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CREATIVE ECONOMIES
SOCIAL DESIGN
URBANISM

Global Review Report

Urban Manufacturing

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1. Introduction

1.1. Context and questions of the report

A rapidly growing number of independent makerspaces, such as FabLabs, open creative labs, open worklabs and other types of social innovation hubs, have paved the way for a paradigmatic shift in the way relevant societal and economic innovation take place in our cities and regions.

The so-called maker movement, a term summarizing various types of bottom-up initiatives between design, manufacturing, craftsmanship, arts, and digital technologies, has been introduced by Anderson recently (2012). According to him, existing and new manufacturing supply chains are considered to have impact to regional transformation, innovation, city development as well as to emerging ecosystems for collaborative making. Although there is a wide global buzz on “maker movement”, “craftsmanship”, digital Fablabs, and other types of Open Workshops, there are no substantial regional policies available how to foster emerging urban manufacturing. This is the objective of the EU funded INTERREG Europe project “Urban Manufacturing” providing tools and policies how to stimulate new urban based production patterns.

We ask, to what extent manufacturing is back on a growth track in European cities, after years of decline in western European countries? Recently, the alleged “re-shoring” process has generated much media attention. In the case of the US, since 2010, there are signs that the outflow of American manufacturing jobs to low-wage China has started to reverse. Recent decisions by Apple Inc., General Electric Co, Caterpillar and General Motors demonstrate this on the side. Since Jan. 2017, potential state intervention of the Trump-led government might follow the same pathway, but under different circumstances.

In Western Europe, we observe that manufacturing and production segments are returning home. Commentators see that manufacturing has a bright future for another reason: it is increasingly associated with the knowledge-based economy and collaborative processes. Manufacturing is linked to digitised production, individualisation of products and new collaborative production methods such as 3D printing, Fablabs, and community-based networks that are changing the relation with services and Research and Development (R&D).

Also in Western Europe, we have a strand of discourse if manufacturing and production segments are returning home. Another strand of research points to the role of the “city as a manufacturing plant”, taking into account geographical proximity, serendipitous effects and close social ties as “breeding conditions” for customized innovation.

So far there has been no sound evidence for that except for some incidental case studies as well as no substantial policy advice as to how the local authorities or government might stimulate urban manufacturing. Commentators often point out that manufacturing has a bright future for another reason: it is increasingly associated with the knowledge-based economy and collaborative processes.

Since 2010, these niche phenomena have started to provide an emerging sentiment that collaborations might bring production and manufacturing firms closer together when small and creative entrepreneurs and makers aim to flourish in advanced and developed countries like the U.S. or Western Europe. It is important to note, however, that the evidence is still thin, case-based, and often routed on charismatic heroic “storytelling”.

1.2 Aims and structure of the report

The report aims at providing three key means to support policy makers in Europe: Firstly, the report explains and defines new modes of value generation.

Secondly, the report presents general as well as case specific empirical evidence for processes and practices of urban manufacturing, pointing to collaboratively generated ideas, prototypes, goods as well as services.

Thirdly, we present three case studies from where we draw policy recommendations how collaborative initiatives can be supported by various policies.

2. Changing production environments – or do we observe the renaissance of urban manufacturing?

2.1. Changes in the configuration of value chains for good, services, and ideation

Due to digitisation, individualisation of products through customer involvement, flexible production methods and decentral organized value chains have significantly changed and reconfigured manufacturing. This is because these components require more knowledge management and adaptation to change circumstances. Changes in consumer expectations and less options to control the market from the side of the producers regarding the success of goods and services allow for different forms of urban-regional management.

From the production side, relevant skills and services are not yet present, so many market participants are insecure how to navigate through this changed production environment. Furthermore, classical innovation processes cannot be provided in-house and in closed silos as in the past. Eco innovation systems represent a new set of changed locational factors that go along with new types and processes of knowledge management and ad-hoc prototyping. Situated and temporal forms of knowledge to secure, how to evaluate, to update and to adapt ideas, processes, and goods only work on the basis of changed and new forms of competencies among stakeholders.

2.2. Knowledge-increase of manufacturing processes

Generally speaking knowledge and innovation cycles have been significantly compressed in the last hundred years and even shortened in the last 2-3 decades, making it necessary to reorganize access to open knowledge development, intellectual property (and its protection) that all becomes more relevant than relying on stable and fixed notions of (physical) goods, patents, and its infrastructures.

In consequence, access to relevant forms of innovation will be key, and not possessing and securing knowledge: Companies see the synergies of keeping their R&D operations close to their production facilities and take into account that geography and proximity/distance matters. Despite measurable brain drain since the 2000s from western European countries (e.g. to the US), investment into research and development has led to increase the return of high-skilled worker. Furthermore, access to

secure patents is of importance as well as closed-relationships to academic and applied research facilities.

