challenges

Below are some key challenges for Timisoara to promote the development of advanced services and digitalisation in the industry:

Public-private collaboration is often problematic; both sectors are world apart, there is little mutual trust, and this is a problem when you want to set up 3helix types of initiatives are needed to promote smart specialisation and digitalisation.

In terms of skills, **an ageing population might lead to skills shortages** on the longer run.

Education is still largely theoretical, the inclusion of practical activities and internships in official curricula is largely absent. Companies, who need skilled staff, hack the system by hiring students for part time jobs, that function as unofficial internships, but this is a suboptimal solution. Also, besides the university, there seems to be a need for professional schools where students learn practical skills in 2-3 years.

There is a big salary gap between the private sector and the public sector, including universities. This makes it very hard for universities to retain research talent. The best ones often leave for the industry. New types

of dual positions could address this. The irony is that many (international) businesses locate in Timisoara for the abundance of talent. But to keep the talent flowing in, the university must be able to hire good staff.

The Romanian education system is perceived as bureaucratic, there is little space for innovation and teacher initiative; this makes teaching a less attractive job and lowers the quality of education.

Modern industry needs advanced services. But in Timisoara, **there is a seeming lack of connection between the local service sector (notably the thriving ICT sector), and manufacturing**. Firms in the manufacturing either rely on service inputs from international service providers or their mother companies (the multinational branchplants), or are not very service oriented (the local manufacturing firms).

Locally-grown manufacturing firms are scarce; moreover, they are technically less advanced and often rely on outdated technology and processes. At the same time, they make less use of European programmes and funding. This is a point of attention for the next funding period. Yet, there is an interesting emerging number of locally-grown companies offering advanced services relevant for industry. Examples are Vitesco Technologies (testing autonomous vehicles), Notalmotec (HR and other services around CNC machinery), and software companies with own product lines.

The startup scene is vibrant, but most startups are micro firms developing code for international companies. There are exceptions: firms that develop AI for robots, smart housing solutions, or more integrated software solutions and own product lines. But when successful, **start-ups tend to leave Timisoara** for Bucharest or Cluj that have larger clusters of ICT companies.

A large part of the industry (estimated 66%) are multinationals; they offer high salaries and interesting working environments and generate many jobs, but they also suffocate local entrepreneurship and make it harder for locally grown firms to attract talent. More targeted support for SMEs could address this.

Timisoara is very reliant on automotive manufacturing; but actual manufacturing jobs are declining because of rising wages and technological developments in the industry. **For the future, Timisoara needs to focus more on highly qualified activity in advanced services and industry 4.0, and develop innovations in AI, robotics, sensors, IT, etc.** This requires a regional vision and strategy, and concerted action between many stakeholders to go in that direction.

Despite good intentions, **the local industry cluster organisations often fail to develop real action**, because collaboration does not take off. The public sector is restrained by sometime excessive regulation and bureaucracy, has a lack of capacity and often lacks knowledge and experience of what the private sector requires; and the private firms have little confidence in the acting power of the local public sector. An ingrained culture of favouritism does not help either. **What lacks is ecosystem mediation**: an effective, experienced and respected person or body that steers the strategy building process, brings players together and mobilises them towards a longer-term common goal.

In general there is a lack of collective action that would benefit all actors in the industrial tissue. Stakeholders see options developing a test track/facility, where players from the car manufacturing cluster could test autonomous driving technologies. For this to emerge, a close public-private collaboration would be needed.

