

CENTRINNO Handbook

REGENERATIVE NEIGHBOURHOODS IN THE MAKING



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PREFACE

by **Tomas Diez, CENTRINNO Scientific Coordinator and Fab City Foundation director**

This book stands as a pivotal document, for individuals, communities, organisations, and local governments towards a transformative vision for their neighbourhoods. The overarching goal is ambitious yet vital: to convert these communities into dynamic, innovative, and experimental playgrounds, nurturing regenerative processes that not only redefine the physical landscape but also offer unparalleled opportunities for the people who call these neighbourhoods home. At the heart of this mission lies the recognition that neighbourhoods, often overlooked in favour of broader city perspectives, serve as a critical canvas for change and community activation. This book, deeply rooted in the Fab City Full Stack framework, emerges as a guide for innovators, activists, and change-makers, enabling them to address global challenges with localised precision and providing them access to a rich array of resources for effective action.

The roots of this book extend into a rich soil of collaboration, a fertile ground where European organisations and international experts have toiled together for an intense and meaningful 36 months within the European CENTRINNO project. Through their concerted efforts, they have orchestrated experiments in 9 pilots across Europe. This collaborative endeavour has not only yielded tangible results in the form of innovative neighbourhood transformations but has also been the crucible for the convergence of years' worth of accumulated knowledge from CENTRINNO partners. This book, therefore, is not just a compilation of information but a living legacy, a testament to the ongoing commitment to change that will resonate through the corridors of the Fab City Network.

As the pages unfold, they reveal a comprehensive guide designed for anyone with a vested interest in propelling transformative change within their neighbourhoods. Comprising over 90 pages, this compendium is not merely an instructive manual but a reservoir of insights, case studies and practical advice. It equips readers with the knowledge and resources necessary to not only initiate but also sustain innovation at the local level. Whether you are a seasoned community organiser, a forward-thinking city planner, an entrepreneurial spirit, or simply a concerned citizen, the book extends its arm, offering a wealth of information and inspiration to aid in the creation of vibrant, resilient neighbourhoods.

The introductory section serves as a gateway, presenting the concept of regenerative transformation and the vision behind the CENTRINNO project. It skillfully delineates

how neighbourhoods can evolve into active agents of change, exploring the concepts that underpin the CENTRINNO framework. Through illustrative examples drawn from successful European neighbourhood initiatives, readers are ushered into an understanding of the potential impact of innovation at the neighbourhood level. This section serves as a foundational primer, shedding light on the roles individuals can play in propelling positive change within their communities.

During three and half years, The CENTRINNO project has been a place of exploration and investigation which was initiated by researchers and change-makers with various profiles, aspirations and expertises. Through five chapters, the readers will immerse in the practices, getting to know the mindset of the people behind the core concepts of CENTRINNO and grasping diverse facets of what makes neighbourhood transformations possible. Whether readers find themselves at the inception of a novel initiative or building upon existing projects, this section serves as a compass, navigating them through the intricate landscapes of neighbourhood transformations.

The conclusive section unfurls a tapestry of organisational principles focused on accompanying, sustaining and scaling neighbourhood innovation. It delves into strategies for ensuring long-term impact, fostering community engagement, and promoting collaboration. This section, in addition to celebrating the emergence of Fab City Hubs across neighbourhoods, offers practical advice on overcoming obstacles and ensuring the enduring vitality of neighbourhood projects.

Woven throughout the book are stories, practical tips, and lessons learnt meticulously crafted to facilitate the transformative journey. From community engagement strategies to design research practices, these resources, developed and tested by CENTRINNO partners, are strategically designed to support readers in the making of their transformative endeavours.

By adopting the concepts and methodologies outlined by CENTRINNO, individuals and communities position themselves as agents of positive transformation within their neighbourhoods. This book serves not only as a guide but as a compelling call to action, encouraging the pooling of collective efforts to cultivate vibrant, inclusive, and sustainable environments that elevate overall quality of life. As the book disseminates valuable knowledge and fosters collaborative initiatives, it emerges as a guiding force propelling communities towards a future where innovation and regeneration flourish at the core of localities. Within its pages lie lessons learnt and shared insights, setting the stage for a collective journey that unfolds, reshaping neighbourhoods into beacons of positive change and resilience. Thus, the legacy of CENTRINNO reverberates not only within the Fab City Network but extends its influence far beyond.

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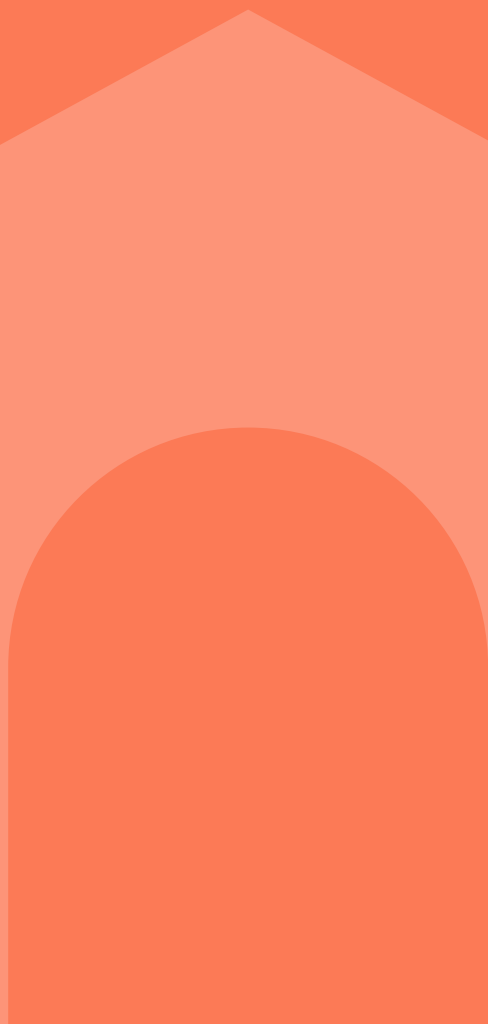
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CENTRINNO IN A NUTSHELL



New CENTRALities in INdustrial areas as engines for inNOvation and urban transformation

CENTRINNO was a EU Horizon 2020^[1] funded project, built upon a unique and highly experienced consortium of 26 partners from eight EU member states (Croatia, Denmark, Estonia, France, Greece, Italy, the Netherlands, and Spain) and two Associated countries (Iceland and Switzerland). The project was coordinated by Comune di Milano and was supported in scientific and technical coordination by the Institute of Advanced Architecture of Catalonia (IAAC).

It aimed to test and demonstrate strategies, approaches and solutions for the regeneration of industrial historic sites as creative, locally productive, and inclusive hubs to:

- Shape new socio-economic and sustainable identities for industrial historic sites
- Foster social inclusion through craftsmanship, culture, and heritage
- Rethink the way cities govern their material resources

CENTRINNO was rooted in project-based learning, focusing on the role of heritage and vocational training, including digital fabrication tools and soft skills connected to local challenges and needs. The project also had a key focus on producing social and environmental impact by adopting the principles of circular economy in new urban transformation processes.

CENTRINNO was at the forefront of experimentation with innovative strategies, approaches, and solutions for alternative urban regeneration processes in different European sites. CENTRINNO involved nine European pilot cities very different in nature, sizes and scales, varying from cities with a population of two million people to towns with just seven thousand inhabitants, including [Amsterdam](#), [Barcelona](#), [Blonduòs](#), [Copenhagen](#), [Geneva](#), [Milan](#), [Paris](#), [Tallinn](#), and [Zagreb](#). The focus area in some cases was a neighbourhood, whereas in other cases was a delimited industrial site or a single building. Some cities were focused on one type of craftsmanship or material, while others combined several, such as fashion, gardening, media production, wood, wool, food, and more.

You can see the latest project activities and all the resources developed during the research on the website^[2]!

Let's take time to situate the project in the context of locally-productive cities.

REGENERATING NEIGHBOURHOODS IN THE CONTEXT OF LOCALLY PRODUCTIVE CITIES

Two centuries ago, Europe sparked the Industrial Revolution, ushering in widespread economic benefits at regional and national levels. However, the more recent phenomenon of globalisation, initially envisioned to bolster global markets, has resulted in significant socio-ecological damage worldwide while causing setbacks for the manufacturing capacity of European cities. The resulting compelled shift towards a knowledge economy has led to a decline in manufacturing jobs, a diminished recognition of their importance, and the neglect of industrial areas.

The prevailing model of extensive consumption and resource extraction is exacerbating the climate crisis. While Automation and Industry 4.0 offer substantial potential, they also present challenges such as job losses, workforce polarisation, and social exclusion, particularly affecting vulnerable populations. The COVID-19 pandemic has starkly exposed the fragility of the current system and the vulnerability of cities.

Cities and their neighbourhoods, intricate systems with diverse pasts and potential futures, are influenced by interconnected groups of people and varied interests. Despite the contemporary interconnectedness of many cities, each urban area underwent a distinct development process shaped by its unique characteristics, local culture, societal dynamics, and historical events.

We find ourselves at a pivotal moment in history, needing reflection on our true aspirations and the imperative for changes aligned with the planet's ecological boundaries, ensuring that no one is left behind.

Towards locally-productive cities: Fab City Global Initiative



Image 1. *DIDO Data In / Data Out*,
Fab City Foundation.

Emerging as an alternative approach to the current urban model, Fab City aims to foster more sustainable, globally connected, and locally productive cities and regions.

Born as a concept in 2011, the Fab City Global Initiative^[3] now unfolds through the activities of three main pillars which are the Fab City Foundation, our Network spanning over 50 cities, and our Collective of experts. Together, they comprise a global repository of knowledge on local production challenges, gathering open recipes on how things are made and how to make them accessible according to local settings.

At its core, Fab City advocates for the reinvention of cities and their relationship with inhabitants and the natural environment. They lie in the strategic re-localisation of production, envisioning cities as generative rather than extractive, restorative rather than destructive, and empowering rather than alienating. The overarching goal is to cultivate convivial environments where individuals find purpose in meaningful work aligned with their passions and talents.

Inspired by the principles of Fab Labs — focusing on connectivity, culture, and creativity — Fab City aims to scale these ideals to the broader urban landscape. This transformative urban model envisions a substantial shift in how cities source and employ materials — transitioning from the conventional 'Products In Trash Out' (PITO) to the innovative 'Data In Data Out' (DIDO)^[4]. This paradigmatic transformation emphasises local production, efficient recycling of materials, and the fulfilment of local needs through local inventiveness.

The Fab City approach is underpinned by a research framework, investigating the rescaling of production using systems thinking, open collaboration, and prototyping. This methodology spans from the domestic scale to the global scale, addressing socio-environmental burdens carried by territories and ensuring a comprehensive and sustainable transformation.

For further exploration and detailed insights into the Fab City Initiative, please refer to the official website at <https://fab.city/>.

Neighbourhoods as compasses of change

Image 2. *Collective Embroidery Gathering, Poblenu Fabrica.*

Numerous projects and initiatives are pollinating at diverse scales to foster locally sustainable futures. Individuals are rethinking the ways they are consuming, learning how to make anything in local fab labs or homes. Cities and regions are initiating new plans for increasing territorial resiliency, making gains in autonomy, fostering circular systems, and local production. Internationally, arenas for global peer-learning act as inspiration for local practitioners participating in processes of transformation in their local contexts. Engaged people gather in collectives, communities, and associations, contributing to projects in order to resist negative externalities caused by the current systems. They actively create new timespaces for dialoguing about the future, and they experiment with alternative forms of living, producing, and consuming.

While such communities can act outside of geographical boundaries through digital means and social media, when it comes to commoning, especially regarding environmental concerns, affordability, and local production settings, there is no other way than acting within and caring about the **place** in which we live, being aware of its interdependencies.

In that context, neighbourhoods, as inter-

mediate scales between domestic places and the city, are looked at as appropriate playgrounds for sharing, synergizing, and experimenting with change allowing for relationships based on the exchange of resources.

As units within the city with diverse physical characteristics, neighbourhoods are part of the urban magma that emerge either as a result of the development of historic settlements, or due to the development of rapid growth in a particular moment of the history^[5], often shaped significantly by the industrial history that has contributed to the formation of cities.

A neighbourhood is generally defined as a geographical area within a city, typically characterised by shared physical proximity, social interactions, and a sense of local identity among its residents. It is a fundamental building block of urban and suburban environments, encompassing a cluster of residences, businesses, public spaces, and community amenities.

It is important to recognize the diversity of neighbourhoods and consider the multifaceted and dynamic phenomenon that reflects the unique characteristics, demographics, and cultural nuances present



within different areas. This diversity is shaped by a variety of factors, contributing to the distinct identities and atmospheres that define each neighbourhood; these factors include: population composition and social dynamics, cultural and natural heritage, architectural and urban styles, distribution of land use, economic disparities, cultural facilities, civic engagement actions, transportation infrastructure, ecological diversities, and green spaces.

Even if neighbourhoods are often overlooked in favour of broader city perspectives, they have unique features and their own metabolism, which can be advantageous in fostering change as well as community activation:

- They are inherently local, and their small-scale nature allows for a more intimate understanding of the community's needs, challenges, and opportunities.
- Residents might be more likely to participate in initiatives that directly impact their immediate surroundings, encouraging a sense of shared responsibility and ownership in creating positive change.
- Leveraging and preserving a sense of

place can be a powerful motivator for sustainable and regenerative practices, ensuring that any changes enhance rather than erode the unique character of the neighbourhood.

Within the CENTRINNO project, we have hypothesised that a neighbourhood, with its local focus, community engagement, and unique characteristics, can serve as a compass for change towards a regenerative future. They can do so by providing a practical and scalable platform for sustainable practices while fostering a sense of shared responsibility among its residents.

These perspectives derive from antecedent research endeavours and initiatives emerging in the Fab City network. One of them is the example of a community of food waste material makers, known as 'Remix El Barrio'^[6-8]. This initiative, situated in the Poblenou neighbourhood of Barcelona, stood as frontrunners in the exploration of how a neighbourhood can cultivate community mobilisation towards locally productive practices. It raised important questions regarding community engagement, public participation, infrastructure development, knowledge dissemination, and the sustainability of grassroots, citizen-driven initiatives.

Zeroing in on old industrial historic sites

Understanding the past of productive areas is key to foreseeing their potential for productive activities in the future. Focusing on industrial historic sites was a strategic decision at the outset of the CENTRINNO project. These are defined as areas that once hosted productive activities and had to stop for various reasons, mainly due to industrial decentralisation and offshoring of productive activities outside of Europe. Over the past few decades, these

areas have undergone drastic transformation in European cities, becoming places where the industrial fabric has led to the coexistence of many different land-uses. This offers great potential to experiment with the future of productive activities in cities, overcoming the modern paradigm of land use separation and moving towards more mixed and flexible cities and neighbourhoods.

A call to regenerative cultures

Emerging regenerative approaches are calling for not only sustaining but actively enhancing the health and vitality of ecosystems. The word 'regeneration' suggests inner transformation in the way we connect with our surroundings - place and people, as well as living and non-living elements. Some authors talk about regenerative cultures^[9]. This concept is further enriched by the metaphor of the resilience peak, the hope that after a fall, a crisis, or a drama, there is a healing process that helps to recover, repair, and feel better. In that sense, regeneration is inherently both a destination and a process of individual and collective transformation.

What does a regenerative neighbourhood look like? Let's reflect on the idea through the perspective of Frenzi Ritter from Metabolic Institute^[10]:

'A regenerative neighbourhood embodies a harmonious blend of ecological restoration and cultural diversity. It is a community committed to healing the urban landscape by revitalising natural ecosystems like local rivers, ponds, forests, and beaches. The neighbourhood serves as a canvas where diverse cultural voices are not only heard but celebrated, fostering an inclusive

environment that thrives on the richness of its inhabitants' experiences. In this regenerative space, local makers and repairers flourish, nurturing a culture of sustainability where the community can repair and repurpose goods and homes. Embedded in their bioregions, regenerative neighbourhoods sustain themselves primarily from the natural resources within its surroundings, contributing to the regeneration of soils and lands by conscientiously managing waste, such as returning nutrients from food waste. Crucially, the community actively works to counteract the forces of gentrification, ensuring that a spectrum of income classes can coexist despite rising housing prices. This commitment extends to creating an open and welcoming environment for all ages, genders, and people from diverse socio-cultural backgrounds, fostering a sense of unity and belonging that defines a truly regenerative neighbourhood.'

For three and a half years, CENTRINNO partners have experimented with new strategies and methodologies to support local communities in facilitating transformation processes towards regenerative neighbourhoods. Let's dig into the CENTRINNO approach.



ONBOARDING WITH THE CENTRINNO APPROACH

Regenerative processes are long in nature and often moved by powers and actors that are difficult to reach or negotiate with. In order to explore the potential of alternative, resilient, and sustainable approaches, CENTRINNO looked at enacting the participation of citizens and local organisations as well as reinforcing different aspects that foster a wider urban transition:

- Reconnection of local productive economies with their regional and local biophysical environment, thus fostering socio-ecological interactions, awareness, and interdependencies in which urban communities play an active role.
- A maker culture that fosters an active role for citizens in the production model, thus increasing local capacity to produce goods, changing mindsets towards non-consumerism, and increasing local communities' resilience and adaptability to global challenges.
- Data exchanges and open knowledge are accessible to citizens and provide opportunities for updating and acquiring new skills as well as creating new job opportunities in sectors such as education, agriculture, health, banking, etc.

To achieve this, the CENTRINNO approach proposes to **change current organisational practices in neighbourhoods through the implementation of productive and creative hubs that will facilitate the realisation of micro-missions addressing local challenges within their communities.**

The approach was operationalised with the definition of a new typology of hubs, the deployment of a conceptual framework of intervention, and the development of a series of platforms created to make it more operational. Each of them is briefly detailed below.

Fab City Hubs: a new hub typology for fostering regenerative neighbourhoods



Fab City Hub is a concept that emerged in the context of the Fab City Global Initiative (FCGI) and is an object of research for CENTRINNO's partners. Through the project, they generated a common definition and defined 10 principles characterising Fab City Hubs.

'Fab City Hubs are open spaces for city making. They work as a physical interface to connect actors within a Fab City Prototype (usually a neighbourhood) and foster collaboration and exchange of skills and knowledge between local communities in a given territory. Fab City Hubs can also be considered Creative and Productive Hubs: they are third places and meeting points for neighbours, citizens, makers, organisations and businesses, connecting these different local stakeholders with the city and its political power and institutions (e.g., the City Council). These spaces are able to integrate and orchestrate different local agendas in urban areas and regions, such as circular economies, smart cities, digital transformation, urban manufacturing and agriculture, as well as connect them with global networks of innovation in these areas. The Hubs expand the role of Fab Labs and Makerspaces, as they expand their reach, and can connect with other local manufacturers within a neighbourhood, city or region. They are the operational enablers of the Fab City vision, and vehicles to implement the Fab City Full Stack approach^[1] at the local level.'

The 10 principles:

1. Fab City Hubs are local ecosystem activators
2. Fab City Hubs are physical interfaces to access local and global distributed ecosystems
3. Fab City Hubs are complex organisms that foster resilience
4. Fab City Hubs are extensions of traditional institutions
5. In Fab City Hubs community comes first, space comes after
6. Fab City Hubs give a voice to citizens
7. Fab City Hubs focus on facilitating and empowering communities
8. Fab City Hubs adopt an incremental approach, and avoid over-design
9. Fab City Hubs do not replace factories
10. Fab City Hubs are multi-layered spaces, both physical and digital

Reference: Fab City Hub Toolkit^[2]

CENTRINNO Framework

Overall structure

The CENTRINNO Framework was designed as a guide for the transformation of neighbourhoods and the implementation of Fab City Hubs across nine diverse and dynamic scenarios. The CENTRINNO Framework is an overarching common structure for experimentation that enables sharing, exchanging, and discussing the project's findings. It is more a living dictionary than an instructions manual. Its two main ingredients are a common research structure and a series of resources developed throughout the project.