Urban manufacturing should therefore always be contextualized with terminologies of knowledge and sense-making processes and not only understood in technology categories, because there is a strong argument of human capital in these processes inscribed. Skills and competences in producing are getting more and more knowledge-based in manufacturing companies. Therefore, an internal “service and knowledge-orientation” takes place within production and manufacturing sectors also in SMEs and not only in corporate companies. This explains expectations of SMEs to have access to applied research and development on the one hand, and to talented graduates from universities on the other in reasonable geographical proximity.

Another driver for urban manufacturing takes place on at the management level. Management and leaders vote for so-called “de-complexity”. Especially western multi-nationals continue to struggle with management of operations in transformation countries. Time zone and cultural differences, inadequate infrastructure, business ethics issues, quality, reliability and traceability concerns, and threats to brand equity all pose everyday challenges. Investing in or acquiring manufacturing operations geographically closer to customers and final markets offers a simpler alternative.

Supply chain management over large geographical distances becomes increasingly complex the greater the geography between manufacturer, intermediary traders and logistics, and end market. Longer distances demand greater inventory requirements for ships at sea, as well as safety stocks, which lead to working capital increases. In contrary to global value chain management, many SMEs are aiming at achieving resiliency in manufacturing: The concept of resiliency is of increasing importance to secure investment, transform firms to the demands of ecological and social security standards and to have a robust consolidated structure that can face economic crisis.

2.3. Partnering and making partnership in blurring knowledge networks

Achieving resiliencies and robust value chains, collaborative innovation processes are needed to stimulate new business models and organisational modes (open innovation). We see a trend of increasing R&D efforts or collaborative partnerships with knowledge institutes. Also, production needs competences from a lot of disciplines and technologies, and no firm can master all of it.

Following the observation of “collaboration”, project management and a notion of “project economy” comes to the fore, where manufacturing firms team up with partners on a project basis, temporary (i.e. BMW develops a new engine with PSA and apply it in both their cars; Intel develops new chips with a lot of partners).

All in all, manufacturing firms become more interconnected and networked. In order to stay competitive, they will have more meetings, and informal discussions with outsiders, and this has an impact on the type of location and building they prefer. Supplier industries face extremely high-quality demands from their clients, and need upgrading to fulfil these demands. New growth industries emerge in the green economy: electric mobility, waste treatment, solar and wind power. The “internet of things” is coming, products will be more connected, and new operating systems emerge; this increases the already very high software and electronics content of manufacturing.

2.4. Grassroots innovation movements as a driver for new cross-sectoral innovation

Urbanistic debates on the significance of knowledge and creativity for urban (re-)development came to an end when suddenly a couple of new guiding terms appeared, in particular the smart city (Dameri & Rosenthal-Sabroux, 2014; Weinert, 2014), the sharing city (McLaren & Agyeman, 2015) and the collaborative city (Chase, 2015).

While urban planning and economic policy hailed this discursive turn as a future comprehensive solution to the problem of precarious urban innovation (Ross, 2008), economists have been reluctant to address focused planning as a new way to compensate for lacking economic performance. In fact, after the global financial crisis the economy has been following its own rules more than ever before. In many cases it left urban aspirations for attracting large-scale technologies and investment untouched.

This trend caused some misunderstandings on the side of urban planning. Urban policies up to this date have embraced a type of technological innovation (e.g. for ‘intelligent’ infrastructures, data exchange, ICT) which is mostly driven by large corporations and technology trusts. Urban politicians and planners usually prefer ‘grand’ concepts such as innovation parks (Cooke, 2012) or the ‘smart city’ while ignoring the small local spots of collaborative based innovation such as FabLabs, Coworking Spaces, Open Worklabs, nota bene, in spite of the fact that the potential of niches to serve urban

needs might contribute much more to urban attractiveness (Kleibrink & Schmidt, 2015).

The habit of preferring big business over small economic or social initiative clearly conformed to models of the neo-liberal city. It had the effect of weakening political attentiveness towards the multidimensional significance of work, especially within a social environment of civilian commitment and grassroots initiative (Ross 2008). Against this backdrop it comes as a surprise to politicians that practices of innovation, and also the mere idea of innovation, recently left the confines of corporate-driven R&D, high-tech SME networks and industrial clusters. Innovation virtually discovered the field of alternative, green, post-growth economies, often within urban contexts which defy traditional notions of “economy and the city” (Schulz & Bailey, 2014).