Key activities and initiatives

Timisoara invested recently in **Incuboxx**¹, a building and infrastructure (EU funded from the 2007-14 programming period), dedicated to smart specialisation focused on business infrastructure in the ICT sector. Incuboxx was opened in 2015 and is owned and managed by the Municipality of Timisoara and is the largest business incubator in Romania in the field of ICT providing spaces for the start-up of micro enterprises to grow into small and medium-sized enterprises. It has 30 spaces/offices for startups in the incubation phase (3y) and 20 for ones in consolidation stage (they might stay up to 5y), plus recreational spaces and facilities (dining hall, copy centre, internet access, workshops). Rents are low compared to the average market rate of 10 euro per m2: 3,5 euro/m2 for incoming firms, then rising with 1 euro per year; consolidating companies pay 5 euro per m2. Most of the firms are in software development, writing code for larger clients, but there are also some service providers in marketing and database management. Most micro companies, 90%, are created by recent university graduates (from the Polytechnic and to a lesser degree from West University), from the motive to be free and independent. The occupation rate is 90%. Most firms here develop code for international clients; they have few connections with local SMEs or with multinational companies in Timisoara; the latter tend to work with larger suppliers in international networks.

Another investment of the Municipality (funded by EU in 2016) is the **Regional Centre for Skills and Supplier Development in the Automotive Sector (CERC)**. It is a learning by doing and development centre for the automotive industry, located in the Industrial Park of Timisoara. CERC is owned and managed by the city. The concept of CERC is to bring together automotive industry, training, prototyping, and testing, and to promote joint innovation between companies. CERC runs a training academy, offering courses to companies in the broad field of automotive (ex: quality management, CNC machinery handling, process management), at the request of companies; courses are provided by external lecturers from universities and from practice. CERC mainly works with larger firms: In the 5-year EU funding period of the CERC (ending in 2021), firms working with CERC must meet some formal EU rules including to hire more staff and to have gender neutrality. In practice, only large firms can meet these conditions.

CERC also has technical equipment that might be used on a pay-per-use basis by companies, such as drills, pipe axes, measuring devices, and a plastic injector. The facility is specialised in facilities for plastic moulding, a strong point of the region. Moulding requires specific skills and competences, as well as specific prototyping equipment. Large companies tend to have this in-house, but smaller ones don't. CERC also rents out business space: Continental, the large automotive supplier, is one of the tenants. Regarding prototyping, CERC has machinery for plastic injection, that is rented out by the hour; small firms get a lower rate than big ones.

For the future, after the 5y EU funding period ends, **CERC wants to engage in more strategic relations with the universities, offer equipment for free for SMEs, and broaden the spectre towards ICT companies**. CERC would need a different legal statute to be able to do this and also benefit from EU funding support. Also, CERC wants to play a larger role in developing trainings with vocational training institutes.

Politechnical University of Timisoara provides **specific training in the context of Industry 4.0** - master programmes in Mechatronic and Robotic and Artificially Intelligent Robotic Systems, Applied Informatics Systems in Production or Services or Automotive Embedded Software. Also, a **new research centre** is in the making, co-designed with the industry, focusing on data engineering and industry. It will have 4 pillars: AI (especially applied to autonomous driving and retail); cloud computing & IoT; Cybersecurity, and smart systems & robotics (especially in industry and medical applications). An application is made for EU funding, and the centre is planned to start in 2024. The Board will be a public-private mix.

¹ <https://archello.com/project/incuboxx-timisoara>

The **ICT Regional Cluster organisation** promotes and supports the regional ICT enterprises to develop as global market players, with their own products into a reputed brand.

The **Regional Centre for Innovation and Technology Transfer Association** helps to connect companies with research, and to further promote and commercialise their innovations, with the purpose to increase the competitiveness of the West Region.

Timisoara has prepared an application for the EU-funded “**Digital Innovation Hub**” programme, launched by the EU to facilitate the digital transformation of the industry at the regional level.

The city stakeholders to be involved in the URBACT Local Group (ULG)

- Municipality
- Polytechnical University
- Incuboxx
- CERC
- Companies

The direction of the IP is not yet clearly set.