It is shaped like a spiderweb where practitioners can position themselves, weave their paths and use it to frame and analyse their strategies. The framework is composed of three action areas and five key concepts to navigate through to initiate and facilitate the **development of micro-missions** supporting regenerative transformations at a neighbourhood scale.

Three areas of actions



Crafting the Vision

Exploring which direction we want to go

Each territory, with its particular specificities, will envision differently what its regenerative future could be. Different needs, motivations and aspirations are present at the same time. Part of the regenerative process consists of better understanding a place's heritage, its current realities, and future possible scenarios in which local actors would want or would not want to live. It means taking time to care and to listen to people, mapping local ecosystems and discovering spaces to co-design and communicate findings and stories, letting new narratives emerge. It means going step by step, crafting a vision that organically evolves through time in alignment with the people taking part in the process as well as the socio-ecological realities of the place.



Building a Community

Defining who is involved in the community, empowering and finding out how to evolve together

A great diversity of stakeholders can take part in regenerative processes. Everyone is concerned and every voice counts. While developing the process, efforts are required to create inclusive communities of practice and facilitate conversations and discussions among local stakeholders which steer the research process towards alternative solutions that are socially and environmentally sustainable, but also locally significant. Engagement will differ according to the type of strategies.



Setting up the Infrastructure

Consolidating the means and local capacities to achieve transformations

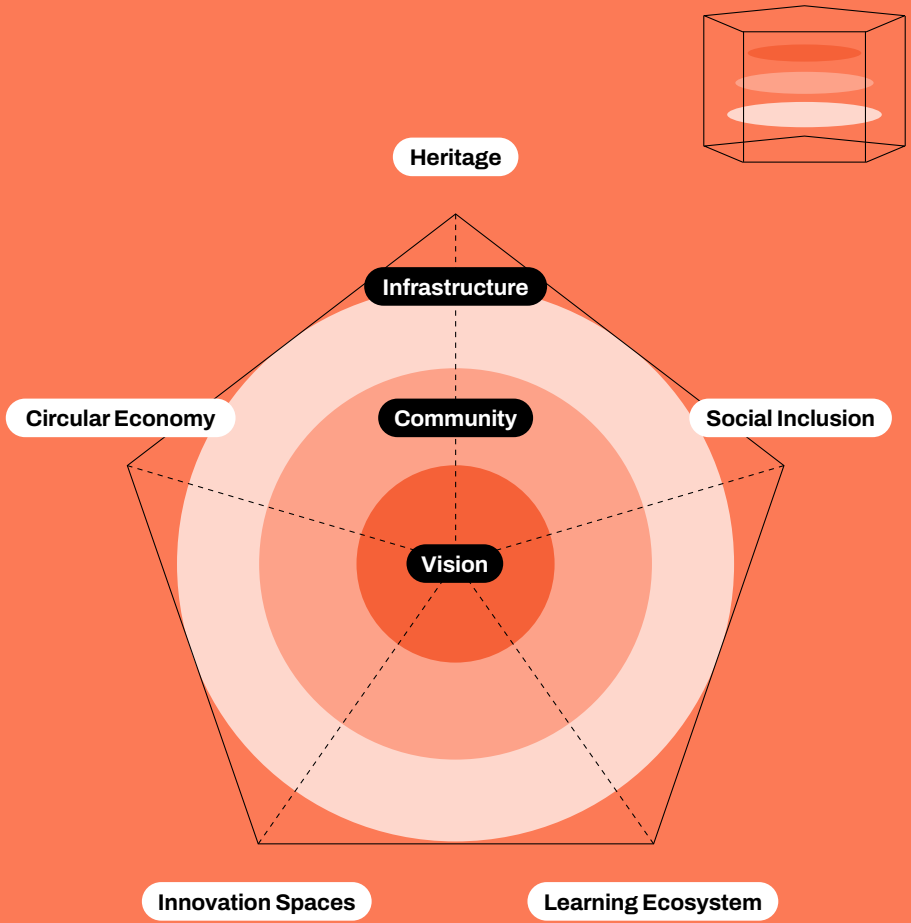
Regenerative processes require tangible and intangible resources to be developed. Mapping the needed infrastructure, looking for opportunities to fund projects and mutualise existing places and platforms is a daily necessity. Setting up the spatial management of places like Fab City Hubs demands time, strategy and methods to make them operational and sustainable.

CENTRINNO

five key concepts

Zeroing in on what is at the core of regenerative neighbourhoods and defining guiding principles of the transformational process, five concepts were identified by the partners; these core ideas were used as a conceptual

foundation for all of the experimentation developed in CENTRINNO. The key concepts include **Circular Economy**, **Heritage**, **Innovative Spaces**, **Learning Ecosystems** and **Social Inclusion**.



Circular Economy

How to rethink the material flows in your territory

Productive activities need to consider alternative and circular resource flows that move away from dominant consumption patterns, based on extraction and depletion of resources, pollution and the generation of waste on a massive scale.

Innovation Spaces

Where to design and produce in the neighbourhood

From idea emergence to socially accepted solutions, innovation processes are complex moments for conceptualising, prototyping, testing, translating, and collectively negotiating emerging products, services, and policies. With the rise of open innovation practices in public and private institutions, a new typology of spaces has been put at the forefront in cities. New forms of production are experimented with in these spaces from the bottom-up through collective practices of prototyping and direct connections with technologies. They are physical and hybrid spaces as enabling environments for collaboration between different stakeholders.

Social Inclusion

How to engage local stakeholders and create a sense of community

Current transformation processes, often in central or strategic metropolitan locations, usually increase land value and bring new land uses, producing drastic changes in the physical and social fabric of the city. Urban transformation processes in CENTRINNO should consider the existing population in decision-making activities, as well as foster social inclusion of disadvantaged or vulnerable groups.

Heritage

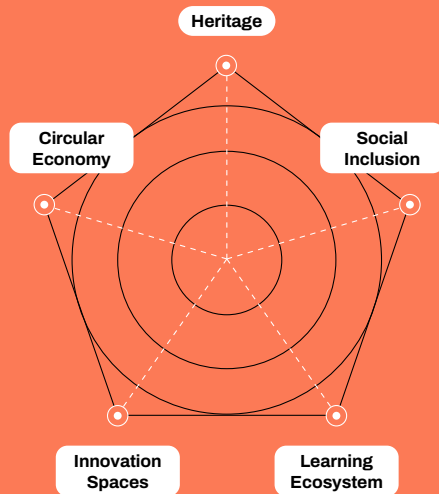
How to care for and value territorial assets across time

Heritage responds to the need of taking into account the material and immaterial past of neighbourhoods and industrial historic areas in order to reflect on the present and discuss what we want for their future.

Learning Ecosystem

How to get prepared and consolidate the offer of training in each neighbourhood

The new economy at the core of sustainable and inclusive transformation of historic industrial areas will need to define new typology of jobs and to reflect on future skills for professionals. Programs at the intersection of hands-on training and theory alongside open and accessible knowledge are elements that play a key role in preparing this new workforce, connecting tangible urban issues with local organisations and companies.



CENTRINNO's open digital resources

The CENTRINNO project developed five primary open digital resources throughout the project: the CENTRINNO Framework, CENTRINNO Cartography, the CENTRINNO Living Archive, The FAB CITY HUB TOOLKIT, and the CENTRINNO Website.

CENTRINNO Framework

The CENTRINNO Framework was synthesised in a GitBook as a living document where the different pieces of the project came together, built *on the fly* during the project's duration. This document's target audiences are CENTRINNO pilot cities and project partners, but also policymakers, local governments, or researchers interested in following and applying the CENTRINNO approach, methods, and tools in other cities.

<https://framework.centrinno.eu/> ^[13]

Living Archive

The Living Archive is an open access platform containing content (stories) stemming from (post-) industrial sites, collected locally with participatory heritage methods. Its purpose is to help communities imagine what can be broadly described as a new 'critical heritage of making', and enable the creation of inclusive and circular hubs (Fab City Hubs).

<https://livingarchive.centrinno.eu/> ^[15]

CENTRINNO Website

After 3.5 years of experimentation, many traces of the CENTRINNO project can be found through diverse channels: deliverables, blog posts, social media posts, locally produced artefacts, tools, and blueprints. The **website of the project** is like an open repository retracing the journey of partners, serving as inspirations for any curious reader.

<https://centrinno.eu/> ^[2]

CENTRINNO Cartography

CENTRINNO Cartography is a platform that supports communities in facilitating a circular economy transition in their neighbourhood. It helps communities to map, build and mobilise local makers, businesses and other organisations to engage in resource exchanges and shared learning pathways towards circularity.

<https://www.centrinno-cartography.org/> ^[14]

Fab City Hubs Toolkit

The Fab City Hubs Toolkit is an interactive online manual that supports interested organisations, municipal representatives or institutions in launching and developing Fab City Hub Initiatives in their local context. Being a very practical resource, enriched with tools, templates, and practical activities, the toolkit aims to support the development of a shared vision, an engaged community and an adapted infrastructure for new and existing Fab City Hubs. It will inspire and share tips on the organisation of workshops, activities and events to launch or strengthen specific Fab City Hub initiatives. Additionally, the toolkit guides users in organising CENTRINNO Schools.

<https://toolkit.centrinno.eu/> ^[12]

EMBARKING IN PARTICIPATORY DESIGN RESEARCH JOURNEYS

When the CENTRINNO project started, partners came together with the idea of experimenting and testing new concepts. They embarked on a collective research journey, acting as action-researchers by strengthening the empirical knowledge related to emerging neighbourhood transformations.

This means going out into the field and approaching each neighbourhood head-on, in all its harshness, with its diverse ecosystems, and historical heritage, but also with its industrial past and the traces left behind.

This also means recognizing uncertainties as well as the diverse ways in which society is evolving with divergent opinions, motivations and recurrent social tensions.

During three and a half years, partners used design as a tool for transition, as a way to explore interventions within a territory, creating unexpected combinations and opening up new areas of conviviality.

Through CENTRINNO, nine city pilots across Europe developed different journeys towards the implementation of their Fab City Hubs and the transformation of their neighbourhoods in a chosen historic industrial site. They did so by setting up and developing micro-missions as commitments to address specific challenges within each environment. All nine pilots applied the CENTRINNO Framework through three sprints, running cycles of micro-missions, with planning, development and reflection phases.

Each pilot was able to create original approaches, including a series of events and exhibitions with the purpose of strengthening local communities^[16].

By using a design mindset and design techniques, they also captured the limits of ongoing interventions, seizing the gaps and slowly refining the transition paths towards regenerative neighbourhoods.

Among the collective of researchers taking part in CENTRINNO, two main roles were assigned:

- The *pilot teams* in each territory were composed of one coordinator facilitating the local experimentations and other project members that contributed in co-designing and implementing events, activities, and workshops.
- The *support team* was made up of researchers and managers that helped pilot teams in their experimentations. Among them were what we called '*concept owners*', who facilitated the research through the lens of one specific concept of the project.

Both roles worked together throughout the project through diverse means: training sessions, co-creation workshops, and regular pilot meetings as well as more informal moments. This allowed for a bilateral knowledge exchange between practice and theory, research and action.

BOOK DESIGN

In this book, we want to bring readers into the intimacy of the design research processes that the partners experienced during the project.

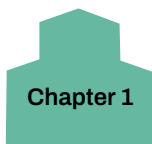
Instead of digging into the narratives of each pilot individually, for details of which we encourage readers to look through other project resources^[17] such as the CENTRINNO Blueprints^[18], we conversely chose to consider the project through the lens of the project's key concepts. By doing so, we allow the main researchers – i.e. the concept owners – to explain their research paths and reflect on their key takeaways.

For this reason, the following five chapters will depict the practices developed for each concept.

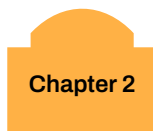
Each chapter follows the same structure:

- The first section is dedicated to defining the key concept, its link with the CENTRINNO Framework and its evolutions throughout the project.
- Next, the key platform and associated tools that were developed during the project are presented in relation to the key concept.
- The most important section of each chapter relies on a research diary where the principal researchers introduce their contributions, discuss three lessons learnt, and share joint experimentation results. Each lesson learnt is illustrated with photos collected by the chapter contributors.
- Each chapter ends with a 'going further' section which compiles additional insights and core references to help the reader find further information.

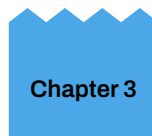
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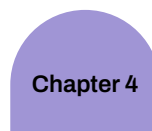
Mapping and Connecting Circular Urban Ecosystems



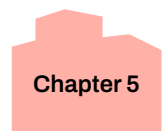
History and the Making of Heritage



Fab City Hubs as Innovation Spaces for Neighbourhood Regeneration



Transmitting Skills and New Vocations



Weaving Social Bonds

MAPPING AND CONNECTING CIRCULAR URBAN ECOSYSTEMS

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Frenzi Ritter, researcher

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The Metabolic Institute is a non-profit think tank, working at the intersection of academic research and real-world experimentation. The think tank advances open-source knowledge on global sustainability issues, by prototyping how society can thrive while remaining safely within the bounds of the planet.

CIRCULAR ECONOMY

Defining and situating the key concept

The circular economic model emphasises a transformative approach to resource management, promoting sustainability and reducing environmental impact. This model advocates for a shift to regenerative and renewable materials, prioritising resources that can be replenished naturally. In this system, products are designed with longevity in mind, enabling easy repair and reuse to extend their life cycles. Waste is not considered a problem but rather a valuable resource, serving as inputs for other businesses, industries, and makers to create new products through recycling and upcycling processes. Business models within the circular economy are centred around the delivery of services rather than the mere production of goods, focusing on reuse, repair, and recycling of materials. This holistic approach aims to minimise waste, maximise resource efficiency, and create a more sustainable and regenerative economic ecosystem.

CENTRINNO's pilots have been addressing the circular economy from the angle of makership and local production. Through our pilots, we have been exploring what role local makers and other local productive businesses can play within a wider circular ecosystem of cities. One of the key premises of CENTRINNO is that cities require makers to function as circular ecosystems to continue repairing, reusing and making things from local resources. CENTRINNO's pilots have been engaging makers in the circular economy discourse in several ways. They have mapped existing circular skills and organised local exhibitions and events showcasing circular makers; likewise, they have developed and run programs that teach circular maker skills to professionals, students and citizens. Others have started to engage in conversations and public debates with politicians and policymakers to raise awareness for the critical role that makers play in urban circular economy goals.

While *circular economy* has become a widely used buzzword for countries, cities and above all corporations to describe their sustainability ambitions, the discourse has not been a socially inclusive one. Oftentimes, the discourse neglects the important role that smaller businesses as well as small and medium-sized enterprises (SMEs) play in the transition to a circular system. These businesses are, however, those that often already act as loop closers or innovators of circular business models. Further, there is little focus placed on the skills and resources that SMEs and makers need in order to adopt more circular practices. CENTRINNO fills this gap by highlighting that circularity is not about **creating a perfect circle in which resources are cycled through two or three larger corporations. Instead, it envisions an intricate web of smaller and larger organisations passing through resources and creating synergies between each other.**

Deploying Circular Economy in each of CENTRINNO's action areas



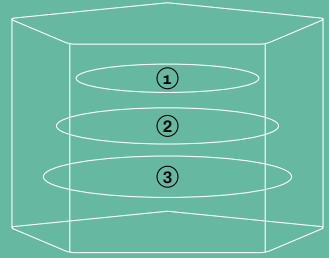
Vision



Community



Infrastructure



Focus on Circular Economy

1

Our vision for a circular economy in CENTRINNO is to build an ecosystem of smaller and larger organisations that share resources, wastes, infrastructure and skills for circular making of goods.

2

This vision requires a consolidated facilitation process that brings together smaller and larger businesses, as well as schools and citizens.

3

The circular economy at the local scale requires proper material and waste management that helps to store and distribute secondary materials. It also requires detailed inventory and data exchange between local businesses and the waste collection system.

Approach and tools to support pilots

1

Together with the pilots, we ran 'Opportunity Finding Workshops' in which we jointly analysed what types of circular synergies and opportunities could emerge. These were based on the resource mapping surveys and interviews the pilots had held in their communities, as well as based on the wider geospatial and urban metabolism analysis of cities.

2

We helped the pilots in firstly mapping all relevant stakeholders which were present in their local communities and could potentially be part of a circular community.

We provided templates and surveys to collect data on their skills, wastes and resources.

3

While we could not develop physical infrastructure within CENTRINNO, we helped pilot sites to map stakeholders which could e.g. space or other infrastructural services for a circular ecosystem.



Recommendations for addressing Circular Economy

- Start with mapping all existing circularity initiatives around your neighbourhood to get a feel for the current momentum around the topic.
- Continue searching for circular makers which might not strike you as necessarily 'circular' - such as tailors, carpenters or others with relevant skills.
- Get in contact with makers and ask them about their experience with the circular economy - what are they doing already, what are their barriers?
- Organise a round-table to invite circular makers and policy makers to discuss their needs and challenges.
- Create a training program for circular design thinking with students and for makers.
- Map the city's material flows to zoom out and learn more about the waste management system of the entire urban area.
- Organise a circular makership exhibition to give visibility to circular businesses.
- Pilot a circular symbiosis by connecting waste donors and willing makers who are interested in using secondary materials for a small product line.

Image 5. Cartography in action at the Poblenou Fabrica Exhibition in Barcelona, Fab Lab Barcelona.

CENTRINNO CARTOGRAPHY

CENTRINNO Cartography is a platform that supports communities in facilitating a circular economy transition in their neighbourhood. It helps communities to map; build and mobilise local makers, businesses, and other organisations to engage in resource exchange; and share learning pathways towards circularity. The Cartography toolkit was developed in an interactive and iterative approach throughout three years. The website acts as a platform to aggregate the resources we developed in the project, which include workshop materials, mapping templates and case studies from CENTRINNO's pilots.

How can it be accessed?

<https://www.centrinno-cartography.org/>^[14]



Image 6. Homepage of the CENTRINNO Cartography Website, www.CENTRINNO-cartography.org

RESEARCH DIARY - THE SOCIAL PRACTICES OF CARTOGRAPHIES

by Frenzi Ritter

Introduction

The Metabolic Institute is an applied research organisation, with a mission to prototype and test alternative systems that showcase what a circular and regenerative future might look like. Being action researchers means that we do not collect and analyse data merely for the sake of advancing knowledge for the scientific community. Instead, we do so to empower communities, organisations and people to take action on local and regional challenges. We work in a participatory fashion that prioritises stakeholder involvement and collaborative data collection throughout every research step.

During CENTRINNO, we wore two hats as action researchers. On one hand, we were **researchers** supporting pilots to collect and make sense of local data on their urban ecosystems. Our anchoring research question that defined our work was **how to map and make sense of different types of urban data** to thoroughly describe the challenges and opportunities faced by former industrial areas. In this role as researchers, we created geospatial maps, analysed urban characteristics and material flows, interpreted data and trained pilots on our findings.