A closer look at such small-scale experimentation reveals a variety of heterogeneous approaches, work models and types of localization. Most of them evolved without any planning or coordination. Meanwhile there are new names galore, such as Fablabs (Dickel, Ferdinand, & Petschow, 2014; Fleischmann, Hielscher, & Merritt, 2016; Hielscher & Smith, 2014; Lange, 2015; Schneidewind & Scheck, 2013), open worklabs (Adrian Smith, Hargreaves, Hielscher, Martiskainen, & Seyfang, 2016), open garages, real labs (Liedtke, Baedeker, Hasselkuß, Rohn, & Grinewitschus, 2015), urban laboratories (Evans & Karvonen, 2014), living labs (Liedtke et al., 2015), real laboratories (Karvonen & van Heur, 2014), open design cities, tech shops, repair cafés, and many more.

Such small-scale experimentations have begun to capture urban sites, leaving policies and initiatives of the public and private hands dazzled. They obviously turn traditional understandings of accumulative, hierarchy-driven innovation upside down, not to say that they render the odd analytical dichotomy of top-down vs. bottom-up innovation obsolete (Adrian Smith, Fressoli, Abrol, Arond, & Ely, 2017). They obviously head for new models of arranging work and stimulating social inclusion while paradoxically being surrounded by a crisis-ridden, socially exclusionary mainstream economy.

The strong element of grassroots innovation which now permeates various models of alternative work which has recently even been attributed to a rising attention of various social movements (Adrian Smith et al., 2017). This raises serious questions about their significance for the future shape of the urban economy as a whole, and for the ways in which urban social life might change as soon as it left old industrial grounds.

Apart from internal knowledge and ideation management within SMEs, a key driver in this open innovation ecosystem is the so-called bottom-up “Maker movement”, that itself generates several questions. Based on open source software, relatively affordable production factors (3-D printer, laser cutter, fabbing technologies), a new prototype of “manufacturer” has appeared on the urban stage: independent, highly connected to like-minded people, using Fab-Labs and other working environments, they fill niches and invent new ideas with subsequent value chains.

Makers devote passion, spare time and political will to “make things” on a small-scale collaborative basis. Very often, this takes place in various types of maker spaces such as TechShops, FabLabs, Open Design City, and other types of Coworking Spaces where start-ups, individuals, and small firms can use equipment and share knowledge. These practices demonstrate social movements, mainly in urban context, in which sharing and sustainability are key words.

New collaborative spaces interact with new places and new experiences developed to foster collaborative practices and value co-creation. They also represent a new intermediation between private and professional lives, corporate organizations and communities, single-handed and collective entrepreneurship that emerge out of so-called ‘third’ places (maker spaces, fab labs, hacker spaces, co-working spaces, etc). These ecosystems incorporate sets of new tools and practices of collaboration such as corporate or mutualized co-working, new digital platforms, BYOD (Bring Your Own Devices), design for working and well-being at home, on-line value co-creation, and open source communities.

Beyond collaborative spaces, collaboration is more and more at stake in collaborative communities and collaborative movements (e.g. coworking, hacker and maker movements).

2.5. Increasing interactions between the worlds of design, art and manufacturing

Initially and originally oriented in the higher-level consumer industries (household appliances, architecture, interiors etc.) new market niches emerged out of an infusion of art, design and technology within traditional industries, like construction and building industries. The Dutch “Studio Roosegaarde” is an example where a big building com-

pany collaborates with the studio to make highways more visibly attractive and appealing; also, they work on “artificial landscapes” where interactive art is fully integrated into public space.

Competing on costs is out of the question; competition takes place, based on innovation. The speed of technological change and increasing competition has the effect that R&D and production/design cannot be separated. Industries with highly complex products sold to individual customers (like machine building), as well as consumer industries that are highly trend-sensitive (fast fashion, furniture, interior design etc.) have taken parts of the manufacturing chain back home (e.g. from Asia) for quality and control reasons.

A lot of discussion focused on the possibility of and their role in paving the way for more “urban manufacturing”: How to bring together the “Makers movement” on the one hand and mainstream manufacturing on the other. A key driver and enabler for this is encounter are 3D-printing, Fabling, and craft technologies that triggers new models of local, on-demand production of goods.

2.6. Spaces as permanent or temporary centres for allocating knowledge resources

The question remains, where new validations of open knowledge forms come together, where F2F exchanges, prototyping and ideation practically takes place. A closer look at small-scale experimentation reveals a variety of heterogeneous approaches, work models and types of localization. Most of them evolved without any planning or coordination and only recently universities such as Birmingham City University (founding Steamhouse), Munich Technical University (Makerspace) and the University of Fine Arts in Berlin (Design Research Lab), Aalto University (Aalto Design Factory) among others have founded open co-institutes to engage in open innovation and maker processes with new partners in flexible projects.

3. Evidence for an urban-based collaborative manufacturing renaissance

3.1. The macro-view – Knowledge intensification of manufacturing processes

Industrial activities in the European Union accounted for just less than one quarter (24.4 %) of the total workforce in the non-financial business economy in 2014, with their share continuing to fall gradually.