Assets and barriers

To what extent can the good-practice of Bilbao be transferred to Timisoara? What are the underlying assets and barriers? The following table contains some considerations:

	Assets	Barriers
<i>Fit with cities’ strategic priorities</i>	Good fit with priorities of city & region; new S3 strategy in development	Priority for firms is questionable; City grapples with bureaucracy and excessive regulation
<i>Level of political support</i>	Strong support, active new city management team	The challenge to grapple with bureaucracy and excessive regulations
<i>Available resources (infrastructure & people)</i>	Good & balanced local team, experienced in transfer and international projects Initiatives such as Incuboxx and CERC are a good basis to work from	More private involvement needed, poor collaboration culture, lack of trust Difficulty to reach local SMEs; overreliance on EU funding
<i>Availability of finance</i>	Strong experience in accessing (EU) funding; ample EU funding is available	Potential difficulty in acquiring private (co)funding; EU funding can be complex and often comes with many strings attached, making it less flexible
<i>Other</i>	Very strong industrial base Can build on/elaborate existing initiatives such as INCUBOXX and CERC.	Low flexibility of education sector & low wages Over-reliance on public sector and EU funding Dominant role of public sector in managing facilities

2.5. Transfer potential

In this section we assess the transfer potential of the AS-FABRIK good practice to the partner cities.

In line with the modular activities of AS-FABRIK we identify four key aspects of the good practice: Talent ecosystem, startup boosting, network brokering; on top of that, we also assess two governance aspects of AS-FABRIK: the multi-stakeholders management setup, the engagement of the private sector, and the observatory/monitoring approach.

Talent ecosystem includes: readiness of (higher) education for digitalization/industry 4.0, connections between industry and education for research and education, life-long learning; places, spaces, programmes and events where industry and research/education meet and collaborate.

Startup boosting includes: Support for industry 4.0 related startups; pro-active connections of startups with existing business; analysis and assessment of market opportunities for startups; promotion of intrapreneurship.

Network brokering includes: actively connecting manufacturing firms to (digital) service providers; facilitating interfirm collaboration; active identification of needs based on new trends, technologies and developments in the market; provision of templates, tools, guidelines and formats for developing effective collaboration; programmes to make companies meet each other; mentoring of collaborations.




























Governance includes: the creation effective multistakeholder management set-up for digital hubs; the engagement of private companies; and the observatory/monitoring systemic as applied in AS-FABRIK.

The following tables, tentatively, assess the interest and capabilities of the partners in transferring the various aspects. The assessment is based on the judgements made during online interviews with many stakeholders in each partner city, and discussion held at the kickoff meeting in Bilbao.

Table 2.5.1 Interest & relevance to transfer best practice

Module	Description	Interest to transfer this (best) practice to our city			
		Bielsko Biala	Tartu	Timisoara	
Talent ecosystem	Practical business oriented training for students	*****	***	****	
	Training for professionals	****	***	****	
	Training for politicians & policymakers	****	****	****	
Partnership brokering & networking	Methods for connecting manufacturing firms with KIBS	**	**	***	
Startup boosting	Sophisticated start-up development	**	*	***	
	Identify and support intrapreneurship potential	**	**	**	
Governance	Observatory & monitoring	***	***	***	
	Create effective multistakeholder management set-up for digital hubs or similar integrated centres	*****	***	*****	
	Engage private sector	*****	*****	*****	

Table 2.5.2 Capability to transfer best practice

Module	Description	Capability to transfer this (best) practice to our city		
		Bielsko Biala	Tartu	Timisoara
Talent ecosystem	Practical business oriented training for students			
	Training for professionals			
Partnership brokering & networking	Training for politicians & policymakers			
	Methods for connecting manufacturing firms with KIBS			
Startup boosting	Sophisticated start-up development			
	Identify and support intrapreneurship potential			
Governance	Observatory & monitoring			
	Create effective multistakeholder management set-up for digital hubs			
	Engage private sector			

Specific mentions of transfer interests and potentials:

During interviews and the kick-off meeting, we gathered specific qualitative assessments of what each cities wants to learn from Bilbao. Here are the results:

Bielsko-Biala:

-University training related to the implementation of the modern IT solutions and competences needed from the local market, in cooperation with R&D centres, BBLAB DIH and employers in Bielsko-Biała.