As **action** researchers, the work did not end with the generation of knowledge alone. Instead, action research meant we needed to create replicable processes that could support others in repeating our work. And above all, our research needed to be used to develop tools and resources which galvanise action in other organisations. Through CENTRINNO Cartography - our toolkit for urban ecosystem mapping - we made sure that our research approach can be taken on by others beyond the project. It functions as a blueprint that, albeit simplified and restructured, makes our research actionable. Combining these two roles, as practitioners and researchers, we had to learn to alter our research methods and constantly reflect on our intentions as researchers. Thus, the meta research question we followed during CENTRINNO can be formulated as follows: **How can we support local organisations in becoming their own facilitators for circular and productive ecosystems?** There are a few lessons we learnt from attempting to answer this question.

Lesson learnt 1: Adapting conventional research methods to match the local needs

We started the CENTRINNO project with the goal of developing and applying a methodology for mapping the complexities of urban ecosystems. As researchers and experts in urban metabolism analysis and geospatial analysis, our mental point of departure was firmly grounded in the scientific fields of Industrial and Urban Ecology. In our work, we are used to starting off by creating a bird-eye view of the system we are researching. We collect and process a lot of data to, for example, create material flow diagrams of cities or make use of other similar ways of visualising complex information on social, environmental, and other spatial indicators. With this mindset, we created the Urban Ecosystem Mapping Guidebook - a collection of methods to thoroughly map urban areas.

The realities of working with action-oriented, bottom-up organisations challenged this traditional approach to our research at the start. During the first year of the project, we began by asking all the pilots to define the types of data they wanted to collect and map. From a scientific standpoint, it was clear to us that we first needed to know the full picture of a place - its history, demographics and ecology - before crafting a strategy or intervention plan for a space. Yet, in interactions with our pilot groups, we came to realise that many locally active organisations have different priorities and are not always used to leveraging scientific data to promote their own agendas. Often, the reason for that lies in the fact that bottom-up actors have different questions and have different, often very specific, data needs which are not entirely in line with the way we approach data collection.

The example of the urban material flow analysis (MFAs) illustrates this point. The urban material flow analysis is a method to map material inputs and outputs through a system, showing how much material is consumed and how much waste is generated by different actors. It can be a powerful tool in applied research to support cities in identifying hotspots for unsustainable resource management. Yet, the majority of action-oriented organisations working in CENTRINNO gave us feedback that **high-level MFAs are not granular enough in their data to spark action or discussion**. Instead of wanting an overview of general material streams processed by the city's public waste system, the pilot groups instead asked for more nuanced information on waste flows. There was interest in mapping specific stakeholders and the concrete **shapes, types and volumes of waste that they generated**. There was the need to zoom in on one specific material at the neighbourhood-scale, which is difficult to accomplish with current data availability.

From this mismatch between our own known research methods and the needs of those beneficiaries that hope to profit from our research we learnt two things: First, as an action researcher you need to be willing to divert from your usual approach; you need to be open to changing course throughout your research. You need to truly question yourself whether you are doing research only for the sake of doing research or in order to enable action at the local level. Second, you need to educate your partners significantly about the power of your research and help them to leverage your findings in the best way possible.

Lesson learnt 2:

Acknowledging the diversity of cultural contexts in the adoption of cartography beyond European urban ecosystems

During the last iteration of CENTRINNO, we focused on creating templates and tools for replicating CENTRINNO Cartography beyond our European pilot cities. In essence, CENTRINNO Cartography was developed with the aim of creating a platform enabling (Fab)cities to transition towards circularity while recognising and respecting the distinct features of each city. Cities differ significantly, as they are shaped by their inhabitants, climate zones, political systems, histories, and various other factors which define their uniqueness. Acknowledging the diverse nature of places and cultures, CENTRINNO Cartography was designed to establish a universally applicable process that can be embraced by anyone, anywhere.

In that context, we had organised a series of workshops and presentations for other cities from across the Fab City Network to learn about CENTRINNO Cartography and urban resource mapping tools. Participants from India, Mexico, Canada, Brazil, China, and Chile took part in these sessions. What we learnt during these workshops and interactions challenged us to rethink the universality of our research findings and their application across various cultures.

We asked ourselves: Can we truly create tools that support cities across the entire world to map their urban environments and use this information to build more circular communities? After all, CENTRINNO Cartography is a platform created collaboratively with nine pilot cities in Europe's post-industrial regions. We began with a common foundation, as these cities

have experienced the conventional trajectory of Western development, decline, and the restructuring of former industrial centres in Europe. However, it is important to note that not all cities have adhered to, nor should they necessarily adhere to, this Western pattern of industrialization, deindustrialization, and eventual gentrification of former industrial areas.

Potentially more important, however, is the question of whose future we are envisioning with CENTRINNO Cartography. Is this a vision everyone can subscribe to? Even the choice of words such as 'regenerative,' 'circular,' 'resilient,' and 'sustainable' are laden with bias. As action researchers, we learnt that we need to use these terms with caution. We need to be willing to adapt our language and framing, based on the beneficiaries of our research and developed tools. And if adjustment is not always possible, we at least need to be self-aware of our own perspective and its limitations in other communities.

Lesson learnt 3:

Considering sustainability and long-term impact of action research from the beginning

One of the strengths of the action research in CENTRINNO lies in the fact that we are developing solutions iteratively that help practitioners to do their work effectively. For us, that means that we shifted away from a top-down mapping methodology and developed CENTRINNO Cartography in a manner that supported our pilot sites in mapping their stakeholder ecosystems and their local resources. The purpose and mission of our Cartography toolkit was tailored to the very specific needs of the pilots, working towards CENTRINNO's wider mission to create circular and productive Fab City Hubs in post-industrial cities.

This niche objective of CENTRINNO as a project, and CENTRINNO Cartography as a platform within this complex project, brings up challenges regarding the replicability and long-term sustainability of our results. Maybe a universal challenge in action research is that the closer you are to a specific problem or use case, the harder it is to abstract your findings and develop tools for a global situation.

For CENTRINNO Cartography, this meant that while it did well in providing our pilots with a useful tool for their internal work, the long-term impact of the results rely on finding enough other users outside of the project. To ensure a sustained adoption of our results, we spent a lot of time and effort testing and validating our Cartography toolkit with other potential users, such as universities and other cities. In this process, we also learnt that the final results often need adaptation to broaden their usefulness.

As an example, in CENTRINNO, we conducted very specific geospatial analyses to understand the trends of rental prices for commercial properties in Copenhagen, or the amount of concrete present in Zagreb's urban to-be-demolished warehouses and factories. These nice analyses are not necessarily suited for replication. Thus, we needed to develop more abstract, high-level mapping tools which neither require specific skills nor cater to a small niche population.

Image 7. Mapping resource flows through companies in an offline workshop, Liat Rogel.



CONCLUSION - GOING FURTHER

Three questions to ask ourselves when engaging with action-research on Circular Economy

- How does your own framing of the problem differ from the perspective of the people you are researching for or with?
- Does your research truly empower action on the ground, or does it only fulfil your own research agenda from a theoretical perspective?
- What do your actors on the ground need to know to take action and make better decisions? How can you factor that into your research approach?

Feedback from the authors on the cooperation in CENTRINNO

CENTRINNO has helped us become better listeners to local needs. It made it more essential for us to question our own standard research practices and critically evaluate them from the standpoint of the questions and demands that truly drive the actions of the people and organisations we worked with.

Opening new horizons for future research

We are eager to continue this journey focusing specifically on the transition towards regenerative bioregions at the scale beyond the individual Fab City. Fab Cities are embedded in their bioregions which provide resources to urban areas, draw down carbon in land, and take up nutrients from urban areas. It is important to understand, together with practitioners, communities, and scientists, how to create more actionable blueprints for regions to adopt more regenerative land management practices that are embedded in a bioeconomy.



HISTORY AND THE MAKING OF HERITAGE

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 Reinwardt Academy, Amsterdam University for the Arts^[19]

The Cultural Heritage research group is embedded in the Reinwardt Academy, a professional education school for heritage professionals. The group's endeavour is to provide (future) heritage professionals with action perspectives for complex interactions related to heritage objects by investigating how various kinds of historical knowledge could be constructively involved into these interactions. The research produces well-substantiated proposals for interventions (actions), which are tested for effectiveness in a practical setting. In CENTRINNO, the group provided training to the pilot teams on heritage engagement methodologies, co-created an approach for co-curating a Living Archive, and reflected upon the various ways in which a diverse group of professionals, networks, and organisations at the pilot level shaped and moved around the concept of heritage.

HERITAGE

Defining and situating the key concept

Heritage is a notion, a label applied to items from the past, in the present, toward the future. Any trace from the past can be labelled as 'heritage'. It is also important to keep in mind that:

- labelling things as heritage always happens in a specific context (in terms of time, place, or actors)
- tangible heritage also always has an intangible dimension and vice versa, and they work in interaction
- heritage is the temporary result of an interaction between places, objects, bodies, ecologies, and materials
- heritage is experienced as embodied, as something that one can 'possess'; it is something emotional
- heritage is always contested, but some examples of heritage are more contested than other examples

The word heritage means different things in different languages and also in different academic and professional fields. Often it is simply used as a synonym for monuments, traditions, rituals, canonic knowledge or ideas, repertoires of songs, stories, languages, etc., meaning that applying a label of heritage to something without being critical about what heritage means, or being critical about the process of working with what has been inherited, greatly undervalues any act of heritage-making.

How does CENTRINNO address the concept?

Fab City Hubs (FCHs) intervene in the local context with the aim of making cities more inclusive and sustainable. In CENTRINNO it is and has been continually acknowledged that this also should imply historical engagement with the buildings or sites from which the FCHs operate. This engagement asks for a critical interest in processes of heritagisation, including the ones that the FCHs themselves are a part of. Being aware of what happened in the past, what happened with the past, and how the past works in the present should make it possible to accelerate the desired transition process, while taking seriously the ethical concerns that come with these types of interventions in a specific context.

Curating the past - as in heritagisation (Harrison, 2013), fostering, safeguarding, showcasing, collecting, archiving, revitalising - can have a positive effect, but it can also, albeit unintentionally, do harm. People may have divergent interests, feelings, and memories in relation to the actual buildings and sites that are used for the development of FCHs. Mutual

misunderstanding, or even sentiments of disgust, antagonism, and polarisation can be the result of such divergent experiences.

In CENTRINNO we generate knowledge about alternative and silenced histories. We want to reveal how these histories and objects unsettle ways of looking at the world and its histories and how to deal with this discomfort. We do this by 'reconnecting' traces from the past with their different historical and cultural biographies. In order to understand the impact of the industrial past in the present, we also need to explore how it came about. How did 'we' turn specific traces of that past into 'heritage', while other aspects were neglected?

By acknowledging the history and the impact of the industrial past - in all its different dimensions - FCHs are better equipped to work in an ethical manner with the past towards the future, to acknowledge and eventually curate the past in the process of re-generation.

Deploying Heritage in each of CENTRINNO's action areas



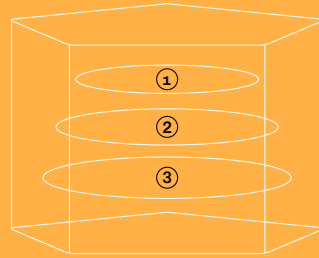
Vision



Community



Infrastructure



Focus on Heritage

1

Neighbourhoods where the working of the past in the present can be expressed, embodied and explored as an enabler for regenerative living.

2

This vision demands a critical attitude toward the social, cultural, economic and political aspects of how heritage is 'made'; which voices are unheard? Why?

3

To ensure this is possible, an infrastructure is needed where multiple forms of knowledge can be accessed in the processes of heritage making.

Approach and tools to support pilots

1

We read and listened to their original description of the pilot site; what was it specifically about the industrial past which they felt was important? How did they expect their heritage work to look?

We also provided training in conducting **ethnographic fieldwork, emotion networking, desk research and oral history**. All this was meant to facilitate a process whereby they - as team and stakeholders - can develop an understanding, **vision if you like, of the past, in the present, toward the future**.

2

In particular with emotion networking and the Living Archive offline heritage engagement (e.g. participatory exhibition), we supported pilots to engage a diverse range of stakeholders in their community and speak and listen about heritage.

3

The stories curated by the pilots, and often exhibited locally in a temporary place, were collected on the Living Archive website. This infrastructure (see section below) ensures the effort remains alive.

Recommendations for addressing Heritage

- Take a dynamic, integrated, and practice-centred approach to 'heritage'.
- Find a starting point to investigate, but be open to observations which may completely change your topic.
- Always dig deeper; whose voices are heard, whose are missing?
- Work as a heritage curator.

CENTRINNO LIVING ARCHIVE

CENTRINNO Living Archive is an open access platform displaying content (e.g., stories) stemming from pilot cities' (post-)industrial sites, collected locally with participatory heritage methods. Its purpose is to help communities imagine what can be broadly described as a new 'critical heritage of making', and enable the creation of inclusive and circular hubs (Fab City Hubs).

It refers to the idea of an open, collaborative, and creative offline or online archive to which everyone can contribute, and which everyone can access; a flexible system in which content is constantly recontextualised.

Just like any other archive, the 'Living Archive' is not to be seen as a neutral site where knowledge is just stored, but as a site of knowledge creation and knowledge management. Collecting activities play an important role here, but always as 'part of a more extensive process consisting of a range of activities, like annotating, questioning, managing, documenting, constructing and transforming, but also forgetting, abandoning, leaving unnamed and erasing'^[8].

How can it be accessed?

Local heritage engagements (e.g. exhibitions, podwalks, etc.) have been of a temporary nature and only some of them can still be accessed at the local level. But the centrally co-curated stories are accessible at <http://livingarchive.centrinno.eu>^[14]. In addition, reflective blog posts are accessible at <http://www.centrinno.eu>^[2].

RESEARCH DIARY - ON THINKING HISTORICALLY AMIDST FUTURE-MAKING DESIGNERS

by Jonathan Even Zohar

Introduction

Find out how sites related to the Industrial Revolution could become the new central hubs for the circular revolution, they said. It should be able to tell us how heritage can be a catalyst for a *new* citizen-industrial revolution, they said. There will be nine different cities, each with its own particularities in terms of location, team set-up, expertise, starting-point, conceptual perception and experience, they said. These will be nine pilots who will do research and innovation, at the same time, for three nine-month sprints, they said. Heritage will be one of five key concepts which all interact with one another on three levels, they said. It will be fun, they said. And they - who were actually us, those who composed the original project proposal and were there to see it implemented - were right. CENTRINNO, from the perspective of a 'simple' historian, was an incredible ride.

The Reinwardt Academy is a professional education school for (future) heritage professionals. Within it resides a small but ambitious research group which investigates how (historical) knowledge and emotions shape the frequencies upon which people in the heritage field, and beyond, together - in interaction - make (or rather (un)label) heritage. It is a fascinating field as the first hurdle is immediately the very understanding that heritage is not something static, permanent or forever. It has been and forever will be something which depends on the living to decide upon. As our societies (hopefully continue to) function democratically and seek to create space for inclusion and social justice, questions like which histories matter, and whose heritage is to be preserved, how (and how not), become ever more present (and) tense.

Our role in the CENTRINNO project was to support the pilots in their utilisation of the concept of heritage. For that purpose, we brought in the collaborative 'mapping' method called Emotion Networking. We quickly learnt that more instruments would be helpful to support the pilot teams to be(come) more 'heritage aware'. In conversations we found

Image 9. *Emotion Networking creates a meta-reflection on how heritage is made, Fab City Grand Paris, 2022.*



out the importance of actively demonstrating what we meant, instead of theorising. In that way, we introduced ethnographic methods, participatory exhibition making methods, and desk research. The result has been that a carefully co-curated selection of stories has been collected by the pilots, uploaded to our common Living Archive, and reflected upon in a series of in-depth blog posts.

But our wide-angle question has remained: what has been the role of (historical) knowledge in doing this?

On one hand, we could say that the role has been negligible. Pilots have engaged locally with the notion of heritage in relation to a variety of places, items, buildings, spaces, and concepts. Only a small portion of the stories bring into play historical perspectives which go further than lived experiences and memories. And the majority of stories deal with the urban transformation of the last couple of decades.

On the other hand, we could say that the mindset of being sensitised, or tuned, to the cultural and communicative ways in which the past is voiced or silenced in the present towards the future, goes deeper than the act of researching and presenting historical perspectives (e.g. events, places, people).

Therefore, to reflect on this issue, in this chapter, we illustrate three distinct insights on the value of historical thinking in the process of heritage making, through the lens of conversations which would otherwise be completely forgotten, unreported in the greater scheme of project management compliance.

Lesson learnt 1: **It's not only about history, but it's also about the space**

At the start of the project, we were seeking to make pilot teams aware of the fundamental problems of historical study of the industrial revolution in the context of global transformation today.

If the industrial revolution was to be a source of inspiration for a new industrial revolution, we needed to look beyond the buildings which used to be factories. We stressed the importance of various historical narrations and chronologies of this key moment in world history. We put forward that the Industrial Revolution offered us a context of an entire ecosystem (of cultural, social, political, environmental, military, economic, change, and continuity), that meant that its 'residue' is everywhere.

As a historian, I felt that it was important to explain the historicity of the chosen frame. I wrote down how in a narrow frame it may indicate a series of technological innovations occurring in the 'long nineteenth' century which transformed first British, then European and Global society, economy, and power. Perceived broadly, I held, it could be seen as a 200-500 year period in which humanity's appropriation and application of natural resources (mainly energy) shifted from limited to 'seemingly' unlimited. And, with an even wider, more socio-cultural angle, I pointed to see centuries and millennia of urbanisation and increasing complexity in manufacturing and production, providing the undercurrent of 'industrious evolution'.

Based on this contextualisation, I have sought to raise more questions. Could the Industrial Revolution have happened elsewhere in the world? How have technological changes impacted people's world-views? How are the histories of European colonialism and

imperialism related to the Industrial Revolution? Bringing in the historical context of industrialisation seemed important in order to spark a certain sense of urgency to studying the past. I put forward that this process has impacted human life to such an extent that it has shifted climatic living conditions on the planet. This context is omnipresent and goes well beyond empty buildings of former factories.

But as the first year of the CENTRINNO project was coming to a close and all this talk about the history of the Industrial Revolution was starting to feel like we were going in circles, a series of conversations with members of the Amsterdam pilot team brought in a clear different view, which led to an important lesson learnt.

In the eyes of the pilot teams, and this subsequently held true for most of CENTRINNO, the historical industrial revolution context of the future Fab City Hub sites was important to capture, but was not of immediate relevance to the pilot teams. Yes, there used to be a factory. Yes, people worked here to build ships. Yes, huge machines made loud noises here as people worked tirelessly at the conveyor belt. But, when it comes down to it, the current and future people, mainly craftspersons, designers, artists and makers, who breathe life into the Fab City Hubs, appreciate the former industrial sites only because they happen to be there. First, those spaces happen to be spacious, and due to the processes of deindustrialisation, they happen to be (but not for much longer) cheap. Second, those spaces diffuse a culture of making and engineering that make them good candidates to engage in dialogues about the future scenario of production and alternative ways of living within the spaces. Finally, these spaces enable creativity as a broader community of makers, but also artists and other creatives, take root there.

Lesson learnt 2: **It's not only about the space, but it's also about the stuff we make**

Another initial aim we took to heart during the project was to help the pilots study the 'heritage values' of the buildings, or other physical traces of the industrial past on the site of the future Fab City Hub. After all, the call of the European Union had indeed suggested that it was these physical spaces in urban settings which could - perhaps, through the transformative potential of heritage - be a key to successful, inclusive, and local productivity.