In 2015, 33.9 million people were employed in the manufacturing sector in the EU 28, a figure which represented 15.4 % of total employment. Of these, 2.4 million were employed in high-tech manufacturing, corresponding to 1.1 % of total employment.

Within the EU-28, the average annual growth rate (AAGR) for employment in high-tech sectors was positive over the 2008-2015 period.

3.2 A micro view on the protagonists of urban manufacturing

The intensification of various forms of relevant knowledge for manufacturing processes goes hand in hand with the emergence of new forms “making your career and your life” in a new urban based manufacturing economy. In doing so, we ask the following questions:

- a) What type of entrepreneur, freelancers, and makers can be detected (at these cases and more in general) as drivers for Urban Manufacturing?
- b) What type of skills and job profiles are relevant for the jobs and occupations in urban manufacturing, and which tendencies can be observed?

With the development of digital technologies, their associated infrastructures and new digital production, distribution and development processes, new forms of value formation and value generation can be found: There is a growing number of creative and knowledge workers, that fulfil these needs, framed with new names such as “Makers”, “Hackers”, “Coworkers”, and others.

Similar to the transition from an agrarian to an industrial society also social structure, value systems, and behaviour patterns and, not least, the concept of work transforms significantly. On the one hand an increasing number of standardised and routinized activities are transferred to technical systems.

On the other hand, the digitization knowledge explosion forces greater specialization. Specialization always remains incomplete due to the rapid dynamic changes, so, in order to control new trends and risky developments, communication platforms, face-to-face situations, collaboration, communities of practice, and various forms of conferences are becoming increasingly important in order to update knowledge and to include new ideas.

In occupational terms, a new type of worker of the so-called "knowledge worker" (e.g. von Streit 2011) comes to the fore, one of the fastest growing occupational groups and employee group in Europe. The number of solo self-employed and freelancers increases continuously. The trend of increasing number of entrepreneurial self-employed has increased steadily in the EU Member States since the 1990s.

In recent times, we do no longer speak of "self-employed", but also of "new self-employed" workers. We hereby describe protagonists, who rely on their own responsibilities, who have a high expertise and qualification, innovation demands and creativity, and, very often, act as a solo entrepreneur, pursuing work from home. This term also stands for new job profiles and market ideas. The increase of start-ups by these "new self-employed" workers is triggered by so-called "modern services". Solo self-employed workers ever more determine the structure e.g. in the creative industries and new intersections to service industries and production segments.

This fine graded segmentation goes hand in hand with new modes of development, organization and management of relevant knowledge. It stands out significantly from the industrial form of work from, requires different skills and abilities as well as places of exchange and transfer. Just because relevant knowledge is not always hierarchically structured in these small-scale structures, it is differently situated than in established SMEs and Corporate Companies. On top of that, the Internet enables new and open cooperation at the same time, where ways of working that are known under the heading of "open innovation" bind new forms of cooperation.

This is particularly true for weak institutionally embedded or a completely free creative and knowledge worker who therefore experiences new opportunities for profiling off of established professional and career paths. Creative and knowledge workers utilize this communication and social media to better connect their expertise with the expertise of other specialists – and to combine new knowledge on the basis of so-called open source technologies.

3.3 Initial conclusion and observations

1. There is still a decreasing number of middle-to-low-skilled jobs in industry when using traditional metrics; this can be explained by productivity increases.
2. Statistically, manufacturing decreases in total, but is silently reorganized geographically due to security issues, unclear production and quality standards, loss of control of value chains over large geographical distances, changed customer expectations, and increase of automatization within the manufacturing sector due to “Industry 4.0” changes.
3. The real picture is unclear as there is so much manufacturing-related employment in other sectors: design (product design, packaging), services, logistics, R&D etc. It is unclear how the full “industrial cluster” is developing in quantitative jobs terms. The new industrial clusters and ecosystems of inter related clusters need to be understood by city policy makers.
4. Overall: there is less need for unskilled labour, more for medium and high skilled technicians. EU report gives more details
5. Competition for skilled workers is fierce. Firms can attract them by higher wages, but also soft factors such as quality of working environment, room for self-expression/development etc.
6. One aspect of this (already clear in software industry and many service industries) is the attraction and the hipness of the workplace understood as an ecosystem, and the access to amenities, and the closeness to home (commuting distances).

4. Case Studies Collaborative Innovation processes stimulates new business models and organisational modes (open innovation)

The following case studies have two functions in the report. Firstly, they present inspiring cases how other institutions have orchestrated collaborative innovation. Secondly, they have a distinct thematic focus and allow to learn from them.

4.1. Collaborative Incubation, interdisciplinary working practices and the role of universities

Case Study | Aalto Design Factory

Aalto Design Factory arose from an interdisciplinary product development project in 1997 and grew over the years nowadays becoming one of the most important projects at the Aalto University which was founded in 2010. The design factory is a school and platform working in close collaboration and with a familiar working atmosphere between product designers, students, researchers, teachers and companies.