-Practical and lifelong training modules, leading to improved conditions for the development of the competence of the employees of the companies operating in Bielsko-Biała.

-Monitoring/observatory: would be interesting to analyse, as Bilbao does, to understand the importance of the local market for KIBS versus (inter)national ones.

Tartu:

-How to bring education and companies effectively together for innovation, across the education spectre.

-How to build practice experience better in the curricula

-Learn how a third party might help in connecting companies and education

-Monitoring: Tartu is pondering how and what to monitor and is interested in Bilbao's approaches.

Timisoara:

Learn how to adapt the workforce to the new requirements of KIBS and digitalisation.

Obtain a better understanding of how education offer could be connected to the local development needs. This should provide an accurate overview regarding the relevant policies that should be engaged to sustain local development.

Be inspired by the methodology developed by the city of Bilbao to enhance the collaboration between local authorities, universities and the economic environment, and develop a joint vision/strategy.

To further enhance Incuboxx, the recently opened building for ICT startups, by putting more emphasis on knowledge transfer and links with industry (rather than just providing spaces). AS-Transfer could be a catalyst to develop this, set up new stakeholder collaboration, and apply for structural funds to make it happen.

To develop and adapt the services offered by CERC - Regional Centre for Skills and Supplier Development in the Automotive Sector, another investment of the municipality of Timisoara.

3. SYNTHESIS, OVERALL TRANSFERABILITY AND METHODOLOGY

3.1. Introduction

This final section outlines the methodology of how the network will operate. It is based on the nature of the best practice case study, the partner profiles, their specific interests in transferring (parts of) the good practice, and the transfer assessment by the lead expert.

3.2. Starting points & considerations

Before detailing the methodology, it must be clear **what the methodology can and should achieve** in the light of the project's possibilities and restrictions, and given the needs, ambitions, preferences assets and barriers of the partners. Based on this, we identify three key elements to be addressed by the methodology behind the transferability process:

1) The method should promote further in-depth learning about good practice AS-FABRIK Bilbao; It is recognized that we should reserve time and efforts to further deepen the understanding of the partners of how AS-FABRIK has achieved what it has achieved, in various domains. This will be reflected in the thematic meetings.

2) The method should underpin in-depth learning and exchange between partners, about the relevant sub-topics of AS-FABRIK, as defined in the last sections: Talent ecosystem, startup boosting, network brokering, and governance. Contentwise, we need to bring focus in what we want to learn from the good practice and from each other. Some conclusions can be drawn from the interviews we conducted with ULG coordinators and other stakeholders in the various cities, as highlighted in table 2.5.1:

- All partners are highly interested in the aspects of effective governance and stakeholder collaboration, and developing the talent ecosystem
- The topics of partnership brokering and start-up boosting come second but are considered important as well.
- Practically speaking -and relevant for the investment plan- all partners are developing Digital Innovation Hubs as integrated concepts to address digitalisation, KIBS development, training, and innovation.

3) The method should contribute to capacity building for ULG coordinators and the creation of investment plans. The ULG is the heart of the project, and their coordinators share the need to learn how to engage stakeholders (and keep them on board) during the transfer process and to develop an effective investment plan.

We will take the AS-FABRIK good practice as a key reference that comes back in each thematic transnational meeting. We see the Good Practice not as a static product but rather as continuous work-in-progress that evolves, and can be enriched and fuelled by the partner cities that are all seen as equal. The degree of "transfer" will vary considerably per partner, as can be witnessed from the transfer assessment. Each partner will adapt and mould aspects of the good practice so that it fits the local situation with its specific institutional

setup, legal situation, stakeholder composition, history, ambition level and readiness. Hence, rather than transfer, it may be better to speak of “inspired re-invention”.