With that in mind, we started to provide tailor-made training courses for each pilot team on how to use Emotion Networking. By making visible the constellation of relations a wide group of actors might have (or not) to the building or physical trace at hand, we imagined the tangible architectural assets, the abandoned sites' key buildings - would be the core topics of investigation. Instead, what we found was a much broader interest in using Emotion Networking to investigate concepts, in particular those related to crafts and making. Going further down this rabbit hole, we found ourselves and the pilots struck by the strong potential of investigating 'wool' or 'wood', or 'plaster'. Pilots themselves could adopt this approach and collaboratively map emotions and positions people and other stakeholders may hold in relation to 'tomato sauce' or 'mushrooms'.

We incorporated these insights in the design of our Living Archive Alpha version, stipulating that Fab City Hubs could create local exhibitions in their spaces around what they make, who makes it, and how. Practices and materials around making are after all what the fab (fabrication) in Fab City Hub is all about.

However, those practices need to be nuanced. First, several pilot conversations made us realise that hubs have real needs regarding

learning about and valuing the past. One pilot partner shared with us the frustration that '*many of us in Fab Labs, it seems, are stuck in the present*'. Second, careful attention needs to be taken in the selection of stories and more generally in the communication impact of narratives and sharing practices, as this can also create inequality in regards to the stories that are not told or made visible. Finally, appreciating the importance of making and crafts, as it remains visible in a number of Living Archive stories, can be seen as a romanticisation of reality, as being utopist change-makers, or as business advertisement strategies.

Therefore, the key insight here was to come up with a way to ensure a certain level of contextualisation, and a query into change of time. History, as an act of narrating how something was before the present, was to have a space in the co-curation of the Living Archive not (necessarily) through a re-telling of an industrial (forgotten) story, but through starting points in the present (e.g. that shoe shop), which are rooted in a perceived, remembered past (which opened on this corner forty years ago), that broadens the perspective of the reader and gives space to the narrator that is otherwise not available (and has been here through times of poverty and now is facing closure due to gentrification).

It has also been very impressive to see the specific role of every-day objects featured in exhibitions within local Living Archive work by the pilots. Sometimes these every-day objects were co-collected in collaboration with members of the public and put forward with a new meaning. Other times they were used as an illustration in relation to industrial functions that have disappeared.

So where did that leave the industrial revolution? One might say nowhere (it is not mentioned), or everywhere (the very processes instilled in almost all of the stories are related to urbanisation, migration, commercialisation, etc.). At least now the stories collected and presented at the pilot sites were narrations that held historical information that can be used as inspiration for post-industrial societies.

Image 10. *Heritage in the eye (or screen) of the beholder*, CENTRINNO consortium member visits an industrial heritage centre as fieldwork, 2023.



Lesson learnt 3: **It's not only about the stuff, it's about political engagement**

A somewhat narrow view on making and makers emerged. Despite our narrative structure which made all pilots stick with a singular narrative story, our understanding was still lacking certain depth. Over the last year and a half of the project we frequently convened pilots in what we called a 'Heritage Working Group'. In this forum we mainly elaborated on the co-design of the Living Archive, but on several occasions we sought to actively problematise our collective approach to the concept to date.

One such session focused on the ethical component of our collaborative co-collection efforts. One might say it was a last-ditch effort to bring to the table the complicated issue of power relations. Heritage-as-usual tends to uphold a status quo. If not consciously provoked, unheard voices might remain unheard. And wasn't the industrial revolution a gigantic colonial endeavour which created dramatic unbalanced interdependencies, and only strengthened extractive, polluting and exploitative systems? Would romantically celebrating the maker be enough to subvert this?

This provoked a mindset shift and prompted several pilots to review their local curation efforts; not only were they seeking out stories, but they were also sharing new perspectives to **ensure that unheard voices could be found**. New stories creatively written emerged. For example, one story talks about the perspective of a building which served a communal purpose under different political regimes, opening up questions relating to different political cultures and their legacies. Likewise, another story explores shifting political norms on the issue of gender.

Yes, stories of makers and making are the stuff that gets Fab City people excited, but without the political gaze (on gender, pollution, systems, and power), one may wonder if the discussion can really open up to wider inclusion and change. By weaving together artefacts, processes, cultural, and political contexts across time, through stories and narratives, Fab City Hubs can be seen as places of expression fostering necessary debates. A sense of activism is present in many hubs that does not have to be lost with institutionalisation.

Image 11. *Fieldwork for co-collecting every-day life, CENTRINNO consortium practises how to go out and co-collect traces of the past.*



CONCLUSION - GOING FURTHER

Three questions to ask ourselves when engaging with action-research on Heritage

If you are going to apply the CENTRINNO approach in your area, and you are seeking to 'curate the past in the present toward the future', as it is stipulated in the Fab City Hub Toolkit, you may ask yourself:

- To what extent do I, and my team, possess historical awareness of the area and actors present in this area?
- Which perspectives could I investigate further using the CENTRINNO methods to build multi voiced narratives?
- Are there specific norms you seek to challenge and how might you amplify unheard voices in order to achieve that?

Feedback from the authors on the cooperation in CENTRINNO

Research by design feels unsettling, unsafe, and unsure. We have constantly wondered in this project 'where are we actually going to do some research', only to find out later that throughout our efforts to discuss, align, exchange, align again, elaborate, present, test, and pitch, we had actually been researching quite intensely the subject matter at hand. This is one very strong insight which has only been possible through the CENTRINNO project.

Opening new horizons for future research

Heritage still reminds people of fixed, static, and formalised places or practices. We feel it is our duty to make this definition more fluid, instead opening it up as a means to subvert norms, challenge power relations, and empower all actors involved to 'make heritage'. What exactly then is or is not the role of historical knowledge, seems to be a secondary thought. And that - at times - still feels unsafe.



FAB CITY HUBS AS INNOVATION SPACES FOR NEIGHBOURHOOD REGENERATION

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Carlotta Fontana Valenti & Francesco Cingolani

Volumes^[20]

Volumes is a laboratory for sustaining and fostering innovative practices in cities by helping organisations to develop a third space for innovation and transition. Volumes develops research, runs educational programmes, and consults on innovation both for spaces and material objects. We are a group of experts in sustainable urban development, architecture, design, and innovative technology for production.

Volumes envisions a city where makers, artists, and sustainable producers foster the development of innovative space for creative solutions, inclusive territories, and a more balanced relation between cities and bioregions; its mission is to support projects that further these values.

INNOVATION SPACES

Defining and situating the key concept

Innovation Spaces are defined as *physical and hybrid spaces in which innovative productive activities are experimented with from the bottom-up, based on collaboration between different stakeholders and a democratic access to technology and knowledge. CENTRINNO is based on situated and contextualised action by new constellations of stakeholders, productive activities, economy, and urban space.*

Space is and will always be a contested and crucial topic to address when we talk about urban regeneration in cities (as well as in rural contexts). Humans and non-humans interact in space and time and the city's fabric is the result of these interactions. Nevertheless, if we want to live in thriving and liveable cities we should pay attention to how, by whom, and for whom this space is produced. If we want to live in cities that are inclusive, sustainable, commonly shared, and safe, we should strive to support the creation of spaces that allow the above mentioned principles to flourish.

Fab City Hubs are defined as:

- *permeable spaces for citizens and organisations to experiment in synergy with makerspaces, Fab Labs, etc. (but also Bio Labs, Food Labs and other creative and productive hubs) on productive and circular practices connected with their local reality (both materials and peoples)*
- *they are also the physical embodiment of the five key concepts.*

Fab City Hubs aim to be the spatial materialisation that supports action and interaction among different actors following the five key principles in order to achieve structural change in the way we produce.

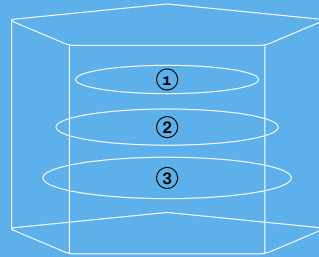
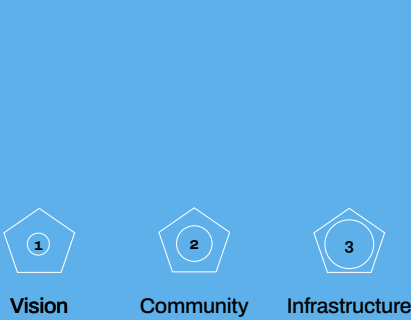
Fab City Hubs aim to be the spaces where this structural change starts, originating at the neighbourhood level and then scaling up to other areas of cities and bioregions.

In particular, Fab City Hubs as permeable, multi-functional and multi-disciplinary typologies aim to demonstrate that space (physical but also digital) is the mi-lieu where innovation can happen.

Image 13 (right). *Fab Lab Barcelona gathering, Fab Lab Barcelona.*



Deploying Innovation Spaces in each of CENTRINNO's action areas



Focus on Innovation Spaces

1

Fab City Hubs as innovative spaces should embrace the following aspect in their vision:

- They should be anchored to their own context, responding to real needs. Mapping the surrounding ecosystem will be an integral part of FCHs.
- FCHs need to be thought of as a learning ecosystem, facilitating connections with actors, resources, and opportunities.
- Fab City Hubs should facilitate actions and activities that help communities value and care for their heritage.

2

Fab City Hubs as innovative spaces should engage with and establish long lasting collaborations with a large number of citizens of all sorts. They should be arenas for open discussions and public participation, they should promote collaborative forms of governance, and democratic decision making. They also have to be managed and supported by a dedicated operational team with clear roles and responsibilities.

3

Fab City Hubs as innovative spaces should take care of organising and setting up their physical and digital infrastructures. FCHs are in fact multidimensional and hybrid spaces simultaneously digital and physical. Those two aspects should be seen synergistically to strengthen impact at local and global levels.

Approach and tools to support pilots

1

We supported pilots in designing a coherent Vision for their FCH through the elaboration of the 10 principles (in particular principles 1 through 4) and the Q&A. For further details and a more accurate look at the correspondent steps and selected tools, see the section Crafting The FCH vision in the Fab City Hub toolkit.

Beside the material that can be found within the FCH Toolkit we also designed a series of thematic workshops and training sessions during the fourth years of research that supported pilots on this topic.

For example, the webinar series FCH Voices^[19] is one of these resources, or the Creative and Productive Hubs Journal which is an in-depth analysis of inspiring cases of CPHs in Europe in the last 40 years.

2

We supported pilots in designing a coherent community engagement strategy for their FCH through the elaboration of the 10 principles (in particular principle 5 through 7) and the FAQ. For further details and a more accurate look at the correspondent steps and selected tools, see the section Building the FCH Community(ies) in the Fab City Hub toolkit. Beside the material that can be found in the FCH Toolkit, we suggest a look into the step dedicated to Governance.

Beside the material that can be found within the FCH Toolkit we also designed a series of thematic workshops and training sessions during the fourth years of research that supported pilots on this topic. For example the webinar series FCH Voices^[19] is one of these resources, or the Creative and Productive Hubs Journal which is an in depth analysis of inspiring cases of CPHs in Europe in the last 40 years.

3

We supported pilots in designing a coherent community engagement strategy for their FCH through the elaboration of the 10 principles (in particular principle 8 through 10) and the FAQ. For further details and a more accurate look at the correspondent steps and selected tools see the section Establish the FCH Infrastructure(s) in the Fab City Hub toolkit.

Beside the material that can be found in the FCH Toolkit at this link, Volumes organised a series of thematic sessions dedicated to Business Model and Spatial strategy for FCHs.

For more detail we suggest having a look at these specific sessions in the Toolkit for finding key aspects, tools and methods:

- Design your FCH business Model
- Find your FCH Spatial Strategy

Recommendations for addressing Innovation Space

Innovation spaces are diverse and unique, context-based and purpose and community-driven. When launching a new project, we recommend you to get inspired by other initiatives and to position your project among the diversity of typologies of places. Get to know and visit places. If you are interested in Fab City Hubs, you will have to organise and materialising the setting up and opening of your place by fostering productive and sustainable actions; such as cultural and artistic works as well as productive and manufacturing activities for citizens. The Fab City Hubs Toolkit will inspire you and help you to define and methodologically support you in the setting up and management of your space.

FAB CITY HUBS TOOLKIT

The main aim of the Fab City Hubs Toolkit is to be a hands-on manual for supporting interested organisations, municipal representatives, or institutions in launching Fab City Hub Initiatives in their local context.

This could encompass a range of different cases. For example, it could be an organisation that aims to transform their innovative space into a Fab City Hub, a municipality that aims to provide a space and support a project for an FCH in their city, an organisation willing to develop a project focused on production seeking for an available space, or a foundation opening a space focused on circular economy with the objective of consolidating a community of practice around that space.

The toolkit is a practical resource, enriched with tools, templates, and practical activities aimed at supporting the organisation of workshops, activities, and events to launch or strengthen specific Fab City Hub initiatives.

How can it be accessed?

<https://volumesmedia.gitbook.io/fab-city-hub-toolkit/> ^[12].

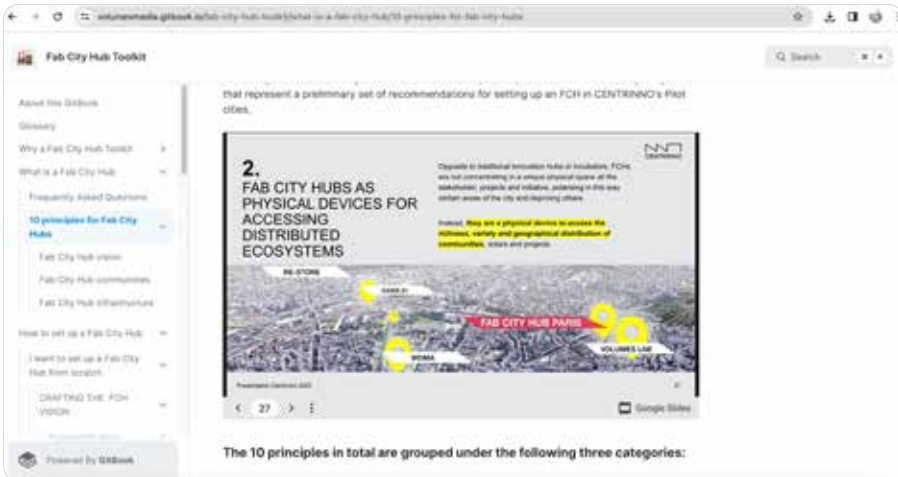


Image 14. Page of the Fab City Hubs Toolkit

RESEARCH DIARY - POLLINATING DISTRIBUTED INNOVATION WITHIN FAB CITY HUBS

by [Carlotta Fontana Valenti](#)

Introduction

CENTRINNO, as a research action project, has focused its efforts on crafting a vision for regenerative neighbourhoods by designing strategies that are able to showcase the value of underused industrial areas, transforming them into innovative places, called Fab City Hubs capable of fostering sustainable, inclusive, creative, and productive practices and communities.

Within this larger scope, Volumes, as an innovation laboratory of researchers and urban designers working for the activations of places for innovation and creativity, was asked to reflect upon the power that space and space design have in fostering innovation and creativity, as well as to co-design with Pilot Cities processes, tools, and methodologies for launching Fab City Hubs.

To be more specific our main mission during CENTRINNO was threefold:

- **Define** what a Fab City Hub is by understanding and building a global vision of what an innovative typology should embody and how it operates;
- **Support** pilot cities to design local models of Fab City Hubs, by adapting a global vision to a local context;
- **Connect** the nine Fab City Hubs to act as a glocal (global and local) network that aims to facilitate the replication of these models, while also working consistently to expand and update knowledge on the subject.

In order to respond to these three goals, we (the Volumes team) as researchers and actors directly involved in setting up these places in Paris and other regions¹, started by posing a set of research questions to help us, together with the pilots, to orient action and design processes to achieve those objectives.

First, how can we define and design tangible and replicable urban models fostering innovation when the very nature of these places is highly hybrid and multifunctional as well as context related and evolving in time?

Second, how can we support pilot cities in defining and implementing their local model of an FCH, when by definition FCHs are an emergent typology that are being tested during the project?

Last, how can we create a sense of a glocal network of multiple identities under a unified model?

1. [How to reclaim a heritage site back to the people, the CENTRINNO way article by Volumes.](#)

Lesson learnt 1: **Innovation cannot be planned or designed. You can only create the conditions for it to flourish**

Drawing upon our experience in Paris^[21], where we successfully activated and launched places for creative production, Volumes undertook a mission in CENTRINNO to delineate the key features and characteristics that a Fab City Hub should embody to function as a platform for sustainable innovation and creativity. This led us to be confronted with very practical questions such as distinguishing between different forms of labs, such as Fab Labs, Co-working spaces, as well as Creative and Productive Hubs^[22]. Inquiries arose frequently, from both the pilot cities in the initial stages and throughout their experimentation process, as well as from the broader community of the Fab City Global Initiative, with some of its members being part of the CENTRINNO consortium.

To address all these inquiries effectively, we looked at clarifying the fundamental question of our role as both researchers and practitioners. As strategic urban designers and researchers, we perceive our role not as holders of an absolute 'truth' or providers of a singular 'solution' as the result of our expertise, data collection, interviews, and research insights. Instead, we viewed ourselves primarily as **facilitators of (co-created) processes**. These processes enabled organisations and individuals to formulate strategies tailored to their local challenges. In a subsequent phase, our objective was to 'extract' replicable and inspiring examples from Pilots' experimental actions.

In the process of conceptualising a global vision for Fab City Hub models, our intention was to avoid creating a checklist defining the characteristics of a Fab City Hub or establishing the categorization of entities. Instead, our focus was on crafting a flexible framework and proposing research pathways.

These pathways were intended to be challenged by the pilots throughout the project duration, allowing them to develop their unique model of a Fab City Hub. This approach aimed to tackle two key challenges underpinning our objectives: defining something inherently hybrid, multifunctional, evolutionary, and adaptable to its context, and supporting and defining something that would undergo experimentation during the project.

Our initial steps in this direction involved understanding the positioning of Fab City Hubs within the broader context of Creative and Productive Hubs and collaborative spaces. We aimed to better understand how these innovative spaces have influenced the reconceptualization of key topics in our research, such as production, innovation, and knowledge, through their spatial arrangements, organisational structures, and governance models. Subsequently, we analysed over twenty Creative and Productive Hubs, conducting interviews with their initiators to identify recurring patterns, primary challenges, and potential opportunities for their local environments. From this exploration, we extracted and shared inspirational stories to initiate the development of a shared vision with Pilots about Fab City Hubs.

In conclusion, as we distil essential insights from our analytical work on Creative and Productive Hubs, we have delineated 10 foundational principles for Fab City Hubs. These principles functioned as investigative pathways throughout the duration of CENTRINNO, offering guidance and presenting challenging inquiries to Pilot Cities - and to other organisations in the future - as they design and implement their distinctive models of Fab City Hubs. The 10 principles provide a certain degree of flexibility, especially evident in defining the spatial structure and strategy of FCHs, as well as establishing the interplay between their physical and digital infrastructures.

Lesson learnt 2: How to set up a Fab City Hub: Vision, Community, and Infrastructure

During CENTRINNO, Volumes undertook a crucial mission, which involved creating a practical manual for the replication and dissemination of Fab City Hubs across European urban environments and beyond. The challenge faced in this endeavour was twofold:

- How can the FCH Toolkit be designed to be flexible and evolutive while ensuring a structure robust enough to offer guidance and support to pilots in their experimental processes?
- How can a Toolkit collect resources, tools and methodologies to inspire and be utilised by other organisations, after CENTRINNO, undertaking similar journeys but in different contexts and with diverse needs and objectives?

To address these questions with comprehensive answers, it was imperative to gain a clearer understanding of what a Toolkit for FCH implementation entails, how it might be structured, and what it should encompass.