Pushing creative minds

Students at Aalto are encouraged to speak their minds and empowered to initiate and develop their ideas. Interdisciplinary working groups ensure real-life problems and subsequent ideation processes to be solved by thorough research and experimental learning strategies. During annual boot-camps, they receive the possibility to participate in teachings about product design, enabling them to further visualize, prototype and experimenting with their ideas.

The projects seek 'crazy' and passionate individuals who in most cases contact the program to be part of it. Aalto design factory is open to new and innovative inputs and puts big efforts into building trust and supporting their own students regarding their individual needs. The community concept aims to build linkages also between internal projects and has a vibrant culture of perpetual exchange and self-organization.

Understandable product design

Although there are also service products which are produced at Aalto, its core focus and speciality lies in mechanical engineering and fabricating goods which are developed for instance in the electro shop or machine shop. Learning activities such as the Bachelor's minor programme on interdisciplinary product development Aaltonaut emphasize the strength on so-called hands-on projects which combines interdisciplinary theoretical frame-working with teamwork and practical implementation.

Sparking into international networks

The concept of the Design Factory in itself operates internationally for collaborations are made across national borders. In addition, Aalto Design Factory supports the development of product design projects at other universities by introducing their concept mostly via the boot-camp and with a remote team, concentrating on special needs of the single host institutions.

The Global Design Factory Network stands for the worldwide innovation hubs which were set up on different continents and which have the task to continue the problem-based learning and building experience of Aalto.

4.2. Investment in Collaborative R&D and design driven innovation

Case Study | Baltan Laboratories

Learning and growing from experiments

Baltan Laboratories, founded in 2008 in Eindhoven, is an independent foundation creating projects and products in partnership with creatives and a diversity of stakeholders, bringing expertise from a variety of disciplines together. The collaborative platform and networking structure of Baltan not only works as an observative mediator but provides entrepreneurs, creative artists and interested partners with their own expertise and consulting. Knowledge is created by projects which always emerge or grow by performing and results of practical experiments.



Source: <http://baltanlaboratories.org/article/news/vacancy:-project-leader-age-of-wonderland>

Letting seeds grow

Developing projects with Baltan Laboratories means getting in touch with different topics of interest and inviting different partners to unfold the idea into a story and creating energy.

It especially aims to push interdisciplinary fields of research into synergetic workflows, combining technology, art and culture. Three main thematic focusses are:

- The relationship between humans and technology
- Social innovation
- Economy and business development (e.g. economia festival)

Source: <https://hec.su/gylv> (24th July 2017)

Despite from those main field of works, about 20 per cent of the projects are invested into so called new seeds. The metaphor of seeds also implies the organic matter of working processes at Baltan; new ideas, planting the seeds, are implemented and programmed events such as workshops let those ideas grow in an organic way, attracting creatives and funding structures to realise the project.

By this method, energy is successfully created on both sides of the partnership, translated into new products which are used as transferable tools to inspire minds and to perceive a new input based on experimental research and development.

Financially tailor-made work

As mentioned above, networks come together at Baltan. This fact also counts for financial structures for each project where funding never has a pre-decided plan of monetary amounts and investors but adjustments depending on each case are made. Public private funding structures such as the combination of co-investors and funding by the city of Eindhoven as well as the province (Noord-Brabant) ensure a healthy combination of (pre-)investments and financial support by external partners.

Impact outreach

The core team of Baltan Laboratories is only six people; nevertheless, the impact of connecting different participants of the creative industry grew steadily since its foundation in 2008. Since 2013, with the location in Eindhoven, the company was physically visible as an accessible building, inviting visitors to take a look at the exhibition space and laboratory.

The company itself does not aim to physically expand, it is rather the sense of extending their impact effect on creatives and reaching more clients with products and results of the projects they created.