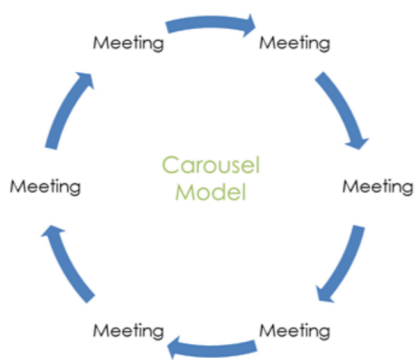
As became clear from the tables in the previous section, the envisioned degree of transfer varies considerably between the partners. We have devised a method that accounts for this, enabling a tailored approach that fits and supports the needs, ambitions and limitations of each partner.

3.3. Methodology

Based on the above considerations, we opt for a “close family model”, in which the family members are rather different but always travel abroad (to thematic network meetings) together. In our view, this model helps us to learn to speak the same language, to understand each other’s specifics, to build the trust that is needed for peer review. This will help the network to improve from one meeting to the next building on a collective memory.

The backbone of our method is a series of four thematic network meetings (TNMs), and hence, we go in principle for a carousel model. The thematic network meetings are closely linked to the work of the Urbact Local Groups.

Figure 3.2 The carousel model



The Transnational Network Meetings

TNMs have the following characteristics:

- Goal: exchanging and learning from 1) the host city, 2) the Good practice Bilbao 3) each other and helping the host to develop further 4) deep dive into one of the sub-topics and 5) infuse the local learning process
- Length: two days
- Methods: Deep dives, site visits, appropriation/transfer exercises to local situation, ecosystem sketching, learning grid
- Results: Each meeting results in a thematic report; After each meeting, the project partners write down what they found inspirational, what they would like to have at home, and what they will work on when home.

Table 3.1 Ingredients of each thematic meeting

Day 1 :The host city central	Day 2: Transfer & learning, with a focus on specific subtheme
<p>Session 1:</p> <ul style="list-style-type: none"> -Welcome, introduction & general overview of the city; -Overview of state-of-the-art regarding industry 4.0/KIBSA/Digitalisation in the city, using the MIRO board tool 	<p>Session 1 : Deep dive into subtheme</p>
<p>Session 2: Well-prepared and moderated site visits + Q&A; Each site visit ends with a session in which visitors, in groups, provide advice and write takeaways</p>	<p>Session 2: The AS-FABRIK way of dealing with the theme; assessing scope for transfer among partners</p>
<p>Session 3: Round table interview (by LE + audience) of key stakeholders/LG members (company, university, etc). Topics: key challenges, main barriers, what should they work on</p>	<p>Session 3 : Updates of partners about their MIRO boards, investment plans, plus identification of difficulties; support & tools for LGs</p>
	<p>Session 4 Updating a key learnings grid, reflection, meeting evaluation</p>

The international network meetings are the inspiration highlights of our network. But the real transfer work will be done in-between those meetings.

Working with a Miroboard to depict and analyse the ecosystem, and work on their IP

During the length of the project, each partner will elaborate on a MIRO-board that sketches the elements of their industry 4.0/KIBS/Digitalisation ecosystem. The board contains the thematic elements (talent ecosystem, network brokering, start-up boosting and governance) and their linkages; on the board, partners can indicated challenges, strong points, weak points, and policy actions.

In the first place, the MIRO board will function as a discussion device in which the local group members can sketch the current situation and challenges and try to reach agreement of what the problems are and what to do about it; it will serve as basis for the investment plan. The lead expert and two ad-hoc experts are there to help the local group in these respects. Secondly, the MIRO boards will be used in the thematic meetings; Each meeting, the partners will present their updated boards to their peers. And for the hosting city, the board can be a good starting point to introduce the current state of the art.

Also, we apply Miro to share and update the progress of the Investment Plans, using a “IP canvas” that will be filled in and elaborated by each local group. During our TNMs, cities will share their progress.

Communication

We have drawn up a communication plan to ensure that the results of the project are communicated to the various stakeholders: locally (firms, educational institutes, public sector) and internationally. Apart from the specific communication channels of the project (Social Media, URBACT Network webpage, newsletter), the Project Partners committed to use their own communication channels to reach the relevant local target groups.