A Toolkit, by definition, is a curated and contextualised compilation of adaptable tools, methods, and best practices aimed at acquiring knowledge about a specific issue and identifying effective approaches for addressing it. What differentiates a Toolkit for a Toolbox, for example, or from a 'how to guide' is its ability not only to furnish relevant tools but also to impart an understanding of a process, propose potential approaches, and provide guidance through that process. Typically, the toolkits we have analysed incorporate maps and diagrams to enhance comprehension of various steps, their sequence, and to suggest possible paths to follow in order to achieve the desired goal.

In our case, the topic we wanted to gain knowledge about, setting up an FCH, was a process in the making. How then could we make sense of the diverse situations in which each pilot city was embarking, especially considering that FCHs represented a typology not yet clearly defined? How could we guide the pilots in their endeavours when each city had specific needs and varied starting points? For these reasons the design and development of the FCH Toolkit needed to overcome the linear and bidimensional aspect of listing a set of consequential steps and correspondent tools that need to be followed and needed to be structured in order to be as flexible as possible to adapt to possible different ways of navigating through its resources and steps to gain the final result.

This approach led us to divide our work into three different main blocks of work that would have planned future actions and interaction with pilots and partners.

Image 15. Community Gathering in Kopli93, Tallinn Pilot.



Operationalising the conceptual approach with the Fab City Roadmap

This work consisted of a first instance of translating the 10 principles for FCH into operational steps. A set of 14 steps that pilots and further organisations need to take into consideration when they start a process of activating an FCH.

These 14 steps constituted the FCH Roadmap, a flexible but comprehensive way of approaching the process of setting up an FCH from scratch. Along the lifespan of the CENTRINNO process the FCH Roadmap would have the threefold objective of:

1. **Orienting Pilots through their journey** with a strategic set of actions to better plan how to reach the final goal
2. **Co-designing FCHs in a collaborative way** using a communication tool that translates theory into practices
3. **Adapting and further updating the Roadmap itself** and the steps according to pilots' insights from the ground. Maybe some steps would not make sense at the end of the project, or additional ones would emerge as was the case for the step on learning ecosystems and the step on curating the past toward the future.

Two ways of navigating in the Toolkit

We identified two main ways pilots may navigate through the sea of resources the Toolkit will have offered:

1. The first, called 'I want to set up a hub from scratch'^[23], suggests following the FCH Roadmap in a free and flexible way.
2. The second is more challenge oriented and is called 'I want to work on a specific challenge'^[24]. This second approach to the Toolkit is thought of for those pilots or future organisations that do not need to follow a comprehensive process; they already have a plan of actions and aim to find specific tools for specific challenges. The challenges we have identified correspond to the five key concepts of CENTRINNO.

Documenting and collecting resource with the CENTRINNO tailor made tagging system

Another important task in our work was to plan the collection and categorisation of useful tools and actions derived from our practices, both from our work as researchers but also and foremost from pilot experiences. Three iterations allowed us to collect tools and practices from pilots and our main partners. In the final version, three categories of tools are presented: Tools collected from other projects but relevant to CENTRINNO, tools and journeys developed or tested by pilots, tools and methods developed and used as design collaborative tools during the CENTRINNO project.

To each of these tools a CENTRINNO tailor-made tagging system has been assigned by both pilots and partners based on their expertise with the specific tool. This **tagging system** serves as a suggested set of tags to analyse, test, and assess the resources selected within the FCH Toolkit. It encompasses the **five key concepts** and the **14 FCH Steps**. By consequence, the collected tools will enhance and contribute meaningfully to the Fab City Hub Roadmap and its steps, providing hands-on support for the crucial aspects of establishing an FCH, namely Vision, Community, and Infrastructure.

This toolkit is designed in an agile way, open to future contributions, evolving with practices and people from Fab City Hubs.

Lesson learnt 3:

Space matters: Fab City Hubs are located, distributed, and digitally connected

One of the primary goals of CENTRINNO and a significant aspect of Volumes' mission throughout the project was to better capture the nature and diversity of what makes Fab City Hubs, and analyse what their spatial strategy looks like.

The project has consistently emphasised the hybrid and multi-layered nature of Fab City Hubs (FCHs). For instance, in the FCH Toolkit, we underlined the significance of conceptualising these infrastructures as spaces that exist simultaneously in both physical and digital dimensions². While the physical aspect of an FCH is vital for building long lasting impacts for the surrounding territory, fostering neighbourhood interaction, and serving as a landmark in the city, it is equally crucial for these physical entities to evolve in synergy with a digital space. This digital realm enables expansion beyond the physical walls, facilitating broader reach and connectivity.

Applying a multi-scalar thinking approach allows Fab City Hubs (FCHs) to establish connections with actors and find opportunities across scales, from industrial sites, to neighbourhood, city and bioregional scales. This approach also facilitates interaction and exchange with globally distributed communities of practice. Throughout these four years of research, overcoming the challenge of clarifying and highlighting the essential interconnectedness of these two dimensions has been a central focus and a difficult challenge with pilots. Many times, there was a perception of these dimensions being in opposition, leading pilots to prioritise one aspect over the other.

Some pilots for example declared, at the beginning of their experimentation process,

that they were struggling (both for conceptual and for practical reasons) to envision their Fab City Hub as a physical space and they thought their FCH could only be a digital network connecting distributed actors across the city. Nevertheless during the course of their experimentation process many key activities were organised in significant (industrial) spaces of their city.

Others started with a distributed approach by connecting existing Maker's workshops in their neighbourhood and evolving in both designing a digital platform for both larger engagement and participation of the network as well as indicating a specific space among those parts of the network that would be the official headquarter of their Fab City Hub Initiative.

Adopting a multidimensional spatial strategy can be difficult mostly at the beginning of regenerative processes where local stakeholders need to prioritise actions and objectives according to their local context and their in-house expertise. Thinking simultaneously of their hub as localised, distributed, and digital is not always evident. In CENTRINNO, the pilot practices nevertheless learnt to deal with this multidimensional aspect of their Hubs and did affirm that it makes sense for long term sustainability. For example, even though Tallinn declared that the digital aspect of their Hub was not a priority and they were focused on concrete actions with their local community in Kopli93, at the same time their Hub's activities were followed and liked by many in their social media account and they also ended up in organising specific webinars for soil pollution.

The main takeaway is that, when effectively integrated, these dimensions enable FCHs to fully harness their potential as innovative spaces for sustainable and just transitions.

2. Check [this FCH Step](#) in the FCH Toolkit.

CONCLUSION - GOING FURTHER

Three questions to ask ourselves when engaging with action-research on Innovation Spaces

- When you start research on a given topic, for example innovation space, make sure that you and the people with whom you are conducting/co-creating the research have a common understanding of the language you are using. In research, mostly interdisciplinary research, there are many conceptual frameworks and research fields that can give the same concept a different meaning. Do not hesitate to ask yourself and to your peers, banal questions such as: What is innovation? How would I represent an innovative space? What is space? What does it mean for us to build an innovative space, or even more complex an innovative place?
- Another important question that needs to be answered is about our role and positionality. This leads to two different questions: what is the role of the research consortium in answering the main research question, and what is my role within this specific consortium both from my professional standpoint but also as an individual?
- Finally, reflect back on the impact of your actions. Ask yourself: how are my research practices, my actions, and my thoughts understood and perceived by others? Have I been clear enough? Did I provide an exhaustive explanation to the audience so that they can contribute their best?

More personal and tailored exchanges are sometimes needed when you are part of a big research consortium. Informal discussions are sometimes more effective and insightful than templates and email.

Feedback from the authors on the cooperation in CENTRINNO

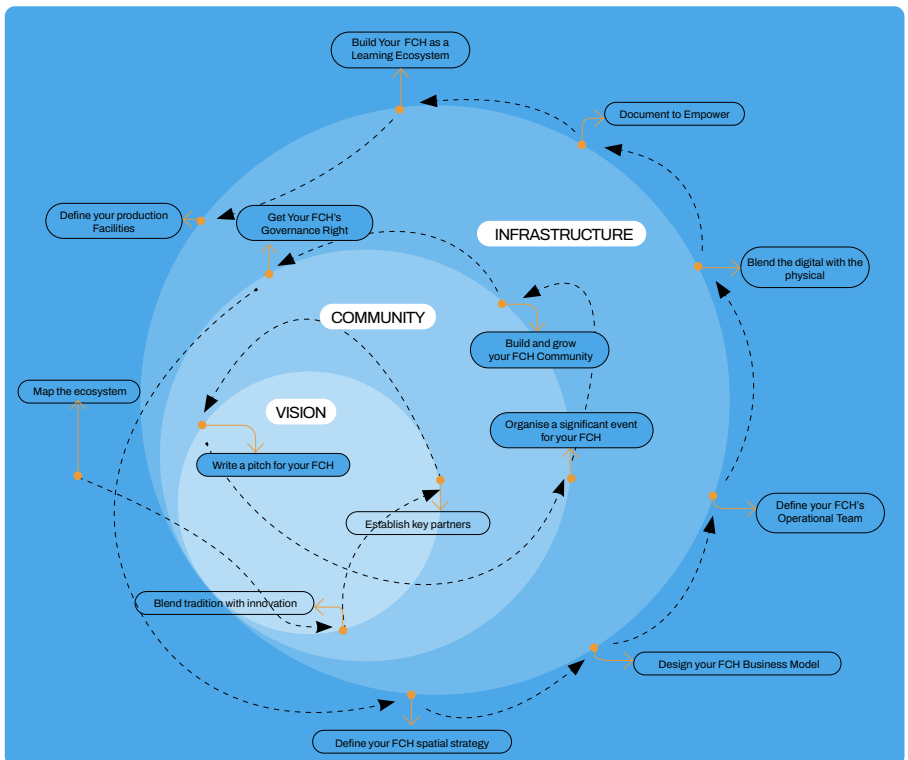
I have come to understand that in-person meetings and informal moments are essential for conducting meaningful research actions. In my future research practices, I plan to organise more interactive and enjoyable workshops, along with fellowship exchanges. I believe that in research, one of the crucial factors to consider is fostering empathy with the individuals you collaborate with. Testing the experience of being in someone else's role is crucial for gaining a better understanding of their objectives and perceptions.

Opening new horizons for future research

The primary enduring outcome of Volumes' work in CENTRINNO is the Fab City Hub Toolkit. Its value and effectiveness as a legacy depend on its continuous evolution, drawing from on-the-ground practices, theoretical work, and ongoing research. **We extend an invitation to pilots and organisations to actively utilise and share the FCH Toolkit as a dynamic resource. We encourage its promotion, testing, challenges, and regular updates in both content and resources.**

To facilitate engagement, you can maintain contact with Volumes through their dedicated webpage^[25] with the Fab City Foundation, our main active partner on this subject. The Foundation is entrusted with the mission of implementing and disseminating this effort within the Fab City Global Community worldwide. Volumes is committed to keeping this platform alive by endorsing and implementing the Toolkit in upcoming research proposals. Additionally, we will integrate it into our projects for innovative spaces in France and in various other regions in Europe where we are involved in project development.

Figure 16. Fab City Hub Toolkit Roadmap.



TRANSMITTING SKILLS AND NEW VOCATIONS

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Cristina Olivotto & Carolina Becker

Onl'fait^[26]

Onl'fait is a Fab Lab based in Geneva that aims to transform the way we learn, consume, produce, and share by exploring the intersections of technology, society, and sustainability. Their areas of expertise and focus are summarised under four concepts: understanding, learning, making, and sharing. Leveraging its human and technical resources, Onl'fait actively engages in applied research projects concerning digital manufacturing, science, and technology education. The reflections and outcomes of these projects enrich other application domains, ensuring a cutting-edge approach. In the context of CENTRINNO, Onl'fait coordinated the actions related to vocational schools and the establishment of learning ecosystems in urban industrial transformation contexts.

LEARNING ECOSYSTEMS

Defining and situating the key concept

Thanks to increasing research and interest, there are many definitions of Learning Ecosystems abound, each revolving around a similar theme – **a system or group of people, coming together with their resources to support the evolution of learning within their community.** Transitions toward locally productive systems require the preservation of specific skill sets of knowledge while developing new competencies that create new profiles of professionals. Providing innovative spaces and fostering multi-stakeholders and cross-disciplinary collaborations for development and education is an engine for driving the development of new economic models in ways that revitalise neighbourhoods and create wider-ranging opportunities for local communities and entrepreneurs. Learning Ecosystems help to explore the ways craft knowledge is transmitted. Moreover, they allow for the rethinking of current and new programs of activities; these forms of collaboration achieve an enhanced societal and economic valuation of crafts and manufacturing techniques that are aligned with a future-oriented approach towards heritage in Europe.



Image 17. Open Geneva Hackathon with university students about waste from woodworking, Open Geneva.

How does CENTRINNO address the concept?

The concept of Fab City Hubs addressed by the CENTRINNO project involves developing activities and programs within physical spaces that serve as convergence points for diverse stakeholders, resources, interests, and knowledge. These hubs act as intermediary spaces where academia, institutional actors, and citizens collaborate and exchange ideas to create new forms of knowledge. Facilitating collaboration and close partnerships with educational institutions, especially vocational schools, is highlighted as an important orientation for CENTRINNO partners to bridge the gap between learning environments and a city's socioeconomic landscape.

All CENTRINNO pilot initiatives centre their training activities on lifelong learning to align vocational and post-vocational training with the skill requirements of an inclusive and sustainable 21st-century economy^[27]. This support enables pilot cities to bridge the divide between formal and informal learning methods and to address evolving skills and job markets.

1. The strategy and implementation of CENTRINNO have been developed hand-in-hand with pilot cities to achieve several key objectives:
2. Redefine and re-establish the value of craftsmanship in contemporary contexts.
3. Ensure vocational and post-vocational training programs better align with the economic landscape.

4. Drive innovation by integrating digital technologies into artisanal processes and creative industries, drawing from previous experiences in Fab Labs and makerspaces.
5. Identify crucial skills for the transition towards a circular economy and develop programmes to integrate these skills into the learning path of future craftsmen and adult professionals.

The realm of Learning Ecosystems stands as an established field of research and interest, fostering engagement among a diverse array of stakeholders who connect more traditional educational organisations with less conventional learning providers in local open spaces. This collaboration aims to facilitate the discovery of innovative learning solutions and pathways. While most educational innovation tends to occur within favourable contexts like academic high schools or primary schools, where teacher and student motivation, as well as curriculum flexibility, allow for the integration of new practices, CENTRINNO focused primarily on vocational schools, unemployed professionals, craftsmen seeking new avenues, and diverse local communities. Often overlooked in discussions, these specific target groups possess a natural inclination to operate in systemic ways and closely collaborate with the job market. Consequently, they serve as ideal partners for expanding networks and refining practices by embracing concepts pertinent to green and digital transitions.

Deploying Learning Ecosystems in each of CENTRINNO's action areas



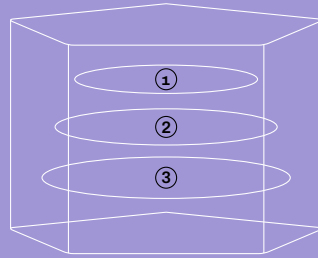
Vision



Community



Infrastructure



Focus on Learning Ecosystems

1	2	3
Open, multi-stakeholder spaces and programs are essential for training, enabling individuals to acquire skills and knowledge to adapt to existing jobs, prepare for new ones, or tackle daily tasks requiring a circular or digital approach.	At the core of a Learning Ecosystem is establishing a community with learners at the centre.	An equipped physical space where learners and relevant stakeholders can make and exchange is crucial.

Approach and tools to support pilots

1	2	3
Given the breadth of education in terms of audience and content, pilots were supported in understanding their focus based on the city context and provided examples and inspiration from existing practices.	A CENTRINNO school roadmap was developed to encompass all steps to develop educational programs, including stakeholder mapping, researching existing networks and practices, and more.	Most partners have established or collaborated with central and distributed spaces within or outside of schools, serving as hubs for learning, making, and sharing.
They were offered a checklist to prompt reflection on embedding CENTRINNO school criteria, such as addressing local issues and acquiring skills, among others.		

Recommendations for addressing Learning Ecosystems

- Make sure you have the knowledge to teach both technical and other transversal skills that match what your audience needs.
- Cultivate trust and work closely with a school, an educational institution, or the public sector.
- Understand what schools really need in practical terms, and remember they often *have a lot going on*.
- Identify your role and niche among the diverse stakeholders in education, then remain committed to fulfilling that role.
- Foster cooperation and build trust with governmental offices for unemployment or social services.

CENTRINNO SCHOOL

CENTRINNO school comprises a collection of methodologies, tools, and approaches designed for any organisation seeking to develop educational programs focused on circular and digital manufacturing, aiming to create a local societal impact. Targeting diverse groups such as communities, formal educational institutions, and adult professionals seeking to broaden their competencies, the CENTRINNO school aims to foster learning environments where a multitude of stakeholders contribute to learners' experiences in acquiring both technical and transversal skills.

How can it be accessed?

All tools, approaches, and frameworks developed for the CENTRINNO School are included in the Fab City Hub Toolkit.

<https://framework.centrinno.eu/centrinno-framework/fab-city-hub-toolkit> ^[28].

RESEARCH DIARY - GROUNDING CHANGES WITH LEARNING EXPERIENCES AND LIFELONG LEARNING PROGRAMS

by Cristina Olivotto



Image 18. *Icelandic textile cooperation*, Icelandic Textile Centre.

Introduction

Learning and sharing knowledge are central in Fab Labs and Fab City networks. Makerspaces operate at the convergence of science, technology, and society, proposing and testing new ideas within both formal and informal learning environments. They serve as a place for understanding, learning, and making. Sometimes Fab Lab members function as researchers, other times as practitioners.

This positioning comes with a unique advantage as it offers the possibility to inform university researchers about learners' needs and constraints while introducing innovative learning methods to adults, students, and educators in maker communities. Open Schooling is an emerging learning practice supported by the European Commission that was introduced in Fab Labs and other organisations such as museums and community centres over the last several years. The ecosystem of makers and researchers acknowledges the societal challenges of 21st century education. Meeting these challenges demands integrating knowledge and expertise from diverse societal actors, employing more innovative, efficient, and open methodologies. This calls for developing meaningful and inclusive connections between scientists, schools, universities, enterprises, civil society, governments, and local communities.

Thanks to the active and frontrunner role of Onl'fait in promoting this vision across the maker environment, CENTRINNO partners were able to engage with CENTRINNO Schools as an opportunity to discover for some and delve further for others into open schooling and learning ecosystems from two perspectives. Firstly, they looked at expanding their focus, shifting to urban manufacturing and sustainability, reinforcing connections with vocational schools, craftsmen, and organisations, as well as exploring new production and consumption methods. Secondly, initiatives developed within the nine pilot cities have fostered learning ecosystems for various target groups beyond primary and secondary schools—such as professionals, universities, and communities. These collaborations involved CENTRINNO partners as different mediators - universities, maker labs, schools - leading to distinct dynamics within the learning ecosystems.

By promoting an open schooling approach, each pilot explored diverse learning ecosystems related to urban manufacturing and circular economy, refining clear criteria and objectives to define a CENTRINNO school programme. Most pilots had developed substantial educational experiences: Onl'fait's role was primarily focused on providing tools, feedback, and inspiration to identify promising areas for investment and to underscore the benefits of a learning ecosystem. In the following sections of this chapter, we invite the reader to discover three inspiring learning experiences that illustrate diverse forms of collaboration encouraged by CENTRINNO Schools.