4.3. Commercialisation of Collaborative Innovation

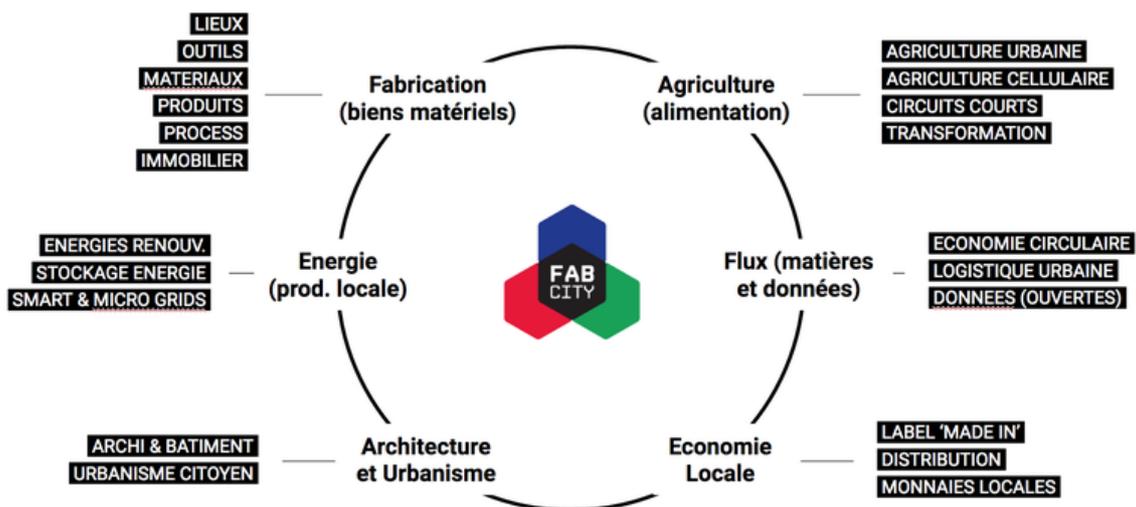
Case Study | La Fab City Grand Paris

The urban model FAB city is a project where cities aim to develop structures of local productivity. Paris in this example joined in 2016, based on the fabcity concept of the fablab in Barcelona.

Paris' dense support network

The specific region of Paris and de Ile-de-France region is considered a suitable place for the Fabcity as its historical influences is densely intertwined with recent movements in innovation, new economies and voluntarist public policies regarding urban issues in the field of digitization, climate or circular economy. Also, Paris itself has been in leading positions of developed and attractive sectors such as the fashion and textile industries, the automotive and building sector.

Paris



Source: xy

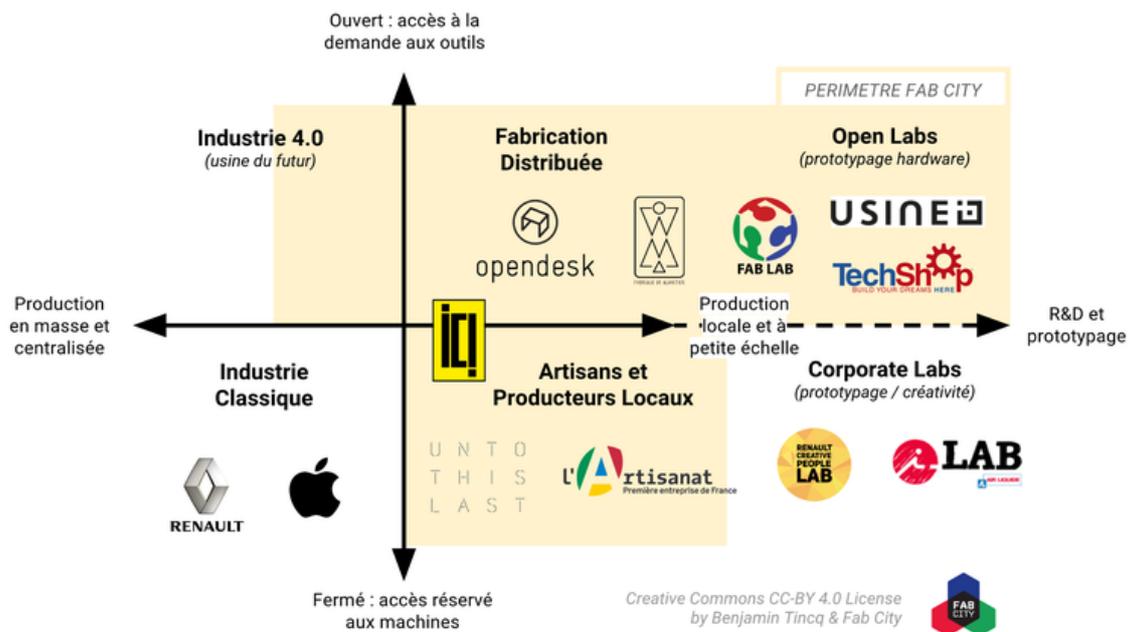
Production of the city as democratization process

Within the fabcity concept, urban planning in Paris becomes a more open approach where different actors are involved and different collectives of architects work on re-planning Parisian squares as well as on concepts of street furniture to be installed in public places as a meeting point for citizens.

Sustainable city (re-)production

As many renewals are constantly made in and around Paris, concerns about the huge amount of building waste occurs. Therefore, the inquiry of sufficient waste management and recycling processes become relevant steps in a sound architecture of the use and reusing of resources. Public training bodies as schools are also involved into rethinking the importance of manufacturing with these materials as an empowerment to contribute to a productive city.