AS TRANSFER project’s communication activities will be addressed to achieve the following main objectives:

-Maximizing the dissemination of the AS TRANSFER network progress work and main results, raising the awareness on the potential of the digital transformation concept for boosting local economic development.

-Connecting with internal stakeholders: Those involved in the project such as the Lead Partner, partner cities, the Lead Expert, URBACT Local Groups members, URBACT Secretariat, etc.

-Connecting with external stakeholders: Those not involved in the project since the beginning but we need to attract in order to be successful. Main authorities and business leaders as well as entrepreneurs and the educational community from all partner cities.

-To raise awareness on the potential of the digital transformation for boosting the urban agenda on business-led local economic development, particularly in Industry 4.0

-To build bridges for the multi-level governance of urban-regional digital transformation strategies that will enable to better articulate the AS-FABRIK with these strategies at local level.

-To reach also SMEs and actors involved in less innovative sectors in order to spread the importance of digital transformation and the challenges of the 4.0 Industry.

-To increase the “city pride” so that the local networks get bigger in the future (when the networks work by their own).

Elaboration of the themes

As mentioned in the previous section, based on the analysis in the partner cities, we identified a number of themes, elaborated below:

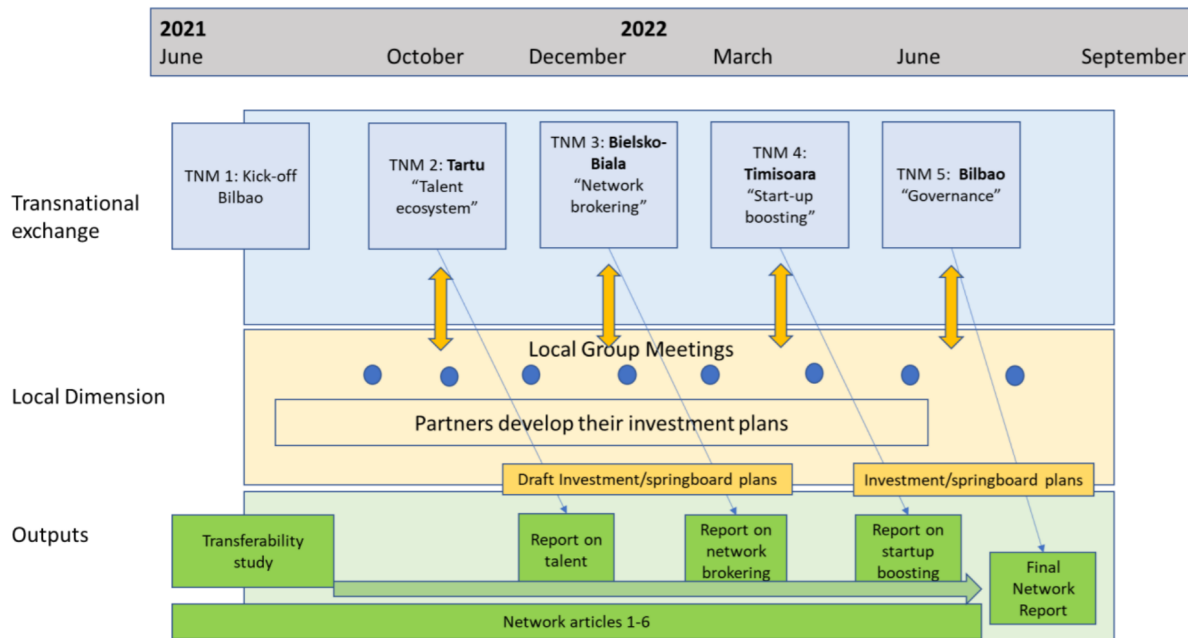
Talent ecosystem: readiness of (higher) education for digitalization/industry 4.0, connections between industry and education for research and education, life-long learning; places, spaces, programmes and events where industry and research/education meet and collaborate.

Startup boosting: Support for industry 4.0 related startups; pro-active connections of startups with existing business; analysis and assessment of market opportunities for startups; promotion of intrapreneurship.