Lesson learnt 1: The future of fashion lies in creative repair

In the past year of the CENTRINNO project, Milan partners collaborated with Caterina da Siena Secondary School, engaging 28 students on the theme of 'cities transitioning towards a circular economy'. These students voluntarily joined a school-to-work alternation, a method involving study periods at school alternating with practical training in companies. This helped them apply their skills in a real work context.

Milan was chosen as a case study due to its fruitful collaboration with a vocational school, a key focus of the CENTRINNO school program. This collaboration aimed to emphasise the importance of craftsmanship for our economies and societies. The students were introduced to digital manufacturing and sustainability in fashion through a project-based approach as part of insights from the CENTRINNO school research. ReteNEMA focused on key skills for future craftsmen: CAD modelling, rapid prototyping, upcycling, and repairing.

The primary goal was to rethink the repair process for second-hand clothing, aiming to optimise and improve processes often done by hand. Students from Caterina da Siena Secondary School collaborated in interdisciplinary groups, merging fashion and graphic design skills to create original repair concepts, focusing on creativity and design.

Their challenge was to make the repaired garments unique, attractive, and replicable, while using digital manufacturing technologies and minimising environmental impact. To facilitate this experience, Humana Vintage provided a selection of garments for repair, exposing students to various material types and intervention needs, enriching their understanding of fashion and driving the creative process.

Beyond repairing garments, students developed distinct repair concepts. Six projects emerged, each presented with mood boards, technical drawings, brand development, and label design.

The collaboration met CENTRINNO's objectives: it broadened career perspectives for students, inspiring them to delve deeper into creative repair and advocate for sustainability in fashion. It also sparked questions about young people's interest in sustainability compared to the slower transformation of the job market. This highlights the need for holistic approaches, as seen within the CENTRINNO project, where education interacts with and informs the circular economy sector. Overall, the program helped vocational training better align with the desired economic landscape for our future society thanks to the interaction of distinct actors coordinated by the Milan pilot.



Image 19. *Milano Learning Ecosystem in practice*, Milano Team.

Lesson learnt 2: Don't lose the thread

'Heldurðu þræði?' (Icelandic for 'Don't lose the thread') is a 9-week program created by the University of Iceland in partnership with the Textile Center, showcasing a successful CENTRINNO school initiative. It addresses local textile industry needs, by offering a hybrid program (online/on-site) which is financially accessible to participants. Co-creating and collaborating with the University of Iceland ensured the program met tertiary education standards, drawing from their vast experience in adult education program development.

This course targets entrepreneurs and innovators in textiles, catering to those aiming to kickstart their businesses or enhance operational knowledge. Before its launch, the team conducted a needs analysis to define the target audience, course format (online/hybrid), and primary focus. Subsequently, tailored courses and workshops were crafted to meet these needs. Although traditionally seen as a women's field, this program welcomed participation from people of all genders to challenge gender stereotypes. Likewise, the course aimed to attract participants from diverse social backgrounds across Iceland.

Attendees engaged in lectures, hands-on sessions, and accessed relevant materials. Activities involved developing comprehensive business plans, understanding strategic planning, management, marketing, branding, and leveraging social media for product promotion. Additionally, the curriculum covered topics like circular economy, gender equality, rural development, and environmental issues.

This 9-week program, hosted online every Tuesday, culminated in a visit to the TextileLab in Blönduós, serving as an educational hub, providing hands-on experience and opportunities to connect with the Lab team and local community members. This space thus

facilitated collaborations between academia, institutions, and professionals, fostering innovative knowledge about manufacturing.

'Heldurðu þræði?' empowered participants with fresh insights, connections, and skills, aiding in the development of their ideas and businesses. It provided invaluable insights to the Blönduós team regarding the needs of Icelandic textile entrepreneurs. Several participants continued their individual projects or ventured into entrepreneurship after the program. For instance, Elín Jóna Traustadóttir, who created a pillow filled with Icelandic wool, founded 'Fjallaspunni' after the course, benefiting from the knowledge to navigate startup environments and seek grants. This initiative showcased successful integration of digital technologies into artisanal processes and creative industries, drawing from Fab Lab network experiences to drive innovation. The 'Heldurðu þræði?' program illustrates how spaces dedicated to digital manufacturing can collaborate with universities, shaping a multi-stakeholder educational program that intertwines heritage, social inclusion, and manufacturing competencies.

Lesson learnt 3: The grandma skills workshops

The heritage of Kopli 93 in Tallinn is deeply intertwined with learning, placing grandma and grandpa's skills at the forefront, inspiring all other activities and innovations. This pilot in Tallinn resurrects knowledge from bygone eras, used in the area over a century ago, providing a strong foundation for local production and self-sufficiency. Heritage in Kopli 93 also embodies the ethos of 'talgud,' communal work toward shared goals. The Tallinn grandma skills workshop vividly showcases how CENTRINNO school programs not only might target communities but also draw inspiration from traditional yet innovative practices.

It emphasises the vital role of non-formal learning in today's educational landscapes, recognizing that acquiring new skills is a lifelong endeavour inside and outside of formal educational settings. This pilot effectively bridges formal and non-formal learning methods, nurturing evolving skills and reinstating the value of craftsmanship in contemporary contexts, aligning seamlessly with CENTRINNO school objectives.

Kopli 93's community exemplifies the successful revival of traditions through 'Community Wednesdays,' where voluntary joint activities have thrived for over three years. These 'Working Wednesdays' have not only fostered skill development but also instilled confidence, fostered community bonding, and provided a space for planning over shared meals—a true communal experience. While valuing traditional skills, contemporary challenges necessitate innovation, merging traditional wisdom with new discoveries. Approaches like permaculture, commons-based peer production, and design thinking—absent a century ago—highlight the necessity of blending traditional wisdom with modern methodologies for greater impact.

In developing Kopli 93, intergenerational inclusion has been pivotal, enabling the transfer of knowledge from elders to young minds. This enriches older perspectives with modern technology used by younger generations. The 'Soil is Gold' week was a remarkable effort involving diverse methods in order to engage a wide audience, providing education on soil health and regeneration via hands-on practices, family workshops, social media engagement, podcasts, panels, and discussions. Numerous training sessions, from wind turbine building to permaculture and natural material workshops, have made these skills more accessible. Techniques involving new materials ranging from algae and kombucha mushrooms to natural paints, recycling old plastic, and food waste all emphasise sustainable practices.

The grandma skills workshops at Kopli 93 underscore community building and revitalising traditions unique to the neighbourhood. They underscore that learning new skills can unite communities rather than divide generations or technological eras. Embracing a diversity of skills and perspectives is crucial for successful societal innovation. Kopli 93 stands as an educational hub and support system, nurturing the local community toward sustainable transformation.

Image 20 (right). Gardening Learning community in Tallinn, CENTRINNO's Tallin team.



CONCLUSION - GOING FURTHER

Three questions to ask ourselves when engaging with action-research on Learning Ecosystems

- Who might benefit the most from a CENTRINNO school? Should my priority lie with communities, adults, or students?
- Do I possess the necessary competencies and legitimacy to teach specific skills? What unique niche am I filling compared to the array of educational organisations in my community?
- How can I actively promote and support the establishment of a learning ecosystem for my community?
- Is certification required to establish a CENTRINNO school? If it is not necessary or beneficial, how can I ensure the quality of the training provided?

Feedback from the authors on the cooperation in CENTRINNO

Thanks to CENTRINNO, we've pinpointed a range of specific practical skills alongside broader, cross-cutting ones crucially tied to green and digital transitions. Currently, our primary emphasis revolves around these skills, particularly in our adult training preparations. Additionally, we're captivated by incorporating the notion of heritage into crafting new courses. This serves as a foundation to unearth forgotten expertise and sustainable practices, engaging an audience less inherently drawn to digital tools.

Image 21. A photo exhibition developed in collaboration with Copenhagen vocational schools, Ida Maj Emborg.



Opening new horizons for future research

During the CENTRINNO project, several questions have arisen and remain open, warranting further exploration:

- What potential do lost skills have, in repairing and maintaining objects, to become a viable business opportunity, given the cost of manpower in Europe? Alternatively, could this become a facet of community activities for individuals or be integrated into primary schools curricula?
- Is there a genuine scarcity of digital and circular skills in the job market? Should we invest in fostering these skills to create a market and subsequently stimulate demand?
- Does it make sense to integrate sustainability into the curriculum of vocational schools, or would practical learning on job sites be more effective?
- How can we ensure that manual jobs are not monotonous and unappealing to younger generations?
- What role do micro-credentials play in lifelong learning?

Chapter 5

WEAVING SOCIAL BONDS



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Marion Real, Milena Juarez Calvo, Jessica Guy & Guenda Dalcin
 Institute of Advanced Architecture of Catalonia

Fab Lab Barcelona^[29] has been working for a number of years on the topic of community engagement and distributed networks. After participating in the development of the Fab Lab network during the effervescence of the peer to peer and open source movements, Fab Lab Barcelona engaged in the topic of citizen science, enabling citizens to monitor their own environmental data thanks to the Smart Citizen Kit and co-creating local solutions to tackle societal challenges such air and noise pollution. Then, with the emergence of Fab City initiative, Fab Lab Barcelona has worked as enablers of transformation within the neighbourhood of Poblenou as a prototype for fostering the emergence of locally circular practices and alternative paths for local production. Meanwhile, our team consolidated a network of distributed designers with shared production development, peer-exchanges, collaborative projects, and residencies. Becoming a real interface for researching and promoting new forms of collaboration, connecting glocal communities of makers. Being passionate, curious, patient, applied, fairly critical, open and communicative is key for opening spaces for dialoguing the way we live and innovate in the city. The team at Fab Lab Barcelona was involved in CENTRINNO as a facilitator of a local pilot, as the technical and scientific coordinator, and as the communication manager.

SOCIAL INCLUSION

Defining and situating the key concept

Current urban systems generate social inequalities and complex phenomena in cities such as gentrification, disengagement, and identity loss that can increase isolation or emphasise violent or antisocial behaviours. Certain jobs and associated modes of living were devalued by mainstream society creating new forms of social barriers and poverty for manufacturers, artisans, and other professionals taking part in primary and secondary activity sectors. Caring about citizen well-being demands a critical look at what is unbalanced in current systems to make visible the invisible, to take action moving towards fair treatment for all, and to create safe spaces for people to feel belonging within communities and contribute to territorial transformations. Cities are developing a wide range of social and solidarity policies and experimenting with new mechanisms that support the inclusion of disadvantaged or vulnerable groups and the participation of existing populations in decision-making processes. When working jointly in defining common values around new collective identities, people engaged in social innovation processes are invited to decentre from their beliefs, learn about non-violent forms of communication, and open themselves to other visions that value diversity and embrace differences. New forms of production cannot ignore social inequalities, like lack of affordability and the tensions they generate, and it is worth anticipating them by actively developing abilities to co-create locally, to develop shared models of governance, and to engage in learning within wider international networks. Social inclusiveness can be increased by targeting a mixed audience (in terms of age, cultural background, socioeconomic status, etc.), by explicitly including vulnerable or marginalised groups in their activities, and by actively involving communities in local and global events ^[21].



Image 22. *Fabrica Poblenu, Emi Del Piccolo.*

How does CENTRINNO address the concept?

The CENTRINNO project strategically addresses the concept of social inclusion in different contexts where productive ecosystems and citizens struggle with phenomena like gentrification and lack of affordability. CENTRINNO supports such ecosystems through the concept of community engagement and open knowledge, by giving voices to citizens, and looking back at shared emotions. The project tackles the imperative of allowing **open access for all** in activities. Emerging from the communities of Fab Labs and open source collectives, partners placed a significant **emphasis on peer learning facilitation, network thinking and glocal exchanges**. CENTRINNO recognizes the importance of breaking down barriers and ensuring that everyone, regardless of background or circumstance, has the opportunity to participate fully. By promoting open access, the project sets the stage for a more inclusive and diverse engagement.

The initiative focuses on creating spaces that foster local **co-creation and multi-stakeholder processes**. By bringing together diverse perspectives and encouraging collaboration, CENTRINNO recognizes the collective strength that arises when **different voices are heard**. This commitment to inclusivity extends beyond mere representation, fostering an environment where everyone feels seen and heard. **Participatory governance** was investigated during the project, and five principles were established, demonstrating

the importance of fair decision-making processes, bottom-up deliberation, and public engagement.

In essence, the project strategically addresses the concept by combining emotion networking and a multifaceted approach to inclusivity. Through these interconnected strategies, the initiative empowers communities, fosters collaboration, and ensures that the voices of the unheard are not only acknowledged but actively contribute to future strategy design and lasting change.

Deploying Social Inclusion in each of CENTRINNO's action areas



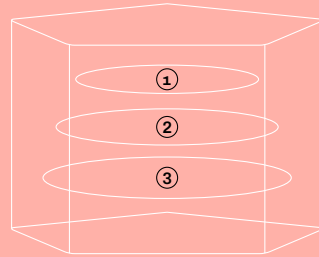
Vision



Community



Infrastructure



Focus on Social Inclusion

1

The shared vision on Social Inclusion is built on the importance of welcoming differences and adopting postures of openness.

2

CENTRINNO's network as community of practice towards social inclusion.

3

The role of open-source platforms and physical spaces as places to identify, show, and foster interactions between diverse community members.

Approach and tools to support pilots

1

Fostering the values of open source, diversity, inclusiveness, empathy, and care for overcoming unfair situations. Creating values from listening to and empathising with different views.

Consolidation of a collection of references (research papers, case studies, and existing frameworks) about governance models and organisational structures as an inspirational resource for the pilots.

2

Organised collaborative one-on-one sessions with each pilot to share challenges and findings in relation to social inclusion and community building. Fellowship program design from Fab City Foundation.

3

Fab City Slack Channel hosts CENTRINNO partners with 3 subchannels fostering online peer-learning exchanges.

Assisting the pilots willing to implement and expand other infrastructure such as Make.Work as a gateway for engaging with local manufacturers, materials providers, and creative spaces.

Recommendations for addressing Social Inclusion

- Emphasise the importance of genuine community engagement, stressing the need for local, collective, and meaningful experiences rather than mere networking.
- Highlight the significance of learning from these processes, how they transform practices, and inspire future collaborations. Prioritise the process itself over the eventual outcome, reinforcing the value of ongoing transformation and synergy creation.
- Stay aware and try to uncover what interests the community shares. Use curiosity, critical thinking, and openness to encourage working together.
- Be critical of what you consider to be an 'inclusive approach'. At times, the methods and criteria used might not fully welcome diverse perspectives or insights from others.

CENTRINNO NETWORK

CENTRINNO Network supports the development of interconnected socially inclusive communities. It has two different scales where interactions take place: The local hubs' networks where different actors will collaborate to tackle urban challenges, and the global knowledge-exchange network across the nine CENTRINNO cities and beyond.

How can it be accessed?

All the work related to the governance of the CENTRINNO Network is described in the deliverable 3.5 and summarised in CENTRINNO Framework^[31].

More information can be found on the following platforms:

- Discover the CENTRINNO website project: <https://centrinno.eu/>^[2]
- Be onboard in the Fab City Network: <https://fab.city/>^[3]
- Discover the Slack Channel: can be joined on demand
- Join a local Fab City Hub and take a look at their network
- Discover the Make.Works platform and community: <https://make.works/>^[32]

RESEARCH DIARY - AT THE INTERSECTION BETWEEN CO-CREATION, PARTICIPATIVE GOVERNANCE, AND PEER- EXCHANGE COMMUNITIES

by Marion Real



Image 23. *Make Works Catalonia gathering at the Fab City Hub Barcelona, Fab Lab Barcelona.*

Introduction

The word 'regeneration' is appealing as it suggests inner transformations in the way we connect with our surroundings - places, people, and non-living elements. It is also inspired by the metaphor of the resilience peak: the hope that after a fall, a crisis, or a drama, there is a healing process that helps to recover, repair, and feel better. Experiences of regeneration are lived at individual or collective levels and in many circumstances. When imagining regeneration processes at the neighbourhood scale, we can easily say that many motivations and historical contexts will shape its development paths. It will depend on the starting point, the vision, the people engaged in the process, and the resources allocated to the project. What matters is not only the architectural results, but what people live and learn from experiencing the process, how it transforms practices, and inspires future projects. Core reflections and learning come from people who live in the places, people that are directly engaged in the process, who give time and energy to design, implement, and participate in collective activities.

Within CENTRINNO, what is clear is that social bonds were woven across the project, at the local and global level, for a better understanding of what is currently at stake in regenerative processes.

We are not talking about networking for the sake of networking. We do think that this is crucial to foster situated collective and meaningful experiences. We are cautious and aware of the influence of social networks in our current overconnected society, and we support people seeking autonomy, well-being, and convivial ways of living. We are aware that the success of having a fair, diverse, and engaged community remains low in such a short period of time, and that this can only be measured in the long-term.

The processes experienced in CENTRINNO remain temporary moments where people united in a common vision, organised activities, and reflected on important concepts. Community engagement requires a lot of care, energy, and patience. Partners engaged in multiple paths to reach an ideal place, and they learnt from trial and error.

While wearing various hats throughout the project, the Fab Lab Barcelona team experienced and learnt a lot. With all the partners, especially Volumes, ECHN and Fab City Foundation, they were able to question the type of social interactions that were taking place during the CENTRINNO project, and to consider at which point these social experiences could generate new findings on current realities, gaps, and possible routes towards *glocal* transformations.

Lesson learnt 1: **Connecting and making sense through synergy activation and local participatory gatherings**

What brings CENTRINNO's partners together is a certain love for making and unmaking. Discovering techniques and machines, sharing knowledge by demonstrating, exploring crazy ideas, innovating through debates as well as trial and error. Locally, CENTRINNO's partners are creating bridges between the transitioners, the makers, the crafts, and the neighbours, opening collective spaces for emergence. Spaces can be ephemeral, but shared practices that remain inside, embodied in the heart of participants, are a source for future research, creation, and reflection; they are something more substantial and will prompt future action and pollinate new projects.

The collaborative work done for the development of the exhibition 'Poblenou Fàbrica / Fabrica' in Barcelona^[33-35] was intense and gave an illustration of the diversity of experiences that can be generated locally to foster dialogues and rethink the future of a neighbourhood. Cooperating with the city and other stakeholders, the Barcelona team hosted the exhibition in an old industrial building transformed to be an active public space, called CA l'Allier. The narrative of the exhibition was built on top of years of investigation as well as the initial activities of the CENTRINNO project. The Fab Lab Barcelona team made the event participative and accessible for a diversity of stakeholders, by:

- Positioning the youth as active designers of their futures, valuing innovative solutions made by students and teachers from vocational schools within Catalonia, in collaboration with local initiatives.
 - Creating a series of distributed open workshops with local fabrication labs and craftspeople where participants could discover the art and feel behind each step of the fabrication processes and be immersed in the artisan's passion.
 - Creating common spaces of conversations inside the community. Sharing viewpoints, progress, feeling, and reflections upon the past, present, and future, co-designing a future agenda for upcoming years.
- One important point that worked well in this process was to build trust within a wider network, and share roles and responsibilities, giving legitimacy to the idea of a network and valuing the importance of 'distributing the network'. The narratives and values of the exhibition, as well as the care and respect of the community stakeholders, permitted the emergence of a network for productive spaces that is actively engaged in co-creating a future that extends beyond the conclusion of the CENTRINNO project.
- Organising participative embroidery and woodcraft workshops, offered specifically to local artists, experts, and collectives of craftspeople as well as the general public, providing the organisational support to co-produce creative artefacts, share, and learn.