Strategic matrix of the FabCity Paris



Source: xy

4.4. Additional case studies where collaboration also is key

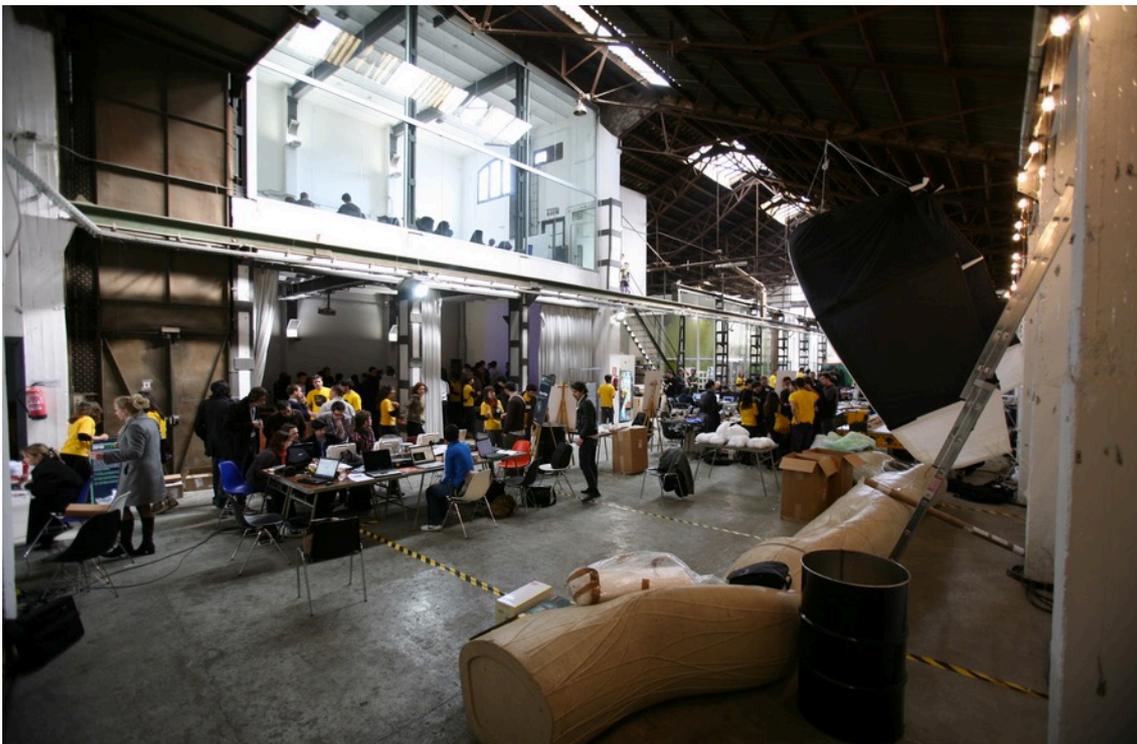
22@Barcelona

22@Barcelona: this area is a complete remake of an old industrial area next to the city core. In 2000 the Barcelona City Council approved a new urban planning ordinance aimed at transforming the old industrial area of Poblenou, with obsolete factories that had long ago been abandoned or were simply not very productive, into a

magnet for new activities. This new ordinance allowed a new land designation called 22@. The project transforms two hundred hectares of industrial land of Poblenou into an innovative district offering modern spaces for the strategic concentration of intensive knowledge-based activities.

This initiative is also a project of urban refurbishment and a new model of the city providing a response to the challenges posed by the knowledge-based society. It is the most important project of urban transformation of Barcelona city of the last years and one of the most ambitious of Europe of these characteristics, with a high real state potential and a 180 million Euros public investment of infrastructure plan.

22@Barcelona is building a new compact city, where the most innovative companies co-exist with research, training and tech transfer centres, as well as housing (4,000 new subsidized residences), facilities (145,000 m² of land) and green areas (114,000 m²). This model city coexists with the neighbourhood's industrial heritage thanks to the Industrial Heritage Protection Plan, written jointly by 22@Barcelona and the Barcelona City Council, which conserves 114 elements of architectural interest.



Source: <http://blog.i-mas.com/wp-content/uploads/2014/03/fab-lab-barcelona.jpg>

Brooklyn Navy Yard, New York

Brooklyn Navy Yard, New York: an old navy yard transformed into “urban manufacturing hub” and marketed as such, is now internationally known and symbol of America’s intention to make a comeback as manufacturing powerhouse. It has a big size and economic impact: The BNY is an active industrial park that occupies 300 acres along the Brooklyn waterfront.

It houses over 330 businesses and 5,800 employees and supports several of New York City’s key industries, including film, media, arts and culture, architecture, and design. The BNY’s annual economic output, that is, its “gross domestic product” for New York City, is nearly \$2 billion. It is responsible for 10,350 direct and indirect jobs and \$390 million in earnings. That economic activity in turn induces another \$2 billion in earnings in the local economy and another 15,500 jobs.