Network brokering: actively connecting manufacturing firms to (digital) service providers; facilitating interfirm collaboration; active identification of needs based on new trends, technologies and developments in the market; provision of templates, tools, guidelines and formats for developing effective collaboration; programmes to make companies meet each other; mentoring of collaborations.

Governance: the creation effective multistakeholder management set-up for digital hubs; the engagement of private companies; and the observatory/monitoring systemic as applied in AS-FABRIK.

Each theme will be summarized in the thematic reports (in green). In the final report, all the findings of the network meetings will be summarized and synthesised, making it an interesting read not only for the network partners but also for other cities with similar ambitions. It will contain a reflection on the road that the partners have travelled during the project period towards their investment plans/springboard plan, the challenges they faced along the way, and an outlook for their further development. Also it will analyse how and to what extent the UIA good practice from Bilbao has been transferred to the partners.



3.4. Conclusions and overall transfer assessment

The partners in this network are different, but face many similar challenges regarding Industry 4.0 and the development of advanced services. Key common challenges revolve around education (better connections with industry; life-long learning); vision and strategy formation (arriving at a joint future strategy for the ecosystem as a whole); connecting local firms to international ones; Upgrading the industry towards more knowledge intensity; attracting talented people to the region, and to the industry (there is an image problem); promoting a societal re-appreciation of practical types of training; opening up facilities and training to SMEs.

Bilbao's AS-FABRIK concept, embedded in a larger regional strategy for industrial and advanced services development, is seen and recognized by all actors as a good practice in many of these fields, a source of inspiration, though not a perfect template to be copied. During the exchange, we need to realise that the situation in Bilbao differs from the three other partners in the sense that Bilbao has a much stronger locally-grown industry, and relies heavily on Mondragon, a conglomerate of companies and university. Also, in contrast to the partners, Bilbao has a decades long tradition of public-private collaboration and has been a frontrunner in cluster policy and S3 strategy elaboration. All these governance aspects are the foundation on which the development of AS Fabrik rests.

Thus, in the transfer process, we must consider how the partners can transfer aspects of AS-FABRIK in the absence of this foundation. In fact, much of the effort might be needed to build the foundation first.

At the same time, the partners have concrete ideas about the direction of their IPs. For Tartu, the focus clearly lies on the talent ecosystem: the Tartu team will work on a more integrated collaboration between industry and education regarding Industry 4.0 and advanced services. Bilbao's experience in this respect will be of great help. For Bielsko-Biala, the focus lies on the further development of the digital hub concept, which will be an integrated service hotspot for digital innovation; the concrete structure and governance of AS-FABRIK might serve as inspiring example. Finally, for Timisoara, the direction of the IP is still open, due to changes in staff, but the groundwork has been done and the municipal leadership team is now ready to go ahead.

Finally, Bilbao will work on its springboard plan to further enhance and elaborate AS-FABRIK as a concept. Here, a key challenge will be to develop a model to ensure that the educational function of AS-FABRIK, which is already strongly institutionalised and well developed, is sufficiently complemented by the other and perhaps more difficult ingredients namely partnership brokering and also start-up boosting.

The aim is to promote the connection between industrial companies (that are mainly located in the region around Bilbao), with the advanced services sector (knowledge-intensive business services including ICT companies) that are mainly located in the city of Bilbao. This will ask for urban-regional collaboration between several layers of government and organisations.

A first step is to have individual talks with the stakeholders, the most important ones being the provincial government of Biscay and the Basque regional government (that is where the main budgets are) in order to find the gaps and identify the complementary services that Bilbao Ekintza together with the local stakeholders (partners of the UIA initiative) could offer. Only after those talks, a local group can be formatted to elaborate plans to enlarge the scope of AS-FABRIK in its current shape. The ambitions for the springboard plan fit well within the regional and urban smart specialisation strategies, in which the connection between advanced services and manufacturing is recognised as driver for local and regional competitiveness.