Lesson learnt 2: **Don't under-estimate the importance of researching for fairer and more inclusive models of governance for Fab City Hubs**

Fab City Hubs are places of confluence and connections among different actors and resources. Governance models and approaches are at the core of these collaborations. While digging into fairer and more participative models of governance, people realise that it is not an easy, one-way journey. To make cooperation work, clear rules of engagement might need to be established as well as a facilitation structure with dedicated time and resources allocated to the management of stakeholder engagement, decision-making processes, and the development of collective missions and associated program of activities. Thanks to the CENTRINNO project, local FCHs have been able to showcase what can be achieved when people spend their energy activating and consolidating community engagement. In Tallinn, participatory budgeting was developed in 2020 to promote the engagement of citizens in the making of their own neighbourhood. Each district had an allocated budget and additional support to deploy community initiatives, using facilities that are public use and free to access.

Fab City Hubs can also experience the difficulties that come with participation in transformation processes, such as divergences, resistances, tensions, disengagement, and opacity. During a collective gathering in Geneva, partners were invited to listen to an open talk about the development of La MACO^[36] in the industrial zone of Charmilles, with exceptional testimonies from three core stakeholders engaged in the governance process: Cristina as manager of an organisation that will be onsite and contribute to the governance of the place; Matthias from a cooperative of

the creative sector that support access to production places by managing the temporary use of abandoned building, commissioned by the city to support the project; and finally, the former project manager of La MACO, employed to coordinate and support the development of the project.

They stressed important takeaways:

- Developing a technical expertise on the reuse of abandoned buildings is essential to be able to coordinate the regenerated area and engage with creatives, artists, and designers.
- Having dedicated time with external coaching is recommended to support the team in adopting horizontal modes of governance.
- Patience is required for mediating between internal and external stakeholders of the area that might show resistance towards a collective project.
- Offering free rent for five years is clearly helpful for the development of such projects, but various hidden costs must be anticipated, such as building rehabilitation and facilitation.

Governance models and practices will evolve across time in spaces such as Fab City Hubs. Observing the changes, giving a voice to people engaged with the space, and finding time to regularly rework the processes cannot be an option if the goal is to reach diverse, fair, and transparent practices.

Image 24. Debating in LA MACO,
La Manufacture Collaborative,
Geneva team.



Lesson learnt 3: Building up an arena for glocal interactions

Image 25. *Distributed Consortium Meeting in Blonduos, Icelandic Textile Centre.*

As introduced in the CENTRINNO Framework, Foster & Swiney (2020)^[37] defined the term 'Glocalization' as processes that connect the local to the global, and the global to the local, as processes that are multi directional and allow for cities and international actors to interact and influence each other. During the three and half years of CENTRINNO, partners were able to foster such interactions throughout the time spent together. The working plan of the project established clear moments and formats that shaped the joint experiences lived by partners. The iterative process in which pilots created their journey was composed of an alternance between the development of local missions and a dedicated time to reflect collectively on them. Throughout the process, bi-weekly meetings were set up between partners, and additional working groups were hosted by concept owners to support pilots in their development. Partners opted to use a Slack Channel to foster asynchronous exchanges within the CENTRINNO network.

If you ask partners about their best moments of interaction, they would likely talk to you about the CENTRINNO consortium meetings; likewise, they might share their experiences travelling to local community events or to global dissemination events such as the Fab City Conferences^[38] or the TP4EU, a first event gathering third places for Europe in Montpellier in June 2023^[39]. Such experiences were built with care and created real moments of discovery and peer-learning exchanges. As an example, partners came with the idea of creating a distributed consortium meeting. Three places were chosen: Blonduos, Paris, and Milan. A joint program of activities was co-constructed with customised visits and events during the same

week. During a first workshop entitled 'The Hubs - They Are A Changin - or how FCHs change pilot areas', participants looked at infographics of their activities and reflected on the changes produced in their urban environment through joint action (including the use of tools and project resources) and, in particular, they reflected on how the implementation of Fab City Hubs might affect the focus areas and cities in the future. While Blonduos participants visited textile factories, discussed learning ecosystems and experienced traditions such the Icelandic morning Hot Bathing ritual, in Milan, partners walked through the Tortona district discussing local circular economy stories and policies. At the same time in Paris, partners walked through the 18th district visiting open spaces and urban agriculture initiatives, questioning how heritage could help to reinvent the urban food system. All came back from the parallel events with closer connections with each other and inspiring experiences for the next steps of their pilots. Opening and closing online sessions facilitated peer-learning exchanges across locations as well as social media groups created for the occasion.



CONCLUSION - GOING FURTHER

Three questions to ask ourselves when engaging with action-research on Social Inclusion

- How can we enhance our ability to listen to the unique qualities of a place and understand the diverse visions, needs, and aspirations of the people involved?
- How can we promote participative decision-making processes, recognizing that they can be potentially time-consuming, while ensuring inclusivity and transparency?
- How can we learn from others across our own boundaries (cultural, economic, territorial...)? How can we benefit from global knowledge exchange while preserving cultural diversity?

Feedback from the authors on the cooperation in CENTRINNO

The CENTRINNO mission approach helped us to operationalise concrete actions in the short-term, while consolidating the vision development and better navigating medium and long-term impact. The three iterations with sprints of activities and reflective moments worked well for such a project and we would like to continue to work with this methodology, ensuring a variety of moments for stakeholders to take part in the process.

Opening new horizons for future research

When envisioning future actions related to engagement and social inclusion in the context of Fab City Hubs, three core axes can be mentioned:

- **Inclusivity: From value to labs practice:**

Communities need to learn how to foster environments where everyone feels valued and included, ensuring that diverse perspectives and voices are not just welcomed but actively sought out.

- **Sense of belonging and healing places:**

Community members are welcome to share fears and a desire to act together, even when things are wrong outside.

- **Viability and presence in the long run:**

Even if physical spaces can be ephemeral due to architectural and political realities, it is crucial for people's well-being that neighbourhoods maintain spaces of expression, keeping the energy of the neighbourhood alive.



CONCLUSION



In this chapter, we propose to reflect on the project's main findings by sharing three views on the legacy of CENTRINNO. It begins with a dialogue from Alex Pazaitis about the impact of the project, highlighting the importance of the impact assessment methodology and the 10 organisational principles that were analysed in the project as emerging pathways of change in regenerative neighbourhoods. Then we propose a shared reflection that was written by Jonathan Even Zohar, Hester Dibbits, and CENTRINNO pilots' partners during the project regarding critical insights on how to rethink our relation to production. Finally, we give the word to Tomas Diez and Marion Real, scientific coordinators of the project to wrap-up with the main findings of the project and share new perspectives to make neighbourhoods as hubs of innovation for regenerative urban futures.

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IMPACT DIALOGUES: HOW TO OBSERVE THE TRANSFORMATION OF ORGANISATIONAL PRACTICES?

by Alex Pazaitis, researcher at the Nurkse Department and a core member of the P2P Lab in TalTech to frame and monitor the impact assessment of the project.

CENTRINNO is a project envisioned to enable regenerative, sustainable transformation. It has been designed, planned, and is being managed and implemented to serve this vision.

The CENTRINNO impact assessment approach focuses on processes of change in terms of human behaviours, actions, and relationships that contribute to the desired impact in the long-term. In other words, the **project's activities are understood as processes of activating and sustaining city-level transformation**, as envisioned by the CENTRINNO approach. For instance, instead of measuring how much CO2 emissions or use of virgin materials has been reduced, how many jobs have been created, or heritage sites renovated in the span of the project, we turn our attention to the types of **individual and organisational changes of actions, decisions or webs of relationships that can lead to and sustain lower CO2 emissions and virgin materials' use**, alongside employment opportunities in sustainable forms of economic and cultural activities. The CENTRINNO evaluation methodology is **values-based and normative**, in the sense that it is based on certain assumptions for what is a good life in cities and how we can make that happen. These assumptions are provided by the CENTRINNO framework and are made explicit through the methodology and theory of change.

The Impact assessment methodology

The CENTRINNO impact assessment framework focused on the monitoring and evaluation of three continuous **processes of change**, spanning from pilot-level to specific project resources and, finally, project-level, as described below:

1. **Outcomes (pilot-level):** This level concerns the monitoring and evaluation of the achievement of outcomes, understood as changes in terms of behaviours, relationships, and actions of the people, groups, or organisations with which the pilots work directly and seek to influence (boundary partners). Each pilot team determines at the beginning of every sprint a number of outcome challenges, along with progress markers reflecting graduated descriptions of achievement of these outcome challenges.

2. **Strategies (resources-level):** This level is related to the processes of experimentation carried out by the core CENTRINNO platforms. The evaluation reflects the effectiveness of the platforms' tools and methods in enabling the achievement of pilot outcomes, while building the necessary organisational capacities to maintain and improve these outcomes.

3. **Organisational practices (project-level):** This level focuses on the monitoring and evaluation of the project's performance in implementing the CENTRINNO approach with the pilot cities. This is done through the documentation and assessment of patterns of organising (organisational practices) that enable the transformation of city districts into Fab City Hubs. This level offers insights into the potential of maintaining and further advancing the project's outcomes and the systemic impact this may entail.

The contribution of the evaluation is a set of reporting tools such as the Outcome Mapping sheets, Outcome Journals and Strategy Journals^[40] that facilitate learning and the development of self-evaluation capabilities. The documentation of organisational practices is a reflexive process, involving key project partners to understand how the various stakeholders involved in city transformation coordinate these capacities for change. These practices span from access to and organisation of space, mapping and documenting people and resources, creating new resources, and building community. In other words, the organisational practices describe what people need to do for the project's long-term transformative vision to take place.

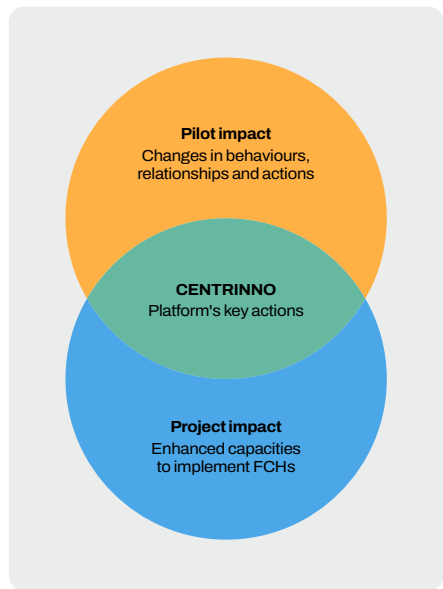
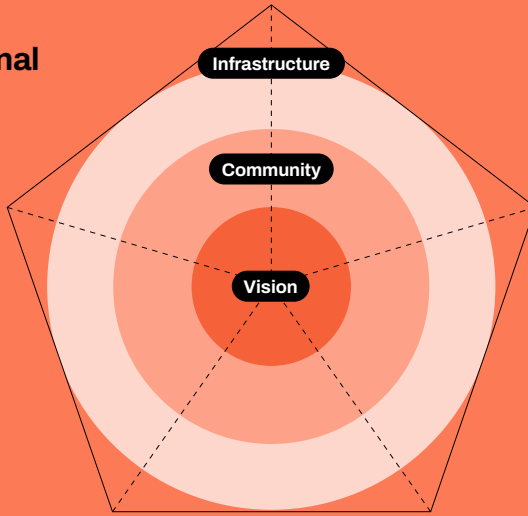


Image 27. Spheres of evaluation of the CENTRINNO project.

Table of Organisational practices



Crafting the Vision

1. Activating interactions and facilitating connections and collaborations among the different actors active in urban environments.
2. Access and connection to information, communities, projects, and initiatives related to the local distributed creative and productive ecosystems.
3. Embracing emergence of new needs, projects, and organisations through open and resilient structures amidst rapidly changing and hazardous environments.
4. Engaging with and creating new institutions through experimentation and prototyping of diverse assemblages of actors and functions.

Building the Community

5. Bottom-up deliberation for defining the needs and conditions for a community coalescing around a physical space.
6. Enabling participation in expression and debate through inclusive approaches that give space to citizens and local communities.
7. Facilitating community action, while orchestrating a common vision.

Establishing the Infrastructure

8. Incremental design of space to create room for real and situated needs to emerge from the community.
9. Create awareness around convivial forms of innovation, manufacturing capabilities, creative citizenship, and social connections.
10. Multi-layered coordination combining physical spaces and facilities, with digital communication for diverse communities.

When working with real people and communities operating in their situated context, a very important perspective is to interpret data as traces of human activity, riddled with all the nuances and imperfections of human nature.

Data collection and analysis were merely a starting point of the CENTRINNO journey in the pilot cities. We collected data on whatever we could observe, request from the pilot teams, or document from stories or other sources.

However, **the most important part of the experimentation process was developing a form of documentation that can convey the thick reality of the context from which the data comes.**

The Impact assessment methodology captures the learnings of a journey from data, representing traces of human activity, to stories, through which these activities acquire meaning, and, finally, to tools, that organise the pilot experience to be exchanged, shared, reflected upon, and further developed. Tools in CENTRINNO are ultimately a form of communication across cities conveying the experiences and practices of developing and implementing Fab City Hubs.

The evaluation of organisational practices demonstrates the effectiveness of CENTRINNO tools in organising people, resources, and skills in different ways to effectuate urban transformation.

Image 28. Mapping Future Impact Scenarios in CENTRINNO.



How can the results be accessed?

The results are available in the deliverable from WP5, synthesised in the CENTRINNO Framework^[41].

RETHINKING OUR RELATION TO PRODUCTION

by Jonathan Even Zohar, Hester Dibbits, and CENTRINNO's partners

Collective reflections emerged throughout the project. Sometimes they were traced in reports, deliverables, blog posts, or platforms. Sometimes they were oral or remained unused. The following text was written during the project. It gives a deep reflection on our way of interacting with productive environments and invites us to think beyond limits and borders.

The initial **mass industrialisation** at the local level changed people's everyday experiences. On balance, people lived longer and healthier lives. Industrial entrepreneurs created companies which provided housing and schooling for workers and their families, which also led to the development of new leisure cultures (i.e. football, swimming, etc.). But they also - for example - in some places paid workers with gin, stimulating alcoholism, and strengthened certain gendered roles. How do we value the industrial revolution today? Was it 'good'?

The actual process of industrial production was (and still is) fueled by **exploiting resources**, initially an endeavour of European imperialism, and later by other Imperial nations and multinational companies. The short-, mid- and long-

term environmental impacts can be found all over Europe and beyond at the local level. Similar to a parallel development of European colonial extraction of natural and human resources, this too has left strong traces in memories and culture.

The effects on people in particular, especially - but not only - the workers, can be explored by looking at the social history of labour movements and unions. Likewise, it can be seen when researching the different ways in which people alive at the time, after the fact and now, attribute values (positive and/or negative) to the very factories and companies where they worked. How, and why have (some of) the workers unionised? When the factories left, what kind of responses were there (e.g. nostalgia, pride)?



Image 29. *Living Archive Stories: AIRPLANE FACTORY FOKKER*, Laura van Roemburg with Museum Amsterdam Noord.

The 20th and early 21st centuries have seen many changing socio-economic structures of manufacturing in Europe (e.g. centralisation, liberalism, offshoring, rise of services-economy, globalisation, digitisation) and these have all impacted and continue to impact the local social fabric. Both the liberal and communist/socialist systems have sought to reduce the costs of labour, be it through repressive measures or through the import of cheap labour through migration. These structures have been experienced differently by different stakeholders.

Parallel to this, the scientific and technological breakthroughs of fossil fuel extraction and consumption radically changed the way societies around the world 'consumed' energy, and introduced within the timespan of 2-3 generations,

wholly new ways of living in the world, from plastics, to the anti-conception pill, to industrial killings and genocides, to cars, aeroplanes, the internet and Artificial Intelligence. None of these would have been imaginable without the seemingly endless supply of energy found in fossil fuels.

Beyond the general themed narratives, lie the endless ways in which local and perspectival variations implore us to (re) tell the history of the Industrial Revolution across Europe. For horses, for example, this transformation has been detrimental, let alone the introduction of mass scale food productions, and how these reconfigured societies as well as human/non-human relations. Given this context, so many voices and/or perspectives are over- and/or under-represented.

The established narrative of the Industrial Revolution as a sudden event born out of Europe, moreover, is an Eurocentric narrative. It often amplifies the creativity and ingenuity of first British inventors and practitioners, and then other (Western) Europeans, while it leaves out the importance of a global flow of ideas, negative aspects such as pollution, new inequalities, and much more. Considering an established cultural heritage text like the one on the European Route of Industrial Heritage^[42], and reviewing the questions above, shows there are many opportunities to deepen our understanding of the 'Industrial Revolution'.

Looking then at the Industrial Revolution means we are applying different ways of dealing with the past in the present. This requires a constant critical re-examination of our own perspectivity and voicedness. As we have seen with the rise of colonial and post-colonial studies the rise of more critical and reflective voices on the ways in which different people and actors deal with the past in the present, **we need to renew our attention to new and unheard voices in the context of industriality**. This helps us to understand and cope with the impact it has had and will have, and to raise awareness of the negative effects of the Industrial Revolution (e.g. climate change, deforestation, environmental pollution, decay in biodiversity, etc.) to challenge dominant historical narratives.

Every Fab City Hub is situated in or around a site where industrial production used to take place. The range is wide. The sites include former shipbuilding yards, meat-processing plants, textile centres and more. The production on these sites has also not

been static over time. Factories came and went. Regimes and economic (production) policies came and went. The very notion that these sites are currently 'post'- or 'former'-industrial could be problematised, as Europe's 'deindustrialisation' can hardly be disconnected from the processes of 'offshoring' and/or 'outsourcing'. Still, looking at these places as examples of built environments which present a past localisation of a process of labour-intensive and highly polluting, energy-consuming production, may indeed offer new inspirations. The histories of these places may not be enough to achieve that. We need to explore the many ways in which the consequences and legacies have become entangled with these places. How do we uncover small personal memories of manufacturing, histories of working life and culture in and around these factories, and/or impacts on human and non-human livelihoods affected by evolving supply-chains and material extractions?

Creating awareness around convivial forms of innovation, manufacturing capabilities, creative citizenship and social connections has been signified with increasing importance during the CENTRINNO project.

In the present, we note how these sites are contested as they are subjected to economic, social, cultural, environmental, and political changes (e.g. gentrification, mass tourism, migration, pollution, etc.) These contestations are not theoretical. Continuous negotiations take place between multiple stakeholders with conflicting interests and agendas. They create stress within individuals, and tension and power struggles among

groups in society. **These contestations exist because of different expectations people may have for the future.**

What should these places become? Who gets to decide this? What kind of changes can be agreed upon? Who are the stakeholders? Is it enough that people involved talk with each other, or are there more people whose voices are not heard? What about those not born yet? What about non-human stakeholders? As we increasingly seek to 'design our way out' in the face of clear, present and potentially apocalyptic danger, how can we find the potential of the past for regeneration transformations?

Discover other reflections from partners in the CENTRINNO Blogposts.^[43]



Image 30. *Living Archive Stories:*
Cobbler Marleen, Joshua Abebrese.

A LEGACY TO MAKE NEIGHBOURHOODS AS HUBS OF INNOVATION FOR REGENERATIVE URBAN FUTURES

by **Tomas Diez and Marion Real**, CENTRINNO Scientific Coordinators

The CENTRINNO project has emerged as a dynamic platform, bringing together world-leading organisations across various fields such as innovation, design research, citizen engagement, heritage, community activation, and technology. As the project concludes, the collective aspiration of all CENTRINNO partners is encapsulated in the handbook—a repository of knowledge, insights, and stories. Beyond preserving the project's legacy, the handbook is a beacon for those who were not part of CENTRINNO, offering them the opportunity to harness the knowledge generated during the project and catalyse impactful transformations in their local communities. It envisions the metamorphosis of neighbourhoods into productive and regenerative centres, redefining urbanity in the 21st century. This handbook presents a collection of outputs we will see in detail, which we hope can outlive the project and continue helping to reclaim the power of neighbourhoods as activators of urban transformations.