RDM Rotterdam

RDM Rotterdam: The RDM Campus is developed on the site of a former and historically important shipyard. The initials RDM previously identifying the Rotterdam Dry Dock Company (Rotterdamsche Droogdok Maatschappij) have been retained but now stand for Research, Design and Manufacturing.

The “Warm Springs Innovation District” will be created in Fremont, California, anchored by Tesla Motors, a manufacturing company that embraces the “open innovation” economy. Fremont City Council members approved a new planning document that spells out land-use and design guidelines for the 879-acre zone. It allows for a mix of residential, office, industrial and retail uses in the area, which had previously been zoned for heavy industrial use.

The plan allows up to 4,000 housing units, plus enough commercial space to support more than 12,000 new jobs. Officials envision concentrating density near the under-construction BART station, which was slated for completion in late 2015. (see <http://bit.ly/1oiR6aI>)

5. Conclusions and recommendations for supporting maker spaces

1. Build a collaborative network with “distributed leadership”: consisting of leaders from key firms, tenants, and other relevant institutions in the area, who meet frequently to bring the district further (in terms of design, marketing, governance, investments etc.). One person, or a team, must play a central role as catalyst, integrator, or facilitator.

2. Set a vision for development where to head to. This provides clarity and guidance for actions and investments. The vision must not be a dream, but a concept well be grounded in evidence. Detailed and thorough analysis is needed to decide the “colour” of the urban manufacturing district (which themes and types of firms or freelancers to promote and develop).

Preferably, the vision fits in the broader strengths and traditions of the entire city. The development vision should include an idea how to attract new actors (key firms, research institutes, university branches or other “innovation assets”) to the area. Also, the vision must communicate how to transform the physical space and landscape of the area, and turn it into a dense, mixed, and dynamic area.

3. Attract and develop talent. Talent can be attracted through outreach programmes, and marketing campaigns, to coworking options, testing contexts such as Barcamps, ad hoc conferences and must not be directed to the city region alone but have national or even international reach.

Also, entrepreneurs must be supported to develop themselves and their companies. Shared workspaces, equipment and technology resources help entrepreneurs and freelancers to develop and focus on their core idea and business.

4. Promote inclusive growth. Use the district to improve adjacent distressed neighbourhoods. This can be done through training programmes that open opportunities for unemployed to work in the district, or initiatives to link innovative firms to schools, or encourage tenants to hire locally, offer on-the-job training opportunities etc. The district can become a cradle for local entrepreneurship: through fablabs (high tech equipment that can be used by the community, with training and supervision).

5. Improve, co-ordinate and integrate access to capital. In such districts, there are many funding streams, from many sources, serving many purposes (real estate of all

sorts, infrastructure, applied research, incubators, regeneration, education, energy, utilities, specific subsidies for brownfield clean-ups, historic conservation and so on); it is important to have a district-wide integrated strategy to prevent a “silo” approach in which synergies are missed. Also, district developers must actively communicate the value and opportunities of the “package” they offer to investors.

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7. Annex

Interview partners

Koen Snoeckx (Baltan Laboratories): board member since 2010, since Jan 2017 strategic advisor and project manager at Baltan Laboratories
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Aalto Design University: Päivi Oinonen: Design Factory Network (DFGN) strategist
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Profile of Dr. Bastian Lange / Multiplicities

Dr. Bastian Lange / Multiplicities

Multiplicities is an independent research and consultancy office operating on the cutting edge between the creative industry, urban development and policy making. The project management service is active in the fields of business consultancy, urban research and the fostering of innovation. Our client base is comprised of creative enterprises, administrative and political entities and also intermediary organisations.

Multiplicities analyses socio-economic transformation in the creative knowledge age, providing transparency within the fields of politics, industry and the creative scenes. Multiplicities recognises new trends in complex structures and brings them to maturity for the benefit of planning processes. In an age in which the established and emerging parameters between labour and production appear caught up in disruptive interference, Multiplicities lays the foundation for a new path in the development of added value in the processes shaping tomorrow's cities.

In a sense, Multiplicities therefore acts as a translator of microtrends for the benefit of cultural policies, civil society, urban planning and business promotion. Multiplicities supports administrative and political entities, cluster managers and creative enterprises in defining and implementing their strategic processes. We advise leading mediators, creative economy agencies, local governments and ministries. We see ourselves as intermediaries and cultural translators.

As a European network, Multiplicities participates in academic studies, scientific articles, strategic consultancies and communication processes. In our philosophy, co-working spaces, FabLabs, open workshops and other hubs represent pivotal starting points for identifying new value added configurations. Multiplicities plays its role in the fashioning of structural transformation within the regions, tailoring the emergence of a new society as creative and knowledge-based.

Within the framework of utmost transparency, Multiplicities is dedicated to the principles of highest excellence and academic and political independence. All data relating to planning, strategy and enterprise is treated with the strictest of confidence.