The essence of the CENTRINNO Framework lies in its ability to integrate diverse knowledge into a shared innovation space. Here, different methods and tools converge, evolving into new utilities that foster a holistic approach to city innovation. By collecting and aligning different dimensions, the framework becomes a catalyst for innovative urban solutions that work cohesively towards a common goal.

CENTRINNO Cartography emerges as an indispensable tool to explore local contexts. It facilitates in-depth analysis and documentation, providing a comprehensive view of challenges and opportunities within neighbourhoods. Designed for innovators, designers, change-makers, and local communities alike, this tool aids in identifying resources and addressing issues effectively. It becomes a navigational guide for those seeking to understand and engage with the intricacies of their surroundings.

At the heart of the project, the CENTRINNO Living Archive stands as a storytelling and story-sharing tool. It captures the cultural and heritage value discovered in the nine pilots, preserving the narrative of each project and its impact on the communities involved. This archival resource serves as a testament to the richness of cultural exploration embedded within the CENTRINNO initiative.

The Fab City Hubs Toolkit, or CENTRINNO Creative Hubs Toolkit, stands out as a fundamental resource for innovation spaces globally. This toolkit empowers these spaces to broaden their outreach and enhance collaborative processes within their unique contexts. It serves as a bridge, connecting different hubs around the world and fostering a network of collaborative innovation.

The CENTRINNO School embodies the collective educational efforts of the project, housing a repository of resources and learning experiences. As a dynamic collection, it continuously grows with more vocational training programs, integrating creative thinking and advanced technologies. The school serves as a knowledge hub, fostering the development of skills essential for driving innovation in communities.

CENTRINNO relies on a Network of Fab City Hubs and associated partners engaged in fostering bottom-up deliberation, enabling participation in expression and debate through inclusive approaches that give space to citizens and local communities, facilitating community action, while orchestrating a common vision.

The relative success of CENTRINNO can be attributed significantly to the collaborative spirit of all partners. Their generosity and commitment to finding innovative solutions

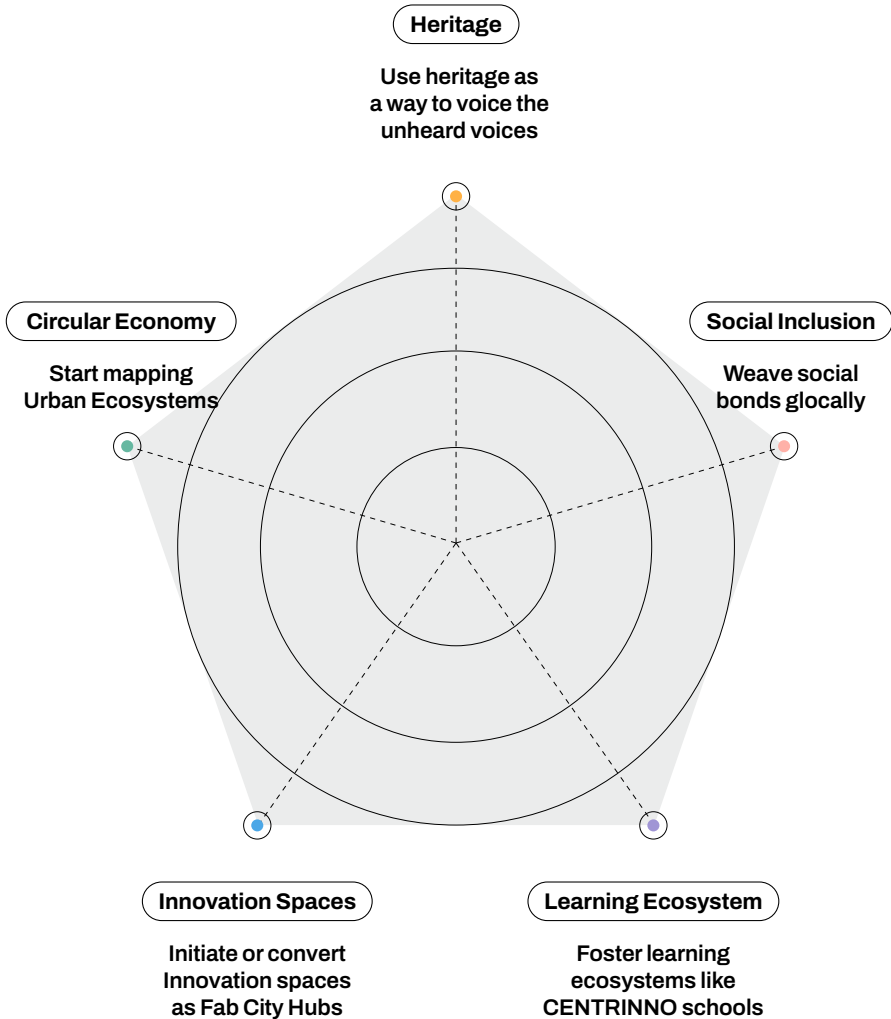
for complex urban issues have been pivotal. The book and associated blueprints, the living archive, school, cartography, network and Fab City Hubs toolkit collectively represent the culmination of shared efforts, providing tangible resources and insights for addressing the multifaceted challenges of our cities.

As CENTRINNO concludes its transformative journey, it leaves a lasting imprint on the landscape of urban innovation. The collaborative ethos embodied by the partners has not only fuelled the success of the project but also laid the groundwork for a paradigm shift in addressing urban complexities. The handbook, serving as a bridge between the collective knowledge of the project and communities worldwide, invites a broader audience to partake in the journey of neighbourhood transformation.

In essence, CENTRINNO's legacy is not confined to the boundaries of the Fab City Network; it extends an invitation for global communities to embark on their own collaborative journeys. Through shared knowledge, innovative tools, and educational resources, CENTRINNO envisions a future where neighbourhoods evolve into dynamic, regenerative hubs, a testament to the enduring impact of collaborative endeavours in shaping the urban landscapes of the 21st century.

The work carried out by the CENTRINNO partners sparks enthusiasm, paves the way for different kinds of socio-economic development, and kindles hope in the face of changes by empowering each place and individual.

Join the network and research for more regenerative futures



● Circular Economy

- Start with mapping all existing circularity initiatives around your neighbourhood to get a feel for the current momentum around the topic.
- Continue searching for circular makers which might not strike you as necessarily 'circular' - such as tailors, carpenters, or others with relevant skills.
- Get in contact with makers and ask them about their experience with the circular economy - what are they doing already, what are their barriers?
- Organise a round-table to invite circular makers and policy makers to discuss their needs and challenges.
- Create a training program for circular design thinking with students and makers.
- Map the city's material flows to zoom out and learn more about the waste management system of the entire urban area.
- Organise a circular makership exhibition to give visibility to circular businesses.
- Pilot a circular symbiosis by connecting waste donors and willing makers who are interested in using secondary materials for a small product line.

● Innovation Spaces

To inspire, to organise, and to materialise the setting up and opening of innovative typologies such as FCHs, it is important to foster productive and sustainable action, such as cultural and artistic works but also productive and manufacturing activities for citizens at large.

● Heritage

- Take a dynamic, integrated, and practice-centred approach to 'heritage'.
- Find a starting point to investigate, but be open to observations which may completely change your topic.
- Always dig deeper; whose voices are heard, whose are missing?
- Work as a heritage curator.

● Social Inclusion

- Empathise and embrace diversity, no-one left behind.
- Be aware of the diversity of shared governance models and learn by practice.
- Take part in global networks to learn, exchange knowledge, create impact, and liveable experiences.

● Learning Ecosystem

- Make sure you have the knowledge to teach both technical and other transversal skills that match what your audience needs.
- Cultivate trust and work closely with a school, an educational institution or the public sector.
- Understand what schools really need in practical terms, and remember they often have a lot going on.
- Identify your role and a niche among the several diverse stakeholders in education, then remain committed to fulfilling that role.

The CENTRINNO Blueprints and Policy Development: Guidelines for Replicability and Wider User

In parallel with the publication of the present book, a comprehensive visual guide to fostering/ nurturing the development of regenerative neighborhoods was published. The CENTRINNO Blueprints and Policy Development: Guidelines for Replicability and Wider User delves into the intricate details of the CENTRINNO framework, unveiling insights into the successful replication of CENTRINNO's core platforms and the significant outcomes achieved in the nine pilot cities. In addition to showcasing the digital and theoretical infrastructure, methodologies, and outcomes generated by the partners, the report extends its reach to policy making, offering recommendations for a people-centered approach to urban development.

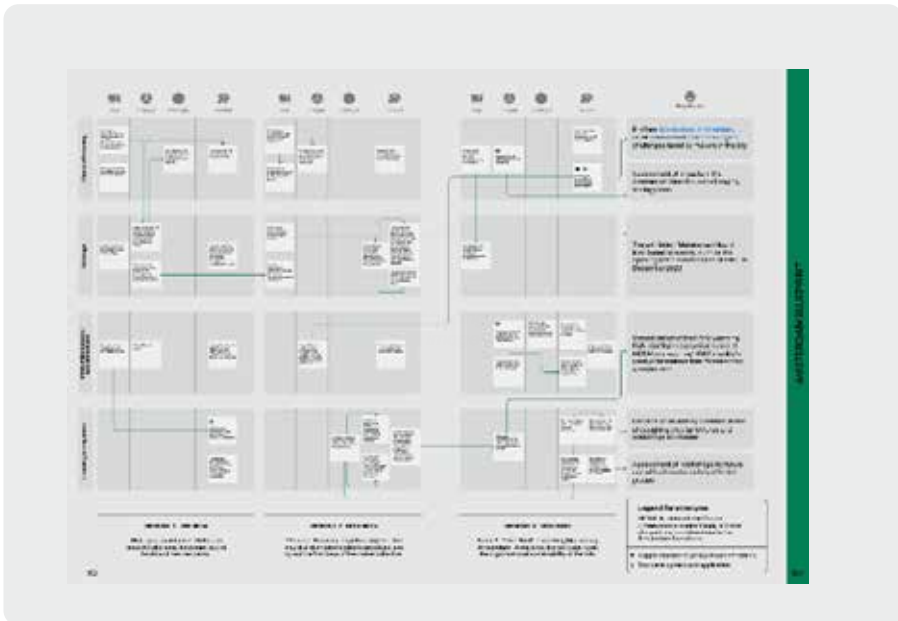


Image 31. Amsterdam Blueprint from The CENTRINNO Blueprints and Policy Development: Guidelines for Replicability and Wider User



Image 32. The CENTRINNO Blueprints and Policy Development: Guidelines for Replicability and Wider User

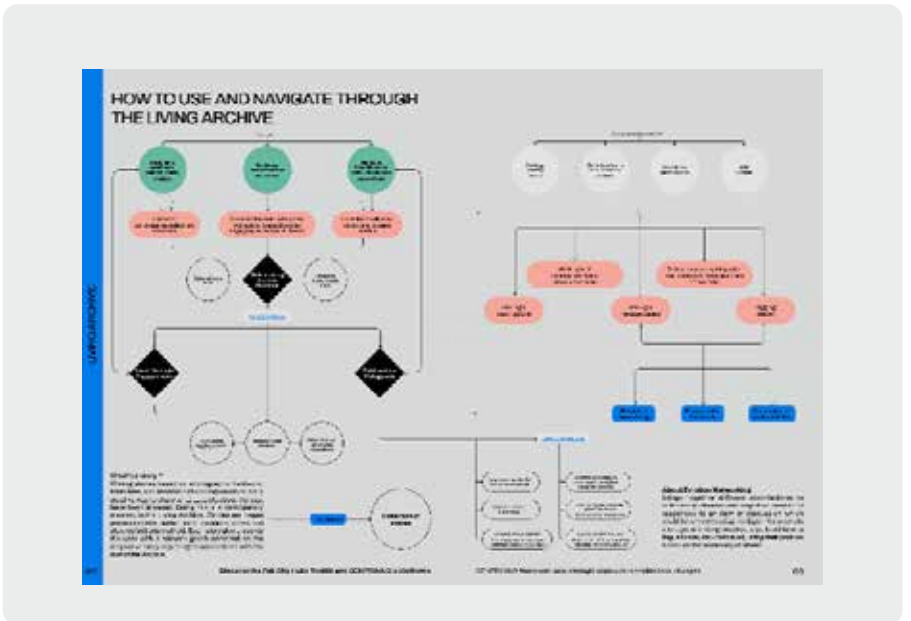


Image 33. Living Archive Blueprint from The CENTRINNO Blueprints and Policy Development: Guidelines for Replicability and Wider User

ACRONYMS AND ABBREVIATIONS

Acronym	Description
CENTRINNO	New CENTRAlities in INdustrial areas as engines for inNOvation and urban transformation.
CE	Circular Economy
CPH	Creative and Productive Hub
EU	European Union
FCH	Fab City Hub
MFA	Material Flow Analysis

GLOSSARY

Term	Definition
CENTRINNO	New CENTRALities in INDUSTRIAL areas as engines for inNOvation and urban transformation.
Circular Economy	Circular Economy is a CENTRINNO Key Concept, that emphasises a transformative approach to resource management, promoting sustainability and reducing environmental impact.
Community	Community is one of the main action areas identified in CENTRINNO defined as groups of people that may come together locally or globally and over a period of time form a community based on their interest or shared concerns. The project encourages inclusive communities of practice and facilitates the engagement of local stakeholders.
Emotion Networking	Emotion Networking is an exercise created by Reinwardt Academy, that provides insights into complicated interplays between emotions, interests and different sorts of knowledge, and between items of heritage and people.
Fab City Full Stack framework	The Fab City Full Stack is a framework that helps cities and regions interpret the Fab City challenge and guides them to implement it in a multiscalar and ecosystemic approach.
Fab City Hubs	Fab City Hubs are open spaces for city making. They work as a physical interface to connect actors within a Fab City Prototype (usually a neighbourhood) and foster collaboration and exchange of skills and knowledge between local communities in a given territory. (FCH Toolkit GitBook)

Term	Definition
Fab City Hubs Network	The (EU) Fab City Hub Network refers to the group of nine European Pilot cities, members of the CENTRINNO consortium, that are currently testing and implementing the first innovative models of FCH in their local regions. Both networks contribute to consolidating the model of Fab City.
CENTRINNO Framework	The CENTRINNO Framework is a resource created during the CENTRINNO project to support partners in consolidating their interventions in local territories. It describes a methodological approach to neighbourhood regeneration composed of three action areas, five key concepts, and associated tools and platforms.
Heritage	Heritage is one of the CENTRINNO Key Concepts, defined as a notion, a label applied to items from the past, in the present, toward the future.
Key Concepts and concept owners	The CENTRINNO Framework defines five key concepts which are Circular Economy, Heritage, Innovation Spaces, Learning Ecosystems and Social Inclusion. For each concept, one organisation partner was responsible to define and operationalise the concept through the design and testing of tools and strategies, during the project. Those organisation partners are called 'concept owners'.
Infrastructure	Infrastructure is one of the main action areas identified in CENTRINNO focusing on the means and local capacities to achieve transformations towards regenerative neighbourhoods and development of Fab City Hubs.
Innovation Spaces	Innovation Spaces is one of the CENTRINNO Key Concepts, framing physical and hybrid spaces in which innovative productive activities are experimented with from the bottom-up, based on collaboration between different stakeholders and a democratic access to technology and knowledge.

Term	Definition
Learning Ecosystems	Learning Ecosystems is one of the CENTRINNO Key Concepts, previously entitled Vocation Training. This Key Concept looks after the importance of learning in regenerative communities and Fab City Hubs by designing training programs to acquire practical skills and a ‘maker’ mindset. Focusing on vocational students, adult professionals, and citizens, in order for them to develop skills for addressing environmental and knowledge issues.
Maker and craft cultures	CENTRINNO project is led by partners who value the maker and craft cultures, as a community of people who design, make and unmake, share in an open-source way about fabrication processes, questioning the role of art and technology in the current societal transformations.
(urban) Material flow diagrams	Material Flow Analysis (MFA) is a method to quantify the inputs and outputs of physical or non-physical resources (energy, materials, goods) that flow through a predefined system (here - a city). MFAs are used to understand a city’s consumption of different types of materials from a higher level, as well as the types of waste it is generating.
Micro-Mission	Micro-Mission is a term used in CENTRINNO as part of the experimentation with the nine pilots’ cities as a unit of action regarding each of the five CENTRINNO key concepts. Pilots organised three sprints during the project with dedicated micro-missions for each concept according to their local context.
Neighbourhood	A neighbourhood is generally defined as a geographical area within a city, typically characterised by shared physical proximity, social interactions, and a sense of local identity among its residents. It is a fundamental building block of urban and suburban environments, encompassing a cluster of residences, businesses, public spaces, and community amenities. As intermediate scales between domestic places and the city, they are viewed in CENTRINNO as appropriate playgrounds for sharing, synergizing, and experimenting with change.

Term	Definition
Organisational practices	Organisational practices were defined in CENTRINNO as skills, competences, and processes necessary for supporting the development of regenerative neighbourhood processes in the long-term.
Platforms	Tools developed during the project supporting pilots in implementing context-driven micro missions for each of the five key concepts. It counts digital platforms (the CENTRINNO Cartography, the Living Archive, the Fab City Hubs toolkit), an elaborated approach (CENTRINNO School) and the Network.
Pilots (Pilot teams)	CENTRINNO run an experimentation with nine pilot cities and associate pilot teams taking part in the different micro-mission on the project.
PITO-DIDO	'Product In Trash Out towards Data In Data Out' is a terminology used by Fab City to emphasise locally-circular economies that foster data rather than product exchanges.
Post-industrial cities	Post-Industrial cities refers to the cities that are being regenerated after industrial uses of their lands.
Research Diary	Research Diary in this document refers to an essay written by the concept owner to situate, illustrate, and reflect on their research during the project.
Social Inclusion	Social Inclusion is one of the five Key concepts of CENTRINNO, addressing the dimension of inclusivity in the process of neighbourhood transformations.
(Industrial) Site Area	Buildings or locations in cities that have once been dominated by industrial functions. They can include abandoned brownfields or derelict infrastructure, as well as areas that have found new functions and uses for industrial heritage buildings. Such sites are present in current neighbourhoods in or outside cities.

Term	Definition
Territory - Place	These two words are used in the book to refer to the studied areas (site area, neighbourhood, cities, bioregions) as geographical spaces qualified by natural and cultural particularities and potentially by administrative perimeter defined by their own national context.
Toolkit/Tools	A carefully curated selection of tools designed to meet specific needs. Each tool is described in terms of its potential purposes and/or outcomes and how it contributes to an overall objective. Depending on the context, different combinations of tools can be used to achieve specific goals. It is important to specify that in this context the term ‘tool’ is a general concept encompassing methods, workshops, digital platforms, various event formats, and school programs, best practice activities and event formats that can be replicated and adapted by others.
Urban ecosystems	In CENTRINNO, industrial and urban ecosystems are understood as complex and interconnected systems that embrace people and their communities, ecological systems, as well as industrial systems. Industrial and Urban Ecology are fields of research that observe the metabolism of such ecosystems.
Vision	Vision is one of the main action areas identified in CENTRINNO focusing on defining the common grounds and envisioning the futures of the investigated area within the community. Mapping is one of the shared activities that is recommended by CENTRINNO partners to engage in regenerative processes in the early stage.

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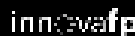


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